CASCADE NATURAL GAS CORPORATION

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

2011
Integrated Resource Plan

December 15, 2011

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Section 1

Executive Summary

Cascade's resource planning continues to focus on ensuring that the Company can meet the needs of our firm gas sales customers in a way that minimizes costs over the long term. Although some pipeline area zones indicate potential shortfalls, in aggregate, through 2012, Cascade has sufficient upstream pipeline capacity. However, as we move past the 2012-2013 winter heating season, primarily as a result of Cascade's growth in its residential and commercial customer base, Cascade's capacity will fall short of its design peak day demand forecast. As a result, Cascade is entering a period where it will need to acquire additional resources to meet the growing needs of these core customers. The following summarizes key findings from this plan.

Adequacy of Gas Supply

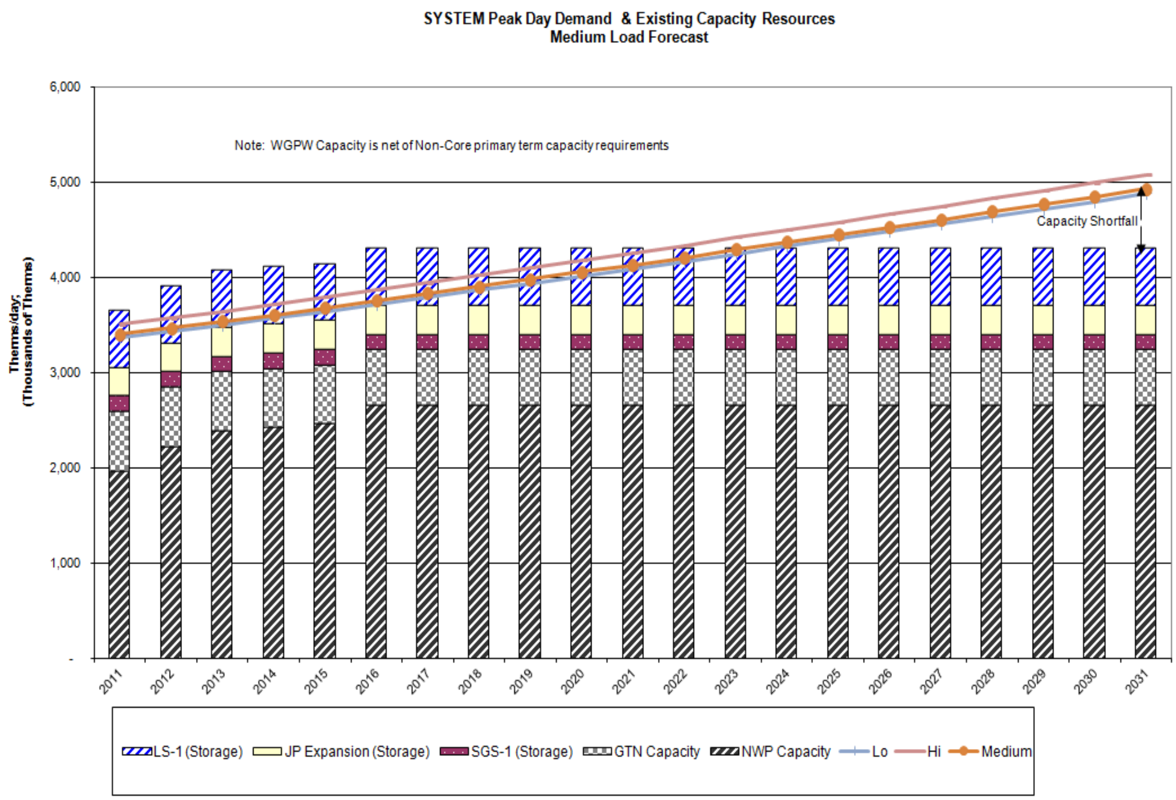
Physical gas supply is expected to be adequate to meet growing demand in the Pacific Northwest and North America. New supply development technologies continue to provide additional resources in British Columbia and the Rocky Mountain regions. Shale gas from the Horn River Basin, Montney and Marcellus are likely to keep sufficient supplies available in North America. Several sources believe that shale is set to comprise more than a third of the US production by the mid 2020s. Well performance in the Horn River play has improved over the past few years. Although players must overcome a multitude of challenges, including a remote operating environment, water availability and disposal issues, infrastructure constraints, and high upfront capital costs, Canadian production and exports are anticipated to decline.

Still, due to on-going financial and regulatory issues, there is still some question as to whether or not a new pipeline will transport Alaskan gas into the North American market, or if it will be completed within the Company's planning period. The Mackenzie Gas Project, which would bring gas from the Canadian Arctic to Alberta, has pushed out its start date to 2018 (from 2014) due to regulatory issues, incomplete financial arrangements and staffing shortages. The Alaska pipeline project, designed to deliver 4.5 (up to 5.9 Bcf/d under maximum compression) Bcf/d from Alaska's North Slope into Alberta and/or the US Lower-48, is not dead, with two competing projects still officially in the works. The TransCanada-ExxonMobil Alaska Pipeline Project is expected to file its draft Resource Reports to FERC in the coming months, although, like many projects—it may expand to include an LNG option. Still, Lower-48 shale development has called into question the ultimate need for this project but indicators are that eventually it will get done around 2023.

Load Resource Balance

During this planning cycle, Cascade continued to evaluate the impacts on both its load and resources and portfolio costs associated with its peak day planning criteria. Until the 2008 IRP, Cascade had historically utilized a system average of 65 heating degree days (DD) for its peak demand forecast as it represented the coldest day recorded in Cascade's 60 plus years of weather history. However, the Company had only experienced a 65DD once in its history (which occurred in 1968), and therefore commencing with the 2008 Plan, the Company modified its design day criteria to utilize the coldest day during the past 30 years. This modification reduced the peak day to 61DD which occurred as recently as 1990. The following graph shows the peak day requirements compared to the Company's existing pipeline capacity resources under the various load growth forecasts. Shortfalls in the 2010/2011 period will be met through citygate peaking resources.

Figure 1-A



Analytical Methods

Cascade continues to utilize the SENDOUT™ model to assist with the analysis of resource alternatives. SENDOUT™ is a linear optimization model that helps identify the long-term least cost combination of resources to meet stated loads. The model determines the optimal portfolio of resources that will minimize costs over the planning horizon based on a set of assumptions regarding resource alternatives, resource costs, demand growth and gas prices. Linear optimization models, such as SENDOUT™, are basically deterministic. In other words, they solve the "least cost problem" based upon the assumptions provided to the model. As a result, the Company, beginning with its 2007 IRP, expanded its uncertainty analysis through the purchase of Vector Gas™ (an add-on product) that facilitated the ability to model gas price and load (driven by weather) uncertainty. The Monte-Carlo functionality was integrated in SENDOUT™ Version 12.5, which is the platform that Cascade used to prepare its integration analysis. The Monte-Carlo modeling capability provides additional information to decision-makers under conditions of uncertainty. The Monte-Carlo analysis was used in this plan to test the physical and financial risks associated with the optimal portfolio from the basecase planning scenario. This tool provides a valuable enhancement to the robustness of the Company's resource planning.

Generic Resources

One of the purposes of Integrated Resource Planning is to identify an illustrative resource portfolio to help guide specific resource acquisitions. In this planning cycle, the Company considered a host of resource alternatives that can be added to its resource portfolio, including additional conservation programs, incremental off-system storage alternatives at MIST and AECO, additional transportation capacity on both Williams and GTN pipeline systems, several of the proposed pipelines to move Rockies gas to the northwest, along with on-system satellite LNG facilities, biogas, and imported LNG. Typically, utility infrastructure projects are "lumpy", since demand grows annually at a small percentage rate, while capacity is typically added on a project-by-project basis. Utilities often have surplus capacity and must "grow into" their new pipeline capacity, because it is more cost effective for pipelines to build for several years' worth of load growth at one time than to make small additions each year. However, the Company can minimize the impacts through the acquisition of citygate peaking resources which include both the supplies and the associated pipeline delivery for a certain number of days or through the purchase of other's excess capacity through short or medium term capacity releases.

Analytical Framework

Traditional integrated resource planning would include analyses targeted at identifying the optimal long-term resource portfolio to meet the demand of the gas utility's customers across a few customer growth and gas price scenarios. In this plan, Cascade's resource analysis includes 8 different scenarios that focus solely on gas utility operations. In addition to scenario analysis, Cascade performed two different kinds of Monte-Carlo analyses to examine a variety of risks as noted above.

Summary of Key Findings

- Cascade anticipates its core customer base will continue to grow over the planning horizon and annual throughput is anticipated to increase between 1.181% and 1.49% per year.

- The projected costs for natural gas have declined significantly and long-term prices are estimated to range between $3.75 to $6 over the planning horizon compared to the $8 to $13 forecasted in the 2008 IRP. This improvement to the long-term gas supply outlook is a stark contrast to the diminishing supply outlook that was prevalent during the development of the Company's 2008 IRP.

- The basecase results indicate energy efficiency programs with a levelized cost of 70 cents per therm or less are cost-effective over the planning horizon, with the price uncertainty analysis indicating that the levelized costs will likely range between 64 to79 cents per therm. However, if carbon legislation is established during the planning horizon similar to that described in Section 6, the cost-effectiveness limits could increase between 8 to 16 cents depending upon the level of the costs and the timing of the implementation.

- As described in Section 6, the conservation potential analyses indicate that over the 20 year planning horizon the technical potential associated with cost effective conservation measures is 23,193,554 therms in Oregon and 44,275,021 therms in Washington for a combined total of 67,468,575 therms.

- Even with energy efficiency programs, Cascade will need to acquire additional capacity resources or enter into other supply arrangements to meet anticipated peak day requirements, primarily due to continued growth in the company's residential and commercial customer base. On September 1, 2010 Williams announced that the Blue Bridge I-5 corridor project had been shelved, and with uncertainty surrounding the likelihood of Palomar being built, Ruby Pipeline is emerging as a possible transportation resource to bring Rockies supplies to central Oregon, via Malin and backhaul service on GTN. Ruby went on line this year and has been running at near capacity since its in-service date. Utilizing the SENDOUT™ resource optimization model, several scenarios were run to test the viability of acquiring Ruby capacity either based on existing recourse rates, discounted rates and via capacity release through a third party. Incremental and corresponding GTN Malin north capacity was also modeled at recourse (secondary firm) and higher pricing levels. Basin prices in the model over the 20 year planning horizon have Rockies trading at a slight discount to AECO, Malin and Sumas ($0.06 - $0.15). Regardless of the scenarios modeled, SENDOUT™ consistently selected Ruby capacity in a range of 17,000 to approximately 19,000 dths/day.

- Many of the proposed pipeline projects will not be viable resources for some time. In the interim, capacity shortfalls will be met through the use of peaking and citygate gas supply deliveries which will utilize third-party (non-Cascade) upstream pipeline transportation.

- Satellite LNG facilities that are located within Cascade's distribution system are also attractive alternatives. Satellite LNG may alleviate the need for incremental pipeline capacity and to the extent the facility could be strategically located on a portion of the distribution system, it could provide the further benefit of eliminating or reducing distribution system constraints. Cascade has considered bio natural gas (BNG) as an alternative, but at the time of this writing, there are no viable projects available to our distribution territory. Regardless, prior to any BNG supplies being added to the portfolio, gas quality issues will need to be satisfactorily addressed. In addition to Cascade, upstream pipelines, such as Northwest Pipeline are beginning to address gas quality issues regarding BNG. We will continue to monitor our market intelligence sources to see if viable BNG opportunities develop.

- None of the proposed LNG projects are within Cascade's distribution system. Many of the initially proposed LNG import facilities located in the Pacific Northwest (Bradwood Landing, Jordan Cove) would require backhaul capability or additional infrastructure on upstream pipelines in order to reach Cascade's distribution system. However, each of these facilities appears to be looking to export as opposed to import. This has made it questionable whether or not to include these as alternative resources as part of the 2011 IRP. Cascade was faced with a similar situation regarding LNG--prior to September 19, 2008, LNG supplies sourced at Kitimat were selected as part of the least cost-portfolio mix, however, on September 19, 2008, Kitimat LNG announced that the development focus of the facility would switch from a regasification to a liquefaction facility, making Kitimat an exporter, rather than an importer of natural gas. Kitimat did leave open the possibility of providing regasification in addition to liquefaction. As of this writing, it appears that Kitimat will focus on exporting natural gas, particularly given the huge supply of shale gas from northeastern British Columbia. The company did analyze the other two LNG options in the Northwest (Bradwood and Jordan Cove) along with the incremental pipeline capacity that would be necessary to reach Cascade's service territory and found that based on preliminary cost estimates that model preferred the Ruby and Malin transportation resources over the import LNG options. Since there was uncertainty about these facilities during the initial SENDOUT™ scenario model runs set up in summer 2011, we chose to leave the analysis of these facilities in the 2011 IRP. It should be noted that neither Bradwood nor Jordan Cove were selected as part of the basecase portfolio. The company will continue to monitor the impact of various imported LNG options (both import and export) and update its modeling assumptions as more information becomes available.

- 20 year portfolio costs, on a Net Present Value (NPV) basis, are expected to range between $2,448,210,000 to $3,216,376,000 for the planning period, with an average cost per therm ranging between $.354748 and $.447916.

Use and Relevance of the Integrated Resource Plan

Cascade's Integrated Resource Plan provides the strategic direction guiding the Company's long-term resource acquisition process. The plan does not commit Cascade to the acquisition of a specific resource type or facility, nor does it preclude the Company from pursuing a particular resource or technology. Rather, the plan identifies key factors related to resource decisions and provides a method for evaluating resources in terms of their cost and risk. Cascade recognizes that integrated resource planning is a dynamic process reflecting changing market forces and a changing regulatory environment.

Section 2

Introduction and Planning Overview

Company/Service Area Profile - Customers, Resource Maps

Beginning in 1953, Cascade Natural Gas Corporation began acquiring small local gas distribution companies in anticipation of the construction of an interstate pipeline to bring natural gas into the Pacific Northwest in 1956. The pipeline began in New Mexico and moved northwesterly into the northeast corner of Oregon and on into Washington, to the Canadian border near Sumas, Washington. Cascade's distribution system tapped into the pipeline at many places in Oregon and Washington. Usually, an industrial operation located in the area made it economically feasible for Cascade to construct its initial distribution system to serve the industrial customer and then branch out from there to serve the residential and commercial communities in the nearby area.

Today, Cascade's service territory covers about 32,000 square miles and extends over 700 highway miles from end to end, encompassing a richly diverse economic base as well as varying climatologically areas (see service area map, Figure 2-A). Cascade serves 96 communities throughout Washington and Oregon consisting of about 260,000 customers. All of the communities Cascade serves are small cities and towns. This makes Cascade unique in the gas distribution business in the Pacific Northwest. Cascade's customer base currently includes approximately 226,000 residential customers, 33,000 commercial customers, and 700 industrial customers. Cascade's sales volumes reflect the ratio of approximately 75% in Washington and 25% in Oregon.

Bundled vs. Unbundled Service

Since Cascade began distributing natural gas in the Pacific Northwest, the Company has offered its customers a “bundled” natural gas distribution service. This bundled service included purchasing the gas supply, transporting that supply to Cascade's city gate, and distributing that transported supply to each Cascade customer through the Company’s local distribution system. Customers receiving traditional bundled services are referred to as core customers. In 1989, Cascade “unbundled” its rates and as a result approximately 200 of the 700 industrial customers have elected to become "non-core" customers. These customers have made the choice to rely on alternative methods of service rather than the traditional bundled gas supply and pipeline transportation services available to core customers for their gas requirements. Therefore, providing gas supply and transportation capacity resources to non-core customers is not considered part of this Integrated Resource Plan as such resources are separate from the supply and capacity contracts for the core customers who continue to utilize Cascade’s bundled system gas supplies and capacity. Although the resource needs for non-core customers are not included in either the conservation or supply side resource analysis, their contracted peak day delivery is considered in the distribution system planning analysis discussed in Section 4.

For the Calendar year ended December 2010, Cascade's 226,000 residential customers represented approximately 13% of the total natural gas delivered on Cascade's system, while the 33,000 commercial customers represented approximately 10% and the 500 core market industrial customers consumed approximately 2% of total gas throughput.

FIGURE 2-A

The remaining 200 non-core industrial customers represented about 75% of total throughput.

Cascade purchases natural gas from a variety of suppliers and transports gas supplies to its distribution system via two natural gas pipeline companies. Williams' Northwest Pipeline GP (NWP) provides access to British Columbia and domestic Rocky Mountain gas while the Gas Transmission Northwest (GTN) provides access to Alberta gas. Cascade also holds transportation contracts upstream of these systems on TransCanada Pipeline's Foothills Pipeline (formerly ANG) and Alberta System (also known as NOVA), as well as on Westcoast Energy, Inc. (Spectra Energy).

IRP Guidelines and Policies

Cascade utilizes integrated resource planning to maximize the efficiencies of the Company's utility operations. The planning process includes an assessment of current and future gas load requirements, the possible resource options for serving the projected load requirements, and a selection of the set of least cost resource alternatives with acceptable level of reliability through the use of an optimization model. Monte-Carlo simulation tools are utilized to further analyze the results of the optimization model to quantify the range of uncertainty in market price and demand due to changes in weather.

Cascade is subject to regulatory oversight by the Washington Utilities and Transportation Commission (WUTC) and the Oregon Public Utility Commission (OPUC). Each commission has established a set of guidelines or rules, which the company's plan must meet. In Washington those guidelines are contained in WAC 480-90-238 and in Oregon the guidelines are found in the Commission Order No. 07-002 in docket UM 1056. In general, both Commissions' guidelines require that the utility develop a range of demand forecasts, examine all feasible resources for meeting that demand whether they are supply-side or demand side and compare them on an equal basis, considering the uncertainty over the planning horizon, develop a 2 year action plan and involve the public and the various stakeholders in the planning process.

Cascade believes that its IRP meets the substantive requirements of both the Washington and Oregon Commissions. This IRP includes a range of demand forecasts that encompass the anticipated forces, both economic and weather-driven, that will impact the load forecasts over the planning horizon. The demand side resource section includes an assessment of technically feasible improvements in the efficient use of natural gas. The supply resource section includes a discussion of the supply side resource options available including an assessment of conventional and commercially available non- conventional gas supplies, an assessment of opportunities for additional company-owned and contracted storage, and an assessment of the Company's existing pipeline transportation capability and reliability along with the opportunity for incremental pipeline transportation resources. The integration section provides a comparative evaluation of the cost of the various resource options on a consistent and comparable method. The resource integration section also describes the integration of the demand forecast and resource evaluations into a long range resource plan describing the strategies designed to reliably meet current and future needs at the lowest reasonable cost to Cascade's ratepayers. The short-term action plan describes the specific actions the utility will take to implement the long-range integrated resource plan during the next two years and reports on the Company's progress in meeting its prior 2-year action plan goals.

Cascade believes all resources described in this IRP have been evaluated on a consistent and comparable basis through the use of its optimization model. Uncertainty has been considered in each component of this plan. The demand forecast includes a reasonable range of uncertainty as quantified in the low, medium and high load growth scenarios along with the additional simulation analysis calculated through SENDOUT's™ Monte-Carlo functionality that assesses the impacts of weather on the load forecasts. The demand side and supply side resource sections describe relative uncertainties regarding reliability, cost and operating constraints and external costs. Uncertainties associated with the environmental effects of carbon emissions have also been included through an analysis of the impact of carbon legislation on the portfolio. Price volatility and market risks and their impacts on the Company's long-term resource portfolio have been assessed through the use of the SENDOUT™ model.

To involve public interests in the development stages of this IRP, Cascade has a Technical Advisory Group (TAG). Three meetings were held to discuss the major IRP topics including the demand forecast, distribution system planning, demand side resources, supply side resources, and resource integration and uncertainty analysis. The TAG meetings were helpful to Cascade as questions were answered and varying points of view were explored. Appendix A-2 contains an outline of the meeting content, a list of participants and the presentation materials.

Appendix A-3 provides additional information regarding the specific requirements or guidelines for each commission and how the company has met those requirements.

Resource Decision Making Process Overview

Cascade makes resource decisions based on the best quantitative and qualitative information available. The IRP tools that are continually evolving assist Cascade in formulating energy resource decisions in a logical, consistent and comparable manner. The steps outlined below are those utilized by Cascade for both its short-term and long- term resource decisions:

1. Construct a range of possible demand forecasts for the core market.
2. Calculate avoidable distribution system enhancement costs.
3. Provide the optimization model the existing supply side and demand side resource options need to meet demand.
4. Run the optimization model to identify resource needs including the types of resources and their timing requirements. The existing portfolio is modeled under a range of demand forecast conditions.
5. Identify incremental supply and demand side resources to satisfy a range of incremental growth scenarios.
6. Run the optimization and Monte-Carlo simulation models to assist in determining the best- fit portfolio given an expected range of forecasted core loads and operating conditions.

The resource decision-making process is dynamic and ongoing and the Company's resource strategy must constantly evolve to reflect dynamic market forces and a continually changing regulatory environment. This IRP document represents a snapshot in time similar to a balance sheet. It is not meant to be a prescription for all future energy resource decisions as conditions will change over the planning horizon and will impact areas covered by this IRP. Rather, this document is meant to describe the currently anticipated conditions over the long-term planning horizon, the anticipated resource selections and most importantly the process for making resource decisions.

Disclaimer –Important notice

Cascade makes the following cautionary statements in its Integrated Resource Plan and appendices to make applicable and to take advantage of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 for any forward-looking statements made by or on behalf of Cascade. This Plan, its appendices, and any amendments or supplements to it, includes forward-looking statements, which are statements of expectations, beliefs, plans, objectives, and assumptions of future events or performance. Words or phrases such as "anticipates", "believes", "estimates", "expects", "intends", "plans", "predicts", "projects", "will likely result", "will continue" or similar expressions identify forward-looking statements.

Forward-looking statements involve risks and uncertainties which could cause actual results or outcomes to differ materially from those expressed. Cascade's expectations, beliefs and projections are expressed in good faith and are believed by the Company to have a reasonable basis; however, there can be no assurance that Cascade's expectations, beliefs or projections will be achieved or accomplished.

Any forward-looking statement speaks only as of the date on which such statement is made and except as required by law, Cascade undertakes no obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement is made or to reflect the occurrence of unanticipated events. New factors emerge from time to time and it is not possible for management to predict all such factors, nor can it assess the impact of any such factor on the business or the extent to which any factor, or combination of factors, may cause results to differ materially from those contained in any forward-looking statement. These materials and any forward-looking statements within them should not be construed as either projections or predictions or as business, legal, tax, financial, or accounting advice and should not be relied upon for any such purpose.

Section 3

Demand Forecast

Each year Cascade develops a 20-year forecast of customers, therm sales and peak requirements for use in short (annual budgeting) and long-term (distribution and integrated resource planning) planning processes. This forecast is a robust portfolio of estimates created by enhancing a single best-estimate forecast with various potential economic, demographic and marketplace eventualities into low, medium and high growth forecast scenarios. The scenarios are used for distribution system enhancement planning and as inputs in optimization models to determine the least cost portfolio of supply and DSM resources.

Forecast Methodology

Cascade begins the forecast process by developing three separate econometric models for each of the Company's 15 districts. Three models for each district, for a total of 45 models, predict customer counts in the three main core customer classes – residential, commercial and industrial. Models are built from the district level up as it is the smallest level at which there is a high degree of consistency and availability of raw data. This is a change of methodology from previous years where certain models were built from the town level and others from the district. The unification of methodologies is expected to increase reliability of the forecast. The district models are rolled up into zones which segregate Cascade's system based on pipelines and weather (see Appendix C).

In addition to these 45 customer count forecasting models, a separate and parallel set of 45 models is developed to estimate per-customer therm usage for each customer class in each district. A multiplicative combination of the customer count and therm usage models is Cascade's annual load projection.

Customer count forecasts are designed to reflect both demographic trends and economic conditions both in the short and long term. Indicators included in the model include: employment and household count forecasts, mortgage rates (for residential customer counts) and the prime rate (for commercial and industrial customer counts). Therm forecasts are constructed from median household income forecast, weather and natural gas prices. Economic indicator forecasts are supplied by Woods & Poole. Mortgage and prime rates are forecast by Cascade using base data provided by Freddie Mac and the Federal Reserve, respectively. Past weather is sourced from NOAA and future weather is Cascade's 20-year normal developed for the Company's last rate case. Natural gas prices are provided by Wood Mackenzie and equal weights are assigned to the AECO, NYMEX and SUMAS indexes based on Cascade's general portfolio mix (Appendix E). These indicators and the functional forms illustrated below were chosen over others as they were the most consistent in returning statistically valid results. Historical data used in the regression extends back up to 1980 for customer counts and 1994 for therms.

$$RESc_{t,d} = f\left(employment_{t,d}, households_{t,d}, mortgage\ rate_{t,d}\right)$$
$$COMc_{t,d}, INDc_{t,d} = f(employment_{t,d}, households_{t,d}, prime\ rate_{t,d})$$
$$RESt_{t,d}, COMt_{t,d}, INDt_{t,d} = f(HDDs_{t,d} + MHI_{t,d} + NG\$_{t,d})$$
$$Load_{year} = \sum_{d=1}^{15} RESc_{t,d} * RESt_{t,d} + COMc_{t,d} * COMt_{t,d} + INDc_{t,d} * INDt_{t,d}$$

Customer count and therm forecasts are augmented by revisions to the base data and output to create a portfolio of potential scenarios. Low and high growth scenarios are created by altering Woods & Poole's forecasts to reflect Cascade's service territory's strongest and weakest performing decades over the last 30 years (Appendix B). These scenarios, along with the original best-estimate mid case scenario, encapsulate a range of most-likely possibilities given known data. Based on historical experience, Cascade expects system load will likely remain within a range bounded by the low and high growth scenarios.

Peak Day Forecast

In order to ensure satisfaction of core customer demand on the coldest days, Cascade develops peak day usage forecasts in conjunction with annual basis load forecasts. Peak day forecasts enable Cascade to make prudent distribution system and peak capacity planning decisions to fulfill its responsibility to provide heating under all but force majeure conditions, particularly as most space-heating customers will have no alternative heating source during the coldest of days in the event gas does not flow.

Historically Cascade has developed peak day forecasts based on a 65 HDD day (0°F) to reflect the coldest day in Cascade's 60-year weather history. Cascade's 2008 IRP changed this practice to reflect the coldest day during the past 30 years. This record is held by December 21, 1990 at 61 HDDs. The peak day forecast is developed by adjusting the therm usage on the coldest day in recent history (January 5, 2004 at 56 HDD) upwards to an estimate of what therm usage would have been had that day been 61 HDD. The therm usage is then applied to each district and escalated into the future at the forecast therm usage annual growth rate.

This method rests on the assumption that core market load shape does not significantly change throughout the forecast horizon. Cascade believes that the peak day forecast conservatively overestimates peak day usage as the base forecast does not explicitly include future conservation measures implemented by customers that would act to increase energy efficiency and reduce therm day usage.

Forecast Results

Load growth across Cascade's system through 2030 is expected to fluctuate between 1.5% and 1.7% annually, with lower, recessionary growth in the short term. Load growth consists of a split between residential and commercial demand, with a slow decline in industrial demand.

Table 3-1: Expected Load Growth by Class

	Residential	Commercial	Industrial	System
2011 – 2016	1.71%	1.68%	-3.22%	1.48%
2016 – 2021	1.78%	1.81%	-1.85%	1.66%
2021 – 2026	1.74%	1.83%	-1.06%	1.68%
2026 – 2031	1.50%	1.59%	-1.24%	1.46%
2011 – 2031	1.68%	1.73%	-1.84%	1.57%

In absolute numbers, system load under normal weather conditions is expected to reach 412 million therms in 2030, up from an estimate of 300 million for 2011. A majority of core load today is residential. Not only will this continue into the future, but since residential load growth is expected to be higher than commercial and industrial, residential customers will experience a slightly increased profile on Cascade's system.

Figure 3-1: Relative Expected Load by Class

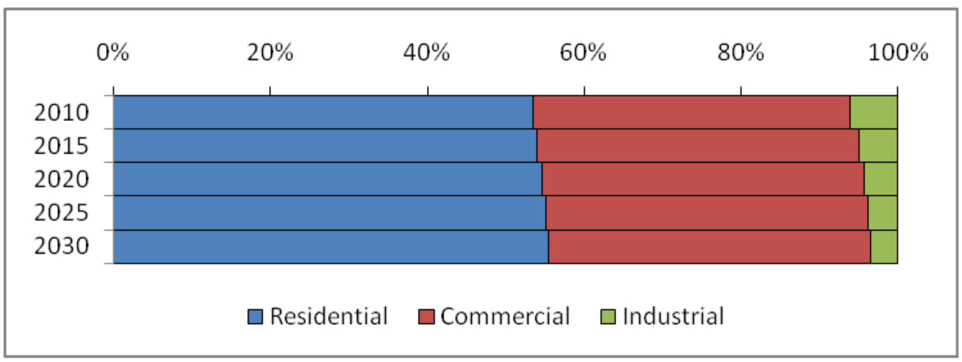


Table 3-2: Expected Load by Class

	Residential	Commercial	Industrial
2011	163,007,592	122,912,569	13,931,851
2016	177,442,906	133,565,259	11,822,190
2021	193,769,389	146,098,658	10,767,863
2026	211,207,260	159,939,319	10,202,021
2031	227,541,615	173,091,273	9,586,154
2011 - 2031	39.6%	40.8%	-31.2%

Residential and commercial load growth is primarily a result of increased customer counts. The number of residential and commercial customers is expected to increase faster than therm usage. Several factors are believed to be the cause of this phenomenon; among them are soft conservation, building codes and heat pump penetration. This reduction is more prevalent among residential customers than commercial.

Table 3-3: Expected Customer Counts by Class

	Residential	Commercial	Industrial
2011	230,833	34,618	441
2016	255,767	38,204	400
2021	282,006	41,954	377
2026	309,492	45,861	365
2031	338,158	49,908	361
2011 - 2031	46.5%	44.2%	-18.2%

Core industrial load and customer counts are a more complex and difficult to distill story. First, industrial users in Cascade's service territory are subject to the same overarching economic conditions that industry elsewhere in the United States has been experiencing. A slow but steady economic shift away from manufacturing towards the service industry is reflected in lower industrial load and less industrial customers. Second, industrial customers may be faced with consolidation and mergers, which would reduce customer counts faster than per customer therm usage. Third, within the historical data period used to develop the industrial customer econometric models was the introduction of unbundled service. With unbundling, many industrial customers have switched to non-core, a trend that will continue into the future. For this reason, the 18% reduction in core industrial demand does not necessarily indicate that industry in Cascade's service territory is in a state of distress.

Table 3-4: Expected Reduction in Therm Usage per Customer

Year	Residential	Commercial	Industrial
2011	706	3551	31590
2016	694	3496	29553
2021	687	3482	28565
2026	682	3487	27959
2031	673	3468	26581
2011 - 2031	-4.7%	-2.3%	-15.9%

Geography

Load across Cascade's two-state service territory is expected to increase 37%, with the Oregon portion outpacing Washington at 41% versus 35%.

Table 3-5: Expected Load by State

	Washington	Oregon	System
2011	228,027,758	73,858,065	301,885,823
2016	246,062,671	78,801,495	324,864,165
2021	266,601,645	86,068,075	352,669,721
2026	288,322,552	95,059,860	383,382,411
2031	308,136,988	104,108,821	412,244,144

Within Oregon, the Bend area is expected to grow significantly faster than the rest of Eastern Oregon. Pendleton is expected to grow faster than Cascade's Baker/Ontario region, which is expected to experience minimal growth.

Table 3-6: Oregon 20-Year Load Growth by District

20-Year Load Growth	
Baker	0.5%
Bend	54.5%
Ontario	-4.0%
Pendleton	22.1%
Oregon	41.0%

Peak Day

Residential customers have higher temperature sensitivity than commercial or industrial. Because of their increasing profile on Cascade's system over the coming 20 years, weather-sensitive peak demand will increase faster than annual load. 2010 load on 61 HDDs is expected to be 3.6 million therms, rising to 5.4 million by 2030. Peak day load will increase at 2.0% annually while annual load will increase by 1.6%.

Table 3-7: Expected Peak Day Growth and Therms

	Peak Growth	Annual Load
2011 -2016	2.08%	1.48%
2016 -2021	1.98%	1.66%
2021- 2025	1.88%	1.68%
2026 -2031	1.78%	1.46%
2011 - 2031	1.93%	1.57%

	Peak Day Therms
2011	3,681,099
2016	4,080,989
2021	4,501,149
2026	4,940,461
2031	5,397,372

High and Low Scenarios

High and low scenarios were created by examining the best and poorest performing years from the historical data period, 1980 to 2009. These scenarios bookend the range within which annual load and peak day usage will reside should underlying indicators vary from Woods & Poole's long range estimates.

Table 3-8: Expected Total System Load Growth Across Scenarios

	Low	Mid	High
2011 - 2016	1.30%	1.48%	1.71%
2016 - 2021	1.47%	1.66%	1.82%
2021 - 2026	1.49%	1.68%	1.85%
2026 - 2031	1.28%	1.46%	1.67%
2011 - 2031	1.39%	1.57%	1.76%

Load growth under poor economic conditions is expected to be around 1.4% annually over the forecast period while load growth under good economic conditions is expected to be around 1.8% annually. The cumulative effect of high growth over 20 years could result in additional load of 20 million therms while low growth will result in load 17 million therms less than predicted in the medium growth scenario.

Table 3-9: Expected Total System Load Across Scenarios

	Low	Mid	High
2011	299,438,282	301,885,823	304,992,382
2016	319,401,636	324,864,165	331,972,707
2021	343,577,530	352,669,721	363,230,566
2026	369,975,542	383,382,411	398,054,290
2031	394,334,672	412,244,157	432,407,449
Deviation	(17,909,485)		20,163,292

Uncertainties

This forecast represents Cascade's best guess about future events. There are several important factors that make prediction future load at this time particularly difficult – economic recovery, carbon legislation, building code changes, carbon legislation, direct use campaigns, soft conservation, and long term weather patterns. The range of scenarios presented here encompasses the full range of possibilities through econometric analysis. These forecasts were created after running through a matrix of different functional forms and economic indicators. The chosen indicators, unchanged from Cascade's 2008 IRP, where chosen because of their consistency in returning statistically valid results. While they maybe the best mathematically, they are not the sole and only determinants of load. As a result, while Cascade believes that the numbers presented here are accurate, and that the scenarios presented represent the full range of possibility, there is and always will be uncertainties in predicting the future.

Section 4

Distribution System Enhancements

Forecasting by town allows Cascade to estimate the need for distribution system enhancements with a reasonable level of accuracy in the near term of the planning horizon. A localized forecast approach also allows a non-coincidental peak forecast to be developed which is necessary when estimating distribution system enhancement needs. Gas supply and pipeline transportation become secondary issues if the distribution system is constrained. An important part of the planning process is to determine potential areas of distribution system constraints, analyze possible solutions, and estimate costs for eliminating constraints.

Distribution System Modeling

Gas distribution networks rely on pressure differentials to move gas from one place to another. If the pressure is exactly the same on both ends of a pipe, the gas will not flow. Therefore, it is important that gas engineers design the distribution network such that the pressure in the pipe will always be high enough that a differential can be created when gas leaves the system. As gas flow increases, pressure is lost due to friction. Using the laws of fluid mechanics, engineers determine the maximum flow of gas through a pipe of a certain diameter and length that will not cause pressure drops that are too great. This process is known as "gas distribution system modeling".

The modeling process is important because it lets the engineer determine how much flow can be delivered at various places on the distribution system. For instance, when large customers are added to a distribution network, the engineer must determine if the network capacity is large enough to provide the additional flow needed to fulfill customer requirements. Modeling is also important when planning new distribution systems. The correct size main distribution pipes must be installed to allow for the flow needed to meet the requirements of current customers, and reasonably anticipated future customers at reasonable costs.

It is desirable to know if an existing distribution system has enough capacity to satisfy new loads due to increasing numbers of customers in the future. The model can also be used to simulate increasing the gas flows through the existing pipes until the pressure loss in the pipes becomes unacceptable.

Engineering Modeling by Town

Utilizing computer software, individual models were created for each of Cascade's different systems. These models include both high-pressure lines and distribution system networks. As gas loads are simulated to increase according to the load forecasts, the pressures within each system are checked. When the simulation shows the pressure dropping to an unacceptable level, that system and the surrounding area is determined to be a constraint area. When constraint areas are found, the analyst determines the most effective way of solving the problem. The solutions sometimes entail increasing the pressure in the system. However, in most situations where future constraint areas are identified, some amount of looping is also needed. The costs for the loops are determined based on system wide averages of past system reinforcements and extensions projects. The average cost per foot is established for each area, and then the most cost-effective alternative to solving the pressure problem is found. After these costs are tabulated, potential reductions of demand within constraint areas due to conservation will be included in the analysis to determine whether any of the costs can be avoided or delayed.

The modeling output is compared to and, where appropriate, supplemented with data from local field personnel to provide forecasts by town. This allows the analyst to specifically determine, town by town, what reinforcement would be necessary to each system for each year. These town by town costs are then grouped together by gate station.

Key Findings

The results of the distribution system analysis are shown in Table 4-1. The table shows the estimated costs of distribution system enhancements necessary to eliminate constraint areas over the 20 year planning horizon. Appendix C contains further information regarding the possible solutions to alleviate the distribution system constraints. It should be noted that the proposed solutions are preliminary estimates of reinforcement solutions and actual solutions may be different due to differences in actual growth patterns and/ or construction conditions from those assumed in the initial modeling.

These results were based on the best information available and included both the anticipated load growth for the core market from the medium demand forecast along with the contracted peak delivery for each of the non-core customers.

Equally important is to review the impacts of proposed conservation resources on anticipated distribution constraints. Although the Company historically provides utility sponsored conservation programs throughout a particular jurisdiction (i.e. all of Washington or all of Oregon), there may be instances where a more targeted approach could reduce or delay the estimated reinforcement for a specific area. However, as will be discussed in Section 5, the acquisition of conservation resources is entirely dependent upon the individual consumer's day-to-day purchasing and behavior decisions. Although the utility attempts to influence these decisions through its conservation programs, the consumer is still the ultimate decision maker regarding the purchase of a conservation measure. Therefore, the Company does not anticipate that the peak day load reductions resulting from incremental conservation will be adequate enough to eliminate distribution system constraint areas at this time. However, over the longer term, (the 2011 through 2025 timeframe) the opportunity for targeted conservation programs to provide a cumulative benefit that offsets potential constraint areas may be an effective strategy.

Table 4-1
Yearly Reinforcement Costs by Gate

Gate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Arlington						$875			$15,660		
Bellingham I			$40,000				$349,192				
Bend			$1,053,775		$2,671,000		$1,699,000		$1,057,000	$710,200	
E Stanwood				$82,954							
Hermiston	$90,480				$61,553	$30,450				$5,425	
Kennewick	$1,564,500		$128,325	$40,238	$872,356			$56,115	$81,128		
Lynden			$22,403			$164,002		$79,388			
Madras						$1,229,080					
Mount Vernon											
Pasco	$145,730	$373,293				$62,776		$113,782			
Pendleton	$28,493										
Prineville			$117,705			$39,235					
Redmond		$75,668	$46,328		$134,438				$81,833	$113,782	
Sedro Woolley	$81,345			$218,595		$875		$35,888	$224,727		
Shelton	$7,788	$4,225,000	$705,589	$251,309		$1,590,000				$1,140,718	
Stanwood				$35,018		$51,983		$106,773			
Sumas Boarder	$298,493			$97,440			$149,640			$77,574	
Sunriver	$306,050					$43,718					
Umatilla							$210,800				
Walla Walla					$63,240						
Yakima		$112,100						$1,915,000			
Grand Total	$2,522,877	$4,786,061	$2,114,124	$725,553	$3,802,587	$3,212,993	$2,408,632	$2,306,944	$1,460,347	$2,047,699	$0

Gate	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Grand Total
Arlington		$116,024									$132,559
Bellingham I			$34,800				$149,616				$573,608
Bend		$128,915		$29,145			$67,260		$43,283		$7,459,578
E Stanwood											$82,954
Hermiston											$187,908
Kennewick			$2,600,000			$203,535			$43,065		$5,589,261
Lynden						$81,000			$41,978	$60,465	$449,235
Madras											$1,229,080
Mount Vernon			$20,880					$56,333			$77,213
Pasco											$695,581
Pendleton											$28,493
Prineville											$156,940
Redmond								$35,872	$208,640		$696,560
Sedro Woolley		$256,709			$29,146			$12,180	$50,925		$910,389
Shelton			$229,068	$5,575,000							$13,724,471
Stanwood	$174,876		$40,000								$408,649
Sumas Boarder		$170,000		$295,944			$1,072,139		$119,625	$250,000	$2,530,856
Sunriver											$349,767
Umatilla											$210,800
Walla Walla											$63,240
Yakima											$2,027,100
Grand Total	$174,876	$671,648	$2,924,748	$5,900,089	$29,146	$284,535	$1,289,015	$104,385	$507,515	$310,465	$37,584,238

Section 5

Supply Side Resources

Cascade's core market residential and small volume commercial and industrial customers expect and require the highest reliability of energy service. Because of the Company's obligation to provide gas service to these customers, the Company must determine and achieve the needed degrees of service reliability and attain the lowest costs possible while providing an infrastructure that responds to the customers' concerns in meeting customer growth and provides all necessary administrative services to provide the stated services. Assuming such an infrastructure is in place and operating effectively, the most important functions necessary for reliable natural gas service are planning for, providing and administering the gas supply, interstate pipeline transportation capacity, and distribution service components that constitute the "bundled services" required by core market customers.

Cascade's 20-year supply side resource goal is to continue to meet the energy needs of its core market customers with a package of services that combines adequate gas supplies and cost-effective winter peaking services with long-term pipeline transportation contracts and sufficient distribution system capacity at the lowest possible cost.

This section describes the various gas supply resource and transportation resource options that are available to the Company as supply side resources.

Gas Supply Resource Options

Gas supply options available to Cascade to meet the core market demand requirements generally fall into two groups: 1) Firm gas supplies on a short or long-term basis, and 2) Short term gas supplies purchased on the open market as needed for a particular month for one or more days. A separate and important source of gas supply is natural gas storage service, which is required to meet the needs of the broad seasonal peak and the needle peaks of the heating season in order to provide economical service to low load factor customers.

Firm Supply Contracts

Firm supply contracts commit both the seller and the buyer to deliver and take gas on a firm basis, except for *force majeure* conditions. From Cascade's perspective, the most important consideration is the seller's contractual commitment to make gas available day in and day out, regardless of market conditions. Firm supplies are a necessary component of Cascade's core market portfolio given the obligation to serve and the lack of easily obtainable alternatives for consumers during periods of peak demand. Firm contracts can provide baseload services, provide seasonal peaking services during the winter months, or can be used to meet daily needle peaking requirements. Each of these services is discussed briefly below.

Baseload resources are those that are taken day in and day out, 365 days a year. As a result, baseload gas tends to be the least expensive of the firm supply contracts because it matches the production of gas and guarantees the producer that the volumes will be taken. Cascade’s ability to contract for baseload supplies is limited because of the relatively low summer demand on the system. Baseload resources are used to meet the non-weather sensitive portion of the core market requirements, or may be used to refill storage reservoirs during periods of lower demand.

Winter gas supplies are firm gas supplies that are purchased for a short period during the winter months to cover increased loads, primarily for space heating. The contracts are typically 3 to 5 month durations (primarily November through March). This enables the Company to ensure firm winter supplies without incurring obligations for high levels of take during periods of low demand in the summer months. Winter supplies combined with baseload supplies will be adequate to cover the moderately cold days in winter.

Peaking gas supplies, similar to storage, are firm contracts purchased only as load actually materializes due to high winter demand. That is, the producer must deliver the gas when the Company requires it, but the Company is not required to take gas unless needed to meet customer load requirements. Peaking resources typically allow the Company to take between 15 and 20 days of service during the winter period. These resources are more expensive than baseload or winter supplies and typically include fixed charges to cover the costs for the producers to stand by to deliver the supplies.

Needle peaking resources are utilized during severe or “arctic” cold experiences when demand can increase sharply. These resources are very expensive and are available for a very short period of time. One source of needle peaking gas supply that is actually a form of demand side management may be obtained from Cascade's industrial customer base. These customers would be required to maintain standby or alternate fuel capability that Cascade would contract the right to request the customer switch to so Cascade could utilize (divert) their gas supply and transportation capacity to meet the Company’s core market requirements. The benefits associated with this type of resource would include lowering the demand of the industrial facility, and providing a like amount of additional gas supply with pipeline capacity to meet core demand. Needle peaking requirements can also be met through the use of propane air plants, or on-site liquefied natural gas (LNG) facilities.

Contract terms for firm commodity supplies vary greatly. Some contracts specify fixed prices, while others are based on indexes that float from month to month. Some contracts have fixed reservation charges assessed each month, while others may have minimum daily or monthly take requirements. Most contain penalty provisions for failure to take the minimum supply according to the contract terms. Contract details will also vary from year to year, depending on company and supplier needs and the general trends in the market.

Appendix E summarizes the gas supply alternatives evaluated during this planning cycle.

Spot Market Supplies

Gas that is purchased for a short period of time (1 to 30 days) when neither the seller nor the buyer has a longer-term firm commitment to deliver or take the gas is referred to as a spot market purchase. Spot market supplies differ from firm resources in that they are more volatile, both in terms of availability and price, and are largely influenced by the laws of supply and demand.

In general, spot market supplies are provided from gas supplies not under any long- term firm contract, as mentioned above. Therefore, as firm market demand decreases, more gas becomes available for the spot market. Prices for spot market supplies are market driven and may be either lower or higher than prices under firm supply contracts. In warmer weather, as firm market demand requirements decrease, usually more gas becomes available for the spot market, resulting in lower prices. In colder weather, as firm markets demand their gas supplies, the remaining spot market supplies can carry higher prices until the price equates or exceeds that of alternate energy supplies (such as oil or electricity). Spot supplies can be expected to move to the markets that offer the highest price, which in turn can affect delivery reliability. [1]

Due to the potential for interruption of the spot market, these supplies are not considered as reliable a source of gas supply for the winter peaking requirements of Cascade's core market. As identified earlier, part of the reason these supplies are considered less reliable is that these volumes are made available after longer-term firm commitments have been contracted for delivery by upstream suppliers. These available volumes are likely to vary daily, depending on production or the suppliers' ability to store un-marketed supply. Under a NAESB (North American Energy Standards Board) contract, which is the standard contract used by buyers and sellers when entering into short term supply transactions, parties have the ability to identify firm variable or interruptible quantities for these supplies. Therefore, these spot volumes are more susceptible to daily operational constraints on the upstream pipelines. This is particularly true in the case of Northwest Pipeline, which is a displacement pipeline with bi-directional flow. Depending on how gas is scheduled versus actually flowing between compressor stations, constraints can possibly occur. Complicating matters is that each of the pipelines has multiple supply scheduling deadlines, allowing scheduled volumes to be adjusted. As a result, at any given point in the process, constraints can occur, leading to the potential of the scheduled spot supply volumes being reduced or not delivered to the citygate at all.

The role for spot market gas supply in the core market portfolio is based upon economics. Spot market supplies may be used to supplement firm contracts during periods of high demand or to displace other volumes when it is cost-effective to do so. For example, should prices in one basin drop radically compared to another basin, a contract may allow the flexibility to reduce takes in order to take advantage of supply from a lower priced basin. Depending upon availability and price, spot market volumes may be used in place of storage withdrawal volumes to meet firm requirements on a given day or for mid-heating season refills of storage inventory during periods of weather moderation.

Other Unconventional Gas Supply Resources

Cascade considers Unconventional Gas Supply Resources such as supplies from an LNG Import Terminal, BNG or other manufactured gas supply opportunities as speculative supply side resources at this point in time. In most cases unconventional gas supply resources would become an alternative to traditional gas supplies from the conventional gas fields in Canada or the Rockies and would have to compete for inclusion in the Company's portfolio planning. The two remaining LNG Import Terminal projects since the publishing of the last IRP, Jordan Cove and Oregon LNG, appear to shifting to export facilities. In early 2012, both facilities filed with FERC to withdraw their plans to import LNG. Jordan Cove re-filed with FERC to become an exporter; industry experts expect Oregon LNG to follow suit.

One of the potential impacts of having export facilities in the Pacific Northwest (including the Kitimat) is what affect the flow of natural gas to export facilities will have on competition and pricing of natural gas supplies. Demand for natural gas in Asia, coupled with relatively inexpensive and plentiful shale gas may create a favorable long-term market opportunity for North American producers. For example, Japan has been hesitant to restart their nuclear plants in the aftermath of the devastating earthquake and tsunami of 2011. However, demand for energy will continue there as well as in China, as that country increasingly flexes its growing economic muscle and need for energy to drive its manufacturing base.

Infrastructure such as the Pacific Connector Pipeline to move natural gas to these facilities also means the opportunity to divert some of these supplies to markets such as LDCs that are located near the routes to the export facilities. In periods of great demand in Asia one would expect upward pressure on natural gas prices; correspondingly during periods of lower demand, prices would likely drop. Of course, if it is economical to do so, producers will increase the volumes of natural gas to this area, which will provide another supply resource alternative for Cascade. While it is much too early to tell (since exports have yet to begin at any of these facilities), export facilities in the Pacific Northwest could potentially create a new pricing dynamic for the region; a dynamic which Cascade will be monitoring carefully as both public (EIA) and private (Wood MacKenzie, Bentek) intelligence becomes available.

Palomar Gas Transmission has withdrawn its application for a certificate to build a natural gas pipeline in Oregon, and it has told the Federal Energy Regulatory Commission that it continues to work with potential customers and a potential additional partner to provide a regional solution to the need for access to this important form of energy. Palomar said that while they will no longer seek to permit a pipeline to serve the previously proposed liquefied natural gas terminal on the Columbia River, it will continue its effort to find commercial support for a new pipeline in Oregon to meet the needs of the Pacific Northwest.

Another alternative is BNG. Bio natural gas continues to receive increased attention as a possible resource. BNG typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. BNG originates from biogenic material and is a type of biofuel. One type of BNG is produced by anaerobic digestion or fermentation of biodegradable materials such as biomass, manure or sewage, municipal waste, green waste and energy crops. This type of BNG is comprised primarily of methane and carbon dioxide. The principal type of BNG is wood gas which is created by gasification of wood or other biomass. This type of BNG is comprised primarily of nitrogen, hydrogen, and carbon monoxide, with trace amounts of methane.

The gases methane, hydrogen and carbon monoxide can be combusted or oxidized with oxygen. Air contains 21% oxygen. This energy release allows BNG to be used as a fuel. BNG can be used as a low-cost fuel in any country for any heating purpose, such as cooking. It can also be utilized in modern waste management facilities where it can be used to run any type of heat engine, to generate either mechanical or electrical power. BNG is a renewable fuel, which can be used for transport, and electricity production, so it attracts renewable energy subsidies in some parts of the world.

In many cases, there is currently not enough pricing and information available to be considered in this planning cycle; however, where possible, we have endeavored to analyze those situations where we feel sufficient data is available. Cascade continues to monitor the BNG activities of companies such as Pacific Gas & Electric, Intermountain Gas, Sempra Utilities and Puget Sound Energy.

Storage Resources

Cascade also utilizes natural gas storage to meet a portion of the requirements of its core market. Storing gas supplies, purchased and injected during periods of low demand, is a cost-effective way of meeting some of the peak requirements of Cascade’s firm market. Natural gas can be stored in naturally occurring reservoirs, such as depleted oil or gas fields, salt caverns or other geological formations with an impermeable cap over a porous reservoir. Gas can also be stored in vessels or tanks under pressure as compressed natural gas, or cooled to a liquid state, which is liquefied natural gas (LNG).

Natural gas storage service is not only an excellent supply source for meeting peak winter demand, but it can also be an important gas supply management tool. Storing excess or unused supply during periods of low demand increases the annual utilization rate of a supply contract, therefore improving the annual load factor for the Company’s gas supplies. Improving the annual load factor of a supply contract improves the Company's ability to purchase gas supplies on a more economical basis. Purchasing natural gas for storage during periods of low demand generally yields prices at the low point on the seasonal price curve.

Depending upon the location of the storage facility, pipeline transportation may also be required. Storage facilities located within the Company’s distribution system or on the interstate pipeline are preferable to those located “off-system”. Off-system storage requires additional pipeline transportation and may limit the flexibility of the resource. Cascade does not own its own storage facility and therefore must contract with storage owners to access a portion of their storage capacity. In 1994, Cascade had two contracts for utilization of underground storage located at Jackson Prairie (SGS-1). SGS-1 service is contracted directly from NWP and additional SGS-1 service was assigned from Avista

Corporation for Cascade's use. Both of these contracts provided daily deliverability and seasonal inventory capacity. However, Avista declined to extend its agreement with Cascade and the Avista storage service was no longer available following the 2006/07 heating season.

Consequently, Cascade entered into an Agreement with Northwest Pipeline for additional Jackson Prairie storage service that will replace the access to storage that was available through the Avista storage contract. The new Agreement will provide Cascade with twice the amount of daily deliverability of the Avista agreement (30,000 Dth/d vs. 15,000 Dth/d) with approximately the same annual storage quantity. The Jackson Prairie expansion will be fully operational by Fall 2012. Cascade has also entered into a companion transportation Agreement with Northwest Pipeline for the transportation of gas supplies stored under this Agreement to Cascade’s service area. The Company also has contracted for service (LS-1) from NWP's Plymouth, Washington LNG facility. Both Jackson Prairie facilities and the Plymouth facility are located directly on NWP's transmission system. Therefore, storage withdrawal rates can be changed several times during an individual gas day to accommodate weather driven changes in core customer requirements. This type of operating flexibility would not necessarily be available with off-system storage. The Company’s contracted storage services are summarized below.

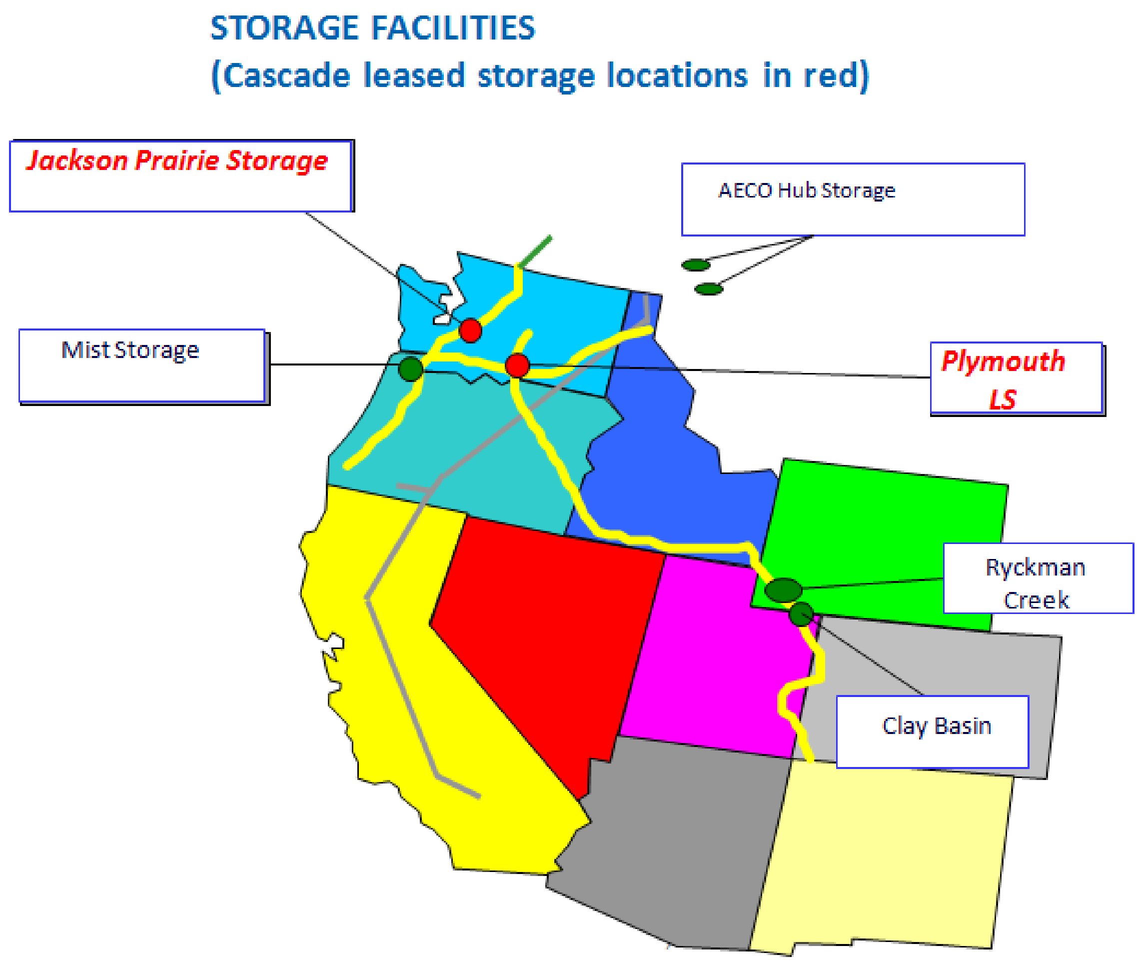
TABLE 5-1
Cascade’s currently contracted storage services

STORAGE FACILITY	SEASONAL QUANTITY (Dths)	DAILY WITHDRAWAL RIGHTS (Dths)	EXPIRATION DATE
PLYMOUTH (LNG)	562,200	60,000	10/21/2019
JACKSON PRAIRIE	604,351	16,789	10/31/2019
JACKSON PRAIRIE EXPANSION	326,339	30,000	10/31/2060

Withdrawal capabilities must also be accompanied by firm capacity on the transporting pipeline(s) to be of any value as a reliable source of gas supply. Cascade's SGS-1 and LS-1 service requires TF-2 firm transportation service for storage withdrawals, and Cascade has sufficient firm TF-2 service to meet its storage daily deliverability levels.

Figure 5-A provides a map of the various storage discussed above, as well as the location of other storage facilities in the region.

FIGURE 5-A



Capacity Resource Options

Capacity options are either interstate pipeline transportation resources or capacity on Cascade's local distribution system. Cascade's local distribution system was built to serve the entire connected load in its various distribution service areas, on a coincidental demand basis, regardless of the type of service the customer may have been receiving. Cascade generally has the distribution capacity available to deliver the gas to customers if the pipeline delivers the gas to the Company's citygate stations. Core interruptible service relates to the spot market supplies and interruptible interstate pipeline transportation contracted to serve these markets. Cascade does not contract for firm supply or interstate transportation for these interruptible customers. Cascade's interruptible rates also reflect the fact that no firm supply or transportation services are purchased on behalf of interruptible customers.

Interstate Pipeline Transportation Services

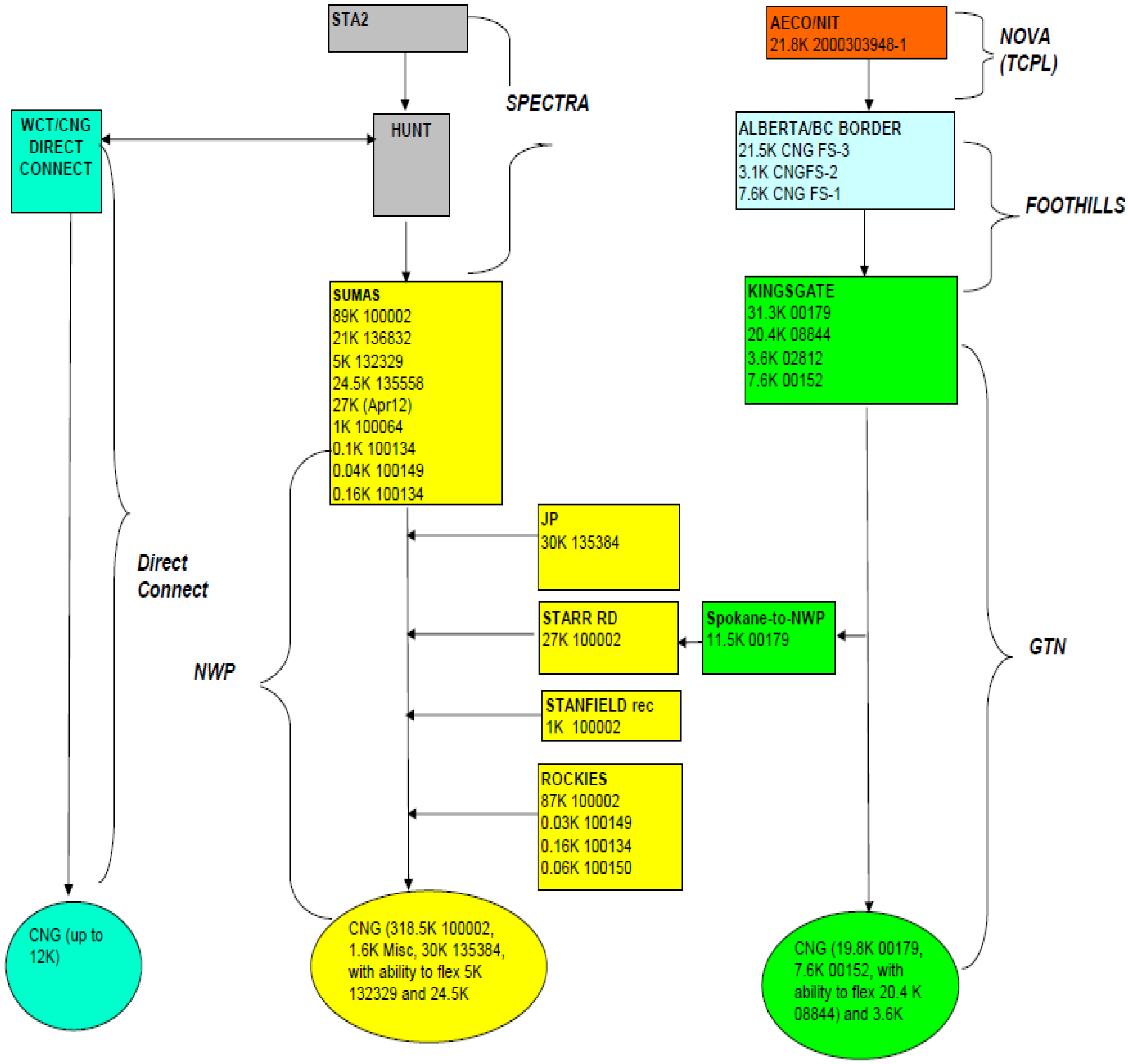
Pipeline transportation resources are utilized to transport the gas supplies from the producer/supply sources to Cascade's system. Cascade currently purchases supplies from three different regions or basins: U.S. Rockies, British Columbia, and Alberta, Canada. Unless the gas supplies have been "bundled" by the supplier, these resources require pipeline transportation to deliver them to Cascade's local distribution system.

Cascade has several long-term annual contracts with NWP, one long-term annual contract and three long-term winter-only contracts with GTN (including the upstream capacity on Trans Canada Pipeline’s Foothills and Alberta systems), and one long-term annual contract with Spectra in British Columbia, Canada. These contracts do not include storage or other peaking services that provide additional delivery capability rights ranging from 9 to 120 days.

As noted earlier, available capacity exists on two of the three upstream pipelines serving the region: Spectra Energy’s T-South Mainline from Northeast BC to the BC-Washington Border at Sumas, and TransCanada’s GTN System that takes natural gas from Alberta at Kingsgate, Idaho and ships it to and through the region. The Company constantly reviews existing capacity options and works to negotiate contract terms that make sense for both parties, whenever we determine a project is viable.

Figure 5-B provides a schematic of Cascade's various transportation agreements, approximate contract demand (in thousands of dths) and their general flow patterns.

FIGURE 5-B



Proposed and New Pipelines

Additionally, several pipeline projects have been proposed by a variety of developers to serve the region. As noted below, some of these projects, which were part of the last IRP, are no longer active, but are recapped and updated with new information since the last IRP.

- Blue Bridge Pipeline – Williams Gas Pipeline Company and Puget Sound Energy proposed this project which included the installation of additional compression horsepower at existing Northwest Pipeline stations and the construction of up to 172 miles of 30-inch pipeline and 16 miles of 36-inch pipeline. The project was designed to deliver about 500 MMcf/d from Stanfield, Oregon to the I-5 Corridor and generally follow Northwest Pipeline's existing pipeline corridor for the majority of the route. On September 1, 2010 the partners announced that they had filed with FERC to shelve the project.

- Palomar Pipeline – Palomar Gas Transmission is a partnership between NW Natural and TransCanada. The proposed 212 mile, 36-inch-diameter underground pipeline will extend from TransCanada's GTN system near Madras, Oregon to NW Natural's system near Molalla, Oregon. It will be a bi-directional pipeline with an initial capacity of 1,200 MMcf/d. As noted earlier, Palomar Gas Transmission has withdrawn its application for a certificate to build a natural gas pipeline in Oregon.

- Integrated Blue Bridge/Palomar project – Essentially would create an "Oregon Hub" via a Transportation by Other (TBO) process using vintage NWP capacity across the Columbia Gorge combined with vintage GTN capacity from Stanfield to Madras, then using Palomar capacity from Madras to Molalla tied to NWP expansion capacity up the I-5 Corridor in Washington. The in-service date was projected to be 2016. This project was presented at an extraordinary joint meeting of the Washington and Oregon utility commissions in February 2011.

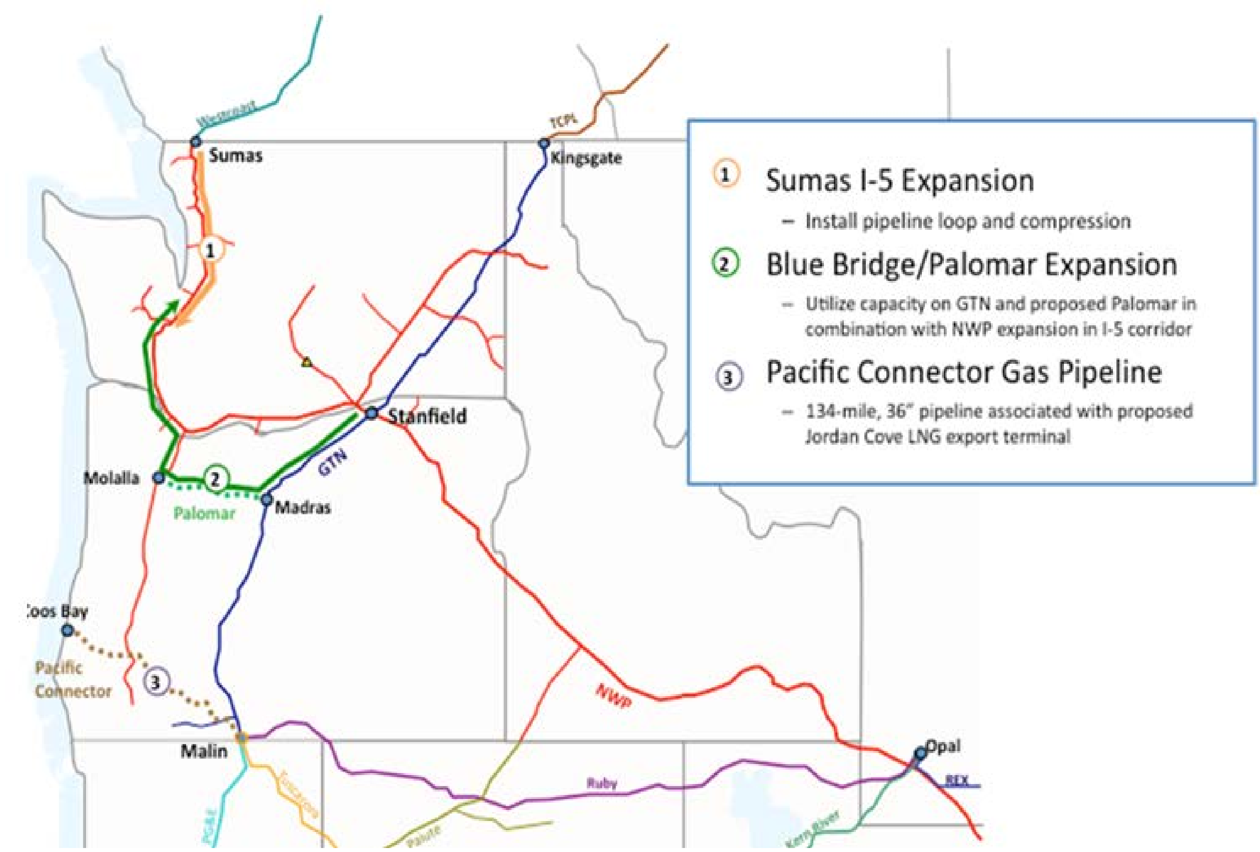
- Pacific Connector Gas Pipeline Project – as identified earlier, is a proposed 234-mile, 36-inch diameter pipeline designed to transport up to 1 billion cubic feet of natural gas per day from the Jordan Cove LNG terminal to markets in the region. The Pacific Connector project includes interconnects to Williams´ Northwest Pipeline near Myrtle Creek, Oregon; Avista Corporation´s distribution system near Shady Cove, Oregon; Pacific Gas and Electric Company´s gas transmission system; Tuscarora Gas Transmission´s system; and Gas Transmission Northwest´s system, all located near Malin, Oregon. As noted earlier, this project is now viewed as an export facility; but it also has the possibility of bringing additional supply to the area to make part of our resource portfolio.

- Southern Crossing Pipeline Extension – this is a project development that is being developed by Terasen Gas. It will extend the existing Southern Crossing from Oliver BC to Kingsvale BC. This bi-directional pipeline would flow new production from Northern BC east to GTN or move Alberta gas into the I-5 corridor via Spectra Pipeline.

On July 28, 2011, El Paso Corporation placed the Ruby Pipeline in service. Ruby is a 680-mile, 42-inch interstate natural gas pipeline, providing transportation service from Opal, Wyoming, to interconnections near Malin, Oregon. Ruby has an initial design capacity of up to 1.5 billion cubic feet per day (Bcf/d) and traverses portions of four states: Wyoming, Utah, Nevada, and Oregon. The project utilizes four compressor stations: one near the Opal Hub in southwestern Wyoming; one south of Curlew Junction, Utah; one at the mid-point of the project, north of Elko, Nevada; and one in northwestern Nevada.

Cascade's utilization of pipeline transportation and peak day capacity for core and contracted for non-core firm transportation gradually changes over the planning horizon. Current company-acquired firm supplies utilize existing core firm transportation capacity. Future core market growth utilizes non-core firm transportation capacity that will be converted to core market firm transportation capacity as core market growth occurs. Figure 5-C provides a map of the current existing and various pipeline projects discussed above.

FIGURE 5-C



Transportation resources historically have been purchased from the pipeline at the time of an expansion under long-term (twenty to thirty year) contracts. As a result, the Company may find that it has capacity excess to its core market needs, especially in the early years following an expansion. Since late 1989, Cascade has, through its Optional Firm Pipeline Capacity tariffs, allowed its non-core customers to utilize Cascade's firm pipeline capacity that is excess to current core customer requirements. By accepting all of the obligations associated with the underutilized pipeline capacity, the non-core customers have relieved Cascade's core customers of the costs associated with holding the pipeline capacity for future growth.

Additionally, pipeline capacity is a tradable commodity through the Electronic Bulletin Board (EBB). Should a utility have temporarily underutilized transportation capacity it can release that capacity to third parties. Such activities allow holders of pipeline capacity contracts to recoup a portion of the fixed costs incurred. The value of the capacity will fluctuate depending upon market conditions. Any pipeline capacity in excess of core requirements can be offered to qualified buyers. The capacity is offered to any credit-worthy market through the respective pipeline's EBB.

As Cascade's customer count and loads continue to grow, the Company will need to acquire additional capacity resources. In May 2011, Cascade was able to obtain vintage NWP capacity through a pre-arranged agreement with the Pipeline that will provide additional MDDOs (daily delivery) to several gates, including Yakima/Union Gap on the Wenatchee lateral and Bellingham/ (Ferndale) gates. This capacity (27,063 dths) becomes available to Cascade in April 2012. The current vintage transportation rates on NWP compared favorably to any of the other proposed pipeline projects at the time, such as the Blue Bridge/Palomar integrated project. For the past several Integrated Resource Plans, Cascade has identified the need for incremental pipeline capacity in order to meet anticipated peak day requirements for its core market as early as the 2012/2013 timeframe. Additionally, there are several locations where Cascade's design day requirements are greater than existing contracted delivery, including the Bellingham area. With the incremental capacity Cascade will have enough receipt MDQ to meet core requirements until 2023 and will provide adequate delivery MDDOs until the 2022 timeframe. The table below describes the capacity:

TABLE 5-2

NWP Incremental Vintage Capacity, effective 4/1/2012

Receipt Point	Delivery Pt	Del Pt Qty (Dths)
Sumas	Bellingham	8,074
Sumas	Prosser	29
Sumas	Yakima/Union Gap	310
Sumas	Umatilla	6,160
Sumas	Plymouth LNG	12,490

In December 2011, the Company was presented with an opportunity to obtain vintage NWP capacity through a pre-arranged agreement with Northwest Pipeline that will provide additional MDDOs (daily delivery) to Sedro-Woolley, and by extension increase our firm rights in NWP Zone 30 (Cascade Zone 30-S and 30-W).

TABLE 5-3

NWP Incremental Vintage Capacity, Sedro-Woolley block

REC PT	*DEL PT*	*Dths/DAY*	*DTHS/D AND TERM*
SUMAS	SEDRO	6191	03/2012 – 10/2050
SUMAS	SEDRO	1050	04/2013 – 10/2050
SUMAS	SEDRO	3259	01/2014 – 10/2050

The pre-arranged agreement was subject to competitive bid and it was ultimately awarded based on the offer which represented the highest net present value (NPV). We believed that based on our modeling, economic feasibility of vintage vs. incremental capacity costs, proximity to our distribution system and our ongoing obligation to serve, that proposing a long-term contract through October 2050 would ensure that the agreement would be awarded to Cascade.

SUPPLMENTAL BACKGROUND AND ANALYSIS XXXXXXX

- For the past several Integrated Resource Plans requirements are greater than existing contracted delivery in CNG Zone 30-W, particularly the Bellingham area. Cascade has identified the need for incremental pipeline capacity in order to meet anticipated peak day requirements for its core market in Whatcom County (CNG Zone 30-W) as early as the 2018 timeframe. Figure 5-C-1 provides a clear picture of the impending peak day shortfall.

- Even at maximum rate, vintage capacity is considerably less expensive than proposed pipeline expansion projects including a Palomar/Blue Bridge type of scenario, which is anticipated to be upward of $.82/dkth and is not guaranteed to be built.

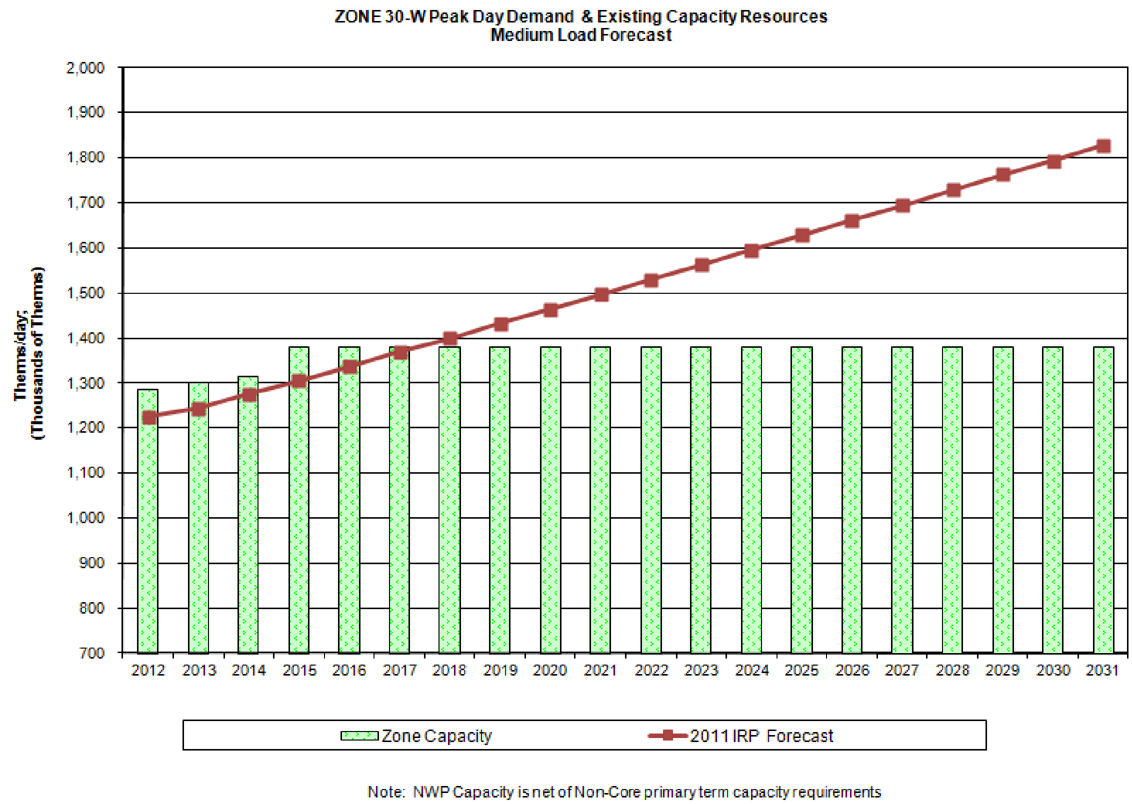
- Both TransAlta and Boardman coal-fired generation plants have committed to reduce and eventually cease operation and will likely be replaced with gas fired generation, providing greater interest in the capacity, particularly if Puget determines to add to their gas fired generation in the areas to meet power shortfalls identified in their integrated resource plan.

- The proposed capacity package provides delivery to Sedro-Woolley, a point on CNG's system.

- Although this capacity will become effective prior to the actual need, NWP has not identified any plans for a future system expansion in the area; however, having this capacity would lessen the amount of incremental capacity (and associated costs) Cascade would need to pay for to participate in a future system expansion.

- Acquiring the proposed capacity from NWP will extend our ability to meet peak day in CNG Zone 30-W to around the 2022 time frame. The combined Zone 30-S and Zone 30-W (the actual nominated zone) would have sufficient capacity to meet peak day through 2026.

FIGURE 5-C-1



Ruby Pipeline and Incremental GTN northbound firm service

Throughout 2011, Cascade worked with both existing Ruby shippers and with Ruby Pipeline to obtain discounted, long-term firm capacity on Ruby Pipeline along with the chance to acquire firm Malin north capacity on GTN through a pre-arranged agreement via Ruby that will provide the means to deliver Rockies supplies to Central Oregon, thereby increasing supply diversity and mitigating some of the negative impacts of constraints on Northwest Pipeline. Currently, gas supplies for Central Oregon are almost exclusively sourced from Alberta. While this has been a price advantage we feel it is important to have flexibility of supply options, particularly since we may find ourselves competing for Canadian supplies that will be pulled to the export facility in Kitimat to serve increasing Asian demand.

Ultimately, as will be explained further, Cascade worked with Ruby to finalize a long term transportation agreement based on the following proposal:

- **Term:** The term of the proposed Ruby Pipeline capacity is for 25 years, beginning as early as April 1, 2012 but no later than November 1, 2012.
- **Maximum Daily Quantity (MDQ):** November 1st - April 30th of each year: 10,000 dths/day. Ruby would also provide Cascade with an option for 20,000 Dth per day (in addition to the 10,000 Dth described above) pursuant to the same terms and conditions. The option would expire on October 31, 2014. If at any time during the option period, Ruby receives a bona fide offer from a third party to contract for the optioned capacity, Ruby would provide notice to Cascade with sixty days to exercise the option. This will be contractually structured consistent with FERC allowances.
- **Receipt Point(s):** Any Ruby interconnect at the Opal Hub, including (CIG, Overthrust, Pioneer)
- **Delivery Point:** Ruby – GTN interconnect at Malin, Oregon (Turquoise Flats)
- **Rate:** Fixed reservation rate of $ 0.75 per dth/d for the twenty-five year term, plus Ruby commodity and FERC fuel and variable charges as authorized (estimated at $0.01 and 1.5% respectively). The current recourse rate is $0.95 per dth/d. This proposal represents a 21% discount.
- **GTN Capacity:** Separate from the Cascade/Ruby capacity, Ruby has been working with GTN to contract for maximum rate firm transportation rate on GTN and compensating GTN for its capital expenditures in providing firm, northbound service. Ruby would, in turn, post on GTN's EBB a pre-arranged capacity release to Cascade with Malin northbound firm transportation capacity, subject to bid, consistent with FERC rules.

SUPPLEMENTAL BACKGROUND AND ANALYSIS

As the chart below indicates, the annual cost per unit for the Nov-Mar Ruby capacity would be less than vintage year round capacity on Northwest Pipeline. Granted, Northwest Pipeline does have some capacity release value but there is intrinsic value with Ruby capacity associated with providing supply diversity for Central Oregon, plus the Ruby/GTN path will give us an alternative path for re-directing NWP Rockies gas around a Kemmerer constraint. Rockies gas originally destined for NWP could be shipped via Ruby-GTN to Stanfield where it can then flow back on NWP if needed, potentially avoiding having to sell otherwise constrained supplies at less than purchase contract terms or incur banking or penalty charges.

TABLE 5-4

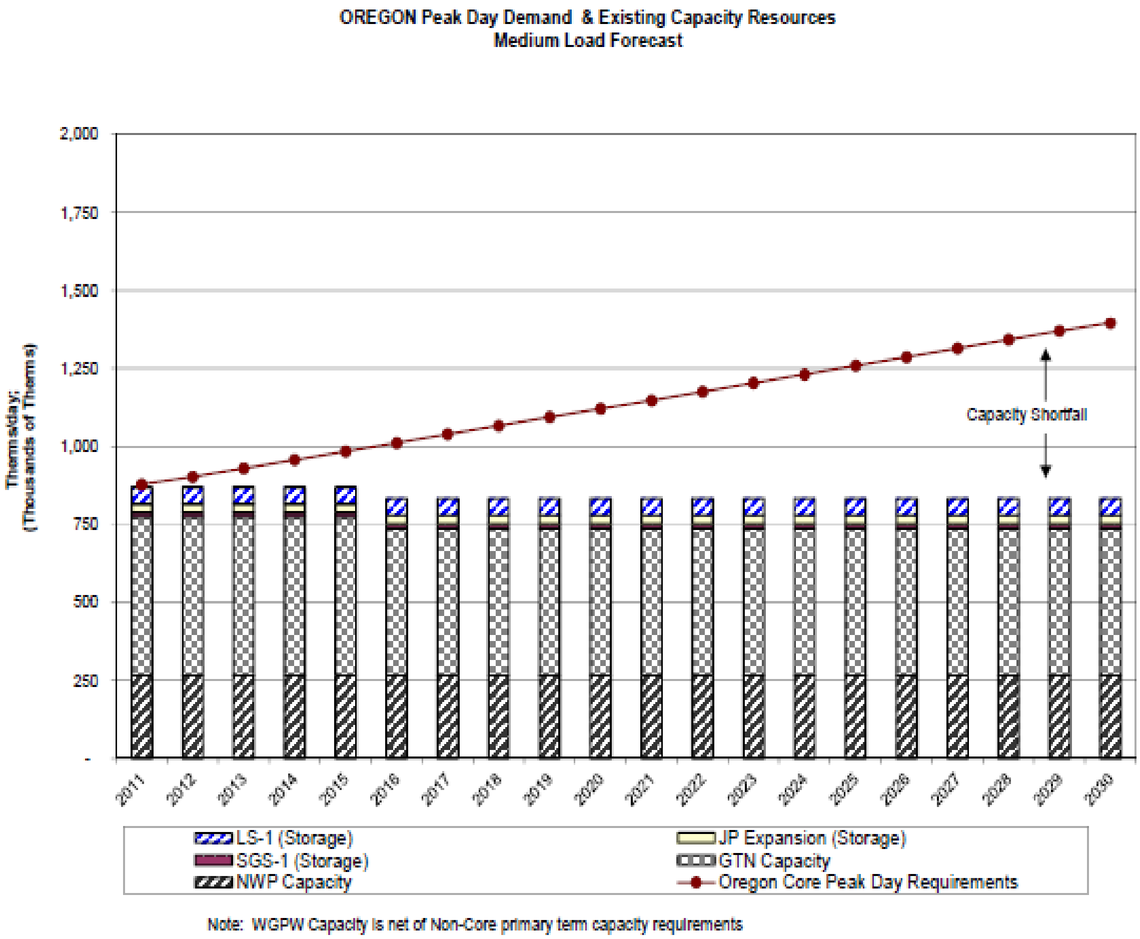
Ruby vs Vintage NWP annualized capacity costs

Category	Rate, per dth	Days in Year	Annual Cost
Vintage NWP	$ 0.3879	365	$ 141.58
Discounted Annual Ruby	$ 0.7600	365	$ 277.40
Winter Only (Nov-Apr)	$ 0.7600	181	$ 137.56

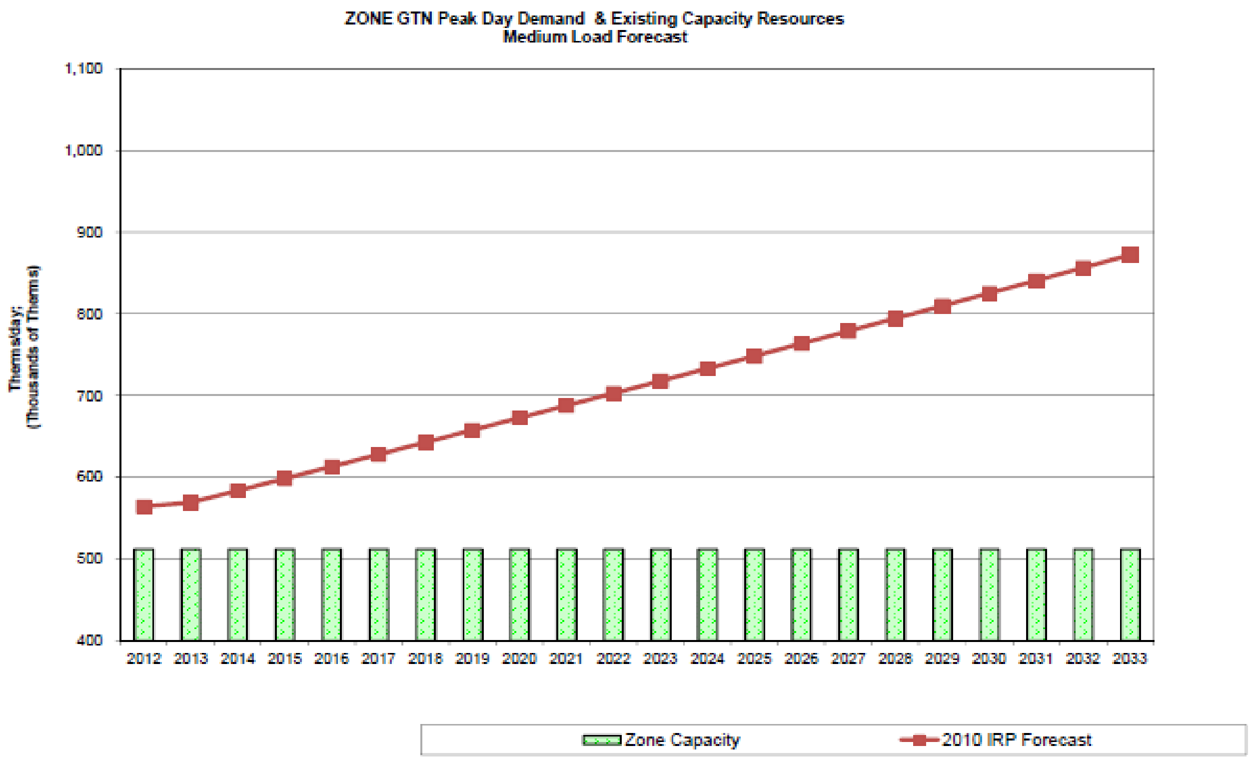
The proposed Blue Bridge and Palomar pipelines which would also bring Rockies gas to the Pacific Northwest are currently on hold and do not look likely to be built. In addition, these options have projected rates that exceed $0.80/dth.

As indicated earlier there was also the possibility of acquiring multi-year (up to ten) capacity releases from existing Ruby shippers; however, none of the parties we worked with were able to match the discount being proposed by Ruby. In fact, most of the parties we spoke with initially did not offer a discount; and when they did the discounts were typically 10%. Additionally, none of these parties had or were seeking to obtain firm primary northbound service on GTN. From the Company's perspective under current resource planning guidelines we could only use the current GTN backhaul as a secondary service; it couldn't be used for peak day planning in the IRP. However, if Ruby is successful in acquiring the GTN northbound capacity and we acquire it via GTN's EBB, then the Ruby/GTN capacity would form a needed primary firm resource for regular use as well as for peak day.

As the following chart shows, Oregon faces sizeable capacity shortfalls on peak day in the long-term. Short-term, we have been and plan on continuing to meet these needs via citygate supplies, which do not require Cascade to pick up additional capacity. Additionally, since GTN is still experiencing continued de-contracting, it is likely that there will be available capacity available on GTN for short term capacity releases. While this is fine for the short-term, we will need to consider acquiring additional resources to meet peak day. The portions of Oregon served by NWP (Zone 24 and Zone ME-OR) have sufficient long-term capacity through 2026.



However, as can be seen on the following chart, the GTN zone, which is primarily supported by Alberta sourced supplies, is significantly short. Therefore, not only will acquiring Ruby bring supply diversity to supplement what is purchased from Alberta, having Ruby acquire firm northbound GTN capacity and releasing it to Cascade will help us meet our long-term incremental need for capacity. It should also be noted that our modeling and discussions with stakeholders have recognized that Cascade needs more storage to serve Oregon. One possible source of storage Cascade will consider as a result of having Ruby capacity is Ryckman Creek storage at the Opal Hub, which will connect to Ruby, thereby giving Cascade a possible storage source to meet Oregon load, as well as price arbitrage to the benefit of all ratepayers.



See Section 7, Resource Integration for additional information regarding the SENDOUT™ modeling for Ruby Pipeline and Incremental GTN northbound firm service.

Some of the growth will require Cascade to look at alternatives to pipeline mainline capacity such as LNG satellite facilities located near or within the Company's distribution system. The Company is continuing to study the viability of LNG satellite facilities to meet these needs.

The Wenatchee lateral is an example where an LNG satellite facility may be more cost effective than the traditional solution of pipeline expansion for solving the upcoming capacity constraints on the lateral. Preliminary cost studies indicate that an LNG satellite facility solution may be 1/3 to 1/2 the cost of a pipeline expansion project that would provide the same peak day incremental capacity.

Additionally, the historic load growth the Company enjoyed throughout much of its service areas has begun to create the need to increase the physical capabilities of some of the pipeline's citygates. Even though Cascade may have an adequate amount of pipeline capacity available on the pipe, it may not have the contractual or physical capabilities at the citygate to meet the incremental load requirements. LNG satellite facilities or trucked in LNG re-gasification facilities or other similar type solutions may provide lower cost alternatives to the cost of city gate rebuilding projects. The Company will continue to study the viability of these alternatives.
Appendix E provides a summary of current and potential capacity resources evaluated during this planning cycle.

Natural Gas Price Forecast

For IRP planning purposes the company develops a baseline, high and low natural gas price forecast. Demand, oil price volatility, the global economy, electric generation, opportunities to take advantage of new extraction technologies, hurricanes and other weather activity will continue to impact natural gas prices for the foreseeable future. Cascade has considered price forecasts from several sources, such as Wood Mackenzie, Energy Information Administration, the Financial Forecast Center's forecast, as well as our observations of the market to develop the low, base and high price forecast. The following discussion provides an overview of the development of the baseline forecasts.

Development of Baseline Henry Hub price forecast

Cascade's long term planning price forecast is based on a blend of current market pricing along with long term fundamental price forecasts. Since pricing on the market is heavily influenced by Henry Hub prices, the Company closely monitors this market trend. While not a guarantee of where the market will ultimately finish, the current market (NYMEX) is the most current information available that provides some direction as to future market prices. On a daily basis, we can see where Henry Hub is trading and how the future basis differential in our physical supply receiving areas (Sumas, AECO, Rockies) is trading.

The fundamental forecasts include Wood Mackenzie, Energy Information Administration (EIA), Northwest Power Planning Council, the Texas Comptroller and the Financial Forecast Center's long term price forecasts. Wood MacKenzie publishes a long-term price forecast each quarter to subscribing customers. This forecast is broken down by month through the planning horizon and includes Henry Hub as well as basis differentials for our receiving areas. The company also considers the EIA forecast; however, it has its limitations since it is not always as current as the most recent market activity. Further, the EIA forecast provides monthly breakdowns in the short term, but longer term forecasts are by year. Many of the other sources above also only provide price forecasts by year. Given Cascade's load profile and the need for more winter gas than summer, the company develops a pattern based on the market monthly forward prices to create a long-term, monthly Henry Hub price.

With a monthly Henry Hub price determined for the above sources, the company assigns a weight to each source to develop the monthly Henry Hub price forecast for the 20 year planning horizon. The forecast weighting factors are shown in Table 5-2. At the time the price forecast was developed, the Financial Forecast Center forecast was significantly lower than the Wood Mackenzie forecast and the forward market. Given the significantly higher future prices at the time versus the Comptroller forecast in addition to the fact that it only gives a three year forecast (2012-2014), the Company decided to severely limit the Financial Forecast Center from the weighted average. The Financial Forecast Center is unlikely to be a price source for Cascade in future plans. In recent years the EIA forecast has often been lower than the actual monthly price; however it is still a respected industry barometer of prices. Therefore, the EIA forecast was given a higher weight. As discussed earlier, while current market pricing may not accurately estimate the final market price, it often is a reliable indicator. Therefore, the company gave the current market pricing (NYMEX HH) some weight based on nearness to term. It should be noted that most of the forecast providers did not provide price forecasts for 2031. We chose to blend the Texas Comptroller and the EIA. While this represented a significant increase in weight for the Comptroller (moving from 1.5% to 45% weight) we decided to use the Comptroller given that 2031 is farthest year for the price forecast and desire to use more than one source for price forecasting. We had the option of also extending the trend-line of the NYMEX HH beyond year 2022, but felt it important to recognize that NYMEX HH is more a factor in short rather than long-term price. In future plans will not use the NYMEX HH trend-line for years beyond NYMEX trading period, consistent with how all other tools are used to develop the 20 year price forecast.

Development of the Basis Differential for Sumas, AECO and Rockies

Since the company's physical supply receiving areas (Sumas, AECO, and Rockies) are at a discount to Henry Hub, we utilize the basis differential from Wood Mackenzie's most recent update and compare that to the future markets basis trading as reported in public market. Although it is impossible to accurately estimate the future, for trading purposes, the most recent period has been the best indicator of the direction of the market. Correspondingly, we applied a weighted average to determine the individual basis differential in the price forecast. Typically, we give the most weight to the current NYMEX Henry Hub price in the early years. As our forecast moves ahead we start to reduce the impact of the NYMEX (and the impact of speculation and other market uncertainties) and give greater weight to NWPPC, Wood Mackenzie and EIA.

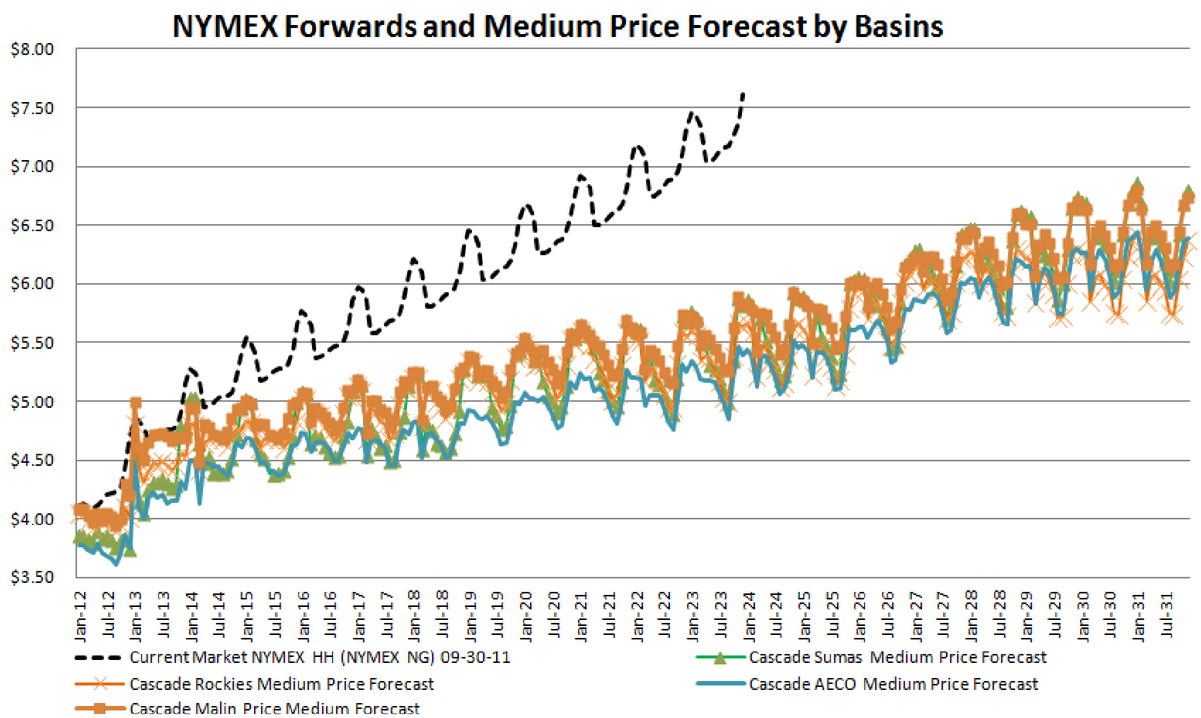
In order to determine the low case and high case, the Company utilized the EIA economic growth factors (EIA Annual Energy Outlook 2011, Table E-1). This resulted in using 2.1 for the Low Case, 2.7 for the Reference Case and 3.2 for the High Case.

TABLE 5-3
HENRY HUB FORECAST WEIGHTING FACTORS

Year	Financial Forecast Center	NWPPC	TEXAS Comptroller	WoodMac	EIA	NYMEX HH
2012	0.50%	8.00%	0.50%	8.00%	8.00%	75.00%
2013	0.50%	8.00%	0.50%	8.00%	8.00%	75.00%
2014	0.50%	8.00%	0.50%	14.50%	14.50%	62.00%
2015	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2016	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2017	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2018	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2019	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2020	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2021	0.00%	30.00%	1.00%	14.50%	14.50%	40.00%
2022	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2023	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2024	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2025	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2026	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2027	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2028	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2029	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2030	0.00%	30.00%	1.50%	30.00%	18.50%	20.00%
2031	0.00%	0.00%	45.00%	0.00%	55.00%	0.00%

Figure 5-D on the following page provides a summary of the medium price forecast (in real dollars) for the various indices over the 20 year planning horizon. Appendix E provides the detailed 20 year price forecasts.

FIGURE 5-D



Supply Side Resource Uncertainties

Several uncertainties exist in evaluating supply-side resources. They include regulatory risks, deliverability risks, and price risks. Regulatory risks include the unknown impacts of future Federal Energy Regulatory Commission or Canada's National Energy Board rulings that may impact the availability and cost of interstate pipeline transportation.

Deliverability risk is the risk that the firm supply will not be available for delivery to the Company's distribution system. Purchasing resources from larger producers or marketers who typically have gas reserves in multiple locations may minimize this risk. The risks associated with prices rising or falling during any winter period represent another supply-side uncertainty. To the extent the company purchases firm contracts that are tied to an index price, it may be at risk for paying more than was initially anticipated for the resource when the decision was made. Price risks associated with climbing prices can be minimized through the use of fixed price contracts or through the use of financial derivatives.

It should be noted that several proposals being discussed or that are in process involve a number of Canadian upstream pipelines which could have a direct impact on the availability of supply or at least may pose potential risks to increases in the price of supplies sourced from British Columbia and Alberta. For example, in response to competitive pressure on their mainline tolls, TransCanada Pipeline filed with the NEB to extend NOVA service east to Steelman and west to Kingsgate. This includes the roll-in of Foothills Pipeline. Under the plan, TCPL estimates western shippers (i.e. Cascade) will save between 5-7 cents including fuel. Eastern shippers will also see reduced rates while receipt shipper rates will increase 3-5 cents. Increases in costs for receipt shippers led to concerns that commodity prices for future gas supplies on the Alberta system may raise substantially. The Company will continue to monitor and be actively involved in the various pipeline forums as these initiatives develop.

As noted earlier, demand in Asia will likely make LNG exports from the Pacific Northwest a competitor for natural gas. It is also important to note an increasing trend in the use of natural gas vehicles (NGV) which utilize natural gas that has been compressed into a transportation fuel, also known simply as compressed natural gas. Taxis, transit and school buses, as well as heady- duty trucks are among the users of natural gas powered vehicles. The Natural Gas Vehicle Institute estimates there are more than 112,000 NGVs in the United States. Plentiful reserves of natural gas exist as a domestic fuel, typically at substantial discounts compared to gasoline. From an environmental impact, exhaust emissions are generally much lower than gasoline powered vehicles. As the United States continues to search for environmentally friendly, economically viable options to displace gasoline, natural gas is seen as a fuel that could significantly contribute to lessening American dependency on foreign oil.

According to the January 2012 Alternative Fuel Price Report from the Department of Energy, compressed natural gas had a price differential of between $1.50 and $2.25 compared to gasoline prices in Washington and Oregon. Several compressed natural gas fueling stations exist in the Seattle Metropolitan area; additionally, Avista has an active NGV fleet program in the works. While we have yet to see the demand for NGVs create notable competition for natural gas in the Pacific Northwest (although there are estimates that over 12 million NGVs exist world-wide), as technology improves and costs of fueling stations become more economical there exists the probability that NGV use will put pressure on future gas prices and availability. Cascade will continue to monitor activities in the NGV sector for possible impacts to our resource planning.

Financial Derivatives

Cascade constantly seeks methods to ensure ratepayers of price stability. In addition to methods such as long-term physical fixed price gas supply contracts and storage, another means for creating stability is through the use of hedges, or financial derivatives. The general concept is to lock-in a forward natural gas price with a hedge, consequently eliminating exposure to significant swings in rising and falling prices. Financial derivatives include futures, swaps, and options on futures or some combination of these.

Natural gas futures contracts are actively traded on the New York Mercantile Exchange (NYMEX). The use of futures allows parties to lock-in a known price for extended periods of time (up to 6 years) in the future. Contracts are typically made in quantities of 10,000 dekatherms to be delivered to agreed-upon points (e.g., Sumas, Station 2, AECO, Northwest Pipeline Rockies, etc.) In a “swap”, parties agree to exchange an index price for a fixed price over a defined period. In this scenario, Cascade would be able to provide its customers with a fixed price over the duration of the swap period. In theory, the idea is to level the price over the long term. Futures and swaps are typically called “costless” because they have no up-front cost. Unlike futures and swaps, an option on futures only provides protection in one direction—either against rising or falling prices. For example, if Cascade wanted to protect itself against rising gas prices but keep the ability to take advantage of falling prices, Cascade can purchase a “call” option on a natural gas future contract. This arrangement would give the Company the right (but not the obligation) to buy the futures contract at a previously determined price (“strike price”). Similar to insurance, this transaction only protects the company from volatile price spikes, via a premium. The premium is typically a function of the variance between the strike price compared to the underlying futures price, the period of time before the option expires, and the volatility of the futures contract.

Portfolio Purchasing Strategy

Cascade’s Gas Supply Oversight Committee (GSOC) oversees the Company’s gas supply purchasing strategy. Beginning with the 2004/05 gas supply portfolio, Cascade has employed a more rigorous gas procurement strategy for both physical gas supplies and for hedging the price of the core portfolio. Cascade has contracted for physical supplies for up to three years (based on a warmer-than-normal weather pattern). The Company’s current gas procurement strategy is to have physical gas supplies under contract for 100% of year one’s warmer than normal core needs, 66% of year two, and 33% of year three. This strategy results in the need to contract annually for approximately one-third of the core portfolio supply needs for the upcoming three-year period. Under this procurement strategy, this leaves roughly 10 to 20% of the annual portfolio to be met with spot purchases. Spot purchases consist of either “First of the Month” deals executed during bid week for the upcoming month, or day purchases which are utilized to meet incremental daily needs.

Once the portfolio procurement strategy and design has been approved by GSOC, the Company employs a variety of methods for securing the best possible deal under existing market conditions. Cascade employs a bidding process when procuring Fixed physical, Indexed Spot physical, as well as financial swaps used to hedge the price of index based physical supplies. In the bidding process we alert a minimum of three suppliers and/or financial counterparties of the specific gas supply transactions Cascade plans to fill. We then collect bids from these parties over a period of days or weeks depending on the number or time requirements of the packages sought, comparing the indicative pricing to each party as well as comparing the information to market intelligence available at the time. Ideally, after monitoring these indicatives and the market, Cascade will award the specific packages to individual parties. Naturally, price is the principle factor; however, Cascade also considers reliability, financial health, past performance, and the party’s share of the overall portfolio so that we ensure party diversity. It should be noted that there is always the possibility the lowest market price may be during a period when we are initially gathering the price indicatives; in that situation there is a risk that a sudden price run-up may lead to filling the transaction at the higher end of the bids over time, or delay the acquisition to another time. However, the reverse is also true—the initial price indicatives may start high and drop over time allowing us to capture the transaction on the downward swing. In the end, timing is always a factor as the market cannot be predicted with any certainty.

GSOC also oversees the Company's gas supply hedging strategy. The Company's current gas hedging strategy is to hedge 45% of the contracted physical supplies of Year One, 30% of Year Two and 15% of Year Three. Depending on market conditions, the strategy allows for the ratchets to increase to 75%, 50% and 30%, respectively, provided current market information supports moving to a higher level. Currently, depressed market prices have significantly reduced the need for financial swaps; the Company's current strategy is to rely primarily on fixed-priced physical supplies for hedging purposes.

Cascade's programmed buying approach has Cascade negotiating with suppliers and/or financial institutions throughout the year, loosely grouped during three specific time periods (Spring, Summer, and Fall). Ideally, the periods are designed so that each pricing basin (Sumas, Rockies, AECO) has financial swaps or fixed-priced physical supplies in each of the three buy periods. Typically, financial swaps are contracted in amounts in standard blocks of 10,000 dths. While it is possible to contract for other amounts, deviating from the standard blocks could potentially result in having to pay a premium as it is harder for the financial institution to hedge that odd amount with one of their counterparties. As a relatively small LDC, Cascade's ability to hedge in standard blocks is severely limited. Dividing the blocks into numerous smaller or odd sizes would incur increased transactional costs. In fact, some trading partners will not even consider executing a transaction that has varying volumes or are of a non-standard size. Consequently, Cascade's procurement and hedging periods are designed with these concerns in mind while trying to ensure that the total notional volume to be contracted is spread as equally as possible across the buy periods.

Utilizing the consistency of a programmed buying method as described above should help ensure that any locked-in prices provide stability over time, in addition to preventing Cascade from being over or under hedged. In the current contract year and beyond, Cascade plans to annually review our gas procurement physical and hedging strategy and, if unchanged, the company would continue its physical and hedging strategies as outlined above.

Cascade believes its gas procurement strategy is achieving diversity and flexibility in its gas supply portfolio through a combination of physical and financial structures. This goal encompasses not only supply basin origination and capacity limitations, but also includes a combination of pricing options that will assist Cascade in minimizing exposure to price volatility. The programmed buying approach to locking in a significant portion of gas prices maintains a market sensitive and balanced supply portfolio that continues to represent stable pricing as well as secure physical supplies for the Company's core customers.

Section 6

Demand Side Resources

Introduction and Overview

Demand Side Management (DSM) resources are generally thought of as conservation measures or actions that result in the reduction of natural gas consumption due to increases in efficiency of energy use or load management. Oregon and Washington Utility Commissions require gas utilities to consider cost-effective DSM resources in their energy portfolio on an equal and comparable basis with supply side resources. In the gas industry, DSM resources are conservation measures that include but are not limited to ceiling, wall and floor insulation, higher efficiency gas appliances, insulated windows and doors, ventilation heat recovery systems and weather stripping to name a few. By prompting customers to change their demand for gas, Cascade can displace the need to purchase additional gas supplies, displace or delay contracting for incremental pipeline capacity and possibly displace or delay the need for reinforcements on the Company's distribution system.

There are two basic types of demand side resources. These are baseload resources and heat sensitive resources. Baseload options are those that displace the need for baseload supply-side resources. They will offset gas supply requirements day in and day out regardless of the weather. Baseload DSM resources include high efficiency water heaters, higher efficiency cooking equipment and horizontal axis washers. Heat sensitive DSM resources are measures whose therm savings increase during cold weather. For example, a high efficiency furnace will lower therm usage in the winter months when the furnace is utilized the most and will provide little if any savings in the summer months when the furnace is rarely used or is turned off. Examples of heat sensitive DSM measures are ceiling/floor/wall insulation measures, high efficiency gas furnaces, and improvements to duct work. These types of measures will offset more of the peaking or seasonal gas supply resources, which are typically more expensive than baseload supplies.

Note on Technical Potential in Oregon:

Technical potential for heat sensitive measures remains viable into the 2012 IRP planning period with the levelized cost for insulation, hearths, furnaces, and weatherization measures below the ETO avoided cost limit. More details regarding the cost-effectiveness of these measures in the State of Oregon can be found on Tables 6-2 and 6-3.

It should be noted that the ETO has reported blended cost-effectiveness achievements for the two gas utilities they serve at levels more conservative than those listed above, with an ETO Conservative Goal of $.47 levelized cost for 2012. In turn, the OPUC, via Docket UM 1158, has enacted an ETO Performance Measure of $.52 levelized costs or lower. While this is not an unreasonable guideline for assessing the *combined* levelized cost threshold for conservation efforts on behalf of Cascade Natural Gas and Northwest Natural, the benchmark would be less realistic if treated as an individual, utility-specific goal for conservation achievements exclusive to CNGC's service territory.

Energy Trust is forecasting to meet 2012 goals for Cascade's Oregon territory and stay below the key performance measure for levelized cost of $0.52/therm as measured across Energy Trust's full natural gas efficiency delivery portfolio *which includes NW Natural savings*. The KPM metric is inclusive of program management, program incentives, program payroll and related expenses and is set at $0.52/th levelized for 2012. The value of this metric will be adjusted for 2013 based upon Energy Trust and utility (CNGC and NW Natural) budgeting for next year's planned goals. The 2012 levelized cost metric is 10% higher than Energy Trust's portfolio wide conservative levelized cost goal.

As this time the ETO does not appear to anticipate the need for revised targets or funding levels commensurate with the more stringent performance metrics. More specifically, the $.52 cost-effectiveness threshold is not directly applicable to the Company based on its current avoided costs and cost-effectiveness threshold (see appendix H).

Energy Trust's levelized cost projections for Cascade ($0.62/therm) are 32% higher than those for NW Natural ($0.46/therm) as provided in the conservative case goals in the 2012 budget and action plan. Because the CNGC total savings goals are 8% of Energy Trust's total Oregon IRP gas savings goals but 9.7% of the budgeted dollars, the resulting combined levelized cost goal is more heavily weighted to the lower levelized cost projection of NW Natural.

Costs to deliver savings in CNG territory are higher for several reasons. CNG's territory is more rural than NW Natural's, contractors need to travel greater distances to complete the same work and there is less competition in the contractor pool. With fewer project opportunities, the economies of scale seen in delivery among densely populated regions is not seen in CNG territory. 80% of CNG's program mix has higher delivery costs than similar programs in NW Natural territory, including new and existing buildings and all residential offerings. Only industrial savings is projected to have a lower levelized cost than NW Natural industrial in 2012.

Although NW Natural's levelized costs are lower, Energy Trust is committed to meeting CNG's overall and program specific savings goals within budget and sees no advantage to more heavily weighting savings performance in NW Natural territory over CNG territory. If it costs less than forecasted for Energy Trust to deliver the CNG savings goal, there will be a minor cushion in cost performance translated to NW Natural. The CNG budget and goals drive Energy Trust to manage costs by limiting total dollars available to deliver savings goals. Energy Trust's short term strategy for keeping costs within projections is to manage programs closely, and, as needed, shift resources between programs in consultation with CNG.

Due to differences in the approach to DSM acquisition between Cascade's Oregon and Washington jurisdictions, each of the states will be addressed individually. In Oregon, the Company has a fiduciary responsibility to evaluate the funding adequacies of its public purpose charges that go to the Energy Trust as well as the Company's own low-income programs. In Washington, Cascade is updating the technically achievable conservation potential in its Washington service territory.

2-Year Action Plan Update

Oregon Conservation Programs and the Energy Trust of Oregon

Since July 2006, Cascade has relied on the Energy Trust of Oregon (ETO) for the delivery and administration of its conservation programs in Oregon. As the delivery agent for gas conservation efforts in customer homes and facilities on qualifying rate schedules 101 and 104. as well as some industrial efforts, The Energy Trust of Oregon has played a prominent role in both the establishment of the ETO's annual therm savings targets in the Company's service territory, and the determination of needed funds to acquire those therm savings. As reported by the ETO in their annual report to the Oregon Public Utilities Commission (OPUC), the 2010 therm savings achievement in Cascade's service territory was 367,875 (including market transformation savings of 57,616 therms), just shy of their annual goal for that year, but above their IRP target for the same timeframe. Spending was $1.3 million, a notable reduction from their initial estimates. The ETO estimates that their 2011 achievements will be on par with their existing IRP target of 391,754. The preliminary stretch target established for 2012 is 409,372 therms (without market transformation) and the conservative goal is 347,966. These goals are expected to be achievable despite the ETO's significant downward revisions to the 20 year therm savings potential for the Company, and more stringent performance metrics from the OPUC. See addendum for additional comments regarding limitations for assessing DSM Potentials and Cost Effectiveness

Oregon Public Purpose Fund

Commensurate with an increase in the Public Purpose charge, as of November 1, 2011, 88% of monies designated as public purpose funding are now transferred to the Energy Trust of Oregon for the purposes of designing, promoting, and administering Natural Gas energy efficiency programs in accordance with agreements executed between Cascade and the Energy Trust. 12% of the monies designated as Public Purpose Funding is transferred to two internal program accounts and dispersed to Community Action Agencies for the purpose of delivering Cascade's low income weatherization and bill assistance programs.

Recent activities pertaining to the Oregon Public Purpose fund and other monies collected for the purposes of conservation within CNGC's service territory can be found below:

- On August 11, 2010, the Commission approved Order No. 10-309, Cascade's request for authorization to defer incremental funding of Public Purpose Funding payable to ETO to support conservation. This order granted Cascade authorization to defer an amount of funding not to exceed $950,000 for a period of 12 months. Because actual achievements and expenditures did not meet the estimates, the ETO entered 2011 with $526,412 of carryover funds available to meet its 2011 budget.

- ETO's 2011 budget for Cascade was $2,497,836 to deliver its projected annual savings of 391,754 therms. ETO entered 2011 with $526,412 in carryover funds from the 2010 program year. Public purpose funding from Cascade was estimated to be around $886,000. On paper, this would leave ETO short of funding for program year 2011 by around $1,085,000 –leaving nothing toward the 5 percent reserve that ETO prefers to enter into each new program year with. In this case, the 2011 planning reserve was an additional $124,892, or 5 percent of the $2,497,836 budget. Cascade continued to work closely with ETO staff toward the end of 2011 in order to most effectively calibrate the final provision of deferred funding so as not to provide an excess of funding should the expenditures finish below budget for 2011.

- On August 3, 2011, the Commission approved in Order No. 11-285, Cascade's request for authorization to defer incremental funding of Public Purpose Funding payable to ETO to support conservation. This order granted Cascade authorization to defer an amount of funding of up to $1,300,000. This additional deferred funding enabled Cascade to be able to adequately fund ETO's planned budget needs for 2011 and provide a sufficient cash reserve at the end of the year.

- On September 30, 2011, the Company filed changes to its Rate Schedule 31 "Public Purposes Funding" tariff. The 1.69% adjustment, made effective November 1, 2011, was filed at the request of the Energy Trust in order to meet the organization's program expenditure requirements.

Based on recent requests and increased program expenditures from the Trust, the Company anticipates that there will still be a need for additional funding during 2012 in addition to the recently approved increase in the Public Purposes charge and the remaining authorized amount of deferred funding. Cascade will shortly begin joint discussions with Staff and ETO to determine the best solution going forward. Cascade will then make the appropriate application(s) for an additional increase in Public Purposes funding and/or a re-authorization of deferred accounting treatment later in 2012 as the ETO budget becomes firm and the actual program expenditures become known.

Oregon Low Income Weatherization Program

From January 1st through December 31, 2010, 133 homes have been weatherized in Oregon with an annual cumulative savings of 21,401 therms and with $263,474.12 provided in rebates. Average savings per home is 160 therms annually. This represents a significant growth in program participation and low-income CNGC households served during the calendar year. This increased momentum reflects in part a strengthened relationship between CNGC and the Community Action Agencies (CAAs) delivering the Weatherization Assistance Program (WAP). The *most* significant factor to this ramp-up has also the availability of ARRA dollars to the Agencies to serve more low income households in the State of Oregon. Leveraged against CNGC rebate monies, the WAP has been able to serve a significantly higher number of Cascade customers than in prior years. From January 1st through September, 2011, Cascade's Oregon Low Income Energy Conservation Program (OLIEC) has served 65 homes and achieved a savings figure of approximately 8,657 therms with a total expenditure of approximately $107,113. This is slightly lower than the achievement numbers from the same time in the prior year, reflecting the impending expiration of the ARRA monies, but still a significant upward improvement from the previous level of savings to CNGC low income households.

Cascade continues to work closely with its Oregon Low Income Advisory Group to better understand the capacity of the WAP (Weatherization Assistance Program) to serve Cascade homes and evaluate strategies designed to maintain active Agency participation in the program either through modifications to the program measures, incentives, or delivery approach. Such utility collaboration will become particularly important in light of impending reductions to both ARRA and other critical federal funding sources.

Program modifications discussed with the Advisory Group and implemented in 2010 included an extension of the OLIEC program to incorporate rebates for high efficiency natural gas water heaters, and allow participation by non-profit entities engaged in providing affordable, energy-efficient housing for low-income individuals. Cascade will continue its efforts to identify opportunities to utilize the available OLIEC funds in a manner that achieves the greatest amount of cost-effective therm savings at homes occupied by low-income households.

Outside Determinants of Customer Usage

Cascade has remained active in monitoring external developments at the state and national level which carry potential impacts to customer usage within our service territory. Such developments include changes to Residential and Commercial building codes. Several substantial changes to Washington code were scheduled to go into effect on July 1, 2010 but have experienced subsequent delays. These changes are likely to have direct impacts to the operation of our Conservation Incentive Program. The Washington State Building Code Council will enter into regular rulemaking to determine whether implementation should be further delayed until April 1, 2011. Measures resulting from this new code that have the potential to impact Cascade's Conservation Incentive Program are outlined as follows:

- *PTCS Duct Sealing (Residential- Existing)* – A duct sealing standard equal in stringency to the PTCS standard will become mandatory. Code will mandate this new standard be enforced whenever homeowners make space conditioning alterations to their home. A space conditioning alteration is defined as any change to the heating and air conditioning equipment (i.e. replacing a furnace).

  The technical potential for the Company to claim savings from this measure is no longer viable since it will soon be mandated by the State. Therefore potential for gas savings to 2030 is reduced by approximately 790k therms (or the amount Stellar associated with this measure). The inclusion of potential from PTCS duct sealing is still viable as a stand-alone measure that would not be combined with a furnace replacement or other space conditioning alternation, but should be reduced downward to reflect that measure potential is now limited to existing homes where space-conditioning equipment has not been altered.

  PTCS Duct Sealing (Residential- New) - On average, 56% of the deemed savings associated with ENERGY STAR certified homes comes from insulation and duct sealing. If the new code equals or exceeds insulation and duct sealing standards for ENERGY STAR certified homes, it may be necessary to reduce the deemed savings (and total technical potential for the CIP) associated with this measure. However this may be somewhat offset by therm savings increases, as ENERGY STAR home requirements may become more stringent in 2011.

  As a means of trying to prepare our contractors for the upcoming changes, CNGC contractors have made numerous calls to builders, HVAC contractors, and insulation contractors. These calls were used to inform program participants of the upcoming code changes, WSU trainings available, and the Trade Ally equipment discounts. Feedback from contractors and builders has made it clear that a small number of contractors feel prepared to comply with these code changes in 2010 and both compliance and enforcement of these codes may take a while to be consistent.

Windows (Commercial) **-** The proposed 2009 WA State Energy Code will eliminate most of the new building window measures proposed in the Stellar report by virtue of requiring a reduction of U values (overall heat transfer coefficient). The old code allowed U values for windows of .55 Btu/sq ft, and the Stellar report used reduced U values ranging from .45 to .31 for modeling their new window measures. The new code stipulates maximum U values of .40 for aluminum frame windows (eliminates potential new window measures E129, E130, E126, E127 in Stellar) and .32 for vinyl windows (eliminates new window measures E123 and E124). This only leaves E131 and E128 for Aluminum frame windows and E125 for vinyl windows, but with commensurate greatly reduced efficiency gains over newer code requirements.

Oregon Building Codes

While code changes, and their impacts to conservation potential, are primarily monitored by the Energy Trust of Oregon, Cascade also reviews these upcoming changes in order to better understand the viable conservation incentive opportunities that can be offered to its customers. Most code changes apply only to new construction or substantial home/facility remodels, and thus it is often critical to maintain incentives for high-efficiency residential gas measures in existing construction even while code tightens. In fact, during times of transition to more stringent code, there may be motivation by manufacturers to "push" lower-efficiency equipment in existing structures/dwellings as demand for the equipment is reduced in the new and remodeling market segments. In a service territory such as Cascade's customer gas equipment purchases are often driven by cost-signals. Thus incentives are an excellent way to further ensure the installation of high-performance equipment and measures that *exceed* the code levels for existing construction and avoid lost opportunities for deeper therm savings.

The OR Building Code Division last updated the Oregon Residential Specialty Code (ORSC) in July, 2011 requiring 10% more efficiency than the previous code had. The energy efficiency code (OEESC- Oregon Energy Efficiency Specialty Code) was last updated in 2010. The next round of building code revisions for commercial properties will begin in 2012 with execution occurring in 2013. This series of updates generally reoccurs a year after the three-year International Code Council model code is updated -enabling us to periodically monitor probable changes in the codes. Cascade will continue to monitor these changes as they develop.

Gas Heating Potential and UM 1565

During the time of preparing this IRP, the Company is actively engaged in deliberations with the OPUC, Energy Trust of Oregon, and Electric and Natural Gas utilities participating with the ETO in Fuel Switching Docket UM 1565. The outcomes of this regulatory examination may have significant impacts on natural gas conservation potential within CNGC's service territory for the following reasons; (1) the formalization of the current active promotion and proliferation of incentives for electric heat pumps, and the discontinuation of incentives for gas space heat measures, may permanently eliminate opportunities for the installation of high performance natural gas equipment in these dwellings, thus requiring a downward assessment of residential conservation potential; (2) more formal guidance as to whether the market for natural gas furnaces has been fully and effectively transformed in CNGC's service territory may ultimately result in the need to upwardly or downwardly adjust the Company's understanding of technical potential for this measure.

Impacts of Governor's 10 Year Energy Plan in Oregon

At the time of the CNGC 2011 Oregon IRP cycle, the State of Oregon is engaged in a comprehensive series of policy changes with potentially significant impacts to statewide energy usage, carbon mitigation strategies, and other environmental goals. The planning and execution of the Oregon Energy Task Force's recommendations to Governor John Kitzhaber have not yet been finalized, but it is anticipated that the outcomes may heavily influence utility DSM policy, existing energy codes, and perceptions regarding optimal fuel mix and natural gas usage in the state. There is also discussion of aggressive carbon regulation and emissions caps which may ultimately serve to increase the range of viable conservation measures commensurate with the inclusion of carbon-adders to the avoided cost of natural gas. Cascade Natural Gas is monitoring these developments closely and will work with the Energy Trust of Oregon and/or other participating entities in order to serve as environmental stewards, optimizing the use of natural gas and energy efficient natural gas measures and technologies to the fullest extent possible.

Washington Program Cost Effectiveness & Emerging Technologies

As the energy efficiency market continues to develop, and conservation technologies become more prevalent, the efficiency, availability, and costs of such measures may evolve over time. The Company continues to work closely with its Program Management Engineers to monitor such changes and determine the most prudent course of action for our Conservation Programs.

An example of an emerging technology that has become affordable and market-accessible within Cascade's service territory is the 90%+ Combo Heat/Water Heat System utilizing a high-efficiency condensing tankless water heater. Over the course of several years, this measure has come down in cost and has become increasingly available within Cascade's service territory. As a result, this promising measure was added to the CNGC conservation portfolio in 2009.

In addition, the Company has also raised the R-values (a measure of insulation's ability to resist heat traveling through it) eligible for rebate in its Commercial/Industrial program, creating two tiers of incentives. An incentive was added for certain boiler steam traps; the incentive was raised for high efficiency boilers, and adjustments were made to the standards and inputs of boilers and furnaces as appropriate.

Following the Company's 2-Year Action Plan, Cascade continues to monitor the viability of .70 conventional water heaters and other emerging technologies in order to assess their applicability to our service territory. If, and when, such measures become market available, we will take steps to include them in our conservation portfolio.

Impacts of Washington's Climate Change Challenge

Since Governor Gregiore announced the Executive Order creating Washington's Climate Change Challenge in February 2007, Cascade has monitored the progress of the Challenge as it pertains to the Utility. On September 23, 2008, the Western Climate Initiative (WCI) released its Greenhouse Gas Cap and Trade design recommendations. WCI participants, which include both Washington and Oregon, have a certain amount of flexibility in setting requirements for implementation, compliance, and enforcement of the program. However key recommendations from the WCI are described in the following statements:

- Reduce GHG emissions to 15% below 2005 levels by 2020
- GHG measurements and monitoring begin 1/1/10 for reporting in early 2011
- First compliance period begins 1/1/12- electric generations (including imports); industrial and commercial combustion; industrial process non-combustion emissions
- Second compliance period begins 1/1/15- residential, commercial, and industrial fuel combustion below 25,000 metric ton threshold; transportation fuel
- No set date for allowance allocations, but they will be established prior to 2012
- Encourage entities to reduce GHG emissions 1/1/08-12/31/11 by issuing Early Reduction Allowances that are in addition to allocated allowances and are treated like allocated allowances

Since the 2008 IRP, the Washington Department of Ecology has moved forward with enacting Executive Order 09-05 *Washington's Leadership on Climate Change* which went into effect May 21, 2009 and directs state agencies to, among other deliverables:

- Continue to work with six other Western states and four Canadian provinces in the Western Climate Initiative to develop a regional emissions reduction program design;
- Work with companies that emit 25,000 metric tons or more each year to develop emission reduction strategies; and
- Work with businesses and interested stakeholders to develop recommendations on emission benchmarks by industry to make sure 2020 reduction targets are met.

During the 2009 Washington Legislative Session, Legislators passed Engrossed Second Substitute Senate Bill 5854 (E2SSB 5854) that amended Chapter 19.27A RCW with the intent of assisting with the implementation of Order 09-05 by tracking energy consumption in buildings. State agencies, colleges, universities and non-residential facilities encompassing more than 10,000 square feet of conditioned space are now directed to track usage with the US Environmental Protection Agency's Portfolio Manager. To facilitate this tracking, the Legislature has directed all electric and natural gas utilities with more than 25,000 WA customers to provide energy consumption information, upon request, for all non-residential and qualifying public agency buildings to which they provide service. In compliance with this mandate, Cascade has begun to provide this critical information as requested.

Following a WCI benchmarking symposium held on May 19, 2010, stakeholders to this initiative have developed a final white paper which explores "Issues and Options for Benchmarking Industrial Greenhouse Gas Emissions". According to the paper, State and federal policy makers are still considering several approaches to achieving emissions benchmarks (once finalized) including the use of Voluntary Performance Goals, a “Cap and Trade” system, or Regulatory GHG performance standards. Since the nature of such benchmarks and final method of delivery are still unknown, Cascade is not yet fully able to anticipate how this initiative will affect the Company and its customers. However, it is likely that we will have a clearer picture of next steps and impacts as we move closer to the Governor’s benchmarking deadline of July 1, 2011.

Already, the impacts of benchmarking and pending legislation are being felt across the state. Electric utilities such as Puget Sound Energy have begun to actively implement “Direct Use” efforts in anticipation of impending climate change legislation. Since Direct Use is often the most prudent use of energy resources, the Company will carefully monitor how environmentally responsible load switching of this nature would be treated under a cap-and-trade scenario.

Additionally, the code changes discussed earlier (and poised to take effect in late 2010/early 2011) are also a direct product of Washington’s aggressive climate change efforts. Such increases in efficiency resulting from code would preemptively capture high percentages of the savings potential outlined in Cascade’s conservation potential study, but would not be attributable to the Company itself.

Because the final design, breadth, and ultimate impacts of climate change legislation are yet unknown, the Company is examining bundles of measures which become cost effective under different price indicators. This will prepare us to adapt as appropriate in the future.

Potential DSM Measures and Their Costs

The first task in designing any DSM program is to analyze and determine costs and the associated energy savings for conservation measures along with estimating their applicability within Cascade’s service territory. Evaluating specific measures involves ranking measures by levelized cost per therm saved. Levelized cost is a straightforward calculation that considers the incremental cost of a measure divided by the discounted therm savings. This calculation allows the Company to better screen technical potential in order to include a broad range of measures with potential conservation benefits to Cascade’s customers. Each measure’s cost and estimated therm savings are compared to supply side costs over a 20-year planning horizon. Administration expenses are included only in total program costs, not in measure costs and are expected to vary by program type and duration. The levelized cost test is a helpful tool for understanding the range of measures that *could* be cost effective contingent upon the avoided cost of natural gas during the planning period. Thus, there is value to maintaining a database of potential conservation measures sorted by levelized cost and reexamining them periodically as avoided costs increase or decrease.

Once measures have been run through levelized cost testing, and screened based on current avoided costs, the Company (or entity operating on the Company’s behalf) is then able build a portfolio of prescribed offerings. These offerings are assessed based on the most recent data pertaining to the incremental costs and therm savings of the measure, In the State of Washington the Company also uses the TRC test to assess cost-effectiveness in the context of all programmatic and administrative expenses incurred in relation to the operation of its Conservation Incentive Program. To the best of the Company’s knowledge, programmatic expenses are not included in assessments performed by the ETO. A total resource cost

(TRC) approach is used to evaluate the cost-effectiveness of all DSM resources. The TRC method compares total net costs of DSM resources to the total net cost of supply side resources displaced. A program or measure is cost-effective if the present value of energy savings and non-energy benefits derived from installing that measure is greater than the total resource cost (TRC) of the program or measure. Non-energy benefits may include, for example, water savings from low-flow showerheads and higher efficiency clothes washers or reductions in maintenance costs. The TRC screening is utilized at the portfolio planning level.

Another tool used to assess the overall cost-effectiveness and benefits of measures within a conservation portfolio is a Cost Benefit Ratio Test. This test assesses the value of a proposed measure by comparing the savings achieved over the lifespan of the measure to the installed cost of the measure (sans non-energy benefits) by dividing the benefits by the costs. If the CB ratio is higher than one, the measure is considered cost effective.

As stated in previous IRPs, the Company's conservation potential (both "technical" and "achievable") was initially determined through a comprehensive study performed by Stellar Processes in conjunction with Ecotope in 2006. This study expanded upon the findings of the Energy Trust of Oregon and further assessed the breadth of available conservation opportunities within Cascade's service territory.

An assessment of all energy savings that could be accomplished in the absence of market barriers such as cost and customer awareness (technical potential) was formulated by Stellar/Ecotope by examining the baseline usage of customers by building type and sector to better understand the savings that could be achieved by measure and portfolio. The study provided analysis to determine the feasibility for utility customers to engage in *specific* conservation activities and measures. Applicability of some measures might depend on the fuel for space heating, for example. Also, the amount of remaining potential is affected by the extent to which the market of a specific product is currently saturated. Utility forecasted growth was then applied to estimate the amount of structures with conservation potential in future years. The study then aimed to quantify energy usage by customer sector (commercial, industrial, residential) and then by the customer type within each sector (single family, small office, wood products, etc). The Energy Trust further refined the assessment of technical potential within Cascade's service territory based on their understanding of the energy/equipment markets and their prior experience operating such programs in the State or Oregon. Outcomes were then translated into an assessment of achievable potential, or what conservation is feasible under "real world" conditions and takes into account customer awareness, participation, and economic constraints.

In 2008, Stellar was once more approached by the ETO to refine savings and cost estimates for previously identified measures. It also explored the feasibility of new and emerging technologies that were unavailable during the original study. A January 2011 report prepared for the Trust (entitled "Energy Efficiency and Conservation Measure Resource Assessment for the years 2010-2030") offered several major revisions to previous understandings of the Company's conservation potential and has led the ETO to offer a significant reassessment of conservation potential over the 20 year outlook. This study was modified for the Cascade Natural Gas service area in July 2011 and again in September, 2011 to help refine and assess the estimates of long-term technical therm savings potential. Further description of these changes can be found in the paragraphs below as well as under Appendix D**.**

One prominent change to the most recent conservation Assessment is the appearance of a major reduction to natural gas conservation potential due to significant adjustments to previous assumptions. The new report also includes the use of “Benefit Cost Ratio” as a screening criterion to determine cost-effectiveness as opposed to the strict use of levelized cost. The BCR model is comprised of the Net Present Value of Benefits divided by Total Resource Cost. This change is more significant for electric measures which would not be covered under a CNGC Gas Conservation effort since it takes savings during peak period into account.

The 2011 Stellar Assessment further notes that, at the direction of Energy Trust Staff, “program related costs” were not included as a factor in cost effectiveness screening of the individual measures as it was noted to be outside the scope of the Study. The levelized costs utilized in the Study do represent the total societal cost of efficiency measures (sans admin expenses). The Study indicated that they have provided “the basic information on the costs of measures, which the Energy Trust will combine with their knowledge of markets and programs and incentives to develop estimates of total program costs to society and (separately) to the utility system”. Most of the proposed measures in the study fall within the cost-effectiveness screen with the “one large exception [of] solar water heaters which remain expensive even after tax credits” according to the Stellar Report. The report goes on to explain that “Energy Trust has found solar water heat to be cost-effective using a more complex cost-effectiveness methodology than the simple first cut approach employed in this study”. The Company is in conversation with the Energy Trust regarding the methodologies surrounding the complex assessment and how they could be best employed to measure other innovative but less commonly available conservation measures such as natural gas heat pump technology.

For the residential sector, Stellar/Ecotope continued to apply prototype models over the climate zones developed in the original study. This was done in order to estimate major end use consumption, calibrated to actual sector consumption. Table 6-1 shows the climate zones utilized and the areas in Cascade's Washington and Oregon Service territory assigned to each zone.

Table 6-1

CLIMATE ZONES

WASHINGTON				OREGON	
ZONE 1	**ZONE 2**	**ZONE 3**		**ZONE 1**	**ZONE 2**
Bellingham Mount Vernon	Aberdeen Bremerton Longview	Sunnyside Tri-Cities Walla Walla Wenatchee Yakima		Bend	Baker Ontario Pendleton

For the Commercial sector, EUI factors provided consumption by end-uses and were based on information developed from a Washington Natural Gas study prepared in 1995. For the industrial sector, Stellar developed sharedown fractions that allowed therm sales to be applied towards specific end-uses.

Following the comprehensive examination of all cost-effective and realistically achievable measures, the Company (in WA, and Energy Trust in OR) was able to estimate attainable program ramp-up rates that consider marketing, technology delivery channels, and other program constraints to develop a 20-year DSM deployment scenario with year-by-year achievable savings. This timeframe, and all associated potential, have been adjusted for the 2011 IRP to consider the final updates made to the most recent Stellar/Ecotope study referenced earlier in this document. As a part of updating the Washington study, Cascade revised the forecasted growth rates utilized in Stellar's original study with the current expectations for growth in both the residential and commercial/industrial sectors. The forecasted growth rate is based on the most recent demand forecast detailed in Section 4 of this plan.

Oregon Conservation Study Results

The complete list of the measures and their applicability to Cascade's Oregon Service territory is included in Appendix D. It is important to recognize that the cost-effectiveness limits included in the IRP represent the Company's best understanding of the future cost of natural gas projected during the current planning period. Future influences on the price of natural gas, such as carbon taxes or similar regulatory mechanisms could lead a broader spread of conservation measures to become cost effective in the future. It is therefore prudent to offer an initial measure screen at a higher level than current levelized cost limits. Understanding the available spread of valuable, but "borderline cost-effective" measures allow the Company (or in the case of Oregon, the Energy Trust) to be prepared to smoothly adapt its conservation portfolio to capture *all* cost-effective natural gas conservation opportunities in the event that economic circumstances permit a more generous screening of DSM potential

It is important to clarify that there are two related but separate discussions of levelized cost related to DSM in the IRP. The first is related to a value used for screening cost effective measures within the resource assessment. The resource assessment is a study used to quantify the cost and amount of technical and achievable savings potential over the next 20 years. (Achievable potential is 65- 85% of technical potential, recognizing an amount that is realistically attainable due to various market barriers in implementation). The total installed costs of the measure for retrofits and total incremental costs for replacement high efficiency options are compared against this screening value to give a reasonable guide for which measures would individually pass the TRC test for cost effectiveness. From year to year, the measures that pass the TRC may vary due to avoided costs increasing or decreasing; or costs of installed measures varying from assumptions used in developing the study. The screening value is only a guide to provide and overall sense for what's most likely to be cost effective across the 20 year period.

The second category of levelized cost discussion is related to the levelized cost for Energy Trust to manage and deliver programs to achieve savings. These costs include measure incentives, management, program payroll and related expenses. The costs the participant carries are not included. For 2012, Energy Trust has a stretch goal to deliver 409,372 therms (without market transformation) for a levelized cost of $0.59/therm and a conservative goal of reaching 347,996 therms for a levelized cost of $0.69/therm. Both levelized cost values exceed Energy Trust's ***portfolio wide*** KPM of $0.52/therm levelized but, as stated earlier in this document performance in CNGC territory will not be compared to the $0.52/therm KPM on a stand-alone basis. Performance in CNGC territory will only be compared to CNGC specific goals. The OPUC will use the $0.52/therm KPM when looking at Energy Trust's entire portfolio performance for the year 2012.

Each of the two categories contains different costs and serves different purposes. The ndividual measures identified in the resource assessment are used to create a mix of measures with varying incentive levels and costs to deliver that are combined to create programs.

For purposes of the Oregon study, the ETO chose to include measures which screen at $1.00 levelized cost. This threshold exceeds the Company-developed cost-effectiveness limits in the Basecase Median Forecast as outlined in Appendix H**,** Avoided Cost Calculations. This calculation considers the annual portfolio cost per therm, nominal cost per therm, non energy benefits, and potential conservation credits. As stated earlier, the ETO has also included Solar measures in its portfolio, which have costs above the $1.00 These measures are include in the Trust's conservation resource stack as well as other efficiency measures determined to produce sufficient additional benefits to warrant their inclusion. Table 6-2 shows the group of residential measures and their technical applicability in Cascade's Oregon service territory based on the published study and metrics provided by the Energy Trust. Cascade's prior IRP noted that Oregon's technical potential, particularly for the residential market was likely high due to the significant decline in the demand forecast, primarily in the Company's Central Oregon service territory where new construction had fallen off significantly from the levels seen through 2008. This prediction appears to have been consistent with the revised data now offered by the ETO which indicates a reduction in technical potential by over an approximate 12 million therms. In addition to the ETO/Company screening limits, the Tables 6-2 and 6-3 also recognize the $.52 levelized cost limit recently instated by the OPUC for the natural gas programs offered by the Energy Trust. This screening would reduce conservation potential even more substantially as outlined below. That being said, the Energy Trust remains confident in the continued viability of its overall conservation potential and targets, nothing that the Trust's goals set the performance measure and that the measure is designed to annually index the Trust's budget and goals.

Table 6-2

RESIDENTIAL CONSERVATION MEASURES TECHNICAL POTENTIAL BY 2031

OREGON		
Measure Description	**Gas Savings Therms**	**Levelized Cost ($/th)**
Gas Hi-eff Washer (New)	4,283	-$3.31
Gas MEF 2.0 Washer (New)	322	-$3.18
Gas Hi-eff Washer (Replace)	48,769	-$3.09
Gas ETO Dishwasher (New)	138	-$2.49
Gas ETO Dishwasher (Replace)	8,459	-$2.47
Gas MEF 2.0 Washer	1,660	-$2.12
Heating Upgrade (AFUE 95) (ZC)	9,721	-$0.70
Heating Upgrade (AFUE95) (ZB)	13,874	-$0.49
AFUE 92 to condensing combo hydrocoil, ZC (New)	24,026	$0.04
AFUE 92 to condensing combo hydrocoil, ZB (New)	21,650	$0.05
AFUE 95 Furnace, ZB (Replace)	220,493	$0.11
AFUE95 Furnace, ZC (Replace)	157,662	$0.16
Window, retro (U-.20), ZB (Retro)	387,586	$0.28
E* Insulation, Ducts, DHW, Lights (ZB) (New)	2,749,381	$0.28
E* Insulation, Ducts, DHW, Lights (ZC) (New)	2,015,061	$0.34
Window, retro (U=.35) ZB	694,784	$0.40
Upgrade Gas Hearth	5,988	$0.46
Window, retro (U=.20), ZC	233,490	$0.47
Near Net Zero (Gas ZB) (New)	1,310,649	$0.49
UM 1158 Performance Measure Cut-Off		
HRV, ZB (Retro)	196,522	$0.53
Window, retro (U=.35) ZC	499,806	$0.56
Tank Upgrade (50 gal gas)	77,004	$0.60
Near New Zero (Gas ZC) (New)	281,389	$0.62
HRV, ZC (Retro)	99,779	$0.76
Window (U=.20) (New)	68,085	$0.78
HRV, E* (Gas, ZB) (New)	394,464	$0.87
Solar Hot Water (50 Gals) w/Gas Backup (Retro)	71,316	$0.90
Solar Hot Water (50 Gals) w/Gas Backup (New)	54,168	$0.92
MF Corridor Ventilation (New)	6,460	$0.93
MF Corridor Ventilation (Retro)	20,656	$0.93
Window (U=.20) ZC (New)	56,676	$0.94
TOTAL TECHNICAL POTENTIAL	**9,734,321**	
TECHNICAL POTENTIAL PER UM1158	**7,907,996**	

Table 6-3 shows the list of measures and their technical applicability to Cascade's commercial market sector in Oregon.

Table 6-3

COMMERCIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2031

OREGON

Measure Description	Gas Savings Therms	Levelized Cost ($/th)
EStar Steam Cooker (Replace)	43	-$1.85
EStar Steam Cooker (New)	19	-$1.85
EStar Commercial Clothes Washer (Retrofit)	11	$0.01
EStar Fryer (New)	7,614	$0.01
EStar Fryer (Replace)	21,560	$0.04
Estar Convection Oven (Replace)	1,318	$0.06
HW Boiler Tune (Retrofit)	688	$0.07
DHW Showerheads (Retrofit)	20,327	$0.12
Roof Insulation- Attic R0-30	38,423	$0.13
Hot Water Temperature Reset (Retrofit)	54,421	$0.14
Wall Insulation- Blown R-11 (Retrofit)	319,414	$0.18
Roof Insulation- Rigid R0-11 (Replace)	6,157	$0.19
Steam Balance (Retrofit)	18,700	$0.20
Wall Insulation- Spray On for Metal Buildings (Retrofit)	74,119	$0.21
DHW Wrap (Retrofit)	1,639	$0.21
Estar Convection Oven	698	$0.22
Heat Reclaim (Replace)	6,561	$0.24
Heat Reclaim (New)	5,213	$0.24
Roof Insulation- Blanket R0-19 (Retrofit)	102,150	$0.25
Roof Insulation- Blanket R0-30 (Retrofit)	107,174	$0.27
Roof Insulation- Rigid R0-22 (Replace)	6,988	$0.30
DCV (Retrofit)	113,718	$0.31
Vent Damper (Retrofit)	6,058	$0.31
Hot Food Holding Cabinet (New)	447	$0.41
SPC Hieff Boiler (Retrofit)	256	$0.41
Hot Food Holding Cabinet (Replace)	1,265	$0.42
Roof Insulation- Attic 11-30 (Retrofit)	87,293	$0.43
SPC Hieff Boiler (New)	987	$0.43
Roof Insulation – Rigid R11-22 (Replace)	18,127	$0.44
Ducts (Retrofit)	46,345	$0.51
SPC Cond Boiler Replace	741	$0.52
UM 1158 Performance Measure Cut-Off		
SPC Cond Boiler (New)	2,364	$0.53
Ozone Laundry Treatment	15,030	$0.57
Combo Hieff Boiler (New)	2,254	$0.59
DHW Recirc Controls (Retrofit)	34,677	$0.63
EStar Griddle (Retrofit)	334	$0.63
DHW Faucets (New)	120	$0.65
DHW Facuets (Retrofit)	1,355	$0.65

Measure Description	Gas Savings Therms	Levelized Cost ($/th)
Combo Hieff Boiler (Retrofit)	2,553	$0.66
Waste Water Heat Exchanger (Retrofit)	3,957	$0.67
EStar Griddle (New)	177	$0.69
DHW Condensing Tank (New)	7,227	$0.73
DHW Condensing Tank (Retrofit)	8,186	$0.73
Power Burner (Retrofit)	62,502	$0.74
Condensing Furnace (New)	10,353	$0.81
Roof Insulation – Roofcut 0-22 (Retrofit)	17	$0.83
Rooftop Condensing Burner (New)	11.949	$0.96
DHW Pipe Insulation (New)	179	$0.98
TOTAL TECHNICAL POTENTIAL	1,231,708	
TECHNICAL POTENTIAL PER UM1158	1,068,474	

Note on Industrial Potential:

The details behind the Company's technical industrial potential may require further analysis and refinement by the Energy Trust of Oregon and is unavailable at this time. However, according, to the ETO the current Cascade deployment scenario and relevant ramp rates correspond to 1,397,825 of therm savings for Energy Trust's Industrial program. This would correspond to a combined technical potential of 2,629,533 therms, or approximately 230k therms *less* than the achievable potential identified by the ETO later in this document. Both the industrial and commercial conservation screens reflect a good-faith assessment of technical potential offered by the ETO. The data is based on best-estimates supported by the most recent Stellar-Ecotope study and additional analysis by Energy Trust staff. The analysis of achievable commercial/industrial potential noted later in the IRP offers a more optimistic view of therm savings opportunities based on a ground-level assessment conducted by the Organization's field team. This accounts for the inverse correlation between technical and achievable potential as it relates to Cascade's Oregon service territory.

The 2011 Stellar Processes resource assessment identified 633,000 therms of cost-effective, achievable resource potential in Industrial sites in Cascade Natural Gas territory for the 20 year IRP window. This presents a discrepancy of 873,370 therms of savings between what ETO Planners believe they can realistically achieve and the total resource potential identified in the market. All Company conservation and DSM evaluation efforts in the State of Oregon are lead by the Energy Trust of Oregon. The Company has received the following details explaining the perceived increase in industrial potential, and has integrated this information into the IRP in good faith. The Energy Trust has acknowledged the discrepancy between the Stellar assessment and their own findings, and feels confident moving forward with the higher potential forecasts on the following grounds:

- The Stellar Processes resource assessment model did not classify customers in the exact way that that Energy Trust separates its customers into sectors, and so a distributional discrepancy is introduced.

- The Stellar Processes model assumes that those customers who are identified as Industrial have a gas load that is dominated by processes, with very little of the load going to space conditioning needs.

- Weatherization measures such as air abatement, retro-commissioning (RCx), and custom O&M have dominated historical (actual reportable) CNG Industrial sector savings (92% of total savings). This is not reflected in the Stellar Resource Assessment Industrial supply curve.

- Forecasts for potential savings from emerging technologies are also excluded from the supply curve. Recent study presented at ACEEE found the Northwest Power and Conservation Council's 5 year annual Power Plans to always find new resource available in the next years' Plans.

Energy Trust's understanding of industrial resource potential for CNG territory is evolving as the Organization learns more through actual deployment of Cascade's industrial program. The Trust perceives characterizing industrial resource potential as particularly difficult because of confidential information related to end use that varies widely by site. It is more problematic for Cascade because Cascade has only a few industrial sites of significant size and some with unusual loads. Increased experience with natural gas Conservation Efforts in CNGC's service territory will help refine the next resource assessment and has already helped refine the short term budget and action plan goals for Cascade industrial. For example, in 2011, the program achieved 87,000 therms and has set a 126,000 therm stretch goal for 2012. This is 100,000 therms more than was projected in the original deployment scenario taken directly from the dated Stellar model version referenced above.

Energy Trust program managers and planning staff remain confident in these higher goals and plan to continually improve resource planning tools going forward. Further updates to the resource supply curves will occur during future Cascade IRP processes, and will incorporate our increased understanding of Cascade's customers.

With the list of measures established, the next step was to determine the achievable potential and the 20-year DSM deployment scenario along with the associated annual utility costs to determine the level of funding that will be necessary to obtain those therm savings. The measures are grouped into categories (SF New construction, SF Retrofit, etc.) and deployment curves were developed.

It should be noted that the 2010 CNG IRP featured relatively 'flat' growth in therm savings from year-to-year after 2015. This is a result of simplifying assumptions employed in previous IRP planning processes, where it was assumed that a roughly 1/20th of the technical potential was available in each year (flat or zero ramp rate). More recently, Energy Trust has shifted away from this approach by utilizing information about the current state of technologies and programs, as well as expected changes in codes and standards to estimate more realistic ramp rates. This difference can be seen most prominently when comparing the 'shape' of the acquisition curves featured in each of the 2010 and 2011 IRP's. The previous (2010) acquisition curve can be characterized by its relative flatness resulting from flat ramp rates, while the more recent (2011) acquisition curve has a more pronounced shape and definition as a consequence of using more detailed and granular data in the forecasting process.

Annual therm savings targets associated with the Low Income WAP have been included in the deployment curves as a separate line item as they are separate from the ETO's targets. The Resource Assessment prepared by Stellar, includes the Conservation potential associated with the Low Income housing stock.

It should be noted that the figures shown for the residential and commercial sector represent the ETO's <u>best case "stretch" scenario</u> annual therm savings targets for the planning horizon. In their annual budgeting process the ETO will typically develop their minimum target by applying 85% to their best case scenario to develop a range of therm savings to be achieved. For the 2012 period, the estimated range of annual therm savings for Cascade's program would be between 347,996 (conservative goal) and 409,372 (stretch goal) and the estimated costs to achieve the stretch therm savings is currently estimated at $2,686,658.

Washington Conservation Study Results

As mentioned earlier, in 2008 the ETO approached Stellar to update the 2006 Oregon study. This Oregon update provided Cascade the opportunity to apply the relevant revisions seen in the Oregon assessment to the Washington study prepared in 2006. The most substantive change to the conservation assessment was the incorporation of the revised customer load growth forecast which significantly reduced the technical potential in the residential sector. In the 2008 Plan, it was estimated that the technical potential by 2030 for the residential sector was approximately 40 million therms, when screened at a levelized cost per therm of $.85. The impact of including the revised load forecast reduced the residential technical potential to 26 million. The complete list of measures and their applicability to Cascade's Washington service territory are included in Appendix D-3 & D-4.

Since the completion of the 2008 IRP, the projected costs for natural gas have declined significantly and long-term prices are estimated to range between $5 to $6 over the planning horizon compared to the $8 to $10 forecasted in the 2008 IRP. This dramatic change is not only a result of the demand destruction that has occurred as a result of the global recession, but perhaps has been more heavily influenced by the new supply development technologies that are providing additional gas resources in North America. Shale gas from the Horn River Basin, Montney and Marcellus are likely to keep sufficient supplies in North America and some believe that shale gas could represent more than a third of the US production by the mid 2020s. This improvement to the long-term gas supply outlook is a stark contrast to the diminishing supply outlook that was prevalent during the development of the Company's 2008 IRP. As a result Cascade's historical approach of screening measures at a levelized cost of $.85 per therm must be modified with this IRP.

For this IRP, the company has grouped the residential measures into the following categories: Existing Shell Measures, New Construction Shell Measures, Domestic Water Heating (DWH), HVAC, Boiler to Combo System, and Appliances. Table 6-4 shows the group of residential measures and their technical applicability in Cascade's Washington service territory under the various levelized therm assumptions.

TABLE 6-4

WASHINGTON

RESIDENTIAL TECHNICAL POTENTIAL

	Screened at Levelized cost/therm of						
	<$0.65	**$0.70**	**$0.75**	**$0.85**	**$1.00**	**$1.50**	**>$2.00**
Existing Shell	3,585,461	3,585,461	3,585,461	3,585,461	3,585,461	3,585,461	3,585,461
New Construction Shell	5,776,721	5,776,721	5,776,721	7,920,357	9,365,736	9,365,736	9,365,736
HVAC	2,183,200	4,452,534	4,482,246	5,753,797	7,698,678	7,892,797	8,249,568
Water Heating (New/Existing)	155,904	155,904	155,904	1,135,937	1,135,937	1,878,664	1,878,664
Boiler to Combo System	6,777,258	6,777,258	6,777,258	6,777,258	6,777,258	6,777,258	6,777,258
Appliances	1,060,550	1,065,143	1,065,143	1,065,143	1,065,143	1,065,143	1,065,143
Total	19,539,094	21,813,021	21,842,733	26,237,953	29,628,213	30,565,059	30,921,830

Table 6-5 shows the list of measures and their technical applicability to Cascade's commercial/industrial market sector. Changes to the Commercial segment are primarily the result of modification to the original Stellar estimates for potential heat reclaim measures and the applicability of cost effective window measures within Cascade's service territory.

Table 6-5

COMMERCIAL/INDUSTRIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030

WASHINGTON COMMERCIAL		
Measure Description	Gas Savings Therms	Levelized Cost ($/th)
Shell Measures	11,606,000	$0.29
O&M and Controls	1,245,000	$0.42
Cooking	2,646,000	$0.35
New Cooking	944,000	$0.35
New Heaters	975,000	$0.03
Replace Heaters	1,717,000	$0.31
New Boilers	673,000	$0.09
DHW Measures	839,000	$0.55
Replace Boiler	437,000	$0.53
New DHW Measures	405,000	$0.60
Refer Heat Reclaim	470,500	$0.80
New Refer Heat Reclaim	277,800	$0.80
Solar Pool Heat	29,400	$0.91
New Solar Pool Heat	6,400	$0.95
New Windows	231,250	$1.50
TOTAL COMMERCIAL	22,502,350	
		INDUSTRIAL
Boilers	442,000	$0.18
Shell Measures	294,000	$0.22
Unit Heater	176,000	$0.18
Process Hot Water	47,000	$0.10
Specialty Hot Water	16,000	-$0.81
TOTAL INDUSTRIAL	975,000	
TOTAL TECHNICAL POTENTIAL	23,477,350	

Based on the above technical potential, the Company has developed an estimate of the incremental conservation resources that can be acquired through 2030 on an annual basis. The company followed the ETO's approach used to develop the targets for Oregon, making modifications when necessary to recognize the differences associated with Cascade's Washington service territory.

It should be noted, that historically, the company has estimated the achievable potential and then estimated the annual targets based on a percentage of the achievable potential. The company modified its approach for this IRP, basing the annual estimates as a percentage of the technical potential rather than estimating the achievable potential and then developing the deployment curves. This modified approach results in achievable potential in the range of 65 to 85% of the technical potential over the 20 year planning horizon. Consistent with the development of the Oregon deployment curves, Cascade grouped the measures into categories (SF New construction, SF Retrofit, etc.) and deployment curves were developed utilizing the following key assumptions:

- In the area of Residential New Construction it was assumed that the technical potential would be spread equally over the 20 year planning horizon. Continuing from the deployment curves estimated in the 2008 Plan, it is assumed that participation levels will continue to ramp-up over the planning horizon, assuming 15% in 2011 and reaching a maximum participation of 75% by 2018.
- In the area of Residential replacement market, similar to the new construction sector, it was assumed that the technical potential would be spread equally over the 20 year planning horizon. Participation levels continue to ramp up, beginning with 30% in 2011 reaching maximum participation of 80% in 2017.
- Participation in the Residential Retrofit market was also assumed to continue to ramp-up over the 20 year planning horizon. Similar to the Oregon approach, it was assumed that over the 20 year horizon, that 80% of the technical potential would be realized through the residential retrofit program. Since the program is still relatively new (2010 is only the third year that retrofit measures have been included in the Company's residential program), participation levels were assumed to range from 3% in 2011reaching a maximum of 6% in 2017.
- In the Commercial retrofit market, similar to the residential retrofit market, it was assumed that participation levels would range from 3% in 2011 to a maximum of 6% in the 2017 period.
- In the Commercial/Industrial New Construction and Replacement markets, the technical potential was spread evenly over the 20 year planning horizon. On the new construction side, participation levels ramp-up from 15% in 2011 to 75% in 2018. In the replacement market, the ramp-up period begins at 20% in 2011 and increases 5% per year until reaching the maximum participation level of 75% in 2021.
- Annual therm savings targets associated with the Low Income Weatherization program have been included in the deployment curves as a separate line item. The Low Income Weatherization program is delivered by the Community Action agencies rather than the third party contactor who delivers the residential program and therefore separate targets are necessary. The Resource Assessment prepared by Stellar, includes the conservation potential associated with the Low Income housing stock.
- In developing the estimated costs to achieve the annual therm savings targets, it was assumed that commercial therm savings could be achieved at $4/therm while the residential sector would require approximately $6.50/therm.

Based on the assumptions outlined above, the estimated annual therm savings targets for the Washington Residential and Commercial/Industrial programs are shown in Table 6-6 on the following page. Similar to the ETO's approach, the figures shown for the residential and commercial sector represent Cascade's best case scenario for annual therm savings targets for the planning horizon.

Table 6-6 illustrates that Cascade anticipates its Low Income Weatherization program will be able to achieve a savings target of 40,000 in CY11, and 45,000 in CY12, then leveling off to a savings of 35,000 therms in CY13 and beyond. These numbers were determined by analyzing the capacity and limitations of the weatherization delivery network, as well as the potential for alternative avenues of therm savings during the years ahead. The company believes that the ARRA funding, which must be spent down by March 2012, will result in higher participation levels in 2011 and 2012. However, once the ARRA funding is spent, the company anticipates a return to the 35,000 level.

Conservation Summary

Based on the deployment curves developed for each state, Cascade estimates that the cumulative therm savings targets for the 2 Year Action Plan period (2011 – 2012) represents the displacement of approximately 44,869 residential customers' annual load requirements.

DSM Implementation Issues and Uncertainties

The amount of DSM potential identified for the plan relies on the best available information today about prices, efficiency, consumer behavior and preferences, and projects information 20 years into the future. As with other resources, DSM resource assessments depend heavily on energy load forecasts and projected growth rates with all of the associated uncertainties. Also similar to supply side resources, assessments of DSM potential are limited by what is currently available in the marketplace in terms of cost-effective technologies for improving energy efficiency. The impacts of new technologies and new energy efficiency codes and standards are difficult to accurately predict. This uncertainty is mitigated through the biennial updates of the IRP, which provide the opportunity to incorporate improvements in demand side technologies and programs.

However, somewhat unique to demand side resources are the utility's dependence on a large number of small purchases with each tied to the individual consumers' day-to-day purchasing and behavioral decisions. The utility attempts to influence these decisions through its programs, but the consumer is the ultimate decision maker regarding the purchase of DSM resources. Cascade's assessments of DSM make the best possible estimates of participation and costs, however, like any new program, the amounts are likely to vary from planning estimates.

Table 6-6

Estimated Achievable Therm Savings

	Washington			Oregon			Annual	Cumulative
	Residential	Comml/Ind	Low Inc.	Residentia*l	Comm/Ind*	Low Income	Savings	Therm Savings
2011	332,399	336,772	40,000	180,462	276,741	12,000	1,178,374	1,178,374
2012	396,845	356,237	45,000	122,224	287,149	15,000	1,222,455	2,400,829
2013	479,384	421,936	35,000	183,867	293,596	10,000	1,423,783	3,824,612
2014	581,840	487,636	35,000	184,321	239,056	10,000	1,537,853	5,362,465
2015	684,296	553,335	35,000	191,633	204,161	10,000	1,678,425	7,040,891
2016	786,752	619,035	35,000	205,236	204,161	10,000	1,860,184	8,901,075
2017	889,208	684,734	35,000	241,621	154,161	10,000	2,014,724	10,915,799
2018	907,301	730,969	35,000	458,437	129,161	10,000	2,270,868	13,186,667
2019	907,301	769,712	35,000	458,437	127,041	10,000	2,307,491	15,494,158
2020	907,301	808,454	35,000	458,437	121,056	10,000	2,340,248	17,834,406
2021	907,301	847,197	35,000	458,437	117,161	10,000	2,375,096	20,209,501
2022	907,301	885,939	35,000	458,437	114,161	10,000	2,410,838	22,620,339
2023	907,301	885,939	35,000	458,457	109,161	10,000	2,405,858	25,026,198
2024	907,301	885,939	35,000	458,437	104,161	10,000	2,400,838	27,427,036
2025	907,301	885,939	35,000	436,410	99,161	10,000	2,373,811	29,800,847
2026	907,301	885,939	35,000	414,383	94,161	10,000	2,346,784	32,147,631
2027	854,428	861,995	35,000	392,356	89,161	10,000	2,242,940	34,390,571
2028	801,555	838,051	35,000	348,301	86,661	10,000	2,119,568	36,510,139
2029	748,682	814,107	35,000	348,301	17,500	10,000	1,973,590	38,483,729
2030	722,245	802,135	35,000	348,301	15,233	10,000	1,932,914	40,416,643

* Achievable therm savings listed for the Residential and Commercial sectors of CNGC's Oregon Conservation Programs reflect the Stretch Target utilized by the Energy Trust of Oregon. The conservative targets utilized by the OPUC for assessing program performance for CY2012 are 244,077 Commercial/Industrial therms and 103,890 Residential for a total of 347,996 (rounded) therms.

It should be noted that yearly savings forecasts for the first five years of the deployment scenario (2012-2016) start at the sector level, where Energy Trust program managers employ a "bottom-up" approach to estimating savings for the immediate future. This process takes into account recent program volume at the measure level, projects 'in-the-pipeline', and the state of the current economic climate all within the context of the total achievable resource potential identified by Stellar Processes July 2011 Resource Assessment.

Annual savings forecasts and corresponding program growth rates for the *last* 15 years of the deployment do not feature as prominently in the inclusion of program manager's predictions or historical savings trends. Instead, in these years more weight is placed on the ramp rates described in the Stellar Processes Deployment Scenario, which the ETO considers more indicative of broader economic trends and movements. These more general economic trends affecting the last 15 years of the deployment scenario can summarized as;

- Moderate growth in savings starting in 2016 as strength in overall economy begins to return.

- A peak in savings in 2019 due to an expected residential code upgrade in 2017 (see assumptions tab of Stellar Deployment Scenario 09-26-11)

- Savings falling gradually after 2019. (IRP projection does not include the adoption of new technologies in the forecast).

It has been agreed with ETO's Board, the OPUC and the IOUs that a range of conservation estimates is necessary. The Stretch goal (see Table 6-6 and accompanying note) is to be used for estimating funding levels, and the Conservative goal (85% of Stretch) is a lower confidence bound which may be used by IRP planners. OPUC utilizes a target of 10% below the Conservative Goal as a performance metric for ETO. Therefore the figures in Table 6-6 reflect the best case or "stretch" scenario identified as achievable by the Energy Trust. Based on the significant updates to the Energy Trust's 2011 Resource Assessment described earlier, the estimated achievable therm savings in Oregon for the 20 year period has been reduced by approximately 1.7 million therms since the last IRP. The conservative deployment scenario identified by ETO would reduce conservation potential by an additional approximate 1.4 million. As suggested earlier, changes in achievable resource potential can be attributed to changes in the baseline as a result of codes and standards, a reduction in the levelized cost threshold from $1.0/therm to $.75/therms for the purposes of assessing *long term* technical potential, and to revisions of load growth forecasts in the face of slow economic growth resulting from an ongoing recovery from the 2008 recession and housing market collapse. Achievable potential may be further weighed under the lens of currently the $.52 levelized cost limits for the combined Northwest Natural and Cascade Natural Gas conservation programs. As described earlier in this document, the OPUC mandated cost-effectiveness thresholds outlined in UM1158 are lower than the avoided cost limits identified by the Company and would reduce ETO conservation potential by an additional 163,234 therms in the commercial sector and 1.8 million therms in the residential sector. However, the ETO does not believe that the performance measures, which have been designed across both NW Natural and CNGC, are used as the basis for measure cost-effectiveness; and that the budget and savings developed for Cascade are not directly influenced by the OPUC performance measure. The Trust will continue to develop the measure portfolio as traditionally done to acquire cost-effective savings within the constructs of its cost-effectiveness model approved by the OPUC.

As discussed above, actual implementation design, delivery, and market conditions will cause energy-efficiency program savings and costs to vary. Customer participation in a program is heavily influenced by the level of incentive paid by the utility or Energy Trust versus the cost to the customer. External infrastructure considerations must also be addressed, such as product availability to utility customers and an adequate network of contractors, retailers, and other trade allies to support a program. As new measures or expanded programs are developed and added to the current program mix, internal and external resources and capabilities need to grow accordingly and progress through a "learning curve". For this reason, the company estimated conservation acquisition schedule increases over time. Additionally, revisions to the company's existing programs may be necessary and will result in additional impacts on the company's projected participation levels.

Other uncertainties relating to conservation resources include the risk of free riders, and lost opportunities. Free riders are those individuals that would have undertaken some form of conservation action even if a program had not existed. Measuring free rider impacts makes program evaluation difficult since it requires information on a hypothetical situation that, by definition, will never be observed. Lost opportunities assume that the opportunity to install cost-effective conservation measures occurs only once in the life of a home, office, or industrial plant. If all potential cost-effective conservation is not installed at one time, future DSM opportunities may be lost as a result. This is most likely true for commercial/industrial resources since it is unlikely that a business would close down or curtail operations for any period just to install conservation measures.

As discussed earlier, the potential for building code changes over the planning horizon represent another uncertainty that could impact the ability of the company to achieve its therm savings goals. When the code changes fully take effect, as they were recently in Oregon, both the Company's programs and targets will need to be adjusted.

Potential carbon legislation is another area of uncertainty that Cascade continues to monitor closely. In Washington, specific requirements resulting from the Western Climate Initiative's (WCI) Greenhouse Gas Cap and Trade design recommendation are still unknown. The recommendations though include reducing greenhouse gas emissions to 15% below 2005 levels by 2020. GHG measurements and monitoring began on January 1, 2010, for reporting in early 2011. The first phase of the cap-and-trade program is proposed to begin in 2012, covering emissions from electricity. The second phase would begin in 2015, when the program expands to include other fossil fuels, including natural gas.

At the Federal level, the traction for national legislation such as Kerry-Lieberman has decreased significantly and it is uncertain at this point the level of impact federal legislation will have as compared to the impacts of regional legislation.

Environmental Externalities

When evaluating DSM resources, the company also includes an evaluation of the impacts of environmental externalities. The impact of utilizing energy on the environment continues to be a subject of societal concern and debate. If there are impacts that cannot be repaired naturally within a reasonable period of time, damage cost to the environment occurs for which society will have to pay in some, as yet undetermined, form. The question of who pays, how much and when payment should be made, are complicated issues.

For many years, The Northwest Power and Conservation Council (NPCC) has utilized a 10% cost advantage for electric utilities acquiring conservation resources to realize the benefits of not using supply side resources. Such electric utility benefits include reduced fish and wildlife impacts, load stability, load predictability and improved air quality. As discussed in Section 7, when calculating the avoided cost figures, the company includes an incremental cost advantage for conservation resources. Historically, Cascade has included the 10% cost advantage for conservation resources which was consistent with Oregon's requirements for gas utilities for mandated residential weatherization programs. For this plan, the company developed a graduated scale ranging from 5% for short-term measures up to a 20% factor for longer-lived measures. The use of a graduated scale is an attempt to recognize non-quantifiable benefits associated with conservation, such as price certainty & a hedge value against future carbon costs.

The OPUC issued Order 93-965 (UM-424) to address how utilities should consider the impact of environmental externalities in planning for future energy resources that goes beyond the 10% cost advantage discussed above. In June 2008, the OPUC issued Order 08-338 (UM1302) which revised the IRP Guidelines associated with the analysis of environmental costs. The original guideline established in UM1056, required utilities to analyze the range of potential CO2 costs referenced in Order 93-965. Rather than providing a specific range of potential CO2 costs to be analyzed, the revised guideline requires the utility to construct a basecase portfolio that reflects what it considers to be the most likely regulatory compliance future for the various emissions. Additionally the guideline requires the utility to develop several compliance scenarios ranging from the present CO2 regulatory level to the upper reaches of credible proposals and each scenario should include a time profile of CO2 costs.

Unlike electric utilities, environmental cost issues rarely impact a gas utility's supply-side resource choices. For example, Cascade cannot choose between coal-fired generation or wind energy sources to meet its load requirements. As a natural gas distribution company, the Company’s only supply-side energy resource is natural gas. However, environmental externality costs do make a difference in the comparison between supply-side and demand-side resources.

At the time of this writing, specific details on the level of carbon allowances and how they may be allocated to the gas utilities under a cap and trade program are still unknown. Therefore, in an effort to create a more realistic and robust assumption with regard to potential Carbon legislation, Cascade utilized the most recent draft legislation, the Kerry-Lieberman proposal. Table 6-7 on the following page shows the updated analysis.

Other Demand Side Management

The general purpose of demand response is to help manage demand during periods of system stress. The term encompasses a number of activities including real time pricing, time of use rates, critical peak pricing, demand buyback, interruptible rates, and direct load controls. As discussed earlier, the majority of Cascade’s annual throughput is for non-core transportation service customers who are responsible for securing their own pipeline capacity arrangements. Of the remaining industrial sales, approximately 25% of that load is being met through interruptible sales service. Interruptible service is attractive for large volume customers because of the lower distribution margin involved. As a result, the company believes that all customers that can manage their operations on interruptible service are currently served on an interruptible basis – leaving little opportunity to reduce peak loads through expanded interruptible service.

Table 6-7
Natural Gas Environmental Externality Cost Analysis
Updated with EIA's Estimated Emission Factors & Inflation

Emission		Emission (Lbs/Therm)	Cost ($/Lb)	Externality Adder ($/Therm)
SCENARIO 1				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$12/Ton	11.673	$0.006	$0.070
TOTAL				$0.080
SCENARIO 2				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$15/Ton	11.673	$0.008	$0.088
TOTAL				$0.098
SCENARIO 3				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$18/Ton	11.673	$0.009	$0.105
TOTAL				$0.115
SCENARIO 4				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$20/Ton	11.673	$0.010	$0.117
TOTAL				$0.127
SCENARIO 5				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$25/Ton	11.673	$0.013	$0.146
TOTAL				$0.156
SCENARIO 6				
NO2	$2500/Ton	0.008	$1.250	$0.010
CO2	$30/Ton	11.673	$0.015	$0.175
TOTAL				$0.185

General Assumptions:
Externality Adder reflects 1st year adder
Adder will increase annually by 3% and will be adjusted by the CPI, estimated to be 3.5%/year

Section 7

Resource Integration

Resource integration is the last step in Cascade's IRP process. It involves finding the least cost mix of demand and supply side resources given the forecasted load requirements of the core customers. The tool used to accomplish this task is a computer optimization model known as SENDOUT™. This model permits the Company to quickly develop and analyze a variety of resource portfolios to help determine the type, size, and timing of resources best matched to forecast requirements. SENDOUT™ is very powerful and complex. It operates by combining a series of existing and potential demand side and supply side resources and optimizes their utilization, at the lowest net present cost over the entire planning period, for a given demand forecast.

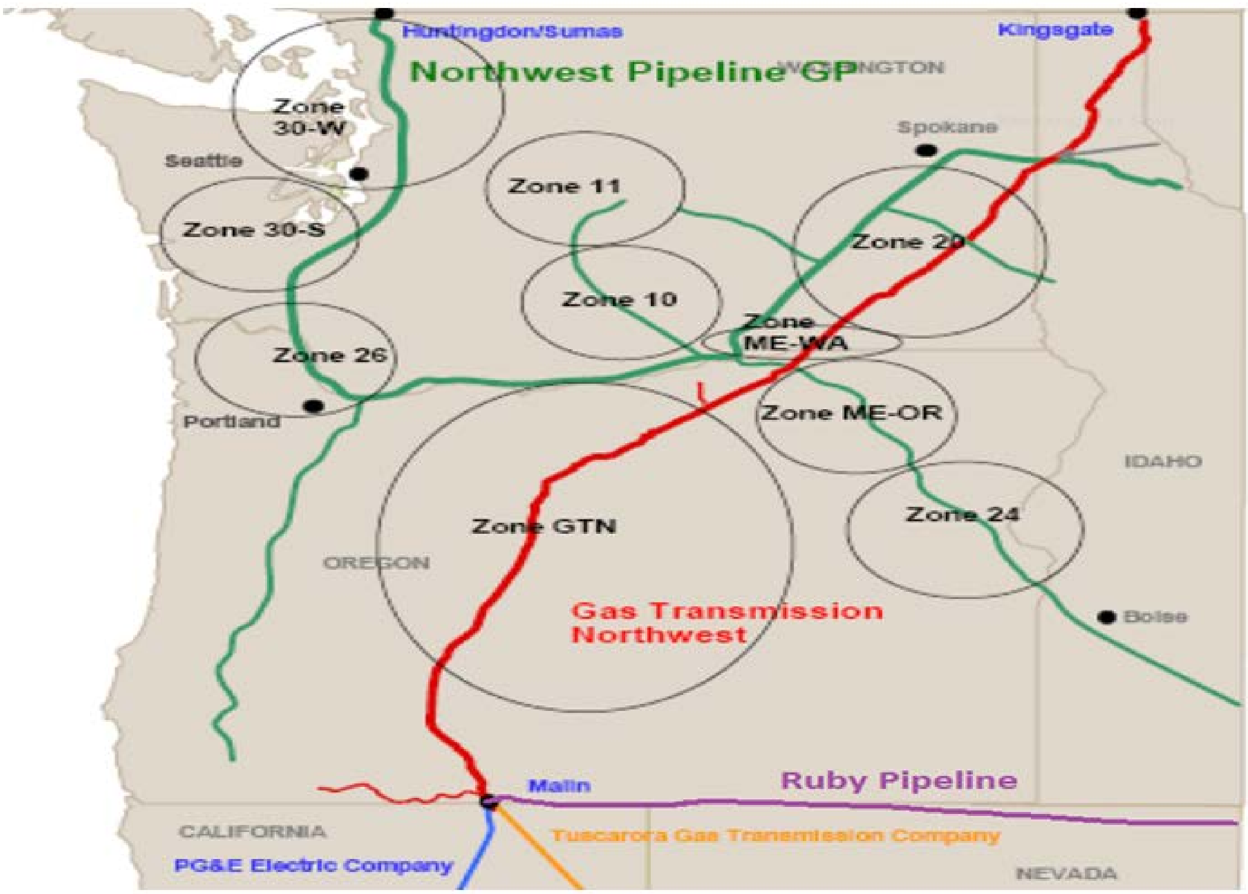
Resource Optimization Analysis Tools

SENDOUT™'s broad capabilities allow the Company to develop supply and demand relationships that closely mirror Cascade's existing operations. Cascade continued to model demand areas grouped by the various pipeline zones, a practice that began with the 2008 IRP. A copy of the network diagram is shown in Figure 7-A on the following page. These demand centers reflect on a daily basis, the aggregate 20 year load forecasts of Cascade's core market customers being served from either Northwest Pipeline GP (NWP) or Gas Transmission Northwest (GTN) interstate pipeline facilities. Individual transportation segments, storage, supply and demand side resources, both existing and potential, are targeted to these pipeline zones. This level of precision allows SENDOUT™ to consider each resource on an individual basis within the portfolio while also recognizing where physical system limitations exist. Resource characteristics such as a supply contract's daily delivery capability, minimum take requirements, maximum daily transport capability by individual segment, and storage inventory limitations and withdrawal and injection curve characteristics can be part of each resource's basic model inputs. The ability to model resources in this fashion allows SENDOUT™ to tailor its optimization within envisioned constraints and ensures that the model's optimal solution can work under anticipated operating conditions.

However, because SENDOUT™ utilizes a linear programming approach, its results are considered "deterministic". For example, the model knows the exact load and price for every day of the planning period based on the analyst's input and can therefore minimize costs in a way that would not be possible in the real world. Therefore, it is important to acknowledge that linear programming analysis provides helpful but not perfect information to guide decisions.

Since decisions are made in the context of uncertainty about the future, in 2006 Cascade purchased VectorGas™. VectorGas™ was an add-in product to the SENDOUT™ model that facilitates the ability to model gas price and load uncertainty (driven by weather) into the future. VectorGas™ utilizes a Monte Carlo approach in combination with the linear programming approach in SENDOUT™. The VectorGas™ functionality was integrated in the SENDOUT™ software with Version 12.5 which is the platform that Cascade prepared its integration analysis. The addition of the Monte-Carlo modeling capability provides additional information to decision makers under conditions of uncertainty. This tool continues to enhance the robustness of the Company's long-term resource planning and acquisition activities.

FIGURE 7-A



Scenarios versus Simulations

Prior to discussing the modeling process, inputs, and ultimately the results of the analyses, a brief discussion of the term scenarios versus simulations is necessary. As stated earlier, SENDOUT™ relies on a series of inputs or assumptions and then solves for the least cost solution based on the information provided to the model. Each group of assumptions is considered a scenario. For example, the company models medium load growth under average weather conditions where the assumed daily weather pattern is input into the SENDOUT™ model. The company also runs scenarios utilizing the low and high growth forecasts and historically has run several different price assumption scenarios. The results of each of these scenarios provide an answer or a least cost solution, which the optimization model has solved based on its perfect knowledge. Historically, this has provided the range of expected outcomes. However, with the addition of the Monte-Carlo functionality, the Company can now run simulations to determine if the scenario results are reasonable and to provide an expected range of results based on a statistical analysis.

Table 7-1 provides the list of scenarios included in this IRP and their key assumptions. To assess the impacts due to variations due in pricing and weather the company ran Monte-Carlo simulations on the Basecase scenario. The Company utilized the Basecase scenario as it represents the scenario Cascade considers most likely to be experienced over the planning horizon.

The basecase (Medium Load Growth, Medium Gas Price Forecast, Average weather with Peak Event) includes existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from various receipt points (AECO, Rockies, Sumas, Station 2 and Malin). Other incremental supplies also include propane and satellite LNG (behind citygate). The basecase includes current upstream pipeline transport capacity, as well as Ruby and incremental NWP and GTN capacity. We also included Cascade's current Jackson Prairie storage accounts, our Plymouth LNG account, as well as the potential to obtain a third party's Jackson Prairie account or Mist storage.

In addition to the 200 draws, the Company prepared several sensitivity scenarios to test the resource selections when the baseline conditions were changed. Table 7-2 below describes those sensitivity scenarios.

Decision Making Tool

Analysis of optimization model results and other operational and contractual constraints allows Cascade to make more informed resource decisions. The IRP optimization model output and Monte-Carlo simulation analysis will provide the quantifiable output from numerous model inputs. The model does not prescribe the ultimate resource portfolio. It can only determine the least cost set of resources given their specific pricing and quantifiable constraint characteristics. However, there are many other combinations of resources that may be available over the planning horizon. Cascade must still make subjective risk judgments about unquantifiable and intangible issues related to resource selections. These will include future flexibility, supplier deliverability risk, pipeline(s) risk, financial risk to the utility and its ratepayers, operational constraints, regulatory risk, etc. The risk judgments are combined with the quantitative IRP analysis to form actual resource decisions.

TABLE 7-1
SUMMARY OF PORTFOLIO ANALYSIS AND RESOURCE ALTERNATI VES

Scenario Name	Key Elements in SENDOUT Scenario
All in Case	Medium Load Growth, Medium Gas Price Forecast, Average weather with Peak Event. Includes existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from variou receipt points (AECO, Rockies, Sumas, Station 2, Malin, as well as behind the citygate (satellite LNG)). Incremental supplies also include propane, satellite LNG (behind citygate), imported LNG (Jordan Cove, Bradwood Landing), current upstream pipeline transport capacity, as well as propose pipelines and extensions (Blue Bridge, Ruby, Pacific Connector, and Palomar). We also included Cascade's current Jackson Prairie storage accounts, our Plymouth LNG account, as well as the potential to obtain a third party's Jackson Prairie account, as well as AECO and Mist storage. Almos any alternative that can be reasonably considered is included.
Limited Canadian Imports	Model contains all the elements of the Basecase, but incremental Annual AECO and seasonal Sumas resources will be unavailable to the model. Additionally, annual Sumas max is lowered from 100,000 to 50,000 dths. The intent is to mimic possible Canadian LNG exports to Asia.
Blue Bridge (NWP Expansion) With GTN backhaul and Palomar	Model contains all the elements of the Basecase, utilize transporation by others (TBO) between NWP and Palomar to reach "Blue Bridge" or continue on to Central Oregon down GTN
No Rockies price advantage	Model contains all the elements of the Basecase; however, all potential incremental resources are priced at NYMEX flat with no basis adder. In other words, incremental AECO, Sumas and Rockies all have the same price. This scenario allowed testing of inputs as transport costs were the variable.
Ruby Pipeline	Model contains all the elements of the Basecase; however, Ruby Pipeline is added as an additional resource. For modeling purposes we assume the $0.95 rate (the max rate identified in their tariff). The model is set up so that Ruby becomes an option to move Rockies gas to GTN, where it would require incremental GTN capacity (backhaul) to move to Cascade's citygates, likely in Central Oregon, although it is possible to move the gas to Stanfield for transport on NWP. See Table 7-5 t see additional scenarios that were run for Ruby Pipeline and Incremental GTN northbound primary service.
Pacific Connector	Model contains all the elements of the Basecase; however, Pacific Connector is added as an additional resource. In addition, we will add incremental LNG (Jordan Cove) as a potential resource. For modeling purposes we started with Pacific Connector transport priced at approximately 3 times the current NWP rate. The model is set up so that Pacific Connector becomes an option to move imported LNG to GTN, where it would require incremental GTN capacity (backhaul) to move to Cascade's citygates.
Original Palomar or a Cross Cascade Pipeline	Model contains all the elements of the Basecase; however, Palomar Pipeline is added as an additional resource. In addition, we will add incremental LNG (Bradwood Landing) as a resource. We will use the max rate identified in their tariff. The model is set up so that Palomar becomes an option to move imported LNG to GTN, where it would take incremental GTN capacity (backhaul) to move to Cascade's citygates. We also will look to see about using Palomar to backhaul to NWP near Portland and move supplies up BlueBridge or continue along NWP.
AECO Storage	Model contains all the elements of the Basecase; however, AECO storage is added as a resource. The inventory is set at 300,000 dths, with daily withdrawal rights of 10,000 dths a day. This storage will be setup like the existing Jackson Prairie to be 100% full at the start of each heating season. Th model is set up so that Canadian withdrawals can use incremental GTN capacity.

TABLE 7-2
Sensititives Analyses

Scenario Name	Key Assumptions
High Growth	Strong Economic Growth result in High Load growth, Average Weather, Medium Gas Prices
Low Growth	Economic Conditions result in Low Load growth, Average Weather, Medium Gas Prices
Environmental Externalities Scenario 1	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder Implemented in 2016 for CO2 emissions at $15/ton with adder increasing annually by 3% plus CPI (EE Case #2)
Environmental Externalities Scenario 2	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder would be applied in 2016 for emissions at $20/ton with adder increasing annually by 3% plus CPI (EE Case #4)
Environmental Externalities Scenario 3	Medium Load Growth, Average Weather, Assumes Carbon Cost Adder would be applied in 2016 for emissions at $30/ton with adder increasing annually by 3% plus CPI (EE Case #6)

Key Inputs

Demand Forecast Items & Weather Assumptions

The optimization process compares a portfolio of resources against a specific demand requirement. SENDOUT™ generates a daily demand forecast by combining base load and temperature sensitive usage factor inputs with a specified daily temperature pattern input. The company develops usage factors for each of the zones shown on Figure 7-A; this includes nine demand centers on NWP and one on GTN which is utilized to meet Cascade's Central Oregon load. In order to develop the temperature sensitive usage factors on a zone by zone basis, the company reviewed pipeline deliveries for the 2004 through 2009 period and developed monthly use per customer per degree day factors. The annual customer growth rates from the low, medium and high forecasts discussed in Section 3 were developed for each of the NWP zones and were applied to 2009 monthly core customer counts. Weather patterns for each of the zones were developed based on 5 distinct weather areas. The weather areas and their applicability to each of the zones are shown in Appendix B-1.

Prior to the 2007 IRP, the company had developed daily temperature patterns to estimate the impact of weather ranging from warmer than normal to design conditions, with the expected portfolio being one with average weather. The average weather pattern historically had been based on the 20 year average excluding the high/low annual degree day totals to develop an annual total for each area. These totals were then allocated to the daily readings based on the 90/91 winter pattern since that was the most recent year in the company's weather history with a peak day reading of 61 DDs. However, with the ability to run Monte-Carlo simulations, the company modified its approach and developed its "average" weather pattern based on the company's 60+ year weather history, and the expected degree days for each month. The average pattern for each area was approached on a month-by-month expected value and then the degree days were allocated within the month based on the past years' average daily distribution. Since a peak event can occur in an otherwise normal weather year, the average weather scenario includes one 3-day peak event, which includes a design day reading of 61 degree days system wide.

Demand Side Alternatives

For purposes of this IRP, the Company has utilized the annual achievable potential schedule shown on Table 6-6 in Section 6 as an input to the optimization model. Because the company models demand by individual zone, conservation has been treated as a "must-take" supply alternative available at the pipeline citygate level. This approach allows the conservation resource to displace supply and pipeline transportation resources that would otherwise be necessary to meet demand requirements. For purposes of modeling, 80% of the identified Oregon Conservation resources are assumed to occur on the GTN pipeline with the remaining 20% occurring on Northwest pipeline. Washington conservation was modeled as a must-take resource at the NWP citygate. Because the acquisition of DSM is dependent upon a number of small purchases, determining which pipeline zones will procure the most conservation at this point is still premature. In future planning cycles, the company will continue to review the results of the participation levels and determine if more detailed assumptions on conservation acquisition can be modeled. Under the basecase scenario the company has assumed that conservation resources could be purchased, on a levelized cost per therm basis of $6. The cost per therm figure of $6 is an estimate of the combined Total Resource Cost for all measures included in the program, including program delivery and administration costs.

Supply Side Resource Alternatives

For modeling purposes, supply side alternatives are grouped into one of three categories: gas supply, storage facilities, or pipeline transportation. As discussed in Section 5, some of the supply alternatives include one or more of these categories. For example, a gas supply resource may be delivered at Cascade's citygate, essentially reducing the requirement for firm pipeline capacity. A satellite LNG facility (whether trucked in or liquefied on site) located within Cascade's distribution system can reduce the need for pipeline capacity on a peak day as the supplies will be available to be directly flowed into Cascade's local system. The following table provides a high level summary of the resource alternatives considered over the planning horizon.

Table 7-3
Supply Side Alternatives Modeled

Resource	Scenario Considered
Conventional Gas Supply Contracts with annual, seasonal or winter only characteristics delivered to Northwest Pipeline & GTN Systems	All
Conventional Gas Supply Peaking Contracts Delivered to Northwest Pipeline & GTN Systems	All
Gas Supply Peaking Contract delivered to Cascade's citygates	All
LNG Import Supplies Delivered to Northwest Pipeline System	All
Satellite LNG Storage within Cascade's distribution sytem	All
Additional Pipeline Capacity secured through medium--long term capacity agreements	All

Natural Gas Price Forecast

Price volatility has become an on-going factor in the natural gas industry since 2005. Prices in the natural gas market continued to be volatile through 2008 (upwards to $13 per dth), but have since dropped considerably (currently around $4). As discussed in Section 5, natural gas prices will continue to be influenced by demand, oil price volatility, the global economy, electric generation, new extraction technologies, hurricanes and other weather activity. As a result, it is impossible to accurately estimate what future natural gas prices will be over the planning horizon. However, Cascade has considered price forecasts from several sources, such as Wood Mackenzie, Energy Information Administration, the Financial Forecast Center's forecast, as well as our observations of the market to develop our low, base and high price forecast. As mentioned earlier, details of the company's price forecast can be found in Appendix E.

The Company compared the Monte-Carlo price simulation results to the low, base and high forecasts and found that the 200 draws captured the same range of pricing outlined in the forecasts shown in the Appendix. Therefore, individual deterministic runs under the low and high price forecast were not run.

Integration Results and Key Findings

As described earlier in this section, Cascade performed several different scenarios and the results are summarized below. However, it should be noted that the results of these analyses should be considered broadly. Like all analyses, the results of the resource optimization models are dependent upon the input assumptions provided. Scenario and Monte-Carlo analysis help by providing information on the ranges of input assumptions. Whether Cascade eventually secures these particular resources, acquires ones of comparable size and characteristics, or decides on an alternative approach is subject to ongoing resource investigation and evaluation activities. Specific resources made available to the model at this time may or may not be physically available at the time they are needed or economically attractive in comparison to alternatives that may become available in the future. Therefore, prior to securing any of these resources, additional analyses of the specific resource must be completed.

The results of the various scenarios are fairly consistent and reveal the following general trends:

- The basecase results indicate energy efficiency programs with a levelized cost of 70 cents per therm or less are cost-effective over the planning horizon, with the price uncertainty analysis indicating that the levelized costs will likely range between 64 to 80 cents per therm. However, if a carbon cost adder was established during the planning horizon similar to those described in Section 6, the cost-effectiveness limits could increase between 8 to 16 cents depending upon the level of the carbon adder and the timing of its implementation. Cascade used the conservation curves based on a levelized cost of 70 cents per therm in developing its conservation deployment curves.

- Even with energy efficiency programs, Cascade will need to acquire additional capacity resources to meet anticipated peak day requirements, due to Cascade's continued growth in its residential and commercial customer base. Several of Cascade's existing transportation agreements will expire over the next several years. In most cases, Cascade has the unilateral right to extend or cancel the expiring contracts upon one year's notice. As a result, the company will have the opportunity to review alternatives to extend or replace those contracts.

- Since Williams announced that the Blue Bridge I-5 corridor project had been shelved, and with uncertainty surrounding the likelihood of Palomar being built, Ruby Pipeline emerged as a more feasible transportation resource to bring Rockies supplies to Central Oregon, via Malin and backhaul service on GTN. Ruby transport could take the form of a long-term transportation agreement and/or via a capacity release from a current Ruby shipper.

- Another alternative to acquiring Rockies supplies, without becoming a shipper on Ruby, would be to enter into supply arrangements with parties at Malin, or a possible exchange arrangement involving Stanfield.

- Satellite LNG/Peak shaving facilities located within Cascade's distribution system (for example Zones 10 and 11—the Wenatchee lateral) may also be an attractive alternative to incremental pipeline capacity in areas where physical limitations at the gate stations would result in even higher costs associated with a pipeline solution. There may be additional advantages to such a strategy to the extent a facility could be strategically located on a portion of the distribution system that will eliminate or reduce distribution system constraints.

- The initially proposed Pacific Northwest LNG import facilities would require incremental transportation via NWP or GTN. The Company has insufficient information available as to the likelihood and costs associated with acquiring additional transport capability to move supplies from the proposed Northwest facilities to Cascade's distribution system. More to the point, based on the shale boom, recent FERC filings and increasing demand in Asia, it looks like LNG will become an export from the Pacific Northwest as opposed to importing.

- We considered the impact of possible reductions in exports of gas supplies physically produced in British Columbia and Alberta, by limiting the amount of physical Canadian supplies that could be exported via existing infrastructure at Station 2, Sumas or AECO to 80%. Under this scenario, the model chose to increase the amount of imported Rockies gas via either Ruby/Malin transaction or Malin/Stanfield exchange. Given the proliferation of shale gas, we do not see access to Canadian gas being a problem—gas will be available—however, we will be competing with many parties and consequently, may experience potential volatility and price spikes.

- Although it has since declared bankruptcy, at the time of the initial development of this IRP a scenario was developed to move LNG from the proposed Bradwood Landing facility, connecting to Palomar Pipeline and ultimately delivered to Madras, OR where it would flow on incremental GTN capacity to serve Central OR. At this time, it is unlikely an import facility at Warrenton will be put into service.

- Although the facility filed in September 2011 to become an exporter, at the time that IRP scenarios were first set during the summer of 2011, the company evaluated transporting LNG from Jordon Cove via Pacific Connector Pipeline and then backhauling supplies on GTN to serve Central OR. Similar to the Bradwood Landing example discussed above, this scenario is complicated because it is unclear whether GTN will provide firm backhaul capability. It appears the infrastructure required to provide that firm backhaul service on GTN coupled with the transport from the facility makes this scenario appear to be undesirable, given other potential options.

- Incremental Jackson Prairie storage was also selected by the model. The company will continue to evaluate potential options to acquire more on system storage capabilities.

- 20 year portfolio costs on a Net Present Value (NPV) basis, are expected to range between $2,448,210,000 to $3,216,376,000 for the planning period, with an average cost per therm ranging between $.354 and $.447.

Table 7-4 on the following page summarizes the results from each of the modeling scenarios.

Table 7-4
SUMMARY OF PORTFOLIO ANALYSIS RESULTS

SENDOUT™ RUN	**Results**
All Resources	The all resource run allows the company to determine the likely basecase although the company still runs sensitivities on the various pipeline projects. Currently Ruby accompanied with incremental GTN capacity seems to be selected. None of the initial LNG facilities were selected unless extremely discounted (e.g. reservation rates at less than $0.05) Satellite LNG facilities located within Cascade's distribution system may also be an attractive alternative to incremental pipeline capacity in areas where physical limitations at the gate stations would result in even higher costs associated with a pipeline solution. There may be additional advantages to such a strategy to the extent a facility could be strategically located on a portion of the distribution system that will eliminate or reduce distribution system constraints.
Limited Canadian Imports	• Not likely—will be exporter • Natural gas is expected to be abundant for the foreseeable future • The other storage options may provide some other sourcing possibilities.
Blue Bridge With GTN backhaul and Palomar	• Rate stacking • Basis parity would mean this provides transportation diversity as opposed to supply diversity • GTN backhaul offering • Potential bottleneck at Stanfield and/or Malin
No Rockies price advantage	In this run, the model chose to increase interest in acquiring Ruby. We continue to run numerous sensitivities with varying levels of restrictions in order to see the impact to the portfolio. See Table 7-5 for more Ruby scenarios.
Ruby Pipeline	• Rate stacking (GTN and Ruby); although discounts increased electability volumes • Basis parity would mean this provides transportation diversity as opposed to supply diversity • GTN backhaul offering
Pacific Connector	• Unknown if facility will ever get built • GTN backhaul offering • Rate stacking • Potential bottleneck at Stanfield and/or Malin
Palomar	• Unknown if infrastructure will ever get built • GTN backhaul offering • NWP additional facilities needed? • Potential bottleneck at Washougal, Stanfield and/or Malin
AECO Storage	• Competition with Alberta for re-fill volumes • Rate stacking

Modeling for Ruby Pipeline and Incremental GTN northbound firm service

Given the likelihood of at least the Ruby capacity becoming part of the portfolio sometime in 2012, we are providing some additional information in this IRP regarding these two potential alternative resources. Utilizing the SENDOUT™ resource optimization model, several scenarios were run to test the viability of acquiring Ruby capacity either based on their proposal, or through a third party. Incremental and corresponding GTN Malin north capacity was also modeled (a summary of the RMIX results is attached). Basin prices in the model over the 20 year planning horizon have Rockies trading at a slight discount to AECO, Malin and Sumas ($0.06 - $0.15).

Regardless of the scenarios modeled, SENDOUT™ consistently selected Ruby capacity in a range of 10,000 to approximately 19,000 dths/day. A recap of some of the scenarios run and the results follows:

Table 7-5

Summary of SENDOUT™ results for Ruby and Incremental GTN northbound firm service

SCENARIO	RESULTS	ADDITIONAL COMMENTS
RUBY DISCOUNTED PORPOSAL WITHOUT DISCOUNTED GTN BACKHAUL Ruby Xport: 25 years, Seasonal (Nov-Mar),$0.75 reservation, $0.01 commodity, 1.5% Fuel, no limit MDQ, allow resizing every year after Oct13: GTN backhaul at current recourse rate (approx $0.26)	SENDOUT™ selected 17.26 MDth/day Nov12-Oct13 and 17 MDth of GTN backhaul	This is the Ruby deal without taking into account discounted GTN backhaul, or comparisons to a shorter term Ruby capacity release.
RUBY PROPOSAL AT RECOURSE VS RUBY DISCOUNTED CAP REL Ruby Xport: 25 years, Seasonal (Nov-Mar),$0.95 reservation (recourse rate), $0.01 commodity, 1.5% Fuel, no limit on MDQ, allow resizing every year after Oct13 Vs Ruby Cap Release: 10 years, Annual release from 3rd party,$0.69(discounted) reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ	SENDOUT™ selected 10 MDth of 3rd party capacity release and 7.45MDth/d of the Ruby proposal and 17.19 MDth of GTN backhaul	Even at the recourse rate, SENDOUT™ selects a substantial portion of Ruby on a seasonal basis
Ruby Xport: 25 years, Seasonal (Nov-Mar),$0.75 reservation, $0.01 commodity, 1.5% Fuel, no limit on MDQ, allow resizing every year after Oct13 Vs: Ruby Cap Release: 10 years, Annual release from 3rd party,$0.75 reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ	SENDOUT™ selected 10 MDth of 3rd party capacity release and 7.26 MDth/d of the Ruby proposal and 17 MDth of GTN backhaul	

25 YR RUBY DISCOUNTED PROPOSAL VS 25 YR ANNUAL CAP REL VS 10 YR CAP REL Ruby Xport: 25 years, Seasonal (Nov-Mar),$0.75 reservation, $0.01 commodity, 1.5% Fuel, no limit on MDQ, allow resizing every year after Oct13 vs. Ruby Cap Release Annual: 25 years, Annual release from 3rd party,$0.75 reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ vs. Ruby Cap Release: 10 years, Annual release from 3rd party,$0.75 reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ	SENDOUT™ selected 10 MDth of 3rd party capacity release and 7.45MDth/d of the Ruby proposal and 17.19 MDth of GTN backhaul	
RUBY DISOUNTED PROPOSAL VS STEEP DISCOUNT RUBY CAP REL Ruby Xport: 25 years, Seasonal (Nov-Mar),$0.75 reservation, $0.01 commodity, 1.5% Fuel, no limit on MDQ, allow resizing every year after Oct13 Vs Ruby Cap Release: 10 years, Annual release from 3rd party,$0.57(40% discount of recourse rate of $0.95) reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ	SENDOUT™ selected 10 MDth of 3rd party capacity release and 7.26MDth/d of the Ruby proposal and 17 MDth of GTN backhaul	
RUBY DISCOUNTED PROPSAL WITH DISCOUNTED GTN VS STEEP DISCOUNT RUBY CAP RELEASE Ruby Xport: 25 years, Seasonal (Nov-Mar), $0.75 reservation, less $0.06 through March 2017 to represent the 80% discounted GTN northbound capacity that Ruby has offered to acquire and then re-release to Cascade for approximately 4 years. Per Ruby email 11/15/2011: ***If the delivery point is Stanfield, assume a ~ $0.20 rate (depends on points selected), with a 10,000 Dthd MDQ. Therefore $ 3,200,000 / $0.20 /10,000 = 1,600 days of FTSA. 1,600 / 365= 4.38 years of discounted GTN capacity***, model assumes GTN northbound returns to recourse levels after 2017, $0.01 commodity, 1.5% Fuel, MDQ limited to 10 MDTh/day vs. Ruby Cap Release: 10 years, Annual release from 3rd party,$0.57(40% discount of recourse rate of $0.95) reservation, $0.01 commodity, 1.5% Fuel, 10,000 dth MDQ	SENDOUT™ selected 8.84 MDth of 3rd party capacity release and 10MDth/d of the Ruby proposal and 18.56 MDth of GTN backhaul	This scenario mimics the current Ruby proposal against a steeply discounted yearly capacity release from a 3rd party.

Peak Day Planning Results

Figures 7-B-1 through 7-B-3 show the projected peak day requirements compared to the Company's existing capacity resources under the medium load growth forecast. This same comparison was completed for both the high and low load growth forecasts and results of the zone by zone analysis are included in Appendix F. Under all growth scenarios, the company will require incremental peak day delivery in order to meet Cascade's anticipated peak loads located on the Northwest Pipeline system. This shortfall results from the expiration of a leased storage agreement that ended in April 2007. As discussed in Section 5, the company has acquired incremental Jackson Prairie storage inventory and withdrawal capability through the participation in the JP expansion open season, which took place during early 2006. The Company has also entered into a companion transportation agreement with Northwest Pipeline for the transportation to deliver the stored supplies under this agreement to Cascade's service territory. In the interim, Cascade will meet its peak day requirements with citygate peaking resources, acquiring vintage transportation returned to the pipeline, and where operational feasible, re-aligning existing contract delivery rights form areas where we project excess capacity to areas where we forecast potential shortfalls.

Figure 7-B-1

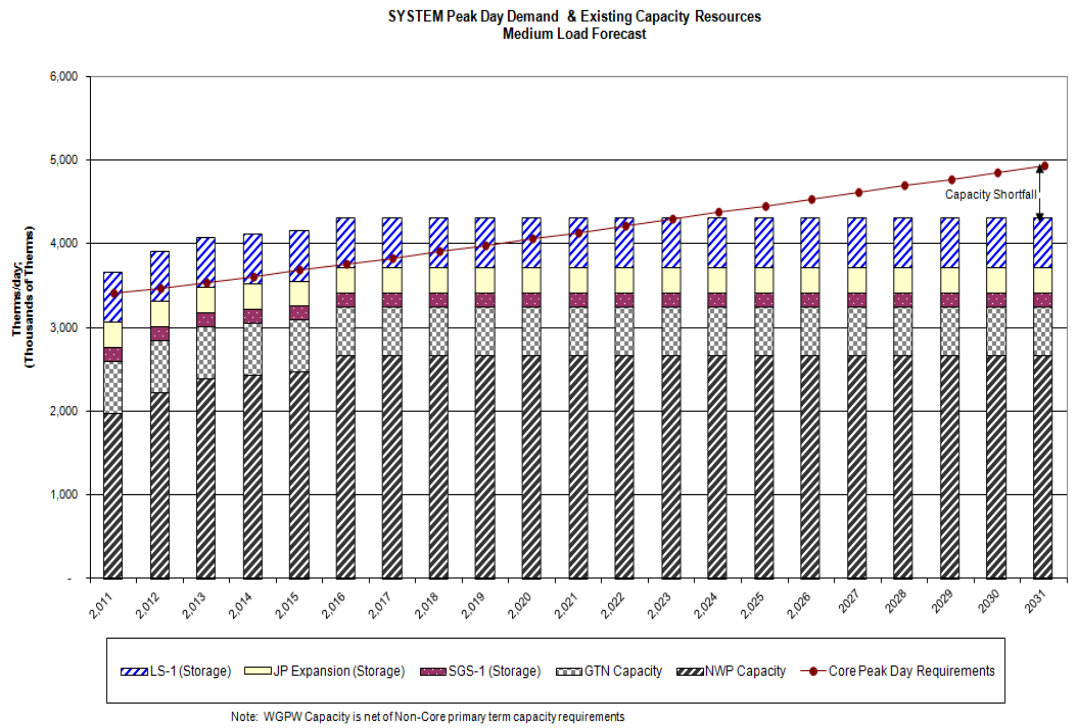


Figure 7-B-2

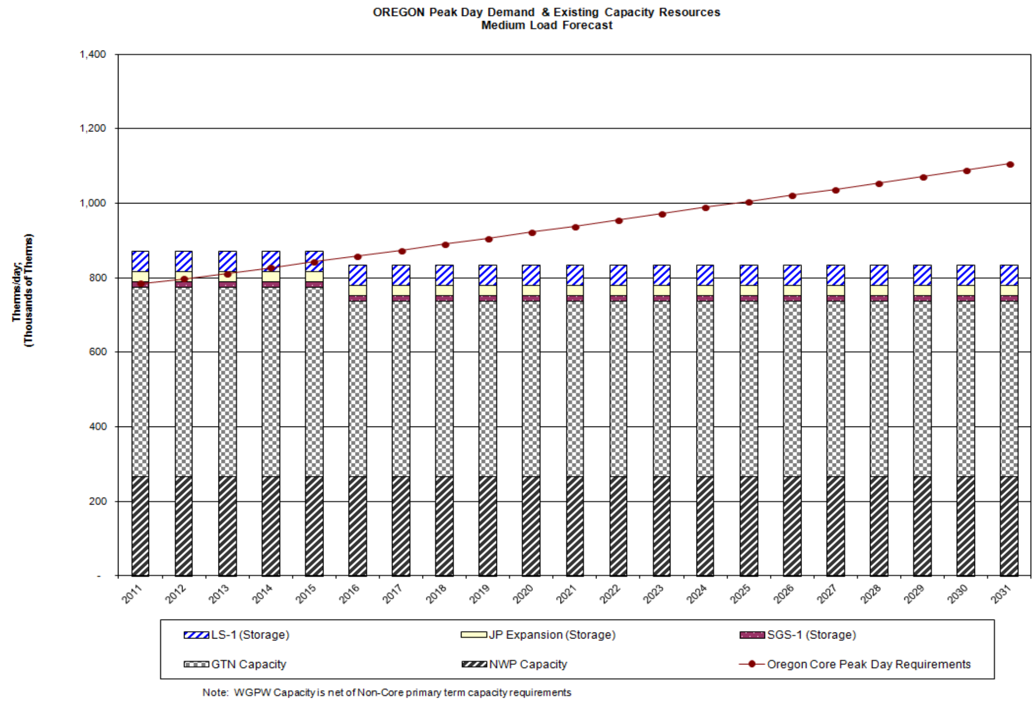
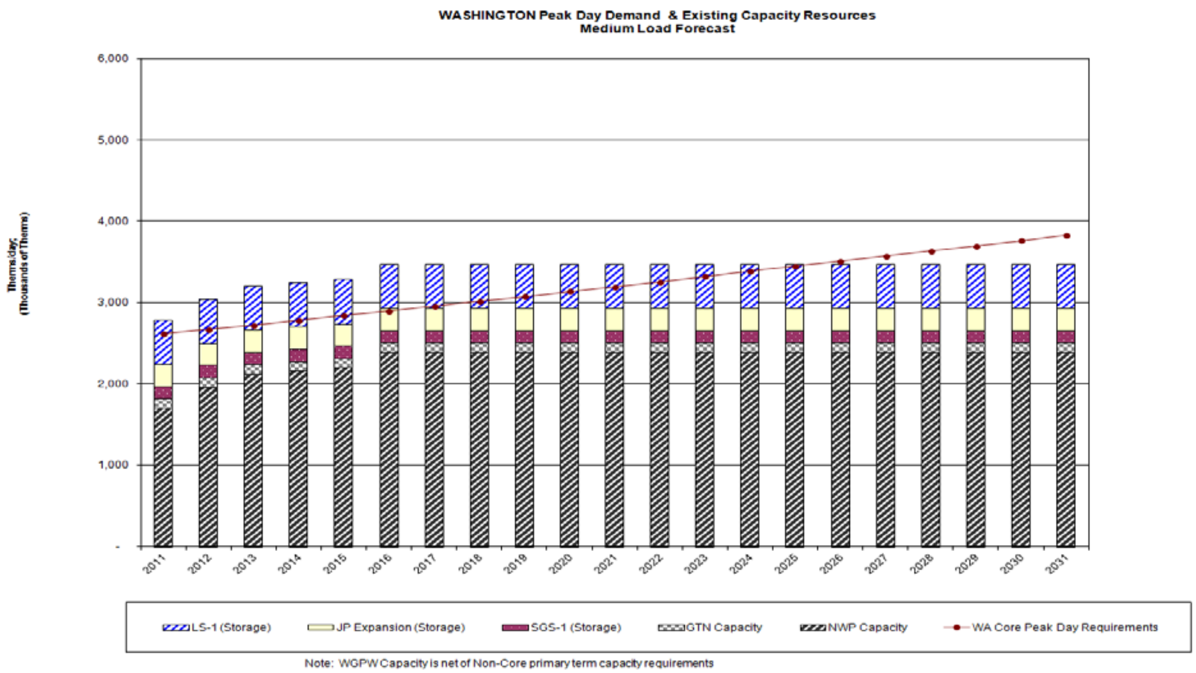


Figure 7-B-3



For modeling purposes, the company included several capacity alternatives to meet peak planning needs. Based on the analysis, peak day requirements will be met through a blend of resources. For purposes of the graphical depiction, the company has shown the incremental conservation resources as a capacity resource. As shown in Figures 7-C-1 through 7-C-3, incremental pipeline capacity on NWP, GTN, along with a combination of citygate peaking, Ruby and satellite LNG alternatives will be used to meet growing peak requirements.

FIGURE 7-C-1

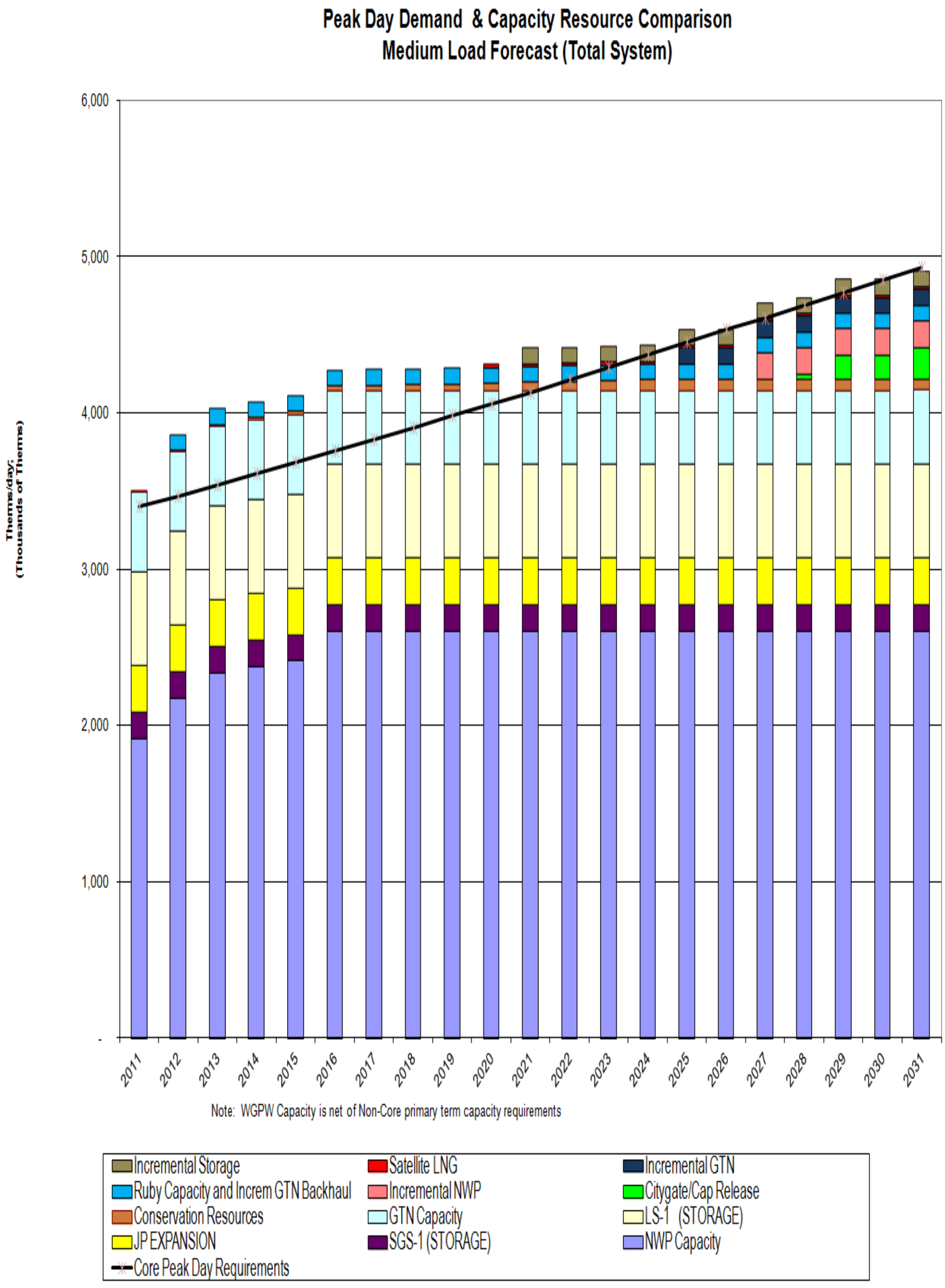

Peak Day Demand & Capacity Resource Comparison
Medium Load Forecast (Total System)
Therms/day
(Thousands of Therms)
6,000
5,000
4,000
3,000
2,000
1,000
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Note: WGPW Capacity is net of Non-Core primary term capacity requirements
Incremental Storage
Satellite LNG
Incremental GTN
Ruby Capacity and Increm GTN Backhaul
Incremental NWP
Citygate/Cap Release
Conservation Resources
GTN Capacity
LS-1 (STORAGE)
JP EXPANSION
SGS-1 (STORAGE)
NWP Capacity
Core Peak Day Requirements

FIGURE 7-C-2

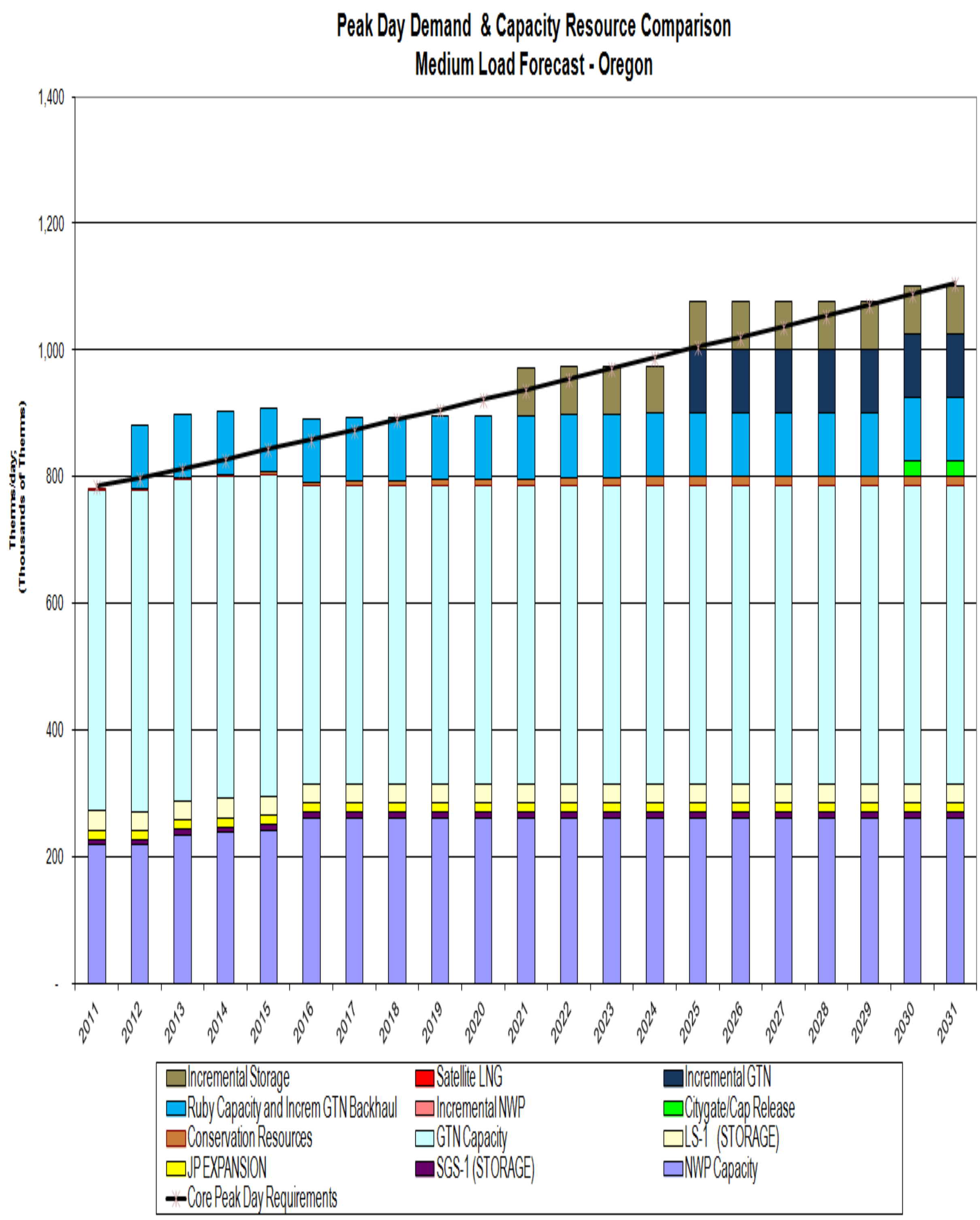
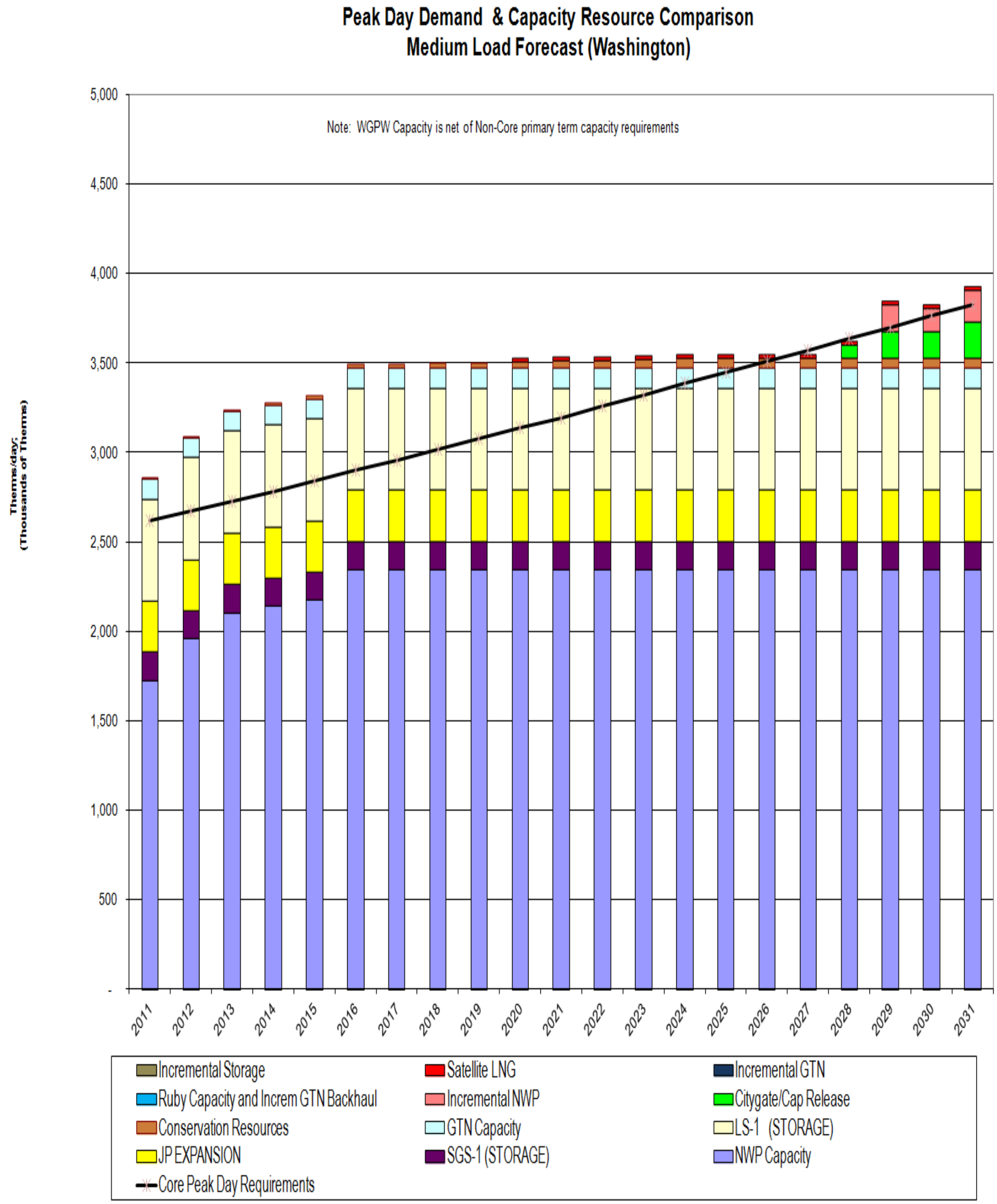


FIGURE 7-C-3



Peak Day Demand & Capacity Resource Comparison
Medium Load Forecast (Washington)
Note: WGPW Capacity is net of Non-Core primary term capacity requirements
Therms/day (Thousands of Therms)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Incremental Storage
Satellite LNG
Incremental GTN
Ruby Capacity and Increm GTN Backhaul
Incremental NWP
Citygate/Cap Release
Conservation Resources
GTN Capacity
LS-1 (STORAGE)
JP EXPANSION
SGS-1 (STORAGE)
NWP Capacity
Core Peak Day Requirements

Annual Load Requirements and Weather Uncertainty

The annual load requirements will vary dramatically based on the weather assumptions. Through the use of SENDOUT™ Monte-Carlo functionality, the company has the ability to analyze the impacts of weather on its load forecast. Figure 7-D shows the overall expected range of the load forecasts, before considering load reductions that can be achieved through incremental conservation programs. The chart provides the upper parameter, which is based on the assumption that the high load growth forecast occurs, with the lower parameter occurring under the low load growth forecast. Capturing the uncertainty around the medium load growth forecast was accomplished through SENDOUT™'s Monte-Carlo functionality. The Monte-Carlo simulation performed 200 draws, with each draw calculating the monthly load based on the weather as randomly determined by the model for each of the weather zones. Figure 7-E provides a more in depth look at the medium scenario results. The absolute maximum and absolute minimum amounts depict the minimum or maximum system demand from the 200 draws for a particular year. The absolute maximum/minimum does not represent any single results for the 20 year planning horizon.

Figure 7-D

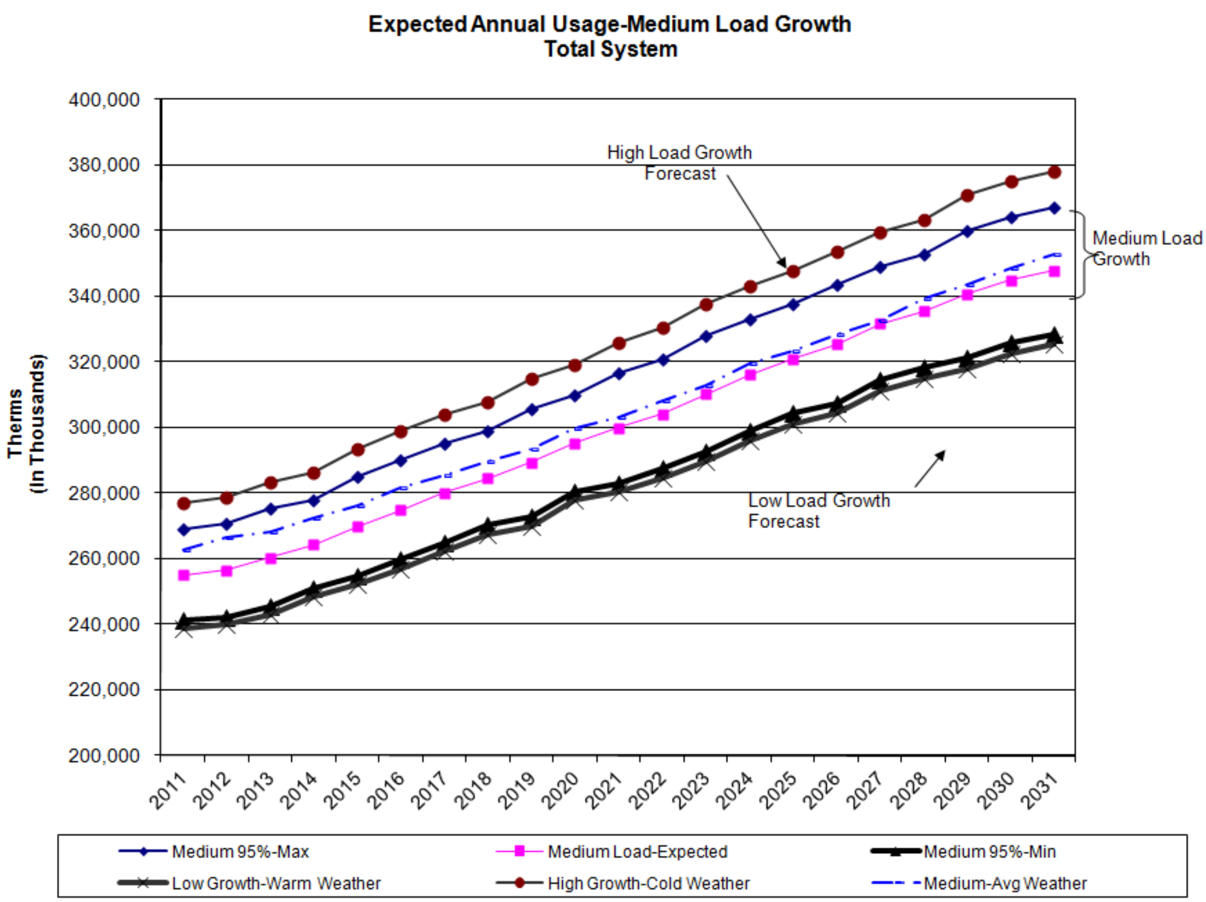
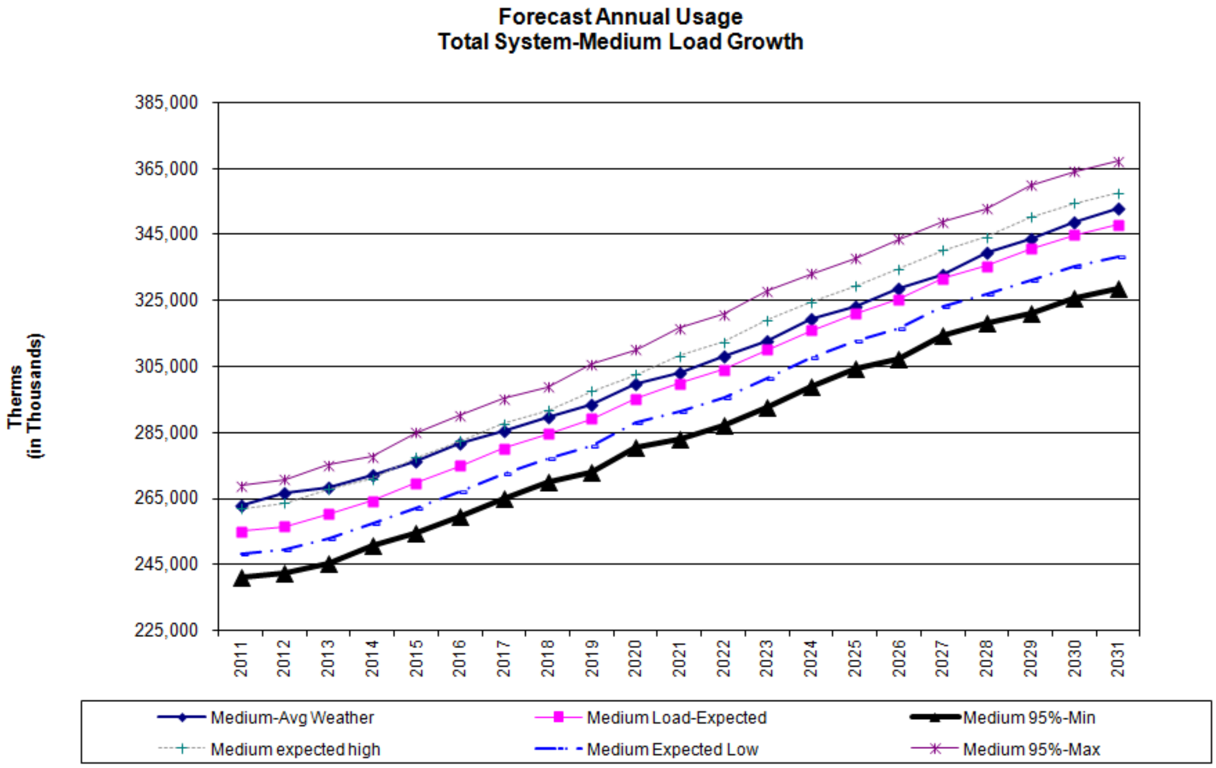


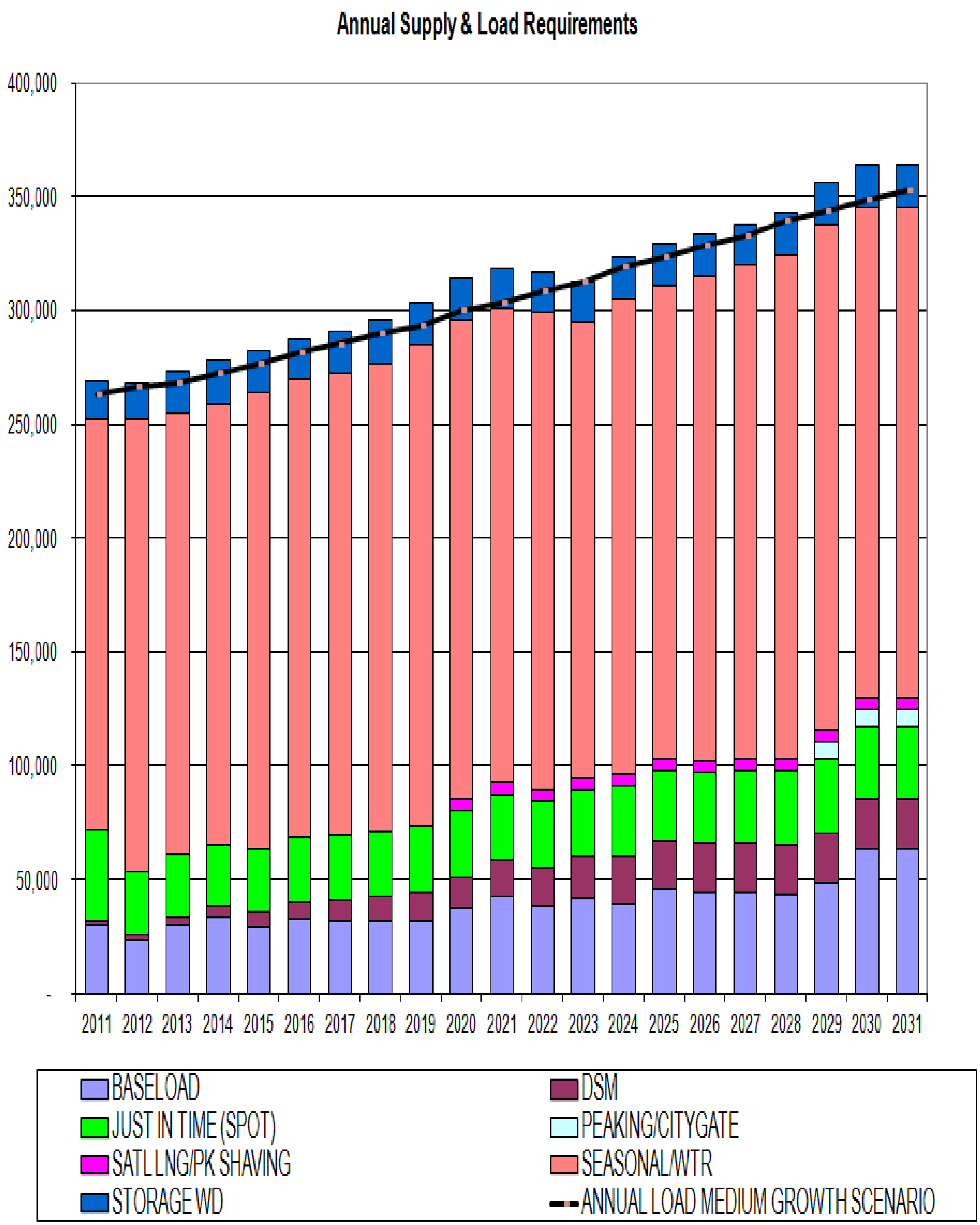
FIGURE 7-E



Additional tables and graphical analyses summarizing the weather and its impact on the annual load forecast are included in Appendix G-1.

To meet this demand, the company will need to acquire a blend of gas supply and conservation resources. For purposes of this plan, the company has estimated the level of conservation that is achievable over the course of the planning horizon which was discussed at length in Section 6. Figure 7-F shows how the company anticipates meeting the projected load over the planning horizon under the basecase scenario. Variations in the portfolio in order to meet actual load requirements during any year will occur primarily through the purchase of just-in-time, or spot gas purchases.

FIGURE 7-F



Impacts of Price Uncertainty and Overall System Costs

The ability to accurately forecast long-term gas prices is influenced by two different types of uncertainty: uncertainty related to long-term changes in the industry and uncertainty related to short-term gas price variability. Contributing to long-term uncertainty are long term supply and demand issues, including growth in demand for electric generation, changes in LNG import infrastructure, possible pipelines to bring Alaskan and other frontier gas supplies to market. Short-term price variability also affects the long-term predictability of gas prices. Even if long-term supply and demand outcomes are exactly as projected, actual prices in future months will still reflect variability due to short-term market conditions. In order to estimate this uncertainty, the Company utilized SENDOUT's™ Monte-Carlo functionality, to analyze the impacts of price on the portfolio costs. Since natural gas is becoming more of a national market, the company believes that volatility in the NYMEX prices will have a far larger influence on the portfolio's price volatility compared to the volatility in the AECO, Sumas and Rocky Mountain basin differentials.

Figure 7-G shows the overall expected range of the NYMEX prices over the planning horizon. The absolute maximum and absolute minimum amounts depicts the minimum amount or maximum amount from the 200 draws for a particular year. The Absolute maximum/minimum does not represent any single draw result for the 20 year planning horizon.

FIGURE 7-G

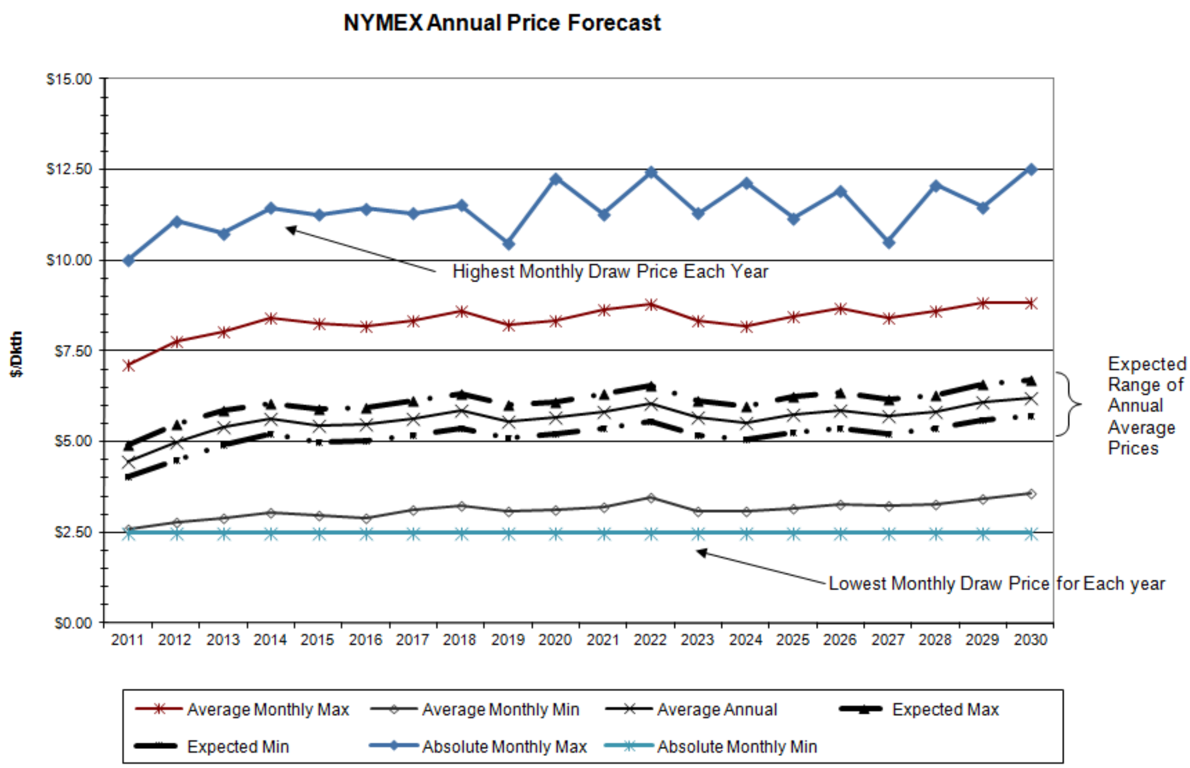


Figure 7-H compares the expected range of NYMEX prices from the Monte-Carlo analysis

including the Environmental Externality costs that were discussed in Section 6. The highest anticipated NYMEX prices would result if the Scenario 3 Carbon Cost Adder was implemented in 2011. In that scenario, Carbon Cost Adder would increase the baseline forecasts by $1.85/dkth beginning in the first year, ramping up to $4.38/dkth over the 20 year planning horizon. The impact of the price volatility on the overall cost of the long- term portfolio is shown below in Figure 7-I. Further tables and graphical analyses summarizing the pricing simulations are included in Appendix G-2.

FIGURE 7-H
PRICE FORECAST-NYMEX
Average Annual Price

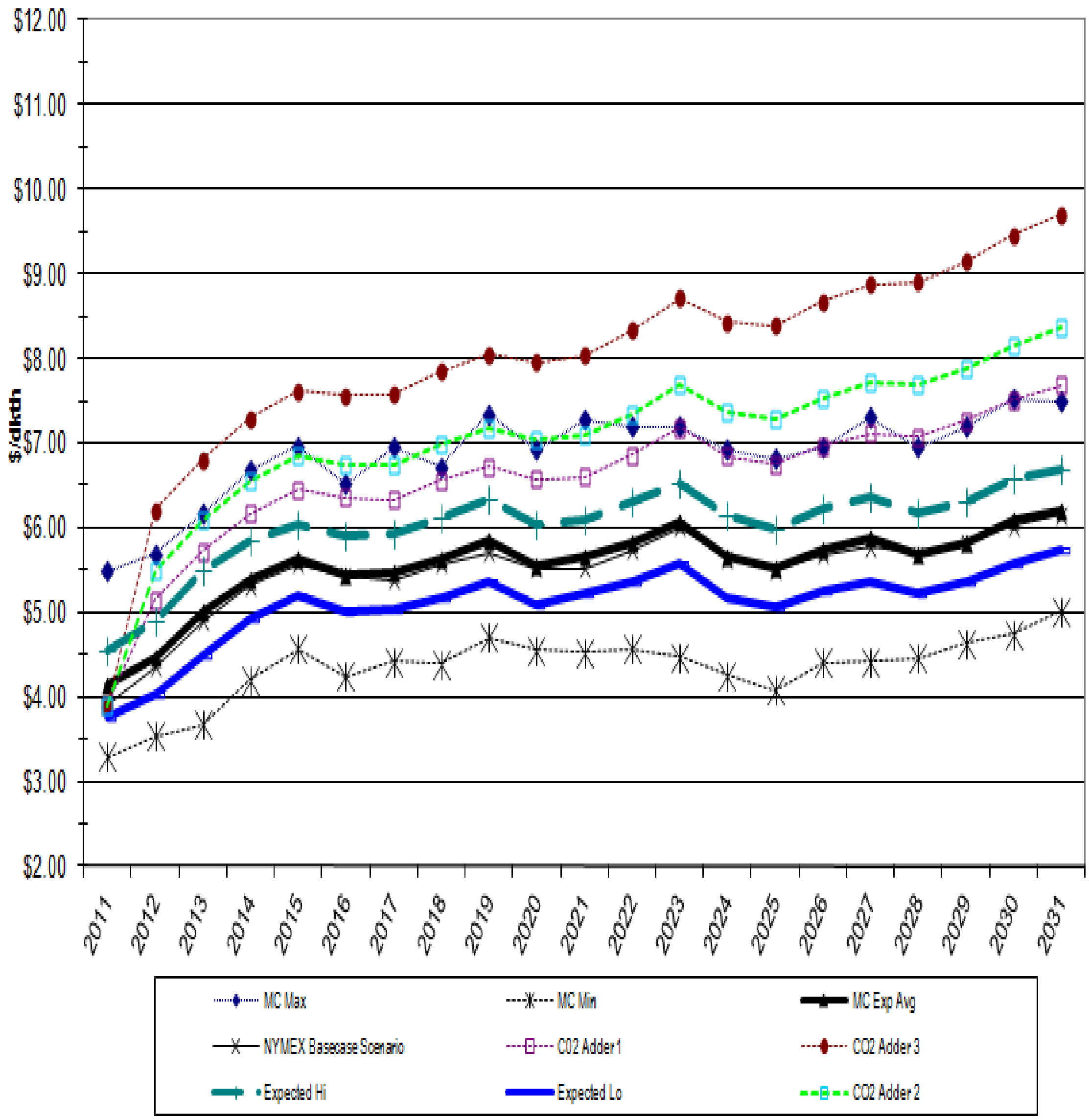


FIGURE 7-I
Annual Portfolio Cost

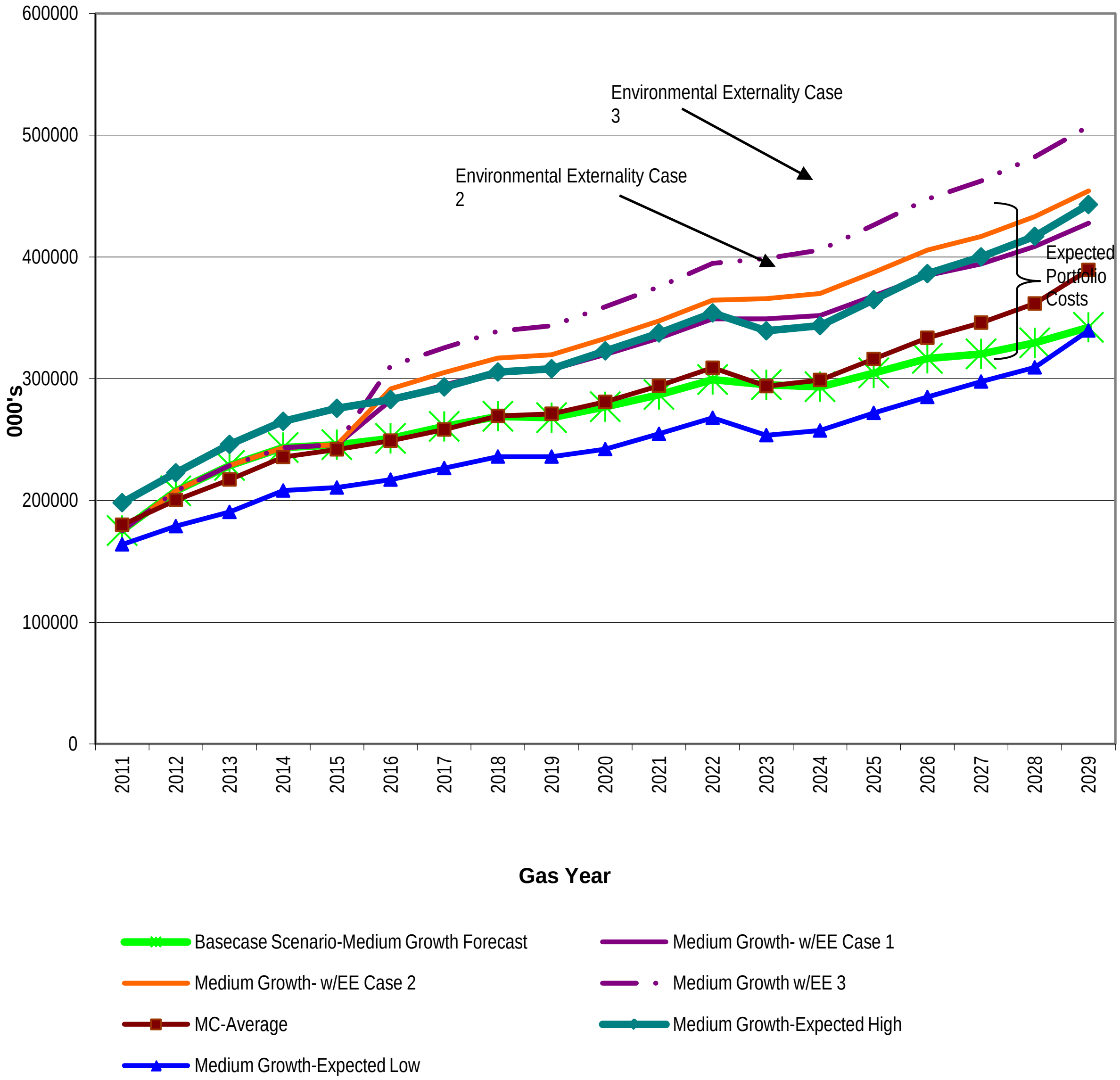


Table 7-5 summarizes the Net Present Value of the 20-year portfolio costs and average cost per therm for each of the scenarios and includes the anticipated range of costs from the Monte-Carlo modeling.

TABLE 7-5

	NPV 20 Yr Portfolio costs in $000s	Average Cost Per Therm
Scenario Results		
Basecase Scenario High Load Growth Low	$ 2,747,378	$ 0.388872
Load Growth	$ 3,267,486	$ 0.425008
Environmental Externalities Case 1	$ 2,657,113	$ 0.408042
Environmental Externalities Case 2	$ 3,149,964	$ 0.445903
Environmental Externalities Case 3	$ 3,272,814	$ 0.463253
	$ 3,518,517	$ 0.498047
Simulation Results		
Monte-Carlo Average	$ 2,816,873	$ 0.399799
Monte-Carlo Expected High	$ 3,216,376	$ 0.447916
Monte-Carlo Expected Low	$ 2,448,210	$ 0.354748

Based on the basecase results, Cascade has calculated its avoided costs. Cascade's avoided cost estimates represent the marginal cost of natural gas usage incremental to the forecasted demand. In other words, avoided cost is the unit cost to serve the next unit of demand during any given period of time. If demand-side management measures reduce customer demand, the Company is able to "avoid" certain commodity and transportation costs. This concept is important to assessing the proper value to demand-side management efforts. As discussed in Section 6, when calculating the avoided cost figures, the company includes an incremental cost advantage for conservation resources to recognize the non-quantifiable benefits associated with conservation such as price certainty and hedge value against future carbon costs.

Based on the annual costs from the Basecase scenario, the Company has estimated that the avoided costs are $11.02 for 30-year measures and the cost-effectiveness limit is 65 cents per therm. Under the Carbon Scenarios, the avoided costs for 30-year measures range between to $12.34 up to $13.56 or 73 to 80 cents per therm.

Additional information regarding the calculation of these avoided cost estimates is included in Appendix H.

Section 8

Two-year Action Plan

Prior IRP Action Plan and Progress Review

Cascade filed its last Integrated Resource Plan in December 2008. Since that time, Cascade has made significant progress in meeting its 2-Year Action Plan. Appendix I includes the detailed Two-year Action Plan along with a description of the Company's progress on each of the items.

2011 Action Plan

Cascade's 2010 Action Plan continues to focus on the following five areas:

- Demand Forecasting
- Distribution System Constraint Analysis
- Demand Side Resources
- Supply Side Resources
- Integration

The 2 year action plan embodies Cascade's commitment to maximizing the efficiency from its Integrated Resource Plan and to achieving the lowest cost resource portfolio of reliable natural gas services and conservation.

Distribution Enhancements actions to be taken in the near term to meet core growth

Cascade has a replacement project scheduled for Bend, Oregon between 2012 and 2016 which is being undertaken to replace a neighborhood pipeline distribution system. In addition to replacement, we will be replacing critical pipelines with larger diameter pipe in order to boost overall capacity to the City of Bend with the intent of meeting our 20-year growth forecast. We are currently in the process of developing a more detailed action plan including specific tasks for each year and more detailed costs estimates. Currently we anticipate budgeting an average of $2 to $3 million each year towards the project, with about 15% of that total being dedicated towards capacity enhancement. It should be noted that the current estimates for this project have increased considerably from the previous year's budget, due to recent developments in Cascade's Distribution Integrity Management Program (DIMP) and our increasing focus on replacement of aging facilities.

Oregon Public Purpose Fund

Cascade and the Energy Trust of Oregon will work with OPUC staff during 2012 to determine the best and most efficient manner to collect public purpose revenues that meet the approved budget needs of Energy Trust. Additionally, there will be discussions and related decisions during 2012 regarding the low-income program funding portion of the public purpose charge.

NWP delivery rights re-alignment and incremental vintage capacity acquisition program

Cascade was able to take advantage of an opportunity to acquire long-term, vintage capacity that was turned back to Northwest Pipeline. Acquiring the 37,563 dths/day of capacity at current rates allows Cascade to mitigate projected capacity shortfalls from 2021 to 2031 of between 30,000 dths and 60,000 dths day in the Bellingham WA area and 3,000 to 6,000 dths day in portions of the Mecham Zone of Northwest Pipeline's system. This action is part of a larger effort to address capacity shortfalls by acquiring or modifying existing upstream pipeline capacity resources. To that end, Cascade will be working with Northwest Pipeline in the near term to re-align Cascade's contractual delivery rights, where operationally feasible, from citygates where we are forecasting an excess of pipeline capacity to citygates where we are projecting a pipeline capacity shortfall, thereby minimizing the costs to secure incremental capacity and facilities in order to meet peak day loads in those areas.

Securing Ruby capacity to meet load growth and add supply diversity

In order to help mitigate the projected 30,000 dths day shortfall discussed in Section 5 of the IRP in the Bend OR area by 2031, Cascade has been negotiating with Ruby Pipeline to acquire 10,000 dths a day of firm, primary path winter-only capacity from the Opal Hub to Ruby's interconnect with GTN. We are negotiating 25 year contract at a discounted rate that will allow Cascade to bring Rockies gas to Oregon beginning in November 2012, increasing supply diversity (currently over 80% of Central OR is supplied by AECO) and address the need for incremental supplies. During the course of the next year, Cascade will determine if it is prudent to invoke a clause in the Ruby contract that allows Cascade to contract for up to an additional 20,000 dths/day to the Ruby deal. This clause is set to expire in October 2014. FERC has conditionally approved this capacity transaction subject to Ruby addressing several of FERC's concerns regarding the services Ruby's tariff allows them to provide in terms of seasonality, ratchets and acquiring other pipeline capacity.

Securing incremental Gas Transmission Northwest Pipeline (GTN) firm backhaul capacity to meet load growth and add supply diversity

On a separate tract to address the projected 30,000 dths day shortfall in the Bend OR area by 2031, Cascade has been working with Ruby Pipeline on an opportunity to obtain 10,000 dths/day of primary, firm Malin north capacity on GTN through a pre-arranged agreement via Ruby. This capacity will provide the means to deliver Rockies supplies to central Oregon, thereby increasing supply diversity. Currently, GTN allows the scheduling of backhauled volumes from Malin northward on a secondary basis at maximum rate. We have discussed with Ruby the idea that should they successfully contract for backhaul capacity on GTN, Cascade would be willing to acquire the GTN backhaul capacity, subject to bid, via a posting on GTN's electronic bulletin board in accordance with existing FERC rules. We anticipate Cascade will finalize a backhaul capacity release on GTN by summer 2012. The initial backhaul capacity is expected to expire within five years at which time we expect GTN will likely file a rate case for the continuation of the primary service; Cascade will be a principle participant in any of those discussions.

Secure incremental storage to meet load growth and mitigate price volatility over the 20 year planning horizon

During 2012 and 2013 Cascade will be exploring several options to acquire approximately 300,000 dths of working inventory at Ryckman Creek Storage facility. The Ryckman Creek Storage facility is located in the Rockies in the Opal Hub area. We are in discussions with existing Ryckman storage holders and will also be considering participation in a possible open season at a negotiated rate for storage service starting in 2013. Ryckman Creek storage will primarily be used to store Rockies gas and with the ability to inject and withdraw via Northwest Pipeline and Ruby. This storage will help meet the projected 30,000 dths shortfall on peak day in central Oregon and provide a significant resource for arbitrage opportunities to manage supply costs to all ratepayers.

CASCADE NATURAL GAS CORPORATION

A Subsidiary of MDU Resources Group, Inc.

In the Community to Serve®

2011
Integrated Resource Plan
Appendices A through I

Appendix A

IRP Process

From: Barnard, Kathie [mailto:Kathie.Barnard@cngc.com]
Sent: Tuesday, January 04, 2011 5:31 PM
To: 'bob@oregoncub.org'; Dan Kirschner; GORSUCH Lisa; KOHO Lori G.; megan clark; ppyron@nwigu.org; Saldivar, Marty; SOBHY Moshrek M.; ZIMMERMAN Ken; gordon@oregoncub.org
Cc: Sellers-Vaughn, Mark; Duggirala, Srinivas; Robbins, Chris; Archer, Pamela
Subject: Cascade Natural Gas 2011 IRP Technical Advisory Group meetings

It's time to start our public process for Cascade's IRP that will be filed by August 9th 2011. We are looking at having 3 Technical Advisory Group (TAG) meetings that will cover the major areas of the IRP. A preliminary schedule is as follow:

TAG 1: Key Assumptions (Price Forecast & Economic Indicators) /preliminary Demand Forecast Results– Early February 2011
TAG 2: Supply Resource Alternatives, preliminary Modeling of Conservation Curves – Mid March 2011
TAG 3: Integration/2 year Action Plan – Mid April 2011

I know how busy everyone's schedules are and therefore I would like to get the meeting dates firmed up in the next week so that we can get them on our calendars. Meetings will be held at the PDX meeting facility unless there is interest in holding one of the meetings at Cascade's new headquarters in the Kennewick.

TAG 1 February 2, 3, or 4 10am to 3pm

TAG 2 March 9, 10 or 11 10am to 3pm

TAG 3 April 12, 13, 14th , 19, 20 or 21st 10 to 3pm time

Please respond by Friday January 7 so we can finalize the schedule. Thank you

Kathie

Katherine Barnard
Manager--Gas Supply & Regulatory Affairs
Cascade Natural Gas & Intermountain Gas Company
Subsidiaries of MDU Resources Group, Inc.

CASCADE NATURAL GAS CORPORATION ®

2011 Integrated Resource Plan

Technical Advisory Group Meeting

February 2, 2011

Agenda

- Introductions
- Key Assumptions & Demand Forecast
- Peak Day Forecasting
- Load/Resource Balancing--Capacity Analysis

CASCADE NATURAL GAS
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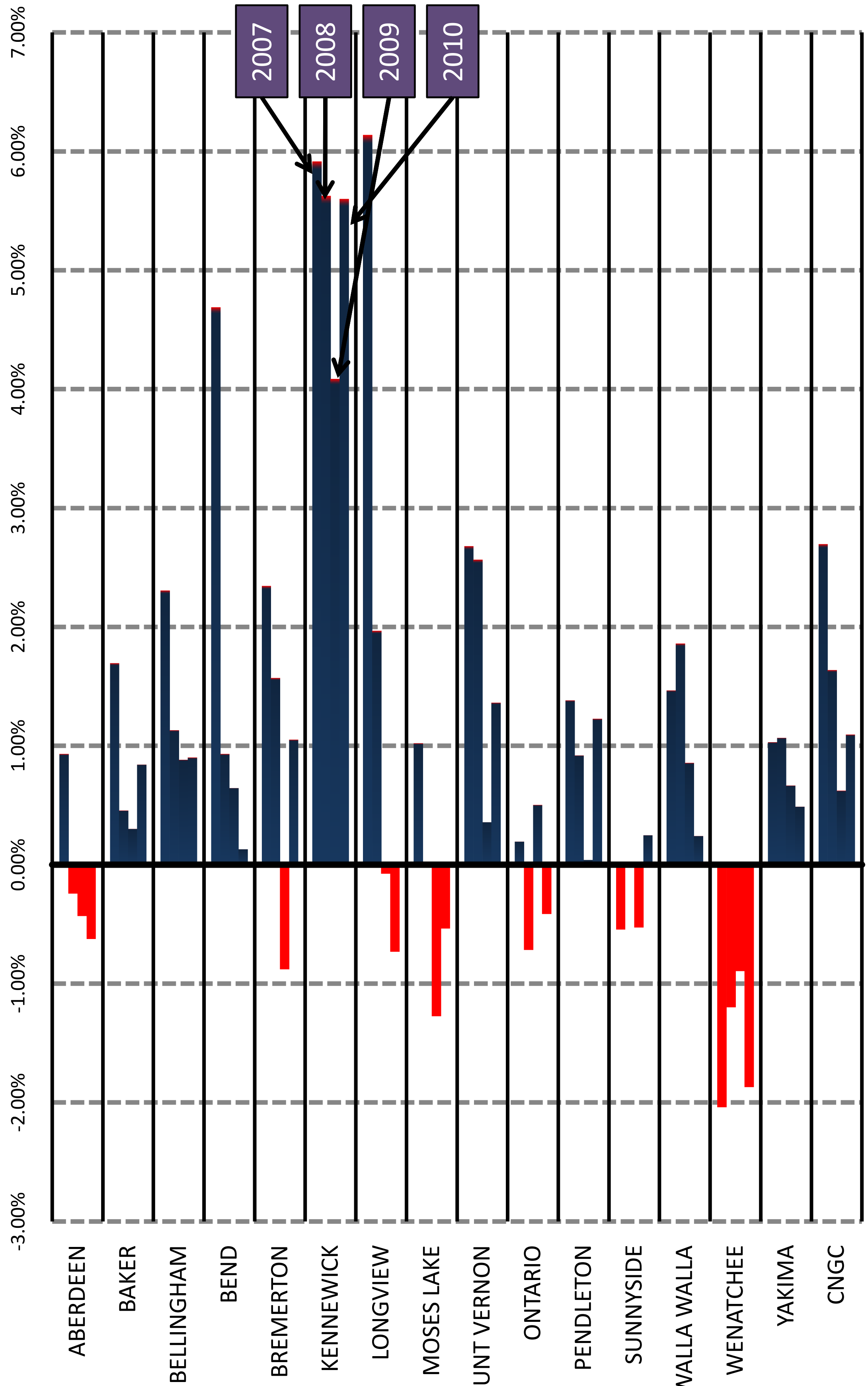
2011 IRP Demand Forecast Presentation

Vas Duggirala
Regulatory Analyst
Cascade Natural Gas
srinivas.duggirala@cngc.com

Current Events

Residential Customer Growth



2008 IRP Revisited

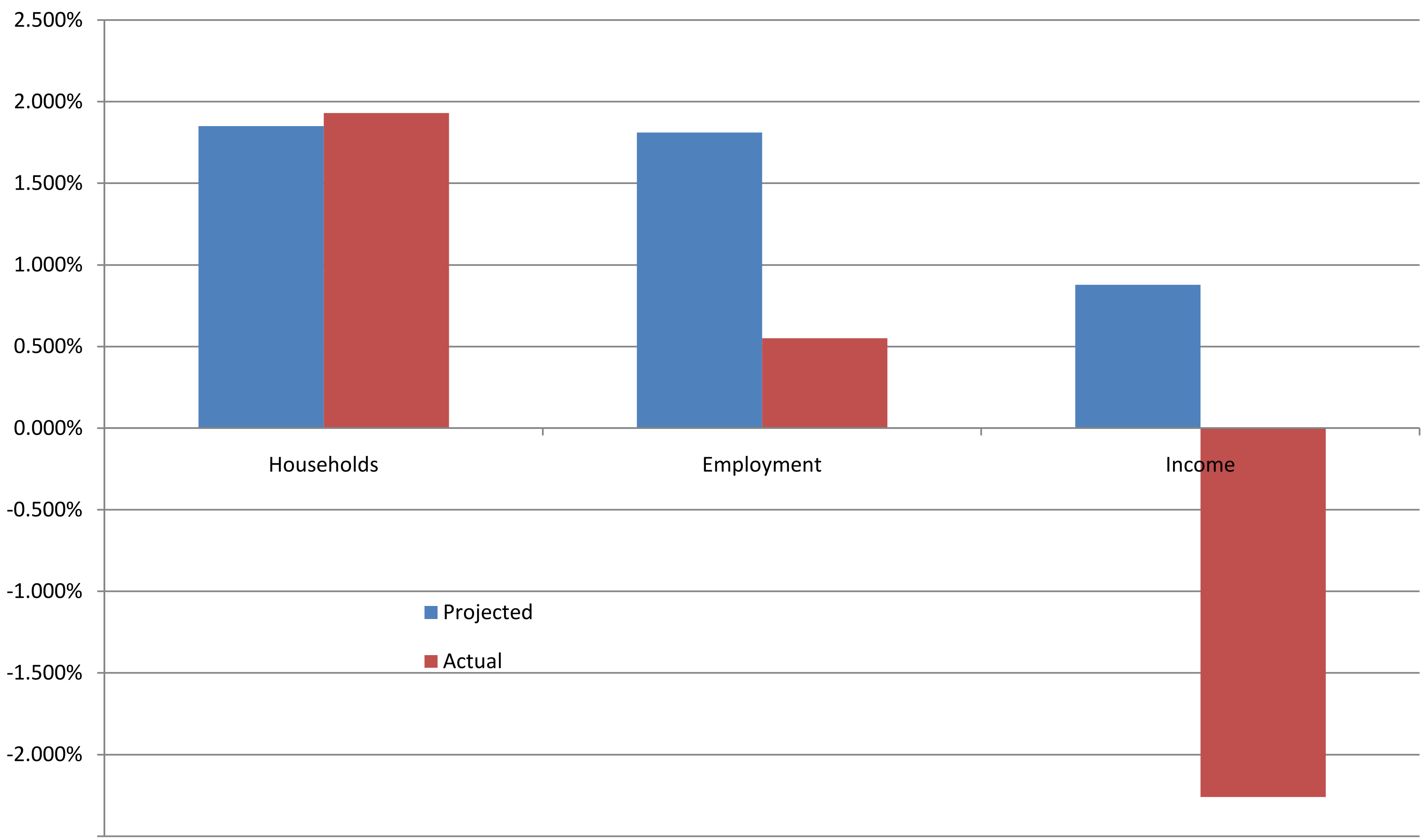
Growth has been far lower than expectations:

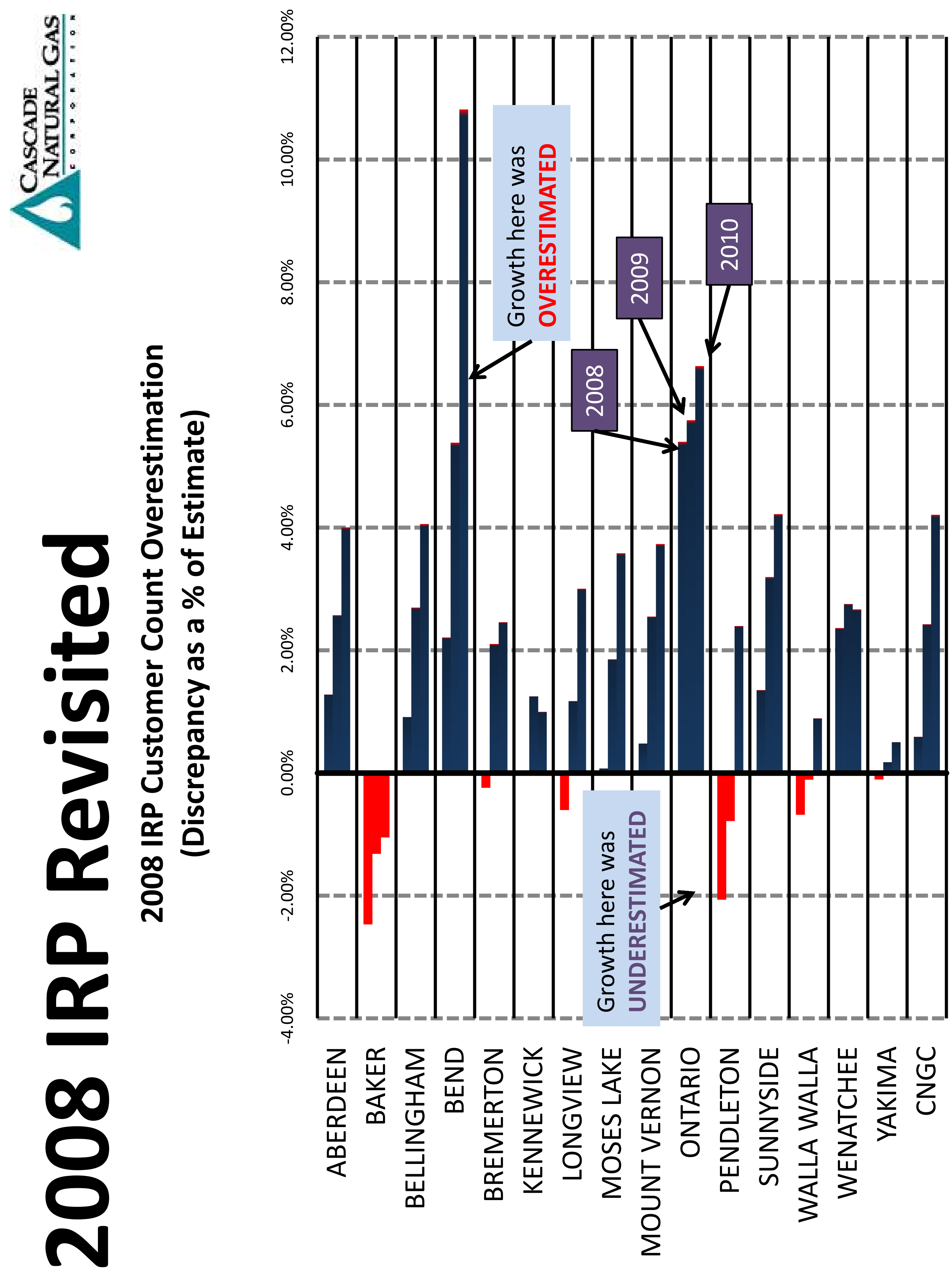
	Forecasted	Actual
2008	2.68%	1.64%
2009	2.62%	0.62%
2010	2.85%	1.09%

2008 IRP Revisited

Customer counts have been low, partially due to the economy:

Performance of Underlying Economic Indicators



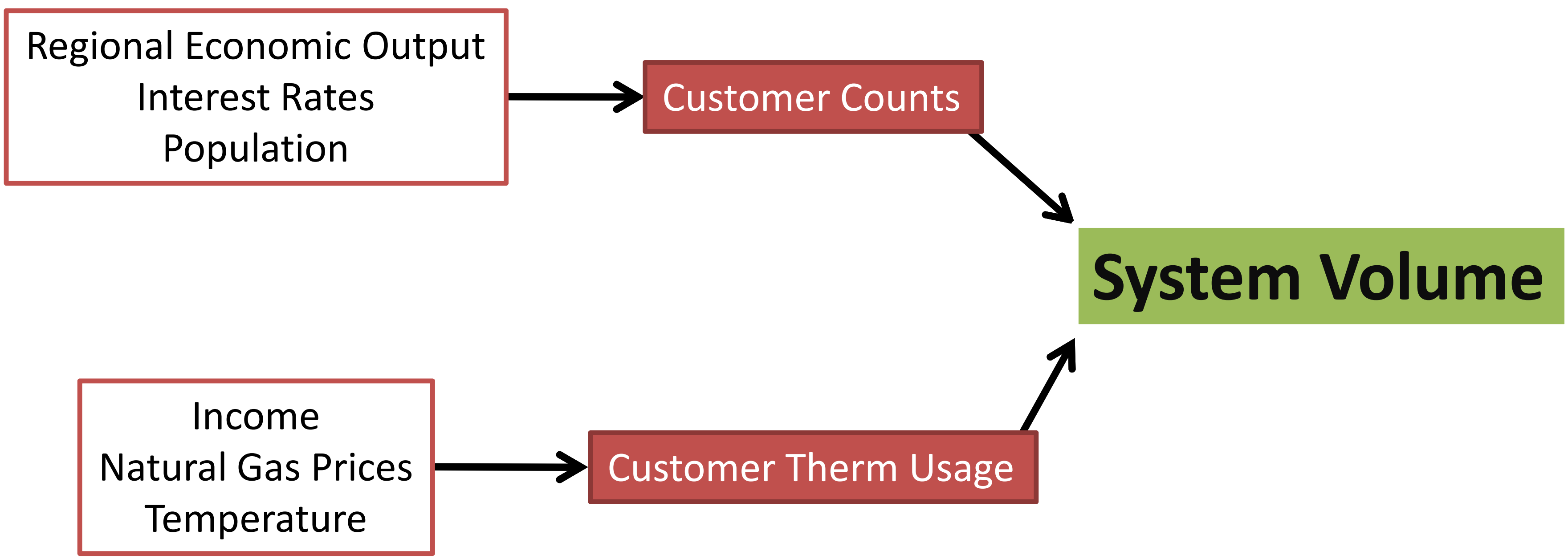

Cascade Natural Gas Corporation
2008 IRP Revisited
2008 IRP Customer Count Overestimation
(Discrepancy as a % of Estimate)
Growth here was OVERESTIMATED
Growth here was UNDERESTIMATED
2008
2009
2010
-4.00%
-2.00%
0.00%
2.00%
4.00%
6.00%
8.00%
10.00%
12.00%
ABERDEEN
BAKER
BELLINGHAM
BEND
BREMERTON
KENNEWICK
LONGVIEW
MOSES LAKE
MOUNT VERNON
ONTARIO
PENDLETON
SUNNYSIDE
WALLA WALLA
WENATCHEE
YAKIMA
CNGC

2008 IRP Revisited

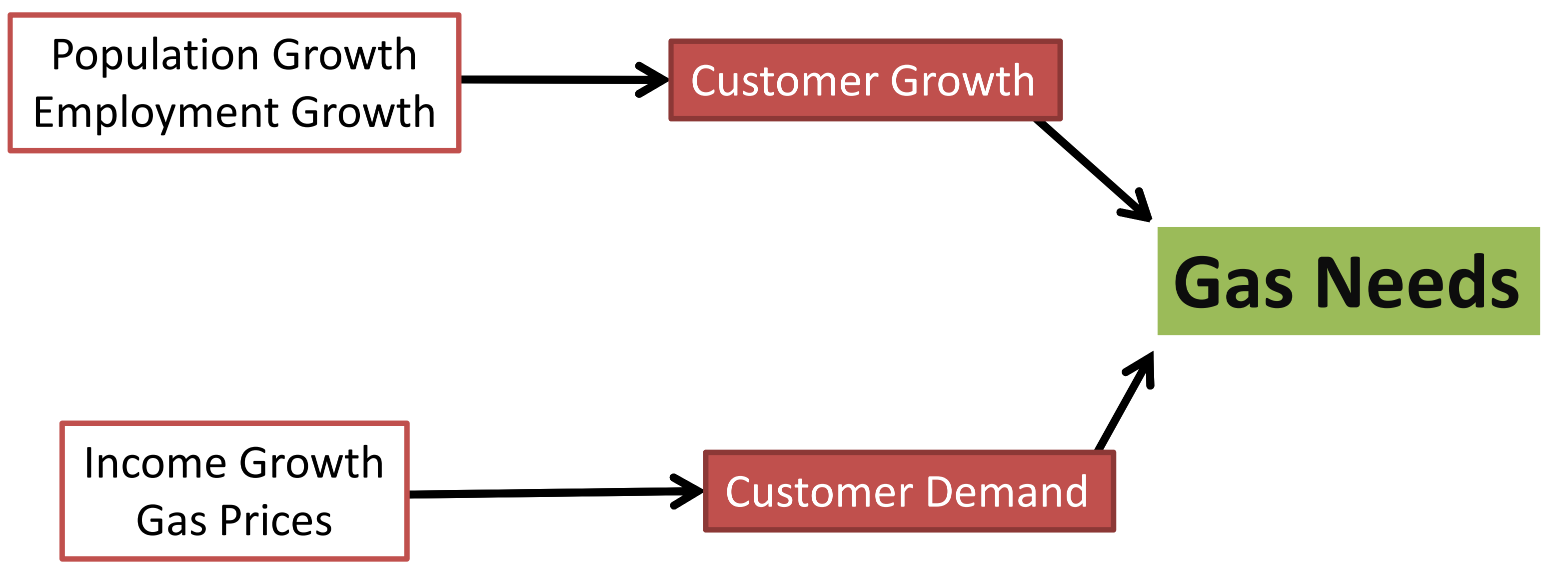
Bend:

	Forecast	Actual	Difference
2008	38,362	37,079	-1,283
2009	40,470	37,318	-3,152
2010	42,616	37,366	-5,250

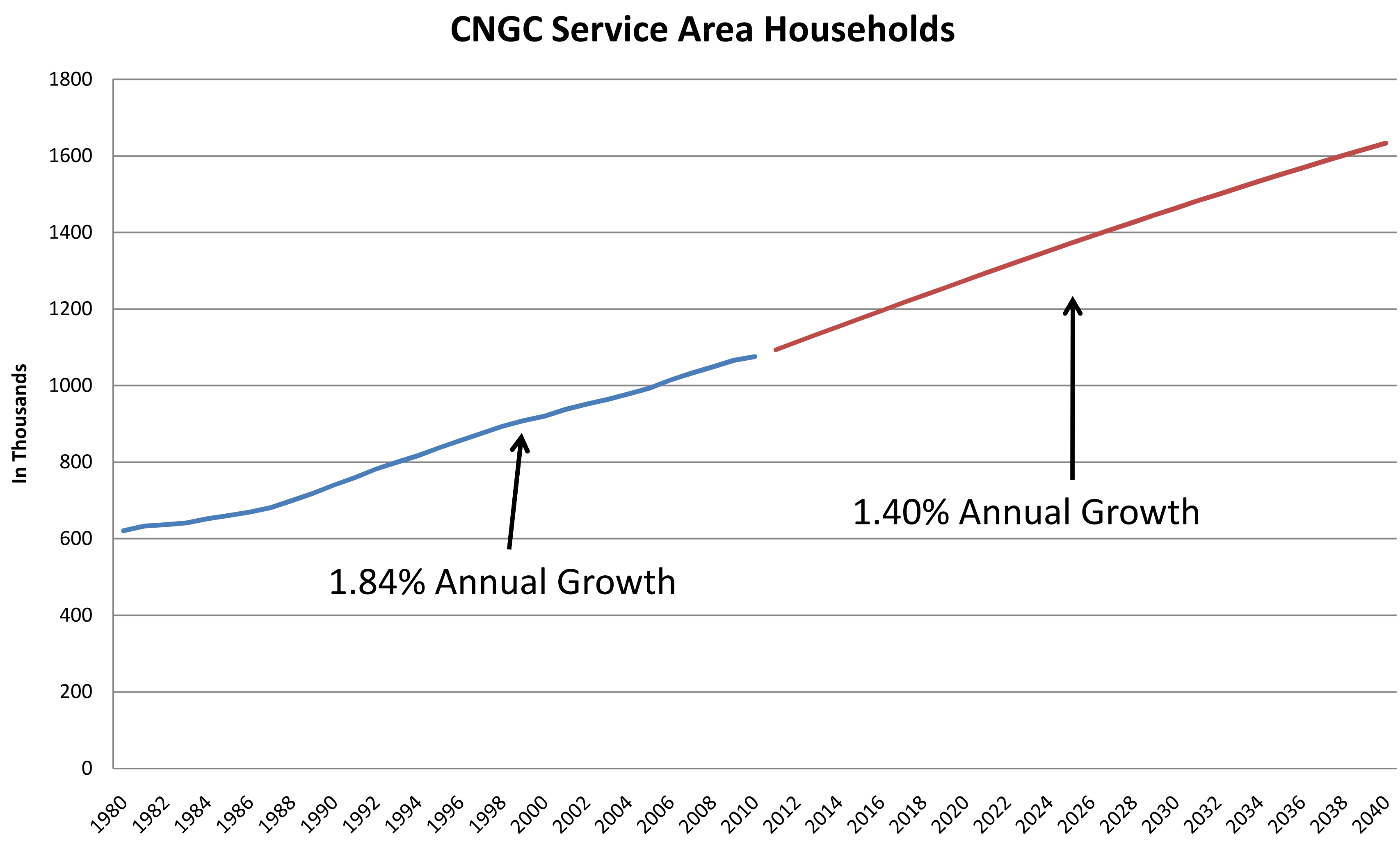
Forecasting Process



Forecasting Process

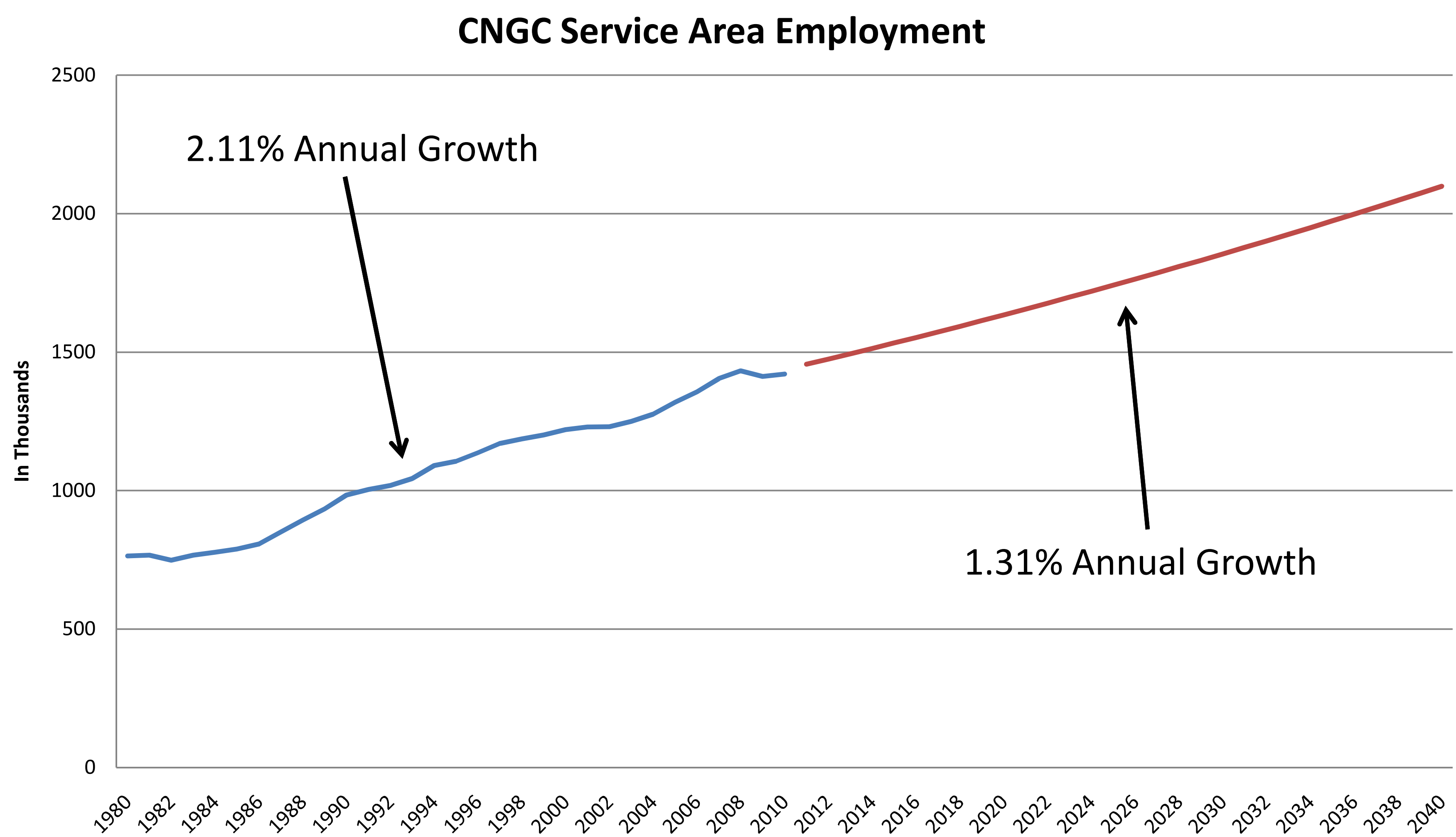


Key Assumptions



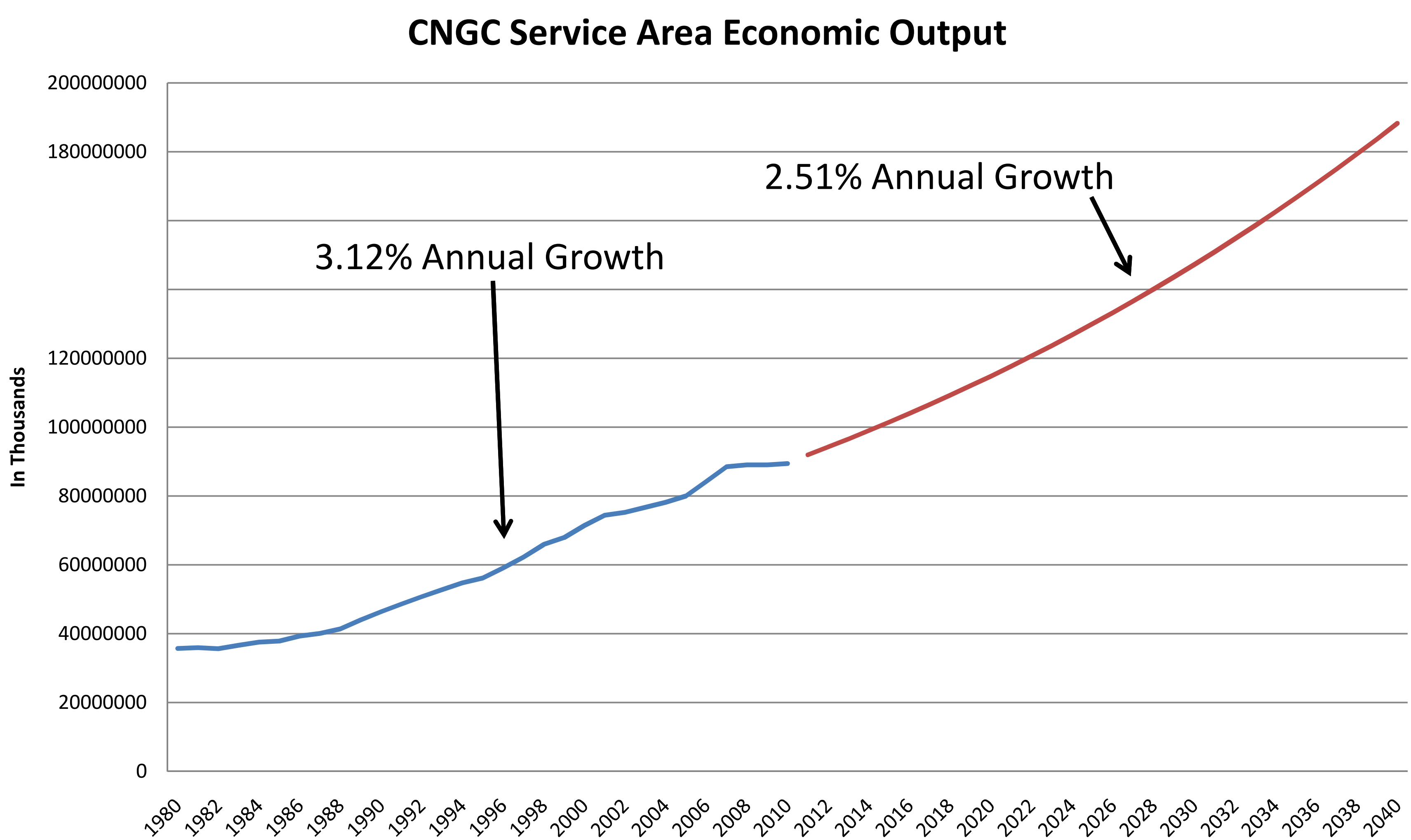
Population | Employment | Income | Interest Rates | Gas Prices | Sensitivity Analysis

Key Assumptions

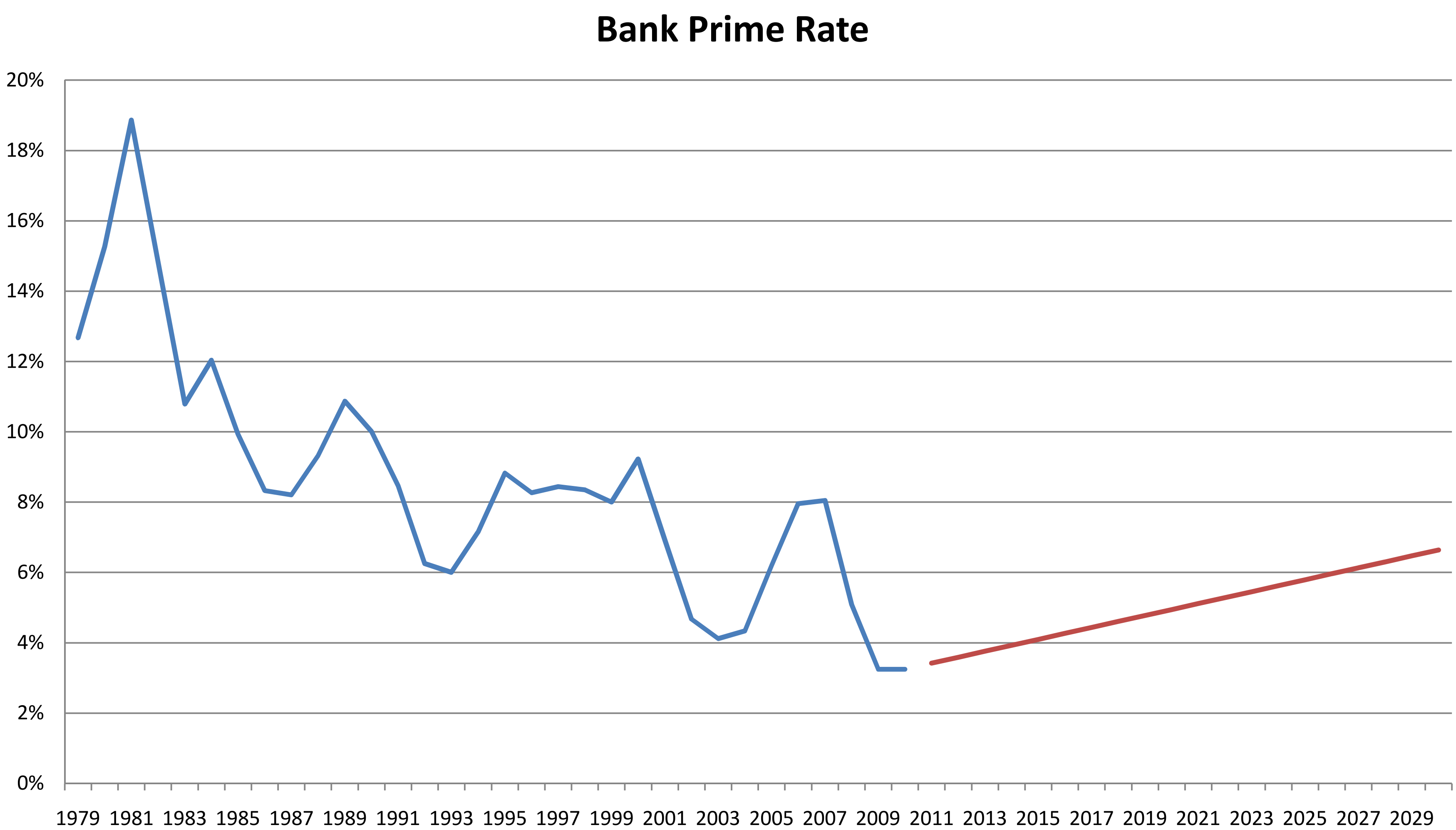


Population | Employment | Income | Interest Rates | Gas Prices | Sensitivity Analysis

Key Assumptions

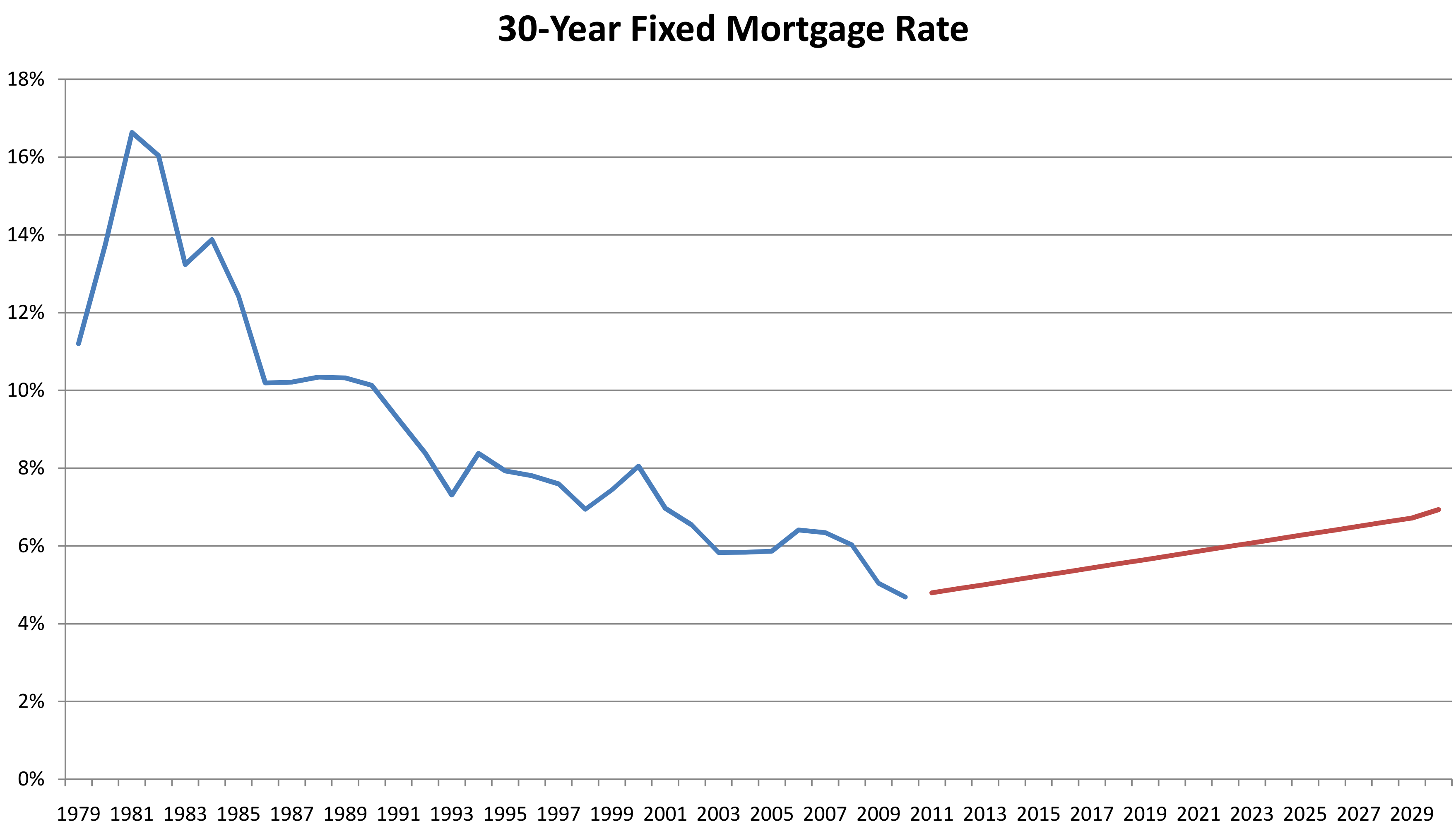


Key Assumptions



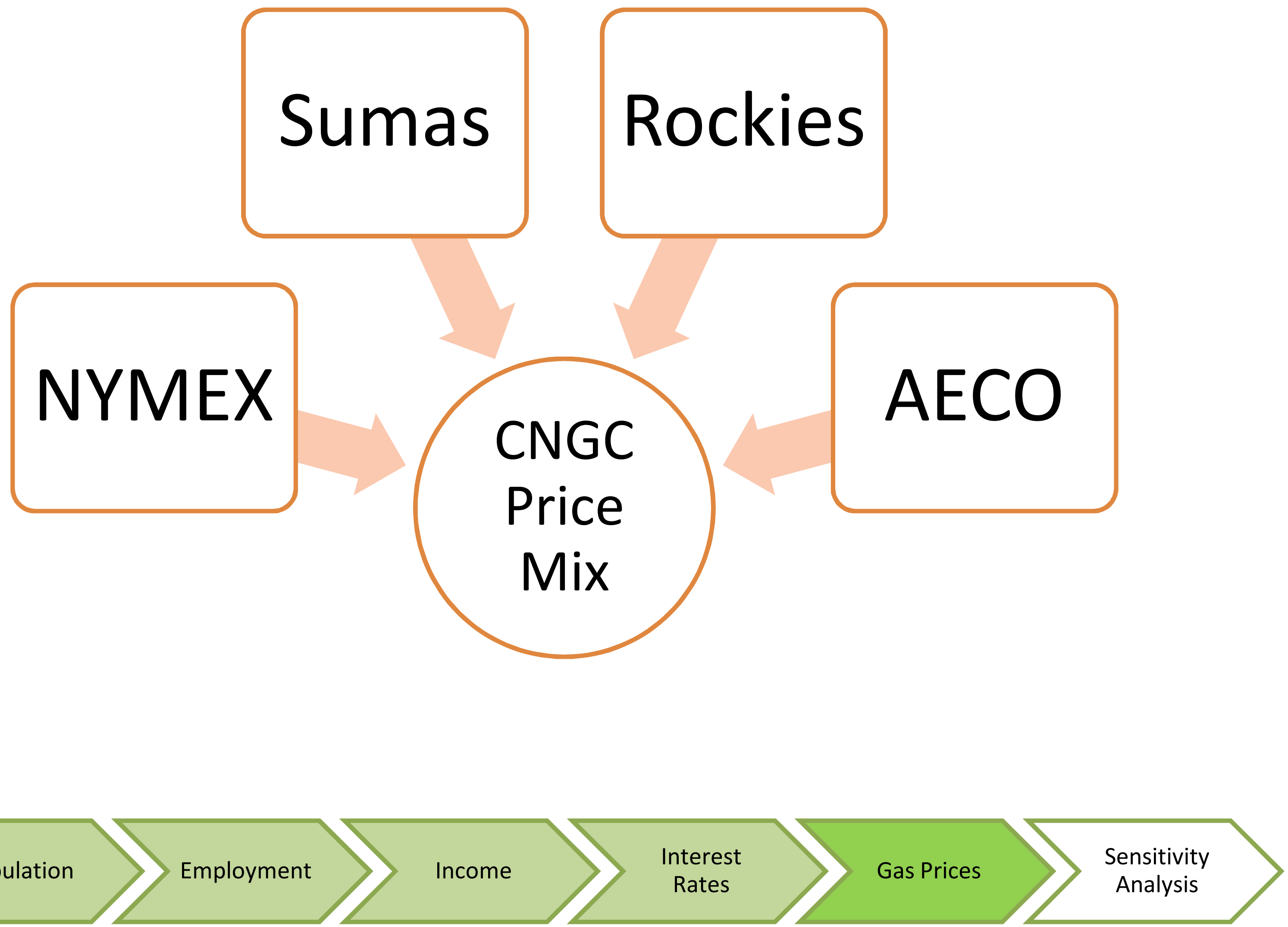
Population | Employment | Income | Interest Rates | Gas Prices | Sensitivity Analysis

Key Assumptions

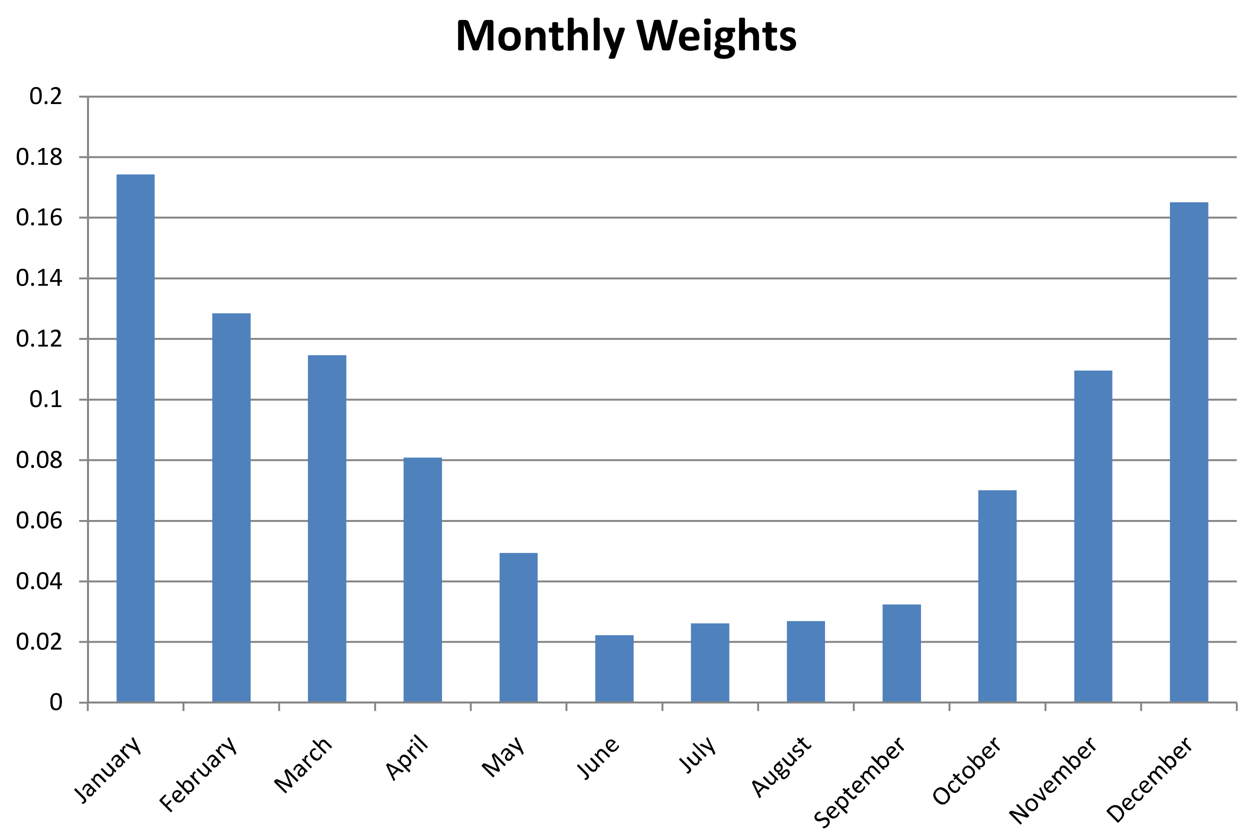


Population | Employment | Income | Interest Rates | Gas Prices | Sensitivity Analysis

Key Assumptions



Key Assumptions



High & Low Scenarios

Calculation of High and Low Scenarios

	Employment	Growth	Ratio	Households	Growth	Ratio	CNGC MHI	Growth	Ratio
1980	763.494			620.777			$57,577.56		
1981	766.32	0.37%	18%	633.085	1.98%	107%	$56,812.30	-1.33%	-107%
1982	748.74	-2.29%	-109%	636.603	0.56%	30%	$56,076.17	-1.30%	-104%
1983	766.806	2.41%	115%	641.215	0.72%	39%	$57,200.87	2.01%	161%
1984	777.186	1.35%	64%	652.585	1.77%	96%	$57,531.66	0.58%	46%
1985	[illegible]	[illegible]	[illegible]	660.843	1.27%	68%	$57,346.87	-0.32%	-26%
1986	[illegible]	[illegible]	[illegible]	669.767	1.35%	73%	$58,739.48	2.43%	195%
1987	849.854	5.31%	252%	681.077	1.69%	91%	$58,838.29	0.17%	14%
1988	893.829	5.17%	246%	699.89	2.76%	149%	$59,118.72	0.48%	38%
1989	934.287	4.53%	215%	718.214	2.62%	141%	$61,257.39	3.62%	291%
1990	983.888	5.31%	252%	740.361	3.08%	167%	$62,660.22	2.29%	184%
1991	1003.965	2.04%	97%	759.492	2.58%	140%	$64,025.95	2.18%	175%
1992	1018.779	1.48%	70%	782.415	3.02%	163%	$64,851.94	1.29%	104%
1993	1043.075	2.38%	113%	800.051	2.25%	122%	$65,911.67	1.63%	131%
1994	1090.431	4.54%	216%	816.887	2.10%	114%	$67,031.68	1.70%	137%
1995	1105.847	1.41%	67%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	1136.601	2.78%	132%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	1169.881	2.93%	139%	874.421	2.12%	114%	$71,210.06	3.16%	254%
1998	1186.301	1.40%	67%	893.517	2.18%	118%	$73,806.57	3.65%	293%
1999	1201.144	1.25%	59%	908.017	1.62%	88%	$74,810.66	1.36%	109%
2000	1219.753	1.55%	74%	919.997	1.32%	71%	$77,637.13	3.78%	304%
2001	1229.271	0.78%	37%	937.555	1.91%	103%	$79,378.68	2.24%	180%
2002	1230.672	0.11%	5%	951.204	1.46%	79%	$79,180.84	-0.25%	-20%
2003	1249.478	1.53%	73%	963.904	1.34%	72%	$79,644.59	0.59%	47%
2004	1275.832	2.11%	100%	978.565	1.52%	82%	$79,940.44	0.37%	30%
2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2007	1404.663	3.54%	168%	1032.397	1.74%	94%	[illegible]	[illegible]	[illegible]
2008	1432.405	1.97%	94%	1049.237	1.63%	88%	$84,879.45	-1.02%	-82%
2009	1412.57	-1.38%	-66%	1066.179	1.61%	87%	$83,579.10	-1.53%	-123%
2010	1420.577	0.57%	27%	1075.801	0.90%	49%	$83,143.24	-0.52%	-42%

Growth rates are 123% of average. Use 123% of W&P as the high for employment.

Growth rates are 73% of average. Use 73% of W&P as the low for employment.

Growth rates are 118% of average. Use 118% of W&P as the high for households.

Growth rates are 85% of average. Use 85% of W&P as the low for households.

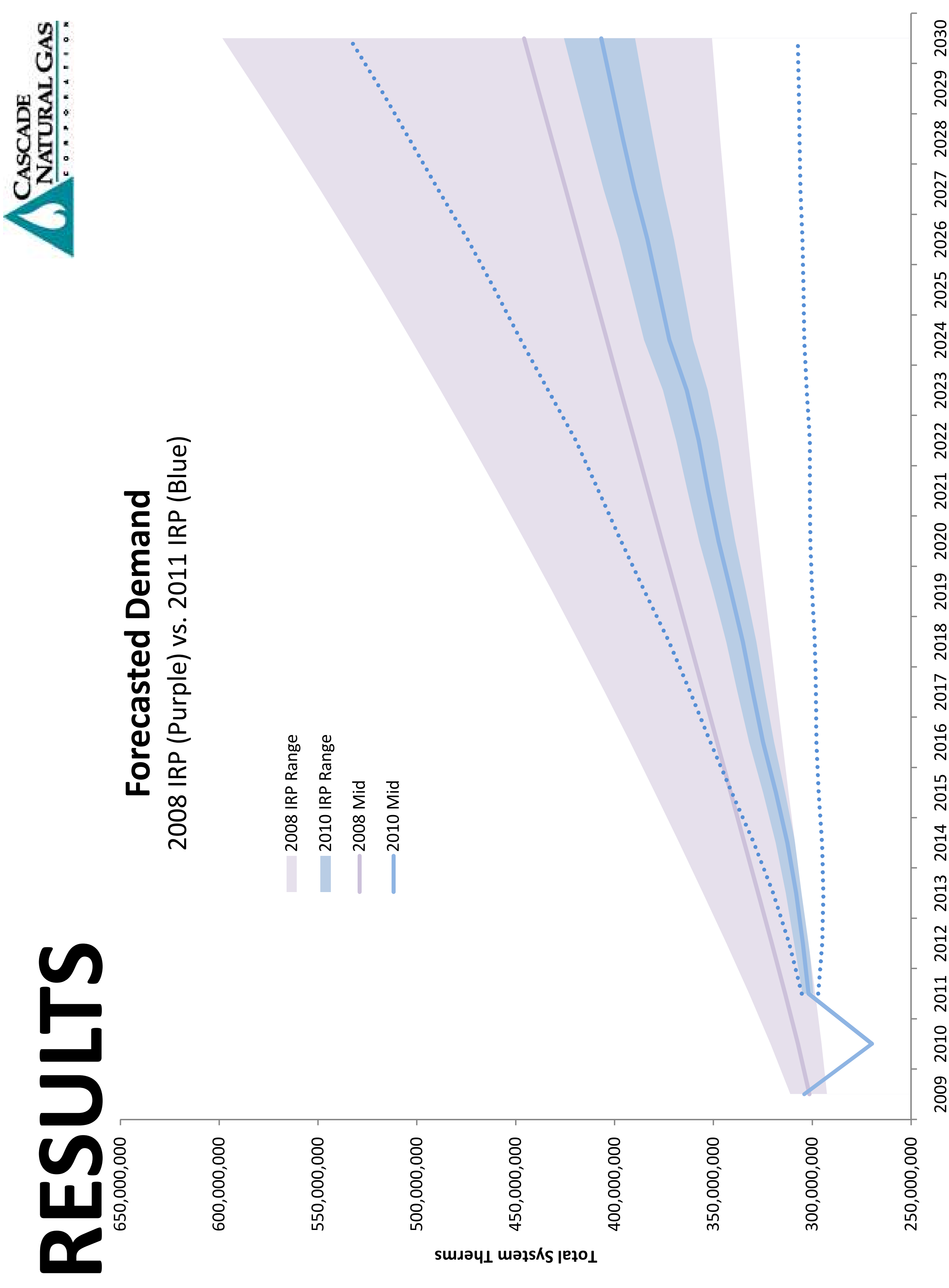
Growth rates are 174% of average. Use 174% of W&P as the high for MHI.

Growth rates are 56% of average. Use 56% of W&P as the low for MHI.

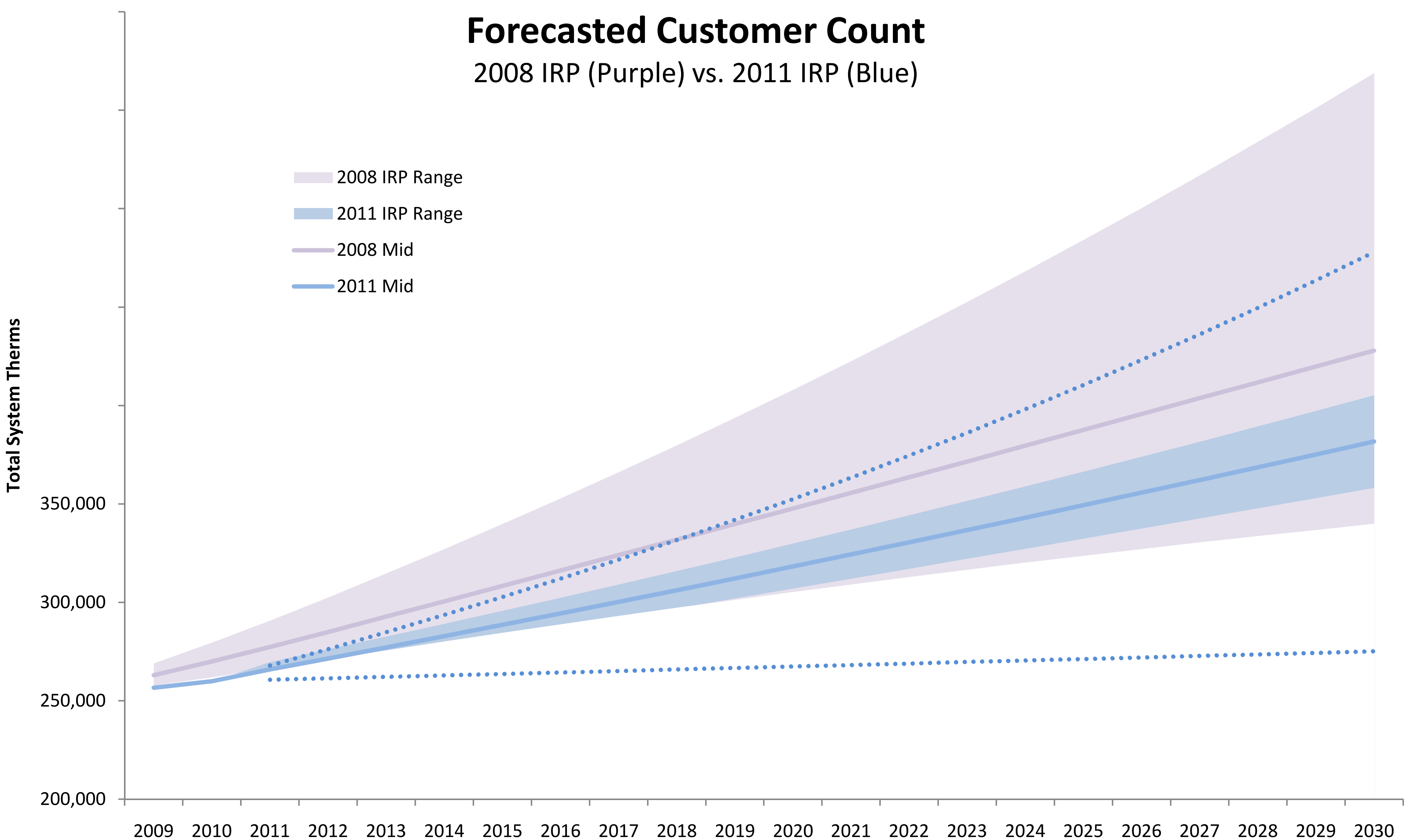
Population | Employment | Income | Interest Rates | Gas Prices | Sensitivity Analysis

High & Low Scenarios

Scenario	Area	Annual Growth 1998 - 2008
Lowest Growth:	Michigan Public Service Commission	0.284%
Highest Growth:	Utah – Questar Gas	3.02%
Alternate Highest:	Cascade	3.09%


RESULTS
Forecasted Demand
2008 IRP (Purple) vs. 2011 IRP (Blue)
2008 IRP Range
2010 IRP Range
2008 Mid
2010 Mid
Total System Therms
650,000,000
600,000,000
550,000,000
500,000,000
450,000,000
400,000,000
350,000,000
300,000,000
250,000,000
2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
CASCADE NATURAL GAS CORPORATION

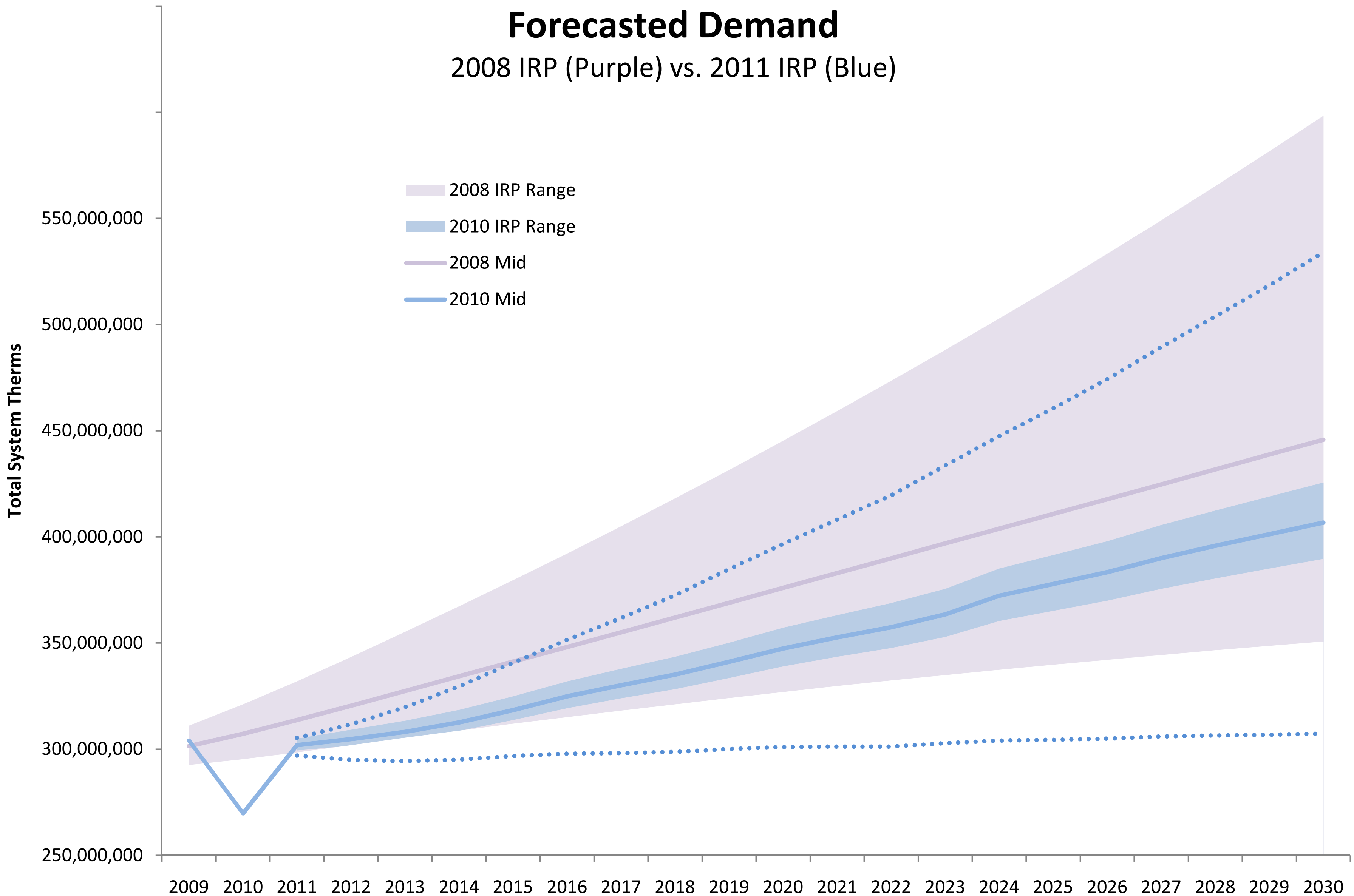
RESULTS


Forecasted Customer Count
2008 IRP (Purple) vs. 2011 IRP (Blue)
2008 IRP Range
2011 IRP Range
2008 Mid
2011 Mid
Total System Therms
350,000
300,000
250,000
200,000
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030

RESULTS

Forecasted Annual Throughput					
		Therms		Growth	
Above/Below System Average		2010	2030	30-Year	Annualized
↓	**Aberdeen**	9,389,358	10,817,668	15.2%	0.71%
↑	**Bellingham**	41,198,725	68,514,030	66.3%	2.58%
↑	**Bremerton**	28,055,900	46,896,186	67.2%	2.60%
↑	**Kennewick**	24,120,207	46,698,954	93.6%	3.36%
→	**Longview**	6,572,097	8,415,721	28.1%	1.24%
→	**Moses Lake**	3,953,220	5,031,219	27.3%	1.21%
↑	**Mount Vernon**	38,248,971	60,895,203	59.2%	2.35%
↓	**Sunnyside**	8,740,643	9,073,321	3.8%	0.19%
→	**Walla Walla**	9,998,512	12,052,935	20.5%	0.94%
↓	**Wenatchee**	5,620,656	4,666,050	-17.0%	-0.93%
↓	**Yakima**	26,834,510	31,315,289	16.7%	0.78%
↓	**Baker**	3,710,991	4,273,384	15.2%	0.71%
↑	**Bend**	46,653,466	75,924,356	62.7%	2.46%
↓	**Ontario**	4,536,805	5,243,507	15.6%	0.73%
→	**Pendleton**	12,225,408	16,923,826	38.4%	1.64%
	Washington	202,732,799	304,679,137	50.3%	2.06%
	Oregon	67,126,670	102,365,074	52.5%	2.13%
	System	269,859,469	407,044,211	50.8%	2.08%

RESULTS


Forecasted Demand
2008 IRP (Purple) vs. 2011 IRP (Blue)
2008 IRP Range
2010 IRP Range
2008 Mid
2010 Mid
Total System Therms
550,000,000
500,000,000
450,000,000
400,000,000
350,000,000
300,000,000
250,000,000
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030

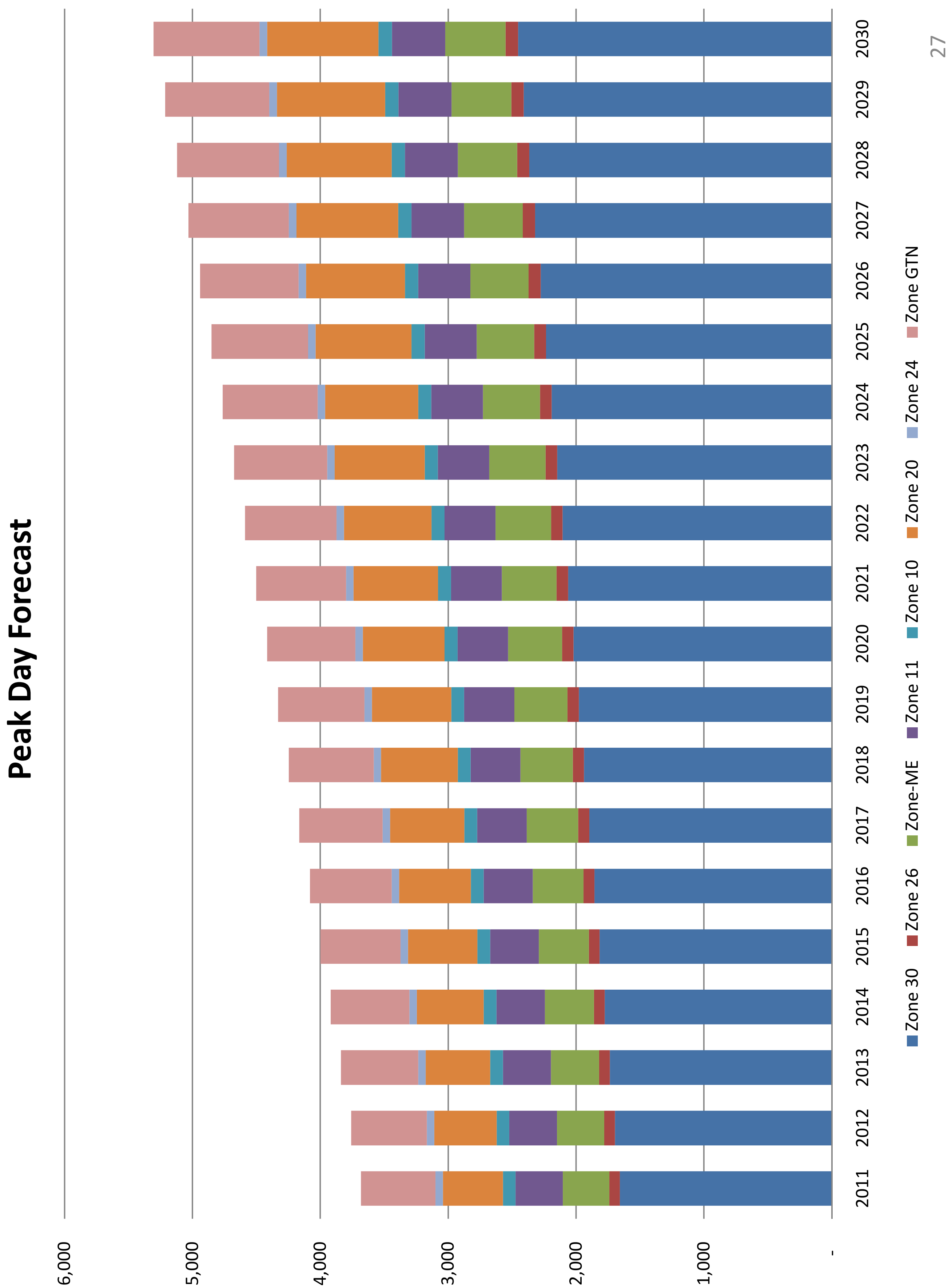
Peak Day Forecast

- Peak day forecast based on a 61degree day (0 degrees Fahrenheit average temperature) for design weather conditions

System Average Degree Days	Date / Year
65	1968
63	1950
61	1964, 1957, 1983,**1990**
60	1950, 1957, 1968, 1990
59	1950, 1972, 1979, 1983, 1989, 1990
58	1950, 1979
57	1957,1964, 1972, 1990
56	1963, 1982, 1983, **2004**

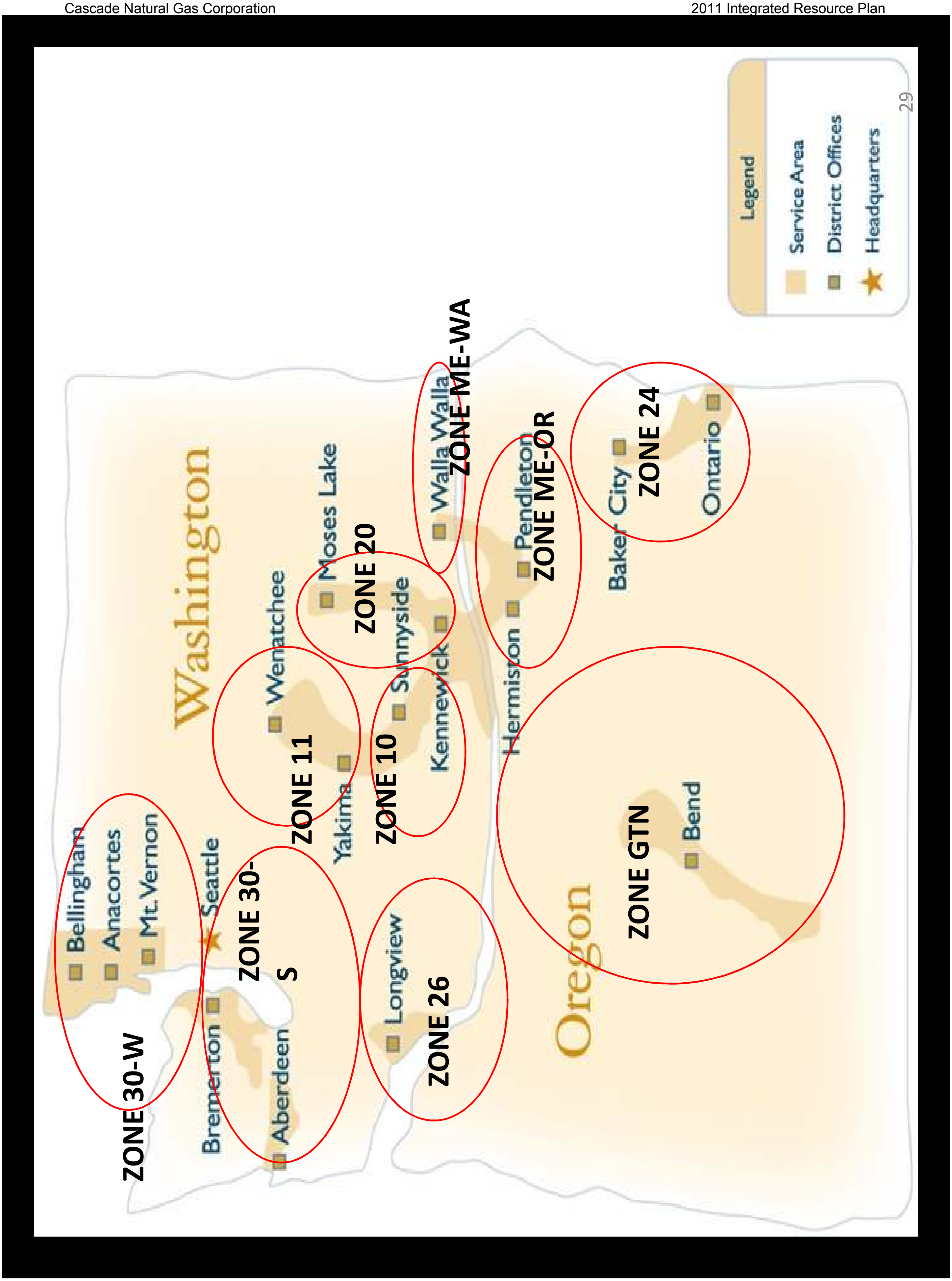
Peak Day Forecast (cont.)

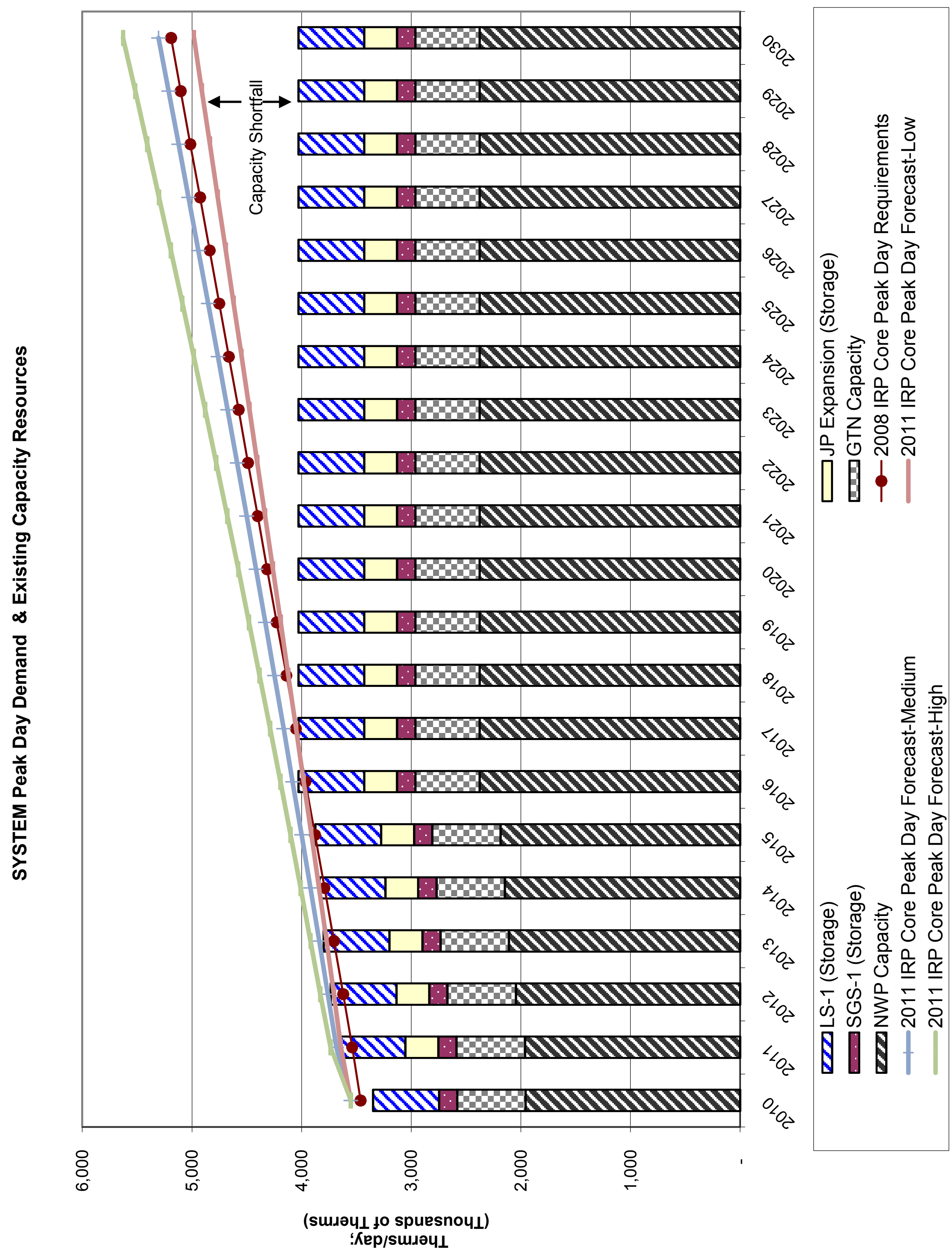
- Gas use on January 5, 2004 represent Cascade’s best peak day demand approximation in recent history (56 degree day).
- Therm consumption was adjusted to reflect estimated consumption during a System wide 61 degree day.
- Peak day therm consumption developed for each area and escalated each year by the customer growth rate.

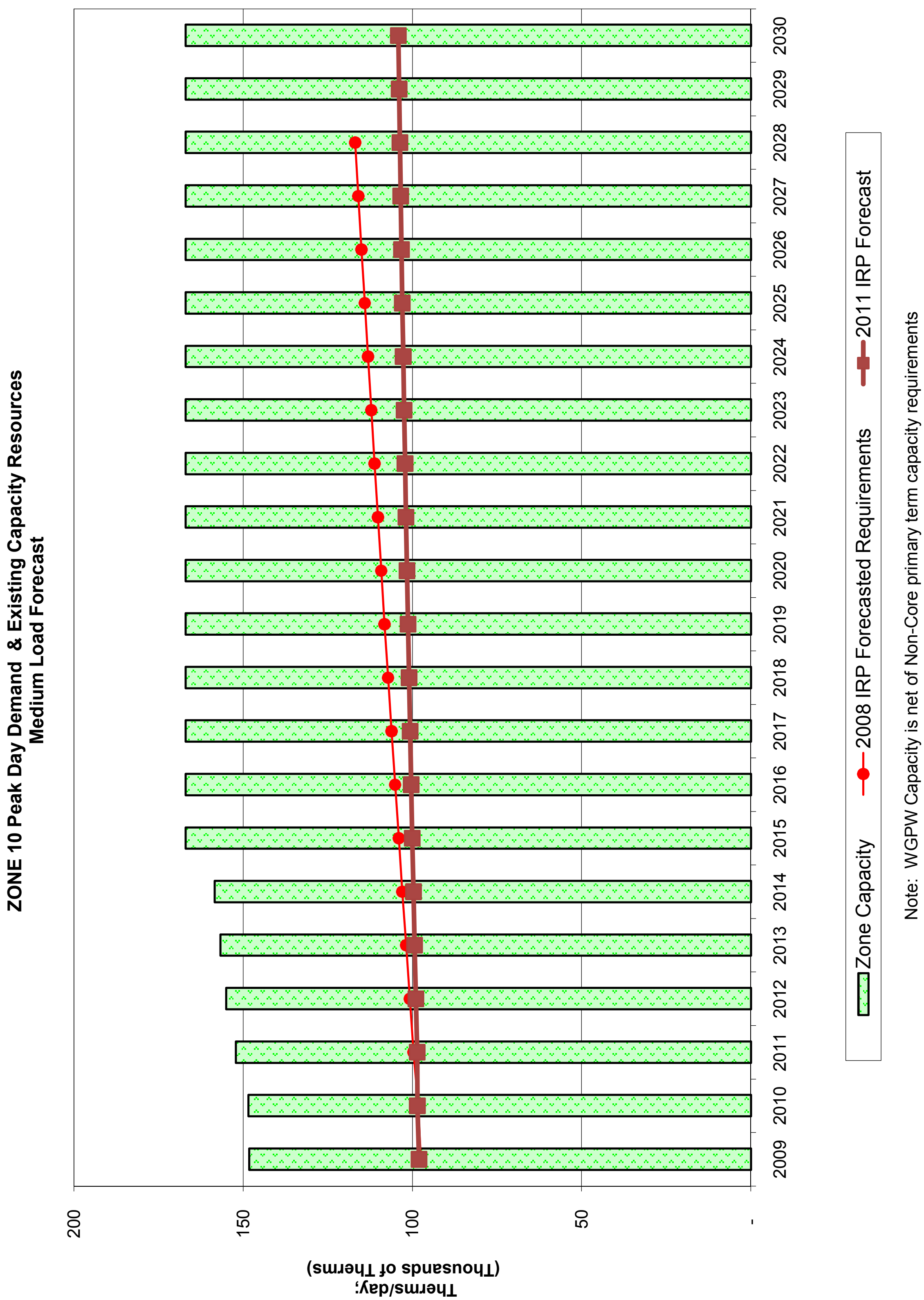

Peak Day Forecast
6,000
5,000
4,000
3,000
2,000
1,000
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone 30
Zone 26
Zone-ME
Zone 11
Zone 10
Zone 20
Zone 24
Zone GTN

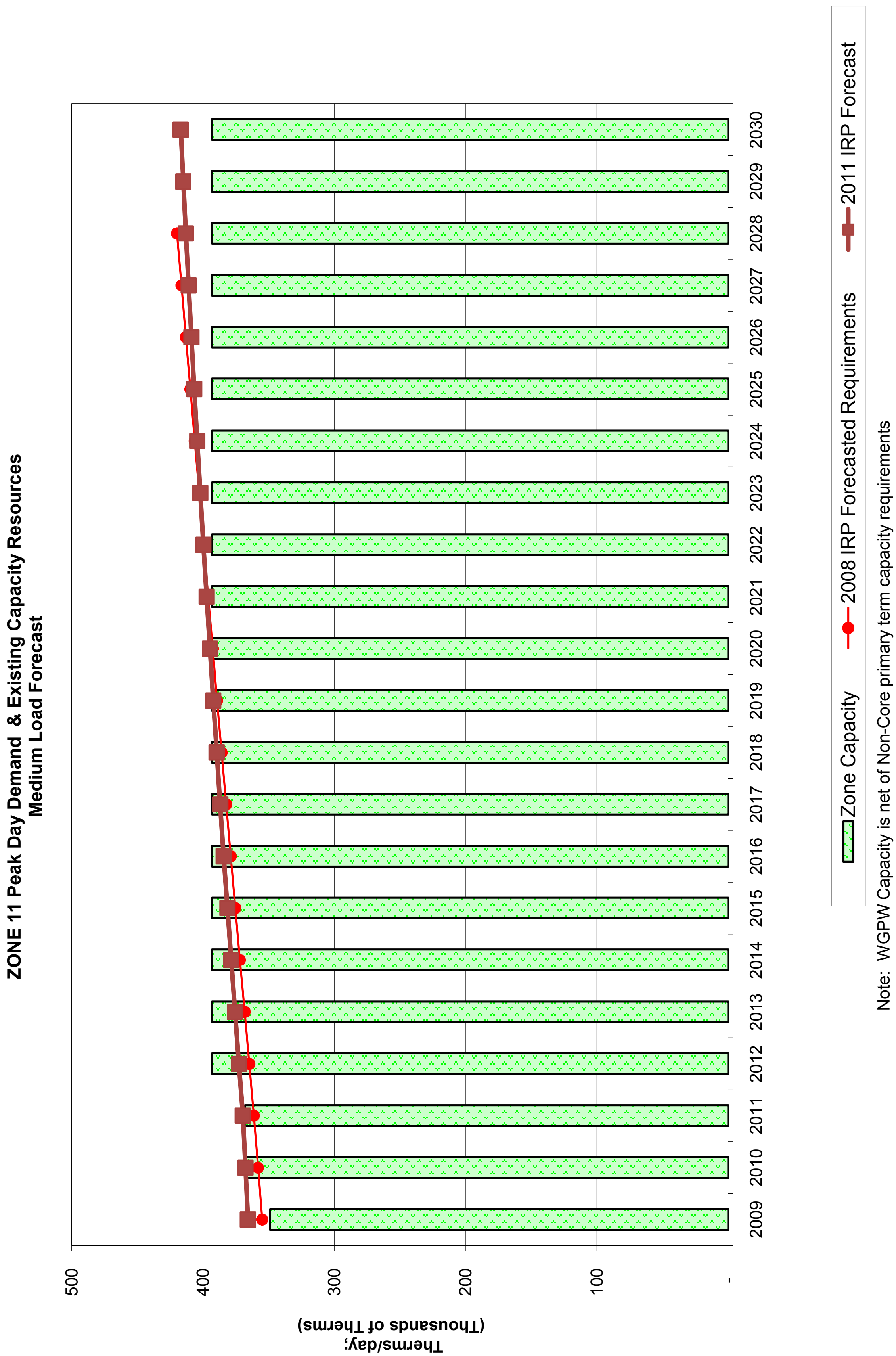
Capacity Analysis

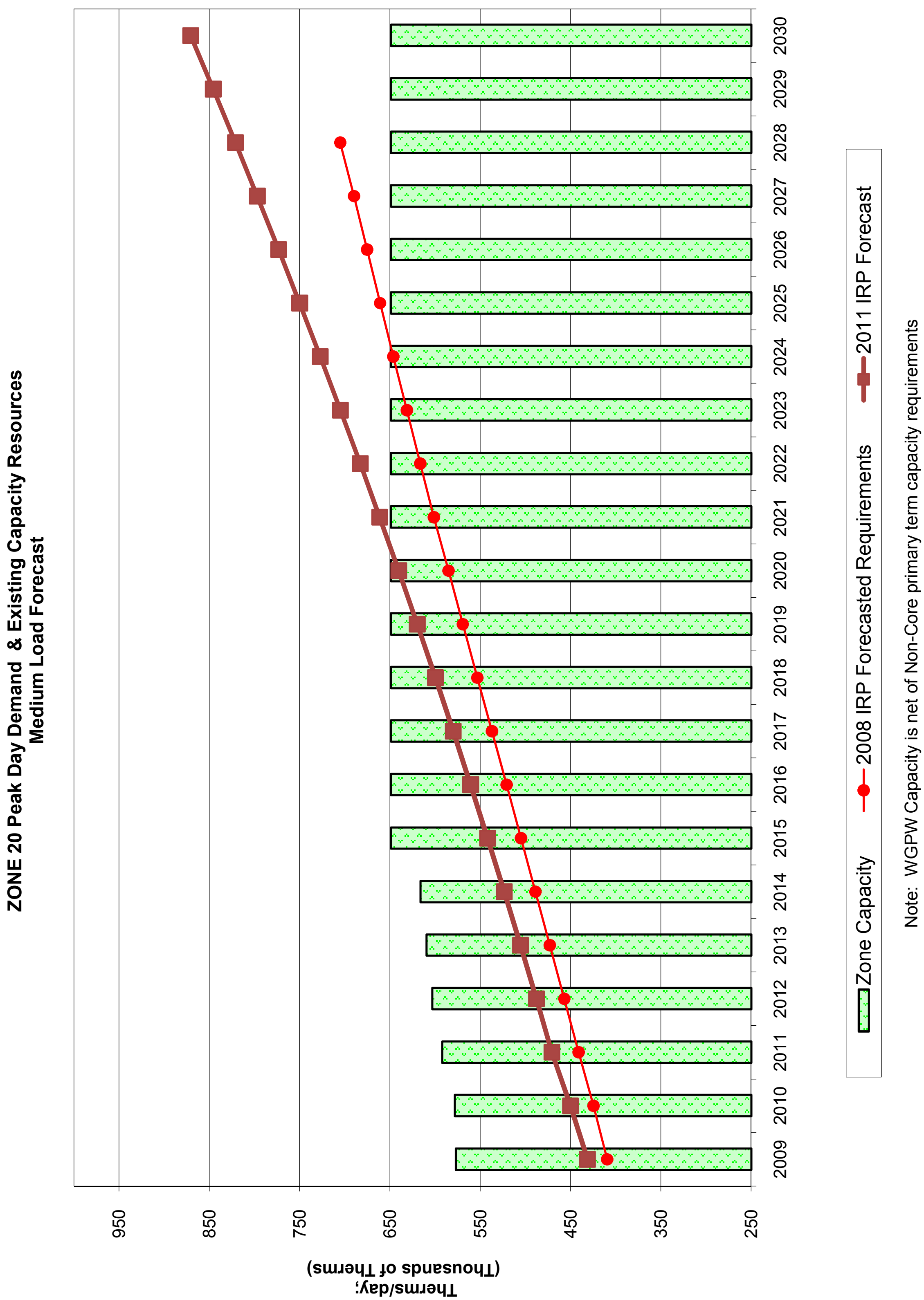
- Overall Pipeline Receipt Capabilities vs Peak Day Demand
- Delivery Capabilities at the Gate (MDDO's)
- Distribution System Needs

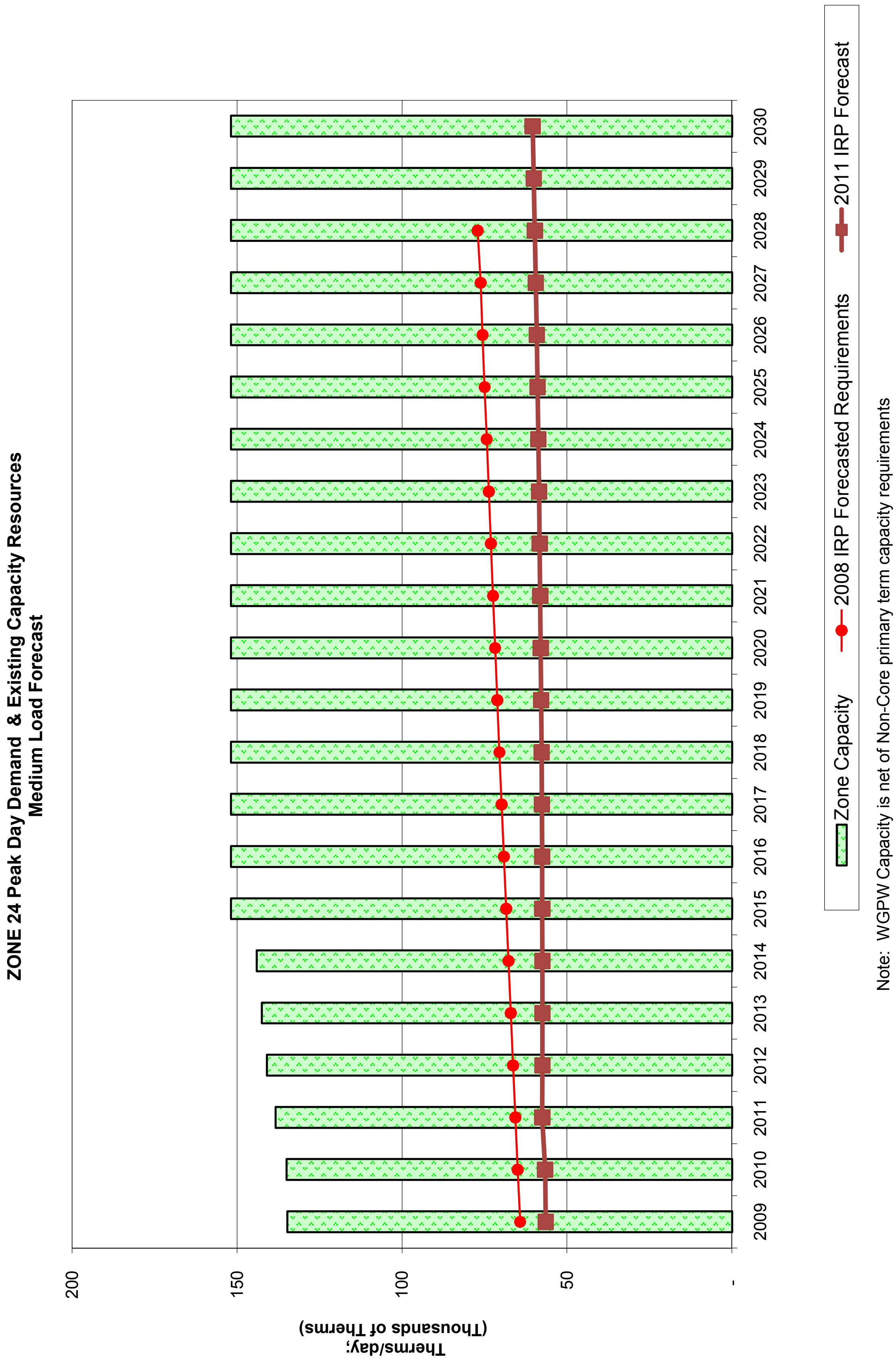

Legend
Service Area
District Offices
Headquarters
29
Washington
Oregon
Bellingham
Anacortes
Mt. Vernon
Seattle
Bremerton
Aberdeen
Longview
Yakima
Wenatchee
Moses Lake
Sunnyside
Kennewick
Walla Walla
Hermiston
Pendleton
Baker City
Ontario
Bend
ZONE 30-W
ZONE 30-S
ZONE 26
ZONE 11
ZONE 10
ZONE 20
ZONE ME-WA
ZONE ME-OR
ZONE 24
ZONE GTN

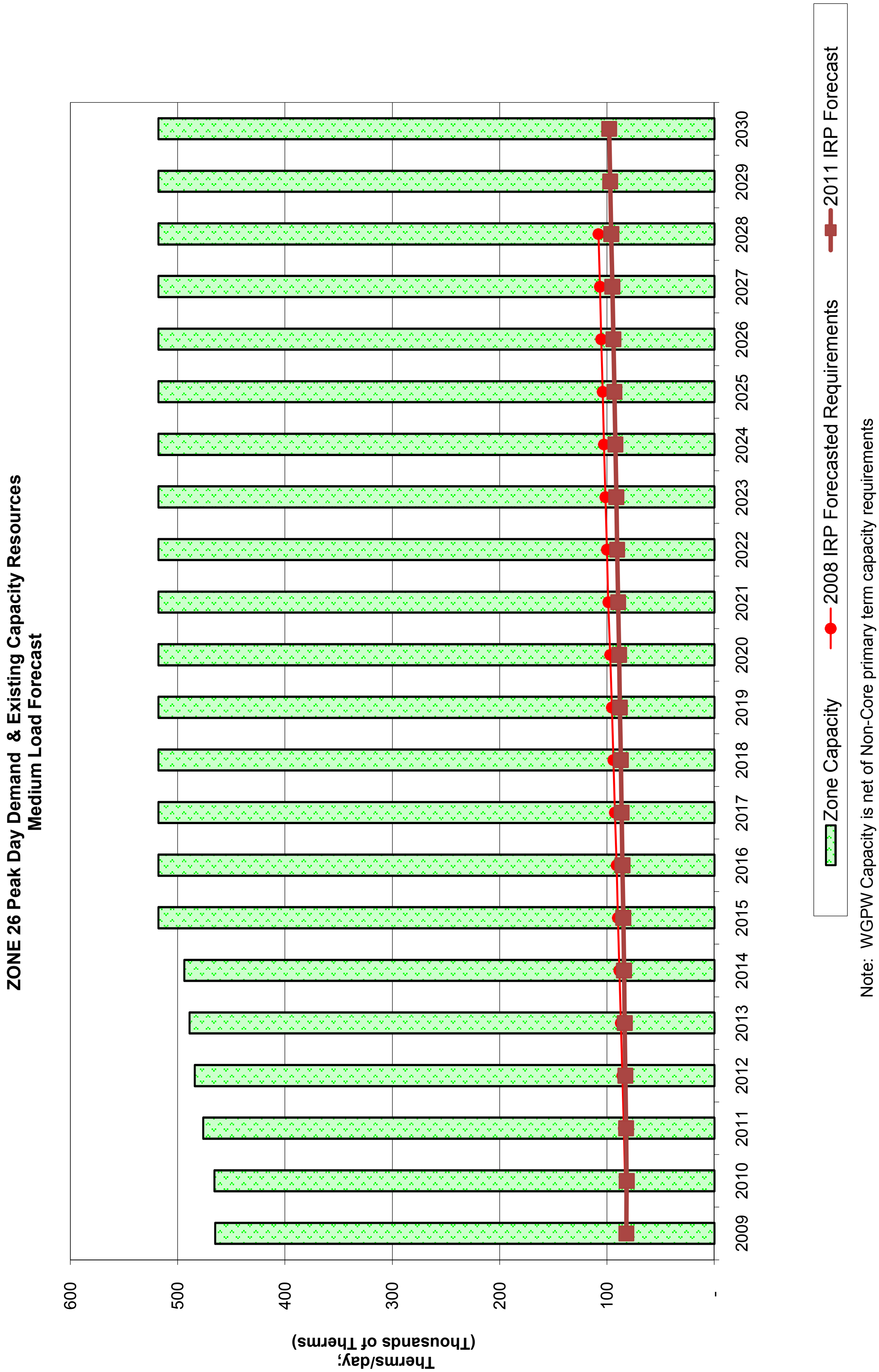

SYSTEM Peak Day Demand & Existing Capacity Resources
Therms/day;
(Thousands of Therms)
6,000
5,000
4,000
3,000
2,000
1,000
-
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Capacity Shortfall
LS-1 (Storage)
SGS-1 (Storage)
NWP Capacity
2011 IRP Core Peak Day Forecast-Medium
2011 IRP Core Peak Day Forecast-High
JP Expansion (Storage)
GTN Capacity
2008 IRP Core Peak Day Requirements
2011 IRP Core Peak Day Forecast-Low


ZONE 10 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
200
150
100
50
-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE 11 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
500
400
300
200
100
-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE 20 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day; (Thousands of Therms)
950
850
750
650
550
450
350
250
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE 24 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day; (Thousands of Therms)
200
150
100
50
-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE 26 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
600
500
400
300
200
100
-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

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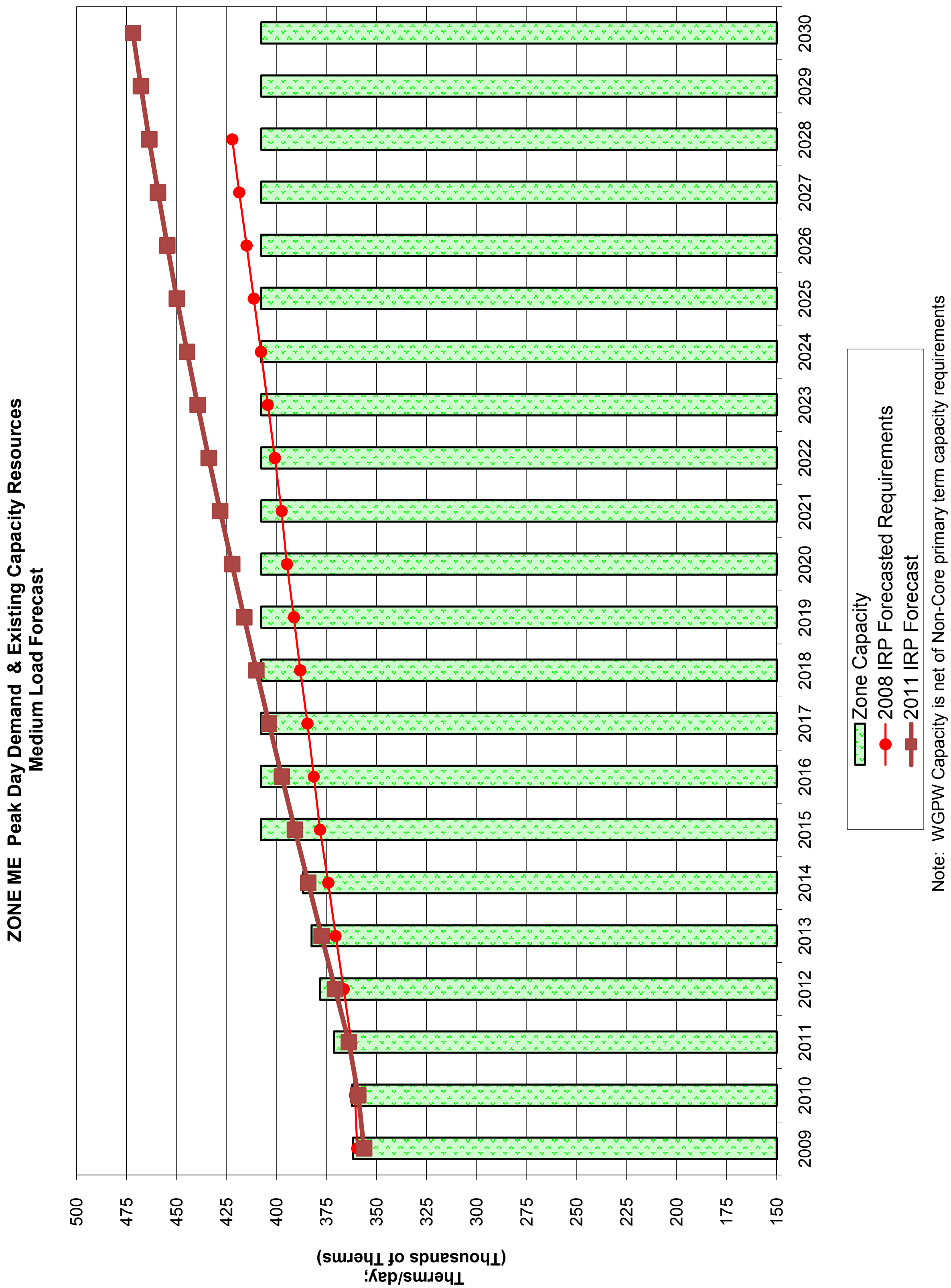
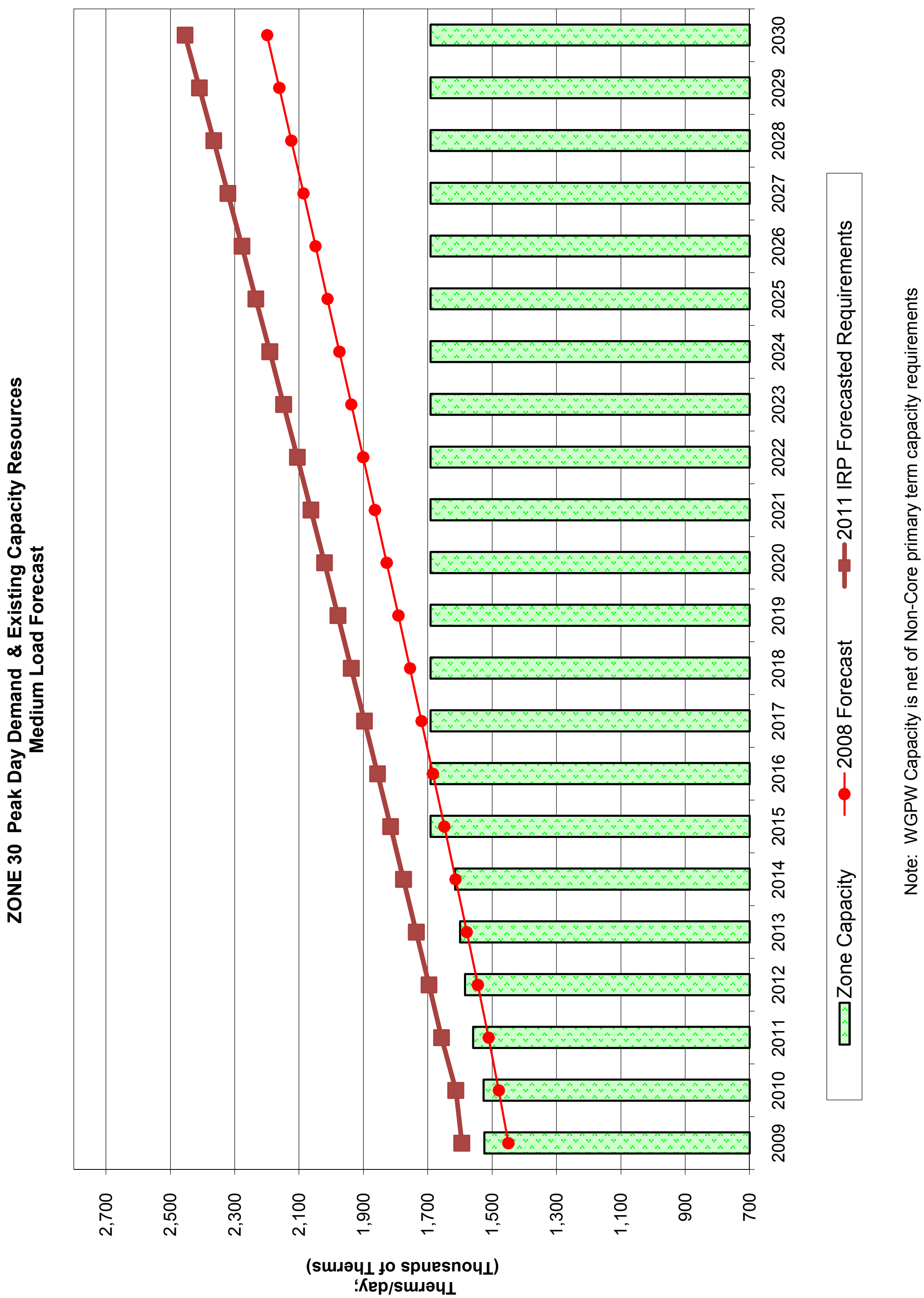
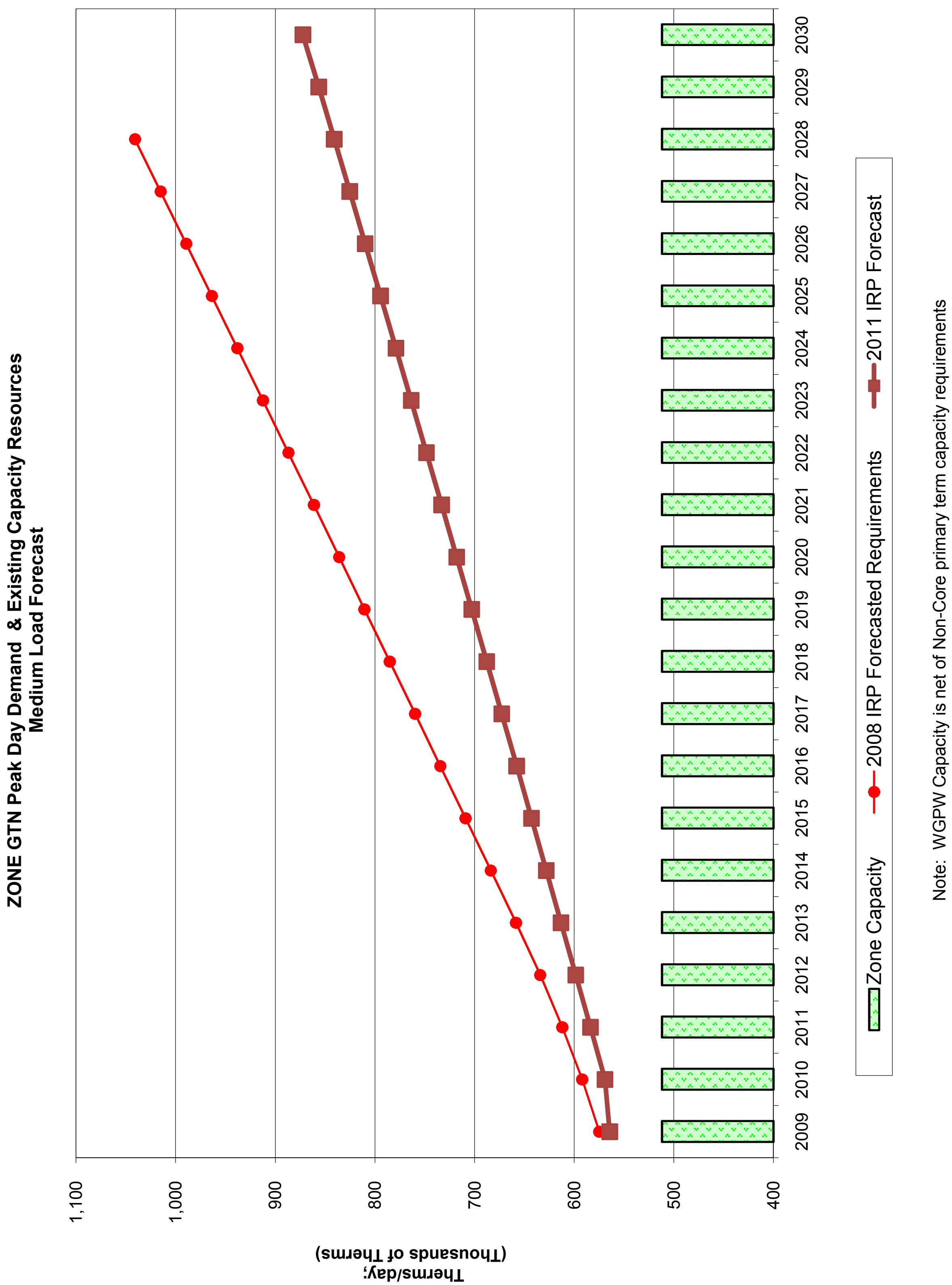
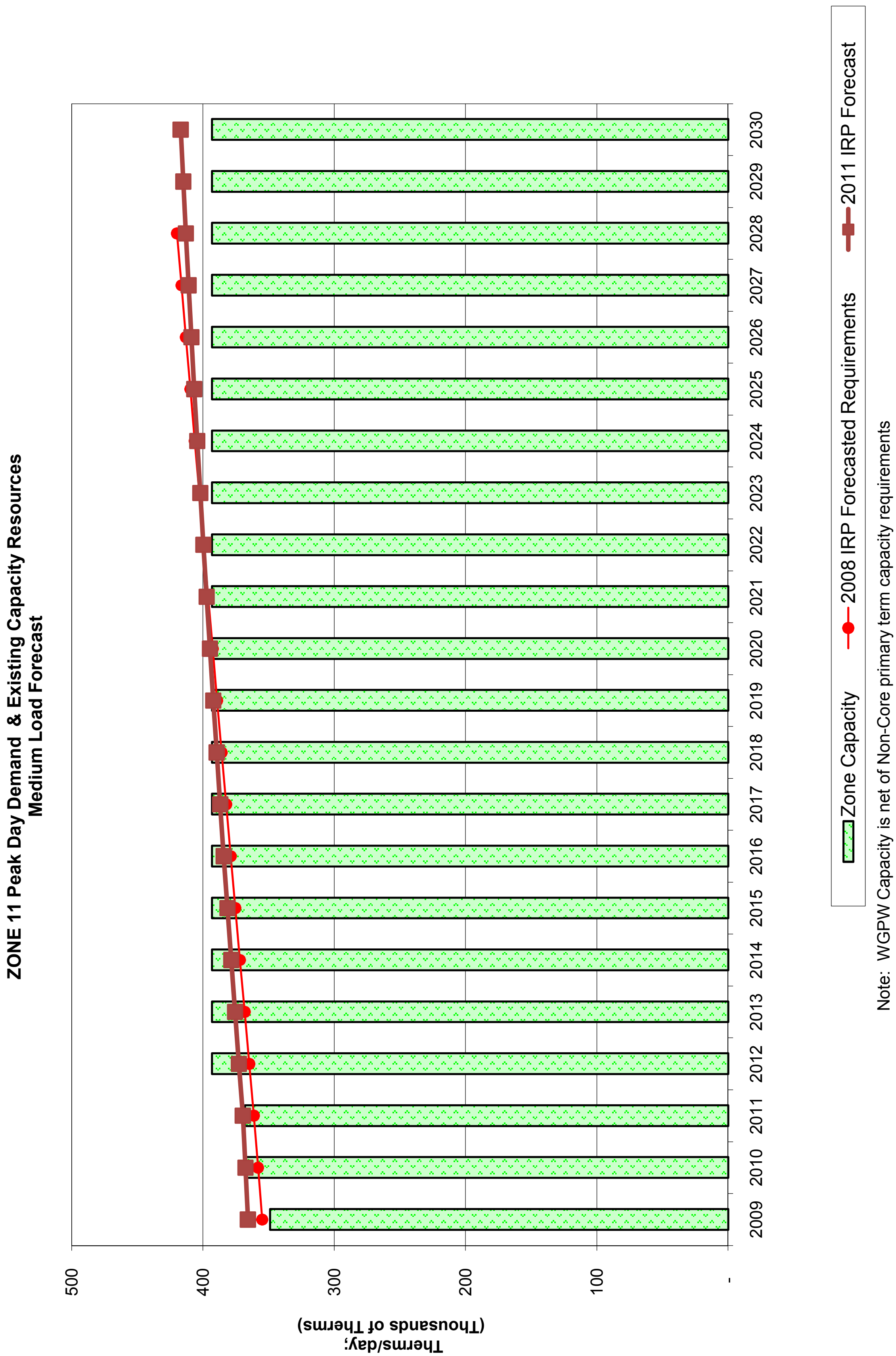

ZONE ME Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day; (Thousands of Therms)
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE 30 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
2,700
2,500
2,300
2,100
1,900
1,700
1,500
1,300
1,100
900
700
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 Forecast
2011 IRP Forecasted Requirements
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


ZONE GTN Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
1,100
1,000
900
800
700
600
500
400
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

Peak Day & Capacity Shortfall Analysis

- Identify Capacity Shortfalls
  - Overall Pipeline Receipt Capabilities vs Peak Day Demand
  - Delivery Capabilities at the Gate (MDDO's)
  - Distribution System Needs
- **Identify/Evaluate solutions**
  - **Determining magnitude of shortfall (degree day coverage)**


ZONE 11 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
500
400
300
200
100
-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

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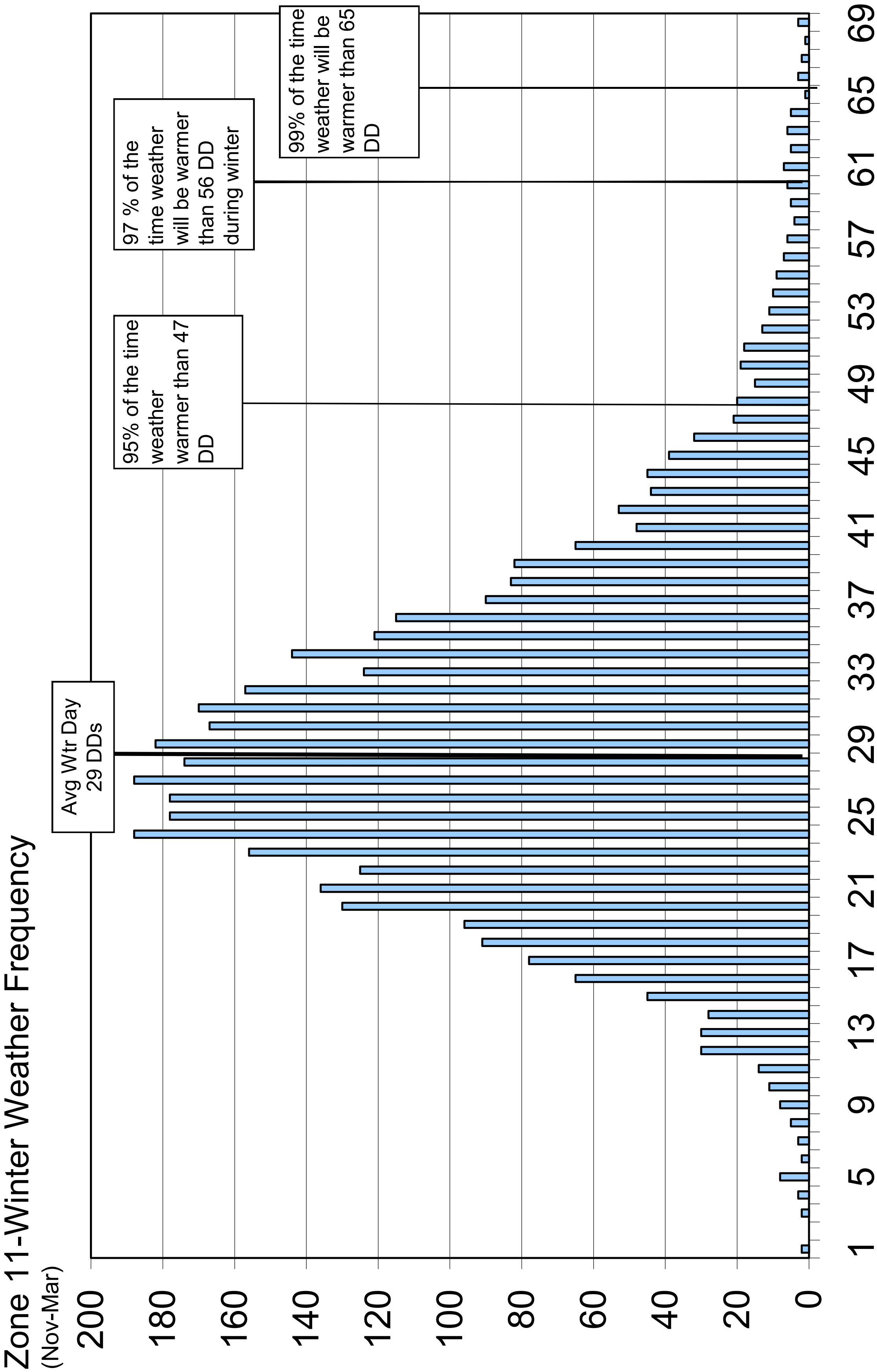
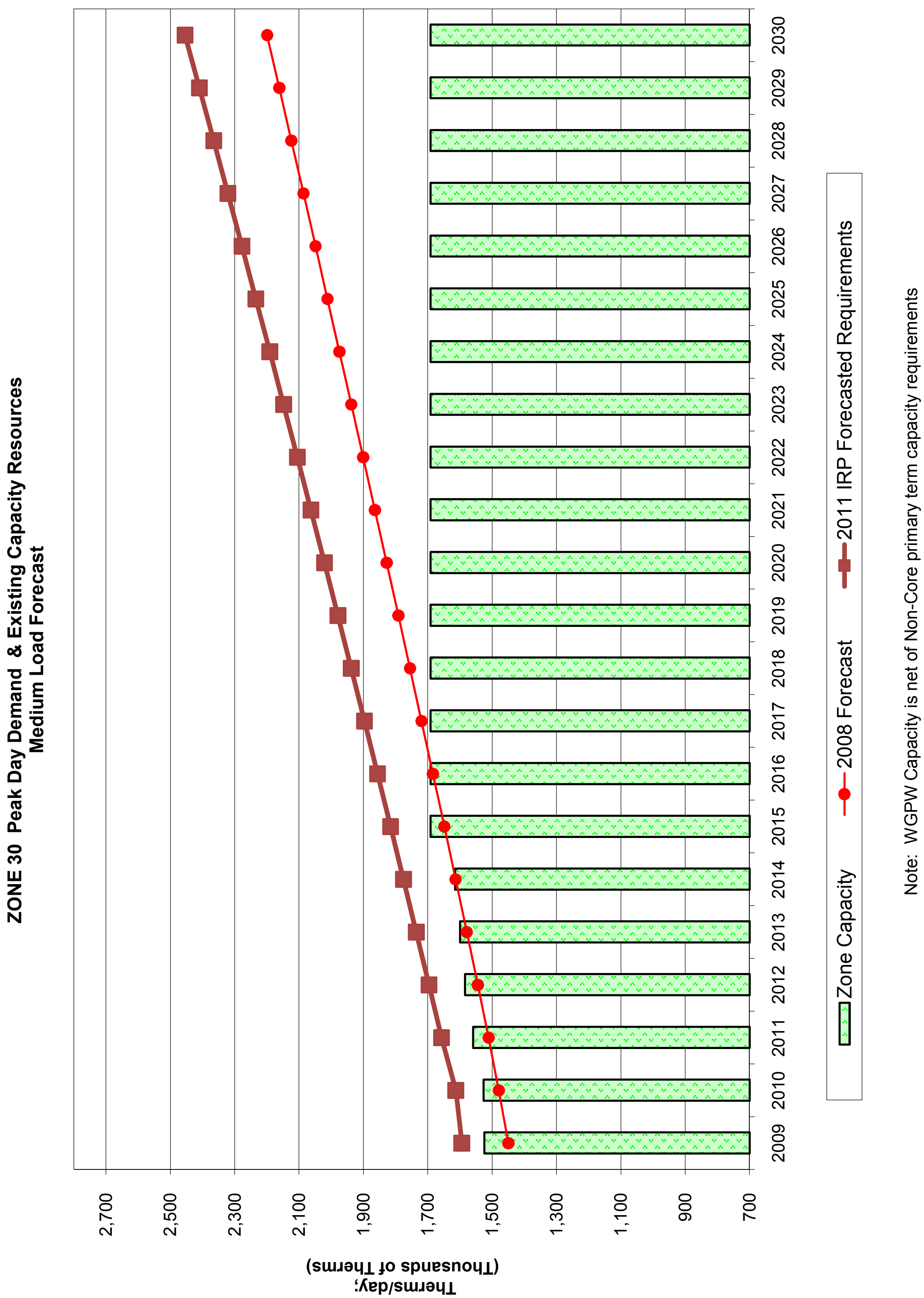
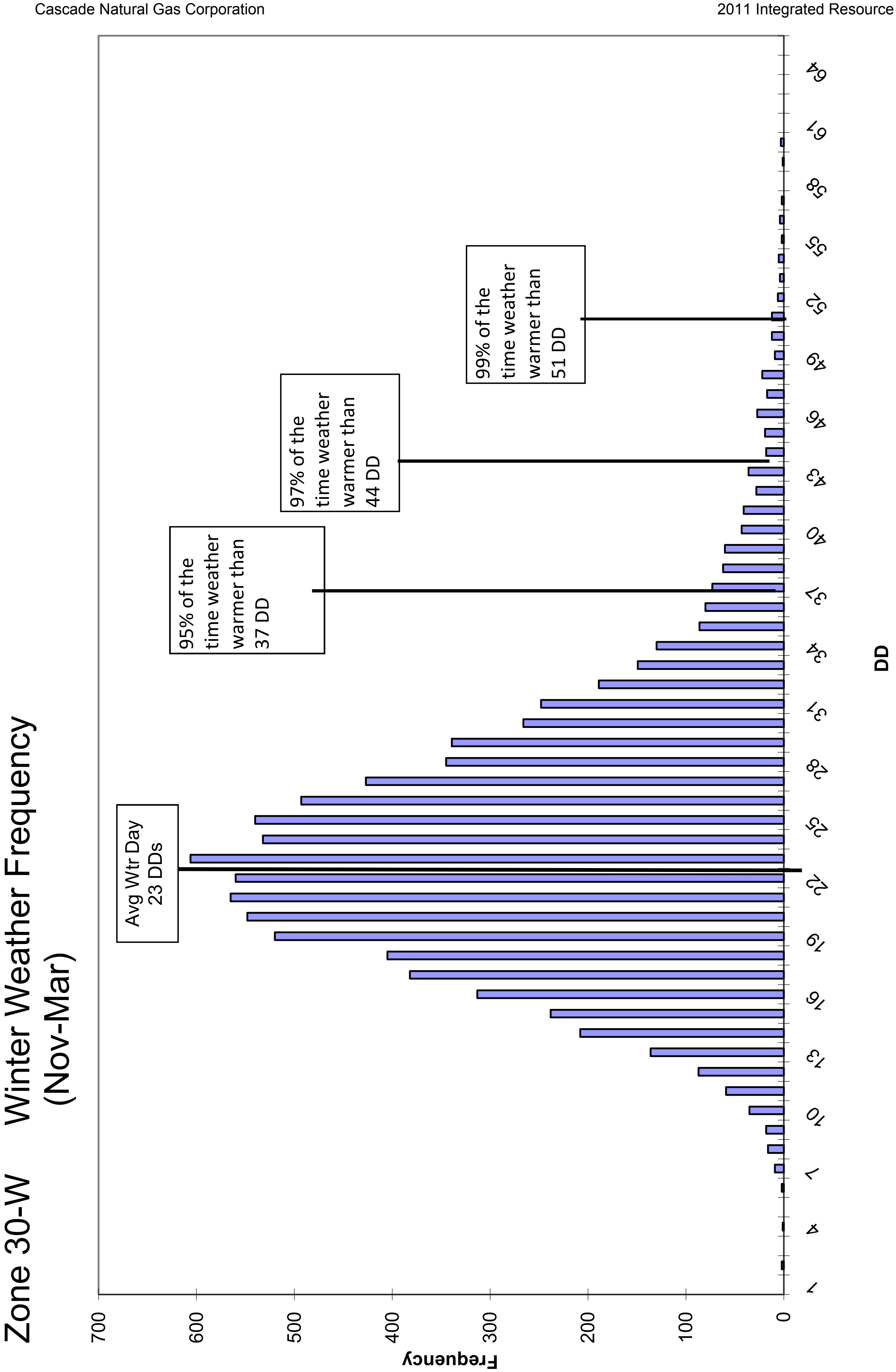
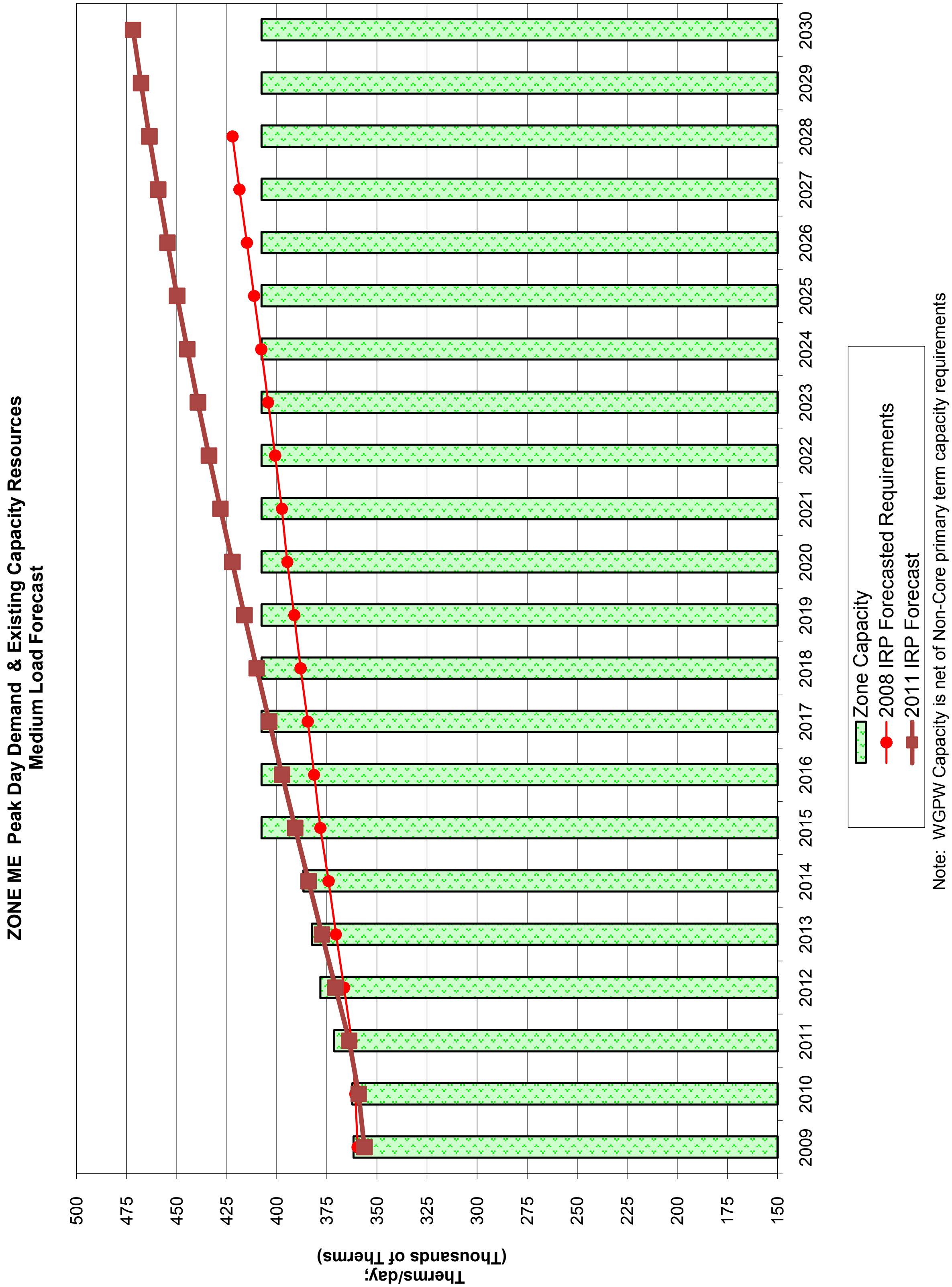
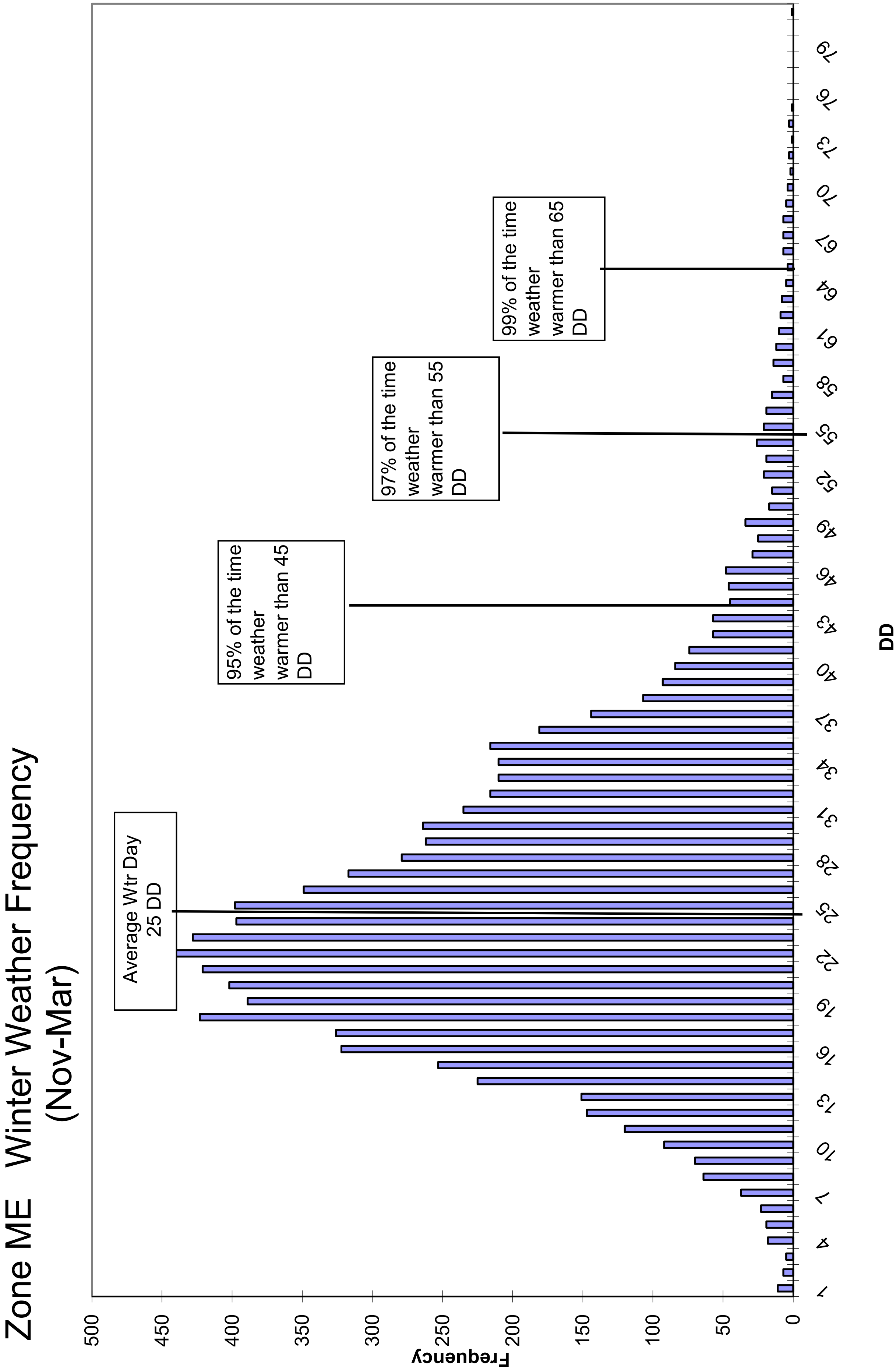

Zone 11-Winter Weather Frequency
(Nov-Mar)
Avg Wtr Day
29 DDs
95% of the time weather warmer than 47 DD
97 % of the time weather will be warmer than 56 DD during winter
99% of the time weather will be warmer than 65 DD
200
180
160
140
120
100
80
60
40
20
0
1
5
9
13
17
21
25
29
33
37
41
45
49
53
57
61
65
69

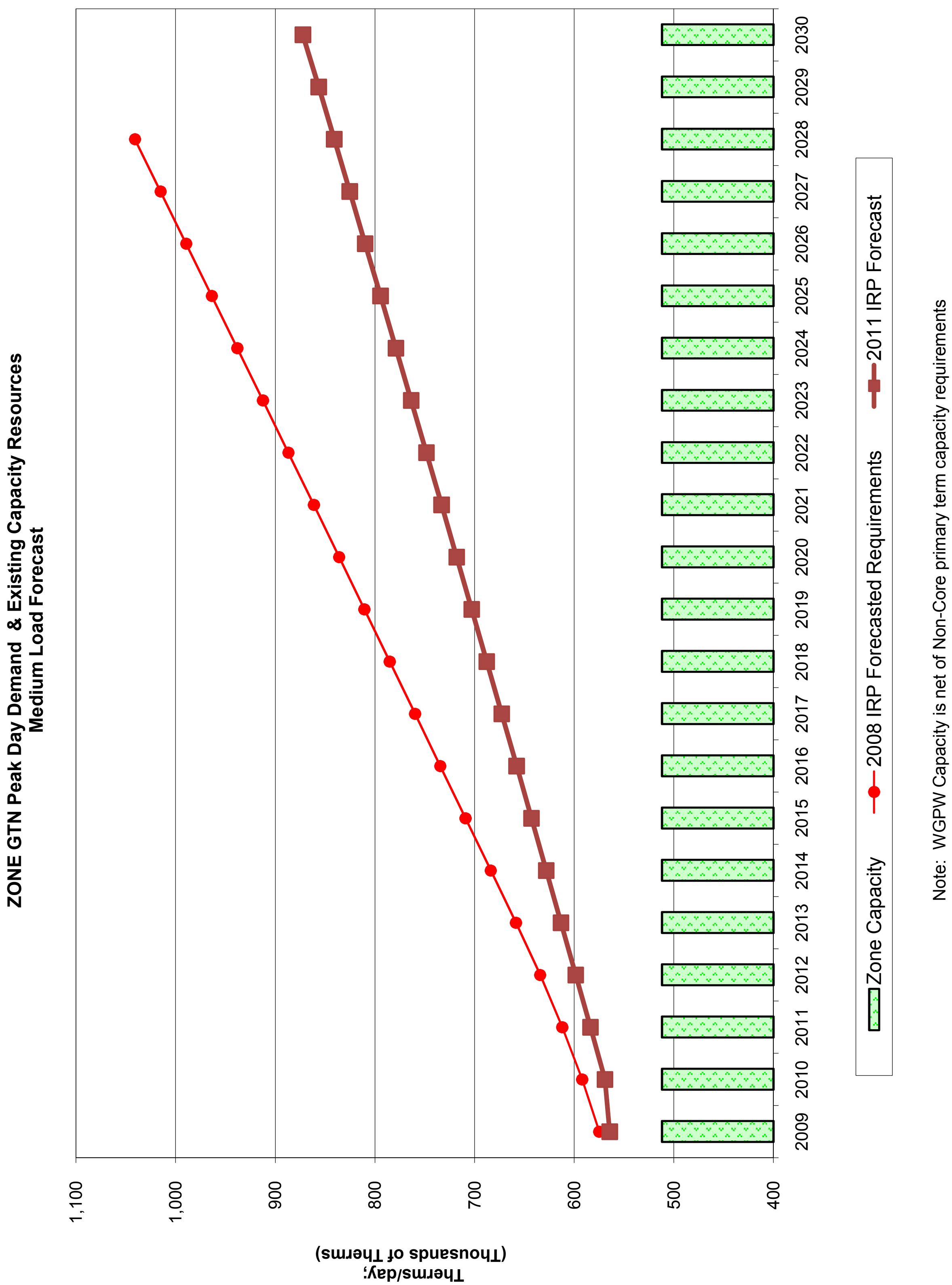

ZONE 30 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day; (Thousands of Therms)
2,700
2,500
2,300
2,100
1,900
1,700
1,500
1,300
1,100
900
700
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 Forecast
2011 IRP Forecasted Requirements
Note: WGPW Capacity is net of Non-Core primary term capacity requirements

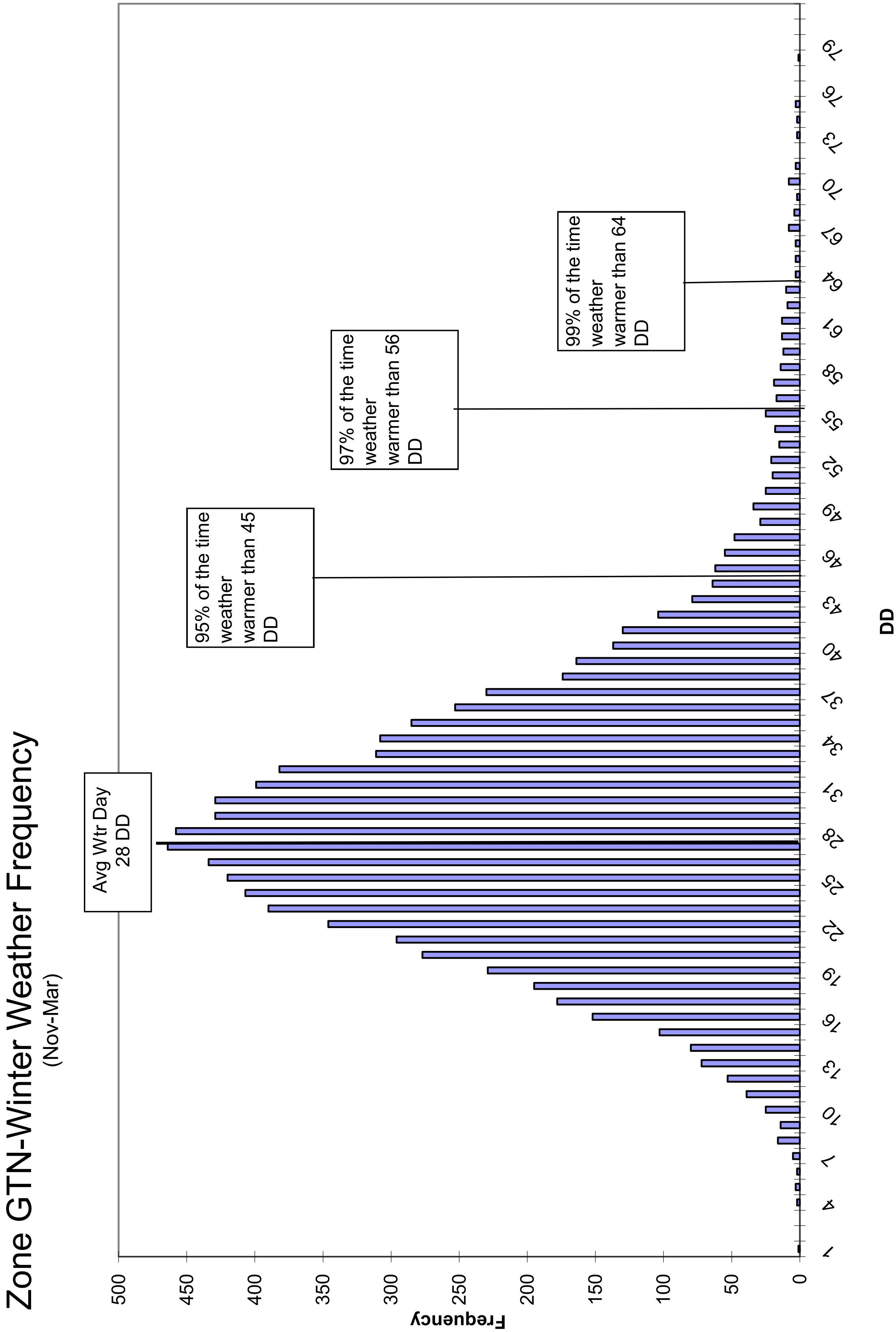

Zone 30-W Winter Weather Frequency (Nov-Mar)
Frequency
700
600
500
400
300
200
100
0
DD
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58
61
64
Avg Wtr Day 23 DDs
95% of the time weather warmer than 37 DD
97% of the time weather warmer than 44 DD
99% of the time weather warmer than 51 DD


ZONE ME Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements



Zone ME Winter Weather Frequency
(Nov-Mar)
Frequency
DD
Average Wtr Day
25 DD
95% of the time weather warmer than 45 DD
97% of the time weather warmer than 55 DD
99% of the time weather warmer than 65 DD
0
50
100
150
200
250
300
350
400
450
500
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58
61
64
67
70
73
76
79


ZONE GTN Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
1,100
1,000
900
800
700
600
500
400
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2008 IRP Forecasted Requirements
2011 IRP Forecast
Note: WGPW Capacity is net of Non-Core primary term capacity requirements


Zone GTN-Winter Weather Frequency
(Nov-Mar)
Avg Wtr Day
28 DD
95% of the time weather warmer than 45 DD
97% of the time weather warmer than 56 DD
99% of the time weather warmer than 64 DD
Frequency
DD
0
50
100
150
200
250
300
350
400
450
500
1
4
7
10
13
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Adjourn

CAPACITY REQUIRMENTS VS CONTRACTED DAILY DELIVERY

	YEAR	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Zone 10	Zone Capacity	148	148	152	155	157	158	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167
	2008 Forecast	98	98	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
	2011 IRP Forecasted Requirements	98	99	99	99	99	100	100	100	101	101	101	102	102	102	102	103	103	103	103	104	104	104
Zone 11	Zone Capacity	349	350	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393	393
	2008 Forecast	355	358	361	365	368	372	375	379	382	386	389	393	396	399	403	406	410	413	416	420	423	426
	2011 IRP Forecasted Requirements	366	368	370	373	376	378	381	384	387	390	392	395	397	400	402	404	407	409	411	413	415	417
Zone 20	Zone Capacity	577	578	592	603	610	616	649	649	649	649	649	649	649	649	649	649	649	649	649	649	649	649
	2008 Forecast	410	425	441	457	473	489	505	521	537	553	569	585	601	617	631	646	661	675	690	705	721	736
	2011 IRP Forecasted Requirements	431	450	471	488	505	523	542	561	580	600	620	640	661	683	705	727	750	773	797	821	846	871
Zone 24	Zone Capacity	135	135	138	141	142	144	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152
	2008 Forecast	64	65	66	66	67	68	68	69	70	70	71	72	72	73	74	74	75	76	76	77	78	78
	2011 IRP Forecasted Requirements	56	57	58	57	57	57	58	58	58	58	58	58	58	58	58	59	59	59	59	60	60	60
Zone 26	Zone Capacity	465	466	476	484	489	494	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518
	2008 Forecast	82	83	84	86	87	88	90	91	93	94	96	97	99	100	101	103	104	105	107	108	109	111
	2011 IRP Forecasted Requirements	82	82	82	83	83	84	85	86	86	87	88	89	90	90	91	92	93	94	95	96	97	98
Zone GTN	Zone Capacity	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512
	2008 Forecast	575	592	612	634	658	684	709	734	760	785	811	836	861	887	912	938	964	989	1,015	1,041	1,066	1,091
	2011 IRP Forecasted Requirements	564	569	584	598	613	628	643	658	673	688	703	718	733	748	764	779	794	810	825	841	856	872
Zone ME	Zone Capacity	362	362	371	378	383	387	408	408	408	408	408	408	408	408	408	408	408	408	408	408	408	408
	2008 Forecast	360	361	363	366	370	374	378	381	385	388	391	395	397	401	404	408	411	415	419	422	426	429
	2011 IRP Forecasted Requirements	356	359	364	371	377	384	391	397	404	410	416	422	428	434	439	445	450	455	459	464	468	472
Zone 30	Zone Capacity	1,524	1,527	1,560	1,585	1,600	1,615	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691	1,691
	2008 Forecast	1,449	1,479	1,511	1,544	1,579	1,614	1,649	1,684	1,719	1,755	1,791	1,828	1,864	1,901	1,938	1,975	2,012	2,049	2,086	2,124	2,161	2,199
	2011 IRP Forecasted Requirements	1,594	1,613	1,657	1,696	1,735	1,775	1,815	1,856	1,897	1,938	1,979	2,021	2,063	2,105	2,148	2,191	2,234	2,277	2,321	2,365	2,409	2,454

Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED EMPLOYMENT GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
	2011	2.93%	2.54%	3.79%	3.51%	0.97%	3.13%	2.25%	3.03%	2.86%	3.22%	2.78%	2.34%	3.54%	2.91%	1.96%	3.29%	2.98%	1.78%	3.59%	2.95%	2.28%	3.71%	2.52%
	2012	1.11%	0.79%	2.13%	1.74%	0.97%	1.71%	2.25%	1.27%	1.18%	1.47%	1.04%	0.86%	1.79%	1.22%	0.41%	1.53%	1.28%	1.78%	1.84%	1.20%	0.65%	1.96%	0.88%
	2013	1.15%	0.80%	2.13%	1.74%	0.97%	1.73%	2.25%	1.25%	1.19%	1.46%	1.03%	0.82%	1.78%	1.24%	0.38%	1.54%	1.19%	1.78%	1.84%	1.20%	0.65%	1.95%	0.87%
	2014	1.15%	0.78%	2.12%	1.72%	0.94%	1.71%	2.25%	1.28%	1.18%	1.46%	1.03%	0.83%	1.78%	1.24%	0.41%	1.52%	1.17%	1.77%	1.84%	1.19%	0.64%	1.95%	0.86%
	2015	1.10%	0.77%	2.11%	1.72%	0.94%	1.76%	2.25%	1.21%	1.20%	1.46%	1.02%	0.74%	1.77%	1.25%	0.39%	1.50%	1.22%	1.77%	1.84%	1.18%	0.66%	1.94%	0.86%
	2016	1.17%	0.73%	2.11%	1.70%	0.92%	1.74%	2.24%	1.26%	1.16%	1.45%	1.00%	0.85%	1.76%	1.25%	0.39%	1.51%	1.27%	1.77%	1.84%	1.17%	0.63%	1.93%	0.85%
	2017	1.13%	0.78%	2.11%	1.71%	0.92%	1.73%	2.24%	1.24%	1.17%	1.45%	1.01%	0.76%	1.76%	1.26%	0.37%	1.50%	1.12%	1.75%	1.84%	1.17%	0.64%	1.92%	0.85%
	2018	1.12%	0.73%	2.10%	1.70%	0.89%	1.78%	2.24%	1.24%	1.16%	1.44%	0.99%	0.81%	1.75%	1.26%	0.39%	1.48%	1.17%	1.75%	1.83%	1.15%	0.62%	1.92%	0.84%
	2019	1.13%	0.75%	2.09%	1.68%	0.89%	1.78%	2.24%	1.21%	1.15%	1.44%	0.98%	0.78%	1.75%	1.27%	0.37%	1.48%	1.17%	1.75%	1.83%	1.16%	0.63%	1.91%	0.83%
	2020	1.11%	0.71%	2.09%	1.68%	0.88%	1.77%	2.24%	1.21%	1.17%	1.44%	0.98%	0.79%	1.74%	1.26%	0.39%	1.47%	1.15%	1.74%	1.83%	1.13%	0.61%	1.90%	0.83%
	2021	1.15%	0.74%	2.08%	1.67%	0.86%	1.80%	2.23%	1.23%	1.15%	1.44%	0.97%	0.78%	1.74%	1.27%	0.36%	1.47%	1.21%	1.74%	1.83%	1.13%	0.62%	1.89%	0.82%
	2022	1.14%	0.72%	2.08%	1.66%	0.86%	1.78%	2.24%	1.20%	1.15%	1.43%	0.95%	0.78%	1.73%	1.27%	0.40%	1.45%	1.11%	1.73%	1.82%	1.12%	0.61%	1.89%	0.82%
HIGH	2023	1.13%	0.70%	2.07%	1.65%	0.83%	1.85%	2.23%	1.20%	1.12%	1.43%	0.95%	0.74%	1.73%	1.30%	0.36%	1.45%	1.15%	1.73%	1.82%	1.12%	0.60%	1.88%	0.81%
	2024	1.09%	0.72%	2.07%	1.64%	0.82%	1.79%	2.24%	1.18%	1.13%	1.41%	0.94%	0.81%	1.72%	1.30%	0.36%	1.44%	1.17%	1.72%	1.82%	1.11%	0.61%	1.87%	0.80%
	2025	1.16%	0.70%	2.06%	1.64%	0.82%	1.82%	2.22%	1.23%	1.13%	1.43%	0.94%	0.78%	1.72%	1.29%	0.37%	1.42%	1.11%	1.73%	1.82%	1.10%	0.60%	1.86%	0.80%
	2026	1.11%	0.65%	2.05%	1.62%	0.80%	1.82%	2.23%	1.16%	1.11%	1.40%	0.93%	0.76%	1.71%	1.30%	0.36%	1.42%	1.12%	1.71%	1.81%	1.08%	0.59%	1.86%	0.79%
	2027	1.10%	0.74%	2.05%	1.62%	0.79%	1.85%	2.23%	1.17%	1.12%	1.41%	0.92%	0.77%	1.71%	1.30%	0.38%	1.42%	1.11%	1.71%	1.81%	1.09%	0.60%	1.85%	0.79%
	2028	1.14%	0.61%	2.04%	1.62%	0.78%	1.88%	2.22%	1.19%	1.11%	1.41%	0.92%	0.75%	1.70%	1.31%	0.35%	1.39%	1.10%	1.70%	1.81%	1.07%	0.59%	1.84%	0.78%
	2029	1.13%	0.70%	2.04%	1.59%	0.77%	1.84%	2.22%	1.16%	1.09%	1.41%	0.91%	0.74%	1.70%	1.32%	0.35%	1.40%	1.11%	1.69%	1.81%	1.07%	0.58%	1.84%	0.77%
	2030	1.13%	0.60%	2.03%	1.60%	0.75%	1.87%	2.22%	1.18%	1.10%	1.40%	0.89%	0.77%	1.69%	1.32%	0.34%	1.39%	1.10%	1.69%	1.80%	1.05%	0.58%	1.83%	0.77%
	2031	1.09%	0.68%	2.03%	1.58%	0.74%	1.88%	2.22%	1.14%	1.09%	1.39%	0.89%	0.71%	1.69%	1.33%	0.38%	1.38%	1.07%	1.69%	1.80%	1.04%	0.58%	1.82%	0.76%
	2032	1.13%	0.67%	2.01%	1.58%	0.73%	1.93%	2.22%	1.16%	1.08%	1.40%	0.87%	0.76%	1.68%	1.34%	0.35%	1.37%	1.06%	1.68%	1.80%	1.05%	0.58%	1.81%	0.75%
	2033	1.13%	0.58%	2.01%	1.57%	0.72%	1.87%	2.21%	1.15%	1.09%	1.39%	0.87%	0.74%	1.67%	1.33%	0.33%	1.37%	1.15%	1.67%	1.79%	1.03%	0.57%	1.80%	0.75%
	2034	1.11%	0.65%	2.01%	1.56%	0.71%	1.92%	2.22%	1.14%	1.07%	1.38%	0.86%	0.71%	1.67%	1.35%	0.33%	1.36%	1.04%	1.67%	1.79%	1.03%	0.57%	1.80%	0.74%
	2035	1.08%	0.66%	1.99%	1.55%	0.69%	1.91%	2.21%	1.13%	1.07%	1.38%	0.86%	0.73%	1.66%	1.35%	0.35%	1.32%	1.02%	1.66%	1.79%	1.01%	0.56%	1.79%	0.74%
	2011	2.32%	2.02%	2.98%	2.77%	0.78%	2.48%	1.79%	2.40%	2.27%	2.55%	2.21%	1.86%	2.79%	2.30%	1.57%	2.60%	2.36%	1.42%	2.83%	2.34%	1.81%	2.92%	2.01%
	2012	0.89%	0.63%	1.70%	1.39%	0.78%	1.36%	1.79%	1.02%	0.95%	1.18%	0.84%	0.69%	1.43%	0.98%	0.33%	1.22%	1.03%	1.42%	1.47%	0.96%	0.53%	1.57%	0.71%
	2013	0.92%	0.64%	1.70%	1.39%	0.78%	1.39%	1.79%	1.00%	0.95%	1.17%	0.83%	0.66%	1.42%	1.00%	0.31%	1.24%	0.95%	1.42%	1.47%	0.97%	0.52%	1.56%	0.70%
	2014	0.92%	0.63%	1.69%	1.38%	0.76%	1.37%	1.79%	1.03%	0.94%	1.17%	0.83%	0.67%	1.42%	1.00%	0.33%	1.22%	0.94%	1.42%	1.47%	0.95%	0.52%	1.56%	0.70%
	2015	0.89%	0.62%	1.69%	1.38%	0.76%	1.41%	1.79%	0.97%	0.96%	1.17%	0.82%	0.60%	1.41%	1.00%	0.32%	1.20%	0.98%	1.41%	1.47%	0.95%	0.53%	1.55%	0.69%
	2016	0.94%	0.59%	1.69%	1.36%	0.74%	1.40%	1.79%	1.02%	0.93%	1.16%	0.81%	0.69%	1.41%	1.01%	0.32%	1.21%	1.02%	1.41%	1.47%	0.94%	0.51%	1.54%	0.69%
	2017	0.91%	0.63%	1.68%	1.37%	0.74%	1.39%	1.79%	1.00%	0.94%	1.16%	0.81%	0.61%	1.41%	1.01%	0.30%	1.20%	0.90%	1.40%	1.47%	0.94%	0.51%	1.53%	0.69%
	2018	0.90%	0.59%	1.67%	1.36%	0.72%	1.42%	1.78%	1.00%	0.93%	1.16%	0.79%	0.65%	1.40%	1.02%	0.31%	1.18%	0.94%	1.40%	1.47%	0.93%	0.50%	1.53%	0.68%
	2019	0.91%	0.61%	1.67%	1.35%	0.72%	1.42%	1.79%	0.97%	0.92%	1.15%	0.79%	0.63%	1.40%	1.02%	0.30%	1.18%	0.94%	1.40%	1.46%	0.93%	0.51%	1.53%	0.67%
	2020	0.89%	0.57%	1.67%	1.34%	0.71%	1.42%	1.78%	0.97%	0.94%	1.16%	0.79%	0.63%	1.39%	1.01%	0.32%	1.18%	0.92%	1.39%	1.46%	0.91%	0.50%	1.52%	0.67%
	2021	0.92%	0.60%	1.66%	1.34%	0.69%	1.44%	1.78%	0.99%	0.92%	1.15%	0.78%	0.63%	1.39%	1.02%	0.29%	1.18%	0.97%	1.39%	1.46%	0.91%	0.50%	1.51%	0.66%
	2022	0.91%	0.58%	1.66%	1.33%	0.69%	1.42%	1.79%	0.96%	0.93%	1.14%	0.77%	0.63%	1.39%	1.02%	0.32%	1.16%	0.89%	1.39%	1.46%	0.90%	0.49%	1.51%	0.66%
MID	2023	0.91%	0.56%	1.65%	1.32%	0.67%	1.48%	1.78%	0.96%	0.90%	1.15%	0.77%	0.60%	1.38%	1.04%	0.29%	1.16%	0.92%	1.39%	1.46%	0.90%	0.49%	1.50%	0.65%
	2024	0.88%	0.58%	1.65%	1.31%	0.66%	1.43%	1.78%	0.95%	0.91%	1.13%	0.76%	0.65%	1.38%	1.04%	0.29%	1.15%	0.94%	1.38%	1.45%	0.89%	0.49%	1.49%	0.65%
	2025	0.94%	0.57%	1.64%	1.31%	0.66%	1.45%	1.77%	0.99%	0.91%	1.14%	0.76%	0.63%	1.38%	1.04%	0.30%	1.14%	0.89%	1.38%	1.45%	0.88%	0.48%	1.49%	0.65%
	2026	0.89%	0.53%	1.64%	1.30%	0.65%	1.46%	1.78%	0.93%	0.89%	1.13%	0.75%	0.61%	1.37%	1.04%	0.29%	1.14%	0.90%	1.37%	1.45%	0.87%	0.48%	1.49%	0.63%
	2027	0.88%	0.60%	1.64%	1.30%	0.63%	1.48%	1.77%	0.94%	0.90%	1.13%	0.74%	0.62%	1.37%	1.05%	0.30%	1.14%	0.89%	1.37%	1.45%	0.88%	0.48%	1.48%	0.64%
	2028	0.92%	0.49%	1.63%	1.30%	0.63%	1.50%	1.77%	0.95%	0.89%	1.13%	0.74%	0.60%	1.36%	1.05%	0.28%	1.12%	0.88%	1.36%	1.45%	0.86%	0.48%	1.47%	0.63%
	2029	0.91%	0.56%	1.63%	1.28%	0.62%	1.47%	1.77%	0.93%	0.88%	1.13%	0.73%	0.60%	1.36%	1.06%	0.28%	1.12%	0.89%	1.36%	1.44%	0.86%	0.46%	1.47%	0.62%
	2030	0.91%	0.49%	1.62%	1.28%	0.61%	1.50%	1.77%	0.95%	0.89%	1.12%	0.72%	0.62%	1.35%	1.06%	0.28%	1.11%	0.88%	1.35%	1.44%	0.85%	0.47%	1.46%	0.62%
	2031	0.88%	0.55%	1.62%	1.27%	0.60%	1.50%	1.77%	0.91%	0.88%	1.12%	0.72%	0.57%	1.35%	1.07%	0.31%	1.11%	0.86%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2032	0.91%	0.54%	1.61%	1.26%	0.59%	1.54%	1.77%	0.93%	0.87%	1.12%	0.70%	0.61%	1.35%	1.07%	0.28%	1.10%	0.85%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2033	0.91%	0.47%	1.60%	1.26%	0.58%	1.50%	1.76%	0.92%	0.87%	1.11%	0.70%	0.60%	1.34%	1.06%	0.27%	1.10%	0.92%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2034	0.90%	0.52%	1.60%	1.25%	0.57%	1.53%	1.77%	0.92%	0.86%	1.11%	0.70%	0.57%	1.34%	1.08%	0.27%	1.09%	0.84%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2035	0.87%	0.53%	1.59%	1.25%	0.56%	1.52%	1.76%	0.91%	0.86%	1.11%	0.70%	0.59%	1.33%	1.09%	0.29%	1.06%	0.82%	1.33%	1.43%	0.82%	0.45%	1.43%	0.59%
	2011	1.75%	1.52%	2.26%	2.09%	0.58%	1.87%	1.34%	1.80%	1.70%	1.92%	1.66%	1.39%	2.11%	1.73%	1.17%	1.96%	1.78%	1.06%	2.14%	1.76%	1.36%	2.21%	1.50%
	2012	0.66%	0.47%	1.27%	1.04%	0.58%	1.02%	1.34%	0.76%	0.71%	0.88%	0.62%	0.51%	1.06%	0.73%	0.24%	0.91%	0.76%	1.06%	1.10%	0.71%	0.39%	1.17%	0.52%
	2013	0.68%	0.47%	1.27%	1.03%	0.58%	1.03%	1.34%	0.74%	0.71%	0.87%	0.61%	0.49%	1.06%	0.74%	0.23%	0.92%	0.71%	1.06%	1.10%	0.72%	0.39%	1.16%	0.52%
	2014	0.68%	0.46%	1.26%	1.03%	0.56%	1.02%	1.34%	0.76%	0.70%	0.87%	0.61%	0.50%	1.06%	0.74%	0.24%	0.91%	0.70%	1.06%	1.10%	0.71%	0.38%	1.16%	0.52%
	2015	0.66%	0.46%	1.26%	1.03%	0.56%	1.05%	1.34%	0.72%	0.71%	0.87%	0.61%	0.44%	1.05%	0.74%	0.23%	0.89%	0.73%	1.05%	1.10%	0.70%	0.39%	1.15%	0.51%
	2016	0.69%	0.43%	1.26%	1.01%	0.55%	1.04%	1.34%	0.75%	0.69%	0.86%	0.60%	0.51%	1.05%	0.75%	0.24%	0.90%	0.75%	1.05%	1.10%	0.69%	0.38%	1.15%	0.51%
	2017	0.67%	0.46%	1.26%	1.02%	0.55%	1.03%	1.34%	0.74%	0.70%	0.86%	0.60%	0.45%	1.05%	0.75%	0.22%	0.89%	0.67%	1.05%	1.09%	0.70%	0.38%	1.14%	0.51%
	2018	0.67%	0.44%	1.25%	1.01%	0.53%	1.06%	1.33%	0.74%	0.69%	0.86%	0.59%	0.48%	1.04%	0.75%	0.23%	0.88%	0.70%	1.04%	1.09%	0.69%	0.37%	1.14%	0.50%
	2019	0.68%	0.45%	1.25%	1.00%	0.53%	1.06%	1.33%	0.72%	0.68%	0.86%	0.59%	0.46%	1.04%	0.76%	0.22%	0.88%	0.70%	1.04%	1.09%	0.69%	0.37%	1.14%	0.50%
	2020	0.66%	0.42%	1.25%	1.00%	0.52%	1.06%	1.33%	0.72%	0.70%	0.86%	0.58%	0.47%	1.04%	0.75%	0.23%	0.87%	0.68%	1.04%	1.09%	0.68%	0.37%	1.13%	0.49%
	2021	0.68%	0.44%	1.24%	0.99%	0.51%	1.07%	1.33%	0.73%	0.68%	0.86%	0.58%	0.47%	1.04%	0.76%	0.21%	0.87%	0.72%	1.04%	1.09%	0.67%	0.37%	1.13%	0.49%
	2022	0.68%	0.43%	1.24%	0.99%	0.51%	1.06%	1.33%	0.71%	0.69%	0.85%	0.57%	0.46%	1.03%	0.76%	0.24%	0.86%	0.66%	1.03%	1.09%	0.67%	0.36%	1.12%	0.49%
LOW	2023	0.67%	0.42%	1.23%	0.98%	0.50%	1.10%	1.33%	0.71%	0.67%	0.85%	0.57%	0.44%	1.03%	0.77%	0.21%	0.86%	0.68%	1.03%	1.09%	0.67%	0.36%	1.12%	0.48%
	2024	0.65%	0.43%	1.23%	0.98%	0.49%	1.07%	1.33%	0.71%	0.68%	0.84%	0.56%	0.48%	1.03%	0.77%	0.21%	0.86%	0.70%	1.02%	1.08%	0.66%	0.36%	1.11%	0.48%
	2025	0.69%	0.42%	1.23%	0.98%	0.49%	1.08%	1.32%	0.73%	0.67%	0.85%	0.56%	0.46%	1.02%	0.77%	0.22%	0.85%	0.66%	1.03%	1.08%	0.65%	0.36%	1.11%	0.48%
	2026	0.66%	0.39%	1.22%	0.97%	0.48%	1.08%	1.33%	0.69%	0.66%	0.84%	0.55%	0.45%	1.02%	0.77%	0.22%	0.84%	0.67%	1.02%	1.08%	0.65%	0.35%	1.11%	0.47%
	2027	0.65%	0.44%	1.22%	0.97%	0.47%	1.10%	1.33%	0.69%	0.67%	0.84%	0.55%	0.46%	1.02%	0.78%	0.22%	0.84%	0.66%	1.02%	1.08%	0.65%	0.36%	1.10%	0.47%
	2028	0.68%	0.36%	1.22%	0.96%	0.47%	1.12%	1.33%	0.71%	0.66%	0.84%	0.55%	0.45%	1.01%	0.78%	0.21%	0.83%	0.65%	1.02%	1.08%	0.64%	0.35%	1.09%	0.46%
	2029	0.67%	0.42%	1.21%	0.95%	0.46%	1.10%	1.32%	0.69%	0.65%	0.84%	0.54%	0.44%	1.01%	0.78%	0.21%	0.83%	0.66%	1.01%	1.08%	0.64%	0.34%	1.09%	0.46%
	2030	0.68%	0.36%	1.21%	0.95%	0.45%	1.12%	1.32%	0.70%	0.66%	0.83%	0.53%	0.46%	1.01%	0.79%	0.20%	0.83%	0.65%	1.01%	1.07%	0.63%	0.35%	1.09%	0.46%
	2031	0.65%	0.41%	1.21%	0.94%	0.44%	1.12%	1.32%	0.68%	0.65%	0.83%	0.53%	0.42%	1.00%	0.79%	0.22%	0.82%	0.64%	1.01%	1.07%	0.62%	0.34%	1.08%	0.45%
	2032	0.68%	0.40%	1.20%	0.94%	0.44%	1.15%	1.32%	0.69%	0.65%	0.83%	0.52%	0.45%	1.00%	0.80%	0.21%	0.82%	0.63%	1.00%	1.07%	0.62%	0.34%	1.08%	0.45%
	2033	0.68%	0.35%	1.20%	0.94%	0.43%	1.12%	1.32%	0.68%	0.65%	0.83%	0.52%	0.44%	1.00%	0.79%	0.20%	0.81%	0.68%	1.00%	1.07%	0.62%	0.34%	1.07%	0.44%
	2034	0.66%	0.39%	1.20%	0.93%	0.42%	1.14%	1.32%	0.68%	0.64%	0.82%	0.51%	0.42%	1.00%	0.80%	0.20%	0.81%	0.62%	1.00%	1.07%	0.61%	0.34%	1.07%	0.44%
	2035	0.65%	0.39%	1.19%	0.93%	0.41%	1.14%	1.32%	0.67%	0.64%	0.82%	0.51%	0.44%	0.99%	0.81%	0.21%	0.79%	0.61%	0.99%	1.06%	0.60%	0.33%	1.07%	0.44%

Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED HOUSEHOLDS GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
	2011	0.90%	0.02%	2.56%	1.54%	-99.90%	2.12%	3.14%	1.67%	2.25%	1.75%	0.59%	1.23%	2.14%	1.14%	-0.05%	2.18%	0.93%	2.26%	2.45%	0.70%	0.58%	3.03%	0.64%
	2012	1.04%	0.33%	2.41%	1.59%	0.88%	2.07%	2.87%	1.69%	2.15%	1.76%	0.79%	1.34%	2.07%	1.25%	0.19%	2.11%	1.07%	2.16%	2.32%	0.89%	0.80%	2.79%	0.84%
	2013	0.98%	0.26%	2.30%	1.51%	0.92%	1.96%	2.75%	1.60%	2.06%	1.67%	0.72%	1.24%	1.98%	1.17%	0.16%	2.01%	1.01%	2.07%	2.21%	0.81%	0.72%	2.67%	0.77%
	2014	0.95%	0.23%	2.24%	1.47%	0.95%	1.91%	2.67%	1.57%	2.01%	1.63%	0.70%	1.23%	1.93%	1.15%	0.17%	1.96%	0.97%	2.02%	2.16%	0.79%	0.71%	2.59%	0.75%
	2015	0.93%	0.22%	2.18%	1.43%	0.98%	1.86%	2.60%	1.53%	1.96%	1.59%	0.67%	1.20%	1.88%	1.12%	0.09%	1.91%	0.97%	1.97%	2.10%	0.75%	0.68%	2.52%	0.72%
	2016	0.88%	0.20%	2.12%	1.40%	1.01%	1.81%	2.52%	1.49%	1.91%	1.55%	0.64%	1.18%	1.83%	1.09%	0.12%	1.86%	0.90%	1.91%	2.05%	0.73%	0.66%	2.45%	0.70%
	2017	0.88%	0.17%	2.07%	1.37%	1.04%	1.77%	2.45%	1.46%	1.86%	1.51%	0.62%	1.15%	1.79%	1.07%	0.13%	1.81%	0.90%	1.86%	1.99%	0.70%	0.63%	2.38%	0.68%
	2018	0.83%	0.14%	2.01%	1.33%	1.07%	1.70%	2.39%	1.43%	1.81%	1.46%	0.59%	1.11%	1.74%	1.04%	0.05%	1.76%	0.87%	1.82%	1.94%	0.67%	0.60%	2.31%	0.65%
	2019	0.81%	0.13%	1.96%	1.30%	1.10%	1.68%	2.32%	1.40%	1.77%	1.43%	0.57%	1.09%	1.70%	1.01%	0.07%	1.72%	0.86%	1.77%	1.89%	0.63%	0.58%	2.26%	0.63%
	2020	0.79%	0.11%	1.92%	1.27%	1.11%	1.63%	2.27%	1.37%	1.73%	1.40%	0.55%	1.08%	1.66%	0.99%	0.07%	1.68%	0.83%	1.73%	1.85%	0.61%	0.56%	2.20%	0.62%
	2021	0.77%	0.10%	1.88%	1.25%	1.14%	1.60%	2.22%	1.35%	1.69%	1.37%	0.54%	1.05%	1.62%	0.98%	0.05%	1.64%	0.80%	1.70%	1.81%	0.59%	0.54%	2.15%	0.60%
	2022	0.77%	0.08%	1.83%	1.23%	1.15%	1.55%	2.16%	1.32%	1.66%	1.34%	0.52%	1.03%	1.58%	0.96%	0.05%	1.60%	0.80%	1.66%	1.76%	0.55%	0.51%	2.09%	0.59%
HIGH	2023	0.72%	0.05%	1.78%	1.19%	1.18%	1.52%	2.11%	1.29%	1.62%	1.31%	0.49%	1.01%	1.54%	0.93%	0.00%	1.55%	0.77%	1.62%	1.72%	0.52%	0.48%	2.04%	0.57%
	2024	0.71%	0.02%	1.74%	1.17%	1.20%	1.48%	2.05%	1.26%	1.58%	1.27%	0.48%	0.98%	1.51%	0.91%	0.02%	1.52%	0.74%	1.58%	1.67%	0.49%	0.45%	1.99%	0.55%
	2025	0.67%	0.01%	1.70%	1.14%	1.22%	1.44%	2.00%	1.24%	1.54%	1.24%	0.45%	0.96%	1.46%	0.88%	0.03%	1.47%	0.74%	1.54%	1.63%	0.44%	0.42%	1.93%	0.53%
	2026	0.65%	0.00%	1.66%	1.11%	1.24%	1.39%	1.95%	1.20%	1.50%	1.20%	0.43%	0.94%	1.43%	0.86%	-0.01%	1.43%	0.71%	1.50%	1.59%	0.41%	0.39%	1.88%	0.51%
	2027	0.63%	-0.02%	1.61%	1.08%	1.26%	1.37%	1.90%	1.17%	1.46%	1.18%	0.41%	0.91%	1.39%	0.83%	-0.04%	1.40%	0.68%	1.46%	1.55%	0.38%	0.37%	1.84%	0.49%
	2028	0.61%	-0.05%	1.58%	1.06%	1.28%	1.32%	1.85%	1.16%	1.43%	1.14%	0.39%	0.90%	1.36%	0.82%	-0.02%	1.35%	0.65%	1.43%	1.51%	0.35%	0.35%	1.79%	0.47%
	2029	0.58%	-0.06%	1.54%	1.03%	1.29%	1.29%	1.81%	1.13%	1.40%	1.12%	0.38%	0.87%	1.32%	0.80%	-0.04%	1.32%	0.65%	1.40%	1.47%	0.32%	0.32%	1.75%	0.46%
	2030	0.56%	-0.08%	1.50%	1.01%	1.30%	1.27%	1.77%	1.10%	1.36%	1.09%	0.36%	0.85%	1.29%	0.78%	-0.08%	1.29%	0.63%	1.37%	1.44%	0.29%	0.30%	1.71%	0.44%
	2031	0.53%	-0.10%	1.47%	0.98%	1.31%	1.23%	1.73%	1.08%	1.33%	1.06%	0.35%	0.85%	1.26%	0.76%	-0.05%	1.26%	0.60%	1.33%	1.40%	0.27%	0.28%	1.67%	0.43%
	2032	0.53%	-0.11%	1.44%	0.97%	1.32%	1.19%	1.69%	1.06%	1.30%	1.04%	0.33%	0.82%	1.23%	0.74%	-0.07%	1.22%	0.60%	1.30%	1.37%	0.23%	0.26%	1.63%	0.41%
	2033	0.49%	-0.14%	1.40%	0.94%	1.33%	1.16%	1.65%	1.03%	1.27%	1.01%	0.31%	0.80%	1.20%	0.72%	-0.10%	1.20%	0.57%	1.27%	1.33%	0.21%	0.25%	1.59%	0.40%
	2034	0.48%	-0.15%	1.37%	0.92%	1.34%	1.14%	1.61%	1.01%	1.24%	0.98%	0.30%	0.78%	1.18%	0.71%	-0.11%	1.17%	0.55%	1.24%	1.30%	0.18%	0.23%	1.55%	0.38%
	2035	0.44%	-0.17%	1.33%	0.89%	1.36%	1.11%	1.56%	0.98%	1.21%	0.95%	0.28%	0.75%	1.14%	0.68%	-0.11%	1.13%	0.53%	1.21%	1.26%	0.15%	0.21%	1.51%	0.36%

	2011	0.75%	0.01%	2.11%	1.28%	0.88%	1.76%	2.58%	1.39%	1.86%	1.46%	0.50%	1.02%	1.77%	0.95%	-0.06%	1.81%	0.78%	1.87%	2.02%	0.59%	0.49%	2.49%	0.53%
	2012	0.98%	0.28%	2.31%	1.52%	0.88%	1.99%	2.76%	1.62%	2.07%	1.69%	0.74%	1.28%	1.99%	1.19%	0.17%	2.03%	1.01%	2.08%	2.23%	0.84%	0.74%	2.68%	0.78%
	2013	0.97%	0.27%	2.26%	1.49%	0.91%	1.93%	2.69%	1.58%	2.03%	1.65%	0.72%	1.24%	1.95%	1.17%	0.16%	1.98%	1.00%	2.03%	2.18%	0.81%	0.72%	2.61%	0.76%
	2014	0.95%	0.24%	2.20%	1.46%	0.94%	1.88%	2.61%	1.55%	1.98%	1.61%	0.70%	1.22%	1.90%	1.14%	0.17%	1.93%	0.97%	1.98%	2.12%	0.79%	0.71%	2.54%	0.74%
	2015	0.92%	0.22%	2.14%	1.42%	0.97%	1.84%	2.54%	1.52%	1.93%	1.57%	0.67%	1.19%	1.86%	1.11%	0.10%	1.88%	0.96%	1.94%	2.07%	0.76%	0.68%	2.47%	0.72%
	2016	0.88%	0.21%	2.09%	1.39%	1.00%	1.79%	2.47%	1.48%	1.88%	1.53%	0.65%	1.17%	1.81%	1.09%	0.12%	1.83%	0.90%	1.89%	2.01%	0.73%	0.66%	2.40%	0.70%
	2017	0.87%	0.18%	2.03%	1.35%	1.03%	1.74%	2.41%	1.45%	1.84%	1.49%	0.62%	1.14%	1.76%	1.06%	0.13%	1.79%	0.90%	1.84%	1.96%	0.70%	0.63%	2.34%	0.68%
	2018	0.84%	0.15%	1.98%	1.32%	1.05%	1.69%	2.34%	1.41%	1.79%	1.45%	0.59%	1.10%	1.72%	1.03%	0.06%	1.74%	0.87%	1.79%	1.91%	0.67%	0.60%	2.27%	0.65%
	2019	0.81%	0.13%	1.93%	1.29%	1.08%	1.66%	2.28%	1.38%	1.75%	1.42%	0.57%	1.08%	1.68%	1.01%	0.07%	1.70%	0.86%	1.75%	1.86%	0.64%	0.58%	2.22%	0.63%
	2020	0.79%	0.12%	1.89%	1.26%	1.10%	1.61%	2.23%	1.36%	1.71%	1.39%	0.55%	1.07%	1.64%	0.99%	0.07%	1.66%	0.83%	1.71%	1.82%	0.61%	0.56%	2.16%	0.62%
	2021	0.77%	0.10%	1.85%	1.24%	1.12%	1.58%	2.18%	1.33%	1.67%	1.36%	0.54%	1.04%	1.60%	0.97%	0.05%	1.62%	0.80%	1.68%	1.78%	0.59%	0.54%	2.11%	0.60%
	2022	0.76%	0.09%	1.81%	1.22%	1.14%	1.54%	2.13%	1.31%	1.64%	1.33%	0.52%	1.02%	1.57%	0.95%	0.05%	1.58%	0.79%	1.64%	1.74%	0.55%	0.51%	2.06%	0.59%
MID	2023	0.73%	0.06%	1.76%	1.18%	1.16%	1.50%	2.07%	1.28%	1.60%	1.30%	0.49%	1.00%	1.53%	0.93%	0.01%	1.54%	0.77%	1.60%	1.70%	0.52%	0.48%	2.01%	0.57%
	2024	0.71%	0.03%	1.72%	1.16%	1.18%	1.46%	2.02%	1.25%	1.56%	1.26%	0.48%	0.98%	1.49%	0.90%	0.02%	1.50%	0.74%	1.56%	1.65%	0.49%	0.45%	1.96%	0.55%
	2025	0.67%	0.01%	1.68%	1.13%	1.20%	1.43%	1.97%	1.23%	1.52%	1.23%	0.45%	0.96%	1.45%	0.88%	0.03%	1.46%	0.73%	1.52%	1.61%	0.45%	0.43%	1.91%	0.53%
	2026	0.65%	0.00%	1.64%	1.10%	1.22%	1.38%	1.92%	1.20%	1.48%	1.20%	0.43%	0.94%	1.41%	0.86%	-0.01%	1.42%	0.71%	1.49%	1.57%	0.42%	0.39%	1.86%	0.51%
	2027	0.63%	-0.03%	1.60%	1.07%	1.24%	1.35%	1.87%	1.16%	1.45%	1.17%	0.41%	0.91%	1.38%	0.83%	-0.05%	1.38%	0.68%	1.45%	1.53%	0.39%	0.38%	1.81%	0.49%
	2028	0.61%	-0.06%	1.56%	1.05%	1.26%	1.31%	1.83%	1.15%	1.41%	1.14%	0.39%	0.90%	1.34%	0.81%	-0.01%	1.34%	0.65%	1.42%	1.49%	0.35%	0.35%	1.77%	0.47%
	2029	0.58%	-0.06%	1.52%	1.03%	1.27%	1.28%	1.79%	1.12%	1.38%	1.11%	0.38%	0.87%	1.31%	0.79%	-0.04%	1.31%	0.65%	1.38%	1.46%	0.33%	0.33%	1.72%	0.46%
	2030	0.56%	-0.09%	1.49%	1.00%	1.28%	1.25%	1.74%	1.09%	1.35%	1.08%	0.36%	0.85%	1.28%	0.78%	-0.09%	1.28%	0.63%	1.35%	1.42%	0.29%	0.30%	1.68%	0.45%
	2031	0.53%	-0.10%	1.46%	0.98%	1.29%	1.22%	1.71%	1.08%	1.32%	1.06%	0.35%	0.84%	1.25%	0.76%	-0.04%	1.25%	0.60%	1.32%	1.39%	0.27%	0.29%	1.65%	0.43%
	2032	0.53%	-0.12%	1.42%	0.96%	1.30%	1.19%	1.67%	1.05%	1.29%	1.03%	0.33%	0.81%	1.22%	0.74%	-0.08%	1.22%	0.60%	1.29%	1.36%	0.24%	0.27%	1.61%	0.42%
	2033	0.49%	-0.15%	1.39%	0.93%	1.31%	1.16%	1.63%	1.03%	1.26%	1.00%	0.32%	0.80%	1.20%	0.72%	-0.11%	1.19%	0.57%	1.26%	1.32%	0.21%	0.25%	1.57%	0.40%
	2034	0.48%	-0.15%	1.36%	0.91%	1.32%	1.13%	1.59%	1.01%	1.23%	0.98%	0.30%	0.78%	1.17%	0.70%	-0.11%	1.16%	0.55%	1.23%	1.29%	0.18%	0.23%	1.53%	0.38%
	2035	0.45%	-0.18%	1.32%	0.89%	1.33%	1.10%	1.55%	0.98%	1.20%	0.95%	0.28%	0.75%	1.14%	0.68%	-0.11%	1.12%	0.53%	1.20%	1.25%	0.16%	0.21%	1.49%	0.37%

	2011	0.65%	0.01%	1.84%	1.11%	-99.90%	1.52%	2.25%	1.20%	1.62%	1.26%	0.42%	0.88%	1.54%	0.82%	-0.11%	1.57%	0.67%	1.62%	1.76%	0.51%	0.42%	2.17%	0.46%
	2012	0.96%	0.24%	2.34%	1.51%	0.88%	1.99%	2.81%	1.61%	2.08%	1.68%	0.71%	1.26%	2.00%	1.17%	0.20%	2.04%	0.99%	2.09%	2.25%	0.81%	0.71%	2.72%	0.75%
	2013	0.99%	0.27%	2.32%	1.52%	0.91%	1.98%	2.77%	1.61%	2.08%	1.68%	0.73%	1.26%	1.99%	1.18%	0.16%	2.03%	1.01%	2.08%	2.23%	0.82%	0.73%	2.69%	0.77%
	2014	0.96%	0.24%	2.26%	1.48%	0.94%	1.93%	2.70%	1.58%	2.03%	1.64%	0.71%	1.24%	1.95%	1.16%	0.17%	1.98%	0.98%	2.03%	2.18%	0.80%	0.71%	2.62%	0.75%
	2015	0.94%	0.22%	2.20%	1.45%	0.97%	1.88%	2.62%	1.55%	1.98%	1.60%	0.68%	1.21%	1.90%	1.13%	0.11%	1.93%	0.97%	1.98%	2.12%	0.77%	0.69%	2.54%	0.73%
	2016	0.90%	0.21%	2.14%	1.41%	1.00%	1.83%	2.55%	1.50%	1.92%	1.56%	0.65%	1.18%	1.85%	1.10%	0.12%	1.88%	0.92%	1.93%	2.06%	0.74%	0.67%	2.47%	0.71%
	2017	0.88%	0.18%	2.08%	1.38%	1.03%	1.78%	2.48%	1.47%	1.88%	1.52%	0.63%	1.16%	1.80%	1.08%	0.13%	1.83%	0.91%	1.88%	2.01%	0.71%	0.64%	2.40%	0.68%
	2018	0.85%	0.15%	2.03%	1.34%	1.06%	1.72%	2.41%	1.44%	1.83%	1.48%	0.60%	1.12%	1.75%	1.05%	0.07%	1.78%	0.88%	1.83%	1.96%	0.68%	0.61%	2.34%	0.66%
	2019	0.82%	0.13%	1.98%	1.31%	1.09%	1.69%	2.35%	1.41%	1.78%	1.44%	0.58%	1.09%	1.71%	1.02%	0.07%	1.73%	0.87%	1.79%	1.91%	0.65%	0.59%	2.28%	0.64%
	2020	0.80%	0.12%	1.93%	1.28%	1.11%	1.65%	2.29%	1.38%	1.74%	1.41%	0.56%	1.08%	1.67%	1.00%	0.07%	1.69%	0.84%	1.75%	1.86%	0.62%	0.57%	2.22%	0.62%
	2021	0.78%	0.10%	1.89%	1.26%	1.13%	1.61%	2.23%	1.36%	1.70%	1.38%	0.54%	1.06%	1.64%	0.98%	0.05%	1.65%	0.81%	1.71%	1.82%	0.59%	0.55%	2.17%	0.61%
	2022	0.77%	0.09%	1.85%	1.24%	1.15%	1.57%	2.18%	1.33%	1.67%	1.35%	0.53%	1.04%	1.60%	0.96%	0.05%	1.61%	0.80%	1.67%	1.78%	0.56%	0.52%	2.11%	0.59%
LOW	2023	0.74%	0.06%	1.80%	1.20%	1.17%	1.53%	2.12%	1.30%	1.63%	1.32%	0.50%	1.01%	1.56%	0.94%	0.02%	1.57%	0.78%	1.63%	1.73%	0.53%	0.49%	2.06%	0.57%
	2024	0.71%	0.03%	1.76%	1.18%	1.19%	1.49%	2.07%	1.27%	1.59%	1.28%	0.48%	0.99%	1.52%	0.92%	0.02%	1.53%	0.75%	1.59%	1.69%	0.50%	0.46%	2.00%	0.56%
	2025	0.68%	0.02%	1.71%	1.15%	1.21%	1.45%	2.02%	1.25%	1.55%	1.25%	0.46%	0.97%	1.48%	0.89%	0.03%	1.48%	0.74%	1.55%	1.64%	0.46%	0.43%	1.95%	0.54%
	2026	0.66%	0.00%	1.67%	1.12%	1.24%	1.41%	1.96%	1.21%	1.51%	1.22%	0.44%	0.95%	1.44%	0.87%	-0.01%	1.44%	0.72%	1.51%	1.60%	0.42%	0.40%	1.90%	0.51%
	2027	0.64%	-0.05%	1.63%	1.09%	1.25%	1.38%	1.92%	1.18%	1.47%	1.19%	0.42%	0.92%	1.40%	0.84%	-0.08%	1.41%	0.69%	1.48%	1.56%	0.39%	0.38%	1.85%	0.50%
	2028	0.62%	-0.08%	1.59%	1.06%	1.27%	1.34%	1.87%	1.16%	1.44%	1.15%	0.40%	0.91%	1.37%	0.82%	0.02%	1.37%	0.66%	1.44%	1.52%	0.36%	0.35%	1.80%	0.48%
	2029	0.59%	-0.06%	1.55%	1.04%	1.29%	1.30%	1.82%	1.14%	1.41%	1.13%	0.38%	0.88%	1.33%	0.80%	-0.07%	1.33%	0.66%	1.41%	1.48%	0.33%	0.33%	1.76%	0.46%
	2030	0.57%	-0.11%	1.52%	1.02%	1.30%	1.27%	1.78%	1.11%	1.37%	1.10%	0.37%	0.86%	1.30%	0.78%	-0.13%	1.30%	0.63%	1.38%	1.45%	0.30%	0.31%	1.72%	0.45%
	2031	0.54%	-0.11%	1.48%	0.99%	1.31%	1.24%	1.74%	1.09%	1.34%	1.07%	0.35%	0.85%	1.27%	0.77%	0.00%	1.27%	0.61%	1.35%	1.41%	0.27%	0.29%	1.68%	0.43%
	2032	0.53%	-0.13%	1.45%	0.97%	1.32%	1.21%	1.70%	1.07%	1.31%	1.05%	0.34%	0.82%	1.24%	0.75%	-0.11%	1.24%	0.60%	1.31%	1.38%	0.24%	0.27%	1.64%	0.42%
	2033	0.50%	-0.17%	1.41%	0.95%	1.33%	1.17%	1.66%	1.04%	1.28%	1.02%	0.32%	0.81%	1.21%	0.73%	-0.14%	1.21%	0.58%	1.28%	1.34%	0.22%	0.26%	1.60%	0.40%
	2034	0.48%	-0.15%	1.38%	0.93%	1.34%	1.14%	1.62%	1.02%	1.25%	0.99%	0.30%	0.79%	1.18%	0.71%	-0.11%	1.18%	0.56%	1.25%	1.31%	0.19%	0.24%	1.56%	0.39%
	2035	0.45%	-0.20%	1.34%	0.90%	1.35%	1.12%	1.58%	0.99%	1.22%	0.96%	0.29%	0.76%	1.15%	0.69%	-0.11%	1.14%	0.53%	1.22%	1.27%	0.16%	0.22%	1.52%	0.37%

Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED INCOME GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
HIGH	2011	-0.52%	6.00%	-0.32%	2.20%	1.98%	9.04%	0.44%	1.51%	0.09%	1.02%	6.46%	0.56%	2.17%	-0.07%	2.84%	2.87%	6.19%	4.33%	2.07%	-0.10%	4.57%	2.49%	1.40%
	2012	1.40%	2.07%	0.91%	1.29%	1.54%	1.99%	1.39%	0.93%	0.10%	0.77%	1.76%	1.86%	1.41%	1.38%	2.14%	1.05%	1.21%	1.01%	0.26%	1.73%	1.14%	1.69%	1.45%
	2013	1.45%	2.10%	1.01%	1.38%	1.60%	2.10%	1.51%	0.94%	0.20%	0.87%	1.82%	1.93%	1.48%	1.44%	2.25%	1.07%	1.25%	1.09%	0.30%	1.79%	1.22%	1.75%	1.51%
	2014	1.53%	2.18%	1.11%	1.46%	1.65%	2.21%	1.63%	0.96%	0.30%	0.95%	1.87%	1.96%	1.55%	1.51%	2.29%	1.12%	1.33%	1.17%	0.37%	1.84%	1.28%	1.81%	1.56%
	2015	1.60%	2.21%	1.21%	1.54%	1.70%	2.29%	1.75%	1.02%	0.39%	1.04%	1.93%	2.03%	1.61%	1.58%	2.46%	1.19%	1.35%	1.26%	0.45%	1.91%	1.34%	1.88%	1.61%
	2016	1.69%	2.26%	1.31%	1.61%	1.76%	2.41%	1.86%	1.10%	0.49%	1.12%	1.99%	2.08%	1.68%	1.66%	2.46%	1.26%	1.47%	1.35%	0.55%	1.96%	1.40%	1.94%	1.67%
	2017	1.72%	2.32%	1.39%	1.67%	1.81%	2.48%	1.97%	1.14%	0.57%	1.19%	2.05%	2.14%	1.74%	1.71%	2.48%	1.33%	1.50%	1.43%	0.64%	2.01%	1.45%	2.00%	1.72%
	2018	1.80%	2.38%	1.49%	1.73%	1.86%	2.60%	2.07%	1.21%	0.66%	1.28%	2.11%	2.22%	1.80%	1.79%	2.63%	1.41%	1.56%	1.51%	0.74%	2.06%	1.51%	2.06%	1.77%
	2019	1.87%	2.41%	1.56%	1.79%	1.91%	2.65%	2.17%	1.27%	0.74%	1.34%	2.15%	2.28%	1.86%	1.85%	2.65%	1.48%	1.58%	1.59%	0.83%	2.12%	1.56%	2.11%	1.82%
	2020	1.92%	2.46%	1.64%	1.84%	1.94%	2.75%	2.26%	1.32%	0.82%	1.41%	2.20%	2.32%	1.91%	1.90%	2.67%	1.54%	1.66%	1.66%	0.91%	2.16%	1.60%	2.16%	1.86%
	2021	1.98%	2.48%	1.70%	1.88%	1.98%	2.82%	2.34%	1.37%	0.89%	1.47%	2.24%	2.38%	1.95%	1.95%	2.73%	1.60%	1.71%	1.72%	0.99%	2.21%	1.64%	2.20%	1.89%
	2022	1.99%	2.51%	1.76%	1.93%	2.01%	2.90%	2.42%	1.42%	0.95%	1.53%	2.28%	2.43%	2.00%	2.00%	2.76%	1.66%	1.73%	1.78%	1.06%	2.25%	1.67%	2.25%	1.93%
	2023	2.07%	2.56%	1.84%	1.98%	2.05%	2.96%	2.50%	1.47%	1.02%	1.59%	2.33%	2.48%	2.05%	2.06%	2.85%	1.73%	1.79%	1.85%	1.14%	2.29%	1.73%	2.30%	1.97%
	2024	2.11%	2.62%	1.90%	2.02%	2.08%	3.04%	2.58%	1.54%	1.09%	1.65%	2.36%	2.53%	2.10%	2.10%	2.85%	1.78%	1.85%	1.91%	1.22%	2.33%	1.77%	2.35%	2.01%
	2025	2.19%	2.64%	1.97%	2.07%	2.13%	3.12%	2.66%	1.58%	1.16%	1.71%	2.42%	2.58%	2.15%	2.17%	2.86%	1.85%	1.86%	1.99%	1.29%	2.39%	1.81%	2.39%	2.05%
	2026	2.22%	2.66%	2.03%	2.12%	2.16%	3.20%	2.74%	1.63%	1.23%	1.77%	2.45%	2.63%	2.20%	2.21%	2.95%	1.90%	1.92%	2.05%	1.37%	2.43%	1.86%	2.44%	2.09%
	2027	2.27%	2.72%	2.09%	2.16%	2.19%	3.25%	2.81%	1.69%	1.29%	1.82%	2.49%	2.69%	2.24%	2.27%	3.04%	1.96%	1.96%	2.10%	1.44%	2.47%	1.89%	2.48%	2.13%
	2028	2.30%	2.75%	2.14%	2.20%	2.23%	3.32%	2.87%	1.72%	1.34%	1.88%	2.53%	2.71%	2.28%	2.31%	2.98%	2.01%	2.01%	2.16%	1.50%	2.51%	1.93%	2.52%	2.16%
	2029	2.36%	2.76%	2.19%	2.24%	2.25%	3.38%	2.93%	1.76%	1.39%	1.92%	2.55%	2.76%	2.32%	2.35%	3.05%	2.05%	2.02%	2.21%	1.57%	2.54%	1.96%	2.56%	2.19%
	2030	2.39%	2.79%	2.24%	2.27%	2.27%	3.42%	2.99%	1.81%	1.45%	1.96%	2.58%	2.80%	2.35%	2.38%	3.14%	2.09%	2.06%	2.25%	1.62%	2.57%	1.99%	2.60%	2.21%
	2031	2.44%	2.81%	2.28%	2.30%	2.29%	3.46%	3.04%	1.83%	1.49%	2.00%	2.60%	2.81%	2.38%	2.42%	3.06%	2.13%	2.10%	2.30%	1.67%	2.59%	2.01%	2.62%	2.23%
	2032	2.43%	2.83%	2.32%	2.32%	2.30%	3.52%	3.09%	1.86%	1.53%	2.03%	2.62%	2.85%	2.42%	2.44%	3.13%	2.16%	2.10%	2.34%	1.73%	2.63%	2.04%	2.65%	2.25%
	2033	2.49%	2.86%	2.36%	2.36%	2.32%	3.57%	3.14%	1.90%	1.57%	2.07%	2.64%	2.88%	2.45%	2.47%	3.19%	2.19%	2.14%	2.38%	1.78%	2.64%	2.05%	2.68%	2.27%
	2034	2.50%	2.85%	2.40%	2.38%	2.33%	3.60%	3.19%	1.92%	1.61%	2.10%	2.66%	2.90%	2.48%	2.50%	3.20%	2.23%	2.18%	2.42%	1.83%	2.68%	2.09%	2.71%	2.29%
	2035	2.55%	2.90%	2.45%	2.41%	2.36%	3.65%	3.24%	1.97%	1.66%	2.15%	2.68%	2.95%	2.51%	2.54%	3.20%	2.27%	2.21%	2.47%	1.89%	2.71%	2.11%	2.75%	2.32%
MID	2011	-0.92%	3.32%	-0.57%	1.24%	1.12%	4.92%	0.25%	0.86%	0.05%	0.58%	3.57%	0.32%	1.23%	-0.13%	1.60%	1.62%	3.42%	2.42%	1.17%	-0.17%	2.55%	1.41%	0.80%
	2012	0.80%	1.17%	0.52%	0.73%	0.88%	1.13%	0.79%	0.53%	0.06%	0.44%	1.00%	1.06%	0.80%	0.78%	1.21%	0.60%	0.69%	0.58%	0.15%	0.98%	0.65%	0.96%	0.83%
	2013	0.83%	1.19%	0.58%	0.78%	0.91%	1.19%	0.86%	0.54%	0.11%	0.49%	1.03%	1.10%	0.84%	0.82%	1.27%	0.61%	0.71%	0.62%	0.17%	1.02%	0.69%	0.99%	0.86%
	2014	0.87%	1.24%	0.63%	0.83%	0.94%	1.25%	0.93%	0.55%	0.17%	0.54%	1.06%	1.11%	0.88%	0.86%	1.30%	0.64%	0.75%	0.67%	0.21%	1.04%	0.73%	1.03%	0.88%
	2015	0.91%	1.25%	0.69%	0.87%	0.97%	1.30%	0.99%	0.58%	0.22%	0.59%	1.09%	1.15%	0.91%	0.90%	1.39%	0.68%	0.77%	0.72%	0.26%	1.08%	0.76%	1.06%	0.92%
	2016	0.96%	1.28%	0.74%	0.91%	1.00%	1.36%	1.06%	0.62%	0.28%	0.64%	1.13%	1.18%	0.95%	0.94%	1.39%	0.72%	0.83%	0.77%	0.31%	1.11%	0.79%	1.10%	0.95%
	2017	0.98%	1.31%	0.79%	0.95%	1.03%	1.40%	1.12%	0.65%	0.33%	0.68%	1.16%	1.21%	0.99%	0.97%	1.40%	0.76%	0.85%	0.81%	0.37%	1.14%	0.83%	1.13%	0.97%
	2018	1.02%	1.35%	0.84%	0.98%	1.05%	1.47%	1.17%	0.69%	0.38%	0.73%	1.19%	1.26%	1.02%	1.01%	1.48%	0.80%	0.89%	0.86%	0.42%	1.17%	0.86%	1.17%	1.00%
	2019	1.06%	1.36%	0.89%	1.02%	1.08%	1.50%	1.23%	0.72%	0.42%	0.76%	1.22%	1.29%	1.05%	1.05%	1.49%	0.84%	0.90%	0.90%	0.47%	1.20%	0.89%	1.20%	1.03%
	2020	1.09%	1.39%	0.93%	1.04%	1.10%	1.55%	1.28%	0.75%	0.47%	0.80%	1.24%	1.31%	1.08%	1.08%	1.51%	0.88%	0.94%	0.94%	0.52%	1.22%	0.91%	1.23%	1.05%
	2021	1.12%	1.40%	0.97%	1.07%	1.12%	1.59%	1.32%	0.78%	0.50%	0.83%	1.27%	1.34%	1.11%	1.11%	1.54%	0.91%	0.97%	0.98%	0.56%	1.25%	0.93%	1.25%	1.07%
	2022	1.13%	1.42%	1.00%	1.09%	1.14%	1.63%	1.37%	0.81%	0.54%	0.87%	1.29%	1.37%	1.13%	1.13%	1.56%	0.94%	0.98%	1.01%	0.60%	1.27%	0.95%	1.27%	1.09%
	2023	1.17%	1.44%	1.04%	1.12%	1.16%	1.67%	1.41%	0.84%	0.58%	0.90%	1.32%	1.40%	1.16%	1.17%	1.61%	0.98%	1.01%	1.05%	0.65%	1.30%	0.98%	1.30%	1.12%
	2024	1.19%	1.48%	1.08%	1.15%	1.18%	1.71%	1.46%	0.87%	0.62%	0.94%	1.34%	1.43%	1.19%	1.19%	1.61%	1.01%	1.05%	1.09%	0.69%	1.32%	1.00%	1.33%	1.14%
	2025	1.24%	1.49%	1.12%	1.17%	1.20%	1.75%	1.50%	0.90%	0.66%	0.97%	1.37%	1.46%	1.22%	1.23%	1.61%	1.05%	1.06%	1.12%	0.74%	1.35%	1.03%	1.35%	1.16%
	2026	1.26%	1.50%	1.15%	1.20%	1.22%	1.80%	1.54%	0.93%	0.70%	1.01%	1.39%	1.48%	1.24%	1.25%	1.66%	1.08%	1.09%	1.16%	0.78%	1.37%	1.05%	1.38%	1.19%
	2027	1.28%	1.53%	1.18%	1.22%	1.24%	1.83%	1.58%	0.96%	0.73%	1.03%	1.41%	1.52%	1.27%	1.28%	1.71%	1.11%	1.11%	1.19%	0.82%	1.40%	1.07%	1.40%	1.20%
	2028	1.30%	1.55%	1.21%	1.25%	1.26%	1.87%	1.62%	0.98%	0.76%	1.06%	1.43%	1.53%	1.29%	1.31%	1.68%	1.14%	1.14%	1.22%	0.85%	1.42%	1.09%	1.43%	1.22%
	2029	1.33%	1.55%	1.24%	1.26%	1.27%	1.90%	1.65%	1.00%	0.79%	1.09%	1.44%	1.56%	1.31%	1.33%	1.72%	1.16%	1.15%	1.25%	0.89%	1.43%	1.11%	1.45%	1.24%
	2030	1.35%	1.57%	1.27%	1.28%	1.28%	1.92%	1.68%	1.03%	0.82%	1.11%	1.46%	1.58%	1.33%	1.35%	1.77%	1.18%	1.17%	1.27%	0.92%	1.45%	1.13%	1.47%	1.25%
	2031	1.38%	1.58%	1.29%	1.30%	1.29%	1.95%	1.71%	1.04%	0.84%	1.13%	1.47%	1.59%	1.35%	1.37%	1.73%	1.20%	1.19%	1.30%	0.95%	1.46%	1.14%	1.48%	1.26%
	2032	1.38%	1.60%	1.31%	1.31%	1.30%	1.98%	1.74%	1.05%	0.87%	1.15%	1.48%	1.61%	1.37%	1.38%	1.76%	1.22%	1.19%	1.32%	0.98%	1.48%	1.16%	1.50%	1.27%
	2033	1.40%	1.61%	1.33%	1.33%	1.31%	2.00%	1.77%	1.08%	0.89%	1.17%	1.49%	1.62%	1.38%	1.40%	1.80%	1.24%	1.21%	1.34%	1.01%	1.49%	1.16%	1.51%	1.28%
	2034	1.41%	1.61%	1.36%	1.34%	1.32%	2.02%	1.79%	1.09%	0.91%	1.19%	1.50%	1.64%	1.40%	1.41%	1.80%	1.26%	1.23%	1.37%	1.04%	1.51%	1.18%	1.53%	1.30%
	2035	1.44%	1.63%	1.38%	1.36%	1.33%	2.05%	1.82%	1.12%	0.94%	1.21%	1.51%	1.66%	1.42%	1.44%	1.80%	1.28%	1.25%	1.39%	1.07%	1.53%	1.20%	1.55%	1.31%
LOW	2011	-1.42%	1.93%	-0.88%	0.71%	0.64%	2.91%	0.14%	0.49%	0.03%	0.33%	2.08%	0.18%	0.70%	-0.20%	0.92%	0.92%	1.99%	1.40%	0.67%	-0.26%	1.47%	0.80%	0.45%
	2012	0.45%	0.67%	0.29%	0.42%	0.50%	0.64%	0.45%	0.30%	0.03%	0.25%	0.57%	0.60%	0.46%	0.44%	0.69%	0.34%	0.39%	0.33%	0.08%	0.56%	0.37%	0.54%	0.47%
	2013	0.47%	0.68%	0.33%	0.44%	0.52%	0.68%	0.49%	0.30%	0.06%	0.28%	0.58%	0.62%	0.48%	0.46%	0.73%	0.35%	0.40%	0.35%	0.10%	0.58%	0.39%	0.56%	0.49%
	2014	0.49%	0.70%	0.36%	0.47%	0.53%	0.71%	0.53%	0.31%	0.10%	0.31%	0.60%	0.63%	0.50%	0.49%	0.74%	0.36%	0.43%	0.38%	0.12%	0.59%	0.41%	0.58%	0.50%
	2015	0.51%	0.71%	0.39%	0.50%	0.55%	0.74%	0.56%	0.33%	0.13%	0.33%	0.62%	0.65%	0.52%	0.51%	0.79%	0.38%	0.43%	0.41%	0.15%	0.61%	0.43%	0.60%	0.52%
	2016	0.54%	0.73%	0.42%	0.52%	0.57%	0.77%	0.60%	0.35%	0.16%	0.36%	0.64%	0.67%	0.54%	0.53%	0.79%	0.41%	0.47%	0.43%	0.18%	0.63%	0.45%	0.63%	0.54%
	2017	0.55%	0.75%	0.45%	0.54%	0.58%	0.80%	0.64%	0.37%	0.18%	0.38%	0.66%	0.69%	0.56%	0.55%	0.80%	0.43%	0.48%	0.46%	0.21%	0.65%	0.47%	0.64%	0.55%
	2018	0.58%	0.77%	0.48%	0.56%	0.60%	0.84%	0.67%	0.39%	0.21%	0.41%	0.68%	0.72%	0.58%	0.58%	0.85%	0.45%	0.50%	0.49%	0.24%	0.66%	0.49%	0.66%	0.57%
	2019	0.60%	0.78%	0.50%	0.58%	0.61%	0.85%	0.70%	0.41%	0.24%	0.43%	0.69%	0.74%	0.60%	0.60%	0.85%	0.48%	0.51%	0.51%	0.27%	0.68%	0.50%	0.68%	0.59%
	2020	0.62%	0.79%	0.53%	0.59%	0.62%	0.89%	0.73%	0.43%	0.26%	0.45%	0.71%	0.75%	0.61%	0.61%	0.86%	0.50%	0.53%	0.53%	0.29%	0.70%	0.51%	0.70%	0.60%
	2021	0.64%	0.80%	0.55%	0.61%	0.64%	0.91%	0.75%	0.44%	0.29%	0.47%	0.72%	0.77%	0.63%	0.63%	0.88%	0.52%	0.55%	0.55%	0.32%	0.71%	0.53%	0.71%	0.61%
	2022	0.64%	0.81%	0.57%	0.62%	0.65%	0.93%	0.78%	0.46%	0.31%	0.49%	0.73%	0.78%	0.64%	0.64%	0.89%	0.53%	0.56%	0.58%	0.34%	0.72%	0.54%	0.72%	0.62%
	2023	0.67%	0.82%	0.59%	0.64%	0.66%	0.95%	0.81%	0.47%	0.33%	0.51%	0.75%	0.80%	0.66%	0.66%	0.92%	0.56%	0.58%	0.60%	0.37%	0.74%	0.56%	0.74%	0.64%
	2024	0.68%	0.84%	0.61%	0.65%	0.67%	0.98%	0.83%	0.49%	0.35%	0.53%	0.76%	0.82%	0.68%	0.68%	0.92%	0.57%	0.59%	0.62%	0.39%	0.75%	0.57%	0.76%	0.65%
	2025	0.71%	0.85%	0.63%	0.67%	0.69%	1.00%	0.86%	0.51%	0.37%	0.55%	0.78%	0.83%	0.69%	0.70%	0.92%	0.60%	0.60%	0.64%	0.42%	0.77%	0.58%	0.77%	0.66%
	2026	0.72%	0.86%	0.65%	0.68%	0.70%	1.03%	0.88%	0.53%	0.39%	0.57%	0.79%	0.85%	0.71%	0.71%	0.95%	0.61%	0.62%	0.66%	0.44%	0.78%	0.60%	0.79%	0.67%
	2027	0.73%	0.88%	0.67%	0.70%	0.71%	1.05%	0.90%	0.55%	0.41%	0.59%	0.80%	0.87%	0.72%	0.73%	0.98%	0.63%	0.63%	0.68%	0.46%	0.80%	0.61%	0.80%	0.68%
	2028	0.74%	0.89%	0.69%	0.71%	0.72%	1.07%	0.93%	0.56%	0.43%	0.60%	0.81%	0.87%	0.74%	0.74%	0.96%	0.65%	0.65%	0.70%	0.48%	0.81%	0.62%	0.81%	0.70%
	2029	0.76%	0.89%	0.71%	0.72%	0.72%	1.09%	0.94%	0.57%	0.45%	0.62%	0.82%	0.89%	0.75%	0.76%	0.98%	0.66%	0.65%	0.71%	0.50%	0.82%	0.63%	0.83%	0.70%
	2030	0.77%	0.90%	0.72%	0.73%	0.73%	1.10%	0.96%	0.58%	0.47%	0.63%	0.83%	0.90%	0.76%	0.77%	1.01%	0.67%	0.66%	0.73%	0.52%	0.83%	0.64%	0.84%	0.71%
	2031	0.79%	0.91%	0.73%	0.74%	0.74%	1.12%	0.98%	0.59%	0.48%	0.64%	0.84%	0.91%	0.77%	0.78%	0.99%	0.68%	0.68%	0.74%	0.54%	0.83%	0.65%	0.85%	0.72%
	2032	0.78%	0.91%	0.75%	0.75%	0.74%	1.14%	0.99%	0.60%	0.49%	0.65%	0.84%	0.92%	0.78%	0.79%	1.01%	0.70%	0.68%	0.75%	0.56%	0.85%	0.66%	0.85%	0.72%
	2033	0.80%	0.92%	0.76%	0.76%	0.75%	1.15%	1.01%	0.61%	0.51%	0.67%	0.85%	0.93%	0.79%	0.80%	1.03%	0.71%	0.69%	0.77%	0.57%	0.85%	0.66%	0.86%	0.73%
	2034	0.81%	0.92%	0.77%	0.77%	0.75%	1.16%	1.03%	0.62%	0.52%	0.68%	0.86%	0.94%	0.80%	0.81%	1.03%	0.72%	0.70%	0.78%	0.59%	0.86%	0.67%	0.87%	0.74%
	2035	0.82%	0.93%	0.79%	0.78%	0.76%	1.18%	1.04%	0.63%	0.53%	0.69%	0.86%	0.95%	0.81%	0.82%	1.03%	0.73%	0.71%	0.79%	0.61%	0.87%	0.68%	0.89%	0.75%

DRAFT

Cascade Natural Gas
2010 IRP Demand Forecast
Medium Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aberdeen											
Total Therms Pct. Growth		-10.13%	6.29%	0.16%	0.26%	0.38%	0.48%	0.51%	0.44%	0.42%	0.47%
Residential Therms	3,907,331	3,518,892	3,956,155	3,966,753	3,978,028	3,991,349	4,007,425	4,023,910	4,036,452	4,046,907	4,059,180
Commercial Therms	5,429,998	5,012,117	5,035,732	5,080,783	5,124,677	5,166,491	5,203,766	5,239,481	5,281,307	5,324,463	5,365,212
Industrial Therms	370,556	119,051	249,104	209,061	180,185	162,862	157,989	157,517	147,683	136,427	131,779
Ind., Inst., & Cmcl. Interrup. Therms	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298
Total Core Therms	**10,447,182**	**9,389,358**	**9,980,289**	**9,995,893**	**10,022,188**	**10,059,999**	**10,108,478**	**10,160,205**	**10,204,739**	**10,247,094**	**10,295,469**
Daily Baseload Therms	8,885	7,985	8,488	8,501	8,524	8,556	8,597	8,641	8,679	8,715	8,756
Peak Day Therms	82,423	82,179	83,544	84,112	84,678	85,247	85,808	86,359	86,912	87,450	87,988
Therms Per Residential Customer	740	671	741	738	735	732	730	728	726	723	720
Therms Per Commercial Customer	4,840	4,408	4,372	4,389	4,405	4,418	4,426	4,434	4,445	4,458	4,469
Therms Per Industrial Customer	26,468	9,158	17,188	14,557	12,648	11,506	11,217	11,226	10,544	9,747	9,409
Residential Customers	5,280	5,247	5,337	5,376	5,414	5,452	5,490	5,527	5,564	5,599	5,635
Commercial Customers	1,122	1,137	1,152	1,158	1,163	1,170	1,176	1,182	1,188	1,194	1,201
Industrial Customers	14	13	14	14	14	14	14	14	14	14	14
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**6,418**	**6,399**	**6,505**	**6,550**	**6,594**	**6,638**	**6,682**	**6,725**	**6,768**	**6,809**	**6,851**
Bellingham											
Total Therms Pct. Growth		-22.62%	20.69%	1.04%	1.27%	1.68%	2.31%	2.52%	1.86%	1.66%	2.04%
Residential Therms	30,430,845	26,890,852	32,309,079	32,740,671	33,234,467	33,851,911	34,666,869	35,563,532	36,270,839	36,926,239	37,716,288
Commercial Therms	15,232,543	13,256,906	16,198,008	16,386,934	16,604,937	16,882,704	17,257,737	17,670,962	17,985,798	18,271,256	18,621,610
Industrial Therms	7,407,240	881,544	1,044,490	941,832	867,374	828,625	836,031	861,896	847,802	825,182	831,237
Ind., Inst., & Cmcl. Interrup. Therms	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423
Total Core Therms	**53,240,051**	**41,198,725**	**49,721,000**	**50,238,860**	**50,876,200**	**51,732,663**	**52,930,060**	**54,265,813**	**55,273,863**	**56,192,100**	**57,338,559**
Daily Baseload Therms	52,413	40,559	48,949	49,459	50,086	50,929	52,108	53,423	54,415	55,319	56,448
Peak Day Therms	687,742	695,374	719,474	738,668	757,993	777,444	796,964	816,565	836,242	855,996	875,832
Therms Per Residential Customer	758	663	769	759	750	745	744	745	741	737	736
Therms Per Commercial Customer	3,265	2,760	3,316	3,273	3,238	3,216	3,213	3,218	3,206	3,189	3,184
Therms Per Industrial Customer	185,181	22,604	26,654	24,227	22,479	21,622	21,955	22,767	22,515	22,020	22,280
Residential Customers	40,169	40,531	42,021	43,152	44,292	45,440	46,593	47,752	48,917	50,087	51,263
Commercial Customers	4,666	4,803	4,885	5,007	5,129	5,250	5,371	5,491	5,611	5,730	5,848
Industrial Customers	40	39	39	39	39	38	38	38	38	37	37
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**44,878**	**45,376**	**46,949**	**48,201**	**49,462**	**50,731**	**52,005**	**53,284**	**54,568**	**55,857**	**57,152**
Bremerton											
Total Therms Pct. Growth		-8.37%	13.74%	2.24%	2.23%	2.22%	2.21%	2.19%	2.15%	2.11%	2.10%
Residential Therms	20,587,402	18,579,097	21,373,539	21,703,768	22,041,430	22,394,200	22,767,571	23,150,165	23,514,751	23,873,688	24,247,759
Commercial Therms	9,662,771	9,011,610	10,022,705	10,404,061	10,789,598	11,175,827	11,557,058	11,939,625	12,339,297	12,747,354	13,153,858
Industrial Therms	12,338	107,569	157,905	162,547	166,307	168,496	168,294	167,065	167,629	168,493	167,826
Ind., Inst., & Cmcl. Interrup. Therms	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624
Total Core Therms	**30,620,135**	**28,055,900**	**31,911,772**	**32,627,999**	**33,354,959**	**34,096,146**	**34,850,546**	**35,614,479**	**36,379,301**	**37,147,159**	**37,927,067**
Daily Baseload Therms	34,510	31,620	35,965	36,772	37,592	38,427	39,277	40,138	41,000	41,866	42,745
Peak Day Therms	340,376	344,656	353,167	360,487	367,894	375,409	382,995	390,670	398,445	406,287	414,226
Therms Per Residential Customer	741	662	743	740	737	735	733	731	729	727	725
Therms Per Commercial Customer	3,967	3,569	3,888	3,902	3,914	3,924	3,931	3,936	3,945	3,955	3,962
Therms Per Industrial Customer	6,169	107,569	152,445	153,630	153,934	152,773	149,518	145,474	143,093	141,038	137,779
Residential Customers	27,781	28,073	28,776	29,337	29,905	30,481	31,062	31,650	32,245	32,847	33,455
Commercial Customers	2,436	2,525	2,578	2,666	2,756	2,848	2,940	3,034	3,128	3,223	3,320
Industrial Customers	2	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**30,221**	**30,601**	**31,357**	**32,007**	**32,664**	**33,331**	**34,005**	**34,686**	**35,377**	**36,073**	**36,778**
Kennewick											
Total Therms Pct. Growth		-7.85%	10.29%	3.17%	3.25%	3.41%	3.69%	3.73%	3.30%	3.12%	3.27%
Residential Therms	12,039,314	11,151,277	12,076,395	12,515,274	12,973,548	13,463,218	13,999,853	14,563,409	15,101,683	15,638,945	16,213,687
Commercial Therms	13,631,076	12,529,798	13,795,646	14,259,155	14,732,153	15,227,399	15,759,708	16,306,083	16,809,438	17,295,461	17,806,117
Industrial Therms	303,216	237,748	528,210	470,034	429,870	411,969	423,360	447,372	445,636	438,167	450,180
Ind., Inst., & Cmcl. Interrup. Therms	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384
Total Core Therms	**26,174,990**	**24,120,207**	**26,601,635**	**27,445,847**	**28,336,955**	**29,303,970**	**30,384,305**	**31,518,249**	**32,558,141**	**33,573,957**	**34,671,368**
Daily Baseload Therms	21,076	19,422	21,420	22,100	22,817	23,596	24,466	25,379	26,216	27,034	27,918
Peak Day Therms	352,047	370,835	390,756	407,486	424,634	442,198	460,179	478,595	497,433	516,666	536,346
Therms Per Residential Customer	627	550	565	561	558	556	556	556	555	553	553
Therms Per Commercial Customer	4,616	4,091	4,286	4,243	4,202	4,167	4,142	4,118	4,083	4,044	4,011
Therms Per Industrial Customer	17,836	14,859	32,275	28,712	26,231	25,097	25,730	27,105	26,900	26,337	26,929
Residential Customers	19,214	20,290	21,389	22,301	23,237	24,196	25,178	26,184	27,214	28,266	29,343
Commercial Customers	2,953	3,063	3,219	3,361	3,506	3,654	3,805	3,959	4,117	4,277	4,440
Industrial Customers	17	16	16	16	16	16	16	17	17	17	17
Interruptible Customers	1										
Total Core Customers	**22,185**	**23,369**	**24,624**	**25,679**	**26,759**	**27,866**	**28,999**	**30,160**	**31,347**	**32,559**	**33,799**
Longview											
Total Therms Pct. Growth		-10.09%	13.30%	-0.44%	-0.05%	0.34%	0.83%	1.01%	0.64%	0.55%	0.84%
Residential Therms	1,558,912	1,361,463	1,624,166	1,628,428	1,635,254	1,643,034	1,653,323	1,664,477	1,675,052	1,685,273	1,697,142
Commercial Therms	5,095,213	4,560,755	4,931,111	4,989,926	5,047,585	5,099,319	5,143,676	5,184,838	5,236,088	5,289,383	5,337,806
Industrial Therms	538,181	532,335	773,077	677,064	609,226	574,628	581,752	605,380	592,112	570,739	575,097
Ind., Inst., & Cmcl. Interrup. Therms	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544
Total Core Therms	**7,309,850**	**6,572,097**	**7,445,898**	**7,412,962**	**7,409,609**	**7,434,525**	**7,496,295**	**7,572,240**	**7,620,795**	**7,662,939**	**7,727,590**
Daily Baseload Therms	8,420	7,571	8,577	8,539	8,535	8,564	8,635	8,723	8,779	8,827	8,902
Peak Day Therms	81,924	81,597	82,232	82,801	83,455	84,113	84,821	85,546	86,314	87,087	87,895
Therms Per Residential Customer	602	530	627	624	622	619	618	617	615	613	611
Therms Per Commercial Customer	4,477	3,990	4,285	4,305	4,322	4,334	4,338	4,340	4,348	4,359	4,364
Therms Per Industrial Customer	17,939	18,356	26,216	22,909	20,557	19,331	19,502	20,217	19,692	18,898	18,953
Residential Customers	2,590	2,571	2,592	2,610	2,631	2,652	2,676	2,700	2,725	2,751	2,779
Commercial Customers	1,138	1,143	1,151	1,159	1,168	1,177	1,186	1,195	1,204	1,213	1,223
Industrial Customers	30	29	29	30	30	30	30	30	30	30	30
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**3,759**	**3,744**	**3,773**	**3,799**	**3,829**	**3,859**	**3,892**	**3,925**	**3,960**	**3,996**	**4,033**

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Aberdeen											
Total Therms Pct. Growth	0.49%	0.43%	0.41%	0.46%	0.55%	0.43%	0.43%	0.46%	0.44%	0.43%	0.42%
Residential Therms	4,071,512	4,080,269	4,086,918	4,095,722	4,110,548	4,116,357	4,121,521	4,128,106	4,132,289	4,135,098	4,136,852
Commercial Therms	5,405,529	5,451,003	5,498,225	5,542,044	5,576,754	5,624,088	5,671,512	5,716,024	5,764,074	5,813,934	5,864,044
Industrial Therms	129,103	119,658	108,567	104,109	112,488	104,980	98,196	95,646	90,193	83,760	77,475
Ind., Inst., & Cmcl. Interrup. Therms	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298
Total Core Therms	**10,345,441**	**10,390,227**	**10,433,007**	**10,481,172**	**10,539,087**	**10,584,723**	**10,630,526**	**10,679,073**	**10,725,853**	**10,772,089**	**10,817,668**
Daily Baseload Therms	8,798	8,837	8,873	8,914	8,963	9,002	9,041	9,082	9,122	9,161	9,200
Peak Day Therms	88,521	89,052	89,572	90,087	90,598	91,102	91,598	92,086	92,570	93,050	93,518
Therms Per Residential Customer	718	715	712	710	708	705	702	700	697	693	690
Therms Per Commercial Customer	4,478	4,492	4,507	4,519	4,523	4,537	4,551	4,563	4,577	4,592	4,608
Therms Per Industrial Customer	9,203	8,507	7,696	7,345	7,892	7,313	6,789	6,556	6,122	5,626	5,149
Residential Customers	5,670	5,705	5,739	5,772	5,805	5,838	5,870	5,901	5,932	5,963	5,992
Commercial Customers	1,207	1,214	1,220	1,227	1,233	1,240	1,246	1,253	1,259	1,266	1,273
Industrial Customers	14	14	14	14	14	14	14	15	15	15	15
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**6,893**	**6,934**	**6,975**	**7,015**	**7,055**	**7,094**	**7,132**	**7,170**	**7,208**	**7,246**	**7,282**
Bellingham											
Total Therms Pct. Growth	2.13%	1.55%	1.30%	1.78%	2.89%	1.42%	1.40%	1.75%	1.39%	1.21%	1.14%
Residential Therms	38,550,060	39,200,723	39,773,566	40,523,806	41,691,260	42,340,722	42,990,499	43,782,981	44,446,786	45,045,928	45,622,645
Commercial Therms	18,991,152	19,266,207	19,499,989	19,819,252	20,342,200	20,605,468	20,866,067	21,194,285	21,456,903	21,684,973	21,899,794
Industrial Therms	846,799	827,098	795,416	798,038	877,529	862,772	850,171	864,415	857,318	840,612	822,167
Ind., Inst., & Cmcl. Interrup. Therms	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423
Total Core Therms	**58,557,435**	**59,463,451**	**60,238,395**	**61,310,519**	**63,080,412**	**63,978,386**	**64,876,161**	**66,011,105**	**66,930,431**	**67,740,937**	**68,514,030**
Daily Baseload Therms	57,648	58,540	59,303	60,358	62,101	62,985	63,869	64,986	65,891	66,689	67,450
Peak Day Therms	895,738	915,773	935,887	956,046	976,270	996,540	1,016,854	1,037,217	1,057,604	1,078,070	1,098,591
Therms Per Residential Customer	735	731	725	723	728	725	721	719	716	712	707
Therms Per Commercial Customer	3,183	3,167	3,144	3,137	3,162	3,146	3,132	3,128	3,115	3,098	3,079
Therms Per Industrial Customer	22,789	22,340	21,555	21,689	23,911	23,561	23,259	23,686	23,521	23,085	22,594
Residential Customers	52,444	53,634	54,829	56,028	57,232	58,440	59,651	60,867	62,085	63,308	64,536
Commercial Customers	5,967	6,084	6,202	6,318	6,434	6,549	6,663	6,776	6,889	7,001	7,112
Industrial Customers	37	37	37	37	37	37	37	36	36	36	36
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**58,451**	**59,758**	**61,071**	**62,386**	**63,706**	**65,028**	**66,354**	**67,683**	**69,013**	**70,349**	**71,688**
Bremerton											
Total Therms Pct. Growth	2.08%	2.04%	2.01%	2.00%	2.00%	1.94%	1.92%	1.90%	1.87%	1.85%	1.82%
Residential Therms	24,626,635	24,988,730	25,343,740	25,716,952	26,132,496	26,497,104	26,861,791	27,240,713	27,607,908	27,969,489	28,329,174
Commercial Therms	13,563,909	13,992,126	14,431,223	14,864,496	15,277,242	15,727,177	16,182,013	16,632,855	17,096,932	17,570,842	18,051,659
Industrial Therms	166,584	166,970	167,895	166,966	162,262	161,968	161,483	159,680	158,772	158,238	157,730
Ind., Inst., & Cmcl. Interrup. Therms	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624
Total Core Therms	**38,714,751**	**39,505,450**	**40,300,482**	**41,106,037**	**41,929,624**	**42,743,872**	**43,562,910**	**44,390,872**	**45,221,234**	**46,056,193**	**46,896,186**
Daily Baseload Therms	43,632	44,523	45,419	46,327	47,256	48,173	49,096	50,029	50,965	51,906	52,853
Peak Day Therms	422,246	430,370	438,577	446,865	455,242	463,704	472,243	480,858	489,564	498,357	507,228
Therms Per Residential Customer	723	720	718	715	714	711	709	706	704	701	698
Therms Per Commercial Customer	3,970	3,980	3,992	4,002	4,004	4,015	4,027	4,036	4,047	4,060	4,073
Therms Per Industrial Customer	134,160	131,938	130,197	127,087	121,248	118,834	116,352	113,007	110,381	108,085	105,870
Residential Customers	34,070	34,693	35,322	35,958	36,601	37,251	37,907	38,569	39,239	39,916	40,599
Commercial Customers	3,417	3,515	3,615	3,715	3,815	3,917	4,019	4,121	4,224	4,328	4,432
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**37,490**	**38,211**	**38,940**	**39,676**	**40,420**	**41,171**	**41,929**	**42,694**	**43,467**	**44,248**	**45,035**
Kennewick											
Total Therms Pct. Growth	3.26%	2.89%	2.72%	2.92%	3.47%	2.62%	2.56%	2.71%	2.47%	2.33%	2.25%
Residential Therms	16,808,935	17,378,070	17,941,990	18,552,838	19,265,244	19,876,933	20,498,532	21,162,744	21,808,383	22,449,383	23,094,233
Commercial Therms	18,321,971	18,794,206	19,244,823	19,726,883	20,295,917	20,741,386	21,178,698	21,639,746	22,063,973	22,464,932	22,851,974
Industrial Therms	469,358	464,063	450,033	460,636	529,722	528,813	529,539	551,945	557,573	555,294	551,363
Ind., Inst., & Cmcl. Interrup. Therms	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384
Total Core Therms	**35,801,648**	**36,837,724**	**37,838,230**	**38,941,741**	**40,292,267**	**41,348,516**	**42,408,152**	**43,555,818**	**44,631,313**	**45,670,993**	**46,698,954**
Daily Baseload Therms	28,828	29,662	30,468	31,356	32,444	33,294	34,147	35,071	35,937	36,775	37,602
Peak Day Therms	556,482	577,088	598,170	619,675	641,650	664,049	686,885	710,183	733,916	758,121	782,764
Therms Per Residential Customer	552	550	548	547	549	547	545	544	543	541	539
Therms Per Commercial Customer	3,978	3,935	3,889	3,849	3,827	3,781	3,735	3,694	3,648	3,599	3,550
Therms Per Industrial Customer	27,928	27,455	26,460	26,905	30,723	30,441	30,244	31,262	31,310	30,904	30,402
Residential Customers	30,445	31,574	32,729	33,908	35,114	36,344	37,598	38,878	40,184	41,515	42,872
Commercial Customers	4,606	4,776	4,949	5,125	5,304	5,485	5,670	5,858	6,048	6,241	6,438
Industrial Customers	17	17	17	17	17	17	18	18	18	18	18
Interruptible Customers											
Total Core Customers	**35,068**	**36,366**	**37,695**	**39,050**	**40,435**	**41,846**	**43,286**	**44,754**	**46,249**	**47,775**	**49,328**
Longview											
Total Therms Pct. Growth	0.94%	0.60%	0.53%	0.81%	1.48%	0.66%	0.67%	0.89%	0.72%	0.65%	0.62%
Residential Therms	1,709,699	1,721,008	1,732,834	1,745,390	1,761,085	1,774,133	1,787,100	1,801,108	1,814,837	1,828,440	1,841,597
Commercial Therms	5,384,917	5,439,904	5,499,979	5,550,953	5,584,879	5,641,725	5,697,830	5,747,827	5,803,662	5,862,269	5,920,680
Industrial Therms	587,768	568,231	538,102	538,178	606,479	590,139	575,568	584,534	574,432	555,873	535,901
Ind., Inst., & Cmcl. Interrup. Therms	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544
Total Core Therms	**7,799,928**	**7,846,687**	**7,888,459**	**7,952,065**	**8,069,987**	**8,123,541**	**8,178,042**	**8,251,014**	**8,310,474**	**8,364,126**	**8,415,721**
Daily Baseload Therms	8,985	9,039	9,087	9,160	9,296	9,358	9,420	9,505	9,573	9,635	9,694
Peak Day Therms	88,725	89,561	90,449	91,317	92,205	93,136	94,067	95,006	95,974	96,959	97,933
Therms Per Residential Customer	609	607	605	603	602	599	597	595	593	591	588
Therms Per Commercial Customer	4,368	4,379	4,392	4,399	4,392	4,403	4,413	4,419	4,429	4,440	4,453
Therms Per Industrial Customer	19,275	18,540	17,463	17,370	19,465	18,830	18,256	18,428	17,997	17,305	16,578
Residential Customers	2,807	2,835	2,866	2,896	2,927	2,960	2,993	3,026	3,060	3,096	3,130
Commercial Customers	1,233	1,242	1,252	1,262	1,271	1,281	1,291	1,301	1,310	1,320	1,330
Industrial Customers	30	31	31	31	31	31	32	32	32	32	32
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**4,071**	**4,109**	**4,150**	**4,190**	**4,231**	**4,273**	**4,316**	**4,359**	**4,404**	**4,449**	**4,494**

Cascade Natural Gas
2010 IRP Demand Forecast
Medium Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Moses Lake																						
Total Therms Pct. Growth		-5.62%	2.83%	0.59%	0.73%	1.00%	1.40%	1.54%	1.16%	1.06%	1.30%	1.37%	1.05%	0.92%	1.21%	1.86%	1.04%	1.03%	1.24%	1.06%	0.97%	0.94%
Residential Therms	1,128,284	986,252	1,058,494	1,049,027	1,041,514	1,037,769	1,039,753	1,043,785	1,042,150	1,038,919	1,039,251	1,040,536	1,036,799	1,031,055	1,029,760	1,038,439	1,034,296	1,030,111	1,029,188	1,025,256	1,019,862	1,014,013
Commercial Therms	2,636,699	2,392,003	2,409,645	2,417,129	2,428,264	2,446,238	2,474,776	2,507,477	2,530,361	2,550,647	2,577,826	2,607,233	2,627,496	2,644,101	2,669,510	2,714,821	2,735,391	2,756,007	2,783,436	2,804,969	2,823,597	2,841,304
Industrial Therms	423,447	574,965	596,949	622,913	649,323	676,287	703,862	731,896	760,290	789,122	818,554	848,596	879,074	909,900	941,462	973,574	1,006,141	1,038,859	1,072,402	1,106,472	1,140,983	1,175,903
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**4,188,430**	**3,953,220**	**4,065,089**	**4,089,069**	**4,119,101**	**4,160,294**	**4,218,391**	**4,283,159**	**4,332,801**	**4,378,688**	**4,435,630**	**4,496,365**	**4,543,369**	**4,585,056**	**4,640,732**	**4,726,834**	**4,775,828**	**4,824,977**	**4,885,025**	**4,936,697**	**4,984,443**	**5,031,219**
Daily Baseload Therms	3,668	3,462	3,560	3,581	3,607	3,644	3,694	3,751	3,795	3,835	3,885	3,938	3,979	4,016	4,064	4,140	4,183	4,226	4,278	4,323	4,365	4,406
Peak Day Therms	79,359	79,335	79,840	80,310	80,772	81,229	81,682	82,128	82,570	83,006	83,438	83,867	84,292	84,712	85,129	85,540	85,949	86,351	86,750	87,145	87,537	87,925
Therms Per Residential Customer	608	534	571	564	558	554	553	553	550	547	545	544	541	536	534	537	533	529	527	524	520	515
Therms Per Commercial Customer	4,179	3,732	3,717	3,689	3,667	3,657	3,662	3,674	3,672	3,667	3,672	3,680	3,676	3,667	3,671	3,702	3,699	3,697	3,705	3,705	3,701	3,697
Therms Per Industrial Customer	23,832	33,821	32,537	32,456	32,368	32,276	32,183	32,086	31,976	31,858	31,739	31,615	31,482	31,343	31,203	31,069	30,918	30,762	30,606	30,444	30,277	30,108
Residential Customers	1,856	1,846	1,853	1,860	1,867	1,874	1,880	1,887	1,893	1,900	1,906	1,912	1,918	1,924	1,929	1,935	1,941	1,946	1,952	1,957	1,962	1,968
Commercial Customers	631	641	648	655	662	669	676	682	689	696	702	708	715	721	727	733	739	745	751	757	763	769
Industrial Customers	18	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33	34	35	36	38	39
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**2,505**	**2,504**	**2,520**	**2,535**	**2,549**	**2,564**	**2,578**	**2,592**	**2,606**	**2,620**	**2,634**	**2,647**	**2,660**	**2,674**	**2,687**	**2,700**	**2,713**	**2,725**	**2,738**	**2,751**	**2,763**	**2,775**
Mount Vernon																						
Total Therms Pct. Growth		-11.48%	13.75%	1.59%	1.68%	1.80%	1.99%	2.05%	1.86%	1.80%	1.91%	1.93%	1.76%	1.68%	1.82%	2.12%	1.70%	1.67%	1.76%	1.65%	1.59%	1.56%
Residential Therms	25,288,799	22,864,684	26,539,874	27,084,401	27,645,018	28,224,706	28,831,758	29,451,791	30,046,525	30,636,674	31,245,983	31,862,023	32,456,837	33,042,670	33,653,807	34,318,832	34,918,517	35,515,167	36,131,445	36,732,141	37,322,265	37,912,059
Commercial Therms	15,862,796	13,992,239	15,308,828	15,569,059	15,850,328	16,169,092	16,545,572	16,948,668	17,303,446	17,648,581	18,034,383	18,435,959	18,791,698	19,129,991	19,521,591	20,030,742	20,403,314	20,778,210	21,196,723	21,584,454	21,956,666	22,327,391
Industrial Therms	1,932,734	1,267,068	1,536,180	1,423,459	1,323,335	1,236,023	1,161,683	1,095,592	1,030,670	970,136	917,102	868,882	821,160	775,964	736,876	706,126	671,051	638,603	610,072	582,225	555,700	530,774
Ind., Inst., & Cmcl. Interrup. Therms	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980
Total Core Therms	**43,209,309**	**38,248,971**	**43,509,863**	**44,201,899**	**44,943,661**	**45,754,801**	**46,663,994**	**47,621,032**	**48,505,621**	**49,380,371**	**50,322,448**	**51,291,844**	**52,194,675**	**53,073,606**	**54,037,254**	**55,180,680**	**56,117,862**	**57,056,960**	**58,063,219**	**59,023,800**	**59,959,611**	**60,895,203**
Daily Baseload Therms	42,329	37,470	42,624	43,302	44,028	44,823	45,714	46,651	47,518	48,375	49,298	50,247	51,132	51,993	52,937	54,057	54,975	55,895	56,881	57,822	58,739	59,655
Peak Day Therms	483,671	490,685	500,909	512,793	524,930	537,236	549,687	562,304	575,037	587,936	600,995	614,193	627,573	641,106	654,810	668,634	682,644	696,731	710,977	725,381	739,888	754,579
Therms Per Residential Customer	720	642	728	726	724	722	721	720	718	716	714	712	710	708	706	705	702	700	697	695	692	689
Therms Per Commercial Customer	3,539	3,054	3,316	3,294	3,276	3,266	3,266	3,271	3,265	3,258	3,257	3,258	3,251	3,240	3,237	3,253	3,246	3,239	3,239	3,233	3,225	3,216
Therms Per Industrial Customer	20,782	13,924	17,950	17,801	17,684	17,623	17,644	17,697	17,678	17,641	17,657	17,688	17,655	17,598	17,604	17,750	17,724	17,701	17,726	17,712	17,680	17,644
Residential Customers	35,144	35,623	36,432	37,304	38,194	39,096	40,009	40,933	41,865	42,809	43,765	44,730	45,709	46,699	47,701	48,711	49,736	50,765	51,807	52,859	53,920	54,993
Commercial Customers	4,482	4,581	4,617	4,727	4,838	4,951	5,066	5,182	5,299	5,417	5,537	5,658	5,781	5,905	6,031	6,157	6,286	6,414	6,545	6,676	6,809	6,943
Industrial Customers	93	91	86	80	75	70	66	62	58	55	52	49	47	44	42	40	38	36	34	33	31	30
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**39,720**	**40,296**	**41,136**	**42,112**	**43,108**	**44,119**	**45,141**	**46,177**	**47,223**	**48,283**	**49,355**	**50,439**	**51,538**	**52,649**	**53,774**	**54,910**	**56,060**	**57,217**	**58,387**	**59,570**	**60,761**	**61,968**
Sunnyside																						
Total Therms Pct. Growth		-8.54%	3.79%	-0.55%	-0.40%	-0.17%	0.17%	0.30%	0.00%	-0.07%	0.14%	0.20%	-0.06%	-0.16%	0.09%	0.65%	-0.04%	-0.04%	0.15%	-0.01%	-0.08%	-0.10%
Residential Therms	3,221,397	2,840,914	3,169,522	3,149,195	3,136,284	3,136,478	3,156,388	3,184,070	3,194,027	3,199,668	3,217,914	3,240,227	3,246,397	3,246,400	3,262,201	3,313,138	3,320,774	3,328,989	3,349,200	3,359,470	3,364,989	3,369,275
Commercial Therms	4,927,358	4,464,731	4,574,176	4,591,817	4,608,701	4,624,851	4,640,031	4,654,324	4,667,774	4,680,366	4,692,191	4,703,361	4,714,014	4,724,131	4,733,344	4,741,839	4,749,574	4,756,568	4,762,802	4,768,423	4,773,447	4,777,953
Industrial Therms	1,330,870	1,357,639	1,250,962	1,204,161	1,163,711	1,132,192	1,112,577	1,097,736	1,074,255	1,049,467	1,031,714	1,016,438	993,990	969,445	952,850	952,136	932,736	914,200	901,220	884,597	866,621	848,734
Ind., Inst., & Cmcl. Interrup. Therms	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359
Total Core Therms	**9,556,984**	**8,740,643**	**9,072,019**	**9,022,531**	**8,986,056**	**8,970,880**	**8,986,355**	**9,013,489**	**9,013,415**	**9,006,860**	**9,019,178**	**9,037,385**	**9,031,760**	**9,017,336**	**9,025,754**	**9,084,472**	**9,080,443**	**9,077,117**	**9,090,581**	**9,089,849**	**9,082,417**	**9,073,321**
Daily Baseload Therms	6,696	6,124	6,356	6,321	6,296	6,285	6,296	6,315	6,315	6,310	6,319	6,332	6,328	6,318	6,324	6,365	6,362	6,360	6,369	6,369	6,363	6,357
Peak Day Therms	98,050	98,538	98,605	98,974	99,333	99,685	100,026	100,358	100,681	100,993	101,298	101,595	101,886	102,171	102,446	102,714	102,973	103,223	103,465	103,700	103,927	104,148
Therms Per Residential Customer	613	539	601	595	590	588	590	593	593	592	594	596	596	594	595	603	603	603	605	606	605	605
Therms Per Commercial Customer	3,705	3,310	3,393	3,390	3,388	3,385	3,382	3,379	3,376	3,373	3,370	3,367	3,363	3,360	3,357	3,353	3,350	3,346	3,342	3,339	3,335	3,331
Therms Per Industrial Customer	28,316	28,284	26,299	25,681	25,164	24,811	24,694	24,665	24,422	24,127	23,977	23,869	23,578	23,220	23,036	23,225	22,946	22,674	22,526	22,276	21,979	21,673
Residential Customers	5,256	5,269	5,275	5,294	5,313	5,332	5,350	5,367	5,384	5,401	5,417	5,433	5,449	5,464	5,479	5,493	5,507	5,521	5,534	5,547	5,560	5,572
Commercial Customers	1,330	1,349	1,348	1,354	1,360	1,366	1,372	1,377	1,383	1,388	1,392	1,397	1,402	1,406	1,410	1,414	1,418	1,422	1,425	1,428	1,431	1,434
Industrial Customers	47	48	48	47	46	46	45	45	44	43	43	43	42	42	41	41	41	40	40	40	39	39
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**6,634**	**6,667**	**6,672**	**6,697**	**6,721**	**6,745**	**6,768**	**6,790**	**6,812**	**6,833**	**6,854**	**6,874**	**6,894**	**6,913**	**6,931**	**6,950**	**6,967**	**6,984**	**7,000**	**7,016**	**7,032**	**7,047**
Walla Walla																						
Total Therms Pct. Growth		-12.93%	9.43%	0.40%	0.45%	0.60%	0.84%	0.91%	0.64%	0.54%	0.68%	0.71%	0.46%	0.34%	0.51%	0.97%	0.33%	0.30%	0.44%	0.27%	0.18%	0.14%
Residential Therms	6,915,315	6,012,829	6,693,983	6,695,631	6,709,824	6,750,854	6,833,431	6,931,115	6,986,454	7,028,579	7,096,505	7,171,945	7,208,263	7,227,078	7,278,318	7,407,412	7,433,514	7,457,071	7,506,185	7,529,097	7,538,145	7,541,782
Commercial Therms	4,450,732	3,915,927	4,132,770	4,171,914	4,206,346	4,232,788	4,247,734	4,257,153	4,276,131	4,296,571	4,309,381	4,319,255	4,337,862	4,359,233	4,370,809	4,362,213	4,377,145	4,390,902	4,397,649	4,409,310	4,422,770	4,436,575
Industrial Therms	117,769	69,756	114,825	117,371	118,700	117,840	113,603	108,430	106,102	104,490	101,037	97,190	95,606	94,866	92,062	85,071	83,461	81,809	78,857	77,026	75,750	74,577
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**11,483,816**	**9,998,512**	**10,941,578**	**10,984,916**	**11,034,870**	**11,101,482**	**11,194,768**	**11,296,697**	**11,368,686**	**11,429,640**	**11,506,923**	**11,588,390**	**11,641,731**	**11,681,178**	**11,741,189**	**11,854,696**	**11,894,120**	**11,929,782**	**11,982,691**	**12,015,433**	**12,036,664**	**12,052,935**
Daily Baseload Therms	7,903	6,881	7,530	7,559	7,594	7,640	7,704	7,774	7,823	7,865	7,919	7,975	8,011	8,039	8,080	8,158	8,185	8,210	8,246	8,269	8,283	8,294
Peak Day Therms	161,336	162,129	162,974	165,097	167,179	169,245	171,283	173,280	175,234	177,128	178,978	180,798	182,582	184,306	185,958	187,552	189,082	190,537	191,953	193,305	194,599	195,842
Therms Per Residential Customer	666	578	640	631	624	620	619	620	618	615	614	614	610	606	604	610	607	604	603	600	597	593
Therms Per Commercial Customer	3,645	3,125	3,295	3,307	3,316	3,319	3,313	3,303	3,300	3,300	3,294	3,285	3,284	3,285	3,279	3,259	3,256	3,253	3,245	3,241	3,238	3,236
Therms Per Industrial Customer	39,256	23,252	40,883	42,945	44,616	45,470	45,026	44,087	44,264	44,701	44,334	43,715	44,084	44,830	44,583	42,237	42,468	42,654	42,141	42,190	42,501	42,877
Residential Customers	10,381	10,406	10,466	10,611	10,754	10,896	11,036	11,173	11,307	11,436	11,563	11,688	11,810	11,928	12,041	12,150	12,254	12,354	12,450	12,542	12,630	12,714
Commercial Customers	1,221	1,253	1,254	1,261	1,269	1,275	1,282	1,289	1,296	1,302	1,308	1,315	1,321	1,327	1,333	1,339	1,344	1,350	1,355	1,361	1,366	1,371
Industrial Customers	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**11,605**	**11,662**	**11,723**	**11,876**	**12,025**	**12,174**	**12,320**	**12,464**	**12,605**	**12,741**	**12,874**	**13,005**	**13,133**	**13,257**	**13,376**	**13,491**	**13,601**	**13,705**	**13,807**	**13,904**	**13,998**	**14,087**
Wenatchee																						
Total Therms Pct. Growth		1.43%	0.83%	-0.59%	-0.67%	-0.80%	-0.99%	-1.08%	-0.96%	-0.95%	-1.07%	-1.12%	-1.00%	-0.96%	-1.11%	-1.39%	-1.07%	-1.09%	-1.19%	-1.12%	-1.09%	-1.09%
Residential Therms	794,386	664,824	812,488	801,762	793,697	790,177	793,453	799,318	798,811	796,672	798,811	802,225	799,956	795,496	796,344	809,077	806,881	804,787	806,646	805,055	801,824	798,118
Commercial Therms	4,046,946	3,580,768	3,850,150	3,806,459	3,758,783	3,705,475	3,644,852	3,581,194	3,522,483	3,464,212	3,401,900	3,338,368	3,279,453	3,222,259	3,160,451	3,090,155	3,030,788	2,971,091	2,908,867	2,849,250	2,791,084	2,733,672
Industrial Therms	604,621	1,279,349	908,697	929,696	947,611	959,547	961,847	960,528	967,530	976,710	979,874	981,043	990,024	1,002,024	1,006,373	993,733	1,001,949	1,010,035	1,012,221	1,019,165	1,028,622	1,038,545
Ind., Inst., & Cmcl. Interrup. Therms	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715
Total Core Therms	**5,541,668**	**5,620,656**	**5,667,049**	**5,633,632**	**5,595,805**	**5,550,915**	**5,495,867**	**5,436,755**	**5,384,538**	**5,333,309**	**5,276,299**	**5,217,351**	**5,165,148**	**5,115,494**	**5,058,883**	**4,988,680**	**4,935,333**	**4,881,628**	**4,823,449**	**4,769,185**	**4,717,245**	**4,666,050**
Daily Baseload Therms	4,955	5,026	5,067	5,037	5,003	4,963	4,914	4,861	4,814	4,769	4,718	4,665	4,618	4,574	4,523	4,460	4,413	4,365	4,313	4,264	4,218	4,172
Peak Day Therms	60,724	60,092	60,157	60,295	60,437	60,580	60,722	60,863	61,003	61,141	61,278	61,413	61,548	61,682	61,813	61,941	62,067	62,190	62,309	62,426	62,541	62,652
Therms Per Residential Customer	513	437	533	524	516	512	512	514	511	508	507	508	505	500	499	506	503	500	500	497	494	491
Therms Per Commercial Customer	5,367	4,712	5,066	5,018	4,963	4,899	4,824	4,744	4,670	4,596	4,515	4,432	4,355	4,279	4,197	4,104	4,024	3,944	3,860	3,780	3,701	3,623
Therms Per Industrial Customer	28,477	63,967	46,564	47,758	48,820	49,595	49,900	50,031	50,624	51,350	51,775	52,114	52,884	53,838	54,400	54,054	54,860	55,675	56,190	56,988	57,935	58,940
Residential Customers	1,550	1,521	1,524	1,531	1,537	1,544	1,550	1,557	1,563	1,568	1,574	1,580	1,585	1,590	1,595	1,600	1,605	1,610	1,614	1,619	1,623	1,627
Commercial Customers	754	760	760	759	757	756	756	755	754	754	753	753	753	753	753	753	753	753	754	754	754	754
Industrial Customers	21	20	20	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**2,326**	**2,302**	**2,305**	**2,310**	**2,315**	**2,321**	**2,326**	**2,332**	**2,337**	**2,342**	**2,347**	**2,353**	**2,358**	**2,363**	**2,368**	**2,373**	**2,378**	**2,382**	**2,387**	**2,391**	**2,396**	**2,400**

Cascade Natural Gas
2010 IRP Demand Forecast
Medium Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Yakima											
Total Therms Pct. Growth		-9.04%	8.49%	-0.79%	-0.50%	0.02%	0.79%	1.08%	0.39%	0.22%	0.70%
Residential Therms	13,231,368	11,854,531	13,269,943	13,265,969	13,292,033	13,372,450	13,536,246	13,732,738	13,850,529	13,947,322	14,098,342
Commercial Therms	13,019,439	11,913,848	13,085,021	12,955,103	12,869,077	12,859,078	12,963,413	13,112,643	13,157,836	13,176,993	13,269,255
Industrial Therms	3,099,141	2,915,647	2,606,117	2,509,530	2,425,571	2,359,495	2,317,299	2,284,689	2,234,724	2,182,210	2,143,854
Ind., Inst., & Cmcl. Interrup. Therms	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484
Total Core Therms	**29,500,432**	**26,834,510**	**29,111,565**	**28,881,086**	**28,737,165**	**28,741,507**	**28,967,443**	**29,280,554**	**29,393,573**	**29,457,009**	**29,661,936**
Daily Baseload Therms	21,301	19,376	21,020	20,853	20,749	20,753	20,916	21,142	21,223	21,269	21,417
Peak Day Therms	305,047	307,465	309,462	312,316	315,135	317,911	320,624	323,273	325,858	328,374	330,833
Therms Per Residential Customer	694	619	688	681	676	674	676	680	680	679	681
Therms Per Commercial Customer	3,943	3,518	3,833	3,772	3,725	3,701	3,710	3,732	3,725	3,711	3,718
Therms Per Industrial Customer	40,249	37,866	34,116	33,356	32,720	32,290	32,157	32,134	31,842	31,486	31,310
Residential Customers	19,070	19,163	19,283	19,474	19,663	19,848	20,029	20,206	20,378	20,546	20,709
Commercial Customers	3,302	3,387	3,414	3,434	3,455	3,475	3,494	3,514	3,532	3,551	3,569
Industrial Customers	77	77	76	75	74	73	72	71	70	69	68
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**22,452**	**22,630**	**22,777**	**22,987**	**23,195**	**23,399**	**23,599**	**23,793**	**23,984**	**24,169**	**24,350**
Baker											
Total Therms Pct. Growth		-9.10%	14.70%	-1.78%	-1.29%	-0.66%	0.15%	0.46%	-0.05%	-0.17%	0.33%
Residential Therms	2,243,586	2,086,237	2,371,398	2,333,081	2,304,401	2,291,292	2,300,004	2,316,995	2,317,781	2,314,911	2,326,604
Commercial Therms	1,782,755	1,549,125	1,734,448	1,730,894	1,729,742	1,731,818	1,739,851	1,749,452	1,753,817	1,755,573	1,761,391
Industrial Therms	56,153	75,629	150,587	116,671	92,579	76,524	66,044	58,248	50,968	45,080	41,137
Ind., Inst., & Cmcl. Interrup. Therms	0										
Total Core Therms	**4,082,494**	**3,710,991**	**4,256,432**	**4,180,646**	**4,126,722**	**4,099,634**	**4,105,899**	**4,124,695**	**4,122,567**	**4,115,564**	**4,129,132**
Daily Baseload Therms	3,336	3,032	3,478	3,416	3,372	3,350	3,355	3,370	3,369	3,363	3,374
Peak Day Therms	25,970	26,208	26,742	26,760	26,789	26,831	26,880	26,927	27,001	27,080	27,171
Therms Per Residential Customer	675	622	693	682	673	668	670	674	673	670	672
Therms Per Commercial Customer	3,638	3,130	3,438	3,409	3,384	3,366	3,361	3,360	3,349	3,334	3,328
Therms Per Industrial Customer	28,077	18,907	37,735	35,183	33,208	32,017	31,888	32,158	31,502	30,642	30,417
Residential Customers	3,326	3,354	3,423	3,423	3,424	3,428	3,432	3,436	3,444	3,453	3,464
Commercial Customers	490	495	504	508	511	514	518	521	524	527	529
Industrial Customers	2	4	4	3	3	2	2	2	2	1	1
Interruptible Customers	0										
Total Core Customers	**3,818**	**3,853**	**3,931**	**3,934**	**3,938**	**3,945**	**3,952**	**3,959**	**3,970**	**3,981**	**3,995**
Bend											
Total Therms Pct. Growth		-5.63%	7.62%	0.87%	1.18%	1.67%	2.38%	2.67%	2.11%	1.99%	2.44%
Residential Therms	29,229,820	27,584,941	29,192,054	29,584,595	30,019,483	30,522,224	31,128,048	31,782,738	32,367,103	32,941,903	33,591,377
Commercial Therms	18,308,461	17,303,858	18,816,696	19,034,960	19,339,623	19,796,333	20,490,787	21,302,587	21,936,497	22,540,051	23,323,180
Industrial Therms	1,897,103	1,764,667	2,201,244	2,025,553	1,883,232	1,778,376	1,716,585	1,673,769	1,609,277	1,545,070	1,504,832
Ind., Inst., & Cmcl. Interrup. Therms	0										
Total Core Therms	**49,435,384**	**46,653,466**	**50,209,995**	**50,645,108**	**51,242,338**	**52,096,934**	**53,335,420**	**54,759,094**	**55,912,878**	**57,027,024**	**58,419,390**
Daily Baseload Therms	41,653	39,309	42,306	42,672	43,175	43,895	44,939	46,138	47,111	48,049	49,223
Peak Day Therms	567,544	571,024	581,526	592,716	604,125	615,711	627,497	639,450	651,600	663,929	676,467
Therms Per Residential Customer	783	738	767	764	761	760	761	763	763	763	764
Therms Per Commercial Customer	3,046	2,779	2,963	2,921	2,894	2,889	2,918	2,961	2,977	2,987	3,020
Therms Per Industrial Customer	36,483	32,085	41,395	39,984	38,898	38,321	38,474	38,912	38,701	38,338	38,433
Residential Customers	37,318	37,366	38,045	38,738	39,446	40,165	40,897	41,640	42,395	43,163	43,944
Commercial Customers	6,011	6,226	6,351	6,516	6,683	6,851	7,022	7,194	7,369	7,545	7,723
Industrial Customers	52	55	53	51	48	46	45	43	42	40	39
Interruptible Customers	0										
Total Core Customers	**43,381**	**43,647**	**44,450**	**45,305**	**46,177**	**47,063**	**47,964**	**48,877**	**49,806**	**50,748**	**51,707**
Ontario											
Total Therms Pct. Growth		-12.87%	20.32%	-2.28%	-1.86%	-1.16%	0.12%	0.50%	-0.52%	-0.54%	0.13%
Residential Therms	2,095,880	1,887,207	2,125,986	2,106,052	2,089,307	2,077,013	2,076,622	2,077,709	2,071,304	2,067,911	2,068,310
Commercial Therms	2,785,550	2,361,432	2,798,301	2,713,364	2,649,463	2,617,613	2,639,137	2,677,410	2,672,627	2,665,138	2,686,176
Industrial Therms	325,396	288,166	534,568	515,190	496,539	479,811	465,108	451,689	435,958	419,110	404,243
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**5,206,826**	**4,536,805**	**5,458,855**	**5,334,605**	**5,235,310**	**5,174,437**	**5,180,867**	**5,206,808**	**5,179,889**	**5,152,159**	**5,158,729**
Daily Baseload Therms	3,868	3,370	4,055	3,963	3,889	3,844	3,849	3,868	3,848	3,827	3,832
Peak Day Therms	30,459	30,432	30,766	30,715	30,667	30,611	30,622	30,612	30,589	30,636	30,669
Therms Per Residential Customer	581	525	586	582	578	576	575	576	575	573	572
Therms Per Commercial Customer	3,231	2,714	3,161	3,069	3,001	2,970	2,992	3,035	3,032	3,017	3,037
Therms Per Industrial Customer	46,485	28,817	53,357	50,876	48,533	46,459	44,618	42,956	41,117	39,208	37,523
Residential Customers	3,609	3,594	3,628	3,621	3,616	3,609	3,609	3,608	3,605	3,610	3,614
Commercial Customers	862	870	885	884	883	881	882	882	882	883	884
Industrial Customers	7	10	10	10	10	10	10	11	11	11	11
Interruptible Customers											
Total Core Customers	**4,478**	**4,474**	**4,523**	**4,516**	**4,509**	**4,500**	**4,502**	**4,501**	**4,497**	**4,504**	**4,509**
Pendleton											
Total Therms Pct. Growth		-12.82%	13.97%	0.64%	0.76%	1.03%	1.44%	1.59%	1.16%	1.03%	1.29%
Residential Therms	6,364,636	5,560,032	6,434,515	6,516,206	6,615,538	6,751,254	6,942,211	7,157,153	7,318,943	7,465,722	7,649,940
Commercial Therms	6,762,023	5,980,426	6,219,332	6,249,181	6,282,728	6,323,844	6,376,672	6,433,361	6,477,043	6,516,196	6,562,750
Industrial Therms	896,694	684,950	1,278,935	1,256,733	1,230,852	1,199,911	1,161,355	1,120,383	1,085,536	1,052,172	1,014,954
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**14,023,353**	**12,225,408**	**13,932,783**	**14,022,121**	**14,129,118**	**14,275,009**	**14,480,238**	**14,710,897**	**14,881,523**	**15,034,091**	**15,227,644**
Daily Baseload Therms	14,417	12,569	14,324	14,416	14,526	14,676	14,887	15,124	15,299	15,456	15,655
Peak Day Therms	194,931	196,962	200,948	205,630	210,280	214,942	219,525	224,057	228,524	232,909	237,201
Therms Per Residential Customer	610	526	596	589	583	581	584	589	590	589	592
Therms Per Commercial Customer	3,711	3,286	3,359	3,340	3,323	3,311	3,306	3,303	3,294	3,283	3,277
Therms Per Industrial Customer	42,700	29,780	55,489	54,448	53,249	51,832	50,091	48,252	46,682	45,182	43,523
Residential Customers	10,441	10,569	10,789	11,064	11,338	11,612	11,882	12,149	12,411	12,669	12,922
Commercial Customers	1,822	1,820	1,851	1,871	1,890	1,910	1,929	1,948	1,966	1,985	2,003
Industrial Customers	21	23	23	23	23	23	23	23	23	23	23
Interruptible Customers											
Total Core Customers	**12,284**	**12,412**	**12,663**	**12,958**	**13,251**	**13,545**	**13,834**	**14,119**	**14,401**	**14,677**	**14,948**

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Yakima											
Total Therms Pct. Growth	0.85%	0.23%	0.00%	0.59%	1.90%	0.27%	0.28%	0.72%	0.34%	0.17%	0.12%
Residential Therms	14,266,698	14,362,467	14,429,304	14,565,048	14,859,092	14,955,214	15,051,728	15,201,612	15,304,139	15,383,151	15,454,910
Commercial Therms	13,384,971	13,405,705	13,389,786	13,465,742	13,747,711	13,774,563	13,803,806	13,903,362	13,943,539	13,955,258	13,959,250
Industrial Therms	2,110,485	2,062,767	2,010,926	1,975,078	1,971,030	1,929,711	1,890,280	1,861,963	1,826,514	1,788,446	1,750,644
Ind., Inst., & Cmcl. Interrup. Therms	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484
Total Core Therms	**29,912,639**	**29,981,423**	**29,980,499**	**30,156,353**	**30,728,317**	**30,809,972**	**30,896,298**	**31,117,422**	**31,224,677**	**31,277,338**	**31,315,289**
Daily Baseload Therms	21,598	21,648	21,647	21,774	22,187	22,246	22,308	22,468	22,546	22,584	22,611
Peak Day Therms	333,246	335,622	337,956	340,219	342,428	344,565	346,628	348,634	350,574	352,461	354,298
Therms Per Residential Customer	684	683	681	683	692	692	692	694	695	695	694
Therms Per Commercial Customer	3,731	3,719	3,696	3,700	3,760	3,750	3,742	3,752	3,748	3,736	3,722
Therms Per Industrial Customer	31,189	30,837	30,401	30,183	30,438	30,101	29,772	29,601	29,299	28,939	28,566
Residential Customers	20,870	21,027	21,182	21,332	21,479	21,620	21,757	21,889	22,017	22,141	22,262
Commercial Customers	3,587	3,605	3,623	3,640	3,657	3,673	3,689	3,705	3,721	3,736	3,751
Industrial Customers	68	67	66	65	65	64	63	63	62	62	61
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**24,528**	**24,702**	**24,874**	**25,041**	**25,203**	**25,361**	**25,512**	**25,660**	**25,803**	**25,942**	**26,077**
Baker											
Total Therms Pct. Growth	0.46%	-0.03%	-0.23%	0.33%	1.58%	0.12%	0.12%	0.64%	0.23%	0.16%	0.07%
Residential Therms	2,342,639	2,343,218	2,337,673	2,350,063	2,401,483	2,408,053	2,415,158	2,438,555	2,450,518	2,459,491	2,466,936
Commercial Therms	1,767,542	1,769,112	1,768,127	1,771,059	1,784,282	1,783,896	1,782,578	1,785,718	1,782,948	1,780,479	1,775,343
Industrial Therms	38,103	34,779	31,717	30,202	30,972	29,948	29,213	29,663	30,070	30,383	31,105
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**4,148,284**	**4,147,110**	**4,137,517**	**4,151,325**	**4,216,738**	**4,221,897**	**4,226,950**	**4,253,936**	**4,263,536**	**4,270,354**	**4,273,384**
Daily Baseload Therms	3,390	3,389	3,381	3,392	3,446	3,450	3,454	3,476	3,484	3,490	3,492
Peak Day Therms	27,261	27,367	27,474	27,592	27,730	27,872	28,011	28,187	28,346	28,529	28,705
Therms Per Residential Customer	674	672	668	668	680	678	676	678	677	675	673
Therms Per Commercial Customer	3,323	3,309	3,292	3,283	3,294	3,281	3,268	3,261	3,249	3,235	3,220
Therms Per Industrial Customer	30,384	29,578	28,514	28,185	29,429	28,709	28,035	27,886	27,313	26,563	25,785
Residential Customers	3,475	3,488	3,501	3,516	3,534	3,553	3,571	3,595	3,617	3,643	3,667
Commercial Customers	532	535	537	539	542	544	546	548	549	550	551
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers											
Total Core Customers	**4,008**	**4,023**	**4,039**	**4,056**	**4,077**	**4,098**	**4,118**	**4,144**	**4,167**	**4,194**	**4,220**
Bend											
Total Therms Pct. Growth	2.60%	2.08%	1.91%	2.44%	3.63%	2.21%	2.25%	2.66%	2.35%	2.21%	2.19%
Residential Therms	34,275,079	34,888,821	35,485,748	36,174,311	37,066,412	37,742,158	38,437,114	39,211,500	39,946,044	40,668,160	41,397,019
Commercial Therms	24,189,133	24,871,616	25,494,221	26,356,509	27,761,775	28,581,923	29,440,146	30,516,829	31,472,634	32,381,705	33,298,726
Industrial Therms	1,474,523	1,425,848	1,374,225	1,346,533	1,365,335	1,333,069	1,305,172	1,293,946	1,273,720	1,250,629	1,228,611
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**59,938,735**	**61,186,285**	**62,354,194**	**63,877,353**	**66,193,522**	**67,657,150**	**69,182,432**	**71,022,275**	**72,692,398**	**74,300,493**	**75,924,356**
Daily Baseload Therms	50,503	51,554	52,538	53,821	55,773	57,006	58,291	59,841	61,249	62,603	63,972
Peak Day Therms	689,209	702,119	715,291	728,611	742,191	755,921	769,913	784,104	798,516	813,156	828,024
Therms Per Residential Customer	766	766	765	766	771	772	772	774	774	775	775
Therms Per Commercial Customer	3,060	3,076	3,082	3,116	3,211	3,234	3,260	3,308	3,340	3,366	3,390
Therms Per Industrial Customer	38,673	38,335	37,787	37,798	39,041	38,762	38,508	38,673	38,496	38,160	37,789
Residential Customers	44,739	45,544	46,367	47,199	48,049	48,908	49,785	50,676	51,581	52,501	53,436
Commercial Customers	7,904	8,086	8,271	8,458	8,647	8,837	9,030	9,225	9,422	9,621	9,822
Industrial Customers	38	37	36	36	35	34	34	33	33	33	33
Interruptible Customers											
Total Core Customers	**52,681**	**53,667**	**54,674**	**55,692**	**56,730**	**57,780**	**58,849**	**59,934**	**61,036**	**62,155**	**63,291**
Ontario											
Total Therms Pct. Growth	0.37%	-0.47%	-0.78%	0.21%	2.13%	-0.27%	-0.11%	0.69%	0.03%	-0.12%	-0.02%
Residential Therms	2,070,206	2,067,254	2,062,208	2,065,257	2,080,192	2,078,858	2,080,283	2,088,632	2,090,626	2,092,867	2,097,929
Commercial Therms	2,717,490	2,712,235	2,693,606	2,715,608	2,820,443	2,821,930	2,829,142	2,869,978	2,882,497	2,887,011	2,894,026
Industrial Therms	390,013	374,067	357,735	343,277	332,718	318,202	303,935	290,866	277,783	264,593	251,551
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**5,177,709**	**5,153,556**	**5,113,549**	**5,124,142**	**5,233,353**	**5,218,990**	**5,213,359**	**5,249,476**	**5,250,906**	**5,244,472**	**5,243,507**
Daily Baseload Therms	3,846	3,828	3,799	3,807	3,888	3,877	3,873	3,900	3,901	3,896	3,895
Peak Day Therms	30,703	30,753	30,807	30,895	30,973	31,040	31,147	31,296	31,400	31,535	31,720
Therms Per Residential Customer	572	571	568	568	570	569	567	567	566	564	562
Therms Per Commercial Customer	3,068	3,056	3,028	3,043	3,151	3,145	3,141	3,169	3,171	3,161	3,148
Therms Per Industrial Customer	35,940	34,222	32,512	30,988	29,842	28,368	26,933	25,624	24,333	23,049	21,789
Residential Customers	3,617	3,623	3,629	3,639	3,647	3,655	3,667	3,684	3,696	3,711	3,733
Commercial Customers	886	888	889	892	895	897	901	906	909	913	919
Industrial Customers	11	11	11	11	11	11	11	11	11	11	12
Interruptible Customers											
Total Core Customers	**4,514**	**4,521**	**4,529**	**4,542**	**4,554**	**4,563**	**4,579**	**4,601**	**4,616**	**4,636**	**4,663**
Pendleton											
Total Therms Pct. Growth	1.36%	0.95%	0.76%	1.10%	1.92%	0.82%	0.79%	1.05%	0.75%	0.60%	0.53%
Residential Therms	7,846,739	7,990,577	8,109,653	8,277,561	8,563,679	8,696,925	8,827,409	8,996,349	9,124,790	9,231,646	9,328,009
Commercial Therms	6,610,421	6,646,021	6,675,702	6,714,765	6,776,393	6,806,244	6,834,751	6,870,441	6,897,120	6,919,547	6,939,163
Industrial Therms	977,183	944,528	913,879	879,369	837,019	805,783	774,959	742,184	712,246	684,021	656,654
Ind., Inst., & Cmcl. Interrup. Therms											
Total Core Therms	**15,434,343**	**15,581,125**	**15,699,234**	**15,871,696**	**16,177,091**	**16,308,952**	**16,437,119**	**16,608,974**	**16,734,156**	**16,835,214**	**16,923,826**
Daily Baseload Therms	15,868	16,019	16,140	16,317	16,631	16,767	16,899	17,075	17,204	17,308	17,399
Peak Day Therms	241,415	245,561	249,568	253,435	257,173	260,710	264,083	267,302	270,337	273,226	275,928
Therms Per Residential Customer	596	596	594	597	608	608	609	613	614	614	614
Therms Per Commercial Customer	3,271	3,260	3,247	3,240	3,243	3,232	3,222	3,215	3,204	3,193	3,180
Therms Per Industrial Customer	41,846	40,393	39,034	37,515	35,669	34,303	32,961	31,541	30,247	29,029	27,852
Residential Customers	13,169	13,413	13,648	13,875	14,093	14,300	14,497	14,684	14,860	15,027	15,183
Commercial Customers	2,021	2,038	2,056	2,073	2,089	2,106	2,122	2,137	2,152	2,167	2,182
Industrial Customers	23	23	23	23	23	23	24	24	24	24	24
Interruptible Customers											
Total Core Customers	**15,213**	**15,475**	**15,727**	**15,971**	**16,206**	**16,429**	**16,642**	**16,845**	**17,036**	**17,218**	**17,388**

Cascade Natural Gas
2010 IRP Demand Forecast
Medium Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Washington										
Total Therms Pct. Growth		-12.34%	12.48%	1.10%	1.25%	1.50%	1.85%	1.98%	1.61%	1.51%
Residential Therms	119,103,353	106,725,615	122,883,638	124,600,878	126,481,098	128,656,145	131,286,069	134,108,311	136,517,271	138,818,885
Commercial Therms	93,995,571	84,630,702	93,343,792	94,632,340	96,020,449	97,589,261	99,438,324	101,402,448	103,109,959	104,745,288
Industrial Therms	16,140,112	9,342,671	9,766,517	9,267,666	8,881,212	8,627,965	8,538,298	8,518,101	8,374,433	8,211,144
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**231,272,847**	**202,732,799**	**228,027,758**	**230,534,695**	**233,416,570**	**236,907,182**	**241,296,502**	**246,062,671**	**250,035,473**	**253,809,127**
Daily Baseload Therms	212,156	185,494	209,555	212,025	214,832	218,179	222,321	226,798	230,578	234,184
Peak Day Therms	2,732,699	2,772,884	2,841,118	2,903,340	2,966,440	3,030,297	3,094,792	3,159,942	3,225,729	3,292,066
Therms Per Residential Customer	708	626	702	697	692	689	688	688	686	683
Therms Per Commercial Customer	3,911	3,434	3,730	3,705	3,684	3,670	3,666	3,666	3,656	3,644
Therms Per Industrial Customer	44,586	26,392	27,842	26,964	26,332	26,031	26,175	26,497	26,399	26,198
Residential Customers	168,291	170,540	174,949	178,851	182,807	186,811	190,852	194,934	199,055	203,210
Commercial Customers	24,035	24,642	25,026	25,542	26,064	26,591	27,123	27,659	28,201	28,745
Industrial Customers	362	354	351	344	337	331	326	321	317	313
Interruptible Customers	15	14	14	14	14	14	14	14	14	14
Total Core Customers	**192,703**	**195,550**	**200,339**	**204,750**	**209,222**	**213,747**	**218,315**	**222,929**	**227,586**	**232,282**
Oregon										
Total Therms Pct. Growth		-7.73%	10.03%	0.44%	0.74%	1.22%	1.93%	2.20%	1.64%	1.54%
Residential Therms	39,933,922	37,118,417	40,123,953	40,539,934	41,028,729	41,641,783	42,446,885	43,334,596	44,075,131	44,790,448
Commercial Therms	29,638,790	27,194,841	29,568,777	29,728,399	30,001,557	30,469,608	31,246,446	32,162,811	32,839,985	33,476,958
Industrial Therms	3,175,346	2,813,412	4,165,334	3,914,147	3,703,201	3,534,622	3,409,093	3,304,088	3,181,740	3,061,432
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**72,748,058**	**67,126,670**	**73,858,065**	**74,182,480**	**74,733,487**	**75,646,014**	**77,102,424**	**78,801,495**	**80,096,856**	**81,328,837**
Daily Baseload Therms	63,274	58,280	64,163	64,467	64,963	65,765	67,030	68,501	69,627	70,696
Peak Day Therms	818,904	824,626	839,981	855,820	871,861	888,095	904,524	921,047	937,714	954,554
Therms Per Residential Customer	730	676	718	713	710	708	710	712	713	712
Therms Per Commercial Customer	3,227	2,890	3,083	3,040	3,010	3,000	3,019	3,050	3,058	3,060
Therms Per Industrial Customer	38,724	30,581	46,162	44,896	43,799	42,961	42,456	42,058	41,290	40,416
Residential Customers	54,694	54,883	55,885	56,847	57,824	58,813	59,820	60,833	61,856	62,895
Commercial Customers	9,185	9,411	9,592	9,779	9,967	10,157	10,351	10,545	10,741	10,940
Industrial Customers	82	92	90	87	85	82	80	79	77	76
Interruptible Customers	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**63,961**	**64,386**	**65,567**	**66,713**	**67,875**	**69,053**	**70,251**	**71,456**	**72,673**	**73,911**
		3,272	5,971							
System										
Total Therms Pct. Growth		-11.24%	11.87%	0.94%	1.13%	1.43%	1.87%	2.03%	1.62%	1.52%
Residential Therms	159,037,275	143,844,032	163,007,592	165,140,812	167,509,827	170,297,928	173,732,955	177,442,906	180,592,402	183,609,333
Commercial Therms	123,634,361	111,825,543	122,912,569	124,360,739	126,022,005	128,058,869	130,684,770	133,565,259	135,949,943	138,222,246
Industrial Therms	19,315,458	12,156,083	13,931,851	13,181,813	12,584,413	12,162,587	11,947,391	11,822,190	11,556,173	11,272,575
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**304,020,905**	**269,859,469**	**301,885,823**	**304,717,175**	**308,150,057**	**312,553,195**	**318,398,926**	**324,864,165**	**330,132,329**	**335,137,965**
Daily Baseload Therms	275,430	243,774	273,718	276,492	279,795	283,944	289,350	295,299	300,205	304,880
Peak Day Therms	3,551,604	3,597,510	3,681,099	3,759,160	3,838,302	3,918,392	3,999,316	4,080,989	4,163,443	4,246,619
Therms Per Residential Customer	713	638	706	701	696	693	693	694	692	690
Therms Per Commercial Customer	3,722	3,284	3,551	3,521	3,498	3,485	3,487	3,496	3,491	3,483
Therms Per Industrial Customer	43,503	27,256	31,590	30,592	29,833	29,397	29,391	29,553	29,309	28,965
Residential Customers	222,985	225,423	230,833	235,698	240,631	245,624	250,672	255,767	260,911	266,105
Commercial Customers	33,220	34,053	34,618	35,320	36,031	36,748	37,474	38,204	38,941	39,684
Industrial Customers	444	446	441	431	422	414	406	400	394	389
Interruptible Customers	15	14	14	14	14	14	14	14	14	14
Total Core Customers	**256,664**	**259,936**	**265,907**	**271,463**	**277,097**	**282,800**	**288,566**	**294,385**	**300,260**	**306,193**

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Washington												
Total Therms Pct. Growth	1.72%	1.77%	1.46%	1.33%	1.59%	2.19%	1.40%	1.38%	1.57%	1.38%	1.27%	1.24%
Residential Therms	141,430,862	144,150,496	146,479,520	148,651,052	151,220,187	154,706,624	157,074,446	159,447,296	162,139,928	164,565,361	166,858,573	169,114,657
Commercial Therms	106,569,540	108,456,623	110,099,673	111,643,741	113,425,075	115,764,472	117,410,620	119,052,702	120,883,575	122,545,487	124,119,773	125,664,296
Industrial Therms	8,148,254	8,122,247	7,988,642	7,823,138	7,772,627	7,970,149	7,873,720	7,788,743	7,792,955	7,734,287	7,649,900	7,563,813
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**258,182,467**	**262,763,177**	**266,601,645**	**270,151,742**	**274,451,699**	**280,475,055**	**284,392,597**	**288,322,552**	**292,850,269**	**296,878,946**	**300,662,056**	**304,376,576**
Daily Baseload Therms	238,323	242,646	246,317	249,736	253,818	259,426	263,176	266,937	271,229	275,081	278,718	282,295
Peak Day Therms	3,359,106	3,426,823	3,495,349	3,564,589	3,634,366	3,704,775	3,775,812	3,847,307	3,919,436	3,992,158	4,065,510	4,139,477
Therms Per Residential Customer	682	681	678	675	673	675	673	670	669	666	663	660
Therms Per Commercial Customer	3,638	3,634	3,621	3,605	3,596	3,605	3,592	3,579	3,572	3,559	3,545	3,529
Therms Per Industrial Customer	26,282	26,457	26,254	25,916	25,928	26,749	26,561	26,388	26,496	26,368	26,132	25,874
Residential Customers	207,408	211,648	215,938	220,272	224,641	229,049	233,496	237,972	242,488	247,041	251,634	256,267
Commercial Customers	29,294	29,848	30,408	30,972	31,539	32,111	32,686	33,263	33,844	34,428	35,015	35,606
Industrial Customers	310	307	304	302	300	298	296	295	294	293	293	292
Interruptible Customers	14	14	14	14	14	14	14	14	14	14	14	14
Total Core Customers	**237,026**	**241,817**	**246,664**	**251,560**	**256,494**	**261,471**	**266,492**	**271,544**	**276,640**	**281,776**	**286,956**	**292,179**
Oregon												
Total Therms Pct. Growth	1.97%	2.13%	1.62%	1.44%	1.97%	3.14%	1.73%	1.77%	2.18%	1.86%	1.73%	1.70%
Residential Therms	45,636,232	46,534,663	47,289,869	47,995,282	48,867,193	50,111,766	50,925,994	51,759,964	52,735,036	53,611,978	54,452,165	55,289,894
Commercial Therms	34,333,497	35,284,586	35,998,984	36,631,656	37,557,942	39,142,894	39,993,993	40,886,618	42,042,966	43,035,199	43,968,742	44,907,258
Industrial Therms	2,965,167	2,879,822	2,779,222	2,677,557	2,599,381	2,566,045	2,487,002	2,413,278	2,356,659	2,293,820	2,229,626	2,167,921
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**82,934,895**	**84,699,071**	**86,068,075**	**87,304,495**	**89,024,516**	**91,820,704**	**93,406,989**	**95,059,860**	**97,134,661**	**98,940,997**	**100,650,533**	**102,365,074**
Daily Baseload Therms	72,084	73,607	74,790	75,858	77,337	79,738	81,100	82,517	84,293	85,837	87,297	88,758
Peak Day Therms	971,508	988,589	1,005,800	1,023,140	1,040,534	1,058,067	1,075,544	1,093,154	1,110,889	1,128,599	1,146,446	1,164,377
Therms Per Residential Customer	714	716	716	715	716	723	723	724	726	727	727	727
Therms Per Commercial Customer	3,082	3,111	3,118	3,117	3,140	3,216	3,229	3,245	3,281	3,302	3,318	3,333
Therms Per Industrial Customer	39,747	39,135	38,237	37,242	36,501	36,326	35,457	34,608	33,956	33,171	32,332	31,492
Residential Customers	63,943	65,000	66,067	67,144	68,228	69,323	70,416	71,520	72,639	73,754	74,882	76,019
Commercial Customers	11,140	11,342	11,547	11,754	11,962	12,173	12,384	12,598	12,816	13,032	13,252	13,475
Industrial Customers	75	74	73	72	71	71	70	70	69	69	69	69
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**75,158**	**76,416**	**77,687**	**78,969**	**80,262**	**81,567**	**82,870**	**84,188**	**85,524**	**86,855**	**88,203**	**89,563**
System												
Total Therms Pct. Growth	1.78%	1.86%	1.50%	1.36%	1.68%	2.43%	1.48%	1.48%	1.72%	1.50%	1.39%	1.35%
Residential Therms	187,067,094	190,685,159	193,769,389	196,646,334	200,087,379	204,818,389	208,000,440	211,207,260	214,874,964	218,177,340	221,310,738	224,404,551
Commercial Therms	140,903,036	143,741,209	146,098,658	148,275,396	150,983,017	154,907,365	157,404,613	159,939,319	162,926,542	165,580,686	168,088,514	170,571,554
Industrial Therms	11,113,421	11,002,070	10,767,863	10,500,695	10,372,008	10,536,194	10,360,722	10,202,021	10,149,614	10,028,107	9,879,526	9,731,734
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**341,117,362**	**347,462,248**	**352,669,721**	**357,456,236**	**363,476,215**	**372,295,759**	**377,799,586**	**383,382,411**	**389,984,931**	**395,819,943**	**401,312,589**	**406,741,650**
Daily Baseload Therms	310,407	316,253	321,107	325,593	331,156	339,164	344,275	349,454	355,521	360,918	366,015	371,053
Peak Day Therms	4,330,614	4,415,412	4,501,149	4,587,729	4,674,899	4,762,842	4,851,356	4,940,461	5,030,325	5,120,758	5,211,955	5,303,854
Therms Per Residential Customer	689	689	687	684	683	686	684	682	682	680	678	675
Therms Per Commercial Customer	3,485	3,490	3,482	3,470	3,471	3,498	3,492	3,487	3,492	3,489	3,482	3,475
Therms Per Industrial Customer	28,894	28,909	28,565	28,094	27,957	28,584	28,263	27,959	27,920	27,666	27,314	26,945
Residential Customers	271,351	276,648	282,006	287,416	292,869	298,372	303,912	309,492	315,126	320,795	326,516	332,286
Commercial Customers	40,434	41,190	41,954	42,726	43,502	44,284	45,070	45,861	46,659	47,460	48,268	49,081
Industrial Customers	385	381	377	374	371	369	367	365	364	362	362	361
Interruptible Customers	14	14	14	14	14	14	14	14	14	14	14	14
Total Core Customers	**312,184**	**318,233**	**324,351**	**330,530**	**336,756**	**343,038**	**349,362**	**355,732**	**362,163**	**368,632**	**375,159**	**381,742**

DRAFT

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aberdeen											
Total Therms Pct. Growth		-10.13%	6.01%	0.25%	0.27%	0.28%	0.27%	0.27%	0.29%	0.29%	0.29%
Residential Therms	3,907,331	3,518,892	3,962,068	3,971,363	3,985,466	4,001,784	4,021,353	4,041,691	4,058,270	4,073,232	4,090,118
Commercial Therms	5,429,998	5,012,117	4,982,254	5,008,861	5,034,834	5,058,299	5,077,022	5,093,958	5,116,323	5,139,768	5,160,453
Industrial Therms	370,555	119,051	270,033	258,696	245,777	233,900	222,881	212,693	203,375	194,678	186,677
Ind., Inst., & Cmcl. Interrup. Therms	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298
Total Core Therms	**10,447,182**	**9,389,358**	**9,953,652**	**9,978,217**	**10,005,374**	**10,033,281**	**10,060,554**	**10,087,640**	**10,117,266**	**10,146,976**	**10,176,545**
Daily Baseload Therms	8,885	7,985	8,465	8,486	8,509	8,533	8,556	8,579	8,604	8,630	8,655
Peak Day Therms	82,423	82,179	83,094	83,474	83,918	84,362	84,802	85,232	85,661	86,078	86,491
Therms Per Residential Customer	740	671	746	744	743	741	741	740	739	738	738
Therms Per Commercial Customer	4,840	4,408	4,351	4,362	4,371	4,378	4,380	4,380	4,385	4,390	4,393
Therms Per Industrial Customer	26,468	9,158	18,919	18,360	17,817	17,290	16,778	16,282	15,801	15,333	14,880
Residential Customers	5,280	5,247	5,309	5,335	5,367	5,398	5,429	5,459	5,488	5,517	5,546
Commercial Customers	1,122	1,137	1,145	1,148	1,152	1,155	1,159	1,163	1,167	1,171	1,175
Industrial Customers	14	13	14	14	14	14	13	13	13	13	13
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**6,418**	**6,399**	**6,470**	**6,500**	**6,534**	**6,569**	**6,603**	**6,637**	**6,670**	**6,703**	**6,735**
Bellingham											
Total Therms Pct. Growth		-22.95%	19.17%	1.11%	1.41%	1.76%	2.31%	2.49%	1.91%	1.74%	2.07%
Residential Therms	30,430,845	26,890,852	31,884,129	32,262,477	32,742,530	33,346,297	34,147,395	35,030,928	35,729,923	36,380,342	37,164,577
Commercial Therms	15,232,542	13,256,906	15,995,152	16,182,316	16,423,343	16,725,148	17,125,541	17,565,822	17,910,224	18,227,519	18,610,752
Industrial Therms	7,638,841	881,544	1,047,659	1,026,391	1,004,935	984,508	965,012	946,415	928,651	911,701	895,479
Ind., Inst., & Cmcl. Interrup. Therms	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423
Total Core Therms	**53,471,652**	**41,198,725**	**49,096,363**	**49,640,607**	**50,340,232**	**51,225,376**	**52,407,372**	**53,712,588**	**54,738,221**	**55,688,986**	**56,840,231**
Daily Baseload Therms	52,641	40,559	48,334	48,870	49,558	50,430	51,593	52,878	53,888	54,824	55,957
Peak Day Therms	687,742	695,374	708,327	725,055	742,723	760,452	778,199	795,954	813,716	831,493	849,261
Therms Per Residential Customer	758	663	771	762	755	751	751	753	752	749	749
Therms Per Commercial Customer	3,265	2,760	3,323	3,284	3,254	3,237	3,239	3,250	3,242	3,231	3,232
Therms Per Industrial Customer	190,971	22,604	26,629	26,376	26,126	25,879	25,633	25,391	25,150	24,912	24,676
Residential Customers	40,169	40,531	41,365	42,344	43,377	44,414	45,453	46,493	47,535	48,577	49,620
Commercial Customers	4,666	4,803	4,814	4,927	5,047	5,167	5,287	5,406	5,524	5,642	5,759
Industrial Customers	40	39	39	39	38	38	38	37	37	37	36
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**44,878**	**45,376**	**46,221**	**47,313**	**48,466**	**49,623**	**50,781**	**51,939**	**53,098**	**54,258**	**55,418**
Bremerton											
Total Therms Pct. Growth		-8.37%	12.37%	1.88%	1.98%	1.98%	1.98%	1.97%	1.92%	1.88%	1.88%
Residential Therms	20,587,402	18,579,097	21,195,073	21,461,504	21,744,879	22,043,186	22,362,405	22,690,955	23,001,936	23,308,139	23,629,087
Commercial Therms	9,662,772	9,011,610	9,813,979	10,138,076	10,487,318	10,834,858	11,175,456	11,514,961	11,868,275	12,227,372	12,581,735
Industrial Therms	12,338	107,569	158,971	160,896	162,822	164,730	166,612	168,476	170,325	172,152	173,964
Ind., Inst., & Cmcl. Interrup. Therms	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624
Total Core Therms	**30,620,136**	**28,055,900**	**31,525,646**	**32,118,100**	**32,752,642**	**33,400,398**	**34,062,097**	**34,732,015**	**35,398,159**	**36,065,286**	**36,742,410**
Daily Baseload Therms	34,510	31,620	35,530	36,198	36,913	37,643	38,389	39,144	39,894	40,646	41,409
Peak Day Therms	340,376	344,656	349,160	354,862	360,816	366,828	372,872	378,957	385,091	391,251	397,452
Therms Per Residential Customer	741	662	744	743	741	740	739	739	738	737	737
Therms Per Commercial Customer	3,967	3,569	3,882	3,891	3,899	3,904	3,906	3,906	3,909	3,914	3,916
Therms Per Industrial Customer	6,169	107,569	154,917	154,166	153,418	152,674	151,934	151,197	150,464	149,734	149,008
Residential Customers	27,781	28,073	28,470	28,899	29,343	29,791	30,242	30,695	31,152	31,611	32,072
Commercial Customers	2,436	2,525	2,528	2,605	2,690	2,775	2,861	2,948	3,036	3,124	3,213
Industrial Customers	2	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**30,221**	**30,601**	**31,001**	**31,507**	**32,036**	**32,570**	**33,106**	**33,646**	**34,191**	**34,738**	**35,289**
Kennewick											
Total Therms Pct. Growth		-7.85%	8.06%	3.05%	3.26%	3.36%	3.56%	3.59%	3.27%	3.14%	3.24%
Residential Therms	12,039,314	11,151,277	11,819,864	12,186,301	12,590,388	13,022,942	13,499,434	13,999,380	14,472,788	14,943,738	15,447,822
Commercial Therms	13,631,077	12,529,798	13,516,768	13,952,895	14,433,178	14,941,486	15,494,427	16,068,652	16,608,153	17,139,539	17,702,586
Industrial Therms	303,216	237,748	526,455	518,199	509,675	501,622	494,054	486,957	480,268	473,947	467,990
Ind., Inst., & Cmcl. Interrup. Therms	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384
Total Core Therms	**26,174,991**	**24,120,207**	**26,064,471**	**26,858,779**	**27,734,625**	**28,667,433**	**29,689,299**	**30,756,373**	**31,762,593**	**32,758,608**	**33,819,781**
Daily Baseload Therms	21,076	19,422	20,987	21,627	22,332	23,083	23,906	24,765	25,575	26,377	27,232
Peak Day Therms	352,047	370,851	382,302	396,390	411,446	426,777	442,401	458,300	474,469	490,893	507,584
Therms Per Residential Customer	627	550	565	562	559	558	558	559	558	557	557
Therms Per Commercial Customer	4,616	4,091	4,294	4,265	4,241	4,223	4,217	4,214	4,200	4,183	4,173
Therms Per Industrial Customer	17,836	14,859	32,213	31,911	31,612	31,316	31,023	30,733	30,445	30,160	29,877
Residential Customers	19,214	20,290	20,926	21,691	22,508	23,339	24,187	25,050	25,928	26,820	27,727
Commercial Customers	2,953	3,063	3,148	3,271	3,403	3,538	3,675	3,814	3,955	4,098	4,243
Industrial Customers	17	16	16	16	16	16	16	16	16	16	16
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**22,185**	**23,370**	**24,092**	**24,979**	**25,928**	**26,894**	**27,879**	**28,881**	**29,900**	**30,935**	**31,987**
Longview											
Total Therms Pct. Growth		-10.09%	12.69%	0.21%	0.23%	0.17%	0.11%	0.09%	0.21%	0.24%	0.20%
Residential Therms	1,558,912	1,361,463	1,610,701	1,606,573	1,604,905	1,604,538	1,606,669	1,609,875	1,612,586	1,615,253	1,619,592
Commercial Therms	5,095,213	4,560,755	4,906,183	4,938,582	4,969,401	4,994,385	5,011,687	5,025,820	5,049,348	5,074,819	5,095,258
Industrial Therms	538,181	532,335	771,708	759,349	747,030	735,173	723,835	712,918	702,440	692,301	682,532
Ind., Inst., & Cmcl. Interrup. Therms	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544
Total Core Therms	**7,309,850**	**6,572,097**	**7,406,135**	**7,422,048**	**7,438,879**	**7,451,640**	**7,459,735**	**7,466,156**	**7,481,919**	**7,499,917**	**7,514,926**
Daily Baseload Therms	8,420	7,571	8,531	8,550	8,569	8,584	8,593	8,600	8,619	8,639	8,657
Peak Day Therms	81,924	81,597	81,541	81,610	81,754	81,911	82,111	82,332	82,591	82,860	83,161
Therms Per Residential Customer	602	530	628	626	625	624	624	623	623	622	621
Therms Per Commercial Customer	4,477	3,990	4,280	4,296	4,310	4,318	4,318	4,315	4,319	4,324	4,325
Therms Per Industrial Customer	17,939	18,356	26,414	25,975	25,543	25,119	24,702	24,292	23,888	23,491	23,101
Residential Customers	2,590	2,571	2,565	2,565	2,568	2,571	2,577	2,583	2,590	2,598	2,607
Commercial Customers	1,138	1,143	1,146	1,149	1,153	1,157	1,161	1,165	1,169	1,174	1,178
Industrial Customers	30	29	29	29	29	29	29	29	29	29	30
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**3,759**	**3,744**	**3,741**	**3,745**	**3,751**	**3,758**	**3,768**	**3,778**	**3,790**	**3,802**	**3,816**

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Aberdeen											
Total Therms Pct. Growth	0.29%	0.31%	0.31%	0.30%	0.28%	0.31%	0.30%	0.29%	0.30%	0.30%	0.30%
Residential Therms	4,107,330	4,121,107	4,133,108	4,147,692	4,168,407	4,180,458	4,191,958	4,205,209	4,216,190	4,225,846	4,234,708
Commercial Therms	5,180,404	5,204,945	5,230,976	5,253,337	5,266,764	5,291,756	5,316,554	5,338,326	5,363,015	5,389,067	5,415,192
Industrial Therms	179,207	172,234	165,622	159,492	153,788	148,460	143,474	138,781	134,415	130,310	126,381
Ind., Inst., & Cmcl. Interrup. Therms	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298
Total Core Therms	**10,206,239**	**10,237,583**	**10,269,004**	**10,299,819**	**10,328,256**	**10,359,972**	**10,391,283**	**10,421,614**	**10,452,916**	**10,484,520**	**10,515,579**
Daily Baseload Therms	8,680	8,707	8,733	8,760	8,784	8,811	8,837	8,863	8,890	8,917	8,943
Peak Day Therms	86,899	87,304	87,700	88,092	88,477	88,858	89,228	89,592	89,951	90,305	90,649
Therms Per Residential Customer	737	736	734	734	734	733	731	731	730	728	727
Therms Per Commercial Customer	4,395	4,401	4,408	4,412	4,408	4,413	4,419	4,421	4,427	4,433	4,439
Therms Per Industrial Customer	14,440	14,012	13,598	13,196	12,806	12,427	12,059	11,703	11,356	11,020	10,694
Residential Customers	5,573	5,601	5,628	5,655	5,680	5,706	5,731	5,755	5,779	5,802	5,825
Commercial Customers	1,179	1,183	1,187	1,191	1,195	1,199	1,203	1,207	1,212	1,216	1,220
Industrial Customers	12	12	12	12	12	12	12	12	12	12	12
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**6,767**	**6,798**	**6,829**	**6,859**	**6,889**	**6,919**	**6,948**	**6,976**	**7,004**	**7,032**	**7,059**
Bellingham											
Total Therms Pct. Growth	2.14%	1.63%	1.41%	1.84%	2.83%	1.52%	1.51%	1.81%	1.50%	1.33%	1.27%
Residential Therms	37,994,324	38,644,243	39,220,548	39,975,082	41,143,053	41,803,336	42,466,524	43,272,802	43,955,015	44,575,070	45,175,269
Commercial Therms	19,015,198	19,326,119	19,597,820	19,957,752	20,524,647	20,832,305	21,139,100	21,515,949	21,828,275	22,106,848	22,373,420
Industrial Therms	879,908	864,969	850,599	836,793	823,523	810,762	798,497	786,683	775,277	764,292	753,679
Ind., Inst., & Cmcl. Interrup. Therms	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423
Total Core Therms	**58,058,852**	**59,004,755**	**59,838,390**	**60,939,049**	**62,660,647**	**63,615,827**	**64,573,545**	**65,744,857**	**66,727,990**	**67,615,633**	**68,471,791**
Daily Baseload Therms	57,157	58,088	58,909	59,993	61,687	62,628	63,571	64,724	65,692	66,566	67,408
Peak Day Therms	867,034	884,840	902,678	920,512	938,325	956,132	973,915	991,666	1,009,386	1,027,100	1,044,801
Therms Per Residential Customer	750	747	743	743	750	748	746	746	744	742	739
Therms Per Commercial Customer	3,237	3,226	3,209	3,208	3,240	3,230	3,222	3,225	3,218	3,207	3,195
Therms Per Industrial Customer	24,442	24,210	23,981	23,753	23,528	23,305	23,084	22,866	22,649	22,434	22,222
Residential Customers	50,664	51,710	52,759	53,808	54,856	55,905	56,953	58,000	59,046	60,093	61,139
Commercial Customers	5,875	5,991	6,106	6,221	6,335	6,449	6,561	6,672	6,783	6,893	7,002
Industrial Customers	36	36	35	35	35	35	35	34	34	34	34
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**56,578**	**57,739**	**58,903**	**60,067**	**61,230**	**62,392**	**63,552**	**64,710**	**65,867**	**67,023**	**68,178**
Bremerton											
Total Therms Pct. Growth	1.86%	1.82%	1.79%	1.79%	1.80%	1.73%	1.71%	1.69%	1.66%	1.64%	1.61%
Residential Therms	23,955,084	24,264,627	24,567,757	24,889,358	25,252,016	25,566,072	25,880,849	26,209,827	26,528,078	26,841,202	27,153,055
Commercial Therms	12,936,686	13,305,874	13,683,117	14,052,542	14,399,180	14,778,492	15,159,209	15,532,826	15,915,956	16,304,678	16,696,688
Industrial Therms	175,758	177,542	179,310	181,065	182,807	184,538	186,255	187,958	189,652	191,334	193,004
Ind., Inst., & Cmcl. Interrup. Therms	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624
Total Core Therms	**37,425,153**	**38,105,666**	**38,787,807**	**39,480,588**	**40,191,626**	**40,886,726**	**41,583,936**	**42,288,235**	**42,991,309**	**43,694,838**	**44,400,370**
Daily Baseload Therms	42,179	42,946	43,715	44,495	45,297	46,080	46,866	47,660	48,452	49,245	50,040
Peak Day Therms	403,687	409,972	416,295	422,655	429,048	435,480	441,938	448,421	454,943	461,496	468,078
Therms Per Residential Customer	736	735	734	733	734	733	731	731	730	729	727
Therms Per Commercial Customer	3,917	3,922	3,928	3,930	3,927	3,931	3,936	3,938	3,942	3,947	3,952
Therms Per Industrial Customer	148,286	147,567	146,851	146,139	145,430	144,725	144,023	143,325	142,630	141,938	141,250
Residential Customers	32,536	33,004	33,475	33,948	34,424	34,902	35,383	35,866	36,352	36,841	37,331
Commercial Customers	3,302	3,393	3,484	3,575	3,667	3,759	3,852	3,945	4,038	4,131	4,224
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**35,842**	**36,400**	**36,962**	**37,526**	**38,094**	**38,665**	**39,238**	**39,814**	**40,393**	**40,975**	**41,559**
Kennewick											
Total Therms Pct. Growth	3.23%	2.95%	2.81%	2.96%	3.38%	2.73%	2.68%	2.79%	2.60%	2.49%	2.42%
Residential Therms	15,969,184	16,463,168	16,950,371	17,480,829	18,104,081	18,631,413	19,165,920	19,738,321	20,291,291	20,838,125	21,386,835
Commercial Therms	18,279,300	18,819,991	19,347,511	19,917,049	20,583,178	21,135,617	21,689,009	22,276,834	22,836,157	23,381,297	23,921,393
Industrial Therms	462,360	457,015	451,940	447,119	442,559	438,235	434,141	430,278	426,601	423,120	419,802
Ind., Inst., & Cmcl. Interrup. Therms	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384
Total Core Therms	**34,912,228**	**35,941,557**	**36,951,206**	**38,046,382**	**39,331,203**	**40,406,649**	**41,490,454**	**42,646,817**	**43,755,433**	**44,843,927**	**45,929,414**
Daily Baseload Therms	28,112	28,940	29,753	30,635	31,670	32,536	33,408	34,340	35,232	36,109	36,983
Peak Day Therms	524,563	541,830	559,404	577,254	595,372	613,759	632,390	651,289	670,428	689,839	709,493
Therms Per Residential Customer	557	556	555	555	557	556	555	555	555	554	552
Therms Per Commercial Customer	4,164	4,146	4,124	4,111	4,116	4,097	4,078	4,065	4,047	4,026	4,004
Therms Per Industrial Customer	29,597	29,320	29,045	28,773	28,504	28,237	27,973	27,711	27,451	27,194	26,939
Residential Customers	28,650	29,589	30,544	31,515	32,501	33,502	34,517	35,546	36,589	37,647	38,719
Commercial Customers	4,390	4,539	4,691	4,845	5,001	5,159	5,318	5,480	5,643	5,808	5,974
Industrial Customers	16	16	16	16	16	16	16	16	16	16	16
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**33,057**	**34,145**	**35,252**	**36,377**	**37,519**	**38,677**	**39,851**	**41,042**	**42,248**	**43,472**	**44,710**
Longview											
Total Therms Pct. Growth	0.20%	0.28%	0.35%	0.25%	0.09%	0.33%	0.33%	0.27%	0.33%	0.36%	0.36%
Residential Therms	1,624,759	1,628,931	1,633,565	1,639,204	1,647,931	1,654,138	1,660,531	1,668,074	1,675,405	1,682,741	1,689,915
Commercial Therms	5,114,256	5,140,701	5,171,345	5,193,640	5,199,853	5,227,020	5,253,457	5,274,159	5,299,898	5,327,937	5,355,858
Industrial Therms	673,082	663,891	655,029	646,351	637,922	629,759	621,791	614,014	606,447	599,061	591,799
Ind., Inst., & Cmcl. Interrup. Therms	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544
Total Core Therms	**7,529,641**	**7,551,067**	**7,577,484**	**7,596,739**	**7,603,250**	**7,628,462**	**7,653,323**	**7,673,792**	**7,699,294**	**7,727,283**	**7,755,117**
Daily Baseload Therms	8,674	8,698	8,729	8,751	8,758	8,787	8,816	8,840	8,869	8,901	8,933
Peak Day Therms	83,483	83,813	84,185	84,546	84,926	85,337	85,752	86,177	86,624	87,086	87,543
Therms Per Residential Customer	621	620	619	618	619	618	617	616	615	614	613
Therms Per Commercial Customer	4,325	4,330	4,338	4,340	4,328	4,333	4,338	4,338	4,343	4,348	4,355
Therms Per Industrial Customer	22,718	22,340	21,969	21,604	21,246	20,893	20,546	20,204	19,869	19,539	19,214
Residential Customers	2,617	2,628	2,640	2,652	2,664	2,678	2,692	2,707	2,723	2,739	2,755
Commercial Customers	1,183	1,187	1,192	1,197	1,201	1,206	1,211	1,216	1,220	1,225	1,230
Industrial Customers	30	30	30	30	30	30	30	30	31	31	31
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**3,830**	**3,846**	**3,863**	**3,879**	**3,897**	**3,916**	**3,935**	**3,954**	**3,975**	**3,996**	**4,017**

DRAFT

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Moses Lake																						
Total Therms Pct. Growth		-5.62%	2.19%	0.42%	0.64%	0.90%	1.30%	1.44%	1.06%	0.97%	1.21%	1.28%	0.95%	0.82%	1.12%	1.77%	0.94%	0.94%	1.16%	0.97%	0.88%	0.85%
Residential Therms	1,128,284	986,252	1,059,638	1,051,555	1,045,759	1,043,898	1,047,990	1,054,333	1,055,118	1,054,467	1,057,559	1,061,770	1,060,979	1,058,239	1,060,187	1,072,569	1,071,855	1,071,224	1,074,085	1,073,912	1,072,274	1,070,218
Commercial Therms	2,636,699	2,392,003	2,393,908	2,397,807	2,407,654	2,424,183	2,451,147	2,482,147	2,503,342	2,521,934	2,547,183	2,574,549	2,592,810	2,607,401	2,630,648	2,673,424	2,691,735	2,710,077	2,734,984	2,754,045	2,770,143	2,785,307
Industrial Therms	423,447	574,965	586,312	607,474	629,255	651,347	673,783	696,497	719,545	742,953	766,707	790,877	815,449	840,330	865,674	891,241	917,412	943,780	970,676	998,062	1,025,830	1,053,963
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**4,188,430**	**3,953,220**	**4,039,859**	**4,056,836**	**4,082,668**	**4,119,428**	**4,172,920**	**4,232,977**	**4,278,005**	**4,319,354**	**4,371,448**	**4,427,196**	**4,469,239**	**4,505,970**	**4,556,509**	**4,637,235**	**4,681,001**	**4,725,080**	**4,779,745**	**4,826,019**	**4,868,247**	**4,909,489**
Daily Baseload Therms	3,668	3,462	3,538	3,553	3,576	3,608	3,655	3,707	3,747	3,783	3,828	3,877	3,914	3,946	3,991	4,061	4,100	4,138	4,186	4,227	4,264	4,300
Peak Day Therms	79,359	79,335	79,642	80,066	80,510	80,948	81,382	81,809	82,230	82,646	83,057	83,462	83,864	84,260	84,653	85,040	85,422	85,799	86,171	86,538	86,901	87,260
Therms Per Residential Customer	608	534	572	566	561	558	558	560	558	556	556	556	554	551	551	555	554	552	552	550	548	545
Therms Per Commercial Customer	4,179	3,732	3,716	3,687	3,665	3,654	3,658	3,669	3,666	3,660	3,663	3,670	3,665	3,654	3,657	3,686	3,682	3,679	3,685	3,683	3,678	3,672
Therms Per Industrial Customer	23,832	33,821	32,600	32,554	32,509	32,463	32,418	32,372	32,327	32,282	32,237	32,192	32,147	32,102	32,057	32,012	31,967	31,923	31,878	31,833	31,789	31,744
Residential Customers	1,856	1,846	1,852	1,858	1,865	1,871	1,878	1,884	1,890	1,896	1,902	1,908	1,914	1,920	1,925	1,931	1,936	1,942	1,947	1,952	1,957	1,962
Commercial Customers	631	641	644	650	657	664	670	676	683	689	695	701	707	713	719	725	731	737	742	748	753	759
Industrial Customers	18	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	29	30	30	31	32	33
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**2,505**	**2,504**	**2,514**	**2,527**	**2,541**	**2,555**	**2,569**	**2,582**	**2,595**	**2,609**	**2,621**	**2,634**	**2,647**	**2,659**	**2,672**	**2,684**	**2,696**	**2,708**	**2,720**	**2,731**	**2,743**	**2,754**
Mount Vernon																						
Total Therms Pct. Growth		-11.86%	13.03%	1.23%	1.41%	1.53%	1.71%	1.78%	1.60%	1.56%	1.66%	1.69%	1.53%	1.47%	1.60%	1.89%	1.50%	1.48%	1.57%	1.47%	1.41%	1.39%
Residential Therms	25,288,799	22,864,684	26,335,673	26,771,710	27,253,948	27,755,026	28,283,389	28,824,613	29,341,548	29,853,903	30,384,886	30,922,449	31,439,097	31,947,877	32,481,776	33,068,109	33,592,231	34,114,646	34,656,334	35,183,469	35,701,714	36,219,219
Commercial Therms	16,077,025	13,992,239	15,170,491	15,367,725	15,600,266	15,868,844	16,193,036	16,541,934	16,842,530	17,132,431	17,460,451	17,802,382	18,098,573	18,377,163	18,705,917	19,145,876	19,453,923	19,763,392	20,113,063	20,432,220	20,735,883	21,036,646
Industrial Therms	1,905,644	1,267,068	1,600,171	1,500,500	1,401,009	1,310,131	1,227,091	1,151,168	1,081,696	1,018,005	959,479	905,545	855,710	809,591	766,938	727,461	690,889	657,006	625,548	596,299	569,062	543,650
Ind., Inst., & Cmcl. Interrup. Therms	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980
Total Core Therms	**43,396,447**	**38,248,971**	**43,231,315**	**43,764,916**	**44,380,203**	**45,058,981**	**45,828,497**	**46,642,695**	**47,390,754**	**48,129,319**	**48,929,796**	**49,755,356**	**50,518,359**	**51,259,611**	**52,079,611**	**53,066,426**	**53,862,023**	**54,660,023**	**55,519,925**	**56,336,968**	**57,131,639**	**57,924,495**
Daily Baseload Therms	42,513	37,470	42,351	42,874	43,476	44,141	44,895	45,693	46,426	47,149	47,933	48,742	49,490	50,216	51,019	51,986	52,765	53,547	54,389	55,190	55,968	56,745
Peak Day Therms	483,671	490,685	494,922	504,192	514,191	524,281	534,439	544,678	554,955	565,305	575,718	586,184	596,733	607,353	618,055	628,789	639,614	650,438	661,320	672,262	683,225	694,257
Therms Per Residential Customer	720	642	732	730	729	728	727	727	727	726	725	725	724	723	722	723	722	721	720	719	718	717
Therms Per Commercial Customer	3,587	3,054	3,322	3,301	3,284	3,275	3,277	3,284	3,280	3,274	3,276	3,279	3,273	3,265	3,264	3,283	3,278	3,274	3,276	3,273	3,268	3,261
Therms Per Industrial Customer	20,491	13,924	17,951	17,935	17,920	17,904	17,889	17,873	17,857	17,842	17,826	17,811	17,795	17,780	17,764	17,749	17,733	17,718	17,702	17,687	17,672	17,656
Residential Customers	35,144	35,623	35,987	36,665	37,397	38,136	38,879	39,627	40,378	41,134	41,894	42,657	43,427	44,201	44,981	45,764	46,553	47,341	48,134	48,930	49,729	50,532
Commercial Customers	4,482	4,581	4,567	4,656	4,750	4,845	4,941	5,038	5,135	5,232	5,331	5,429	5,529	5,629	5,730	5,832	5,934	6,036	6,139	6,242	6,346	6,450
Industrial Customers	93	91	89	84	78	73	69	64	61	57	54	51	48	46	43	41	39	37	35	34	32	31
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**39,720**	**40,296**	**40,644**	**41,405**	**42,226**	**43,055**	**43,889**	**44,730**	**45,574**	**46,424**	**47,279**	**48,139**	**49,005**	**49,877**	**50,756**	**51,637**	**52,526**	**53,415**	**54,309**	**55,208**	**56,108**	**57,014**
Sunnyside																						
Total Therms Pct. Growth		-9.75%	3.77%	-0.33%	-0.19%	-0.05%	0.17%	0.26%	0.07%	0.02%	0.16%	0.20%	0.03%	-0.04%	0.13%	0.51%	0.04%	0.04%	0.17%	0.06%	0.01%	-0.01%
Residential Therms	3,221,397	2,840,914	3,163,581	3,139,190	3,124,026	3,121,839	3,139,202	3,164,167	3,171,400	3,174,254	3,189,490	3,208,637	3,211,696	3,208,598	3,221,070	3,268,081	3,272,280	3,276,960	3,293,340	3,299,866	3,301,647	3,302,161
Commercial Therms	4,918,533	4,464,731	4,569,529	4,585,561	4,607,338	4,628,471	4,648,857	4,668,448	4,687,298	4,705,402	4,722,728	4,739,412	4,755,595	4,771,328	4,786,400	4,800,685	4,814,408	4,827,431	4,839,671	4,851,357	4,862,431	4,872,983
Industrial Therms	1,467,854	1,357,639	1,259,662	1,238,029	1,213,826	1,190,698	1,168,621	1,147,573	1,127,509	1,108,352	1,090,042	1,072,487	1,055,610	1,039,342	1,023,712	1,008,723	994,352	980,570	967,376	954,676	942,471	930,699
Ind., Inst., & Cmcl. Interrup. Therms	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359
Total Core Therms	**9,685,143**	**8,740,643**	**9,070,131**	**9,040,139**	**9,022,548**	**9,018,367**	**9,034,039**	**9,057,548**	**9,063,565**	**9,065,366**	**9,079,619**	**9,097,895**	**9,100,260**	**9,096,627**	**9,108,541**	**9,154,849**	**9,158,399**	**9,162,320**	**9,177,746**	**9,183,259**	**9,183,907**	**9,183,202**
Daily Baseload Therms	6,786	6,124	6,355	6,334	6,321	6,319	6,330	6,346	6,350	6,351	6,361	6,374	6,376	6,373	6,382	6,414	6,417	6,419	6,430	6,434	6,435	6,434
Peak Day Therms	98,050	98,538	98,488	98,800	99,173	99,539	99,896	100,244	100,582	100,911	101,230	101,542	101,846	102,145	102,436	102,718	102,993	103,258	103,515	103,764	104,005	104,240
Therms Per Residential Customer	613	539	600	594	589	586	588	590	590	588	589	591	590	588	588	595	595	594	596	595	594	593
Therms Per Commercial Customer	3,698	3,310	3,394	3,394	3,393	3,392	3,391	3,390	3,389	3,388	3,387	3,386	3,385	3,383	3,382	3,381	3,380	3,379	3,377	3,376	3,375	3,373
Therms Per Industrial Customer	31,231	28,284	26,408	26,287	26,166	26,046	25,926	25,806	25,688	25,569	25,452	25,335	25,218	25,102	24,987	24,872	24,757	24,643	24,530	24,417	24,305	24,193
Residential Customers	5,256	5,269	5,269	5,285	5,305	5,323	5,342	5,360	5,377	5,394	5,411	5,427	5,443	5,458	5,474	5,488	5,503	5,517	5,530	5,544	5,556	5,569
Commercial Customers	1,330	1,349	1,346	1,351	1,358	1,365	1,371	1,377	1,383	1,389	1,394	1,400	1,405	1,410	1,415	1,420	1,424	1,429	1,433	1,437	1,441	1,444
Industrial Customers	47	48	48	47	46	46	45	44	44	43	43	42	42	41	41	41	40	40	39	39	39	38
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**6,634**	**6,667**	**6,664**	**6,685**	**6,710**	**6,735**	**6,759**	**6,782**	**6,805**	**6,828**	**6,849**	**6,870**	**6,891**	**6,911**	**6,931**	**6,950**	**6,968**	**6,986**	**7,004**	**7,021**	**7,037**	**7,053**
Walla Walla																						
Total Therms Pct. Growth		-12.94%	9.42%	0.25%	0.51%	0.68%	0.96%	1.05%	0.76%	0.66%	0.82%	0.85%	0.59%	0.47%	0.67%	1.17%	0.49%	0.46%	0.61%	0.44%	0.34%	0.30%
Residential Therms	6,915,315	6,012,829	6,693,204	6,685,858	6,709,581	6,760,105	6,853,402	6,962,628	7,030,282	7,085,595	7,167,193	7,256,359	7,306,774	7,340,478	7,408,002	7,555,185	7,598,050	7,639,179	7,705,992	7,747,041	7,773,955	7,795,560
Commercial Therms	4,450,732	3,915,927	4,129,309	4,166,028	4,200,533	4,227,180	4,242,472	4,252,527	4,272,277	4,293,753	4,307,664	4,318,721	4,338,636	4,361,541	4,374,852	4,367,993	4,384,865	4,400,776	4,409,607	4,423,558	4,439,470	4,455,780
Industrial Therms	118,639	69,756	117,879	115,812	114,059	112,389	110,711	109,159	107,620	106,151	104,683	103,274	101,881	100,532	99,206	97,860	96,555	95,277	93,989	92,719	91,500	90,274
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**11,484,686**	**9,998,512**	**10,940,392**	**10,967,698**	**11,024,173**	**11,099,673**	**11,206,584**	**11,324,314**	**11,410,179**	**11,485,500**	**11,579,540**	**11,678,353**	**11,747,291**	**11,802,551**	**11,882,060**	**12,021,038**	**12,079,469**	**12,135,232**	**12,209,587**	**12,263,317**	**12,304,926**	**12,341,613**
Daily Baseload Therms	7,903	6,881	7,529	7,548	7,586	7,638	7,712	7,793	7,852	7,904	7,969	8,037	8,084	8,122	8,177	8,272	8,313	8,351	8,402	8,439	8,468	8,493
Peak Day Therms	161,336	162,129	162,152	163,857	165,916	167,947	169,961	171,935	173,873	175,758	177,592	179,383	181,144	182,859	184,509	186,095	187,616	189,071	190,465	191,810	193,091	194,320
Therms Per Residential Customer	666	578	643	635	629	625	626	628	627	624	625	626	623	620	620	626	625	623	623	622	620	617
Therms Per Commercial Customer	3,645	3,125	3,303	3,318	3,329	3,335	3,331	3,324	3,324	3,327	3,324	3,318	3,320	3,325	3,322	3,305	3,305	3,306	3,301	3,301	3,302	3,304
Therms Per Industrial Customer	39,546	23,252	41,093	41,272	41,452	41,632	41,813	41,995	42,178	42,361	42,546	42,731	42,917	43,103	43,291	43,479	43,668	43,858	44,049	44,241	44,433	44,626
Residential Customers	10,381	10,406	10,411	10,528	10,670	10,810	10,949	11,085	11,219	11,349	11,476	11,599	11,721	11,839	11,953	12,062	12,167	12,267	12,362	12,455	12,543	12,627
Commercial Customers	1,221	1,253	1,250	1,256	1,262	1,268	1,274	1,279	1,285	1,291	1,296	1,301	1,307	1,312	1,317	1,322	1,327	1,331	1,336	1,340	1,344	1,349
Industrial Customers	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**11,605**	**11,662**	**11,664**	**11,786**	**11,934**	**12,081**	**12,225**	**12,367**	**12,507**	**12,642**	**12,774**	**12,903**	**13,030**	**13,153**	**13,272**	**13,386**	**13,495**	**13,600**	**13,700**	**13,797**	**13,889**	**13,978**
Wenatchee																						
Total Therms Pct. Growth		1.43%	1.50%	-0.34%	-0.28%	-0.28%	-0.28%	-0.28%	-0.30%	-0.31%	-0.31%	-0.31%	-0.33%	-0.34%	-0.34%	-0.30%	-0.36%	-0.37%	-0.36%	-0.38%	-0.40%	-0.41%
Residential Therms	794,386	664,824	811,419	801,406	794,795	792,787	797,675	805,227	806,420	806,019	809,981	815,292	814,847	812,196	815,027	830,074	829,879	829,827	833,879	834,400	833,227	831,581
Commercial Therms	4,046,946	3,580,768	3,892,514	3,876,307	3,859,090	3,837,592	3,809,749	3,779,500	3,754,991	3,731,679	3,704,434	3,676,037	3,652,610	3,631,073	3,604,662	3,568,200	3,544,127	3,519,641	3,491,777	3,466,594	3,442,607	3,418,956
Industrial Therms	604,621	1,279,349	905,512	912,402	920,263	927,855	935,061	942,018	948,531	954,800	960,827	966,562	972,049	977,307	982,364	987,183	991,719	996,094	1,000,142	1,003,949	1,007,690	1,011,132
Ind., Inst., & Cmcl. Interrup. Therms	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715
Total Core Therms	**5,541,668**	**5,620,656**	**5,705,160**	**5,685,829**	**5,669,863**	**5,653,948**	**5,638,200**	**5,622,460**	**5,605,657**	**5,588,212**	**5,570,957**	**5,553,606**	**5,535,221**	**5,516,292**	**5,497,768**	**5,481,172**	**5,461,441**	**5,441,277**	**5,421,513**	**5,400,658**	**5,379,239**	**5,357,384**
Daily Baseload Therms	4,955	5,026	5,101	5,084	5,070	5,055	5,041	5,027	5,012	4,997	4,981	4,966	4,949	4,932	4,916	4,901	4,883	4,865	4,847	4,829	4,810	4,790
Peak Day Therms	60,724	60,092	59,958	60,061	60,211	60,362	60,513	60,663	60,811	60,958	61,103	61,247	61,389	61,531	61,671	61,808	61,942	62,073	62,201	62,326	62,448	62,568
Therms Per Residential Customer	513	437	534	526	519	515	516	518	517	514	515	516	514	510	510	518	516	514	515	514	511	509
Therms Per Commercial Customer	5,367	4,712	5,138	5,131	5,120	5,102	5,074	5,042	5,017	4,992	4,961	4,928	4,901	4,876	4,844	4,798	4,768	4,737	4,701	4,668	4,637	4,606
Therms Per Industrial Customer	28,477	63,967	46,179	46,429	46,681	46,935	47,189	47,445	47,703	47,962	48,222	48,484	48,747	49,011	49,277	49,545	49,813	50,084	50,355	50,629	50,903	51,180
Residential Customers	1,550	1,521	1,519	1,525	1,532	1,539	1,547	1,553	1,560	1,567	1,573	1,579	1,586	1,592	1,597	1,603	1,609	1,614	1,619	1,624	1,629	1,634
Commercial Customers	754	760	758	755	754	752	751	750	749	748	747	746	745	745	744	744	743	743	743	743	742	742
Industrial Customers	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**2,326**	**2,302**	**2,297**	**2,301**	**2,307**	**2,312**	**2,318**	**2,324**	**2,330**	**2,335**	**2,341**	**2,346**	**2,352**	**2,357**	**2,362**	**2,368**	**2,373**	**2,378**	**2,383**	**2,388**	**2,392**	**2,397**

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Yakima																						
Total Therms Pct. Growth		-8.91%	8.13%	-0.82%	-0.43%	0.02%	0.71%	0.98%	0.35%	0.20%	0.63%	0.76%	0.20%	-0.02%	0.52%	1.72%	0.23%	0.24%	0.64%	0.29%	0.13%	0.08%
Residential Therms	13,231,368	11,854,531	13,194,989	13,150,014	13,166,894	13,237,110	13,389,806	13,574,121	13,679,956	13,764,573	13,901,650	14,054,900	14,135,790	14,187,896	14,308,052	14,582,404	14,662,343	14,742,085	14,873,103	14,957,376	15,017,918	15,070,856
Commercial Therms	13,019,440	11,913,848	13,038,870	12,889,849	12,798,120	12,782,062	12,879,832	13,022,101	13,060,935	13,073,980	13,159,353	13,267,780	13,281,867	13,259,730	13,328,903	13,601,641	13,622,025	13,644,824	13,736,858	13,770,283	13,775,471	13,773,005
Industrial Therms	3,057,998	2,915,647	2,631,606	2,588,116	2,538,154	2,490,171	2,444,140	2,400,091	2,357,925	2,317,553	2,278,866	2,241,657	2,205,766	2,171,083	2,137,681	2,105,610	2,074,768	2,045,195	2,016,808	1,989,479	1,963,171	1,937,775
Ind., Inst., & Cmcl. Interrup. Therms	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484
Total Core Therms	**29,459,291**	**26,834,510**	**29,015,949**	**28,778,464**	**28,653,652**	**28,659,828**	**28,864,263**	**29,146,798**	**29,249,301**	**29,306,591**	**29,490,354**	**29,714,821**	**29,773,906**	**29,769,193**	**29,925,121**	**30,440,139**	**30,509,621**	**30,582,588**	**30,777,254**	**30,867,623**	**30,907,045**	**30,932,120**
Daily Baseload Therms	21,271	19,376	20,951	20,779	20,689	20,694	20,841	21,045	21,119	21,161	21,293	21,455	21,498	21,495	21,607	21,979	22,029	22,082	22,223	22,288	22,316	22,334
Peak Day Therms	305,047	307,465	308,039	310,217	313,049	315,837	318,576	321,250	323,861	326,406	328,885	331,312	333,696	336,041	338,333	340,560	342,728	344,822	346,849	348,815	350,720	352,573
Therms Per Residential Customer	694	619	688	680	674	671	673	676	675	674	675	677	676	673	674	682	681	681	682	682	681	679
Therms Per Commercial Customer	3,943	3,518	3,832	3,772	3,724	3,700	3,709	3,731	3,723	3,709	3,716	3,729	3,716	3,693	3,696	3,756	3,746	3,738	3,748	3,743	3,731	3,717
Therms Per Industrial Customer	39,714	37,866	34,246	34,099	33,953	33,808	33,664	33,519	33,376	33,233	33,091	32,949	32,808	32,668	32,528	32,389	32,250	32,112	31,975	31,838	31,702	31,566
Residential Customers	19,070	19,163	19,190	19,336	19,527	19,715	19,899	20,080	20,255	20,426	20,593	20,756	20,916	21,074	21,227	21,377	21,522	21,662	21,798	21,929	22,056	22,180
Commercial Customers	3,302	3,387	3,402	3,418	3,436	3,455	3,473	3,490	3,508	3,525	3,542	3,558	3,574	3,590	3,606	3,621	3,636	3,651	3,665	3,679	3,693	3,706
Industrial Customers	77	77	77	76	75	74	73	72	71	70	69	68	67	66	66	65	64	64	63	62	62	61
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**22,452**	**22,630**	**22,672**	**22,833**	**23,041**	**23,246**	**23,448**	**23,645**	**23,837**	**24,024**	**24,207**	**24,385**	**24,561**	**24,733**	**24,902**	**25,066**	**25,225**	**25,380**	**25,529**	**25,673**	**25,814**	**25,950**
Baker																						
Total Therms Pct. Growth		-9.10%	14.26%	-1.32%	-1.42%	-0.85%	-0.06%	0.26%	-0.22%	-0.30%	0.19%	0.33%	-0.14%	-0.32%	0.22%	1.41%	0.03%	0.04%	0.54%	0.18%	0.08%	0.03%
Residential Therms	2,243,586	2,086,237	2,358,327	2,325,071	2,291,780	2,273,667	2,277,746	2,290,197	2,285,883	2,278,190	2,285,207	2,296,653	2,292,757	2,283,032	2,290,411	2,335,602	2,337,645	2,340,456	2,359,557	2,368,249	2,373,020	2,377,340
Commercial Therms	1,782,755	1,549,125	1,731,030	1,722,389	1,720,800	1,722,845	1,730,631	1,740,217	1,744,711	1,746,882	1,752,799	1,759,288	1,761,109	1,760,543	1,764,263	1,778,232	1,778,494	1,778,092	1,781,293	1,779,246	1,777,351	1,773,011
Industrial Therms	56,153	75,629	150,990	137,049	112,365	93,414	78,971	67,410	58,401	51,531	46,232	41,855	38,306	35,381	33,090	31,547	30,534	29,800	30,054	30,771	31,404	32,768
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**4,082,494**	**3,710,991**	**4,240,347**	**4,184,509**	**4,124,945**	**4,089,926**	**4,087,348**	**4,097,824**	**4,088,994**	**4,076,604**	**4,084,238**	**4,097,796**	**4,092,171**	**4,078,955**	**4,087,764**	**4,145,381**	**4,146,673**	**4,148,348**	**4,170,903**	**4,178,266**	**4,181,775**	**4,183,120**
Daily Baseload Therms	3,336	3,032	3,465	3,419	3,371	3,342	3,340	3,349	3,341	3,331	3,337	3,349	3,344	3,333	3,340	3,387	3,388	3,390	3,408	3,414	3,417	3,418
Peak Day Therms	25,970	26,208	26,596	26,651	26,628	26,613	26,610	26,609	26,626	26,651	26,691	26,732	26,787	26,844	26,908	26,990	27,081	27,171	27,301	27,423	27,557	27,694
Therms Per Residential Customer	675	622	693	681	673	668	670	674	672	670	671	674	671	667	668	679	677	675	677	676	674	671
Therms Per Commercial Customer	3,638	3,130	3,454	3,429	3,409	3,398	3,398	3,403	3,397	3,389	3,388	3,390	3,382	3,370	3,368	3,386	3,379	3,372	3,372	3,367	3,359	3,350
Therms Per Industrial Customer	28,076	18,907	38,587	38,174	37,766	37,363	36,963	36,568	36,178	35,791	35,408	35,030	34,656	34,285	33,919	33,556	33,198	32,843	32,492	32,145	31,801	31,461
Residential Customers	3,326	3,354	3,405	3,412	3,407	3,403	3,401	3,399	3,399	3,401	3,405	3,410	3,416	3,423	3,431	3,442	3,454	3,466	3,485	3,502	3,521	3,541
Commercial Customers	490	495	501	502	505	507	509	511	514	515	517	519	521	522	524	525	526	527	528	528	529	529
Industrial Customers	2	4	4	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**3,818**	**3,853**	**3,910**	**3,918**	**3,915**	**3,912**	**3,912**	**3,912**	**3,914**	**3,918**	**3,924**	**3,930**	**3,938**	**3,946**	**3,956**	**3,968**	**3,981**	**3,995**	**4,014**	**4,032**	**4,051**	**4,071**
Bend																						
Total Therms Pct. Growth		-5.63%	6.88%	0.34%	0.61%	1.03%	1.66%	1.92%	1.41%	1.30%	1.70%	1.84%	1.36%	1.19%	1.67%	2.75%	1.44%	1.47%	1.83%	1.54%	1.40%	1.37%
Residential Therms	29,229,820	27,584,941	29,020,237	29,258,289	29,536,749	29,877,083	30,312,332	30,788,864	31,190,729	31,577,625	32,029,686	32,507,619	32,913,328	33,296,583	33,760,309	34,405,630	34,843,259	35,291,441	35,805,781	36,276,643	36,729,401	37,181,613
Commercial Therms	18,308,461	17,303,858	18,573,754	18,646,671	18,811,323	19,113,577	19,632,103	20,247,173	20,677,222	21,064,786	21,604,706	22,203,940	22,619,070	22,965,598	23,512,820	24,521,531	24,991,491	25,477,080	26,132,255	26,663,929	27,137,605	27,600,383
Industrial Therms	1,897,103	1,764,667	2,269,166	2,125,321	1,985,363	1,860,212	1,748,195	1,647,551	1,557,093	1,475,422	1,401,641	1,334,688	1,273,492	1,217,762	1,166,650	1,120,161	1,077,427	1,038,555	1,002,891	970,150	940,099	912,435
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**49,435,384**	**46,653,466**	**49,863,157**	**50,030,281**	**50,333,436**	**50,850,872**	**51,692,629**	**52,683,588**	**53,425,044**	**54,117,834**	**55,036,032**	**56,046,247**	**56,805,890**	**57,479,942**	**58,439,779**	**60,047,322**	**60,912,176**	**61,807,076**	**62,940,928**	**63,910,723**	**64,807,105**	**65,694,431**
Daily Baseload Therms	41,653	39,309	42,013	42,154	42,410	42,845	43,555	44,390	45,014	45,598	46,372	47,223	47,863	48,431	49,240	50,594	51,323	52,077	53,032	53,849	54,605	55,352
Peak Day Therms	567,544	571,024	577,708	586,088	594,716	603,437	612,263	621,171	630,178	639,273	648,473	657,775	667,151	676,671	686,253	695,970	705,749	715,661	725,664	735,771	745,986	756,308
Therms Per Residential Customer	783	738	767	763	760	759	760	761	761	760	761	762	762	760	761	765	765	764	766	765	765	764
Therms Per Commercial Customer	3,046	2,779	2,959	2,907	2,868	2,852	2,867	2,894	2,895	2,889	2,904	2,925	2,922	2,909	2,922	2,990	2,991	2,994	3,015	3,022	3,021	3,019
Therms Per Industrial Customer	36,483	32,085	41,402	41,240	41,078	40,917	40,756	40,596	40,436	40,278	40,119	39,962	39,805	39,649	39,493	39,338	39,183	39,030	38,876	38,724	38,572	38,420
Residential Customers	37,318	37,366	37,826	38,333	38,852	39,376	39,907	40,444	40,987	41,536	42,092	42,654	43,222	43,798	44,379	44,969	45,562	46,165	46,774	47,390	48,013	48,644
Commercial Customers	6,011	6,226	6,277	6,414	6,558	6,703	6,849	6,995	7,143	7,291	7,440	7,590	7,741	7,893	8,046	8,200	8,355	8,511	8,667	8,825	8,983	9,142
Industrial Customers	52	55	55	52	48	45	43	41	39	37	35	33	32	31	30	28	27	27	26	25	24	24
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**43,381**	**43,647**	**44,158**	**44,798**	**45,458**	**46,125**	**46,799**	**47,480**	**48,169**	**48,864**	**49,567**	**50,278**	**50,995**	**51,722**	**52,455**	**53,197**	**53,945**	**54,703**	**55,467**	**56,240**	**57,020**	**57,809**
Ontario																						
Total Therms Pct. Growth		-12.87%	20.48%	-1.78%	-1.67%	-0.98%	0.09%	0.61%	-0.37%	-0.53%	0.24%	0.43%	-0.38%	-0.64%	0.19%	2.05%	-0.18%	-0.10%	0.73%	0.01%	-0.05%	0.07%
Residential Therms	2,095,880	1,887,207	2,127,112	2,114,644	2,098,648	2,088,000	2,085,880	2,089,280	2,084,737	2,079,748	2,082,188	2,085,678	2,083,484	2,080,031	2,083,083	2,100,375	2,101,248	2,103,427	2,114,735	2,117,703	2,122,656	2,131,053
Commercial Therms	2,785,550	2,361,432	2,784,458	2,702,206	2,631,640	2,594,147	2,604,554	2,636,733	2,625,901	2,607,320	2,621,518	2,644,861	2,631,399	2,605,994	2,617,526	2,711,577	2,705,946	2,703,519	2,735,728	2,738,445	2,735,704	2,735,826
Industrial Therms	325,396	288,166	554,177	551,529	548,402	544,892	541,206	537,350	533,291	529,045	524,772	520,265	515,717	510,964	506,229	501,447	496,528	491,588	486,699	481,674	476,711	471,836
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**5,206,826**	**4,536,805**	**5,465,747**	**5,368,379**	**5,278,690**	**5,227,039**	**5,231,639**	**5,263,363**	**5,243,929**	**5,216,113**	**5,228,479**	**5,250,804**	**5,230,600**	**5,196,989**	**5,206,838**	**5,313,398**	**5,303,722**	**5,298,533**	**5,337,162**	**5,337,821**	**5,335,072**	**5,338,714**
Daily Baseload Therms	3,868	3,370	4,060	3,988	3,921	3,883	3,886	3,910	3,896	3,875	3,884	3,901	3,886	3,861	3,868	3,947	3,940	3,936	3,965	3,965	3,963	3,966
Peak Day Therms	30,459	30,432	30,736	30,767	30,703	30,642	30,596	30,589	30,562	30,552	30,583	30,607	30,634	30,676	30,729	30,803	30,867	30,947	31,099	31,179	31,313	31,507
Therms Per Residential Customer	581	525	587	583	579	578	578	579	578	577	577	578	577	575	575	578	577	576	577	576	575	574
Therms Per Commercial Customer	3,231	2,714	3,154	3,058	2,985	2,948	2,965	3,003	2,993	2,973	2,987	3,011	2,993	2,960	2,968	3,067	3,054	3,043	3,064	3,059	3,042	3,022
Therms Per Industrial Customer	46,485	28,817	55,096	54,185	53,289	52,407	51,541	50,688	49,850	49,026	48,215	47,418	46,633	45,862	45,104	44,358	43,624	42,903	42,193	41,496	40,809	40,135
Residential Customers	3,609	3,594	3,626	3,629	3,622	3,615	3,609	3,608	3,605	3,604	3,607	3,610	3,613	3,618	3,624	3,633	3,640	3,650	3,667	3,677	3,693	3,715
Commercial Customers	862	870	883	884	882	880	878	878	877	877	878	878	879	880	882	884	886	888	893	895	899	905
Industrial Customers	7	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	12	12	12	12
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**4,478**	**4,474**	**4,519**	**4,523**	**4,514**	**4,505**	**4,498**	**4,497**	**4,493**	**4,492**	**4,496**	**4,500**	**4,504**	**4,510**	**4,518**	**4,529**	**4,538**	**4,550**	**4,572**	**4,584**	**4,604**	**4,632**
Pendleton																						
Total Therms Pct. Growth		-12.82%	13.04%	0.34%	0.76%	1.05%	1.52%	1.68%	1.20%	1.06%	1.34%	1.40%	0.96%	0.77%	1.12%	1.96%	0.82%	0.78%	1.03%	0.73%	0.57%	0.49%
Residential Therms	6,364,636	5,560,032	6,357,439	6,395,681	6,481,071	6,600,179	6,774,307	6,969,873	7,112,957	7,240,541	7,403,745	7,577,215	7,698,479	7,796,448	7,940,395	8,195,996	8,305,425	8,410,386	8,550,924	8,652,117	8,731,526	8,800,858
Commercial Therms	6,762,023	5,980,426	6,184,763	6,207,935	6,241,301	6,282,250	6,335,621	6,393,027	6,437,834	6,478,505	6,526,871	6,576,584	6,614,542	6,647,158	6,689,387	6,754,334	6,788,299	6,821,083	6,861,193	6,892,757	6,920,124	6,945,134
Industrial Therms	896,694	684,950	1,277,756	1,263,542	1,250,520	1,237,666	1,224,982	1,212,397	1,199,937	1,187,562	1,175,281	1,163,061	1,150,942	1,138,894	1,126,887	1,114,919	1,102,982	1,091,054	1,079,177	1,067,318	1,055,510	1,043,739
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**14,023,353**	**12,225,408**	**13,819,958**	**13,867,157**	**13,972,892**	**14,120,095**	**14,334,911**	**14,575,297**	**14,750,729**	**14,906,608**	**15,105,897**	**15,316,860**	**15,463,964**	**15,582,500**	**15,756,669**	**16,065,250**	**16,196,705**	**16,322,523**	**16,491,293**	**16,612,192**	**16,707,160**	**16,789,731**
Daily Baseload Therms	14,417	12,569	14,208	14,257	14,365	14,517	14,738	14,985	15,165	15,325	15,530	15,747	15,898	16,020	16,199	16,516	16,652	16,781	16,954	17,079	17,176	17,261
Peak Day Therms	194,931	196,962	198,754	202,450	206,954	211,433	215,890	220,271	224,595	228,837	232,996	237,053	241,040	244,928	248,676	252,282	255,731	258,992	262,097	265,024	267,790	270,388
Therms Per Residential Customer	610	526	596	588	581	578	580	584	583	582	583	586	585	582	583	592	592	591	593	593	592	591
Therms Per Commercial Customer	3,711	3,286	3,360	3,345	3,333	3,325	3,325	3,327	3,322	3,317	3,315	3,315	3,310	3,302	3,300	3,309	3,304	3,299	3,298	3,294	3,288	3,282
Therms Per Industrial Customer	42,700	29,780	55,584	54,948	54,318	53,697	53,082	52,474	51,873	51,279	50,692	50,112	49,538	48,971	48,411	47,856	47,308	46,767	46,231	45,702	45,179	44,662
Residential Customers	10,441	10,569	10,661	10,879	11,146	11,412	11,676	11,936	12,193	12,444	12,691	12,932	13,168	13,399	13,620	13,834	14,038	14,230	14,413	14,585	14,748	14,900
Commercial Customers	1,822	1,820	1,841	1,856	1,873	1,889	1,906	1,922	1,938	1,953	1,969	1,984	1,998	2,013	2,027	2,041	2,054	2,067	2,080	2,092	2,104	2,116
Industrial Customers	21	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**12,284**	**12,412**	**12,525**	**12,758**	**13,042**	**13,324**	**13,605**	**13,881**	**14,153**	**14,421**	**14,683**	**14,938**	**15,190**	**15,435**	**15,671**	**15,898**	**16,115**	**16,321**	**16,517**	**16,701**	**16,875**	**17,039**

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Washington										
Total Therms Pct. Growth		-12.53%	11.50%	1.00%	1.22%	1.42%	1.72%	1.83%	1.53%	1.44%
Residential Therms	119,103,353	106,725,615	121,730,339	123,087,951	124,763,171	126,729,512	129,148,721	131,757,917	133,960,227	136,059,517
Commercial Therms	94,200,977	84,630,702	92,408,956	93,504,007	94,821,074	96,322,508	98,109,225	100,015,871	101,673,697	103,268,195
Industrial Therms	16,441,334	9,342,671	9,875,967	9,685,865	9,486,803	9,302,523	9,131,801	8,973,965	8,827,885	8,692,594
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**231,779,474**	**202,732,799**	**226,049,073**	**228,311,633**	**231,104,859**	**234,388,354**	**238,423,558**	**242,781,564**	**246,495,620**	**250,054,117**
Daily Baseload Therms	212,628	185,494	207,672	209,901	212,600	215,728	219,511	223,578	227,087	230,461
Peak Day Therms	2,732,699	2,772,900	2,807,626	2,858,585	2,913,708	2,969,245	3,025,150	3,081,355	3,137,840	3,194,559
Therms Per Residential Customer	708	626	704	699	695	693	693	694	693	691
Therms Per Commercial Customer	3,919	3,434	3,734	3,712	3,695	3,685	3,685	3,690	3,685	3,678
Therms Per Industrial Customer	45,418	26,392	27,871	27,889	27,916	27,934	27,945	27,948	27,944	27,933
Residential Customers	168,291	170,540	172,861	176,031	179,458	182,910	186,381	189,870	193,373	196,890
Commercial Customers	24,035	24,642	24,749	25,187	25,662	26,140	26,622	27,106	27,592	28,081
Industrial Customers	362	354	354	347	340	333	327	321	316	311
Interruptible Customers	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**192,703**	**195,551**	**197,980**	**201,581**	**205,475**	**209,398**	**213,344**	**217,311**	**221,297**	**225,297**
Oregon										
Total Therms Pct. Growth		-7.73%	9.33%	0.08%	0.35%	0.78%	1.42%	1.69%	1.16%	1.04%
Residential Therms	39,933,922	37,118,417	39,863,115	40,093,684	40,408,247	40,838,929	41,450,264	42,138,214	42,674,307	43,176,105
Commercial Therms	29,638,790	27,194,841	29,274,005	29,279,202	29,405,064	29,712,819	30,302,909	31,017,150	31,485,668	31,897,494
Industrial Therms	3,175,346	2,813,412	4,252,089	4,077,440	3,896,651	3,736,185	3,593,354	3,464,708	3,348,721	3,243,561
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**72,748,058**	**67,126,670**	**73,389,209**	**73,450,326**	**73,709,962**	**74,287,933**	**75,346,526**	**76,620,073**	**77,508,696**	**78,317,159**
Daily Baseload Therms	63,274	58,280	63,747	63,818	64,067	64,587	65,519	66,633	67,416	68,129
Peak Day Therms	818,904	824,626	833,794	845,956	859,001	872,124	885,359	898,639	911,961	925,313
Therms Per Residential Customer	730	676	718	713	709	706	707	710	709	708
Therms Per Commercial Customer	3,227	2,890	3,081	3,032	2,995	2,977	2,988	3,009	3,007	2,999
Therms Per Industrial Customer	38,724	30,581	46,336	46,177	46,049	45,893	45,712	45,508	45,283	45,036
Residential Customers	54,694	54,883	55,518	56,253	57,026	57,805	58,593	59,387	60,184	60,985
Commercial Customers	9,185	9,411	9,502	9,656	9,817	9,979	10,142	10,307	10,471	10,637
Industrial Customers	82	92	92	88	85	81	79	76	74	72
Interruptible Customers										
Total Core Customers	**63,961**	**64,386**	**65,112**	**65,998**	**66,928**	**67,866**	**68,814**	**69,770**	**70,729**	**71,694**
System										
Total Therms Pct. Growth		-11.38%	10.96%	0.78%	1.01%	1.27%	1.65%	1.79%	1.44%	1.35%
Residential Therms	159,037,275	143,844,032	161,593,454	163,181,635	165,171,419	167,568,441	170,598,985	173,896,131	176,634,534	179,235,621
Commercial Therms	123,839,766	111,825,543	121,682,961	122,783,208	124,226,138	126,035,327	128,412,134	131,033,021	133,159,365	135,165,689
Industrial Therms	19,616,680	12,156,083	14,128,055	13,763,305	13,383,454	13,038,708	12,725,155	12,438,673	12,176,606	11,936,154
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**304,527,532**	**269,859,469**	**299,438,282**	**301,761,959**	**304,814,821**	**308,676,287**	**313,770,084**	**319,401,636**	**324,004,316**	**328,371,276**
Daily Baseload Therms	275,902	243,774	271,419	273,719	276,667	280,315	285,030	290,211	294,503	298,591
Peak Day Therms	3,551,604	3,597,526	3,641,420	3,704,541	3,772,709	3,841,369	3,910,510	3,979,994	4,049,801	4,119,872
Therms Per Residential Customer	713	638	708	703	698	696	696	698	697	695
Therms Per Commercial Customer	3,728	3,284	3,553	3,524	3,501	3,489	3,493	3,502	3,498	3,491
Therms Per Industrial Customer	44,182	27,256	31,669	31,597	31,531	31,462	31,390	31,314	31,233	31,147
Residential Customers	222,985	225,423	228,379	232,284	236,484	240,715	244,974	249,257	253,557	257,876
Commercial Customers	33,220	34,053	34,250	34,843	35,479	36,119	36,764	37,413	38,064	38,718
Industrial Customers	444	446	446	436	424	414	405	397	390	383
Interruptible Customers	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**256,664**	**259,937**	**263,091**	**267,578**	**272,403**	**277,263**	**282,159**	**287,081**	**292,026**	**296,991**

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Washington												
Total Therms Pct. Growth	1.62%	1.67%	1.40%	1.29%	1.52%	2.04%	1.36%	1.35%	1.51%	1.34%	1.25%	1.22%
Residential Therms	138,461,953	140,970,089	143,091,257	145,060,633	147,426,280	150,691,910	152,862,057	155,039,703	157,530,968	159,762,043	161,863,720	163,929,377
Commercial Therms	105,052,596	106,904,724	108,517,720	110,039,005	111,805,701	114,131,441	115,776,273	117,423,469	119,264,054	120,941,357	122,535,832	124,105,227
Industrial Therms	8,567,246	8,450,717	8,342,117	8,240,685	8,146,396	8,058,678	7,977,447	7,902,078	7,832,252	7,767,575	7,707,843	7,652,159
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**254,115,606**	**258,359,341**	**261,984,905**	**265,374,134**	**269,412,187**	**274,915,840**	**278,649,588**	**282,399,061**	**286,661,084**	**290,504,785**	**294,141,205**	**297,720,574**
Daily Baseload Therms	234,277	238,253	241,690	244,924	248,725	253,810	257,348	260,901	264,904	268,541	271,997	275,404
Peak Day Therms	3,251,533	3,308,795	3,366,431	3,424,450	3,482,715	3,541,157	3,599,881	3,658,684	3,717,667	3,776,847	3,836,217	3,895,782
Therms Per Residential Customer	691	691	689	687	687	690	689	687	687	686	684	682
Therms Per Commercial Customer	3,677	3,678	3,671	3,661	3,658	3,674	3,668	3,661	3,661	3,656	3,648	3,639
Therms Per Industrial Customer	27,915	27,892	27,864	27,831	27,794	27,751	27,704	27,654	27,599	27,541	27,480	27,416
Residential Customers	200,421	203,968	207,538	211,129	214,735	218,351	221,983	225,619	229,265	232,923	236,592	240,273
Commercial Customers	28,572	29,065	29,561	30,060	30,561	31,063	31,568	32,072	32,577	33,084	33,592	34,100
Industrial Customers	307	303	299	296	293	290	288	286	284	282	280	279
Interruptible Customers	15	15	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**229,315**	**233,351**	**237,413**	**241,500**	**245,604**	**249,719**	**253,853**	**257,991**	**262,141**	**266,304**	**270,479**	**274,668**
Oregon												
Total Therms Pct. Growth	1.45%	1.58%	1.09%	0.91%	1.40%	2.49%	1.15%	1.18%	1.56%	1.24%	1.10%	1.07%
Residential Therms	43,800,826	44,467,166	44,988,048	45,456,093	46,074,197	47,037,603	47,587,576	48,145,710	48,830,996	49,414,712	49,956,604	50,490,864
Commercial Therms	32,505,894	33,184,673	33,626,120	33,979,293	34,583,997	35,765,675	36,264,230	36,779,773	37,510,469	38,074,377	38,570,784	39,054,354
Industrial Therms	3,147,926	3,059,869	2,978,457	2,903,000	2,832,856	2,768,074	2,707,470	2,650,997	2,598,821	2,549,913	2,503,724	2,460,778
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**79,454,646**	**80,711,708**	**81,592,626**	**82,338,386**	**83,491,050**	**85,571,351**	**86,559,276**	**87,576,480**	**88,940,286**	**90,039,002**	**91,031,112**	**92,005,996**
Daily Baseload Therms	69,123	70,219	70,991	71,645	72,647	74,445	75,303	76,184	77,360	78,308	79,161	79,998
Peak Day Therms	938,742	952,167	965,611	979,119	992,566	1,006,045	1,019,428	1,032,772	1,046,161	1,059,397	1,072,647	1,085,897
Therms Per Residential Customer	709	710	709	708	708	714	714	713	715	715	714	713
Therms Per Commercial Customer	3,009	3,025	3,019	3,005	3,013	3,070	3,068	3,067	3,083	3,085	3,082	3,077
Therms Per Industrial Customer	44,772	44,491	44,197	43,889	43,571	43,240	42,899	42,549	42,189	41,821	41,449	41,070
Residential Customers	61,796	62,606	63,419	64,238	65,055	65,877	66,695	67,512	68,339	69,154	69,975	70,800
Commercial Customers	10,804	10,971	11,139	11,309	11,479	11,651	11,822	11,994	12,169	12,341	12,516	12,692
Industrial Customers	70	69	67	66	65	64	63	62	62	61	60	60
Interruptible Customers												
Total Core Customers	**72,670**	**73,646**	**74,626**	**75,613**	**76,599**	**77,592**	**78,580**	**79,568**	**80,569**	**81,556**	**82,551**	**83,552**
System												
Total Therms Pct. Growth	1.58%	1.65%	1.33%	1.20%	1.49%	2.15%	1.31%	1.31%	1.52%	1.32%	1.22%	1.18%
Residential Therms	182,262,780	185,437,255	188,079,305	190,516,726	193,500,478	197,729,513	200,449,633	203,185,413	206,361,964	209,176,754	211,820,324	214,420,241
Commercial Therms	137,558,490	140,089,397	142,143,841	144,018,298	146,389,697	149,897,115	152,040,503	154,203,243	156,774,523	159,015,734	161,106,615	163,159,581
Industrial Therms	11,715,172	11,510,586	11,320,574	11,143,685	10,979,252	10,826,752	10,684,917	10,553,076	10,431,072	10,317,488	10,211,568	10,112,937
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**333,570,252**	**339,071,048**	**343,577,530**	**347,712,520**	**352,903,238**	**360,487,191**	**365,208,865**	**369,975,542**	**375,601,370**	**380,543,787**	**385,172,317**	**389,726,570**
Daily Baseload Therms	303,400	308,472	312,681	316,568	321,372	328,255	332,651	337,085	342,263	346,849	351,158	355,401
Peak Day Therms	4,190,275	4,260,962	4,332,043	4,403,569	4,475,281	4,547,202	4,619,309	4,691,456	4,763,828	4,836,244	4,908,864	4,981,679
Therms Per Residential Customer	695	696	694	692	692	696	694	693	693	692	691	689
Therms Per Commercial Customer	3,494	3,499	3,492	3,481	3,482	3,509	3,504	3,499	3,504	3,501	3,494	3,487
Therms Per Industrial Customer	31,057	30,963	30,865	30,763	30,658	30,549	30,436	30,320	30,201	30,079	29,955	29,829
Residential Customers	262,217	266,574	270,957	275,367	279,790	284,228	288,677	293,130	297,604	302,078	306,567	311,073
Commercial Customers	39,375	40,036	40,700	41,369	42,040	42,714	43,389	44,066	44,746	45,425	46,107	46,793
Industrial Customers	377	372	367	362	358	354	351	348	345	343	341	339
Interruptible Customers	15	15	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**301,984**	**306,997**	**312,039**	**317,113**	**322,203**	**327,311**	**332,433**	**337,559**	**342,711**	**347,861**	**353,030**	**358,220**

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

Aberdeen

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Therms Pct. Growth		-10.13%	6.42%	0.71%	0.67%	0.67%	0.65%	0.64%	0.66%	0.66%	0.65%	0.65%	0.67%	0.67%	0.65%	0.62%	0.67%	0.66%	0.65%	0.67%	0.68%	0.67%
Residential Therms	3,907,331	3,518,892	3,937,794	3,946,632	3,949,726	3,954,578	3,961,443	3,968,208	3,970,753	3,970,598	3,972,104	3,973,302	3,970,787	3,965,791	3,962,313	3,964,668	3,957,656	3,949,965	3,943,266	3,934,065	3,923,525	3,911,694
Commercial Therms	5,429,998	5,012,117	5,100,835	5,168,116	5,233,573	5,297,704	5,357,833	5,416,999	5,483,386	5,551,761	5,618,470	5,685,433	5,758,570	5,834,139	5,906,965	5,970,808	6,048,969	6,127,970	6,204,583	6,285,887	6,369,955	6,454,910
Industrial Therms	370,555	119,051	214,546	209,571	208,022	206,778	205,928	205,301	205,043	205,022	205,162	205,494	205,977	206,532	207,559	208,579	210,066	211,544	213,233	215,208	217,250	219,360
Ind., Inst., & Cmcl. Interrup. Therms	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298	739,298
Total Core Therms	**10,447,182**	**9,389,358**	**9,992,473**	**10,063,617**	**10,130,619**	**10,198,357**	**10,264,502**	**10,329,806**	**10,398,479**	**10,466,678**	**10,535,033**	**10,603,527**	**10,674,632**	**10,745,759**	**10,816,135**	**10,883,352**	**10,955,988**	**11,028,776**	**11,100,380**	**11,174,458**	**11,250,027**	**11,325,261**
Daily Baseload Therms	8,885	7,985	8,498	8,559	8,616	8,673	8,730	8,785	8,844	8,902	8,960	9,018	9,078	9,139	9,199	9,256	9,318	9,380	9,441	9,504	9,568	9,632
Peak Day Therms	82,423	82,179	84,026	84,805	85,476	86,153	86,818	87,474	88,135	88,777	89,424	90,067	90,711	91,341	91,963	92,587	93,199	93,807	94,405	95,002	95,597	96,178
Therms Per Residential Customer	740	671	733	728	723	718	713	709	704	699	694	689	684	679	673	669	664	658	653	648	642	636
Therms Per Commercial Customer	4,840	4,408	4,405	4,432	4,458	4,481	4,501	4,519	4,542	4,567	4,590	4,612	4,639	4,667	4,693	4,711	4,739	4,768	4,795	4,825	4,856	4,888
Therms Per Industrial Customer	26,468	9,158	14,811	14,649	14,488	14,329	14,171	14,016	13,862	13,710	13,559	13,410	13,263	13,117	12,973	12,831	12,690	12,550	12,413	12,276	12,142	12,008
Residential Customers	5,280	5,247	5,369	5,421	5,465	5,510	5,553	5,596	5,639	5,680	5,722	5,763	5,804	5,845	5,884	5,924	5,962	6,000	6,038	6,075	6,112	6,148
Commercial Customers	1,122	1,137	1,158	1,166	1,174	1,182	1,190	1,199	1,207	1,216	1,224	1,233	1,241	1,250	1,259	1,268	1,276	1,285	1,294	1,303	1,312	1,321
Industrial Customers	14	13	14	14	14	14	15	15	15	15	15	15	16	16	16	16	17	17	17	18	18	18
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**6,418**	**6,399**	**6,543**	**6,603**	**6,656**	**6,708**	**6,760**	**6,811**	**6,863**	**6,913**	**6,963**	**7,013**	**7,063**	**7,112**	**7,161**	**7,209**	**7,257**	**7,304**	**7,351**	**7,397**	**7,444**	**7,489**

Bellingham

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Therms Pct. Growth		-22.95%	22.82%	1.27%	1.23%	1.56%	2.09%	2.26%	1.66%	1.47%	1.80%	1.86%	1.35%	1.11%	1.52%	2.49%	1.18%	1.15%	1.45%	1.13%	0.96%	0.89%
Residential Therms	30,430,845	26,890,852	32,884,179	33,344,902	33,804,094	34,384,244	35,158,586	36,010,143	36,664,495	37,260,214	37,987,987	38,753,799	39,332,379	39,826,428	40,491,239	41,567,437	42,119,282	42,665,769	43,348,890	43,898,206	44,379,319	44,833,516
Commercial Therms	15,232,542	13,256,906	16,512,539	16,699,469	16,876,419	17,111,492	17,441,653	17,807,279	18,070,768	18,301,463	18,595,383	18,905,402	19,119,794	19,290,052	19,541,504	19,991,085	20,181,433	20,366,637	20,615,758	20,798,243	20,945,455	21,077,961
Industrial Therms	7,638,841	881,544	1,034,198	1,027,201	1,022,587	1,018,588	1,015,127	1,012,156	1,009,652	1,007,692	1,006,079	1,004,822	1,003,891	1,003,343	1,003,192	1,003,322	1,003,823	1,004,666	1,005,764	1,007,121	1,008,771	1,010,669
Ind., Inst., & Cmcl. Interrup. Therms	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423	169,423
Total Core Therms	**53,471,652**	**41,198,725**	**50,600,340**	**51,240,994**	**51,872,523**	**52,683,747**	**53,784,789**	**54,999,001**	**55,914,339**	**56,738,792**	**57,758,873**	**58,833,445**	**59,625,488**	**60,289,247**	**61,205,358**	**62,731,267**	**63,473,961**	**64,206,496**	**65,139,835**	**65,872,994**	**66,502,969**	**67,091,569**
Daily Baseload Therms	52,641	40,559	49,814	50,445	51,067	51,866	52,949	54,145	55,046	55,858	56,862	57,920	58,699	59,353	60,255	61,757	62,488	63,209	64,128	64,850	65,470	66,050
Peak Day Therms	687,742	695,374	735,231	757,259	778,089	799,104	820,225	841,498	862,913	884,457	906,186	928,048	950,148	972,362	994,653	1,017,108	1,039,650	1,062,304	1,085,097	1,107,969	1,131,012	1,154,183
Therms Per Residential Customer	758	663	766	754	743	736	733	731	726	719	715	712	706	698	693	696	689	683	679	673	666	659
Therms Per Commercial Customer	3,265	2,760	3,305	3,255	3,212	3,183	3,172	3,169	3,148	3,123	3,110	3,100	3,075	3,044	3,028	3,042	3,018	2,994	2,980	2,958	2,932	2,904
Therms Per Industrial Customer	190,971	22,604	26,693	26,673	26,654	26,634	26,615	26,595	26,575	26,556	26,536	26,517	26,497	26,478	26,458	26,439	26,419	26,400	26,380	26,361	26,341	26,322
Residential Customers	40,169	40,531	42,939	44,242	45,479	46,727	47,984	49,251	50,528	51,814	53,112	54,419	55,742	57,073	58,410	59,758	61,113	62,476	63,848	65,227	66,617	68,017
Commercial Customers	4,666	4,803	4,996	5,131	5,254	5,376	5,498	5,619	5,740	5,860	5,980	6,099	6,218	6,337	6,455	6,572	6,688	6,803	6,918	7,031	7,145	7,257
Industrial Customers	40	39	39	39	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**44,878**	**45,376**	**47,977**	**49,414**	**50,774**	**52,145**	**53,523**	**54,911**	**56,309**	**57,714**	**59,132**	**60,559**	**62,001**	**63,451**	**64,905**	**66,371**	**67,841**	**69,320**	**70,807**	**72,300**	**73,803**	**75,315**

Bremerton

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Therms Pct. Growth		-8.37%	15.43%	2.57%	2.39%	2.38%	2.37%	2.35%	2.30%	2.26%	2.25%	2.23%	2.20%	2.16%	2.15%	2.16%	2.09%	2.06%	2.05%	2.02%	2.00%	1.98%
Residential Therms	20,587,402	18,579,097	21,537,498	21,905,933	22,265,410	22,638,293	23,029,454	23,427,668	23,805,583	24,175,023	24,558,009	24,943,579	25,310,502	25,667,891	26,040,649	26,454,250	26,813,373	27,169,890	27,538,388	27,892,306	28,238,458	28,580,273
Commercial Therms	9,662,772	9,011,610	10,334,123	10,795,538	11,226,342	11,661,075	12,093,471	12,530,614	12,989,564	13,460,599	13,934,871	14,417,140	14,923,428	15,444,709	15,963,170	16,465,001	17,010,572	17,566,614	18,123,862	18,700,159	19,293,212	19,899,135
Industrial Therms	12,338	107,569	155,282	158,555	161,796	165,064	168,342	171,640	174,968	178,308	181,676	185,063	188,482	191,921	195,385	198,875	202,394	205,936	209,500	213,096	216,720	220,367
Ind., Inst., & Cmcl. Interrup. Therms	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624	357,624
Total Core Therms	**30,620,136**	**28,055,900**	**32,384,526**	**33,217,649**	**34,011,172**	**34,822,056**	**35,648,891**	**36,487,547**	**37,327,739**	**38,171,553**	**39,032,179**	**39,903,406**	**40,780,036**	**41,662,145**	**42,556,827**	**43,475,750**	**44,383,962**	**45,300,063**	**46,229,374**	**47,163,184**	**48,106,014**	**49,057,398**
Daily Baseload Therms	34,510	31,620	36,498	37,437	38,331	39,245	40,177	41,122	42,069	43,020	43,990	44,972	45,960	46,954	47,962	48,998	50,022	51,054	52,101	53,154	54,216	55,289
Peak Day Therms	340,376	344,656	357,676	366,589	375,307	384,187	393,180	402,312	411,601	421,002	430,563	440,261	450,127	460,123	470,250	480,531	490,951	501,507	512,203	523,050	534,052	545,193
Therms Per Residential Customer	741	662	740	735	731	727	723	719	715	710	706	702	697	692	688	684	679	674	669	664	659	653
Therms Per Commercial Customer	3,967	3,569	3,899	3,919	3,939	3,956	3,970	3,984	4,001	4,020	4,037	4,054	4,075	4,097	4,117	4,130	4,153	4,175	4,196	4,220	4,245	4,271
Therms Per Industrial Customer	6,169	107,569	148,613	148,003	147,396	146,792	146,190	145,590	144,993	144,398	143,806	143,216	142,628	142,043	141,460	140,880	140,302	139,727	139,154	138,583	138,014	137,448
Residential Customers	27,781	28,073	29,103	29,791	30,469	31,160	31,860	32,571	33,295	34,028	34,774	35,530	36,300	37,080	37,871	38,675	39,490	40,317	41,155	42,005	42,869	43,743
Commercial Customers	2,436	2,525	2,651	2,755	2,850	2,948	3,046	3,145	3,246	3,348	3,451	3,556	3,662	3,770	3,877	3,987	4,096	4,207	4,319	4,431	4,545	4,659
Industrial Customers	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	**30,221**	**30,601**	**31,757**	**32,548**	**33,322**	**34,111**	**34,909**	**35,720**	**36,545**	**37,380**	**38,228**	**39,089**	**39,965**	**40,853**	**41,752**	**42,665**	**43,590**	**44,527**	**45,477**	**46,440**	**47,417**	**48,406**

Kennewick

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Therms Pct. Growth		-7.85%	13.34%	3.63%	3.30%	3.34%	3.47%	3.45%	3.08%	2.89%	2.96%	2.91%	2.61%	2.44%	2.54%	2.93%	2.25%	2.18%	2.26%	2.06%	1.94%	1.86%
Residential Therms	12,039,314	11,151,277	12,420,204	12,934,557	13,436,128	13,970,956	14,553,980	15,165,891	15,752,035	16,336,617	16,961,641	17,608,516	18,229,100	18,844,081	19,506,874	20,277,573	20,940,633	21,614,307	22,332,488	23,031,148	23,724,343	24,421,076
Commercial Therms	13,631,077	12,529,798	14,190,902	14,663,760	15,087,905	15,522,837	15,980,184	16,437,841	16,838,266	17,205,858	17,585,472	17,956,046	18,271,739	18,553,232	18,849,427	19,215,656	19,448,244	19,660,733	19,881,913	20,057,589	20,200,193	20,319,650
Industrial Therms	303,216	237,748	525,606	531,869	539,900	548,338	557,353	566,893	576,921	587,443	598,434	609,931	621,865	634,314	647,318	660,817	674,913	689,534	704,775	720,516	736,877	753,785
Ind., Inst., & Cmcl. Interrup. Therms	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384	201,384
Total Core Therms	**26,174,991**	**24,120,207**	**27,338,095**	**28,331,570**	**29,265,317**	**30,243,514**	**31,292,901**	**32,372,009**	**33,368,606**	**34,331,302**	**35,346,931**	**36,375,877**	**37,324,087**	**38,233,010**	**39,205,004**	**40,355,430**	**41,265,174**	**42,165,958**	**43,120,559**	**44,010,637**	**44,862,797**	**45,695,896**
Daily Baseload Therms	21,076	19,422	22,013	22,813	23,565	24,352	25,197	26,066	26,869	27,644	28,462	29,290	30,054	30,786	31,568	32,495	33,227	33,952	34,721	35,438	36,124	36,795
Peak Day Therms	352,047	370,851	402,261	421,972	441,126	460,840	481,083	501,924	523,345	545,297	567,895	591,127	615,031	639,585	664,701	690,517	716,906	743,952	771,668	800,045	829,113	858,837
Therms Per Residential Customer	627	550	564	560	557	554	553	552	550	547	545	544	541	538	535	536	533	530	527	524	521	518
Therms Per Commercial Customer	4,616	4,091	4,273	4,207	4,142	4,080	4,026	3,972	3,905	3,834	3,767	3,699	3,623	3,543	3,469	3,409	3,329	3,249	3,174	3,095	3,014	2,933
Therms Per Industrial Customer	17,836	14,859	32,369	32,590	32,811	33,035	33,260	33,486	33,714	33,944	34,175	34,408	34,642	34,878	35,115	35,355	35,595	35,838	36,082	36,327	36,575	36,824
Residential Customers	19,214	20,290	22,011	23,089	24,138	25,219	26,329	27,473	28,650	29,857	31,100	32,379	33,695	35,048	36,434	37,859	39,316	40,811	42,344	43,915	45,525	47,172
Commercial Customers	2,953	3,063	3,321	3,485	3,643	3,804	3,969	4,139	4,312	4,488	4,669	4,854	5,043	5,237	5,434	5,636	5,841	6,050	6,264	6,481	6,702	6,928
Industrial Customers	17	16	16	16	16	17	17	17	17	17	18	18	18	18	18	19	19	19	20	20	20	20
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**22,185**	**23,370**	**25,349**	**26,591**	**27,799**	**29,041**	**30,317**	**31,630**	**32,980**	**34,363**	**35,787**	**37,251**	**38,758**	**40,305**	**41,888**	**43,514**	**45,177**	**46,882**	**48,628**	**50,417**	**52,248**	**54,121**

Longview

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Therms Pct. Growth		-10.09%	13.85%	1.27%	1.30%	1.22%	1.16%	1.12%	1.24%	1.25%	1.21%	1.19%	1.27%	1.33%	1.21%	1.03%	1.28%	1.26%	1.19%	1.25%	1.27%	1.25%
Residential Therms	1,558,912	1,361,463	1,637,727	1,647,529	1,660,115	1,673,298	1,688,971	1,705,259	1,720,850	1,735,740	1,752,189	1,769,101	1,784,506	1,800,411	1,816,734	1,836,101	1,852,709	1,868,885	1,885,886	1,902,480	1,918,735	1,934,200
Commercial Therms	5,095,213	4,560,755	4,955,350	5,040,762	5,125,783	5,205,230	5,278,001	5,347,985	5,429,176	5,512,981	5,592,502	5,671,274	5,758,815	5,852,795	5,937,351	6,004,243	6,096,623	6,188,734	6,274,790	6,368,016	6,465,002	6,562,164
Industrial Therms	538,181	532,335	771,602	771,317	772,301	773,459	774,982	776,707	778,734	780,882	783,272	785,797	788,435	791,324	794,229	797,243	800,509	803,810	807,174	810,688	814,279	817,835
Ind., Inst., & Cmcl. Interrup. Therms	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544	117,544
Total Core Therms	**7,309,850**	**6,572,097**	**7,482,223**	**7,577,153**	**7,675,743**	**7,769,531**	**7,859,498**	**7,947,495**	**8,046,304**	**8,147,147**	**8,245,507**	**8,343,715**	**8,449,300**	**8,562,074**	**8,665,858**	**8,755,132**	**8,867,384**	**8,978,973**	**9,085,394**	**9,198,728**	**9,315,560**	**9,431,744**
Daily Baseload Therms	8,420	7,571	8,619	8,728	8,842	8,950	9,054	9,155	9,269	9,385	9,498	9,611	9,733	9,863	9,982	10,085	10,215	10,343	10,466	10,596	10,731	10,865
Peak Day Therms	81,924	81,597	82,980	83,997	85,119	86,242	87,425	88,628	89,885	91,146	92,451	93,781	95,121	96,528	97,911	99,319	100,789	102,256	103,735	105,255	106,798	108,326
Therms Per Residential Customer	602	530	625	620	616	612	609	606	602	598	595	591	587	583	579	576	572	567	564	559	555	551
Therms Per Commercial Customer	4,477	3,990	4,293	4,319	4,342	4,361	4,372	4,380	4,396	4,414	4,427	4,439	4,458	4,479	4,494	4,496	4,515	4,535	4,550	4,569	4,590	4,612
Therms Per Industrial Customer	17,939	18,356	25,907	25,816	25,725	25,635	25,545	25,455	25,365	25,276	25,187	25,099	25,011	24,923	24,835	24,748	24,661	24,574	24,487	24,401	24,316	24,230
Residential Customers	2,590	2,571	2,622	2,656	2,694	2,732	2,773	2,814	2,858	2,901	2,947	2,993	3,040	3,090	3,139	3,188	3,241	3,293	3,347	3,401	3,457	3,513
Commercial Customers	1,138	1,143	1,154	1,167	1,180	1,194	1,207	1,221	1,235	1,249	1,263	1,278	1,292	1,307	1,321	1,335	1,350	1,365	1,379	1,394	1,408	1,423
Industrial Customers	30	29	30	30	30	30	30	31	31	31	31	31	32	32	32	32	32	33	33	33	33	34
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**3,759**	**3,744**	**3,807**	**3,854**	**3,906**	**3,957**	**4,011**	**4,067**	**4,124**	**4,182**	**4,242**	**4,303**	**4,365**	**4,429**	**4,493**	**4,557**	**4,625**	**4,692**	**4,760**	**4,830**	**4,900**	**4,970**

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Moses Lake																						
Total Therms Pct. Growth		-5.62%	3.61%	0.68%	0.72%	0.98%	1.37%	1.51%	1.14%	1.05%	1.29%	1.37%	1.05%	0.93%	1.23%	1.86%	1.07%	1.06%	1.28%	1.11%	1.03%	1.01%
Residential Therms	1,128,284	986,252	1,056,496	1,044,754	1,034,459	1,027,682	1,026,300	1,026,668	1,021,226	1,013,972	1,010,031	1,006,820	998,600	988,331	982,183	985,348	976,178	966,835	960,461	951,182	940,512	929,394
Commercial Therms	2,636,699	2,392,003	2,433,007	2,445,442	2,457,900	2,477,436	2,507,714	2,542,339	2,567,136	2,589,346	2,618,793	2,650,628	2,673,279	2,692,305	2,720,329	2,768,760	2,792,103	2,815,516	2,846,095	2,870,723	2,892,556	2,913,493
Industrial Therms	423,447	574,965	606,550	633,853	661,202	689,224	717,947	747,277	777,313	808,089	839,640	872,056	905,313	939,228	974,085	1,009,445	1,046,069	1,083,122	1,121,337	1,160,592	1,200,722	1,241,637
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**4,188,430**	**3,953,220**	**4,096,052**	**4,124,049**	**4,153,561**	**4,194,342**	**4,251,961**	**4,316,285**	**4,365,676**	**4,411,407**	**4,468,463**	**4,529,505**	**4,577,193**	**4,619,864**	**4,676,596**	**4,763,553**	**4,814,349**	**4,865,473**	**4,927,893**	**4,982,497**	**5,033,790**	**5,084,524**
Daily Baseload Therms	3,668	3,462	3,587	3,612	3,638	3,673	3,724	3,780	3,823	3,863	3,913	3,967	4,009	4,046	4,096	4,172	4,216	4,261	4,316	4,364	4,408	4,453
Peak Day Therms	79,359	79,335	80,122	80,652	81,128	81,601	82,068	82,530	82,988	83,440	83,891	84,339	84,783	85,225	85,662	86,094	86,525	86,949	87,372	87,791	88,210	88,624
Therms Per Residential Customer	608	534	569	561	553	547	545	543	538	533	529	526	520	513	508	508	502	496	491	485	478	471
Therms Per Commercial Customer	4,179	3,732	3,718	3,692	3,671	3,662	3,669	3,683	3,682	3,679	3,686	3,696	3,694	3,687	3,693	3,726	3,726	3,727	3,737	3,740	3,739	3,738
Therms Per Industrial Customer	23,832	33,821	32,438	32,169	31,901	31,636	31,373	31,113	30,854	30,598	30,343	30,091	29,841	29,593	29,347	29,103	28,861	28,622	28,384	28,148	27,914	27,682
Residential Customers	1,856	1,846	1,856	1,863	1,870	1,877	1,884	1,890	1,897	1,903	1,910	1,916	1,922	1,928	1,934	1,940	1,945	1,951	1,957	1,962	1,967	1,973
Commercial Customers	631	641	654	662	670	677	683	690	697	704	711	717	724	730	737	743	749	755	762	768	774	780
Industrial Customers	18	17	19	20	21	22	23	24	25	26	28	29	30	32	33	35	36	38	40	41	43	45
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**2,505**	**2,504**	**2,529**	**2,546**	**2,561**	**2,576**	**2,590**	**2,605**	**2,619**	**2,634**	**2,648**	**2,662**	**2,676**	**2,690**	**2,704**	**2,717**	**2,731**	**2,744**	**2,758**	**2,771**	**2,784**	**2,797**
Mount Vernon																						
Total Therms Pct. Growth		-11.86%	14.63%	1.95%	1.88%	1.98%	2.14%	2.18%	1.99%	1.92%	2.01%	2.02%	1.85%	1.77%	1.88%	2.17%	1.75%	1.71%	1.79%	1.68%	1.60%	1.58%
Residential Therms	25,288,799	22,864,684	26,788,425	27,426,971	28,031,584	28,652,671	29,298,130	29,953,333	30,579,313	31,197,656	31,832,570	32,471,465	33,086,142	33,687,464	34,310,294	34,984,537	35,587,292	36,182,628	36,794,138	37,386,015	37,962,571	38,536,434
Commercial Therms	16,077,025	13,992,239	15,490,573	15,812,424	16,131,774	16,489,538	16,906,542	17,351,269	17,747,045	18,133,620	18,562,780	19,008,982	19,408,854	19,790,761	20,228,026	20,787,869	21,206,248	21,627,268	22,094,249	22,529,726	22,949,129	23,368,024
Industrial Therms	1,905,644	1,267,068	1,440,278	1,334,982	1,250,384	1,173,081	1,102,292	1,037,547	978,071	923,344	872,787	825,958	782,477	742,263	705,093	670,523	638,582	608,843	581,156	555,344	531,243	508,613
Ind., Inst., & Cmcl. Interrup. Therms	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980	124,980
Total Core Therms	**43,396,447**	**38,248,971**	**43,844,256**	**44,699,357**	**45,538,722**	**46,440,270**	**47,431,945**	**48,467,129**	**49,429,410**	**50,379,600**	**51,393,117**	**52,431,385**	**53,402,452**	**54,345,468**	**55,368,393**	**56,567,909**	**57,557,101**	**58,543,720**	**59,594,524**	**60,596,065**	**61,567,923**	**62,538,050**
Daily Baseload Therms	42,513	37,470	42,951	43,789	44,611	45,495	46,466	47,480	48,423	49,354	50,347	51,364	52,315	53,239	54,241	55,416	56,385	57,352	58,381	59,362	60,314	61,265
Peak Day Therms	483,671	490,685	509,045	523,681	537,763	552,090	566,644	581,448	596,453	611,727	627,264	643,042	659,115	675,424	692,001	708,801	725,884	743,140	760,669	778,471	796,476	814,803
Therms Per Residential Customer	720	642	723	720	716	713	710	707	704	700	696	693	689	684	680	677	672	668	663	658	653	648
Therms Per Commercial Customer	3,587	3,054	3,307	3,283	3,263	3,250	3,248	3,250	3,242	3,232	3,228	3,226	3,215	3,200	3,194	3,206	3,195	3,185	3,180	3,170	3,158	3,145
Therms Per Industrial Customer	20,491	13,924	17,947	17,930	17,913	17,896	17,879	17,862	17,845	17,828	17,811	17,794	17,777	17,760	17,743	17,726	17,709	17,692	17,675	17,658	17,641	17,625
Residential Customers	35,144	35,623	37,039	38,114	39,148	40,199	41,267	42,352	43,453	44,572	45,711	46,867	48,045	49,240	50,455	51,686	52,938	54,202	55,486	56,790	58,110	59,452
Commercial Customers	4,482	4,581	4,684	4,816	4,943	5,073	5,204	5,338	5,474	5,611	5,751	5,893	6,038	6,184	6,333	6,483	6,636	6,791	6,948	7,107	7,267	7,431
Industrial Customers	93	91	80	74	70	66	62	58	55	52	49	46	44	42	40	38	36	34	33	31	30	29
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**39,720**	**40,296**	**41,804**	**43,006**	**44,162**	**45,339**	**46,534**	**47,750**	**48,982**	**50,236**	**51,512**	**52,808**	**54,128**	**55,467**	**56,829**	**58,208**	**59,611**	**61,028**	**62,468**	**63,930**	**65,408**	**66,913**
Sunnyside																						
Total Therms Pct. Growth		-9.75%	3.84%	-0.18%	-0.18%	-0.03%	0.19%	0.27%	0.07%	0.03%	0.17%	0.21%	0.03%	-0.04%	0.13%	0.53%	0.04%	0.04%	0.18%	0.06%	0.01%	0.00%
Residential Therms	3,221,397	2,840,914	3,179,106	3,165,298	3,156,048	3,160,110	3,184,163	3,216,270	3,230,671	3,240,865	3,264,036	3,291,537	3,302,817	3,307,924	3,329,212	3,386,624	3,399,953	3,414,035	3,440,611	3,457,122	3,468,890	3,479,498
Commercial Therms	4,918,533	4,464,731	4,585,762	4,607,397	4,617,999	4,627,732	4,636,166	4,643,582	4,650,017	4,655,431	4,660,104	4,664,116	4,667,607	4,670,444	4,672,014	4,672,980	4,672,911	4,672,035	4,670,461	4,668,190	4,665,362	4,662,033
Industrial Therms	1,467,854	1,357,639	1,234,396	1,210,389	1,193,019	1,176,459	1,160,867	1,146,066	1,132,040	1,118,747	1,105,998	1,093,758	1,081,975	1,070,679	1,060,086	1,049,853	1,040,261	1,031,119	1,022,373	1,014,036	1,006,038	998,348
Ind., Inst., & Cmcl. Interrup. Therms	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359	77,359
Total Core Therms	**9,685,143**	**8,740,643**	**9,076,623**	**9,060,444**	**9,044,424**	**9,041,660**	**9,058,555**	**9,083,277**	**9,090,087**	**9,092,401**	**9,107,497**	**9,126,771**	**9,129,759**	**9,126,407**	**9,138,670**	**9,186,816**	**9,190,484**	**9,194,547**	**9,210,804**	**9,216,707**	**9,217,650**	**9,217,238**
Daily Baseload Therms	6,786	6,124	6,359	6,348	6,337	6,335	6,347	6,364	6,369	6,370	6,381	6,394	6,397	6,394	6,403	6,437	6,439	6,442	6,453	6,458	6,458	6,458
Peak Day Therms	98,050	98,538	98,809	99,278	99,621	99,957	100,281	100,595	100,900	101,195	101,483	101,765	102,042	102,312	102,570	102,822	103,064	103,296	103,522	103,741	103,953	104,160
Therms Per Residential Customer	613	539	602	596	592	591	594	598	599	599	601	605	605	604	607	615	616	617	621	622	623	624
Therms Per Commercial Customer	3,698	3,310	3,390	3,385	3,380	3,374	3,368	3,362	3,356	3,350	3,343	3,337	3,330	3,323	3,316	3,309	3,302	3,295	3,287	3,280	3,272	3,265
Therms Per Industrial Customer	31,231	28,284	26,125	26,076	26,027	25,978	25,929	25,880	25,831	25,783	25,734	25,686	25,637	25,589	25,541	25,493	25,445	25,397	25,349	25,301	25,254	25,206
Residential Customers	5,256	5,269	5,284	5,309	5,327	5,345	5,363	5,380	5,397	5,413	5,429	5,444	5,459	5,474	5,489	5,503	5,516	5,529	5,542	5,555	5,567	5,579
Commercial Customers	1,330	1,349	1,353	1,361	1,366	1,372	1,376	1,381	1,386	1,390	1,394	1,398	1,402	1,405	1,409	1,412	1,415	1,418	1,421	1,423	1,426	1,428
Industrial Customers	47	48	47	46	46	45	45	44	44	43	43	43	42	42	42	41	41	41	40	40	40	40
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**6,634**	**6,667**	**6,685**	**6,717**	**6,740**	**6,763**	**6,785**	**6,806**	**6,827**	**6,847**	**6,866**	**6,885**	**6,904**	**6,922**	**6,940**	**6,957**	**6,973**	**6,989**	**7,004**	**7,019**	**7,033**	**7,047**
Walla Walla																						
Total Therms Pct. Growth		-12.94%	9.38%	0.48%	0.24%	0.41%	0.66%	0.73%	0.42%	0.31%	0.46%	0.50%	0.22%	0.08%	0.26%	0.74%	0.06%	0.02%	0.18%	-0.01%	-0.11%	-0.15%
Residential Therms	6,915,315	6,012,829	6,692,871	6,707,717	6,705,857	6,730,933	6,795,620	6,874,200	6,909,331	6,930,016	6,975,788	7,029,076	7,042,834	7,038,040	7,063,608	7,164,202	7,164,226	7,160,664	7,182,512	7,177,762	7,159,782	7,136,421
Commercial Therms	4,450,732	3,915,927	4,130,971	4,171,667	4,203,692	4,227,543	4,239,629	4,245,840	4,261,320	4,277,877	4,286,710	4,292,534	4,306,813	4,323,506	4,330,171	4,316,790	4,326,474	4,334,683	4,336,037	4,341,945	4,349,443	4,357,180
Industrial Therms	118,639	69,756	112,205	108,811	105,214	101,827	98,465	95,360	92,326	89,452	86,647	83,999	81,417	78,937	76,541	74,181	71,928	69,759	67,644	65,588	63,646	61,737
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**11,484,686**	**9,998,512**	**10,936,047**	**10,988,195**	**11,014,763**	**11,060,304**	**11,133,715**	**11,215,400**	**11,262,977**	**11,297,344**	**11,349,145**	**11,405,608**	**11,431,065**	**11,440,484**	**11,470,320**	**11,555,172**	**11,562,628**	**11,565,107**	**11,586,193**	**11,585,295**	**11,572,870**	**11,555,338**
Daily Baseload Therms	7,903	6,881	7,526	7,562	7,580	7,611	7,662	7,718	7,751	7,774	7,810	7,849	7,866	7,873	7,893	7,952	7,957	7,959	7,973	7,973	7,964	7,952
Peak Day Therms	161,336	162,129	164,186	166,951	169,038	171,131	173,175	175,177	177,125	179,002	180,845	182,680	184,468	186,172	187,793	189,367	190,877	192,299	193,715	195,045	196,328	197,558
Therms Per Residential Customer	666	578	635	625	616	611	609	608	604	599	597	595	590	584	581	584	579	575	572	567	562	557
Therms Per Commercial Customer	3,645	3,125	3,281	3,290	3,295	3,294	3,283	3,269	3,263	3,258	3,247	3,234	3,228	3,224	3,213	3,187	3,179	3,171	3,157	3,148	3,140	3,132
Therms Per Industrial Customer	39,546	23,252	40,556	40,540	40,524	40,507	40,491	40,474	40,458	40,441	40,425	40,409	40,392	40,376	40,359	40,343	40,327	40,310	40,294	40,278	40,261	40,245
Residential Customers	10,381	10,406	10,548	10,738	10,881	11,024	11,163	11,300	11,432	11,560	11,686	11,811	11,932	12,048	12,158	12,265	12,367	12,463	12,559	12,649	12,735	12,818
Commercial Customers	1,221	1,253	1,259	1,268	1,276	1,283	1,291	1,299	1,306	1,313	1,320	1,327	1,334	1,341	1,348	1,354	1,361	1,367	1,373	1,379	1,385	1,391
Industrial Customers	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**11,605**	**11,662**	**11,810**	**12,009**	**12,159**	**12,310**	**12,457**	**12,601**	**12,741**	**12,876**	**13,008**	**13,140**	**13,269**	**13,391**	**13,508**	**13,621**	**13,730**	**13,832**	**13,934**	**14,030**	**14,122**	**14,210**
Wenatchee																						
Total Therms Pct. Growth		1.43%	-0.15%	-1.47%	-1.64%	-1.71%	-1.75%	-1.79%	-1.85%	-1.90%	-1.90%	-1.91%	-1.95%	-1.97%	-1.95%	-1.84%	-1.97%	-1.97%	-1.93%	-1.95%	-1.94%	-1.93%
Residential Therms	794,386	664,824	814,588	802,916	792,748	787,047	788,001	791,445	788,502	783,877	783,419	784,143	779,298	772,290	770,357	779,864	774,890	769,974	768,818	764,341	758,315	751,831
Commercial Therms	4,046,946	3,580,768	3,780,034	3,692,381	3,597,313	3,495,822	3,386,931	3,275,524	3,169,348	3,064,098	2,956,283	2,848,773	2,746,954	2,648,219	2,546,973	2,440,967	2,345,512	2,251,519	2,157,674	2,067,875	1,981,329	1,897,483
Industrial Therms	604,621	1,279,349	921,779	938,545	953,065	967,507	981,624	995,808	1,009,625	1,023,389	1,037,193	1,050,870	1,064,567	1,078,153	1,091,619	1,105,134	1,118,447	1,131,805	1,144,970	1,158,039	1,171,399	1,184,468
Ind., Inst., & Cmcl. Interrup. Therms	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715	95,715
Total Core Therms	**5,541,668**	**5,620,656**	**5,612,116**	**5,529,557**	**5,438,841**	**5,346,091**	**5,252,271**	**5,158,493**	**5,063,190**	**4,967,079**	**4,872,610**	**4,779,501**	**4,686,534**	**4,594,378**	**4,504,664**	**4,421,680**	**4,334,564**	**4,249,013**	**4,167,177**	**4,085,969**	**4,006,758**	**3,929,497**
Daily Baseload Therms	4,955	5,026	5,018	4,944	4,863	4,780	4,696	4,612	4,527	4,441	4,357	4,273	4,190	4,108	4,028	3,953	3,876	3,799	3,726	3,653	3,582	3,513
Peak Day Therms	60,724	60,092	60,476	60,671	60,804	60,937	61,068	61,198	61,328	61,456	61,582	61,708	61,835	61,961	62,080	62,200	62,316	62,429	62,539	62,646	62,753	62,856
Therms Per Residential Customer	513	437	531	521	512	507	506	506	502	498	496	495	490	485	482	487	482	478	476	472	468	463
Therms Per Commercial Customer	5,367	4,712	4,954	4,843	4,723	4,593	4,452	4,308	4,169	4,031	3,888	3,746	3,611	3,479	3,345	3,203	3,076	2,950	2,825	2,705	2,589	2,477
Therms Per Industrial Customer	28,477	63,967	47,179	48,300	49,448	50,623	51,826	53,058	54,319	55,610	56,931	58,284	59,669	61,088	62,539	64,026	65,547	67,105	68,700	70,332	72,004	73,715
Residential Customers	1,550	1,521	1,533	1,541	1,547	1,553	1,559	1,564	1,570	1,575	1,580	1,584	1,589	1,594	1,598	1,603	1,607	1,611	1,614	1,618	1,622	1,625
Commercial Customers	754	760	763	762	762	761	761	760	760	760	760	760	761	761	762	762	763	763	764	764	765	766
Industrial Customers	21	20	20	19	19	19	19	19	19	18	18	18	18	18	17	17	17	17	17	16	16	16
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	**2,326**	**2,302**	**2,317**	**2,324**	**2,329**	**2,334**	**2,339**	**2,344**	**2,349**	**2,354**	**2,359**	**2,364**	**2,369**	**2,374**	**2,378**	**2,383**	**2,387**	**2,392**	**2,396**	**2,400**	**2,404**	**2,408**

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Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Yakima																						
Total Therms Pct. Growth		-8.91%	9.01%	-0.33%	-0.27%	0.19%	0.88%	1.15%	0.52%	0.37%	0.81%	0.95%	0.39%	0.18%	0.71%	1.92%	0.42%	0.43%	0.84%	0.50%	0.33%	0.29%
Residential Therms	13,231,368	11,854,531	13,390,227	13,452,384	13,493,592	13,590,814	13,772,904	13,989,467	14,127,012	14,243,953	14,418,041	14,611,411	14,731,891	14,823,255	14,984,975	15,311,783	15,434,997	15,559,637	15,741,180	15,874,440	15,984,639	16,088,264
Commercial Therms	13,019,440	11,913,848	13,145,187	13,041,232	12,959,908	12,955,131	13,065,252	13,220,747	13,271,485	13,295,909	13,394,440	13,516,942	13,543,807	13,533,544	13,615,633	13,906,540	13,939,202	13,974,267	14,080,909	14,127,346	14,145,176	14,155,264
Industrial Therms	3,057,998	2,915,647	2,565,201	2,510,572	2,470,724	2,432,463	2,396,141	2,361,433	2,328,270	2,296,661	2,266,190	2,236,766	2,208,257	2,180,803	2,154,865	2,129,734	2,105,931	2,083,196	2,061,257	2,040,276	2,020,023	2,000,467
Ind., Inst., & Cmcl. Interrup. Therms	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484	150,484
Total Core Therms	**29,459,291**	**26,834,510**	**29,251,100**	**29,154,671**	**29,074,708**	**29,128,893**	**29,384,781**	**29,722,131**	**29,877,251**	**29,987,008**	**30,229,155**	**30,515,604**	**30,634,439**	**30,688,087**	**30,905,957**	**31,498,541**	**31,630,614**	**31,767,584**	**32,033,830**	**32,192,547**	**32,300,323**	**32,394,479**
Daily Baseload Therms	21,271	19,376	21,121	21,051	20,993	21,032	21,217	21,461	21,573	21,652	21,827	22,034	22,119	22,158	22,315	22,743	22,839	22,938	23,130	23,244	23,322	23,390
Peak Day Therms	305,047	307,465	311,694	315,615	318,402	321,144	323,803	326,398	328,928	331,383	333,797	336,175	338,526	340,829	343,029	345,197	347,272	349,272	351,230	353,118	354,961	356,760
Therms Per Residential Customer	694	619	689	683	679	677	681	685	687	687	690	694	695	694	697	707	709	710	714	716	717	718
Therms Per Commercial Customer	3,943	3,518	3,833	3,773	3,726	3,702	3,712	3,734	3,727	3,714	3,721	3,735	3,723	3,701	3,704	3,765	3,756	3,748	3,759	3,755	3,743	3,730
Therms Per Industrial Customer	39,714	37,866	33,912	33,854	33,795	33,737	33,679	33,621	33,563	33,505	33,448	33,390	33,333	33,275	33,218	33,161	33,104	33,047	32,990	32,933	32,877	32,820
Residential Customers	19,070	19,163	19,433	19,696	19,881	20,062	20,238	20,410	20,577	20,738	20,897	21,054	21,209	21,360	21,504	21,646	21,782	21,912	22,040	22,163	22,283	22,399
Commercial Customers	3,302	3,387	3,429	3,457	3,478	3,499	3,520	3,541	3,561	3,580	3,600	3,619	3,638	3,657	3,675	3,694	3,711	3,729	3,746	3,762	3,779	3,795
Industrial Customers	77	77	76	74	73	72	71	70	69	69	68	67	66	66	65	64	64	63	62	62	61	61
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	**22,452**	**22,630**	**22,941**	**23,230**	**23,435**	**23,637**	**23,833**	**24,023**	**24,210**	**24,390**	**24,568**	**24,743**	**24,916**	**25,086**	**25,248**	**25,407**	**25,560**	**25,707**	**25,851**	**25,990**	**26,126**	**26,258**
Baker																						
Total Therms Pct. Growth		-9.10%	14.86%	-2.13%	-1.01%	-0.46%	0.24%	0.51%	0.07%	-0.07%	0.39%	0.51%	0.04%	-0.16%	0.40%	1.62%	0.18%	0.17%	0.67%	0.24%	0.22%	0.10%
Residential Therms	2,243,586	2,086,237	2,382,822	2,333,663	2,309,615	2,301,809	2,315,111	2,336,615	2,342,824	2,345,156	2,361,564	2,382,254	2,387,419	2,386,211	2,404,076	2,462,123	2,473,420	2,485,057	2,512,288	2,527,140	2,540,220	2,550,431
Commercial Therms	1,782,755	1,549,125	1,732,308	1,734,459	1,731,561	1,731,279	1,737,250	1,744,521	1,746,226	1,745,029	1,748,275	1,751,588	1,750,427	1,746,584	1,746,060	1,755,609	1,752,038	1,747,312	1,747,961	1,742,242	1,736,803	1,728,716
Industrial Therms	56,153	75,629	147,211	103,539	88,212	77,341	67,892	60,121	54,906	51,022	47,494	44,575	42,315	40,517	39,868	40,003	40,124	40,543	41,135	42,264	44,023	46,089
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**4,082,494**	**3,710,991**	**4,262,341**	**4,171,660**	**4,129,388**	**4,110,430**	**4,120,253**	**4,141,257**	**4,143,956**	**4,141,207**	**4,157,332**	**4,178,417**	**4,180,161**	**4,173,312**	**4,190,004**	**4,257,735**	**4,265,582**	**4,272,912**	**4,301,384**	**4,311,646**	**4,321,046**	**4,325,236**
Daily Baseload Therms	3,336	3,032	3,483	3,409	3,374	3,359	3,367	3,384	3,386	3,384	3,397	3,414	3,416	3,410	3,424	3,479	3,486	3,492	3,515	3,523	3,531	3,534
Peak Day Therms	25,970	26,208	26,866	26,791	26,871	26,969	27,067	27,162	27,292	27,426	27,567	27,705	27,860	28,016	28,190	28,386	28,578	28,765	28,980	29,171	29,399	29,607
Therms Per Residential Customer	675	622	693	682	673	669	671	675	674	671	673	675	673	669	670	681	679	678	680	679	677	675
Therms Per Commercial Customer	3,638	3,130	3,415	3,377	3,344	3,318	3,304	3,294	3,274	3,251	3,235	3,221	3,198	3,171	3,153	3,154	3,132	3,109	3,093	3,072	3,048	3,024
Therms Per Industrial Customer	28,076	18,907	36,449	36,325	36,201	36,077	35,954	35,831	35,709	35,587	35,465	35,344	35,224	35,103	34,984	34,864	34,745	34,627	34,508	34,391	34,273	34,156
Residential Customers	3,326	3,354	3,438	3,422	3,430	3,441	3,452	3,462	3,477	3,494	3,511	3,528	3,547	3,567	3,589	3,615	3,641	3,666	3,694	3,720	3,751	3,780
Commercial Customers	490	495	507	514	518	522	526	530	533	537	540	544	547	551	554	557	559	562	565	567	570	572
Industrial Customers	2	4	4	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**3,818**	**3,853**	**3,950**	**3,939**	**3,950**	**3,965**	**3,979**	**3,993**	**4,012**	**4,032**	**4,053**	**4,073**	**4,096**	**4,119**	**4,144**	**4,173**	**4,201**	**4,229**	**4,260**	**4,289**	**4,322**	**4,353**
Bend																						
Total Therms Pct. Growth		-5.63%	8.43%	1.72%	1.98%	2.44%	3.11%	3.41%	2.91%	2.83%	3.27%	3.45%	2.98%	2.83%	3.37%	4.55%	3.19%	3.26%	3.68%	3.40%	3.28%	3.27%
Residential Therms	29,229,820	27,584,941	29,367,288	29,907,618	30,492,403	31,153,008	31,926,904	32,759,488	33,528,540	34,295,961	35,150,228	36,049,924	36,884,844	37,711,582	38,644,471	39,806,745	40,747,308	41,719,614	42,788,969	43,826,162	44,860,899	45,914,191
Commercial Therms	18,308,461	17,303,858	19,158,795	19,569,435	20,060,141	20,727,438	21,667,339	22,759,737	23,691,635	24,618,315	25,772,229	27,053,053	28,162,628	29,236,786	30,621,868	32,688,514	34,117,596	35,637,323	37,472,349	39,212,733	40,947,723	42,745,999
Industrial Therms	1,897,103	1,764,667	2,058,052	1,975,493	1,919,154	1,869,856	1,827,238	1,790,515	1,759,018	1,732,389	1,710,056	1,691,709	1,675,932	1,664,479	1,656,113	1,651,191	1,649,215	1,650,739	1,654,647	1,661,547	1,670,970	1,682,933
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**49,435,384**	**46,653,466**	**50,584,135**	**51,452,546**	**52,471,697**	**53,750,302**	**55,421,481**	**57,309,739**	**58,979,193**	**60,646,666**	**62,632,513**	**64,794,686**	**66,723,404**	**68,612,847**	**70,922,453**	**74,146,451**	**76,514,119**	**79,007,675**	**81,915,965**	**84,700,442**	**87,479,591**	**90,343,123**
Daily Baseload Therms	41,653	39,309	42,621	43,352	44,211	45,288	46,697	48,288	49,694	51,099	52,772	54,594	56,219	57,811	59,757	62,474	64,469	66,570	69,020	71,366	73,708	76,121
Peak Day Therms	567,544	571,024	585,712	599,472	613,361	627,525	641,993	656,726	671,768	687,094	702,750	718,728	734,990	751,647	768,558	785,876	803,454	821,444	839,772	858,460	877,527	896,972
Therms Per Residential Customer	783	738	767	764	762	762	764	766	767	768	770	772	773	773	776	782	783	784	787	789	790	791
Therms Per Commercial Customer	3,046	2,779	2,968	2,944	2,935	2,951	3,002	3,070	3,112	3,150	3,213	3,287	3,336	3,377	3,450	3,593	3,660	3,732	3,831	3,915	3,993	4,072
Therms Per Industrial Customer	36,483	32,085	41,384	41,359	41,334	41,308	41,283	41,257	41,232	41,207	41,182	41,156	41,131	41,106	41,080	41,055	41,030	41,005	40,980	40,954	40,929	40,904
Residential Customers	37,318	37,366	38,265	39,126	40,002	40,896	41,809	42,740	43,692	44,662	45,654	46,667	47,698	48,756	49,830	50,932	52,051	53,198	54,367	55,560	56,778	58,022
Commercial Customers	6,011	6,226	6,455	6,647	6,835	7,025	7,218	7,414	7,613	7,815	8,020	8,229	8,441	8,657	8,875	9,097	9,322	9,550	9,782	10,017	10,256	10,498
Industrial Customers	52	55	50	48	46	45	44	43	43	42	42	41	41	40	40	40	40	40	40	41	41	41
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**43,381**	**43,647**	**44,770**	**45,821**	**46,883**	**47,966**	**49,072**	**50,198**	**51,347**	**52,519**	**53,716**	**54,937**	**56,180**	**57,453**	**58,746**	**60,070**	**61,413**	**62,788**	**64,189**	**65,618**	**67,075**	**68,561**
Ontario																						
Total Therms Pct. Growth		-12.87%	19.96%	-2.26%	-1.36%	-0.75%	0.77%	0.82%	-0.12%	0.15%	0.51%	0.77%	0.03%	-0.33%	0.74%	2.42%	0.10%	0.38%	1.01%	0.47%	0.21%	0.28%
Residential Therms	2,095,880	1,887,207	2,122,519	2,090,273	2,072,031	2,056,805	2,058,781	2,055,894	2,046,262	2,045,037	2,041,935	2,041,006	2,036,581	2,028,734	2,031,471	2,042,407	2,037,355	2,037,338	2,040,898	2,040,998	2,038,871	2,038,680
Commercial Therms	2,785,550	2,361,432	2,813,412	2,722,668	2,668,324	2,644,255	2,682,380	2,729,002	2,732,843	2,742,414	2,773,382	2,816,395	2,823,754	2,815,367	2,853,779	2,974,635	2,987,021	3,009,648	3,063,749	3,091,921	3,108,031	3,126,114
Industrial Therms	325,396	288,166	506,481	506,609	506,890	506,664	506,584	505,981	505,236	504,555	503,563	502,303	501,103	499,514	498,121	496,465	494,612	492,833	490,882	488,941	486,897	484,875
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**5,206,826**	**4,536,805**	**5,442,413**	**5,319,550**	**5,247,245**	**5,207,724**	**5,247,745**	**5,290,877**	**5,284,342**	**5,292,006**	**5,318,879**	**5,359,704**	**5,361,438**	**5,343,615**	**5,383,371**	**5,513,506**	**5,518,987**	**5,539,819**	**5,595,530**	**5,621,860**	**5,633,798**	**5,649,669**
Daily Baseload Therms	3,868	3,370	4,043	3,952	3,898	3,869	3,898	3,930	3,926	3,931	3,951	3,982	3,983	3,970	3,999	4,096	4,100	4,115	4,157	4,176	4,185	4,197
Peak Day Therms	30,459	30,432	30,779	30,587	30,560	30,503	30,597	30,575	30,550	30,680	30,711	30,754	30,834	30,897	31,037	31,113	31,179	31,322	31,459	31,593	31,721	31,889
Therms Per Residential Customer	581	525	585	580	575	572	571	571	569	566	565	564	561	558	556	558	556	553	552	550	547	544
Therms Per Commercial Customer	3,231	2,714	3,172	3,088	3,027	3,004	3,035	3,088	3,093	3,089	3,118	3,160	3,158	3,140	3,166	3,290	3,294	3,301	3,343	3,357	3,358	3,357
Therms Per Industrial Customer	46,485	28,817	50,725	50,264	49,808	49,355	48,907	48,463	48,023	47,587	47,154	46,726	46,302	45,881	45,465	45,052	44,643	44,237	43,835	43,437	43,043	42,652
Residential Customers	3,609	3,594	3,628	3,605	3,601	3,594	3,604	3,601	3,597	3,612	3,615	3,619	3,628	3,635	3,651	3,659	3,666	3,682	3,697	3,712	3,727	3,746
Commercial Customers	862	870	887	882	881	880	884	884	883	888	889	891	894	897	901	904	907	912	917	921	926	931
Industrial Customers	7	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**4,478**	**4,474**	**4,525**	**4,497**	**4,493**	**4,484**	**4,498**	**4,495**	**4,491**	**4,510**	**4,515**	**4,521**	**4,533**	**4,542**	**4,563**	**4,574**	**4,584**	**4,605**	**4,625**	**4,645**	**4,663**	**4,688**
Pendleton																						
Total Therms Pct. Growth		-12.82%	15.25%	1.26%	0.97%	1.30%	1.74%	1.92%	1.44%	1.29%	1.58%	1.66%	1.22%	1.00%	1.37%	2.25%	1.05%	1.03%	1.31%	1.00%	0.85%	0.76%
Residential Therms	6,364,636	5,560,032	6,550,887	6,700,493	6,819,556	6,979,339	7,194,498	7,437,743	7,626,879	7,801,926	8,017,207	8,248,960	8,426,856	8,577,721	8,781,921	9,114,545	9,284,220	9,454,258	9,667,365	9,838,627	9,989,052	10,128,592
Commercial Therms	6,762,023	5,980,426	6,258,738	6,292,655	6,319,823	6,354,523	6,399,685	6,448,382	6,483,417	6,513,361	6,550,067	6,587,577	6,612,605	6,630,894	6,658,051	6,707,191	6,723,812	6,738,903	6,760,742	6,773,143	6,781,249	6,786,006
Industrial Therms	896,694	684,950	1,280,017	1,274,354	1,267,201	1,260,217	1,253,143	1,246,139	1,239,144	1,232,137	1,225,112	1,218,108	1,211,119	1,204,015	1,196,867	1,189,695	1,182,368	1,175,013	1,167,631	1,160,158	1,152,682	1,145,111
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**14,023,353**	**12,225,408**	**14,089,642**	**14,267,502**	**14,406,580**	**14,594,079**	**14,847,326**	**15,132,264**	**15,349,439**	**15,547,424**	**15,792,386**	**16,054,645**	**16,250,579**	**16,412,631**	**16,636,839**	**17,011,431**	**17,190,400**	**17,368,174**	**17,595,738**	**17,771,927**	**17,922,983**	**18,059,709**
Daily Baseload Therms	14,417	12,569	14,485	14,668	14,811	15,004	15,264	15,557	15,781	15,984	16,236	16,506	16,707	16,874	17,104	17,489	17,673	17,856	18,090	18,271	18,426	18,567
Peak Day Therms	194,931	196,962	204,199	210,364	215,124	219,953	224,607	229,248	233,805	238,277	242,635	246,955	251,207	255,252	259,155	262,947	266,467	269,862	273,103	276,152	279,077	281,785
Therms Per Residential Customer	610	526	597	591	587	586	591	597	600	601	606	612	614	614	619	632	635	638	645	649	651	654
Therms Per Commercial Customer	3,711	3,286	3,359	3,333	3,309	3,290	3,277	3,266	3,249	3,231	3,216	3,203	3,184	3,162	3,146	3,141	3,121	3,102	3,086	3,067	3,047	3,026
Therms Per Industrial Customer	42,700	29,780	55,344	54,942	54,543	54,146	53,753	53,362	52,974	52,589	52,207	51,828	51,451	51,077	50,706	50,337	49,971	49,608	49,248	48,890	48,534	48,182
Residential Customers	10,441	10,569	10,982	11,345	11,623	11,906	12,178	12,449	12,715	12,976	13,230	13,482	13,730	13,965	14,191	14,411	14,614	14,810	14,996	15,170	15,337	15,491
Commercial Customers	1,822	1,820	1,863	1,888	1,910	1,932	1,953	1,974	1,995	2,016	2,037	2,057	2,077	2,097	2,116	2,135	2,154	2,172	2,191	2,208	2,226	2,243
Industrial Customers	21	23	23	23	23	23	23	23	23	23	23	24	24	24	24	24	24	24	24	24	24	24
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	**12,284**	**12,412**	**12,868**	**13,257**	**13,556**	**13,861**	**14,154**	**14,447**	**14,734**	**15,016**	**15,290**	**15,562**	**15,830**	**16,085**	**16,331**	**16,570**	**16,792**	**17,006**	**17,210**	**17,402**	**17,587**	**17,757**

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Washington																						
Total Therms Pct. Growth		-12.53%	13.75%	1.46%	1.38%	1.56%	1.84%	1.93%	1.62%	1.51%	1.69%	1.72%	1.45%	1.33%	1.53%	2.04%	1.35%	1.33%	1.48%	1.31%	1.22%	1.18%
Residential Therms	119,103,353	106,725,615	124,339,115	126,379,592	128,329,761	130,570,626	133,257,553	136,128,553	138,569,770	140,888,531	143,515,814	146,242,750	148,568,856	150,721,906	153,258,438	156,712,387	159,021,188	161,322,590	163,936,637	166,269,066	168,459,089	170,602,600
Commercial Therms	94,200,977	84,630,702	94,659,282	96,138,188	97,518,608	99,071,541	100,893,378	102,820,020	104,477,513	106,048,943	107,805,807	109,617,270	111,179,660	112,633,707	114,311,563	116,540,700	118,068,288	119,585,975	121,286,332	122,815,698	124,256,813	125,667,297
Industrial Therms	16,441,334	9,342,671	9,581,643	9,435,664	9,338,216	9,252,788	9,179,068	9,116,187	9,062,963	9,019,029	8,983,079	8,954,514	8,932,657	8,917,498	8,909,970	8,907,706	8,912,923	8,923,334	8,939,184	8,960,505	8,986,968	9,017,286
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**231,779,474**	**202,732,799**	**230,613,851**	**233,987,255**	**237,220,395**	**240,928,767**	**245,363,809**	**250,098,570**	**254,144,056**	**257,990,313**	**262,338,511**	**266,848,344**	**270,714,983**	**274,306,922**	**278,513,781**	**284,194,603**	**288,036,210**	**291,865,710**	**296,195,964**	**300,079,079**	**303,736,680**	**307,320,994**
Daily Baseload Therms	212,628	185,494	212,005	215,288	218,442	222,013	226,219	230,689	234,562	238,263	242,406	246,692	250,421	253,912	257,943	263,264	266,981	270,688	274,836	278,595	282,159	285,660
Peak Day Therms	2,732,699	2,772,900	2,886,506	2,961,470	3,031,873	3,103,385	3,175,771	3,249,183	3,323,602	3,398,882	3,475,382	3,552,991	3,631,906	3,711,861	3,792,614	3,874,544	3,957,432	4,041,212	4,126,156	4,212,134	4,299,252	4,387,478
Therms Per Residential Customer	708	626	700	693	687	682	680	679	675	671	668	665	661	656	653	653	648	644	641	636	631	626
Therms Per Commercial Customer	3,919	3,434	3,723	3,693	3,667	3,646	3,636	3,629	3,612	3,593	3,579	3,567	3,546	3,522	3,506	3,505	3,484	3,463	3,447	3,426	3,404	3,380
Therms Per Industrial Customer	45,418	26,392	27,818	28,004	28,157	28,303	28,440	28,570	28,692	28,806	28,914	29,014	29,108	29,195	29,274	29,346	29,409	29,467	29,517	29,559	29,596	29,627
Residential Customers	168,291	170,540	177,738	182,460	186,899	191,409	195,973	200,602	205,294	210,042	214,866	219,760	224,738	229,780	234,876	240,045	245,277	250,566	255,930	261,360	266,863	272,439
Commercial Customers	24,035	24,642	25,422	26,031	26,596	27,169	27,747	28,332	28,923	29,519	30,123	30,734	31,354	31,980	32,609	33,246	33,888	34,534	35,186	35,844	36,508	37,178
Industrial Customers	362	354	344	337	332	327	323	319	316	313	311	309	307	305	304	304	303	303	303	303	304	304
Interruptible Customers	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**192,703**	**195,551**	**203,519**	**208,843**	**213,842**	**218,920**	**224,058**	**229,268**	**234,548**	**239,889**	**245,315**	**250,818**	**256,414**	**262,080**	**267,804**	**273,610**	**279,483**	**285,417**	**291,434**	**297,522**	**303,690**	**309,937**
Oregon																						
Total Therms Pct. Growth		-7.73%	10.80%	1.12%	1.39%	1.85%	2.54%	2.81%	2.30%	2.23%	2.66%	2.83%	2.35%	2.19%	2.74%	3.91%	2.54%	2.61%	3.03%	2.74%	2.63%	2.62%
Residential Therms	39,933,922	37,118,417	40,423,516	41,032,047	41,693,604	42,490,962	43,495,295	44,589,739	45,544,505	46,488,081	47,570,934	48,722,144	49,735,700	50,704,249	51,861,939	53,425,821	54,542,303	55,696,266	57,009,521	58,232,927	59,429,041	60,631,893
Commercial Therms	29,638,790	27,194,841	29,963,254	30,319,217	30,779,849	31,457,496	32,486,653	33,681,641	34,654,121	35,619,120	36,843,953	38,208,613	39,349,413	40,429,631	41,879,758	44,125,949	45,580,466	47,133,186	49,044,801	50,820,038	52,573,805	54,386,836
Industrial Therms	3,175,346	2,813,412	3,991,762	3,859,995	3,781,457	3,714,078	3,654,856	3,602,757	3,558,304	3,520,103	3,486,224	3,456,695	3,430,469	3,408,525	3,390,969	3,377,353	3,366,318	3,359,128	3,354,294	3,352,910	3,354,572	3,359,008
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	**72,748,058**	**67,126,670**	**74,378,531**	**75,211,259**	**76,254,910**	**77,662,536**	**79,636,805**	**81,874,137**	**83,756,930**	**85,627,303**	**87,901,111**	**90,387,452**	**92,515,583**	**94,542,405**	**97,132,667**	**100,929,123**	**103,489,087**	**106,188,580**	**109,408,616**	**112,405,875**	**115,357,418**	**118,377,737**
Daily Baseload Therms	63,274	58,280	64,632	65,381	66,295	67,520	69,226	71,159	72,786	74,398	76,357	78,496	80,325	82,065	84,284	87,538	89,727	92,032	94,782	97,337	99,850	102,419
Peak Day Therms	818,904	824,626	847,556	867,215	885,916	904,951	924,265	943,711	963,415	983,477	1,003,664	1,024,143	1,044,891	1,065,812	1,086,940	1,108,322	1,129,678	1,151,393	1,173,313	1,195,376	1,217,723	1,240,253
Therms Per Residential Customer	730	676	718	714	711	710	713	716	717	718	721	724	725	725	728	736	737	739	743	745	747	748
Therms Per Commercial Customer	3,227	2,890	3,085	3,053	3,034	3,037	3,070	3,118	3,143	3,164	3,207	3,260	3,290	3,314	3,365	3,476	3,522	3,572	3,645	3,706	3,761	3,818
Therms Per Industrial Customer	38,724	30,581	45,945	46,013	45,960	45,881	45,788	45,680	45,554	45,416	45,270	45,116	44,955	44,786	44,610	44,427	44,241	44,051	43,860	43,666	43,469	43,271
Residential Customers	54,694	54,883	56,313	57,499	58,657	59,836	61,043	62,252	63,481	64,744	66,010	67,296	68,603	69,922	71,262	72,617	73,972	75,355	76,754	78,163	79,593	81,038
Commercial Customers	9,185	9,411	9,712	9,931	10,144	10,359	10,581	10,802	11,025	11,256	11,487	11,721	11,960	12,201	12,446	12,694	12,942	13,196	13,454	13,714	13,977	14,244
Industrial Customers	82	92	87	84	82	81	80	79	78	78	77	77	76	76	76	76	76	76	76	77	77	78
Interruptible Customers																						
Total Core Customers	**63,961**	**64,386**	**66,112**	**67,514**	**68,883**	**70,276**	**71,703**	**73,133**	**74,585**	**76,077**	**77,574**	**79,094**	**80,639**	**82,200**	**83,784**	**85,387**	**86,990**	**88,628**	**90,285**	**91,953**	**93,647**	**95,359**
System																						
Total Therms Pct. Growth		-11.38%	13.02%	1.38%	1.38%	1.63%	2.01%	2.15%	1.79%	1.69%	1.93%	2.00%	1.68%	1.55%	1.84%	2.52%	1.66%	1.67%	1.90%	1.70%	1.60%	1.58%
Residential Therms	159,037,275	143,844,032	164,762,631	167,411,639	170,023,365	173,061,588	176,752,848	180,718,292	184,114,274	187,376,612	191,086,748	194,964,894	198,304,556	201,426,155	205,120,377	210,138,207	213,563,491	217,018,856	220,946,159	224,501,993	227,888,130	231,234,493
Commercial Therms	123,839,766	111,825,543	124,622,536	126,457,405	128,298,457	130,529,037	133,380,031	136,501,661	139,131,634	141,668,063	144,649,760	147,825,883	150,529,073	153,063,338	156,191,321	160,666,649	163,648,754	166,719,162	170,331,133	173,635,736	176,830,618	180,054,133
Industrial Therms	19,616,680	12,156,083	13,573,405	13,295,659	13,119,672	12,966,866	12,833,924	12,718,944	12,621,267	12,539,131	12,469,303	12,411,209	12,363,126	12,326,023	12,300,939	12,285,059	12,279,241	12,282,462	12,293,478	12,313,414	12,341,539	12,376,294
Ind., Inst., & Cmcl. Interrup. Therms	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811	2,033,811
Total Core Therms	**304,527,532**	**269,859,469**	**304,992,382**	**309,198,514**	**313,475,305**	**318,591,302**	**325,000,613**	**331,972,707**	**337,900,986**	**343,617,616**	**350,239,622**	**357,235,797**	**363,230,566**	**368,849,327**	**375,646,448**	**385,123,727**	**391,525,298**	**398,054,290**	**405,604,580**	**412,484,954**	**419,094,098**	**425,698,731**
Daily Baseload Therms	275,902	243,774	276,637	280,669	284,737	289,533	295,445	301,848	307,348	312,661	318,763	325,188	330,746	335,977	342,227	350,802	356,708	362,721	369,617	375,932	382,009	388,079
Peak Day Therms	3,551,604	3,597,526	3,734,062	3,828,684	3,917,789	4,008,336	4,100,035	4,192,894	4,287,017	4,382,359	4,479,046	4,577,134	4,676,797	4,777,673	4,879,554	4,982,866	5,087,110	5,192,605	5,299,469	5,407,510	5,516,976	5,627,730
Therms Per Residential Customer	713	638	704	698	692	689	688	688	685	682	680	679	676	672	670	672	669	666	664	661	658	654
Therms Per Commercial Customer	3,728	3,284	3,547	3,516	3,492	3,478	3,480	3,488	3,483	3,474	3,476	3,482	3,475	3,464	3,467	3,497	3,495	3,493	3,502	3,504	3,503	3,502
Therms Per Industrial Customer	44,182	27,256	31,469	31,594	31,696	31,792	31,880	31,961	32,035	32,102	32,163	32,217	32,264	32,305	32,338	32,366	32,386	32,401	32,409	32,410	32,407	32,399
Residential Customers	222,985	225,423	234,051	239,959	245,556	251,245	257,016	262,854	268,775	274,785	280,876	287,056	293,341	299,702	306,137	312,663	319,249	325,921	332,684	339,523	346,456	353,477
Commercial Customers	33,220	34,053	35,135	35,962	36,740	37,528	38,328	39,134	39,949	40,775	41,610	42,455	43,314	44,181	45,056	45,940	46,830	47,730	48,640	49,558	50,485	51,422
Industrial Customers	444	446	431	421	414	408	403	398	394	391	388	385	383	382	380	380	379	379	379	380	381	382
Interruptible Customers	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Total Core Customers	**256,664**	**259,937**	**269,632**	**276,357**	**282,725**	**289,196**	**295,761**	**302,401**	**309,133**	**315,966**	**322,889**	**329,912**	**337,053**	**344,280**	**351,588**	**358,997**	**366,473**	**374,045**	**381,718**	**389,476**	**397,337**	**405,296**

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Baker

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	2,975,626	1,264,721	4,240,347	2,986,914	1,269,518	4,256,432	2,991,060	1,271,281	4,262,341
2012	2,936,442	1,248,067	4,184,509	2,933,732	1,246,915	4,180,646	2,927,426	1,244,234	4,171,660
2013	2,894,644	1,230,301	4,124,945	2,895,891	1,230,831	4,126,722	2,897,762	1,231,626	4,129,388
2014	2,870,070	1,219,856	4,089,926	2,876,882	1,222,752	4,099,634	2,884,458	1,225,972	4,110,430
2015	2,868,260	1,219,087	4,087,348	2,881,279	1,224,621	4,105,899	2,891,351	1,228,902	4,120,253
2016	2,875,612	1,222,212	4,097,824	2,894,469	1,230,227	4,124,695	2,906,091	1,235,166	4,141,257
2017	2,869,416	1,219,579	4,088,994	2,892,975	1,229,592	4,122,567	2,907,985	1,235,971	4,143,956
2018	2,860,721	1,215,883	4,076,604	2,888,061	1,227,503	4,115,564	2,906,055	1,235,151	4,141,207
2019	2,866,078	1,218,160	4,084,238	2,897,582	1,231,550	4,129,132	2,917,371	1,239,961	4,157,332
2020	2,875,593	1,222,204	4,097,796	2,911,022	1,237,262	4,148,284	2,932,168	1,246,250	4,178,417
2021	2,871,645	1,220,526	4,092,171	2,910,198	1,236,912	4,147,110	2,933,391	1,246,770	4,180,161
2022	2,862,371	1,216,584	4,078,955	2,903,466	1,234,051	4,137,517	2,928,585	1,244,727	4,173,312
2023	2,868,553	1,219,212	4,087,764	2,913,155	1,238,169	4,151,325	2,940,298	1,249,705	4,190,004
2024	2,908,985	1,236,396	4,145,381	2,959,058	1,257,679	4,216,738	2,987,828	1,269,907	4,257,735
2025	2,909,891	1,236,782	4,146,673	2,962,679	1,259,218	4,221,897	2,993,335	1,272,247	4,265,582
2026	2,911,067	1,237,281	4,148,348	2,966,225	1,260,725	4,226,950	2,998,478	1,274,434	4,272,912
2027	2,926,895	1,244,009	4,170,903	2,985,162	1,268,774	4,253,936	3,018,458	1,282,926	4,301,384
2028	2,932,061	1,246,205	4,178,266	2,991,899	1,271,637	4,263,536	3,025,660	1,285,986	4,311,646
2029	2,934,524	1,247,251	4,181,775	2,996,683	1,273,671	4,270,354	3,032,256	1,288,790	4,321,046
2030	2,935,467	1,247,652	4,183,120	2,998,810	1,274,575	4,273,384	3,035,196	1,290,040	4,325,236

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	14.26%	14.26%	14.26%	14.70%	14.70%	14.70%	14.86%	14.86%	14.86%
2012	-1.32%	-1.32%	-1.32%	-1.78%	-1.78%	-1.78%	-2.13%	-2.13%	-2.13%
2013	-1.42%	-1.42%	-1.42%	-1.29%	-1.29%	-1.29%	-1.01%	-1.01%	-1.01%
2014	-0.85%	-0.85%	-0.85%	-0.66%	-0.66%	-0.66%	-0.46%	-0.46%	-0.46%
2015	-0.06%	-0.06%	-0.06%	0.15%	0.15%	0.15%	0.24%	0.24%	0.24%
2016	0.26%	0.26%	0.26%	0.46%	0.46%	0.46%	0.51%	0.51%	0.51%
2017	-0.22%	-0.22%	-0.22%	-0.05%	-0.05%	-0.05%	0.07%	0.07%	0.07%
2018	-0.30%	-0.30%	-0.30%	-0.17%	-0.17%	-0.17%	-0.07%	-0.07%	-0.07%
2019	0.19%	0.19%	0.19%	0.33%	0.33%	0.33%	0.39%	0.39%	0.39%
2020	0.33%	0.33%	0.33%	0.46%	0.46%	0.46%	0.51%	0.51%	0.51%
2021	-0.14%	-0.14%	-0.14%	-0.03%	-0.03%	-0.03%	0.04%	0.04%	0.04%
2022	-0.32%	-0.32%	-0.32%	-0.23%	-0.23%	-0.23%	-0.16%	-0.16%	-0.16%
2023	0.22%	0.22%	0.22%	0.33%	0.33%	0.33%	0.40%	0.40%	0.40%
2024	1.41%	1.41%	1.41%	1.58%	1.58%	1.58%	1.62%	1.62%	1.62%
2025	0.03%	0.03%	0.03%	0.12%	0.12%	0.12%	0.18%	0.18%	0.18%
2026	0.04%	0.04%	0.04%	0.12%	0.12%	0.12%	0.17%	0.17%	0.17%
2027	0.54%	0.54%	0.54%	0.64%	0.64%	0.64%	0.67%	0.67%	0.67%
2028	0.18%	0.18%	0.18%	0.23%	0.23%	0.23%	0.24%	0.24%	0.24%
2029	0.08%	0.08%	0.08%	0.16%	0.16%	0.16%	0.22%	0.22%	0.22%
2030	0.03%	0.03%	0.03%	0.07%	0.07%	0.07%	0.10%	0.10%	0.10%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	3,465	23,131	26,596	3,478	23,264	26,742	3,483	23,383	26,866
2012	3,419	23,232	26,651	3,416	23,344	26,760	3,409	23,383	26,791
2013	3,371	23,257	26,628	3,372	23,417	26,789	3,374	23,497	26,871
2014	3,342	23,271	26,613	3,350	23,481	26,831	3,359	23,610	26,969
2015	3,340	23,270	26,610	3,355	23,525	26,880	3,367	23,700	27,067
2016	3,349	23,260	26,609	3,370	23,557	26,927	3,384	23,778	27,162
2017	3,341	23,285	26,626	3,369	23,632	27,001	3,386	23,906	27,292
2018	3,331	23,319	26,651	3,363	23,717	27,080	3,384	24,042	27,426
2019	3,337	23,354	26,691	3,374	23,797	27,171	3,397	24,170	27,567
2020	3,349	23,384	26,732	3,390	23,871	27,261	3,414	24,290	27,705
2021	3,344	23,443	26,787	3,389	23,978	27,367	3,416	24,444	27,860
2022	3,333	23,510	26,844	3,381	24,093	27,474	3,410	24,605	28,016
2023	3,340	23,567	26,908	3,392	24,200	27,592	3,424	24,766	28,190
2024	3,387	23,602	26,990	3,446	24,284	27,730	3,479	24,906	28,386
2025	3,388	23,693	27,081	3,450	24,422	27,872	3,486	25,093	28,578
2026	3,390	23,782	27,171	3,454	24,557	28,011	3,492	25,273	28,765
2027	3,408	23,893	27,301	3,476	24,711	28,187	3,515	25,465	28,980
2028	3,414	24,009	27,423	3,484	24,862	28,346	3,523	25,648	29,171
2029	3,417	24,140	27,557	3,490	25,040	28,529	3,531	25,868	29,399
2030	3,418	24,276	27,694	3,492	25,213	28,705	3,534	26,073	29,607

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	14.26%	-0.19%	1.48%	14.70%	0.38%	2.04%	14.86%	0.89%	2.51%
2012	-1.32%	0.44%	0.21%	-1.78%	0.34%	0.07%	-2.13%	0.00%	-0.28%
2013	-1.42%	0.11%	-0.09%	-1.29%	0.32%	0.11%	-1.01%	0.49%	0.30%
2014	-0.85%	0.06%	-0.06%	-0.66%	0.27%	0.15%	-0.46%	0.48%	0.36%
2015	-0.06%	0.00%	-0.01%	0.15%	0.19%	0.18%	0.24%	0.38%	0.36%
2016	0.26%	-0.04%	0.00%	0.46%	0.14%	0.18%	0.51%	0.33%	0.35%
2017	-0.22%	0.10%	0.06%	-0.05%	0.32%	0.27%	0.07%	0.54%	0.48%
2018	-0.30%	0.15%	0.09%	-0.17%	0.36%	0.29%	-0.07%	0.57%	0.49%
2019	0.19%	0.15%	0.15%	0.33%	0.34%	0.34%	0.39%	0.53%	0.51%
2020	0.33%	0.13%	0.15%	0.46%	0.31%	0.33%	0.51%	0.50%	0.50%
2021	-0.14%	0.25%	0.20%	-0.03%	0.45%	0.39%	0.04%	0.63%	0.56%
2022	-0.32%	0.29%	0.21%	-0.23%	0.48%	0.39%	-0.16%	0.66%	0.56%
2023	0.22%	0.24%	0.24%	0.33%	0.44%	0.43%	0.40%	0.65%	0.62%
2024	1.41%	0.15%	0.30%	1.58%	0.35%	0.50%	1.62%	0.57%	0.70%
2025	0.03%	0.38%	0.34%	0.12%	0.57%	0.51%	0.18%	0.75%	0.68%
2026	0.04%	0.38%	0.33%	0.12%	0.55%	0.50%	0.17%	0.72%	0.65%
2027	0.54%	0.47%	0.48%	0.64%	0.63%	0.63%	0.67%	0.76%	0.75%
2028	0.18%	0.49%	0.45%	0.23%	0.61%	0.57%	0.24%	0.72%	0.66%
2029	0.08%	0.55%	0.49%	0.16%	0.71%	0.65%	0.22%	0.86%	0.78%
2030	0.03%	0.56%	0.50%	0.07%	0.69%	0.62%	0.10%	0.79%	0.71%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	2,358,327	1,882,020	4,240,347	2,371,398	1,885,034	4,256,432	2,382,822	1,879,519	4,262,341
2012	2,325,071	1,859,438	4,184,509	2,333,081	1,847,566	4,180,646	2,333,663	1,837,997	4,171,660
2013	2,291,780	1,833,165	4,124,945	2,304,401	1,822,321	4,126,722	2,309,615	1,819,773	4,129,388
2014	2,273,667	1,816,260	4,089,926	2,291,292	1,808,342	4,099,634	2,301,809	1,808,621	4,110,430
2015	2,277,746	1,809,602	4,087,348	2,300,004	1,805,895	4,105,899	2,315,111	1,805,142	4,120,253
2016	2,290,197	1,807,627	4,097,824	2,316,995	1,807,700	4,124,695	2,336,615	1,804,642	4,141,257
2017	2,285,883	1,803,111	4,088,994	2,317,781	1,804,786	4,122,567	2,342,824	1,801,132	4,143,956
2018	2,278,190	1,798,414	4,076,604	2,314,911	1,800,652	4,115,564	2,345,156	1,796,051	4,141,207
2019	2,285,207	1,799,031	4,084,238	2,326,604	1,802,528	4,129,132	2,361,564	1,795,768	4,157,332
2020	2,296,653	1,801,143	4,097,796	2,342,639	1,805,645	4,148,284	2,382,254	1,796,163	4,178,417
2021	2,292,757	1,799,415	4,092,171	2,343,218	1,803,891	4,147,110	2,387,419	1,792,742	4,180,161
2022	2,283,032	1,795,923	4,078,955	2,337,673	1,799,844	4,137,517	2,386,211	1,787,101	4,173,312
2023	2,290,411	1,797,354	4,087,764	2,350,063	1,801,261	4,151,325	2,404,076	1,785,928	4,190,004
2024	2,335,602	1,809,779	4,145,381	2,401,483	1,815,254	4,216,738	2,462,123	1,795,612	4,257,735
2025	2,337,645	1,809,028	4,146,673	2,408,053	1,813,844	4,221,897	2,473,420	1,792,161	4,265,582
2026	2,340,456	1,807,892	4,148,348	2,415,158	1,811,791	4,226,950	2,485,057	1,787,855	4,272,912
2027	2,359,557	1,811,346	4,170,903	2,438,555	1,815,381	4,253,936	2,512,288	1,789,096	4,301,384
2028	2,368,249	1,810,017	4,178,266	2,450,518	1,813,018	4,263,536	2,527,140	1,784,506	4,311,646
2029	2,373,020	1,808,755	4,181,775	2,459,491	1,810,862	4,270,354	2,540,220	1,780,826	4,321,046
2030	2,377,340	1,805,779	4,183,120	2,466,936	1,806,448	4,273,384	2,550,431	1,774,805	4,325,236

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	13.04%	15.83%	14.26%	13.67%	16.02%	14.70%	14.22%	15.68%	14.86%
2012	-1.41%	-1.20%	-1.32%	-1.62%	-1.99%	-1.78%	-2.06%	-2.21%	-2.13%
2013	-1.43%	-1.41%	-1.42%	-1.23%	-1.37%	-1.29%	-1.03%	-0.99%	-1.01%
2014	-0.79%	-0.92%	-0.85%	-0.57%	-0.77%	-0.66%	-0.34%	-0.61%	-0.46%
2015	0.18%	-0.37%	-0.06%	0.38%	-0.14%	0.15%	0.58%	-0.19%	0.24%
2016	0.55%	-0.11%	0.26%	0.74%	0.10%	0.46%	0.93%	-0.03%	0.51%
2017	-0.19%	-0.25%	-0.22%	0.03%	-0.16%	-0.05%	0.27%	-0.19%	0.07%
2018	-0.34%	-0.26%	-0.30%	-0.12%	-0.23%	-0.17%	0.10%	-0.28%	-0.07%
2019	0.31%	0.03%	0.19%	0.51%	0.10%	0.33%	0.70%	-0.02%	0.39%
2020	0.50%	0.12%	0.33%	0.69%	0.17%	0.46%	0.88%	0.02%	0.51%
2021	-0.17%	-0.10%	-0.14%	0.02%	-0.10%	-0.03%	0.22%	-0.19%	0.04%
2022	-0.42%	-0.19%	-0.32%	-0.24%	-0.22%	-0.23%	-0.05%	-0.31%	-0.16%
2023	0.32%	0.08%	0.22%	0.53%	0.08%	0.33%	0.75%	-0.07%	0.40%
2024	1.97%	0.69%	1.41%	2.19%	0.78%	1.58%	2.41%	0.54%	1.62%
2025	0.09%	-0.04%	0.03%	0.27%	-0.08%	0.12%	0.46%	-0.19%	0.18%
2026	0.12%	-0.06%	0.04%	0.30%	-0.11%	0.12%	0.47%	-0.24%	0.17%
2027	0.82%	0.19%	0.54%	0.97%	0.20%	0.64%	1.10%	0.07%	0.67%
2028	0.37%	-0.07%	0.18%	0.49%	-0.13%	0.23%	0.59%	-0.26%	0.24%
2029	0.20%	-0.07%	0.08%	0.37%	-0.12%	0.16%	0.52%	-0.21%	0.22%
2030	0.18%	-0.16%	0.03%	0.30%	-0.24%	0.07%	0.40%	-0.34%	0.10%

Customer Count Forecast

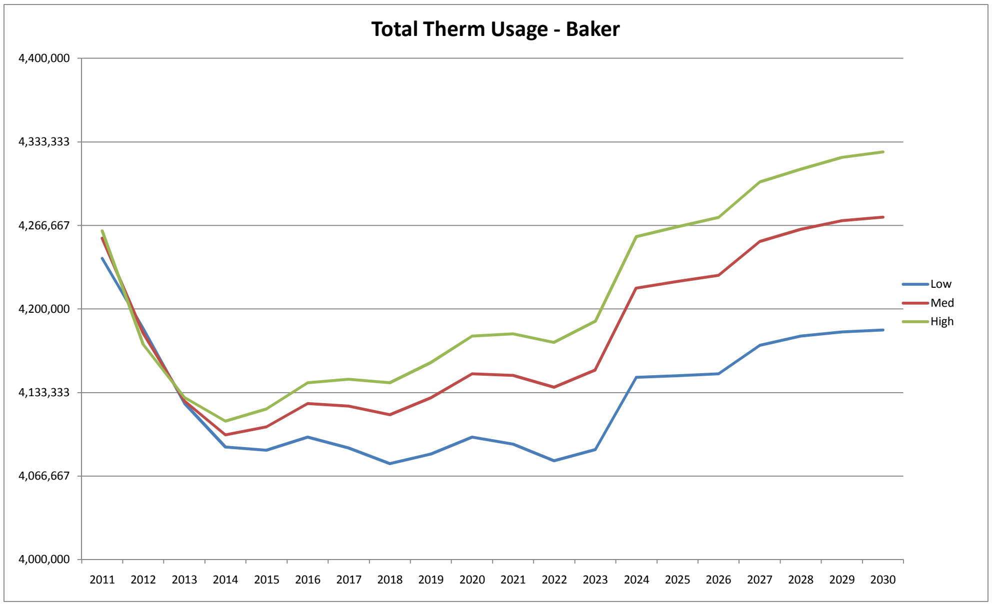
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3,405	505	3,910	3,423	508	3,931	3,438	511	3,950
2012	3,412	506	3,918	3,423	511	3,934	3,422	517	3,939
2013	3,407	508	3,915	3,424	514	3,938	3,430	520	3,950
2014	3,403	510	3,912	3,428	517	3,945	3,441	524	3,965
2015	3,401	511	3,912	3,432	520	3,952	3,452	528	3,979
2016	3,399	513	3,912	3,436	522	3,959	3,462	531	3,993
2017	3,399	515	3,914	3,444	525	3,970	3,477	535	4,012
2018	3,401	517	3,918	3,453	528	3,981	3,494	538	4,032
2019	3,405	519	3,924	3,464	531	3,995	3,511	542	4,053
2020	3,410	520	3,930	3,475	533	4,008	3,528	545	4,073
2021	3,416	522	3,938	3,488	536	4,023	3,547	549	4,096
2022	3,423	523	3,946	3,501	538	4,039	3,567	552	4,119
2023	3,431	525	3,956	3,516	541	4,056	3,589	555	4,144
2024	3,442	526	3,968	3,534	543	4,077	3,615	558	4,173
2025	3,454	527	3,981	3,553	545	4,098	3,641	561	4,201
2026	3,466	528	3,995	3,571	547	4,118	3,666	563	4,229
2027	3,485	529	4,014	3,595	549	4,144	3,694	566	4,260
2028	3,502	529	4,032	3,617	550	4,167	3,720	568	4,289
2029	3,521	530	4,051	3,643	552	4,194	3,751	571	4,322
2030	3,541	530	4,071	3,667	553	4,220	3,780	573	4,353

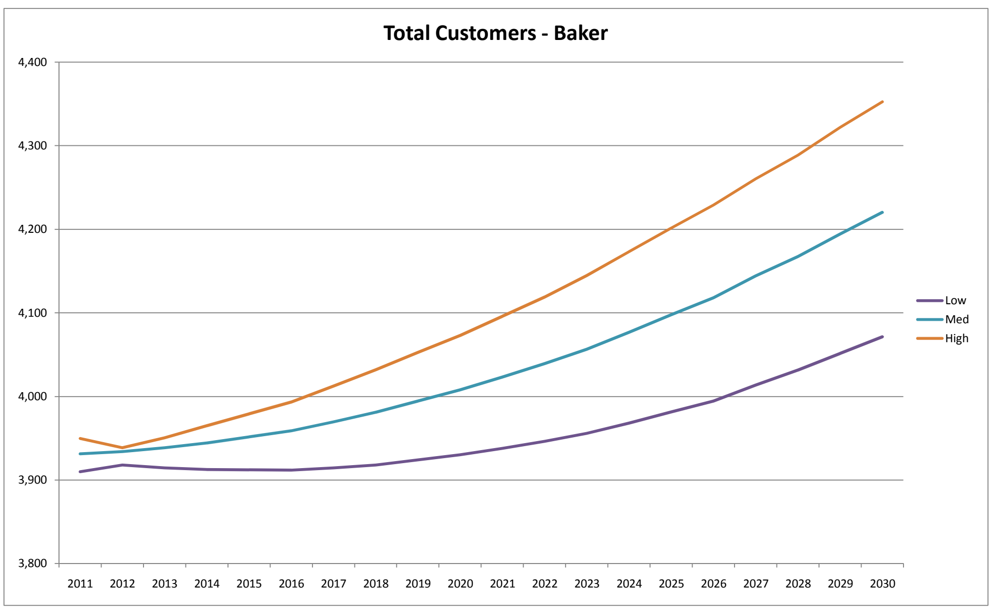
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.52%	1.23%	1.48%	2.06%	1.89%	2.04%	2.51%	2.48%	2.51%
2012	0.22%	0.15%	0.21%	0.00%	0.53%	0.07%	-0.47%	1.00%	-0.28%
2013	-0.15%	0.36%	-0.09%	0.04%	0.56%	0.11%	0.23%	0.74%	0.30%
2014	-0.12%	0.37%	-0.06%	0.10%	0.55%	0.15%	0.31%	0.70%	0.36%
2015	-0.07%	0.37%	-0.01%	0.13%	0.56%	0.18%	0.31%	0.72%	0.36%
2016	-0.06%	0.35%	0.00%	0.12%	0.53%	0.18%	0.30%	0.67%	0.35%
2017	0.02%	0.38%	0.06%	0.23%	0.56%	0.27%	0.45%	0.69%	0.48%
2018	0.06%	0.33%	0.09%	0.26%	0.50%	0.29%	0.47%	0.62%	0.49%
2019	0.12%	0.34%	0.15%	0.31%	0.51%	0.34%	0.49%	0.66%	0.51%
2020	0.13%	0.30%	0.15%	0.31%	0.47%	0.33%	0.48%	0.61%	0.50%
2021	0.19%	0.32%	0.20%	0.37%	0.50%	0.39%	0.55%	0.64%	0.56%
2022	0.20%	0.29%	0.21%	0.38%	0.46%	0.39%	0.55%	0.60%	0.56%
2023	0.23%	0.27%	0.24%	0.43%	0.42%	0.43%	0.64%	0.53%	0.62%
2024	0.31%	0.25%	0.30%	0.51%	0.41%	0.50%	0.72%	0.53%	0.70%
2025	0.36%	0.22%	0.34%	0.53%	0.38%	0.51%	0.70%	0.52%	0.68%
2026	0.36%	0.17%	0.33%	0.52%	0.32%	0.50%	0.68%	0.45%	0.65%
2027	0.52%	0.18%	0.48%	0.67%	0.38%	0.63%	0.78%	0.56%	0.75%
2028	0.51%	0.05%	0.45%	0.62%	0.22%	0.57%	0.70%	0.37%	0.66%
2029	0.54%	0.14%	0.49%	0.70%	0.31%	0.65%	0.83%	0.47%	0.78%
2030	0.57%	0.02%	0.50%	0.68%	0.19%	0.62%	0.76%	0.34%	0.71%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Baker





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bend

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	34,528,310	15,334,847	49,863,157	34,768,482	15,441,513	50,209,995	35,027,560	15,556,575	50,584,135
2012	34,644,037	15,386,244	50,030,281	35,069,781	15,575,327	50,645,108	35,628,901	15,823,645	51,452,546
2013	34,853,960	15,479,476	50,333,436	35,483,340	15,758,998	51,242,338	36,334,623	16,137,074	52,471,697
2014	35,212,265	15,638,607	50,850,872	36,075,114	16,021,819	52,096,934	37,220,008	16,530,294	53,750,302
2015	35,795,149	15,897,480	51,692,629	36,932,718	16,402,702	53,335,420	38,377,235	17,044,246	55,421,481
2016	36,481,350	16,202,238	52,683,588	37,918,557	16,840,536	54,759,094	39,684,781	17,624,958	57,309,739
2017	36,994,779	16,430,265	53,425,044	38,717,508	17,195,370	55,912,878	40,840,813	18,138,380	58,979,193
2018	37,474,509	16,643,324	54,117,834	39,489,012	17,538,013	57,027,024	41,995,474	18,651,192	60,646,666
2019	38,110,326	16,925,706	55,036,032	40,453,171	17,966,219	58,419,390	43,370,596	19,261,917	62,632,513
2020	38,809,861	17,236,386	56,046,247	41,505,259	18,433,476	59,938,735	44,867,817	19,926,869	64,794,686
2021	39,335,885	17,470,005	56,805,890	42,369,139	18,817,146	61,186,285	46,203,380	20,520,024	66,723,404
2022	39,802,640	17,677,302	57,479,942	43,177,871	19,176,323	62,354,194	47,511,746	21,101,101	68,612,847
2023	40,467,290	17,972,489	58,439,779	44,232,599	19,644,753	63,877,353	49,111,059	21,811,394	70,922,453
2024	41,580,451	18,466,871	60,047,322	45,836,457	20,357,065	66,193,522	51,343,553	22,802,897	74,146,451
2025	42,179,329	18,732,847	60,912,176	46,849,963	20,807,187	67,657,150	52,983,072	23,531,047	76,514,119
2026	42,799,013	19,008,063	61,807,076	47,906,162	21,276,270	69,182,432	54,709,763	24,297,912	79,007,675
2027	43,584,161	19,356,766	62,940,928	49,180,182	21,842,093	71,022,275	56,723,642	25,192,323	81,915,965
2028	44,255,707	19,655,016	63,910,723	50,336,678	22,355,720	72,692,398	58,651,784	26,048,657	84,700,442
2029	44,876,417	19,930,688	64,807,105	51,450,222	22,850,272	74,300,493	60,576,238	26,903,353	87,479,591
2030	45,490,856	20,203,575	65,694,431	52,574,684	23,349,672	75,924,356	62,559,123	27,784,000	90,343,123

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	6.88%	6.88%	6.88%	7.62%	7.62%	7.62%	8.43%	8.43%	8.43%
2012	0.34%	0.34%	0.34%	0.87%	0.87%	0.87%	1.72%	1.72%	1.72%
2013	0.61%	0.61%	0.61%	1.18%	1.18%	1.18%	1.98%	1.98%	1.98%
2014	1.03%	1.03%	1.03%	1.67%	1.67%	1.67%	2.44%	2.44%	2.44%
2015	1.66%	1.66%	1.66%	2.38%	2.38%	2.38%	3.11%	3.11%	3.11%
2016	1.92%	1.92%	1.92%	2.67%	2.67%	2.67%	3.41%	3.41%	3.41%
2017	1.41%	1.41%	1.41%	2.11%	2.11%	2.11%	2.91%	2.91%	2.91%
2018	1.30%	1.30%	1.30%	1.99%	1.99%	1.99%	2.83%	2.83%	2.83%
2019	1.70%	1.70%	1.70%	2.44%	2.44%	2.44%	3.27%	3.27%	3.27%
2020	1.84%	1.84%	1.84%	2.60%	2.60%	2.60%	3.45%	3.45%	3.45%
2021	1.36%	1.36%	1.36%	2.08%	2.08%	2.08%	2.98%	2.98%	2.98%
2022	1.19%	1.19%	1.19%	1.91%	1.91%	1.91%	2.83%	2.83%	2.83%
2023	1.67%	1.67%	1.67%	2.44%	2.44%	2.44%	3.37%	3.37%	3.37%
2024	2.75%	2.75%	2.75%	3.63%	3.63%	3.63%	4.55%	4.55%	4.55%
2025	1.44%	1.44%	1.44%	2.21%	2.21%	2.21%	3.19%	3.19%	3.19%
2026	1.47%	1.47%	1.47%	2.25%	2.25%	2.25%	3.26%	3.26%	3.26%
2027	1.83%	1.83%	1.83%	2.66%	2.66%	2.66%	3.68%	3.68%	3.68%
2028	1.54%	1.54%	1.54%	2.35%	2.35%	2.35%	3.40%	3.40%	3.40%
2029	1.40%	1.40%	1.40%	2.21%	2.21%	2.21%	3.28%	3.28%	3.28%
2030	1.37%	1.37%	1.37%	2.19%	2.19%	2.19%	3.27%	3.27%	3.27%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	42,013	535,695	577,708	42,306	539,220	581,526	42,621	543,092	585,712
2012	42,154	543,934	586,088	42,672	550,044	592,716	43,352	556,120	599,472
2013	42,410	552,307	594,716	43,175	560,949	604,125	44,211	569,150	613,361
2014	42,845	560,591	603,437	43,895	571,816	615,711	45,288	582,237	627,525
2015	43,555	568,708	612,263	44,939	582,558	627,497	46,697	595,296	641,993
2016	44,390	576,781	621,171	46,138	593,311	639,450	48,288	608,438	656,726
2017	45,014	585,164	630,178	47,111	604,490	651,600	49,694	622,074	671,768
2018	45,598	593,674	639,273	48,049	615,880	663,929	51,099	635,995	687,094
2019	46,372	602,101	648,473	49,223	627,245	676,467	52,772	649,978	702,750
2020	47,223	610,552	657,775	50,503	638,706	689,209	54,594	664,134	718,728
2021	47,863	619,288	667,151	51,554	650,565	702,119	56,219	678,770	734,990
2022	48,431	628,240	676,671	52,538	662,753	715,291	57,811	693,836	751,647
2023	49,240	637,013	686,253	53,821	674,790	728,611	59,757	708,801	768,558
2024	50,594	645,376	695,970	55,773	686,418	742,191	62,474	723,402	785,876
2025	51,323	654,426	705,749	57,006	698,915	755,921	64,469	738,986	803,454
2026	52,077	663,585	715,661	58,291	711,621	769,913	66,570	754,875	821,444
2027	53,032	672,631	725,664	59,841	724,263	784,104	69,020	770,752	839,772
2028	53,849	681,922	735,771	61,249	737,267	798,516	71,366	787,094	858,460
2029	54,605	691,381	745,986	62,603	750,552	813,156	73,708	803,819	877,527
2030	55,352	700,956	756,308	63,972	764,052	828,024	76,121	820,851	896,972

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	6.88%	0.75%	1.17%	7.62%	1.41%	1.84%	8.43%	2.14%	2.57%
2012	0.34%	1.54%	1.45%	0.87%	2.01%	1.92%	1.72%	2.40%	2.35%
2013	0.61%	1.54%	1.47%	1.18%	1.98%	1.92%	1.98%	2.34%	2.32%
2014	1.03%	1.50%	1.47%	1.67%	1.94%	1.92%	2.44%	2.30%	2.31%
2015	1.66%	1.45%	1.46%	2.38%	1.88%	1.91%	3.11%	2.24%	2.31%
2016	1.92%	1.42%	1.45%	2.67%	1.85%	1.90%	3.41%	2.21%	2.29%
2017	1.41%	1.45%	1.45%	2.11%	1.88%	1.90%	2.91%	2.24%	2.29%
2018	1.30%	1.45%	1.44%	1.99%	1.88%	1.89%	2.83%	2.24%	2.28%
2019	1.70%	1.42%	1.44%	2.44%	1.85%	1.89%	3.27%	2.20%	2.28%
2020	1.84%	1.40%	1.43%	2.60%	1.83%	1.88%	3.45%	2.18%	2.27%
2021	1.36%	1.43%	1.43%	2.08%	1.86%	1.87%	2.98%	2.20%	2.26%
2022	1.19%	1.45%	1.43%	1.91%	1.87%	1.88%	2.83%	2.22%	2.27%
2023	1.67%	1.40%	1.42%	2.44%	1.82%	1.86%	3.37%	2.16%	2.25%
2024	2.75%	1.31%	1.42%	3.63%	1.72%	1.86%	4.55%	2.06%	2.25%
2025	1.44%	1.40%	1.41%	2.21%	1.82%	1.85%	3.19%	2.15%	2.24%
2026	1.47%	1.40%	1.40%	2.25%	1.82%	1.85%	3.26%	2.15%	2.24%
2027	1.83%	1.36%	1.40%	2.66%	1.78%	1.84%	3.68%	2.10%	2.23%
2028	1.54%	1.38%	1.39%	2.35%	1.80%	1.84%	3.40%	2.12%	2.23%
2029	1.40%	1.39%	1.39%	2.21%	1.80%	1.83%	3.28%	2.12%	2.22%
2030	1.37%	1.38%	1.38%	2.19%	1.80%	1.83%	3.27%	2.12%	2.22%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	29,020,237	20,842,920	49,863,157	29,192,054	21,017,941	50,209,995	29,367,288	21,216,847	50,584,135
2012	29,258,289	20,771,992	50,030,281	29,584,595	21,060,513	50,645,108	29,907,618	21,544,928	51,452,546
2013	29,536,749	20,796,686	50,333,436	30,019,483	21,222,855	51,242,338	30,492,403	21,979,294	52,471,697
2014	29,877,083	20,973,789	50,850,872	30,522,224	21,574,710	52,096,934	31,153,008	22,597,294	53,750,302
2015	30,312,332	21,380,297	51,692,629	31,128,048	22,207,372	53,335,420	31,926,904	23,494,576	55,421,481
2016	30,788,864	21,894,724	52,683,588	31,782,738	22,976,356	54,759,094	32,759,488	24,550,252	57,309,739
2017	31,190,729	22,234,314	53,425,044	32,367,103	23,545,774	55,912,878	33,528,540	25,450,653	58,979,193
2018	31,577,625	22,540,209	54,117,834	32,941,903	24,085,121	57,027,024	34,295,961	26,350,704	60,646,666
2019	32,029,686	23,006,346	55,036,032	33,591,377	24,828,012	58,419,390	35,150,228	27,482,285	62,632,513
2020	32,507,619	23,538,628	56,046,247	34,275,079	25,663,655	59,938,735	36,049,924	28,744,762	64,794,686
2021	32,913,328	23,892,562	56,805,890	34,888,821	26,297,464	61,186,285	36,884,844	29,838,560	66,723,404
2022	33,296,583	24,183,360	57,479,942	35,485,748	26,868,446	62,354,194	37,711,582	30,901,265	68,612,847
2023	33,760,309	24,679,470	58,439,779	36,174,311	27,703,041	63,877,353	38,644,471	32,277,981	70,922,453
2024	34,405,630	25,641,692	60,047,322	37,066,412	29,127,110	66,193,522	39,806,745	34,339,705	74,146,451
2025	34,843,259	26,068,917	60,912,176	37,742,158	29,914,992	67,657,150	40,747,308	35,766,811	76,514,119
2026	35,291,441	26,515,635	61,807,076	38,437,114	30,745,318	69,182,432	41,719,614	37,288,061	79,007,675
2027	35,805,781	27,135,147	62,940,928	39,211,500	31,810,775	71,022,275	42,788,969	39,126,996	81,915,965
2028	36,276,643	27,634,080	63,910,723	39,946,044	32,746,354	72,692,398	43,826,162	40,874,280	84,700,442
2029	36,729,401	28,077,704	64,807,105	40,668,160	33,632,334	74,300,493	44,860,899	42,618,692	87,479,591
2030	37,181,613	28,512,818	65,694,431	41,397,019	34,527,337	75,924,356	45,914,191	44,428,932	90,343,123

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	5.20%	9.31%	6.88%	5.83%	10.22%	7.62%	6.46%	11.27%	8.43%
2012	0.82%	-0.34%	0.34%	1.34%	0.20%	0.87%	1.84%	1.55%	1.72%
2013	0.95%	0.12%	0.61%	1.47%	0.77%	1.18%	1.96%	2.02%	1.98%
2014	1.15%	0.85%	1.03%	1.67%	1.66%	1.67%	2.17%	2.81%	2.44%
2015	1.46%	1.94%	1.66%	1.98%	2.93%	2.38%	2.48%	3.97%	3.11%
2016	1.57%	2.41%	1.92%	2.10%	3.46%	2.67%	2.61%	4.49%	3.41%
2017	1.31%	1.55%	1.41%	1.84%	2.48%	2.11%	2.35%	3.67%	2.91%
2018	1.24%	1.38%	1.30%	1.78%	2.29%	1.99%	2.29%	3.54%	2.83%
2019	1.43%	2.07%	1.70%	1.97%	3.08%	2.44%	2.49%	4.29%	3.27%
2020	1.49%	2.31%	1.84%	2.04%	3.37%	2.60%	2.56%	4.59%	3.45%
2021	1.25%	1.50%	1.36%	1.79%	2.47%	2.08%	2.32%	3.81%	2.98%
2022	1.16%	1.22%	1.19%	1.71%	2.17%	1.91%	2.24%	3.56%	2.83%
2023	1.39%	2.05%	1.67%	1.94%	3.11%	2.44%	2.47%	4.46%	3.37%
2024	1.91%	3.90%	2.75%	2.47%	5.14%	3.63%	3.01%	6.39%	4.55%
2025	1.27%	1.67%	1.44%	1.82%	2.70%	2.21%	2.36%	4.16%	3.19%
2026	1.29%	1.71%	1.47%	1.84%	2.78%	2.25%	2.39%	4.25%	3.26%
2027	1.46%	2.34%	1.83%	2.01%	3.47%	2.66%	2.56%	4.93%	3.68%
2028	1.32%	1.84%	1.54%	1.87%	2.94%	2.35%	2.42%	4.47%	3.40%
2029	1.25%	1.61%	1.40%	1.81%	2.71%	2.21%	2.36%	4.27%	3.28%
2030	1.23%	1.55%	1.37%	1.79%	2.66%	2.19%	2.35%	4.25%	3.27%

Customer Count Forecast

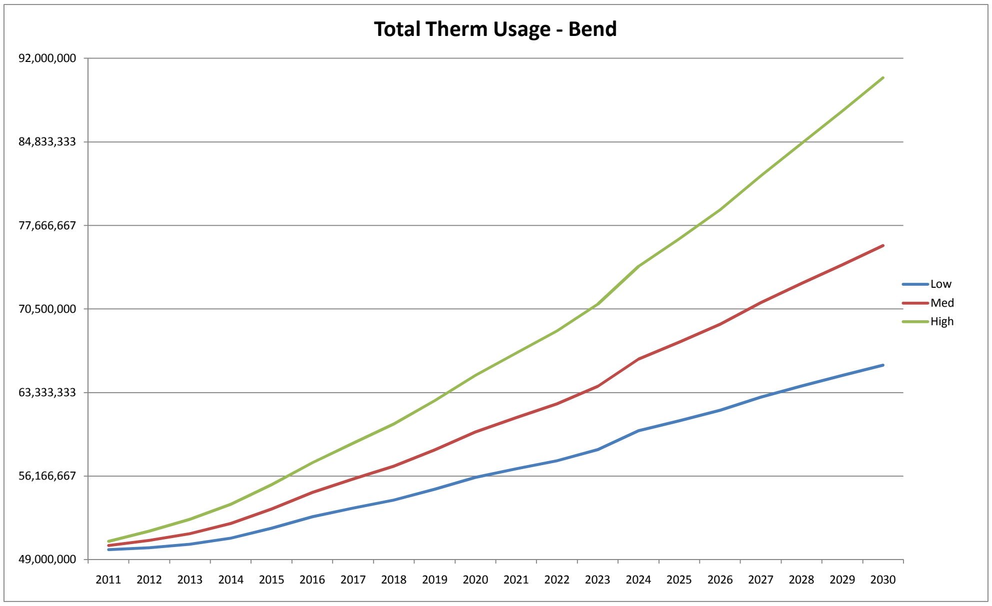
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	37,826	6,331	44,158	38,045	6,404	44,450	38,265	6,504	44,770
2012	38,333	6,466	44,798	38,738	6,567	45,305	39,126	6,695	45,821
2013	38,852	6,606	45,458	39,446	6,731	46,177	40,002	6,881	46,883
2014	39,376	6,748	46,125	40,165	6,898	47,063	40,896	7,070	47,966
2015	39,907	6,892	46,799	40,897	7,067	47,964	41,809	7,262	49,072
2016	40,444	7,036	47,480	41,640	7,238	48,877	42,740	7,457	50,198
2017	40,987	7,181	48,169	42,395	7,410	49,806	43,692	7,656	51,347
2018	41,536	7,328	48,864	43,163	7,585	50,748	44,662	7,857	52,519
2019	42,092	7,475	49,567	43,944	7,763	51,707	45,654	8,062	53,716
2020	42,654	7,624	50,278	44,739	7,942	52,681	46,667	8,270	54,937
2021	43,222	7,773	50,995	45,544	8,123	53,667	47,698	8,482	56,180
2022	43,798	7,924	51,722	46,367	8,308	54,674	48,756	8,697	57,453
2023	44,379	8,076	52,455	47,199	8,493	55,692	49,830	8,915	58,746
2024	44,969	8,229	53,197	48,049	8,682	56,730	50,932	9,137	60,070
2025	45,562	8,383	53,945	48,908	8,872	57,780	52,051	9,362	61,413
2026	46,165	8,537	54,703	49,785	9,064	58,849	53,198	9,590	62,788
2027	46,774	8,693	55,467	50,676	9,258	59,934	54,367	9,822	64,189
2028	47,390	8,850	56,240	51,581	9,455	61,036	55,560	10,058	65,618
2029	48,013	9,007	57,020	52,501	9,654	62,155	56,778	10,297	67,075
2030	48,644	9,166	57,809	53,436	9,855	63,291	58,022	10,539	68,561

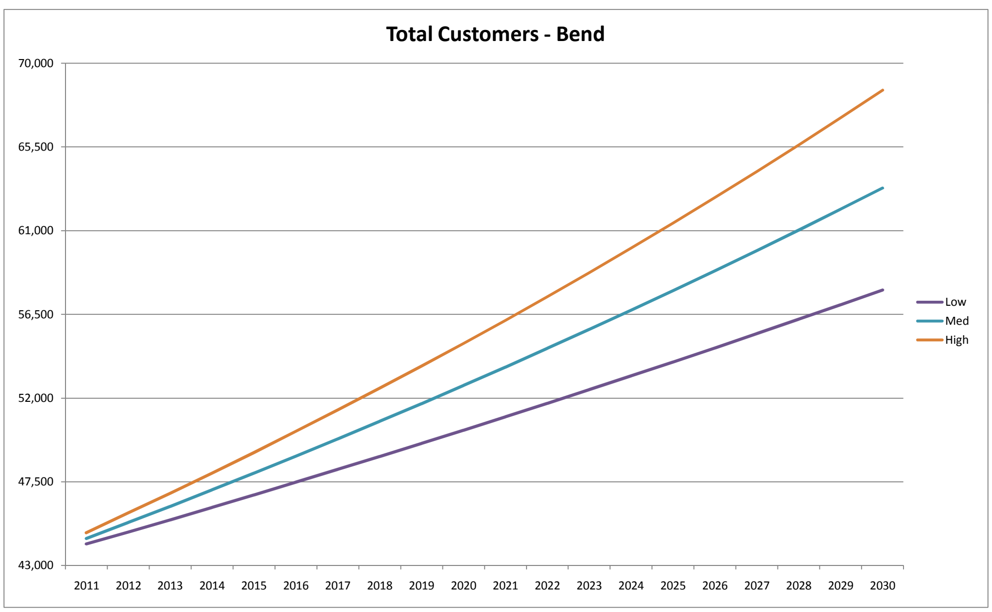
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.23%	0.80%	1.17%	1.82%	1.97%	1.84%	2.41%	3.56%	2.57%
2012	1.34%	2.12%	1.45%	1.82%	2.53%	1.92%	2.25%	2.93%	2.35%
2013	1.35%	2.18%	1.47%	1.83%	2.51%	1.92%	2.24%	2.78%	2.32%
2014	1.35%	2.15%	1.47%	1.82%	2.48%	1.92%	2.23%	2.75%	2.31%
2015	1.35%	2.12%	1.46%	1.82%	2.45%	1.91%	2.23%	2.72%	2.31%
2016	1.34%	2.09%	1.45%	1.82%	2.42%	1.90%	2.23%	2.69%	2.29%
2017	1.34%	2.07%	1.45%	1.82%	2.39%	1.90%	2.23%	2.66%	2.29%
2018	1.34%	2.04%	1.44%	1.81%	2.36%	1.89%	2.22%	2.63%	2.28%
2019	1.34%	2.01%	1.44%	1.81%	2.34%	1.89%	2.22%	2.61%	2.28%
2020	1.34%	1.99%	1.43%	1.81%	2.31%	1.88%	2.22%	2.58%	2.27%
2021	1.33%	1.96%	1.43%	1.80%	2.28%	1.87%	2.21%	2.56%	2.26%
2022	1.33%	1.94%	1.43%	1.81%	2.27%	1.88%	2.22%	2.54%	2.27%
2023	1.33%	1.92%	1.42%	1.80%	2.24%	1.86%	2.20%	2.51%	2.25%
2024	1.33%	1.90%	1.42%	1.80%	2.22%	1.86%	2.21%	2.49%	2.25%
2025	1.32%	1.87%	1.41%	1.79%	2.19%	1.85%	2.20%	2.46%	2.24%
2026	1.32%	1.85%	1.40%	1.79%	2.17%	1.85%	2.20%	2.44%	2.24%
2027	1.32%	1.82%	1.40%	1.79%	2.15%	1.84%	2.20%	2.42%	2.23%
2028	1.32%	1.80%	1.39%	1.79%	2.12%	1.84%	2.19%	2.40%	2.23%
2029	1.32%	1.78%	1.39%	1.78%	2.10%	1.83%	2.19%	2.38%	2.22%
2030	1.31%	1.76%	1.38%	1.78%	2.08%	1.83%	2.19%	2.36%	2.22%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bend





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Ontario

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	3,983,745	1,482,002	5,465,747	3,978,722	1,480,134	5,458,855	3,966,738	1,475,675	5,442,413
2012	3,912,777	1,455,601	5,368,379	3,888,161	1,446,444	5,334,605	3,877,188	1,442,362	5,319,550
2013	3,847,407	1,431,283	5,278,690	3,815,789	1,419,521	5,235,310	3,824,488	1,422,757	5,247,245
2014	3,809,761	1,417,278	5,227,039	3,771,421	1,403,015	5,174,437	3,795,683	1,412,041	5,207,724
2015	3,813,114	1,418,525	5,231,639	3,776,108	1,404,759	5,180,867	3,824,853	1,422,892	5,247,745
2016	3,836,236	1,427,127	5,263,363	3,795,016	1,411,793	5,206,808	3,856,290	1,434,587	5,290,877
2017	3,822,071	1,421,858	5,243,929	3,775,395	1,404,494	5,179,889	3,851,526	1,432,815	5,284,342
2018	3,801,798	1,414,316	5,216,113	3,755,184	1,396,975	5,152,159	3,857,113	1,434,894	5,292,006
2019	3,810,810	1,417,669	5,228,479	3,759,973	1,398,756	5,158,729	3,876,699	1,442,180	5,318,879
2020	3,827,082	1,423,722	5,250,804	3,773,806	1,403,902	5,177,709	3,906,455	1,453,249	5,359,704
2021	3,812,356	1,418,244	5,230,600	3,756,202	1,397,354	5,153,556	3,907,719	1,453,720	5,361,438
2022	3,787,859	1,409,130	5,196,989	3,727,043	1,386,506	5,113,549	3,894,728	1,448,887	5,343,615
2023	3,795,037	1,411,801	5,206,838	3,734,764	1,389,378	5,124,142	3,923,705	1,459,667	5,383,371
2024	3,872,705	1,440,694	5,313,398	3,814,363	1,418,990	5,233,353	4,018,554	1,494,952	5,513,506
2025	3,865,652	1,438,070	5,303,722	3,803,894	1,415,096	5,218,990	4,022,549	1,496,438	5,518,987
2026	3,861,870	1,436,663	5,298,533	3,799,790	1,413,569	5,213,359	4,037,733	1,502,086	5,539,819
2027	3,890,025	1,447,137	5,337,162	3,826,114	1,423,362	5,249,476	4,078,338	1,517,192	5,595,530
2028	3,890,505	1,447,316	5,337,821	3,827,157	1,423,750	5,250,906	4,097,529	1,524,331	5,621,860
2029	3,888,501	1,446,570	5,335,072	3,822,467	1,422,005	5,244,472	4,106,230	1,527,568	5,633,798
2030	3,891,156	1,447,558	5,338,714	3,821,764	1,421,743	5,243,507	4,117,798	1,531,872	5,649,669

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	20.48%	20.48%	20.48%	20.32%	20.32%	20.32%	19.96%	19.96%	19.96%
2012	-1.78%	-1.78%	-1.78%	-2.28%	-2.28%	-2.28%	-2.26%	-2.26%	-2.26%
2013	-1.67%	-1.67%	-1.67%	-1.86%	-1.86%	-1.86%	-1.36%	-1.36%	-1.36%
2014	-0.98%	-0.98%	-0.98%	-1.16%	-1.16%	-1.16%	-0.75%	-0.75%	-0.75%
2015	0.09%	0.09%	0.09%	0.12%	0.12%	0.12%	0.77%	0.77%	0.77%
2016	0.61%	0.61%	0.61%	0.50%	0.50%	0.50%	0.82%	0.82%	0.82%
2017	-0.37%	-0.37%	-0.37%	-0.52%	-0.52%	-0.52%	-0.12%	-0.12%	-0.12%
2018	-0.53%	-0.53%	-0.53%	-0.54%	-0.54%	-0.54%	0.15%	0.15%	0.15%
2019	0.24%	0.24%	0.24%	0.13%	0.13%	0.13%	0.51%	0.51%	0.51%
2020	0.43%	0.43%	0.43%	0.37%	0.37%	0.37%	0.77%	0.77%	0.77%
2021	-0.38%	-0.38%	-0.38%	-0.47%	-0.47%	-0.47%	0.03%	0.03%	0.03%
2022	-0.64%	-0.64%	-0.64%	-0.78%	-0.78%	-0.78%	-0.33%	-0.33%	-0.33%
2023	0.19%	0.19%	0.19%	0.21%	0.21%	0.21%	0.74%	0.74%	0.74%
2024	2.05%	2.05%	2.05%	2.13%	2.13%	2.13%	2.42%	2.42%	2.42%
2025	-0.18%	-0.18%	-0.18%	-0.27%	-0.27%	-0.27%	0.10%	0.10%	0.10%
2026	-0.10%	-0.10%	-0.10%	-0.11%	-0.11%	-0.11%	0.38%	0.38%	0.38%
2027	0.73%	0.73%	0.73%	0.69%	0.69%	0.69%	1.01%	1.01%	1.01%
2028	0.01%	0.01%	0.01%	0.03%	0.03%	0.03%	0.47%	0.47%	0.47%
2029	-0.05%	-0.05%	-0.05%	-0.12%	-0.12%	-0.12%	0.21%	0.21%	0.21%
2030	0.07%	0.07%	0.07%	-0.02%	-0.02%	-0.02%	0.28%	0.28%	0.28%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	4,060	26,676	30,736	4,055	26,711	30,766	4,043	26,736	30,779
2012	3,988	26,779	30,767	3,963	26,752	30,715	3,952	26,636	30,587
2013	3,921	26,781	30,703	3,889	26,778	30,667	3,898	26,662	30,560
2014	3,883	26,759	30,642	3,844	26,767	30,611	3,869	26,634	30,503
2015	3,886	26,710	30,596	3,849	26,774	30,622	3,898	26,699	30,597
2016	3,910	26,679	30,589	3,868	26,744	30,612	3,930	26,645	30,575
2017	3,896	26,667	30,562	3,848	26,741	30,589	3,926	26,624	30,550
2018	3,875	26,678	30,552	3,827	26,808	30,636	3,931	26,749	30,680
2019	3,884	26,699	30,583	3,832	26,837	30,669	3,951	26,760	30,711
2020	3,901	26,706	30,607	3,846	26,857	30,703	3,982	26,773	30,754
2021	3,886	26,748	30,634	3,828	26,925	30,753	3,983	26,851	30,834
2022	3,861	26,816	30,676	3,799	27,008	30,807	3,970	26,927	30,897
2023	3,868	26,861	30,729	3,807	27,089	30,895	3,999	27,038	31,037
2024	3,947	26,856	30,803	3,888	27,085	30,973	4,096	27,017	31,113
2025	3,940	26,927	30,867	3,877	27,163	31,040	4,100	27,079	31,179
2026	3,936	27,011	30,947	3,873	27,275	31,147	4,115	27,206	31,322
2027	3,965	27,134	31,099	3,900	27,396	31,296	4,157	27,302	31,459
2028	3,965	27,213	31,179	3,901	27,499	31,400	4,176	27,417	31,593
2029	3,963	27,350	31,313	3,896	27,639	31,535	4,185	27,536	31,721
2030	3,966	27,541	31,507	3,895	27,825	31,720	4,197	27,692	31,889

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	20.48%	-1.43%	1.00%	20.32%	-1.30%	1.10%	19.96%	-1.20%	1.14%
2012	-1.78%	0.39%	0.10%	-2.28%	0.15%	-0.17%	-2.26%	-0.38%	-0.62%
2013	-1.67%	0.01%	-0.21%	-1.86%	0.10%	-0.15%	-1.36%	0.10%	-0.09%
2014	-0.98%	-0.08%	-0.20%	-1.16%	-0.04%	-0.18%	-0.75%	-0.10%	-0.19%
2015	0.09%	-0.18%	-0.15%	0.12%	0.02%	0.04%	0.77%	0.24%	0.31%
2016	0.61%	-0.12%	-0.02%	0.50%	-0.11%	-0.03%	0.82%	-0.20%	-0.07%
2017	-0.37%	-0.05%	-0.09%	-0.52%	-0.01%	-0.08%	-0.12%	-0.08%	-0.08%
2018	-0.53%	0.04%	-0.03%	-0.54%	0.25%	0.15%	0.15%	0.47%	0.43%
2019	0.24%	0.08%	0.10%	0.13%	0.11%	0.11%	0.51%	0.04%	0.10%
2020	0.43%	0.03%	0.08%	0.37%	0.08%	0.11%	0.77%	0.05%	0.14%
2021	-0.38%	0.16%	0.09%	-0.47%	0.25%	0.16%	0.03%	0.29%	0.26%
2022	-0.64%	0.25%	0.14%	-0.78%	0.31%	0.17%	-0.33%	0.28%	0.20%
2023	0.19%	0.17%	0.17%	0.21%	0.30%	0.29%	0.74%	0.41%	0.45%
2024	2.05%	-0.02%	0.24%	2.13%	-0.01%	0.25%	2.42%	-0.08%	0.24%
2025	-0.18%	0.26%	0.21%	-0.27%	0.29%	0.22%	0.10%	0.23%	0.21%
2026	-0.10%	0.31%	0.26%	-0.11%	0.41%	0.34%	0.38%	0.47%	0.46%
2027	0.73%	0.46%	0.49%	0.69%	0.45%	0.48%	1.01%	0.35%	0.44%
2028	0.01%	0.29%	0.26%	0.03%	0.38%	0.33%	0.47%	0.42%	0.43%
2029	-0.05%	0.50%	0.43%	-0.12%	0.51%	0.43%	0.21%	0.43%	0.40%
2030	0.07%	0.70%	0.62%	-0.02%	0.67%	0.59%	0.28%	0.57%	0.53%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	2,127,112	3,338,635	5,465,747	2,125,986	3,332,869	5,458,855	2,122,519	3,319,894	5,442,413
2012	2,114,644	3,253,734	5,368,379	2,106,052	3,228,553	5,334,605	2,090,273	3,229,277	5,319,550
2013	2,098,648	3,180,042	5,278,690	2,089,307	3,146,002	5,235,310	2,072,031	3,175,214	5,247,245
2014	2,088,000	3,139,040	5,227,039	2,077,013	3,097,423	5,174,437	2,056,805	3,150,919	5,207,724
2015	2,085,880	3,145,759	5,231,639	2,076,622	3,104,245	5,180,867	2,058,781	3,188,964	5,247,745
2016	2,089,280	3,174,083	5,263,363	2,077,709	3,129,099	5,206,808	2,055,894	3,234,983	5,290,877
2017	2,084,737	3,159,192	5,243,929	2,071,304	3,108,585	5,179,889	2,046,262	3,238,080	5,284,342
2018	2,079,748	3,136,365	5,216,113	2,067,911	3,084,248	5,152,159	2,045,037	3,246,969	5,292,006
2019	2,082,188	3,146,291	5,228,479	2,068,310	3,090,419	5,158,729	2,041,935	3,276,945	5,318,879
2020	2,085,678	3,165,126	5,250,804	2,070,206	3,107,503	5,177,709	2,041,006	3,318,698	5,359,704
2021	2,083,484	3,147,116	5,230,600	2,067,254	3,086,302	5,153,556	2,036,581	3,324,857	5,361,438
2022	2,080,031	3,116,958	5,196,989	2,062,208	3,051,342	5,113,549	2,028,734	3,314,881	5,343,615
2023	2,083,083	3,123,755	5,206,838	2,065,257	3,058,886	5,124,142	2,031,471	3,351,901	5,383,371
2024	2,100,375	3,213,024	5,313,398	2,080,192	3,153,161	5,233,353	2,042,407	3,471,099	5,513,506
2025	2,101,248	3,202,474	5,303,722	2,078,858	3,140,132	5,218,990	2,037,355	3,481,632	5,518,987
2026	2,103,427	3,195,106	5,298,533	2,080,283	3,133,077	5,213,359	2,037,338	3,502,481	5,539,819
2027	2,114,735	3,222,427	5,337,162	2,088,632	3,160,844	5,249,476	2,040,898	3,554,631	5,595,530
2028	2,117,703	3,220,119	5,337,821	2,090,626	3,160,280	5,250,906	2,040,998	3,580,862	5,621,860
2029	2,122,656	3,212,415	5,335,072	2,092,867	3,151,604	5,244,472	2,038,871	3,594,928	5,633,798
2030	2,131,053	3,207,661	5,338,714	2,097,929	3,145,578	5,243,507	2,038,680	3,610,989	5,649,669

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	12.71%	26.01%	20.48%	12.65%	25.79%	20.32%	12.47%	25.30%	19.96%
2012	-0.59%	-2.54%	-1.78%	-0.94%	-3.13%	-2.28%	-1.52%	-2.73%	-2.26%
2013	-0.76%	-2.26%	-1.67%	-0.80%	-2.56%	-1.86%	-0.87%	-1.67%	-1.36%
2014	-0.51%	-1.29%	-0.98%	-0.59%	-1.54%	-1.16%	-0.73%	-0.77%	-0.75%
2015	-0.10%	0.21%	0.09%	-0.02%	0.22%	0.12%	0.10%	1.21%	0.77%
2016	0.16%	0.90%	0.61%	0.05%	0.80%	0.50%	-0.14%	1.44%	0.82%
2017	-0.22%	-0.47%	-0.37%	-0.31%	-0.66%	-0.52%	-0.47%	0.10%	-0.12%
2018	-0.24%	-0.72%	-0.53%	-0.16%	-0.78%	-0.54%	-0.06%	0.27%	0.15%
2019	0.12%	0.32%	0.24%	0.02%	0.20%	0.13%	-0.15%	0.92%	0.51%
2020	0.17%	0.60%	0.43%	0.09%	0.55%	0.37%	-0.05%	1.27%	0.77%
2021	-0.11%	-0.57%	-0.38%	-0.14%	-0.68%	-0.47%	-0.22%	0.19%	0.03%
2022	-0.17%	-0.96%	-0.64%	-0.24%	-1.13%	-0.78%	-0.39%	-0.30%	-0.33%
2023	0.15%	0.22%	0.19%	0.15%	0.25%	0.21%	0.13%	1.12%	0.74%
2024	0.83%	2.86%	2.05%	0.72%	3.08%	2.13%	0.54%	3.56%	2.42%
2025	0.04%	-0.33%	-0.18%	-0.06%	-0.41%	-0.27%	-0.25%	0.30%	0.10%
2026	0.10%	-0.23%	-0.10%	0.07%	-0.22%	-0.11%	0.00%	0.60%	0.38%
2027	0.54%	0.86%	0.73%	0.40%	0.89%	0.69%	0.17%	1.49%	1.01%
2028	0.14%	-0.07%	0.01%	0.10%	-0.02%	0.03%	0.00%	0.74%	0.47%
2029	0.23%	-0.24%	-0.05%	0.11%	-0.27%	-0.12%	-0.10%	0.39%	0.21%
2030	0.40%	-0.15%	0.07%	0.24%	-0.19%	-0.02%	-0.01%	0.45%	0.28%

Customer Count Forecast

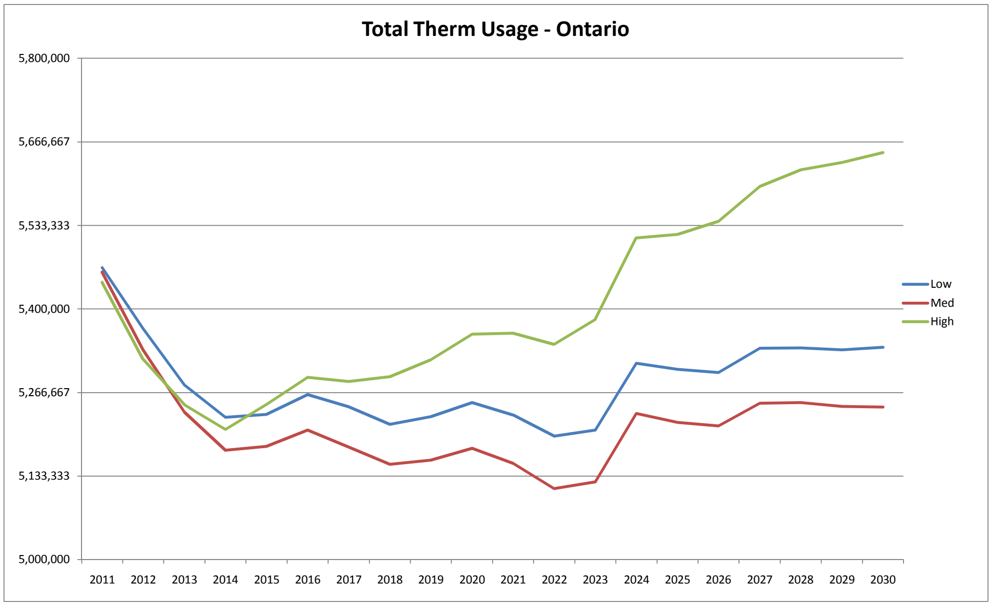
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3,626	893	4,519	3,628	895	4,523	3,628	897	4,525
2012	3,629	894	4,523	3,621	894	4,516	3,605	892	4,497
2013	3,622	892	4,514	3,616	893	4,509	3,601	892	4,493
2014	3,615	890	4,505	3,609	892	4,500	3,594	891	4,484
2015	3,609	889	4,498	3,609	892	4,502	3,604	894	4,498
2016	3,608	889	4,497	3,608	893	4,501	3,601	894	4,495
2017	3,605	888	4,493	3,605	892	4,497	3,597	894	4,491
2018	3,604	888	4,492	3,610	894	4,504	3,612	899	4,510
2019	3,607	889	4,496	3,614	895	4,509	3,615	900	4,515
2020	3,610	889	4,500	3,617	897	4,514	3,619	902	4,521
2021	3,613	890	4,504	3,623	898	4,521	3,628	905	4,533
2022	3,618	892	4,510	3,629	900	4,529	3,635	908	4,542
2023	3,624	893	4,518	3,639	903	4,542	3,651	912	4,563
2024	3,633	895	4,529	3,647	906	4,554	3,659	915	4,574
2025	3,640	897	4,538	3,655	909	4,563	3,666	918	4,584
2026	3,650	900	4,550	3,667	912	4,579	3,682	923	4,605
2027	3,667	905	4,572	3,684	917	4,601	3,697	928	4,625
2028	3,677	907	4,584	3,696	920	4,616	3,712	932	4,645
2029	3,693	911	4,604	3,711	925	4,636	3,727	937	4,663
2030	3,715	917	4,632	3,733	931	4,663	3,746	943	4,688

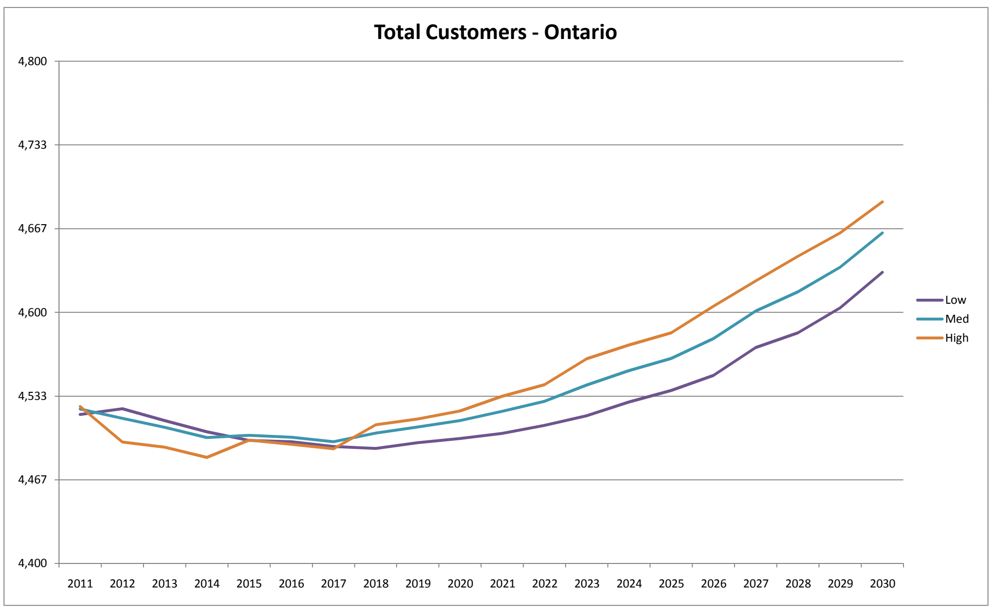
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	0.89%	1.46%	1.00%	0.94%	1.74%	1.10%	0.95%	1.94%	1.14%
2012	0.10%	0.11%	0.10%	-0.18%	-0.13%	-0.17%	-0.63%	-0.58%	-0.62%
2013	-0.21%	-0.21%	-0.21%	-0.16%	-0.12%	-0.15%	-0.11%	-0.03%	-0.09%
2014	-0.20%	-0.19%	-0.20%	-0.19%	-0.14%	-0.18%	-0.20%	-0.11%	-0.19%
2015	-0.15%	-0.15%	-0.15%	0.03%	0.08%	0.04%	0.29%	0.40%	0.31%
2016	-0.03%	-0.02%	-0.02%	-0.04%	0.01%	-0.03%	-0.09%	0.00%	-0.07%
2017	-0.09%	-0.09%	-0.09%	-0.09%	-0.05%	-0.08%	-0.10%	-0.02%	-0.08%
2018	-0.03%	-0.03%	-0.03%	0.14%	0.20%	0.15%	0.40%	0.51%	0.43%
2019	0.10%	0.10%	0.10%	0.10%	0.15%	0.11%	0.09%	0.17%	0.10%
2020	0.08%	0.09%	0.08%	0.10%	0.16%	0.11%	0.12%	0.22%	0.14%
2021	0.09%	0.09%	0.09%	0.15%	0.20%	0.16%	0.24%	0.33%	0.26%
2022	0.13%	0.15%	0.14%	0.16%	0.23%	0.17%	0.18%	0.29%	0.20%
2023	0.17%	0.18%	0.17%	0.28%	0.33%	0.29%	0.43%	0.53%	0.45%
2024	0.24%	0.25%	0.24%	0.24%	0.29%	0.25%	0.23%	0.31%	0.24%
2025	0.20%	0.22%	0.21%	0.21%	0.26%	0.22%	0.19%	0.29%	0.21%
2026	0.26%	0.27%	0.26%	0.33%	0.39%	0.34%	0.44%	0.54%	0.46%
2027	0.48%	0.52%	0.49%	0.46%	0.54%	0.48%	0.42%	0.53%	0.44%
2028	0.25%	0.27%	0.26%	0.32%	0.38%	0.33%	0.41%	0.50%	0.43%
2029	0.43%	0.45%	0.43%	0.42%	0.48%	0.43%	0.38%	0.48%	0.40%
2030	0.61%	0.64%	0.62%	0.58%	0.64%	0.59%	0.51%	0.61%	0.53%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Ontario





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

OR

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	50,121,683	23,267,527	73,389,209	50,438,606	23,419,459	73,858,065	50,787,844	23,590,688	74,378,531
2012	50,156,746	23,293,580	73,450,326	50,651,976	23,530,504	74,182,480	51,347,119	23,864,140	75,211,259
2013	50,325,557	23,384,405	73,709,962	51,022,168	23,711,319	74,733,487	52,057,366	24,197,544	76,254,910
2014	50,713,607	23,574,326	74,287,933	51,641,712	24,004,302	75,646,014	53,017,782	24,644,754	77,662,536
2015	51,432,240	23,914,286	75,346,526	52,636,615	24,465,809	77,102,424	54,369,287	25,267,518	79,636,805
2016	52,299,096	24,320,976	76,620,073	53,798,656	25,002,839	78,801,495	55,901,024	25,973,113	81,874,137
2017	52,901,765	24,606,930	77,508,696	54,683,091	25,413,765	80,096,856	57,189,867	26,567,063	83,756,930
2018	53,449,913	24,867,247	78,317,159	55,524,785	25,804,052	81,328,837	58,471,875	27,155,428	85,627,303
2019	54,224,605	25,230,041	79,454,646	56,624,177	26,310,718	82,934,895	60,030,940	27,870,171	87,901,111
2020	55,081,725	25,629,983	80,711,708	57,832,673	26,866,398	84,699,071	61,736,559	28,650,894	90,387,452
2021	55,680,978	25,911,647	81,592,626	58,769,827	27,298,248	86,068,075	63,197,019	29,318,564	92,515,583
2022	56,188,016	26,150,370	82,338,386	59,616,457	27,688,038	87,304,495	64,588,830	29,953,575	94,542,405
2023	56,974,838	26,516,212	83,491,050	60,796,341	28,228,175	89,024,516	66,368,906	30,763,761	97,132,667
2024	58,398,885	27,172,467	85,571,351	62,716,496	29,104,208	91,820,704	68,977,806	31,951,318	100,929,123
2025	59,073,743	27,485,533	86,559,276	63,805,533	29,601,455	93,406,989	70,738,636	32,750,451	103,489,087
2026	59,769,425	27,807,055	87,576,480	64,941,246	30,118,614	95,059,860	72,596,719	33,591,861	106,188,580
2027	60,703,995	28,236,291	88,940,286	66,367,894	30,766,767	97,134,661	74,813,352	34,595,264	109,408,616
2028	61,456,719	28,582,283	90,039,002	67,610,377	31,330,620	98,940,997	76,877,962	35,527,913	112,405,875
2029	62,137,219	28,893,893	91,031,112	68,787,150	31,863,382	100,650,533	78,912,085	36,445,333	115,357,418
2030	62,806,843	29,199,153	92,005,996	69,968,396	32,396,677	102,365,074	80,994,897	37,382,840	118,377,737

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	9.31%	9.38%	9.33%	10.00%	10.09%	10.03%	10.76%	10.90%	10.80%
2012	0.07%	0.11%	0.08%	0.42%	0.47%	0.44%	1.10%	1.16%	1.12%
2013	0.34%	0.39%	0.35%	0.73%	0.77%	0.74%	1.38%	1.40%	1.39%
2014	0.77%	0.81%	0.78%	1.21%	1.24%	1.22%	1.84%	1.85%	1.85%
2015	1.42%	1.44%	1.42%	1.93%	1.92%	1.93%	2.55%	2.53%	2.54%
2016	1.69%	1.70%	1.69%	2.21%	2.20%	2.20%	2.82%	2.79%	2.81%
2017	1.15%	1.18%	1.16%	1.64%	1.64%	1.64%	2.31%	2.29%	2.30%
2018	1.04%	1.06%	1.04%	1.54%	1.54%	1.54%	2.24%	2.21%	2.23%
2019	1.45%	1.46%	1.45%	1.98%	1.96%	1.97%	2.67%	2.63%	2.66%
2020	1.58%	1.59%	1.58%	2.13%	2.11%	2.13%	2.84%	2.80%	2.83%
2021	1.09%	1.10%	1.09%	1.62%	1.61%	1.62%	2.37%	2.33%	2.35%
2022	0.91%	0.92%	0.91%	1.44%	1.43%	1.44%	2.20%	2.17%	2.19%
2023	1.40%	1.40%	1.40%	1.98%	1.95%	1.97%	2.76%	2.70%	2.74%
2024	2.50%	2.47%	2.49%	3.16%	3.10%	3.14%	3.93%	3.86%	3.91%
2025	1.16%	1.15%	1.15%	1.74%	1.71%	1.73%	2.55%	2.50%	2.54%
2026	1.18%	1.17%	1.18%	1.78%	1.75%	1.77%	2.63%	2.57%	2.61%
2027	1.56%	1.54%	1.56%	2.20%	2.15%	2.18%	3.05%	2.99%	3.03%
2028	1.24%	1.23%	1.24%	1.87%	1.83%	1.86%	2.76%	2.70%	2.74%
2029	1.11%	1.09%	1.10%	1.74%	1.70%	1.73%	2.65%	2.58%	2.63%
2030	1.08%	1.06%	1.07%	1.72%	1.67%	1.70%	2.64%	2.57%	2.62%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	63,747	770,047	833,794	64,163	775,819	839,981	64,632	782,924	847,556
2012	63,818	782,138	845,956	64,467	791,353	855,820	65,381	801,834	867,215
2013	64,067	794,934	859,001	64,963	806,899	871,861	66,295	819,621	885,916
2014	64,587	807,537	872,124	65,765	822,329	888,095	67,520	837,431	904,951
2015	65,519	819,841	885,359	67,030	837,495	904,524	69,226	855,039	924,265
2016	66,633	832,007	898,639	68,501	852,546	921,047	71,159	872,552	943,711
2017	67,416	844,545	911,961	69,627	868,087	937,714	72,786	890,628	963,415
2018	68,129	857,184	925,313	70,696	883,858	954,554	74,398	909,079	983,477
2019	69,123	869,619	938,742	72,084	899,424	971,508	76,357	927,307	1,003,664
2020	70,219	881,948	952,167	73,607	914,982	988,589	78,496	945,647	1,024,143
2021	70,991	894,621	965,611	74,790	931,011	1,005,800	80,325	964,566	1,044,891
2022	71,645	907,475	979,119	75,858	947,282	1,023,140	82,065	983,748	1,065,812
2023	72,647	919,918	992,566	77,337	963,196	1,040,534	84,284	1,002,656	1,086,940
2024	74,445	931,600	1,006,045	79,738	978,329	1,058,067	87,538	1,020,784	1,108,322
2025	75,303	944,125	1,019,428	81,100	994,444	1,075,544	89,727	1,039,951	1,129,678
2026	76,184	956,588	1,032,772	82,517	1,010,637	1,093,154	92,032	1,059,360	1,151,393
2027	77,360	968,801	1,046,161	84,293	1,026,596	1,110,889	94,782	1,078,532	1,173,313
2028	78,308	981,089	1,059,397	85,837	1,042,762	1,128,599	97,337	1,098,039	1,195,376
2029	79,161	993,486	1,072,647	87,297	1,059,149	1,146,446	99,850	1,117,873	1,217,723
2030	79,998	1,005,900	1,085,897	88,758	1,075,619	1,164,377	102,419	1,137,834	1,240,253

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	9.38%	0.48%	1.11%	10.09%	1.24%	1.86%	10.90%	2.16%	2.78%
2012	0.11%	1.57%	1.46%	0.47%	2.00%	1.89%	1.16%	2.42%	2.32%
2013	0.39%	1.64%	1.54%	0.77%	1.96%	1.87%	1.40%	2.22%	2.16%
2014	0.81%	1.59%	1.53%	1.24%	1.91%	1.86%	1.85%	2.17%	2.15%
2015	1.44%	1.52%	1.52%	1.92%	1.84%	1.85%	2.53%	2.10%	2.13%
2016	1.70%	1.48%	1.50%	2.20%	1.80%	1.83%	2.79%	2.05%	2.10%
2017	1.18%	1.51%	1.48%	1.64%	1.82%	1.81%	2.29%	2.07%	2.09%
2018	1.06%	1.50%	1.46%	1.54%	1.82%	1.80%	2.21%	2.07%	2.08%
2019	1.46%	1.45%	1.45%	1.96%	1.76%	1.78%	2.63%	2.01%	2.05%
2020	1.59%	1.42%	1.43%	2.11%	1.73%	1.76%	2.80%	1.98%	2.04%
2021	1.10%	1.44%	1.41%	1.61%	1.75%	1.74%	2.33%	2.00%	2.03%
2022	0.92%	1.44%	1.40%	1.43%	1.75%	1.72%	2.17%	1.99%	2.00%
2023	1.40%	1.37%	1.37%	1.95%	1.68%	1.70%	2.70%	1.92%	1.98%
2024	2.47%	1.27%	1.36%	3.10%	1.57%	1.68%	3.86%	1.81%	1.97%
2025	1.15%	1.34%	1.33%	1.71%	1.65%	1.65%	2.50%	1.88%	1.93%
2026	1.17%	1.32%	1.31%	1.75%	1.63%	1.64%	2.57%	1.87%	1.92%
2027	1.54%	1.28%	1.30%	2.15%	1.58%	1.62%	2.99%	1.81%	1.90%
2028	1.23%	1.27%	1.27%	1.83%	1.57%	1.59%	2.70%	1.81%	1.88%
2029	1.09%	1.26%	1.25%	1.70%	1.57%	1.58%	2.58%	1.81%	1.87%
2030	1.06%	1.25%	1.24%	1.67%	1.55%	1.56%	2.57%	1.79%	1.85%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	39,863,115	33,526,094	73,389,209	40,123,953	33,734,111	73,858,065	40,423,516	33,955,015	74,378,531
2012	40,093,684	33,356,642	73,450,326	40,539,934	33,642,546	74,182,480	41,032,047	34,179,212	75,211,259
2013	40,408,247	33,301,715	73,709,962	41,028,729	33,704,758	74,733,487	41,693,604	34,561,305	76,254,910
2014	40,838,929	33,449,004	74,287,933	41,641,783	34,004,230	75,646,014	42,490,962	35,171,574	77,662,536
2015	41,450,264	33,896,262	75,346,526	42,446,885	34,655,539	77,102,424	43,495,295	36,141,510	79,636,805
2016	42,138,214	34,481,858	76,620,073	43,334,596	35,466,899	78,801,495	44,589,739	37,284,398	81,874,137
2017	42,674,307	34,834,389	77,508,696	44,075,131	36,021,725	80,096,856	45,544,505	38,212,425	83,756,930
2018	43,176,105	35,141,055	78,317,159	44,790,448	36,538,390	81,328,837	46,488,081	39,139,223	85,627,303
2019	43,800,826	35,653,820	79,454,646	45,636,232	37,298,663	82,934,895	47,570,934	40,330,177	87,901,111
2020	44,467,166	36,244,542	80,711,708	46,534,663	38,164,408	84,699,071	48,722,144	41,665,308	90,387,452
2021	44,988,048	36,604,578	81,592,626	47,289,869	38,778,206	86,068,075	49,735,700	42,779,882	92,515,583
2022	45,456,093	36,882,293	82,338,386	47,995,282	39,309,213	87,304,495	50,704,249	43,838,157	94,542,405
2023	46,074,197	37,416,853	83,491,050	48,867,193	40,157,323	89,024,516	51,861,939	45,270,727	97,132,667
2024	47,037,603	38,533,748	85,571,351	50,111,766	41,708,939	91,820,704	53,425,821	47,503,303	100,929,123
2025	47,587,576	38,971,700	86,559,276	50,925,994	42,480,995	93,406,989	54,542,303	48,946,784	103,489,087
2026	48,145,710	39,430,771	87,576,480	51,759,964	43,299,896	95,059,860	55,696,266	50,492,314	106,188,580
2027	48,830,996	40,109,289	88,940,286	52,735,036	44,399,625	97,134,661	57,009,521	52,399,095	109,408,616
2028	49,414,712	40,624,290	90,039,002	53,611,978	45,329,019	98,940,997	58,232,927	54,172,948	112,405,875
2029	49,956,604	41,074,508	91,031,112	54,452,165	46,198,368	100,650,533	59,429,041	55,928,377	115,357,418
2030	50,490,864	41,515,131	92,005,996	55,289,894	47,075,180	102,365,074	60,631,893	57,745,844	118,377,737

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	7.39%	11.72%	9.33%	8.10%	12.42%	10.03%	8.90%	13.15%	10.80%
2012	0.58%	-0.51%	0.08%	1.04%	-0.27%	0.44%	1.51%	0.66%	1.12%
2013	0.78%	-0.16%	0.35%	1.21%	0.18%	0.74%	1.61%	1.12%	1.39%
2014	1.07%	0.44%	0.78%	1.49%	0.89%	1.22%	1.91%	1.77%	1.85%
2015	1.50%	1.34%	1.42%	1.93%	1.92%	1.93%	2.36%	2.76%	2.54%
2016	1.66%	1.73%	1.69%	2.09%	2.34%	2.20%	2.52%	3.16%	2.81%
2017	1.27%	1.02%	1.16%	1.71%	1.56%	1.64%	2.14%	2.49%	2.30%
2018	1.18%	0.88%	1.04%	1.62%	1.43%	1.54%	2.07%	2.43%	2.23%
2019	1.45%	1.46%	1.45%	1.89%	2.08%	1.97%	2.33%	3.04%	2.66%
2020	1.52%	1.66%	1.58%	1.97%	2.32%	2.13%	2.42%	3.31%	2.83%
2021	1.17%	0.99%	1.09%	1.62%	1.61%	1.62%	2.08%	2.68%	2.35%
2022	1.04%	0.76%	0.91%	1.49%	1.37%	1.44%	1.95%	2.47%	2.19%
2023	1.36%	1.45%	1.40%	1.82%	2.16%	1.97%	2.28%	3.27%	2.74%
2024	2.09%	2.99%	2.49%	2.55%	3.86%	3.14%	3.02%	4.93%	3.91%
2025	1.17%	1.14%	1.15%	1.62%	1.85%	1.73%	2.09%	3.04%	2.54%
2026	1.17%	1.18%	1.18%	1.64%	1.93%	1.77%	2.12%	3.16%	2.61%
2027	1.42%	1.72%	1.56%	1.88%	2.54%	2.18%	2.36%	3.78%	3.03%
2028	1.20%	1.28%	1.24%	1.66%	2.09%	1.86%	2.15%	3.39%	2.74%
2029	1.10%	1.11%	1.10%	1.57%	1.92%	1.73%	2.05%	3.24%	2.63%
2030	1.07%	1.07%	1.07%	1.54%	1.90%	1.70%	2.02%	3.25%	2.62%

Customer Count Forecast

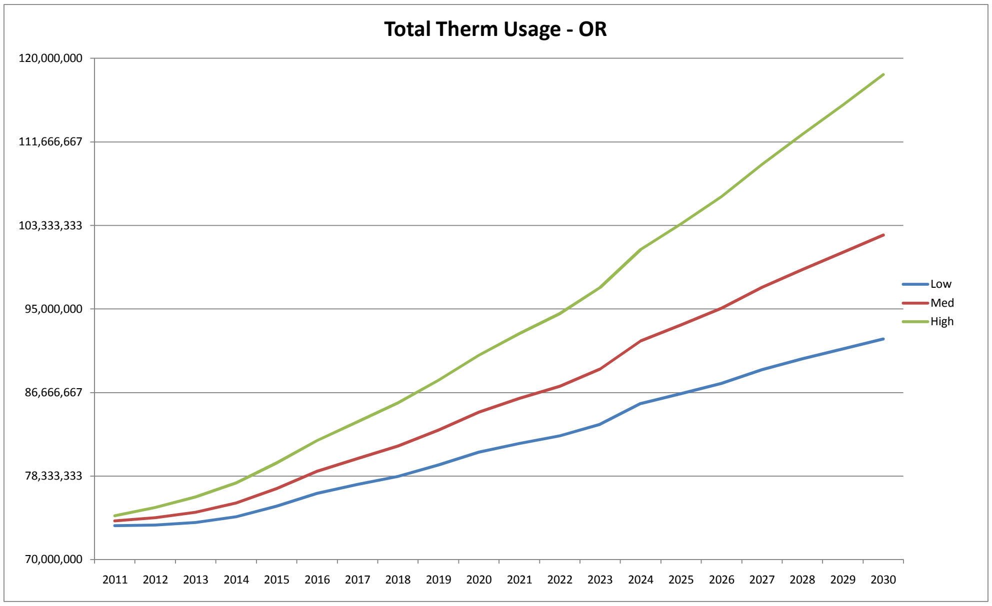
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	55,518	9,593	65,112	55,885	9,683	65,567	56,313	9,799	66,112
2012	56,253	9,744	65,998	56,847	9,866	66,713	57,499	10,015	67,514
2013	57,026	9,902	66,928	57,824	10,052	67,875	58,657	10,226	68,883
2014	57,805	10,061	67,866	58,813	10,239	69,053	59,836	10,440	70,276
2015	58,593	10,221	68,814	59,820	10,431	70,251	61,043	10,661	71,703
2016	59,387	10,383	69,770	60,833	10,623	71,456	62,252	10,880	73,133
2017	60,184	10,545	70,729	61,856	10,818	72,673	63,481	11,103	74,585
2018	60,985	10,709	71,694	62,895	11,015	73,911	64,744	11,333	76,077
2019	61,796	10,874	72,670	63,943	11,215	75,158	66,010	11,564	77,574
2020	62,606	11,040	73,646	65,000	11,416	76,416	67,296	11,798	79,094
2021	63,419	11,207	74,626	66,067	11,619	77,687	68,603	12,036	80,639
2022	64,238	11,375	75,613	67,144	11,825	78,969	69,922	12,277	82,200
2023	65,055	11,544	76,599	68,228	12,034	80,262	71,262	12,522	83,784
2024	65,877	11,715	77,592	69,323	12,244	81,567	72,617	12,770	85,387
2025	66,695	11,885	78,580	70,416	12,454	82,870	73,972	13,018	86,990
2026	67,512	12,056	79,568	71,520	12,668	84,188	75,355	13,272	88,628
2027	68,339	12,230	80,569	72,639	12,885	85,524	76,754	13,531	90,285
2028	69,154	12,402	81,556	73,754	13,101	86,855	78,163	13,790	91,953
2029	69,975	12,576	82,551	74,882	13,321	88,203	79,593	14,054	93,647
2030	70,800	12,752	83,552	76,019	13,544	89,563	81,038	14,321	95,359

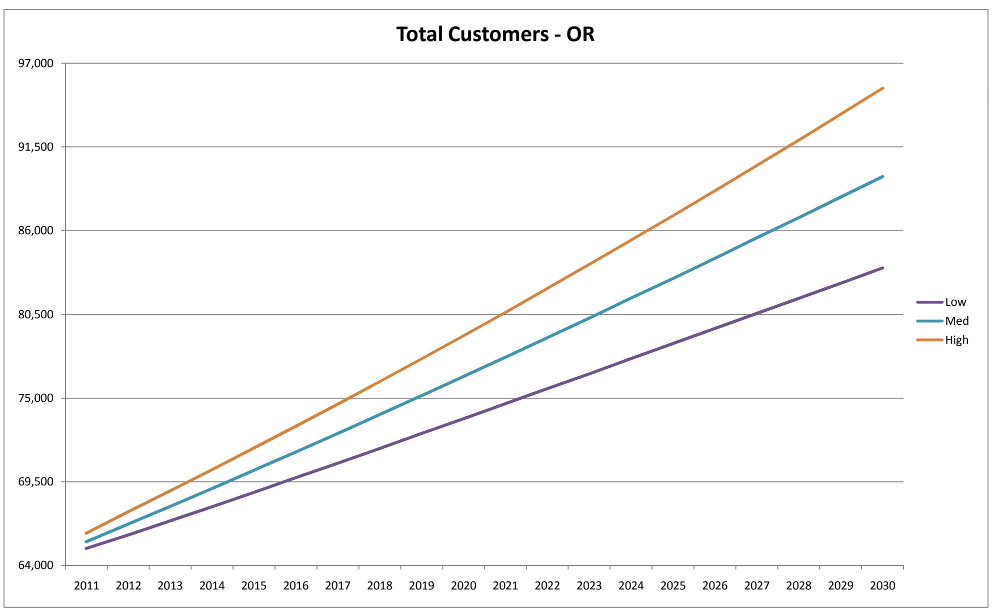
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.16%	0.95%	1.13%	1.83%	1.89%	1.83%	2.61%	3.12%	2.68%
2012	1.32%	1.57%	1.36%	1.72%	1.89%	1.75%	2.11%	2.20%	2.12%
2013	1.37%	1.62%	1.41%	1.72%	1.88%	1.74%	2.01%	2.11%	2.03%
2014	1.37%	1.60%	1.40%	1.71%	1.87%	1.73%	2.01%	2.09%	2.02%
2015	1.36%	1.59%	1.40%	1.71%	1.87%	1.74%	2.02%	2.12%	2.03%
2016	1.35%	1.59%	1.39%	1.69%	1.85%	1.71%	1.98%	2.06%	1.99%
2017	1.34%	1.56%	1.38%	1.68%	1.83%	1.70%	1.97%	2.05%	1.99%
2018	1.33%	1.55%	1.36%	1.68%	1.83%	1.70%	1.99%	2.07%	2.00%
2019	1.33%	1.55%	1.36%	1.67%	1.81%	1.69%	1.96%	2.03%	1.97%
2020	1.31%	1.53%	1.34%	1.65%	1.79%	1.67%	1.95%	2.02%	1.96%
2021	1.30%	1.51%	1.33%	1.64%	1.78%	1.66%	1.94%	2.02%	1.95%
2022	1.29%	1.50%	1.32%	1.63%	1.77%	1.65%	1.92%	2.00%	1.93%
2023	1.27%	1.49%	1.30%	1.61%	1.76%	1.64%	1.92%	2.00%	1.93%
2024	1.26%	1.48%	1.30%	1.61%	1.75%	1.63%	1.90%	1.97%	1.91%
2025	1.24%	1.45%	1.27%	1.58%	1.72%	1.60%	1.87%	1.95%	1.88%
2026	1.23%	1.44%	1.26%	1.57%	1.72%	1.59%	1.87%	1.95%	1.88%
2027	1.23%	1.44%	1.26%	1.56%	1.71%	1.59%	1.86%	1.95%	1.87%
2028	1.19%	1.40%	1.22%	1.54%	1.68%	1.56%	1.84%	1.92%	1.85%
2029	1.19%	1.41%	1.22%	1.53%	1.68%	1.55%	1.83%	1.91%	1.84%
2030	1.18%	1.40%	1.21%	1.52%	1.67%	1.54%	1.82%	1.90%	1.83%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

OR





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Pendleton

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	8,634,001	5,185,957	13,819,958	8,704,488	5,228,294	13,932,783	8,802,486	5,287,156	14,089,642
2012	8,663,489	5,203,668	13,867,157	8,760,302	5,261,819	14,022,121	8,913,604	5,353,898	14,267,502
2013	8,729,546	5,243,345	13,972,892	8,827,148	5,301,969	14,129,118	9,000,492	5,406,087	14,406,580
2014	8,821,512	5,298,584	14,120,095	8,918,294	5,356,715	14,275,009	9,117,633	5,476,447	14,594,079
2015	8,955,717	5,379,194	14,334,911	9,046,510	5,433,728	14,480,238	9,275,848	5,571,478	14,847,326
2016	9,105,898	5,469,399	14,575,297	9,190,614	5,520,283	14,710,897	9,453,862	5,678,401	15,132,264
2017	9,215,499	5,535,230	14,750,729	9,297,212	5,584,310	14,881,523	9,589,543	5,759,897	15,349,439
2018	9,312,885	5,593,724	14,906,608	9,392,529	5,641,562	15,034,091	9,713,234	5,834,191	15,547,424
2019	9,437,390	5,668,507	15,105,897	9,513,451	5,714,193	15,227,644	9,866,273	5,926,113	15,792,386
2020	9,569,189	5,747,671	15,316,860	9,642,586	5,791,757	15,434,343	10,030,119	6,024,526	16,054,645
2021	9,661,092	5,802,872	15,463,964	9,734,288	5,846,837	15,581,125	10,152,529	6,098,051	16,250,579
2022	9,735,147	5,847,353	15,582,500	9,808,077	5,891,158	15,699,234	10,253,770	6,158,861	16,412,631
2023	9,843,959	5,912,710	15,756,669	9,915,822	5,955,874	15,871,696	10,393,844	6,242,995	16,636,839
2024	10,036,744	6,028,505	16,065,250	10,106,617	6,070,474	16,177,091	10,627,870	6,383,561	17,011,431
2025	10,118,871	6,077,834	16,196,705	10,188,997	6,119,955	16,308,952	10,739,680	6,450,719	17,190,400
2026	10,197,475	6,125,048	16,322,523	10,269,069	6,168,050	16,437,119	10,850,745	6,517,429	17,368,174
2027	10,302,915	6,188,379	16,491,293	10,376,435	6,232,539	16,608,974	10,992,915	6,602,823	17,595,738
2028	10,378,446	6,233,746	16,612,192	10,454,643	6,279,513	16,734,156	11,102,989	6,668,938	17,771,927
2029	10,437,777	6,269,383	16,707,160	10,517,779	6,317,436	16,835,214	11,197,361	6,725,622	17,922,983
2030	10,489,363	6,300,368	16,789,731	10,573,139	6,350,687	16,923,826	11,282,780	6,776,929	18,059,709

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	13.04%	13.04%	13.04%	13.97%	13.97%	13.97%	15.25%	15.25%	15.25%
2012	0.34%	0.34%	0.34%	0.64%	0.64%	0.64%	1.26%	1.26%	1.26%
2013	0.76%	0.76%	0.76%	0.76%	0.76%	0.76%	0.97%	0.97%	0.97%
2014	1.05%	1.05%	1.05%	1.03%	1.03%	1.03%	1.30%	1.30%	1.30%
2015	1.52%	1.52%	1.52%	1.44%	1.44%	1.44%	1.74%	1.74%	1.74%
2016	1.68%	1.68%	1.68%	1.59%	1.59%	1.59%	1.92%	1.92%	1.92%
2017	1.20%	1.20%	1.20%	1.16%	1.16%	1.16%	1.44%	1.44%	1.44%
2018	1.06%	1.06%	1.06%	1.03%	1.03%	1.03%	1.29%	1.29%	1.29%
2019	1.34%	1.34%	1.34%	1.29%	1.29%	1.29%	1.58%	1.58%	1.58%
2020	1.40%	1.40%	1.40%	1.36%	1.36%	1.36%	1.66%	1.66%	1.66%
2021	0.96%	0.96%	0.96%	0.95%	0.95%	0.95%	1.22%	1.22%	1.22%
2022	0.77%	0.77%	0.77%	0.76%	0.76%	0.76%	1.00%	1.00%	1.00%
2023	1.12%	1.12%	1.12%	1.10%	1.10%	1.10%	1.37%	1.37%	1.37%
2024	1.96%	1.96%	1.96%	1.92%	1.92%	1.92%	2.25%	2.25%	2.25%
2025	0.82%	0.82%	0.82%	0.82%	0.82%	0.82%	1.05%	1.05%	1.05%
2026	0.78%	0.78%	0.78%	0.79%	0.79%	0.79%	1.03%	1.03%	1.03%
2027	1.03%	1.03%	1.03%	1.05%	1.05%	1.05%	1.31%	1.31%	1.31%
2028	0.73%	0.73%	0.73%	0.75%	0.75%	0.75%	1.00%	1.00%	1.00%
2029	0.57%	0.57%	0.57%	0.60%	0.60%	0.60%	0.85%	0.85%	0.85%
2030	0.49%	0.49%	0.49%	0.53%	0.53%	0.53%	0.76%	0.76%	0.76%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	14,208	184,546	198,754	14,324	186,624	200,948	14,485	189,714	204,199
2012	14,257	188,193	202,450	14,416	191,214	205,630	14,668	195,696	210,364
2013	14,365	192,589	206,954	14,526	195,754	210,280	14,811	200,312	215,124
2014	14,517	196,916	211,433	14,676	200,266	214,942	15,004	204,949	219,953
2015	14,738	201,152	215,890	14,887	204,638	219,525	15,264	209,343	224,607
2016	14,985	205,286	220,271	15,124	208,933	224,057	15,557	213,691	229,248
2017	15,165	209,430	224,595	15,299	213,225	228,524	15,781	218,024	233,805
2018	15,325	213,512	228,837	15,456	217,453	232,909	15,984	222,293	238,277
2019	15,530	217,466	232,996	15,655	221,545	237,201	16,236	226,399	242,635
2020	15,747	221,306	237,053	15,868	225,547	241,415	16,506	230,450	246,955
2021	15,898	225,142	241,040	16,019	229,542	245,561	16,707	234,500	251,207
2022	16,020	228,908	244,928	16,140	233,428	249,568	16,874	238,379	255,252
2023	16,199	232,477	248,676	16,317	237,118	253,435	17,104	242,051	259,155
2024	16,516	235,765	252,282	16,631	240,541	257,173	17,489	245,458	262,947
2025	16,652	239,080	255,731	16,767	243,943	260,710	17,673	248,794	266,467
2026	16,781	242,211	258,992	16,899	247,185	264,083	17,856	252,006	269,862
2027	16,954	245,142	262,097	17,075	250,227	267,302	18,090	255,013	273,103
2028	17,079	247,945	265,024	17,204	253,133	270,337	18,271	257,881	276,152
2029	17,176	250,614	267,790	17,308	255,918	273,226	18,426	260,651	279,077
2030	17,261	253,127	270,388	17,399	258,529	275,928	18,567	263,218	281,785

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	13.04%	0.08%	0.91%	13.97%	1.21%	2.02%	15.25%	2.89%	3.67%
2012	0.34%	1.98%	1.86%	0.64%	2.46%	2.33%	1.26%	3.15%	3.02%
2013	0.76%	2.34%	2.23%	0.76%	2.37%	2.26%	0.97%	2.36%	2.26%
2014	1.05%	2.25%	2.16%	1.03%	2.30%	2.22%	1.30%	2.31%	2.25%
2015	1.52%	2.15%	2.11%	1.44%	2.18%	2.13%	1.74%	2.14%	2.12%
2016	1.68%	2.05%	2.03%	1.59%	2.10%	2.06%	1.92%	2.08%	2.07%
2017	1.20%	2.02%	1.96%	1.16%	2.05%	1.99%	1.44%	2.03%	1.99%
2018	1.06%	1.95%	1.89%	1.03%	1.98%	1.92%	1.29%	1.96%	1.91%
2019	1.34%	1.85%	1.82%	1.29%	1.88%	1.84%	1.58%	1.85%	1.83%
2020	1.40%	1.77%	1.74%	1.36%	1.81%	1.78%	1.66%	1.79%	1.78%
2021	0.96%	1.73%	1.68%	0.95%	1.77%	1.72%	1.22%	1.76%	1.72%
2022	0.77%	1.67%	1.61%	0.76%	1.69%	1.63%	1.00%	1.65%	1.61%
2023	1.12%	1.56%	1.53%	1.10%	1.58%	1.55%	1.37%	1.54%	1.53%
2024	1.96%	1.41%	1.45%	1.92%	1.44%	1.47%	2.25%	1.41%	1.46%
2025	0.82%	1.41%	1.37%	0.82%	1.41%	1.38%	1.05%	1.36%	1.34%
2026	0.78%	1.31%	1.28%	0.79%	1.33%	1.29%	1.03%	1.29%	1.27%
2027	1.03%	1.21%	1.20%	1.05%	1.23%	1.22%	1.31%	1.19%	1.20%
2028	0.73%	1.14%	1.12%	0.75%	1.16%	1.14%	1.00%	1.12%	1.12%
2029	0.57%	1.08%	1.04%	0.60%	1.10%	1.07%	0.85%	1.07%	1.06%
2030	0.49%	1.00%	0.97%	0.53%	1.02%	0.99%	0.76%	0.99%	0.97%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	6,357,439	7,462,519	13,819,958	6,434,515	7,498,267	13,932,783	6,550,887	7,538,755	14,089,642
2012	6,395,681	7,471,477	13,867,157	6,516,206	7,505,914	14,022,121	6,700,493	7,567,009	14,267,502
2013	6,481,071	7,491,821	13,972,892	6,615,538	7,513,580	14,129,118	6,819,556	7,587,024	14,406,580
2014	6,600,179	7,519,916	14,120,095	6,751,254	7,523,755	14,275,009	6,979,339	7,614,740	14,594,079
2015	6,774,307	7,560,604	14,334,911	6,942,211	7,538,027	14,480,238	7,194,498	7,652,828	14,847,326
2016	6,969,873	7,605,424	14,575,297	7,157,153	7,553,744	14,710,897	7,437,743	7,694,520	15,132,264
2017	7,112,957	7,637,771	14,750,729	7,318,943	7,562,580	14,881,523	7,626,879	7,722,560	15,349,439
2018	7,240,541	7,666,067	14,906,608	7,465,722	7,568,369	15,034,091	7,801,926	7,745,498	15,547,424
2019	7,403,745	7,702,152	15,105,897	7,649,940	7,577,704	15,227,644	8,017,207	7,775,179	15,792,386
2020	7,577,215	7,739,645	15,316,860	7,846,739	7,587,605	15,434,343	8,248,960	7,805,685	16,054,645
2021	7,698,479	7,765,485	15,463,964	7,990,577	7,590,549	15,581,125	8,426,856	7,823,723	16,250,579
2022	7,796,448	7,786,052	15,582,500	8,109,653	7,589,581	15,699,234	8,577,721	7,834,910	16,412,631
2023	7,940,395	7,816,274	15,756,669	8,277,561	7,594,135	15,871,696	8,781,921	7,854,918	16,636,839
2024	8,195,996	7,869,253	16,065,250	8,563,679	7,613,412	16,177,091	9,114,545	7,896,886	17,011,431
2025	8,305,425	7,891,280	16,196,705	8,696,925	7,612,027	16,308,952	9,284,220	7,906,180	17,190,400
2026	8,410,386	7,912,137	16,322,523	8,827,409	7,609,710	16,437,119	9,454,258	7,913,916	17,368,174
2027	8,550,924	7,940,370	16,491,293	8,996,349	7,612,625	16,608,974	9,667,365	7,928,372	17,595,738
2028	8,652,117	7,960,075	16,612,192	9,124,790	7,609,366	16,734,156	9,838,627	7,933,300	17,771,927
2029	8,731,526	7,975,634	16,707,160	9,231,646	7,603,568	16,835,214	9,989,052	7,933,931	17,922,983
2030	8,800,858	7,988,873	16,789,731	9,328,009	7,595,817	16,923,826	10,128,592	7,931,117	18,059,709

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	14.34%	11.96%	13.04%	15.73%	12.50%	13.97%	17.82%	13.10%	15.25%
2012	0.60%	0.12%	0.34%	1.27%	0.10%	0.64%	2.28%	0.37%	1.26%
2013	1.34%	0.27%	0.76%	1.52%	0.10%	0.76%	1.78%	0.26%	0.97%
2014	1.84%	0.38%	1.05%	2.05%	0.14%	1.03%	2.34%	0.37%	1.30%
2015	2.64%	0.54%	1.52%	2.83%	0.19%	1.44%	3.08%	0.50%	1.74%
2016	2.89%	0.59%	1.68%	3.10%	0.21%	1.59%	3.38%	0.54%	1.92%
2017	2.05%	0.43%	1.20%	2.26%	0.12%	1.16%	2.54%	0.36%	1.44%
2018	1.79%	0.37%	1.06%	2.01%	0.08%	1.03%	2.30%	0.30%	1.29%
2019	2.25%	0.47%	1.34%	2.47%	0.12%	1.29%	2.76%	0.38%	1.58%
2020	2.34%	0.49%	1.40%	2.57%	0.13%	1.36%	2.89%	0.39%	1.66%
2021	1.60%	0.33%	0.96%	1.83%	0.04%	0.95%	2.16%	0.23%	1.22%
2022	1.27%	0.26%	0.77%	1.49%	-0.01%	0.76%	1.79%	0.14%	1.00%
2023	1.85%	0.39%	1.12%	2.07%	0.06%	1.10%	2.38%	0.26%	1.37%
2024	3.22%	0.68%	1.96%	3.46%	0.25%	1.92%	3.79%	0.53%	2.25%
2025	1.34%	0.28%	0.82%	1.56%	-0.02%	0.82%	1.86%	0.12%	1.05%
2026	1.26%	0.26%	0.78%	1.50%	-0.03%	0.79%	1.83%	0.10%	1.03%
2027	1.67%	0.36%	1.03%	1.91%	0.04%	1.05%	2.25%	0.18%	1.31%
2028	1.18%	0.25%	0.73%	1.43%	-0.04%	0.75%	1.77%	0.06%	1.00%
2029	0.92%	0.20%	0.57%	1.17%	-0.08%	0.60%	1.53%	0.01%	0.85%
2030	0.79%	0.17%	0.49%	1.04%	-0.10%	0.53%	1.40%	-0.04%	0.76%

Customer Count Forecast

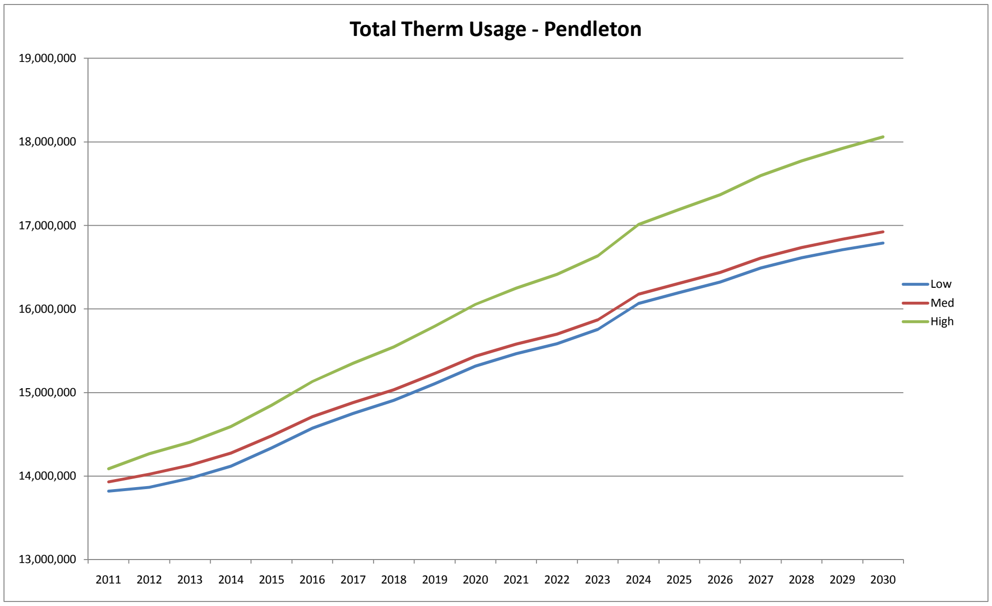
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	10,661	1,864	12,525	10,789	1,874	12,663	10,982	1,887	12,868
2012	10,879	1,879	12,758	11,064	1,894	12,958	11,345	1,911	13,257
2013	11,146	1,896	13,042	11,338	1,914	13,251	11,623	1,933	13,556
2014	11,412	1,912	13,324	11,612	1,933	13,545	11,906	1,955	13,861
2015	11,676	1,929	13,605	11,882	1,952	13,834	12,178	1,976	14,154
2016	11,936	1,945	13,881	12,149	1,971	14,119	12,449	1,998	14,447
2017	12,193	1,961	14,153	12,411	1,990	14,401	12,715	2,019	14,734
2018	12,444	1,976	14,421	12,669	2,008	14,677	12,976	2,039	15,016
2019	12,691	1,992	14,683	12,922	2,026	14,948	13,230	2,060	15,290
2020	12,932	2,007	14,938	13,169	2,044	15,213	13,482	2,080	15,562
2021	13,168	2,022	15,190	13,413	2,062	15,475	13,730	2,101	15,830
2022	13,399	2,036	15,435	13,648	2,079	15,727	13,965	2,120	16,085
2023	13,620	2,050	15,671	13,875	2,096	15,971	14,191	2,140	16,331
2024	13,834	2,064	15,898	14,093	2,113	16,206	14,411	2,159	16,570
2025	14,038	2,078	16,115	14,300	2,129	16,429	14,614	2,178	16,792
2026	14,230	2,091	16,321	14,497	2,145	16,642	14,810	2,196	17,006
2027	14,413	2,103	16,517	14,684	2,161	16,845	14,996	2,214	17,210
2028	14,585	2,116	16,701	14,860	2,176	17,036	15,170	2,232	17,402
2029	14,748	2,128	16,875	15,027	2,191	17,218	15,337	2,249	17,587
2030	14,900	2,139	17,039	15,183	2,205	17,388	15,491	2,266	17,757

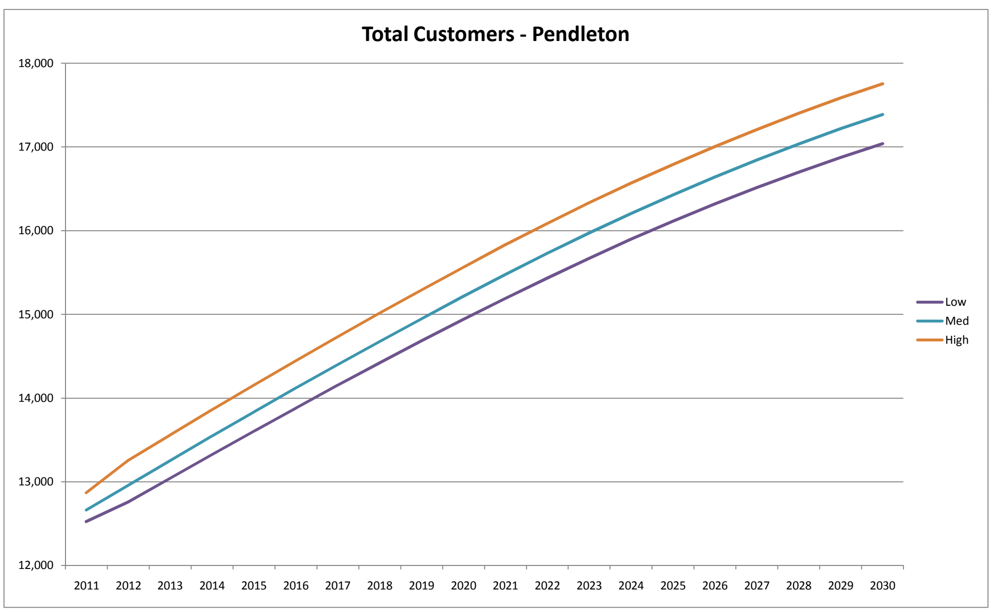
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	0.87%	1.13%	0.91%	2.08%	1.70%	2.02%	3.90%	2.36%	3.67%
2012	2.04%	0.81%	1.86%	2.55%	1.05%	2.33%	3.31%	1.32%	3.02%
2013	2.45%	0.90%	2.23%	2.47%	1.03%	2.26%	2.45%	1.14%	2.26%
2014	2.38%	0.87%	2.16%	2.42%	1.01%	2.22%	2.43%	1.13%	2.25%
2015	2.32%	0.86%	2.11%	2.32%	0.99%	2.13%	2.28%	1.09%	2.12%
2016	2.23%	0.83%	2.03%	2.25%	0.97%	2.06%	2.23%	1.07%	2.07%
2017	2.15%	0.82%	1.96%	2.16%	0.95%	1.99%	2.14%	1.06%	1.99%
2018	2.06%	0.80%	1.89%	2.08%	0.92%	1.92%	2.05%	1.03%	1.91%
2019	1.98%	0.78%	1.82%	1.99%	0.91%	1.84%	1.96%	1.01%	1.83%
2020	1.90%	0.75%	1.74%	1.92%	0.88%	1.78%	1.90%	0.99%	1.78%
2021	1.83%	0.74%	1.68%	1.85%	0.87%	1.72%	1.84%	0.97%	1.72%
2022	1.75%	0.72%	1.61%	1.75%	0.84%	1.63%	1.71%	0.94%	1.61%
2023	1.66%	0.70%	1.53%	1.66%	0.82%	1.55%	1.62%	0.92%	1.53%
2024	1.57%	0.68%	1.45%	1.58%	0.80%	1.47%	1.55%	0.90%	1.46%
2025	1.47%	0.65%	1.37%	1.47%	0.77%	1.38%	1.41%	0.86%	1.34%
2026	1.37%	0.63%	1.28%	1.38%	0.75%	1.29%	1.34%	0.84%	1.27%
2027	1.29%	0.61%	1.20%	1.29%	0.73%	1.22%	1.26%	0.83%	1.20%
2028	1.19%	0.58%	1.12%	1.20%	0.70%	1.14%	1.16%	0.80%	1.12%
2029	1.11%	0.57%	1.04%	1.12%	0.69%	1.07%	1.10%	0.79%	1.06%
2030	1.03%	0.55%	0.97%	1.04%	0.66%	0.99%	1.00%	0.75%	0.97%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Pendleton





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

SYSTEM TOTAL

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	200,370,396	99,067,886	299,438,282	201,978,648	99,907,175	301,885,823	204,019,930	100,972,453	304,992,382
2012	201,854,461	99,907,498	301,761,959	203,797,435	100,919,740	304,717,175	206,754,395	102,444,119	309,198,514
2013	203,831,309	100,983,512	304,814,821	206,025,016	102,125,041	308,150,057	209,546,286	103,929,019	313,475,305
2014	206,361,362	102,314,925	308,676,287	208,913,551	103,639,644	312,553,195	212,911,912	105,679,391	318,591,302
2015	209,734,223	104,035,861	313,770,084	212,786,012	105,612,914	318,398,926	217,163,327	107,837,287	325,000,613
2016	213,474,542	105,927,094	319,401,636	217,080,056	107,784,109	324,864,165	221,798,257	110,174,451	331,972,707
2017	216,510,634	107,493,682	324,004,316	220,557,609	109,574,720	330,132,329	225,718,950	112,182,036	337,900,986
2018	219,385,598	108,985,678	328,371,276	223,856,637	111,281,328	335,137,965	229,496,182	114,121,434	343,617,616
2019	222,829,248	110,741,004	333,570,252	227,818,834	113,298,528	341,117,362	233,891,302	116,348,320	350,239,622
2020	226,478,881	112,592,168	339,071,048	232,029,926	115,432,321	347,462,248	238,542,294	118,693,503	357,235,797
2021	229,448,852	114,128,678	343,577,530	235,465,759	117,203,961	352,669,721	242,508,426	120,722,139	363,230,566
2022	232,165,043	115,547,477	347,712,520	238,614,711	118,841,525	357,456,236	246,217,767	122,631,560	368,849,327
2023	235,602,471	117,300,767	352,903,238	242,604,449	120,871,766	363,476,215	250,733,654	124,912,794	375,646,448
2024	240,674,153	119,813,038	360,487,191	248,500,980	123,794,779	372,295,759	257,081,124	128,042,602	385,123,727
2025	243,791,149	121,417,715	365,208,865	252,139,072	125,660,514	377,799,586	261,326,837	130,198,461	391,525,298
2026	246,939,567	123,035,974	369,975,542	255,831,826	127,550,586	383,382,411	265,661,129	132,393,161	398,054,290
2027	250,675,250	124,926,120	375,601,370	260,219,703	129,765,227	389,984,931	270,694,223	134,910,358	405,604,580
2028	253,944,068	126,599,719	380,543,787	264,084,745	131,735,198	395,819,943	275,269,941	137,215,013	412,484,954
2029	256,999,472	128,172,845	385,172,317	267,717,206	133,595,382	401,312,589	279,660,844	139,433,254	419,094,098
2030	260,005,028	129,721,543	389,726,570	271,307,129	135,434,521	406,741,650	284,049,857	141,648,874	425,698,731

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	10.77%	11.34%	10.96%	11.66%	12.28%	11.87%	12.79%	13.48%	13.02%
2012	0.74%	0.85%	0.78%	0.90%	1.01%	0.94%	1.34%	1.46%	1.38%
2013	0.98%	1.08%	1.01%	1.09%	1.19%	1.13%	1.35%	1.45%	1.38%
2014	1.24%	1.32%	1.27%	1.40%	1.48%	1.43%	1.61%	1.68%	1.63%
2015	1.63%	1.68%	1.65%	1.85%	1.90%	1.87%	2.00%	2.04%	2.01%
2016	1.78%	1.82%	1.79%	2.02%	2.06%	2.03%	2.13%	2.17%	2.15%
2017	1.42%	1.48%	1.44%	1.60%	1.66%	1.62%	1.77%	1.82%	1.79%
2018	1.33%	1.39%	1.35%	1.50%	1.56%	1.52%	1.67%	1.73%	1.69%
2019	1.57%	1.61%	1.58%	1.77%	1.81%	1.78%	1.92%	1.95%	1.93%
2020	1.64%	1.67%	1.65%	1.85%	1.88%	1.86%	1.99%	2.02%	2.00%
2021	1.31%	1.36%	1.33%	1.48%	1.53%	1.50%	1.66%	1.71%	1.68%
2022	1.18%	1.24%	1.20%	1.34%	1.40%	1.36%	1.53%	1.58%	1.55%
2023	1.48%	1.52%	1.49%	1.67%	1.71%	1.68%	1.83%	1.86%	1.84%
2024	2.15%	2.14%	2.15%	2.43%	2.42%	2.43%	2.53%	2.51%	2.52%
2025	1.30%	1.34%	1.31%	1.46%	1.51%	1.48%	1.65%	1.68%	1.66%
2026	1.29%	1.33%	1.31%	1.46%	1.50%	1.48%	1.66%	1.69%	1.67%
2027	1.51%	1.54%	1.52%	1.72%	1.74%	1.72%	1.89%	1.90%	1.90%
2028	1.30%	1.34%	1.32%	1.49%	1.52%	1.50%	1.69%	1.71%	1.70%
2029	1.20%	1.24%	1.22%	1.38%	1.41%	1.39%	1.60%	1.62%	1.60%
2030	1.17%	1.21%	1.18%	1.34%	1.38%	1.35%	1.57%	1.59%	1.58%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	271,419	3,370,001	3,641,420	273,718	3,407,381	3,681,099	276,637	3,457,425	3,734,062
2012	273,719	3,430,821	3,704,541	276,492	3,482,668	3,759,160	280,669	3,548,015	3,828,684
2013	276,667	3,496,041	3,772,709	279,795	3,558,507	3,838,302	284,737	3,633,051	3,917,789
2014	280,315	3,561,054	3,841,369	283,944	3,634,447	3,918,392	289,533	3,718,803	4,008,336
2015	285,030	3,625,480	3,910,510	289,350	3,709,965	3,999,316	295,445	3,804,591	4,100,035
2016	290,211	3,689,783	3,979,994	295,299	3,785,690	4,080,989	301,848	3,891,046	4,192,894
2017	294,503	3,755,298	4,049,801	300,205	3,863,238	4,163,443	307,348	3,979,669	4,287,017
2018	298,591	3,821,281	4,119,872	304,880	3,941,739	4,246,619	312,661	4,069,697	4,382,359
2019	303,400	3,886,875	4,190,275	310,407	4,020,207	4,330,614	318,763	4,160,283	4,479,046
2020	308,472	3,952,491	4,260,962	316,253	4,099,159	4,415,412	325,188	4,251,946	4,577,134
2021	312,681	4,019,362	4,332,043	321,107	4,180,043	4,501,149	330,746	4,346,051	4,676,797
2022	316,568	4,087,001	4,403,569	325,593	4,262,136	4,587,729	335,977	4,441,696	4,777,673
2023	321,372	4,153,909	4,475,281	331,156	4,343,744	4,674,899	342,227	4,537,327	4,879,554
2024	328,255	4,218,947	4,547,202	339,164	4,423,678	4,762,842	350,802	4,632,064	4,982,866
2025	332,651	4,286,658	4,619,309	344,275	4,507,080	4,851,356	356,708	4,730,402	5,087,110
2026	337,085	4,354,371	4,691,456	349,454	4,591,007	4,940,461	362,721	4,829,884	5,192,605
2027	342,263	4,421,564	4,763,828	355,521	4,674,804	5,030,325	369,617	4,929,852	5,299,469
2028	346,849	4,489,396	4,836,244	360,918	4,759,839	5,120,758	375,932	5,031,578	5,407,510
2029	351,158	4,557,706	4,908,864	366,015	4,845,941	5,211,955	382,009	5,134,967	5,516,976
2030	355,401	4,626,278	4,981,679	371,053	4,932,800	5,303,854	388,079	5,239,651	5,627,730

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	11.34%	0.48%	1.22%	12.28%	1.60%	2.32%	13.48%	3.09%	3.80%
2012	0.85%	1.80%	1.73%	1.01%	2.21%	2.12%	1.46%	2.62%	2.53%
2013	1.08%	1.90%	1.84%	1.19%	2.18%	2.11%	1.45%	2.40%	2.33%
2014	1.32%	1.86%	1.82%	1.48%	2.13%	2.09%	1.68%	2.36%	2.31%
2015	1.68%	1.81%	1.80%	1.90%	2.08%	2.07%	2.04%	2.31%	2.29%
2016	1.82%	1.77%	1.78%	2.06%	2.04%	2.04%	2.17%	2.27%	2.26%
2017	1.48%	1.78%	1.75%	1.66%	2.05%	2.02%	1.82%	2.28%	2.24%
2018	1.39%	1.76%	1.73%	1.56%	2.03%	2.00%	1.73%	2.26%	2.22%
2019	1.61%	1.72%	1.71%	1.81%	1.99%	1.98%	1.95%	2.23%	2.21%
2020	1.67%	1.69%	1.69%	1.88%	1.96%	1.96%	2.02%	2.20%	2.19%
2021	1.36%	1.69%	1.67%	1.53%	1.97%	1.94%	1.71%	2.21%	2.18%
2022	1.24%	1.68%	1.65%	1.40%	1.96%	1.92%	1.58%	2.20%	2.16%
2023	1.52%	1.64%	1.63%	1.71%	1.91%	1.90%	1.86%	2.15%	2.13%
2024	2.14%	1.57%	1.61%	2.42%	1.84%	1.88%	2.51%	2.09%	2.12%
2025	1.34%	1.60%	1.59%	1.51%	1.89%	1.86%	1.68%	2.12%	2.09%
2026	1.33%	1.58%	1.56%	1.50%	1.86%	1.84%	1.69%	2.10%	2.07%
2027	1.54%	1.54%	1.54%	1.74%	1.83%	1.82%	1.90%	2.07%	2.06%
2028	1.34%	1.53%	1.52%	1.52%	1.82%	1.80%	1.71%	2.06%	2.04%
2029	1.24%	1.52%	1.50%	1.41%	1.81%	1.78%	1.62%	2.05%	2.02%
2030	1.21%	1.50%	1.48%	1.38%	1.79%	1.76%	1.59%	2.04%	2.01%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	161,593,454	137,844,827	299,438,282	163,007,592	138,878,231	301,885,823	164,762,631	140,229,752	304,992,382
2012	163,181,635	138,580,324	301,761,959	165,140,812	139,576,363	304,717,175	167,411,639	141,786,875	309,198,514
2013	165,171,419	139,643,402	304,814,821	167,509,827	140,640,229	308,150,057	170,023,365	143,451,940	313,475,305
2014	167,568,441	141,107,846	308,676,287	170,297,928	142,255,267	312,553,195	173,061,588	145,529,714	318,591,302
2015	170,598,985	143,171,100	313,770,084	173,732,955	144,665,972	318,398,926	176,752,848	148,247,766	325,000,613
2016	173,896,131	145,505,505	319,401,636	177,442,906	147,421,259	324,864,165	180,718,292	151,254,415	331,972,707
2017	176,634,534	147,369,782	324,004,316	180,592,402	149,539,927	330,132,329	184,114,274	153,786,712	337,900,986
2018	179,235,621	149,135,654	328,371,276	183,609,333	151,528,632	335,137,965	187,376,612	156,241,005	343,617,616
2019	182,262,780	151,307,473	333,570,252	187,067,094	154,050,268	341,117,362	191,086,748	159,152,874	350,239,622
2020	185,437,255	153,633,794	339,071,048	190,685,159	156,777,089	347,462,248	194,964,894	162,270,903	357,235,797
2021	188,079,305	155,498,225	343,577,530	193,769,389	158,900,332	352,669,721	198,304,556	164,926,010	363,230,566
2022	190,516,726	157,195,794	347,712,520	196,646,334	160,809,902	357,456,236	201,426,155	167,423,172	368,849,327
2023	193,500,478	159,402,760	352,903,238	200,087,379	163,388,836	363,476,215	205,120,377	170,526,071	375,646,448
2024	197,729,513	162,757,678	360,487,191	204,818,389	167,477,370	372,295,759	210,138,207	174,985,519	385,123,727
2025	200,449,633	164,759,231	365,208,865	208,000,440	169,799,146	377,799,586	213,563,491	177,961,806	391,525,298
2026	203,185,413	166,790,129	369,975,542	211,207,260	172,175,151	383,382,411	217,018,856	181,035,434	398,054,290
2027	206,361,964	169,239,406	375,601,370	214,874,964	175,109,966	389,984,931	220,946,159	184,658,422	405,604,580
2028	209,176,754	171,367,033	380,543,787	218,177,340	177,642,604	395,819,943	224,501,993	187,982,961	412,484,954
2029	211,820,324	173,351,994	385,172,317	221,310,738	180,001,851	401,312,589	227,888,130	191,205,968	419,094,098
2030	214,420,241	175,306,329	389,726,570	224,404,551	182,337,099	406,741,650	231,234,493	194,464,238	425,698,731

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	12.34%	9.39%	10.96%	13.32%	10.21%	11.87%	14.54%	11.28%	13.02%
2012	0.98%	0.53%	0.78%	1.31%	0.50%	0.94%	1.61%	1.11%	1.38%
2013	1.22%	0.77%	1.01%	1.43%	0.76%	1.13%	1.56%	1.17%	1.38%
2014	1.45%	1.05%	1.27%	1.66%	1.15%	1.43%	1.79%	1.45%	1.63%
2015	1.81%	1.46%	1.65%	2.02%	1.69%	1.87%	2.13%	1.87%	2.01%
2016	1.93%	1.63%	1.79%	2.14%	1.90%	2.03%	2.24%	2.03%	2.15%
2017	1.57%	1.28%	1.44%	1.77%	1.44%	1.62%	1.88%	1.67%	1.79%
2018	1.47%	1.20%	1.35%	1.67%	1.33%	1.52%	1.77%	1.60%	1.69%
2019	1.69%	1.46%	1.58%	1.88%	1.66%	1.78%	1.98%	1.86%	1.93%
2020	1.74%	1.54%	1.65%	1.93%	1.77%	1.86%	2.03%	1.96%	2.00%
2021	1.42%	1.21%	1.33%	1.62%	1.35%	1.50%	1.71%	1.64%	1.68%
2022	1.30%	1.09%	1.20%	1.48%	1.20%	1.36%	1.57%	1.51%	1.55%
2023	1.57%	1.40%	1.49%	1.75%	1.60%	1.68%	1.83%	1.85%	1.84%
2024	2.19%	2.10%	2.15%	2.36%	2.50%	2.43%	2.45%	2.62%	2.52%
2025	1.38%	1.23%	1.31%	1.55%	1.39%	1.48%	1.63%	1.70%	1.66%
2026	1.36%	1.23%	1.31%	1.54%	1.40%	1.48%	1.62%	1.73%	1.67%
2027	1.56%	1.47%	1.52%	1.74%	1.70%	1.72%	1.81%	2.00%	1.90%
2028	1.36%	1.26%	1.32%	1.54%	1.45%	1.50%	1.61%	1.80%	1.70%
2029	1.26%	1.16%	1.22%	1.44%	1.33%	1.39%	1.51%	1.71%	1.60%
2030	1.23%	1.13%	1.18%	1.40%	1.30%	1.35%	1.47%	1.70%	1.58%

Customer Count Forecast

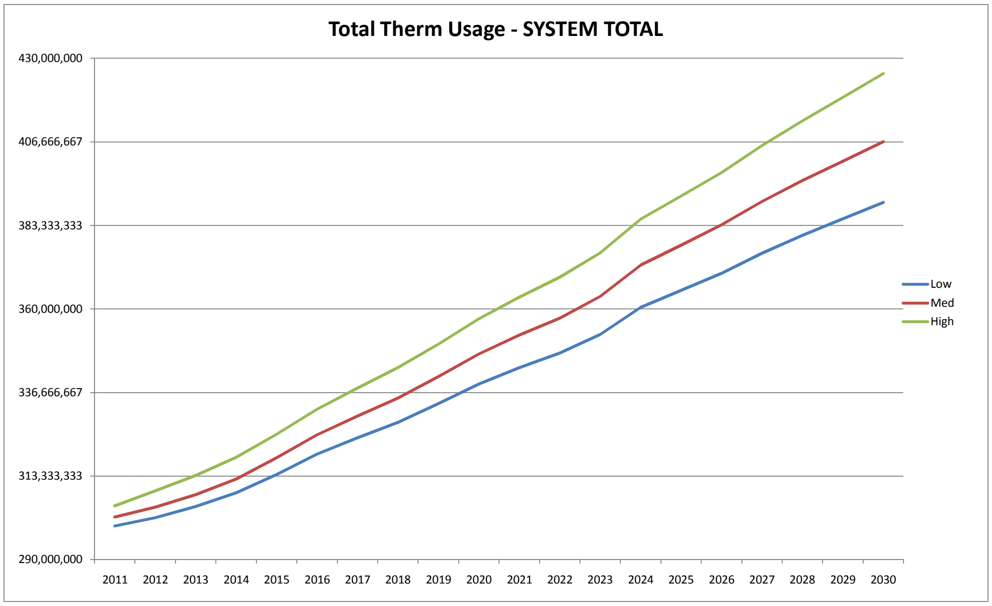
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	228,379	34,712	263,091	230,833	35,073	265,907	234,051	35,581	269,632
2012	232,284	35,294	267,578	235,698	35,765	271,463	239,959	36,398	276,357
2013	236,484	35,919	272,403	240,631	36,467	277,097	245,556	37,169	282,725
2014	240,715	36,549	277,263	245,624	37,176	282,800	251,245	37,951	289,196
2015	244,974	37,184	282,159	250,672	37,894	288,566	257,016	38,746	295,761
2016	249,257	37,825	287,081	255,767	38,618	294,385	262,854	39,547	302,401
2017	253,557	38,469	292,026	260,911	39,349	300,260	268,775	40,358	309,133
2018	257,876	39,116	296,991	266,105	40,088	306,193	274,785	41,181	315,966
2019	262,217	39,768	301,984	271,351	40,833	312,184	280,876	42,013	322,889
2020	266,574	40,423	306,997	276,648	41,585	318,233	287,056	42,856	329,912
2021	270,957	41,082	312,039	282,006	42,345	324,351	293,341	43,712	337,053
2022	275,367	41,746	317,113	287,416	43,113	330,530	299,702	44,577	344,280
2023	279,790	42,413	322,203	292,869	43,887	336,756	306,137	45,451	351,588
2024	284,228	43,083	327,311	298,372	44,666	343,038	312,663	46,334	358,997
2025	288,677	43,755	332,433	303,912	45,450	349,362	319,249	47,224	366,473
2026	293,130	44,429	337,559	309,492	46,240	355,732	325,921	48,124	374,045
2027	297,604	45,106	342,711	315,126	47,037	362,163	332,684	49,034	381,718
2028	302,078	45,783	347,861	320,795	47,837	368,632	339,523	49,953	389,476
2029	306,567	46,463	353,030	326,516	48,643	375,159	346,456	50,881	397,337
2030	311,073	47,147	358,220	332,286	49,456	381,742	353,477	51,819	405,296

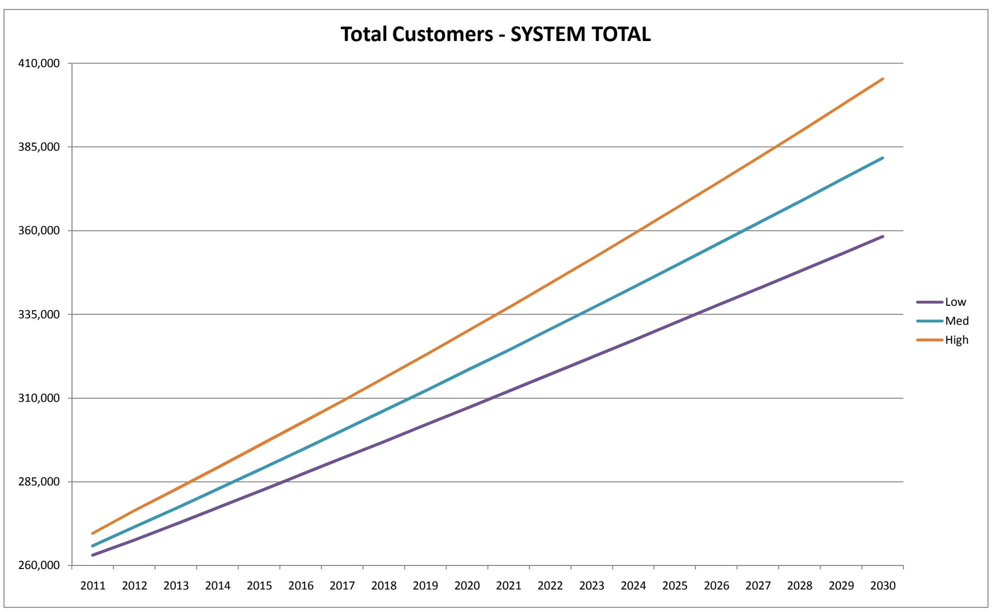
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.31%	0.57%	1.21%	2.40%	1.62%	2.30%	3.83%	3.09%	3.73%
2012	1.71%	1.68%	1.71%	2.11%	1.97%	2.09%	2.52%	2.29%	2.49%
2013	1.81%	1.77%	1.80%	2.09%	1.96%	2.08%	2.33%	2.12%	2.30%
2014	1.79%	1.75%	1.78%	2.08%	1.94%	2.06%	2.32%	2.10%	2.29%
2015	1.77%	1.74%	1.77%	2.06%	1.93%	2.04%	2.30%	2.10%	2.27%
2016	1.75%	1.72%	1.74%	2.03%	1.91%	2.02%	2.27%	2.07%	2.24%
2017	1.73%	1.70%	1.72%	2.01%	1.89%	2.00%	2.25%	2.05%	2.23%
2018	1.70%	1.68%	1.70%	1.99%	1.88%	1.98%	2.24%	2.04%	2.21%
2019	1.68%	1.67%	1.68%	1.97%	1.86%	1.96%	2.22%	2.02%	2.19%
2020	1.66%	1.65%	1.66%	1.95%	1.84%	1.94%	2.20%	2.01%	2.18%
2021	1.64%	1.63%	1.64%	1.94%	1.83%	1.92%	2.19%	2.00%	2.16%
2022	1.63%	1.62%	1.63%	1.92%	1.81%	1.90%	2.17%	1.98%	2.14%
2023	1.61%	1.60%	1.61%	1.90%	1.79%	1.88%	2.15%	1.96%	2.12%
2024	1.59%	1.58%	1.59%	1.88%	1.78%	1.87%	2.13%	1.94%	2.11%
2025	1.57%	1.56%	1.56%	1.86%	1.76%	1.84%	2.11%	1.92%	2.08%
2026	1.54%	1.54%	1.54%	1.84%	1.74%	1.82%	2.09%	1.91%	2.07%
2027	1.53%	1.52%	1.53%	1.82%	1.72%	1.81%	2.07%	1.89%	2.05%
2028	1.50%	1.50%	1.50%	1.80%	1.70%	1.79%	2.06%	1.87%	2.03%
2029	1.49%	1.49%	1.49%	1.78%	1.69%	1.77%	2.04%	1.86%	2.02%
2030	1.47%	1.47%	1.47%	1.77%	1.67%	1.75%	2.03%	1.84%	2.00%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

SYSTEM TOTAL





Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED EMPLOYMENT GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
HIGH	2011	2.93%	2.54%	3.79%	3.51%	0.97%	3.13%	2.25%	3.03%	2.86%	3.22%	2.78%	2.34%	3.54%	2.91%	1.96%	3.29%	2.98%	1.78%	3.59%	2.95%	2.28%	3.71%	2.52%
	2012	1.11%	0.79%	2.13%	1.74%	0.97%	1.71%	2.25%	1.27%	1.18%	1.47%	1.04%	0.86%	1.79%	1.22%	0.41%	1.53%	1.28%	1.78%	1.84%	1.20%	0.65%	1.96%	0.88%
	2013	1.15%	0.80%	2.13%	1.74%	0.97%	1.73%	2.25%	1.25%	1.19%	1.46%	1.03%	0.82%	1.78%	1.24%	0.38%	1.54%	1.19%	1.78%	1.84%	1.20%	0.65%	1.95%	0.87%
	2014	1.15%	0.78%	2.12%	1.72%	0.94%	1.71%	2.25%	1.28%	1.18%	1.46%	1.03%	0.83%	1.78%	1.24%	0.41%	1.52%	1.17%	1.77%	1.84%	1.19%	0.64%	1.95%	0.86%
	2015	1.10%	0.77%	2.11%	1.72%	0.94%	1.76%	2.25%	1.21%	1.20%	1.46%	1.02%	0.74%	1.77%	1.25%	0.39%	1.50%	1.22%	1.77%	1.84%	1.18%	0.66%	1.94%	0.86%
	2016	1.17%	0.73%	2.11%	1.70%	0.92%	1.74%	2.24%	1.26%	1.16%	1.45%	1.00%	0.85%	1.76%	1.25%	0.39%	1.51%	1.27%	1.77%	1.84%	1.17%	0.63%	1.93%	0.85%
	2017	1.13%	0.78%	2.11%	1.71%	0.92%	1.73%	2.24%	1.24%	1.17%	1.45%	1.01%	0.76%	1.76%	1.26%	0.37%	1.50%	1.12%	1.75%	1.84%	1.17%	0.64%	1.92%	0.85%
	2018	1.12%	0.73%	2.10%	1.70%	0.89%	1.78%	2.24%	1.24%	1.16%	1.44%	0.99%	0.81%	1.75%	1.26%	0.39%	1.48%	1.17%	1.75%	1.83%	1.15%	0.62%	1.92%	0.84%
	2019	1.13%	0.75%	2.09%	1.68%	0.89%	1.78%	2.24%	1.21%	1.15%	1.44%	0.98%	0.78%	1.75%	1.27%	0.37%	1.48%	1.17%	1.75%	1.83%	1.16%	0.63%	1.91%	0.83%
	2020	1.11%	0.71%	2.09%	1.68%	0.88%	1.77%	2.24%	1.21%	1.17%	1.44%	0.98%	0.79%	1.74%	1.26%	0.39%	1.47%	1.15%	1.74%	1.83%	1.13%	0.61%	1.90%	0.83%
	2021	1.15%	0.74%	2.08%	1.67%	0.86%	1.80%	2.23%	1.23%	1.15%	1.44%	0.97%	0.78%	1.74%	1.27%	0.36%	1.47%	1.21%	1.74%	1.83%	1.13%	0.62%	1.89%	0.82%
	2022	1.14%	0.72%	2.08%	1.66%	0.86%	1.78%	2.24%	1.20%	1.15%	1.43%	0.95%	0.78%	1.73%	1.27%	0.40%	1.45%	1.11%	1.73%	1.82%	1.12%	0.61%	1.89%	0.82%
	2023	1.13%	0.70%	2.07%	1.65%	0.83%	1.85%	2.23%	1.20%	1.12%	1.43%	0.95%	0.74%	1.73%	1.30%	0.36%	1.45%	1.15%	1.73%	1.82%	1.12%	0.60%	1.88%	0.81%
	2024	1.09%	0.72%	2.07%	1.64%	0.82%	1.79%	2.24%	1.18%	1.13%	1.41%	0.94%	0.81%	1.72%	1.30%	0.36%	1.44%	1.17%	1.72%	1.82%	1.11%	0.61%	1.87%	0.80%
	2025	1.16%	0.70%	2.06%	1.64%	0.82%	1.82%	2.22%	1.23%	1.13%	1.43%	0.94%	0.78%	1.72%	1.29%	0.37%	1.42%	1.11%	1.73%	1.82%	1.10%	0.60%	1.86%	0.80%
	2026	1.11%	0.65%	2.05%	1.62%	0.80%	1.82%	2.23%	1.16%	1.11%	1.40%	0.93%	0.76%	1.71%	1.30%	0.36%	1.42%	1.12%	1.71%	1.81%	1.08%	0.59%	1.86%	0.79%
	2027	1.10%	0.74%	2.05%	1.62%	0.79%	1.85%	2.23%	1.17%	1.12%	1.41%	0.92%	0.77%	1.71%	1.30%	0.38%	1.42%	1.11%	1.71%	1.81%	1.09%	0.60%	1.85%	0.79%
	2028	1.14%	0.61%	2.04%	1.62%	0.78%	1.88%	2.22%	1.19%	1.11%	1.41%	0.92%	0.75%	1.70%	1.31%	0.35%	1.39%	1.10%	1.70%	1.81%	1.07%	0.59%	1.84%	0.78%
	2029	1.13%	0.70%	2.04%	1.59%	0.77%	1.84%	2.22%	1.16%	1.09%	1.41%	0.91%	0.74%	1.70%	1.32%	0.35%	1.40%	1.11%	1.69%	1.81%	1.07%	0.58%	1.84%	0.77%
	2030	1.13%	0.60%	2.03%	1.60%	0.75%	1.87%	2.22%	1.18%	1.10%	1.40%	0.89%	0.77%	1.69%	1.32%	0.34%	1.39%	1.10%	1.69%	1.80%	1.05%	0.58%	1.83%	0.77%
	2031	1.09%	0.68%	2.03%	1.58%	0.74%	1.88%	2.22%	1.14%	1.09%	1.39%	0.89%	0.71%	1.69%	1.33%	0.38%	1.38%	1.07%	1.69%	1.80%	1.04%	0.58%	1.82%	0.76%
	2032	1.13%	0.67%	2.01%	1.58%	0.73%	1.93%	2.22%	1.16%	1.08%	1.40%	0.87%	0.76%	1.68%	1.34%	0.35%	1.37%	1.06%	1.68%	1.80%	1.05%	0.58%	1.81%	0.75%
	2033	1.13%	0.58%	2.01%	1.57%	0.72%	1.87%	2.21%	1.15%	1.09%	1.39%	0.87%	0.74%	1.67%	1.33%	0.33%	1.37%	1.15%	1.67%	1.79%	1.03%	0.57%	1.80%	0.75%
	2034	1.11%	0.65%	2.01%	1.56%	0.71%	1.92%	2.22%	1.14%	1.07%	1.38%	0.86%	0.71%	1.67%	1.35%	0.33%	1.36%	1.04%	1.67%	1.79%	1.03%	0.57%	1.80%	0.74%
	2035	1.08%	0.66%	1.99%	1.55%	0.69%	1.91%	2.21%	1.13%	1.07%	1.38%	0.86%	0.73%	1.66%	1.35%	0.35%	1.32%	1.02%	1.66%	1.79%	1.01%	0.56%	1.79%	0.74%
MID	2011	2.32%	2.02%	2.98%	2.77%	0.78%	2.48%	1.79%	2.40%	2.27%	2.55%	2.21%	1.86%	2.79%	2.30%	1.57%	2.60%	2.36%	1.42%	2.83%	2.34%	1.81%	2.92%	2.01%
	2012	0.89%	0.63%	1.70%	1.39%	0.78%	1.36%	1.79%	1.02%	0.95%	1.18%	0.84%	0.69%	1.43%	0.98%	0.33%	1.22%	1.03%	1.42%	1.47%	0.96%	0.53%	1.57%	0.71%
	2013	0.92%	0.64%	1.70%	1.39%	0.78%	1.39%	1.79%	1.00%	0.95%	1.17%	0.83%	0.66%	1.42%	1.00%	0.31%	1.24%	0.95%	1.42%	1.47%	0.97%	0.52%	1.56%	0.70%
	2014	0.92%	0.63%	1.69%	1.38%	0.76%	1.37%	1.79%	1.03%	0.94%	1.17%	0.83%	0.67%	1.42%	1.00%	0.33%	1.22%	0.94%	1.42%	1.47%	0.95%	0.52%	1.56%	0.70%
	2015	0.89%	0.62%	1.69%	1.38%	0.76%	1.41%	1.79%	0.97%	0.96%	1.17%	0.82%	0.60%	1.41%	1.00%	0.32%	1.20%	0.98%	1.41%	1.47%	0.95%	0.53%	1.55%	0.69%
	2016	0.94%	0.59%	1.69%	1.36%	0.74%	1.40%	1.79%	1.02%	0.93%	1.16%	0.81%	0.69%	1.41%	1.01%	0.32%	1.21%	1.02%	1.41%	1.47%	0.94%	0.51%	1.54%	0.69%
	2017	0.91%	0.63%	1.68%	1.37%	0.74%	1.39%	1.79%	1.00%	0.94%	1.16%	0.81%	0.61%	1.41%	1.01%	0.30%	1.20%	0.90%	1.40%	1.47%	0.94%	0.51%	1.53%	0.69%
	2018	0.90%	0.59%	1.67%	1.36%	0.72%	1.42%	1.78%	1.00%	0.93%	1.16%	0.79%	0.65%	1.40%	1.02%	0.31%	1.18%	0.94%	1.40%	1.47%	0.93%	0.50%	1.53%	0.68%
	2019	0.91%	0.61%	1.67%	1.35%	0.72%	1.42%	1.79%	0.97%	0.92%	1.15%	0.79%	0.63%	1.40%	1.02%	0.30%	1.18%	0.94%	1.40%	1.46%	0.93%	0.51%	1.53%	0.67%
	2020	0.89%	0.57%	1.67%	1.34%	0.71%	1.42%	1.78%	0.97%	0.94%	1.16%	0.79%	0.63%	1.39%	1.01%	0.32%	1.18%	0.92%	1.39%	1.46%	0.91%	0.50%	1.52%	0.67%
	2021	0.92%	0.60%	1.66%	1.34%	0.69%	1.44%	1.78%	0.99%	0.92%	1.15%	0.78%	0.63%	1.39%	1.02%	0.29%	1.18%	0.97%	1.39%	1.46%	0.91%	0.50%	1.51%	0.66%
	2022	0.91%	0.58%	1.66%	1.33%	0.69%	1.42%	1.79%	0.96%	0.93%	1.14%	0.77%	0.63%	1.39%	1.02%	0.32%	1.16%	0.89%	1.39%	1.46%	0.90%	0.49%	1.51%	0.66%
	2023	0.91%	0.56%	1.65%	1.32%	0.67%	1.48%	1.78%	0.96%	0.90%	1.15%	0.77%	0.60%	1.38%	1.04%	0.29%	1.16%	0.92%	1.39%	1.46%	0.90%	0.49%	1.50%	0.65%
	2024	0.88%	0.58%	1.65%	1.31%	0.66%	1.43%	1.78%	0.95%	0.91%	1.13%	0.76%	0.65%	1.38%	1.04%	0.29%	1.15%	0.94%	1.38%	1.45%	0.89%	0.49%	1.49%	0.65%
	2025	0.94%	0.57%	1.64%	1.31%	0.66%	1.45%	1.77%	0.99%	0.91%	1.14%	0.76%	0.63%	1.38%	1.04%	0.30%	1.14%	0.89%	1.38%	1.45%	0.88%	0.48%	1.49%	0.65%
	2026	0.89%	0.53%	1.64%	1.30%	0.65%	1.46%	1.78%	0.93%	0.89%	1.13%	0.75%	0.61%	1.37%	1.04%	0.29%	1.14%	0.90%	1.37%	1.45%	0.87%	0.48%	1.49%	0.63%
	2027	0.88%	0.60%	1.64%	1.30%	0.63%	1.48%	1.77%	0.94%	0.90%	1.13%	0.74%	0.62%	1.37%	1.05%	0.30%	1.14%	0.89%	1.37%	1.45%	0.88%	0.48%	1.48%	0.64%
	2028	0.92%	0.49%	1.63%	1.30%	0.63%	1.50%	1.77%	0.95%	0.89%	1.13%	0.74%	0.60%	1.36%	1.05%	0.28%	1.12%	0.88%	1.36%	1.45%	0.86%	0.48%	1.47%	0.63%
	2029	0.91%	0.56%	1.63%	1.28%	0.62%	1.47%	1.77%	0.93%	0.88%	1.13%	0.73%	0.60%	1.36%	1.06%	0.28%	1.12%	0.89%	1.36%	1.44%	0.86%	0.46%	1.47%	0.62%
	2030	0.91%	0.49%	1.62%	1.28%	0.61%	1.50%	1.77%	0.95%	0.89%	1.12%	0.72%	0.62%	1.35%	1.06%	0.28%	1.11%	0.88%	1.35%	1.44%	0.85%	0.47%	1.46%	0.62%
	2031	0.88%	0.55%	1.62%	1.27%	0.60%	1.50%	1.77%	0.91%	0.88%	1.12%	0.72%	0.57%	1.35%	1.07%	0.31%	1.11%	0.86%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2032	0.91%	0.54%	1.61%	1.26%	0.59%	1.54%	1.77%	0.93%	0.87%	1.12%	0.70%	0.61%	1.35%	1.07%	0.28%	1.10%	0.85%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2033	0.91%	0.47%	1.60%	1.26%	0.58%	1.50%	1.76%	0.92%	0.87%	1.11%	0.70%	0.60%	1.34%	1.06%	0.27%	1.10%	0.92%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2034	0.90%	0.52%	1.60%	1.25%	0.57%	1.53%	1.77%	0.92%	0.86%	1.11%	0.70%	0.57%	1.34%	1.08%	0.27%	1.09%	0.84%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2035	0.87%	0.53%	1.59%	1.25%	0.56%	1.52%	1.76%	0.91%	0.86%	1.11%	0.70%	0.59%	1.33%	1.09%	0.29%	1.06%	0.82%	1.33%	1.43%	0.82%	0.45%	1.43%	0.59%
LOW	2011	1.75%	1.52%	2.26%	2.09%	0.58%	1.87%	1.34%	1.80%	1.70%	1.92%	1.66%	1.39%	2.11%	1.73%	1.17%	1.96%	1.78%	1.06%	2.14%	1.76%	1.36%	2.21%	1.50%
	2012	0.66%	0.47%	1.27%	1.04%	0.58%	1.02%	1.34%	0.76%	0.71%	0.88%	0.62%	0.51%	1.06%	0.73%	0.24%	0.91%	0.76%	1.06%	1.10%	0.71%	0.39%	1.17%	0.52%
	2013	0.68%	0.47%	1.27%	1.03%	0.58%	1.03%	1.34%	0.74%	0.71%	0.87%	0.61%	0.49%	1.06%	0.74%	0.23%	0.92%	0.71%	1.06%	1.10%	0.72%	0.39%	1.16%	0.52%
	2014	0.68%	0.46%	1.26%	1.03%	0.56%	1.02%	1.34%	0.76%	0.70%	0.87%	0.61%	0.50%	1.06%	0.74%	0.24%	0.91%	0.70%	1.06%	1.10%	0.71%	0.38%	1.16%	0.52%
	2015	0.66%	0.46%	1.26%	1.03%	0.56%	1.05%	1.34%	0.72%	0.71%	0.87%	0.61%	0.44%	1.05%	0.74%	0.23%	0.89%	0.73%	1.05%	1.10%	0.70%	0.39%	1.15%	0.51%
	2016	0.69%	0.43%	1.26%	1.01%	0.55%	1.04%	1.34%	0.75%	0.69%	0.86%	0.60%	0.51%	1.05%	0.75%	0.24%	0.90%	0.75%	1.05%	1.10%	0.69%	0.38%	1.15%	0.51%
	2017	0.67%	0.46%	1.26%	1.02%	0.55%	1.03%	1.34%	0.74%	0.70%	0.86%	0.60%	0.45%	1.05%	0.75%	0.22%	0.89%	0.67%	1.05%	1.09%	0.70%	0.38%	1.14%	0.51%
	2018	0.67%	0.44%	1.25%	1.01%	0.53%	1.06%	1.33%	0.74%	0.69%	0.86%	0.59%	0.48%	1.04%	0.75%	0.23%	0.88%	0.70%	1.04%	1.09%	0.69%	0.37%	1.14%	0.50%
	2019	0.68%	0.45%	1.25%	1.00%	0.53%	1.06%	1.33%	0.72%	0.68%	0.86%	0.59%	0.46%	1.04%	0.76%	0.22%	0.88%	0.70%	1.04%	1.09%	0.69%	0.37%	1.14%	0.50%
	2020	0.66%	0.42%	1.25%	1.00%	0.52%	1.06%	1.33%	0.72%	0.70%	0.86%	0.58%	0.47%	1.04%	0.75%	0.23%	0.87%	0.68%	1.04%	1.09%	0.68%	0.37%	1.13%	0.49%
	2021	0.68%	0.44%	1.24%	0.99%	0.51%	1.07%	1.33%	0.73%	0.68%	0.86%	0.58%	0.47%	1.04%	0.76%	0.21%	0.87%	0.72%	1.04%	1.09%	0.67%	0.37%	1.13%	0.49%
	2022	0.68%	0.43%	1.24%	0.99%	0.51%	1.06%	1.33%	0.71%	0.69%	0.85%	0.57%	0.46%	1.03%	0.76%	0.24%	0.86%	0.66%	1.03%	1.09%	0.67%	0.36%	1.12%	0.49%
	2023	0.67%	0.42%	1.23%	0.98%	0.50%	1.10%	1.33%	0.71%	0.67%	0.85%	0.57%	0.44%	1.03%	0.77%	0.21%	0.86%	0.68%	1.03%	1.09%	0.67%	0.36%	1.12%	0.48%
	2024	0.65%	0.43%	1.23%	0.98%	0.49%	1.07%	1.33%	0.71%	0.68%	0.84%	0.56%	0.48%	1.03%	0.77%	0.21%	0.86%	0.70%	1.02%	1.08%	0.66%	0.36%	1.11%	0.48%
	2025	0.69%	0.42%	1.23%	0.98%	0.49%	1.08%	1.32%	0.73%	0.67%	0.85%	0.56%	0.46%	1.02%	0.77%	0.22%	0.85%	0.66%	1.03%	1.08%	0.65%	0.36%	1.11%	0.48%
	2026	0.66%	0.39%	1.22%	0.97%	0.48%	1.08%	1.33%	0.69%	0.66%	0.84%	0.55%	0.45%	1.02%	0.77%	0.22%	0.84%	0.67%	1.02%	1.08%	0.65%	0.35%	1.11%	0.47%
	2027	0.65%	0.44%	1.22%	0.97%	0.47%	1.10%	1.33%	0.69%	0.67%	0.84%	0.55%	0.46%	1.02%	0.78%	0.22%	0.84%	0.66%	1.02%	1.08%	0.65%	0.36%	1.10%	0.47%
	2028	0.68%	0.36%	1.22%	0.96%	0.47%	1.12%	1.33%	0.71%	0.66%	0.84%	0.55%	0.45%	1.01%	0.78%	0.21%	0.83%	0.65%	1.02%	1.08%	0.64%	0.35%	1.09%	0.46%
	2029	0.67%	0.42%	1.21%	0.95%	0.46%	1.10%	1.32%	0.69%	0.65%	0.84%	0.54%	0.44%	1.01%	0.78%	0.21%	0.83%	0.66%	1.01%	1.08%	0.64%	0.34%	1.09%	0.46%
	2030	0.68%	0.36%	1.21%	0.95%	0.45%	1.12%	1.32%	0.70%	0.66%	0.83%	0.53%	0.46%	1.01%	0.79%	0.20%	0.83%	0.65%	1.01%	1.07%	0.63%	0.35%	1.09%	0.46%
	2031	0.65%	0.41%	1.21%	0.94%	0.44%	1.12%	1.32%	0.68%	0.65%	0.83%	0.53%	0.42%	1.00%	0.79%	0.22%	0.82%	0.64%	1.01%	1.07%	0.62%	0.34%	1.08%	0.45%
	2032	0.68%	0.40%	1.20%	0.94%	0.44%	1.15%	1.32%	0.69%	0.65%	0.83%	0.52%	0.45%	1.00%	0.80%	0.21%	0.82%	0.63%	1.00%	1.07%	0.62%	0.34%	1.08%	0.45%
	2033	0.68%	0.35%	1.20%	0.94%	0.43%	1.12%	1.32%	0.68%	0.65%	0.83%	0.52%	0.44%	1.00%	0.79%	0.20%	0.81%	0.68%	1.00%	1.07%	0.62%	0.34%	1.07%	0.44%
	2034	0.66%	0.39%	1.20%	0.93%	0.42%	1.14%	1.32%	0.68%	0.64%	0.82%	0.51%	0.42%	1.00%	0.80%	0.20%	0.81%	0.62%	1.00%	1.07%	0.61%	0.34%	1.07%	0.44%
	2035	0.65%	0.39%	1.19%	0.93%	0.41%	1.14%	1.32%	0.67%	0.64%	0.82%	0.51%	0.44%	0.99%	0.81%	0.21%	0.79%	0.61%	0.99%	1.06%	0.60%	0.33%	1.07%	0.44%

Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED HOUSEHOLDS GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
	2011	0.90%	0.02%	2.56%	1.54%	-99.90%	2.12%	3.14%	1.67%	2.25%	1.75%	0.59%	1.23%	2.14%	1.14%	-0.05%	2.18%	0.93%	2.26%	2.45%	0.70%	0.58%	3.03%	0.64%
	2012	1.04%	0.33%	2.41%	1.59%	0.88%	2.07%	2.87%	1.69%	2.15%	1.76%	0.79%	1.34%	2.07%	1.25%	0.19%	2.11%	1.07%	2.16%	2.32%	0.89%	0.80%	2.79%	0.84%
	2013	0.98%	0.26%	2.30%	1.51%	0.92%	1.96%	2.75%	1.60%	2.06%	1.67%	0.72%	1.24%	1.98%	1.17%	0.16%	2.01%	1.01%	2.07%	2.21%	0.81%	0.72%	2.67%	0.77%
	2014	0.95%	0.23%	2.24%	1.47%	0.95%	1.91%	2.67%	1.57%	2.01%	1.63%	0.70%	1.23%	1.93%	1.15%	0.17%	1.96%	0.97%	2.02%	2.16%	0.79%	0.71%	2.59%	0.75%
	2015	0.93%	0.22%	2.18%	1.43%	0.98%	1.86%	2.60%	1.53%	1.96%	1.59%	0.67%	1.20%	1.88%	1.12%	0.09%	1.91%	0.97%	1.97%	2.10%	0.75%	0.68%	2.52%	0.72%
	2016	0.88%	0.20%	2.12%	1.40%	1.01%	1.81%	2.52%	1.49%	1.91%	1.55%	0.64%	1.18%	1.83%	1.09%	0.12%	1.86%	0.90%	1.91%	2.05%	0.73%	0.66%	2.45%	0.70%
	2017	0.88%	0.17%	2.07%	1.37%	1.04%	1.77%	2.45%	1.46%	1.86%	1.51%	0.62%	1.15%	1.79%	1.07%	0.13%	1.81%	0.90%	1.86%	1.99%	0.70%	0.63%	2.38%	0.68%
	2018	0.83%	0.14%	2.01%	1.33%	1.07%	1.70%	2.39%	1.43%	1.81%	1.46%	0.59%	1.11%	1.74%	1.04%	0.05%	1.76%	0.87%	1.82%	1.94%	0.67%	0.60%	2.31%	0.65%
	2019	0.81%	0.13%	1.96%	1.30%	1.10%	1.68%	2.32%	1.40%	1.77%	1.43%	0.57%	1.09%	1.70%	1.01%	0.07%	1.72%	0.86%	1.77%	1.89%	0.63%	0.58%	2.26%	0.63%
	2020	0.79%	0.11%	1.92%	1.27%	1.11%	1.63%	2.27%	1.37%	1.73%	1.40%	0.55%	1.08%	1.66%	0.99%	0.07%	1.68%	0.83%	1.73%	1.85%	0.61%	0.56%	2.20%	0.62%
	2021	0.77%	0.10%	1.88%	1.25%	1.14%	1.60%	2.22%	1.35%	1.69%	1.37%	0.54%	1.05%	1.62%	0.98%	0.05%	1.64%	0.80%	1.70%	1.81%	0.59%	0.54%	2.15%	0.60%
	2022	0.77%	0.08%	1.83%	1.23%	1.15%	1.55%	2.16%	1.32%	1.66%	1.34%	0.52%	1.03%	1.58%	0.96%	0.05%	1.60%	0.80%	1.66%	1.76%	0.55%	0.51%	2.09%	0.59%
HIGH	2023	0.72%	0.05%	1.78%	1.19%	1.18%	1.52%	2.11%	1.29%	1.62%	1.31%	0.49%	1.01%	1.54%	0.93%	0.00%	1.55%	0.77%	1.62%	1.72%	0.52%	0.48%	2.04%	0.57%
	2024	0.71%	0.02%	1.74%	1.17%	1.20%	1.48%	2.05%	1.26%	1.58%	1.27%	0.48%	0.98%	1.51%	0.91%	0.02%	1.52%	0.74%	1.58%	1.67%	0.49%	0.45%	1.99%	0.55%
	2025	0.67%	0.01%	1.70%	1.14%	1.22%	1.44%	2.00%	1.24%	1.54%	1.24%	0.45%	0.96%	1.46%	0.88%	0.03%	1.47%	0.74%	1.54%	1.63%	0.44%	0.42%	1.93%	0.53%
	2026	0.65%	0.00%	1.66%	1.11%	1.24%	1.39%	1.95%	1.20%	1.50%	1.20%	0.43%	0.94%	1.43%	0.86%	-0.01%	1.43%	0.71%	1.50%	1.59%	0.41%	0.39%	1.88%	0.51%
	2027	0.63%	-0.02%	1.61%	1.08%	1.26%	1.37%	1.90%	1.17%	1.46%	1.18%	0.41%	0.91%	1.39%	0.83%	-0.04%	1.40%	0.68%	1.46%	1.55%	0.38%	0.37%	1.84%	0.49%
	2028	0.61%	-0.05%	1.58%	1.06%	1.28%	1.32%	1.85%	1.16%	1.43%	1.14%	0.39%	0.90%	1.36%	0.82%	-0.02%	1.35%	0.65%	1.43%	1.51%	0.35%	0.35%	1.79%	0.47%
	2029	0.58%	-0.06%	1.54%	1.03%	1.29%	1.29%	1.81%	1.13%	1.40%	1.12%	0.38%	0.87%	1.32%	0.80%	-0.04%	1.32%	0.65%	1.40%	1.47%	0.32%	0.32%	1.75%	0.46%
	2030	0.56%	-0.08%	1.50%	1.01%	1.30%	1.27%	1.77%	1.10%	1.36%	1.09%	0.36%	0.85%	1.29%	0.78%	-0.08%	1.29%	0.63%	1.37%	1.44%	0.29%	0.30%	1.71%	0.44%
	2031	0.53%	-0.10%	1.47%	0.98%	1.31%	1.23%	1.73%	1.08%	1.33%	1.06%	0.35%	0.85%	1.26%	0.76%	-0.05%	1.26%	0.60%	1.33%	1.40%	0.27%	0.28%	1.67%	0.43%
	2032	0.53%	-0.11%	1.44%	0.97%	1.32%	1.19%	1.69%	1.06%	1.30%	1.04%	0.33%	0.82%	1.23%	0.74%	-0.07%	1.22%	0.60%	1.30%	1.37%	0.23%	0.26%	1.63%	0.41%
	2033	0.49%	-0.14%	1.40%	0.94%	1.33%	1.16%	1.65%	1.03%	1.27%	1.01%	0.31%	0.80%	1.20%	0.72%	-0.10%	1.20%	0.57%	1.27%	1.33%	0.21%	0.25%	1.59%	0.40%
	2034	0.48%	-0.15%	1.37%	0.92%	1.34%	1.14%	1.61%	1.01%	1.24%	0.98%	0.30%	0.78%	1.18%	0.71%	-0.11%	1.17%	0.55%	1.24%	1.30%	0.18%	0.23%	1.55%	0.38%
	2035	0.44%	-0.17%	1.33%	0.89%	1.36%	1.11%	1.56%	0.98%	1.21%	0.95%	0.28%	0.75%	1.14%	0.68%	-0.11%	1.13%	0.53%	1.21%	1.26%	0.15%	0.21%	1.51%	0.36%
	2011	0.75%	0.01%	2.11%	1.28%	0.88%	1.76%	2.58%	1.39%	1.86%	1.46%	0.50%	1.02%	1.77%	0.95%	-0.06%	1.81%	0.78%	1.87%	2.02%	0.59%	0.49%	2.49%	0.53%
	2012	0.98%	0.28%	2.31%	1.52%	0.88%	1.99%	2.76%	1.62%	2.07%	1.69%	0.74%	1.28%	1.99%	1.19%	0.17%	2.03%	1.01%	2.08%	2.23%	0.84%	0.74%	2.68%	0.78%
	2013	0.97%	0.27%	2.26%	1.49%	0.91%	1.93%	2.69%	1.58%	2.03%	1.65%	0.72%	1.24%	1.95%	1.17%	0.16%	1.98%	1.00%	2.03%	2.18%	0.81%	0.72%	2.61%	0.76%
	2014	0.95%	0.24%	2.20%	1.46%	0.94%	1.88%	2.61%	1.55%	1.98%	1.61%	0.70%	1.22%	1.90%	1.14%	0.17%	1.93%	0.97%	1.98%	2.12%	0.79%	0.71%	2.54%	0.74%
	2015	0.92%	0.22%	2.14%	1.42%	0.97%	1.84%	2.54%	1.52%	1.93%	1.57%	0.67%	1.19%	1.86%	1.11%	0.10%	1.88%	0.96%	1.94%	2.07%	0.76%	0.68%	2.47%	0.72%
	2016	0.88%	0.21%	2.09%	1.39%	1.00%	1.79%	2.47%	1.48%	1.88%	1.53%	0.65%	1.17%	1.81%	1.09%	0.12%	1.83%	0.90%	1.89%	2.01%	0.73%	0.66%	2.40%	0.70%
	2017	0.87%	0.18%	2.03%	1.35%	1.03%	1.74%	2.41%	1.45%	1.84%	1.49%	0.62%	1.14%	1.76%	1.06%	0.13%	1.79%	0.90%	1.84%	1.96%	0.70%	0.63%	2.34%	0.68%
	2018	0.84%	0.15%	1.98%	1.32%	1.05%	1.69%	2.34%	1.41%	1.79%	1.45%	0.59%	1.10%	1.72%	1.03%	0.06%	1.74%	0.87%	1.79%	1.91%	0.67%	0.60%	2.27%	0.65%
	2019	0.81%	0.13%	1.93%	1.29%	1.08%	1.66%	2.28%	1.38%	1.75%	1.42%	0.57%	1.08%	1.68%	1.01%	0.07%	1.70%	0.86%	1.75%	1.86%	0.64%	0.58%	2.22%	0.63%
	2020	0.79%	0.12%	1.89%	1.26%	1.10%	1.61%	2.23%	1.36%	1.71%	1.39%	0.55%	1.07%	1.64%	0.99%	0.07%	1.66%	0.83%	1.71%	1.82%	0.61%	0.56%	2.16%	0.62%
	2021	0.77%	0.10%	1.85%	1.24%	1.12%	1.58%	2.18%	1.33%	1.67%	1.36%	0.54%	1.04%	1.60%	0.97%	0.05%	1.62%	0.80%	1.68%	1.78%	0.59%	0.54%	2.11%	0.60%
	2022	0.76%	0.09%	1.81%	1.22%	1.14%	1.54%	2.13%	1.31%	1.64%	1.33%	0.52%	1.02%	1.57%	0.95%	0.05%	1.58%	0.79%	1.64%	1.74%	0.55%	0.51%	2.06%	0.59%
MID	2023	0.73%	0.06%	1.76%	1.18%	1.16%	1.50%	2.07%	1.28%	1.60%	1.30%	0.49%	1.00%	1.53%	0.93%	0.01%	1.54%	0.77%	1.60%	1.70%	0.52%	0.48%	2.01%	0.57%
	2024	0.71%	0.03%	1.72%	1.16%	1.18%	1.46%	2.02%	1.25%	1.56%	1.26%	0.48%	0.98%	1.49%	0.90%	0.02%	1.50%	0.74%	1.56%	1.65%	0.49%	0.45%	1.96%	0.55%
	2025	0.67%	0.01%	1.68%	1.13%	1.20%	1.43%	1.97%	1.23%	1.52%	1.23%	0.45%	0.96%	1.45%	0.88%	0.03%	1.46%	0.73%	1.52%	1.61%	0.45%	0.43%	1.91%	0.53%
	2026	0.65%	0.00%	1.64%	1.10%	1.22%	1.38%	1.92%	1.20%	1.48%	1.20%	0.43%	0.94%	1.41%	0.86%	-0.01%	1.42%	0.71%	1.49%	1.57%	0.42%	0.39%	1.86%	0.51%
	2027	0.63%	-0.03%	1.60%	1.07%	1.24%	1.35%	1.87%	1.16%	1.45%	1.17%	0.41%	0.91%	1.38%	0.83%	-0.05%	1.38%	0.68%	1.45%	1.53%	0.39%	0.38%	1.81%	0.49%
	2028	0.61%	-0.06%	1.56%	1.05%	1.26%	1.31%	1.83%	1.15%	1.41%	1.14%	0.39%	0.90%	1.34%	0.81%	-0.01%	1.34%	0.65%	1.42%	1.49%	0.35%	0.35%	1.77%	0.47%
	2029	0.58%	-0.06%	1.52%	1.03%	1.27%	1.28%	1.79%	1.12%	1.38%	1.11%	0.38%	0.87%	1.31%	0.79%	-0.04%	1.31%	0.65%	1.38%	1.46%	0.33%	0.33%	1.72%	0.46%
	2030	0.56%	-0.09%	1.49%	1.00%	1.28%	1.25%	1.74%	1.09%	1.35%	1.08%	0.36%	0.85%	1.28%	0.78%	-0.09%	1.28%	0.63%	1.35%	1.42%	0.29%	0.30%	1.68%	0.45%
	2031	0.53%	-0.10%	1.46%	0.98%	1.29%	1.22%	1.71%	1.08%	1.32%	1.06%	0.35%	0.84%	1.25%	0.76%	-0.04%	1.25%	0.60%	1.32%	1.39%	0.27%	0.29%	1.65%	0.43%
	2032	0.53%	-0.12%	1.42%	0.96%	1.30%	1.19%	1.67%	1.05%	1.29%	1.03%	0.33%	0.81%	1.22%	0.74%	-0.08%	1.22%	0.60%	1.29%	1.36%	0.24%	0.27%	1.61%	0.42%
	2033	0.49%	-0.15%	1.39%	0.93%	1.31%	1.16%	1.63%	1.03%	1.26%	1.00%	0.32%	0.80%	1.20%	0.72%	-0.11%	1.19%	0.57%	1.26%	1.32%	0.21%	0.25%	1.57%	0.40%
	2034	0.48%	-0.15%	1.36%	0.91%	1.32%	1.13%	1.59%	1.01%	1.23%	0.98%	0.30%	0.78%	1.17%	0.70%	-0.11%	1.16%	0.55%	1.23%	1.29%	0.18%	0.23%	1.53%	0.38%
	2035	0.45%	-0.18%	1.32%	0.89%	1.33%	1.10%	1.55%	0.98%	1.20%	0.95%	0.28%	0.75%	1.14%	0.68%	-0.11%	1.12%	0.53%	1.20%	1.25%	0.16%	0.21%	1.49%	0.37%
	2011	0.65%	0.01%	1.84%	1.11%	-99.90%	1.52%	2.25%	1.20%	1.62%	1.26%	0.42%	0.88%	1.54%	0.82%	-0.11%	1.57%	0.67%	1.62%	1.76%	0.51%	0.42%	2.17%	0.46%
	2012	0.96%	0.24%	2.34%	1.51%	0.88%	1.99%	2.81%	1.61%	2.08%	1.68%	0.71%	1.26%	2.00%	1.17%	0.20%	2.04%	0.99%	2.09%	2.25%	0.81%	0.71%	2.72%	0.75%
	2013	0.99%	0.27%	2.32%	1.52%	0.91%	1.98%	2.77%	1.61%	2.08%	1.68%	0.73%	1.26%	1.99%	1.18%	0.16%	2.03%	1.01%	2.08%	2.23%	0.82%	0.73%	2.69%	0.77%
	2014	0.96%	0.24%	2.26%	1.48%	0.94%	1.93%	2.70%	1.58%	2.03%	1.64%	0.71%	1.24%	1.95%	1.16%	0.17%	1.98%	0.98%	2.03%	2.18%	0.80%	0.71%	2.62%	0.75%
	2015	0.94%	0.22%	2.20%	1.45%	0.97%	1.88%	2.62%	1.55%	1.98%	1.60%	0.68%	1.21%	1.90%	1.13%	0.11%	1.93%	0.97%	1.98%	2.12%	0.77%	0.69%	2.54%	0.73%
	2016	0.90%	0.21%	2.14%	1.41%	1.00%	1.83%	2.55%	1.50%	1.92%	1.56%	0.65%	1.18%	1.85%	1.10%	0.12%	1.88%	0.92%	1.93%	2.06%	0.74%	0.67%	2.47%	0.71%
	2017	0.88%	0.18%	2.08%	1.38%	1.03%	1.78%	2.48%	1.47%	1.88%	1.52%	0.63%	1.16%	1.80%	1.08%	0.13%	1.83%	0.91%	1.88%	2.01%	0.71%	0.64%	2.40%	0.68%
	2018	0.85%	0.15%	2.03%	1.34%	1.06%	1.72%	2.41%	1.44%	1.83%	1.48%	0.60%	1.12%	1.75%	1.05%	0.07%	1.78%	0.88%	1.83%	1.96%	0.68%	0.61%	2.34%	0.66%
	2019	0.82%	0.13%	1.98%	1.31%	1.09%	1.69%	2.35%	1.41%	1.78%	1.44%	0.58%	1.09%	1.71%	1.02%	0.07%	1.73%	0.87%	1.79%	1.91%	0.65%	0.59%	2.28%	0.64%
	2020	0.80%	0.12%	1.93%	1.28%	1.11%	1.65%	2.29%	1.38%	1.74%	1.41%	0.56%	1.08%	1.67%	1.00%	0.07%	1.69%	0.84%	1.75%	1.86%	0.62%	0.57%	2.22%	0.62%
	2021	0.78%	0.10%	1.89%	1.26%	1.13%	1.61%	2.23%	1.36%	1.70%	1.38%	0.54%	1.06%	1.64%	0.98%	0.05%	1.65%	0.81%	1.71%	1.82%	0.59%	0.55%	2.17%	0.61%
	2022	0.77%	0.09%	1.85%	1.24%	1.15%	1.57%	2.18%	1.33%	1.67%	1.35%	0.53%	1.04%	1.60%	0.96%	0.05%	1.61%	0.80%	1.67%	1.78%	0.56%	0.52%	2.11%	0.59%
LOW	2023	0.74%	0.06%	1.80%	1.20%	1.17%	1.53%	2.12%	1.30%	1.63%	1.32%	0.50%	1.01%	1.56%	0.94%	0.02%	1.57%	0.78%	1.63%	1.73%	0.53%	0.49%	2.06%	0.57%
	2024	0.71%	0.03%	1.76%	1.18%	1.19%	1.49%	2.07%	1.27%	1.59%	1.28%	0.48%	0.99%	1.52%	0.92%	0.02%	1.53%	0.75%	1.59%	1.69%	0.50%	0.46%	2.00%	0.56%
	2025	0.68%	0.02%	1.71%	1.15%	1.21%	1.45%	2.02%	1.25%	1.55%	1.25%	0.46%	0.97%	1.48%	0.89%	0.03%	1.48%	0.74%	1.55%	1.64%	0.46%	0.43%	1.95%	0.54%
	2026	0.66%	0.00%	1.67%	1.12%	1.24%	1.41%	1.96%	1.21%	1.51%	1.22%	0.44%	0.95%	1.44%	0.87%	-0.01%	1.44%	0.72%	1.51%	1.60%	0.42%	0.40%	1.90%	0.51%
	2027	0.64%	-0.05%	1.63%	1.09%	1.25%	1.38%	1.92%	1.18%	1.47%	1.19%	0.42%	0.92%	1.40%	0.84%	-0.08%	1.41%	0.69%	1.48%	1.56%	0.39%	0.38%	1.85%	0.50%
	2028	0.62%	-0.08%	1.59%	1.06%	1.27%	1.34%	1.87%	1.16%	1.44%	1.15%	0.40%	0.91%	1.37%	0.82%	0.02%	1.37%	0.66%	1.44%	1.52%	0.36%	0.35%	1.80%	0.48%
	2029	0.59%	-0.06%	1.55%	1.04%	1.29%	1.30%	1.82%	1.14%	1.41%	1.13%	0.38%	0.88%	1.33%	0.80%	-0.07%	1.33%	0.66%	1.41%	1.48%	0.33%	0.33%	1.76%	0.46%
	2030	0.57%	-0.11%	1.52%	1.02%	1.30%	1.27%	1.78%	1.11%	1.37%	1.10%	0.37%	0.86%	1.30%	0.78%	-0.13%	1.30%	0.63%	1.38%	1.45%	0.30%	0.31%	1.72%	0.45%
	2031	0.54%	-0.11%	1.48%	0.99%	1.31%	1.24%	1.74%	1.09%	1.34%	1.07%	0.35%	0.85%	1.27%	0.77%	0.00%	1.27%	0.61%	1.35%	1.41%	0.27%	0.29%	1.68%	0.43%
	2032	0.53%	-0.13%	1.45%	0.97%	1.32%	1.21%	1.70%	1.07%	1.31%	1.05%	0.34%	0.82%	1.24%	0.75%	-0.11%	1.24%	0.60%	1.31%	1.38%	0.24%	0.27%	1.64%	0.42%
	2033	0.50%	-0.17%	1.41%	0.95%	1.33%	1.17%	1.66%	1.04%	1.28%	1.02%	0.32%	0.81%	1.21%	0.73%	-0.14%	1.21%	0.58%	1.28%	1.34%	0.22%	0.26%	1.60%	0.40%
	2034	0.48%	-0.15%	1.38%	0.93%	1.34%	1.14%	1.62%	1.02%	1.25%	0.99%	0.30%	0.79%	1.18%	0.71%	-0.11%	1.18%	0.56%	1.25%	1.31%	0.19%	0.24%	1.56%	0.39%
	2035	0.45%	-0.20%	1.34%	0.90%	1.35%	1.12%	1.58%	0.99%	1.22%	0.96%	0.29%	0.76%	1.15%	0.69%	-0.11%	1.14%	0.53%	1.22%	1.27%	0.16%	0.22%	1.52%	0.37%

Cascade Natural Gas
2010 IRP Demand Forecast
Economic Indicators

PROJECTED INCOME GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
HIGH	2011	-0.52%	6.00%	-0.32%	2.20%	1.98%	9.04%	0.44%	1.51%	0.09%	1.02%	6.46%	0.56%	2.17%	-0.07%	2.84%	2.87%	6.19%	4.33%	2.07%	-0.10%	4.57%	2.49%	1.40%
	2012	1.40%	2.07%	0.91%	1.29%	1.54%	1.99%	1.39%	0.93%	0.10%	0.77%	1.76%	1.86%	1.41%	1.38%	2.14%	1.05%	1.21%	1.01%	0.26%	1.73%	1.14%	1.69%	1.45%
	2013	1.45%	2.10%	1.01%	1.38%	1.60%	2.10%	1.51%	0.94%	0.20%	0.87%	1.82%	1.93%	1.48%	1.44%	2.25%	1.07%	1.25%	1.09%	0.30%	1.79%	1.22%	1.75%	1.51%
	2014	1.53%	2.18%	1.11%	1.46%	1.65%	2.21%	1.63%	0.96%	0.30%	0.95%	1.87%	1.96%	1.55%	1.51%	2.29%	1.12%	1.33%	1.17%	0.37%	1.84%	1.28%	1.81%	1.56%
	2015	1.60%	2.21%	1.21%	1.54%	1.70%	2.29%	1.75%	1.02%	0.39%	1.04%	1.93%	2.03%	1.61%	1.58%	2.46%	1.19%	1.35%	1.26%	0.45%	1.91%	1.34%	1.88%	1.61%
	2016	1.69%	2.26%	1.31%	1.61%	1.76%	2.41%	1.86%	1.10%	0.49%	1.12%	1.99%	2.08%	1.68%	1.66%	2.46%	1.26%	1.47%	1.35%	0.55%	1.96%	1.40%	1.94%	1.67%
	2017	1.72%	2.32%	1.39%	1.67%	1.81%	2.48%	1.97%	1.14%	0.57%	1.19%	2.05%	2.14%	1.74%	1.71%	2.48%	1.33%	1.50%	1.43%	0.64%	2.01%	1.45%	2.00%	1.72%
	2018	1.80%	2.38%	1.49%	1.73%	1.86%	2.60%	2.07%	1.21%	0.66%	1.28%	2.11%	2.22%	1.80%	1.79%	2.63%	1.41%	1.56%	1.51%	0.74%	2.06%	1.51%	2.06%	1.77%
	2019	1.87%	2.41%	1.56%	1.79%	1.91%	2.65%	2.17%	1.27%	0.74%	1.34%	2.15%	2.28%	1.86%	1.85%	2.65%	1.48%	1.58%	1.59%	0.83%	2.12%	1.56%	2.11%	1.82%
	2020	1.92%	2.46%	1.64%	1.84%	1.94%	2.75%	2.26%	1.32%	0.82%	1.41%	2.20%	2.32%	1.91%	1.90%	2.67%	1.54%	1.66%	1.66%	0.91%	2.16%	1.60%	2.16%	1.86%
	2021	1.98%	2.48%	1.70%	1.88%	1.98%	2.82%	2.34%	1.37%	0.89%	1.47%	2.24%	2.38%	1.95%	1.95%	2.73%	1.60%	1.71%	1.72%	0.99%	2.21%	1.64%	2.20%	1.89%
	2022	1.99%	2.51%	1.76%	1.93%	2.01%	2.90%	2.42%	1.42%	0.95%	1.53%	2.28%	2.43%	2.00%	2.00%	2.76%	1.66%	1.73%	1.78%	1.06%	2.25%	1.67%	2.25%	1.93%
	2023	2.07%	2.56%	1.84%	1.98%	2.05%	2.96%	2.50%	1.47%	1.02%	1.59%	2.33%	2.48%	2.05%	2.06%	2.85%	1.73%	1.79%	1.85%	1.14%	2.29%	1.73%	2.30%	1.97%
	2024	2.11%	2.62%	1.90%	2.02%	2.08%	3.04%	2.58%	1.54%	1.09%	1.65%	2.36%	2.53%	2.10%	2.10%	2.85%	1.78%	1.85%	1.91%	1.22%	2.33%	1.77%	2.35%	2.01%
	2025	2.19%	2.64%	1.97%	2.07%	2.13%	3.12%	2.66%	1.58%	1.16%	1.71%	2.42%	2.58%	2.15%	2.17%	2.86%	1.85%	1.86%	1.99%	1.29%	2.39%	1.81%	2.39%	2.05%
	2026	2.22%	2.66%	2.03%	2.12%	2.16%	3.20%	2.74%	1.63%	1.23%	1.77%	2.45%	2.63%	2.20%	2.21%	2.95%	1.90%	1.92%	2.05%	1.37%	2.43%	1.86%	2.44%	2.09%
	2027	2.27%	2.72%	2.09%	2.16%	2.19%	3.25%	2.81%	1.69%	1.29%	1.82%	2.49%	2.69%	2.24%	2.27%	3.04%	1.96%	1.96%	2.10%	1.44%	2.47%	1.89%	2.48%	2.13%
	2028	2.30%	2.75%	2.14%	2.20%	2.23%	3.32%	2.87%	1.72%	1.34%	1.88%	2.53%	2.71%	2.28%	2.31%	2.98%	2.01%	2.01%	2.16%	1.50%	2.51%	1.93%	2.52%	2.16%
	2029	2.36%	2.76%	2.19%	2.24%	2.25%	3.38%	2.93%	1.76%	1.39%	1.92%	2.55%	2.76%	2.32%	2.35%	3.05%	2.05%	2.02%	2.21%	1.57%	2.54%	1.96%	2.56%	2.19%
	2030	2.39%	2.79%	2.24%	2.27%	2.27%	3.42%	2.99%	1.81%	1.45%	1.96%	2.58%	2.80%	2.35%	2.38%	3.14%	2.09%	2.06%	2.25%	1.62%	2.57%	1.99%	2.60%	2.21%
	2031	2.44%	2.81%	2.28%	2.30%	2.29%	3.46%	3.04%	1.83%	1.49%	2.00%	2.60%	2.81%	2.38%	2.42%	3.06%	2.13%	2.10%	2.30%	1.67%	2.59%	2.01%	2.62%	2.23%
	2032	2.43%	2.83%	2.32%	2.32%	2.30%	3.52%	3.09%	1.86%	1.53%	2.03%	2.62%	2.85%	2.42%	2.44%	3.13%	2.16%	2.10%	2.34%	1.73%	2.63%	2.04%	2.65%	2.25%
	2033	2.49%	2.86%	2.36%	2.36%	2.32%	3.57%	3.14%	1.90%	1.57%	2.07%	2.64%	2.88%	2.45%	2.47%	3.19%	2.19%	2.14%	2.38%	1.78%	2.64%	2.05%	2.68%	2.27%
	2034	2.50%	2.85%	2.40%	2.38%	2.33%	3.60%	3.19%	1.92%	1.61%	2.10%	2.66%	2.90%	2.48%	2.50%	3.20%	2.23%	2.18%	2.42%	1.83%	2.68%	2.09%	2.71%	2.29%
	2035	2.55%	2.90%	2.45%	2.41%	2.36%	3.65%	3.24%	1.97%	1.66%	2.15%	2.68%	2.95%	2.51%	2.54%	3.20%	2.27%	2.21%	2.47%	1.89%	2.71%	2.11%	2.75%	2.32%
MID	2011	-0.92%	3.32%	-0.57%	1.24%	1.12%	4.92%	0.25%	0.86%	0.05%	0.58%	3.57%	0.32%	1.23%	-0.13%	1.60%	1.62%	3.42%	2.42%	1.17%	-0.17%	2.55%	1.41%	0.80%
	2012	0.80%	1.17%	0.52%	0.73%	0.88%	1.13%	0.79%	0.53%	0.06%	0.44%	1.00%	1.06%	0.80%	0.78%	1.21%	0.60%	0.69%	0.58%	0.15%	0.98%	0.65%	0.96%	0.83%
	2013	0.83%	1.19%	0.58%	0.78%	0.91%	1.19%	0.86%	0.54%	0.11%	0.49%	1.03%	1.10%	0.84%	0.82%	1.27%	0.61%	0.71%	0.62%	0.17%	1.02%	0.69%	0.99%	0.86%
	2014	0.87%	1.24%	0.63%	0.83%	0.94%	1.25%	0.93%	0.55%	0.17%	0.54%	1.06%	1.11%	0.88%	0.86%	1.30%	0.64%	0.75%	0.67%	0.21%	1.04%	0.73%	1.03%	0.88%
	2015	0.91%	1.25%	0.69%	0.87%	0.97%	1.30%	0.99%	0.58%	0.22%	0.59%	1.09%	1.15%	0.91%	0.90%	1.39%	0.68%	0.77%	0.72%	0.26%	1.08%	0.76%	1.06%	0.92%
	2016	0.96%	1.28%	0.74%	0.91%	1.00%	1.36%	1.06%	0.62%	0.28%	0.64%	1.13%	1.18%	0.95%	0.94%	1.39%	0.72%	0.83%	0.77%	0.31%	1.11%	0.79%	1.10%	0.95%
	2017	0.98%	1.31%	0.79%	0.95%	1.03%	1.40%	1.12%	0.65%	0.33%	0.68%	1.16%	1.21%	0.99%	0.97%	1.40%	0.76%	0.85%	0.81%	0.37%	1.14%	0.83%	1.13%	0.97%
	2018	1.02%	1.35%	0.84%	0.98%	1.05%	1.47%	1.17%	0.69%	0.38%	0.73%	1.19%	1.26%	1.02%	1.01%	1.48%	0.80%	0.89%	0.86%	0.42%	1.17%	0.86%	1.17%	1.00%
	2019	1.06%	1.36%	0.89%	1.02%	1.08%	1.50%	1.23%	0.72%	0.42%	0.76%	1.22%	1.29%	1.05%	1.05%	1.49%	0.84%	0.90%	0.90%	0.47%	1.20%	0.89%	1.20%	1.03%
	2020	1.09%	1.39%	0.93%	1.04%	1.10%	1.55%	1.28%	0.75%	0.47%	0.80%	1.24%	1.31%	1.08%	1.08%	1.51%	0.88%	0.94%	0.94%	0.52%	1.22%	0.91%	1.23%	1.05%
	2021	1.12%	1.40%	0.97%	1.07%	1.12%	1.59%	1.32%	0.78%	0.50%	0.83%	1.27%	1.34%	1.11%	1.11%	1.54%	0.91%	0.97%	0.98%	0.56%	1.25%	0.93%	1.25%	1.07%
	2022	1.13%	1.42%	1.00%	1.09%	1.14%	1.63%	1.37%	0.81%	0.54%	0.87%	1.29%	1.37%	1.13%	1.13%	1.56%	0.94%	0.98%	1.01%	0.60%	1.27%	0.95%	1.27%	1.09%
	2023	1.17%	1.44%	1.04%	1.12%	1.16%	1.67%	1.41%	0.84%	0.58%	0.90%	1.32%	1.40%	1.16%	1.17%	1.61%	0.98%	1.01%	1.05%	0.65%	1.30%	0.98%	1.30%	1.12%
	2024	1.19%	1.48%	1.08%	1.15%	1.18%	1.71%	1.46%	0.87%	0.62%	0.94%	1.34%	1.43%	1.19%	1.19%	1.61%	1.01%	1.05%	1.09%	0.69%	1.32%	1.00%	1.33%	1.14%
	2025	1.24%	1.49%	1.12%	1.17%	1.20%	1.75%	1.50%	0.90%	0.66%	0.97%	1.37%	1.46%	1.22%	1.23%	1.61%	1.05%	1.06%	1.12%	0.74%	1.35%	1.03%	1.35%	1.16%
	2026	1.26%	1.50%	1.15%	1.20%	1.22%	1.80%	1.54%	0.93%	0.70%	1.01%	1.39%	1.48%	1.24%	1.25%	1.66%	1.08%	1.09%	1.16%	0.78%	1.37%	1.05%	1.38%	1.19%
	2027	1.28%	1.53%	1.18%	1.22%	1.24%	1.83%	1.58%	0.96%	0.73%	1.03%	1.41%	1.52%	1.27%	1.28%	1.71%	1.11%	1.11%	1.19%	0.82%	1.40%	1.07%	1.40%	1.20%
	2028	1.30%	1.55%	1.21%	1.25%	1.26%	1.87%	1.62%	0.98%	0.76%	1.06%	1.43%	1.53%	1.29%	1.31%	1.68%	1.14%	1.14%	1.22%	0.85%	1.42%	1.09%	1.43%	1.22%
	2029	1.33%	1.55%	1.24%	1.26%	1.27%	1.90%	1.65%	1.00%	0.79%	1.09%	1.44%	1.56%	1.31%	1.33%	1.72%	1.16%	1.15%	1.25%	0.89%	1.43%	1.11%	1.45%	1.24%
	2030	1.35%	1.57%	1.27%	1.28%	1.28%	1.92%	1.68%	1.03%	0.82%	1.11%	1.46%	1.58%	1.33%	1.35%	1.77%	1.18%	1.17%	1.27%	0.92%	1.45%	1.13%	1.47%	1.25%
	2031	1.38%	1.58%	1.29%	1.30%	1.29%	1.95%	1.71%	1.04%	0.84%	1.13%	1.47%	1.59%	1.35%	1.37%	1.73%	1.20%	1.19%	1.30%	0.95%	1.46%	1.14%	1.48%	1.26%
	2032	1.38%	1.60%	1.31%	1.31%	1.30%	1.98%	1.74%	1.05%	0.87%	1.15%	1.48%	1.61%	1.37%	1.38%	1.76%	1.22%	1.19%	1.32%	0.98%	1.48%	1.16%	1.50%	1.27%
	2033	1.40%	1.61%	1.33%	1.33%	1.31%	2.00%	1.77%	1.08%	0.89%	1.17%	1.49%	1.62%	1.38%	1.40%	1.80%	1.24%	1.21%	1.34%	1.01%	1.49%	1.16%	1.51%	1.28%
	2034	1.41%	1.61%	1.36%	1.34%	1.32%	2.02%	1.79%	1.09%	0.91%	1.19%	1.50%	1.64%	1.40%	1.41%	1.80%	1.26%	1.23%	1.37%	1.04%	1.51%	1.18%	1.53%	1.30%
	2035	1.44%	1.63%	1.38%	1.36%	1.33%	2.05%	1.82%	1.12%	0.94%	1.21%	1.51%	1.66%	1.42%	1.44%	1.80%	1.28%	1.25%	1.39%	1.07%	1.53%	1.20%	1.55%	1.31%
LOW	2011	-1.42%	1.93%	-0.88%	0.71%	0.64%	2.91%	0.14%	0.49%	0.03%	0.33%	2.08%	0.18%	0.70%	-0.20%	0.92%	0.92%	1.99%	1.40%	0.67%	-0.26%	1.47%	0.80%	0.45%
	2012	0.45%	0.67%	0.29%	0.42%	0.50%	0.64%	0.45%	0.30%	0.03%	0.25%	0.57%	0.60%	0.46%	0.44%	0.69%	0.34%	0.39%	0.33%	0.08%	0.56%	0.37%	0.54%	0.47%
	2013	0.47%	0.68%	0.33%	0.44%	0.52%	0.68%	0.49%	0.30%	0.06%	0.28%	0.58%	0.62%	0.48%	0.46%	0.73%	0.35%	0.40%	0.35%	0.10%	0.58%	0.39%	0.56%	0.49%
	2014	0.49%	0.70%	0.36%	0.47%	0.53%	0.71%	0.53%	0.31%	0.10%	0.31%	0.60%	0.63%	0.50%	0.49%	0.74%	0.36%	0.43%	0.38%	0.12%	0.59%	0.41%	0.58%	0.50%
	2015	0.51%	0.71%	0.39%	0.50%	0.55%	0.74%	0.56%	0.33%	0.13%	0.33%	0.62%	0.65%	0.52%	0.51%	0.79%	0.38%	0.43%	0.41%	0.15%	0.61%	0.43%	0.60%	0.52%
	2016	0.54%	0.73%	0.42%	0.52%	0.57%	0.77%	0.60%	0.35%	0.16%	0.36%	0.64%	0.67%	0.54%	0.53%	0.79%	0.41%	0.47%	0.43%	0.18%	0.63%	0.45%	0.63%	0.54%
	2017	0.55%	0.75%	0.45%	0.54%	0.58%	0.80%	0.64%	0.37%	0.18%	0.38%	0.66%	0.69%	0.56%	0.55%	0.80%	0.43%	0.48%	0.46%	0.21%	0.65%	0.47%	0.64%	0.55%
	2018	0.58%	0.77%	0.48%	0.56%	0.60%	0.84%	0.67%	0.39%	0.21%	0.41%	0.68%	0.72%	0.58%	0.58%	0.85%	0.45%	0.50%	0.49%	0.24%	0.66%	0.49%	0.66%	0.57%
	2019	0.60%	0.78%	0.50%	0.58%	0.61%	0.85%	0.70%	0.41%	0.24%	0.43%	0.69%	0.74%	0.60%	0.60%	0.85%	0.48%	0.51%	0.51%	0.27%	0.68%	0.50%	0.68%	0.59%
	2020	0.62%	0.79%	0.53%	0.59%	0.62%	0.89%	0.73%	0.43%	0.26%	0.45%	0.71%	0.75%	0.61%	0.61%	0.86%	0.50%	0.53%	0.53%	0.29%	0.70%	0.51%	0.70%	0.60%
	2021	0.64%	0.80%	0.55%	0.61%	0.64%	0.91%	0.75%	0.44%	0.29%	0.47%	0.72%	0.77%	0.63%	0.63%	0.88%	0.52%	0.55%	0.55%	0.32%	0.71%	0.53%	0.71%	0.61%
	2022	0.64%	0.81%	0.57%	0.62%	0.65%	0.93%	0.78%	0.46%	0.31%	0.49%	0.73%	0.78%	0.64%	0.64%	0.89%	0.53%	0.56%	0.58%	0.34%	0.72%	0.54%	0.72%	0.62%
	2023	0.67%	0.82%	0.59%	0.64%	0.66%	0.95%	0.81%	0.47%	0.33%	0.51%	0.75%	0.80%	0.66%	0.66%	0.92%	0.56%	0.58%	0.60%	0.37%	0.74%	0.56%	0.74%	0.64%
	2024	0.68%	0.84%	0.61%	0.65%	0.67%	0.98%	0.83%	0.49%	0.35%	0.53%	0.76%	0.82%	0.68%	0.68%	0.92%	0.57%	0.59%	0.62%	0.39%	0.75%	0.57%	0.76%	0.65%
	2025	0.71%	0.85%	0.63%	0.67%	0.69%	1.00%	0.86%	0.51%	0.37%	0.55%	0.78%	0.83%	0.69%	0.70%	0.92%	0.60%	0.60%	0.64%	0.42%	0.77%	0.58%	0.77%	0.66%
	2026	0.72%	0.86%	0.65%	0.68%	0.70%	1.03%	0.88%	0.53%	0.39%	0.57%	0.79%	0.85%	0.71%	0.71%	0.95%	0.61%	0.62%	0.66%	0.44%	0.78%	0.60%	0.79%	0.67%
	2027	0.73%	0.88%	0.67%	0.70%	0.71%	1.05%	0.90%	0.55%	0.41%	0.59%	0.80%	0.87%	0.72%	0.73%	0.98%	0.63%	0.63%	0.68%	0.46%	0.80%	0.61%	0.80%	0.68%
	2028	0.74%	0.89%	0.69%	0.71%	0.72%	1.07%	0.93%	0.56%	0.43%	0.60%	0.81%	0.87%	0.74%	0.74%	0.96%	0.65%	0.65%	0.70%	0.48%	0.81%	0.62%	0.81%	0.70%
	2029	0.76%	0.89%	0.71%	0.72%	0.72%	1.09%	0.94%	0.57%	0.45%	0.62%	0.82%	0.89%	0.75%	0.76%	0.98%	0.66%	0.65%	0.71%	0.50%	0.82%	0.63%	0.83%	0.70%
	2030	0.77%	0.90%	0.72%	0.73%	0.73%	1.10%	0.96%	0.58%	0.47%	0.63%	0.83%	0.90%	0.76%	0.77%	1.01%	0.67%	0.66%	0.73%	0.52%	0.83%	0.64%	0.84%	0.71%
	2031	0.79%	0.91%	0.73%	0.74%	0.74%	1.12%	0.98%	0.59%	0.48%	0.64%	0.84%	0.91%	0.77%	0.78%	0.99%	0.68%	0.68%	0.74%	0.54%	0.83%	0.65%	0.85%	0.72%
	2032	0.78%	0.91%	0.75%	0.75%	0.74%	1.14%	0.99%	0.60%	0.49%	0.65%	0.84%	0.92%	0.78%	0.79%	1.01%	0.70%	0.68%	0.75%	0.56%	0.85%	0.66%	0.85%	0.72%
	2033	0.80%	0.92%	0.76%	0.76%	0.75%	1.15%	1.01%	0.61%	0.51%	0.67%	0.85%	0.93%	0.79%	0.80%	1.03%	0.71%	0.69%	0.77%	0.57%	0.85%	0.66%	0.86%	0.73%
	2034	0.81%	0.92%	0.77%	0.77%	0.75%	1.16%	1.03%	0.62%	0.52%	0.68%	0.86%	0.94%	0.80%	0.81%	1.03%	0.72%	0.70%	0.78%	0.59%	0.86%	0.67%	0.87%	0.74%
	2035	0.82%	0.93%	0.79%	0.78%	0.76%	1.18%	1.04%	0.63%	0.53%	0.69%	0.86%	0.95%	0.81%	0.82%	1.03%	0.73%	0.71%	0.79%	0.61%	0.87%	0.68%	0.89%	0.75%

CASCADE NATURAL GAS CORPORATION®

2011 Integrated Resource Plan

Technical Advisory Group Meeting

March 10, 2011

Agenda

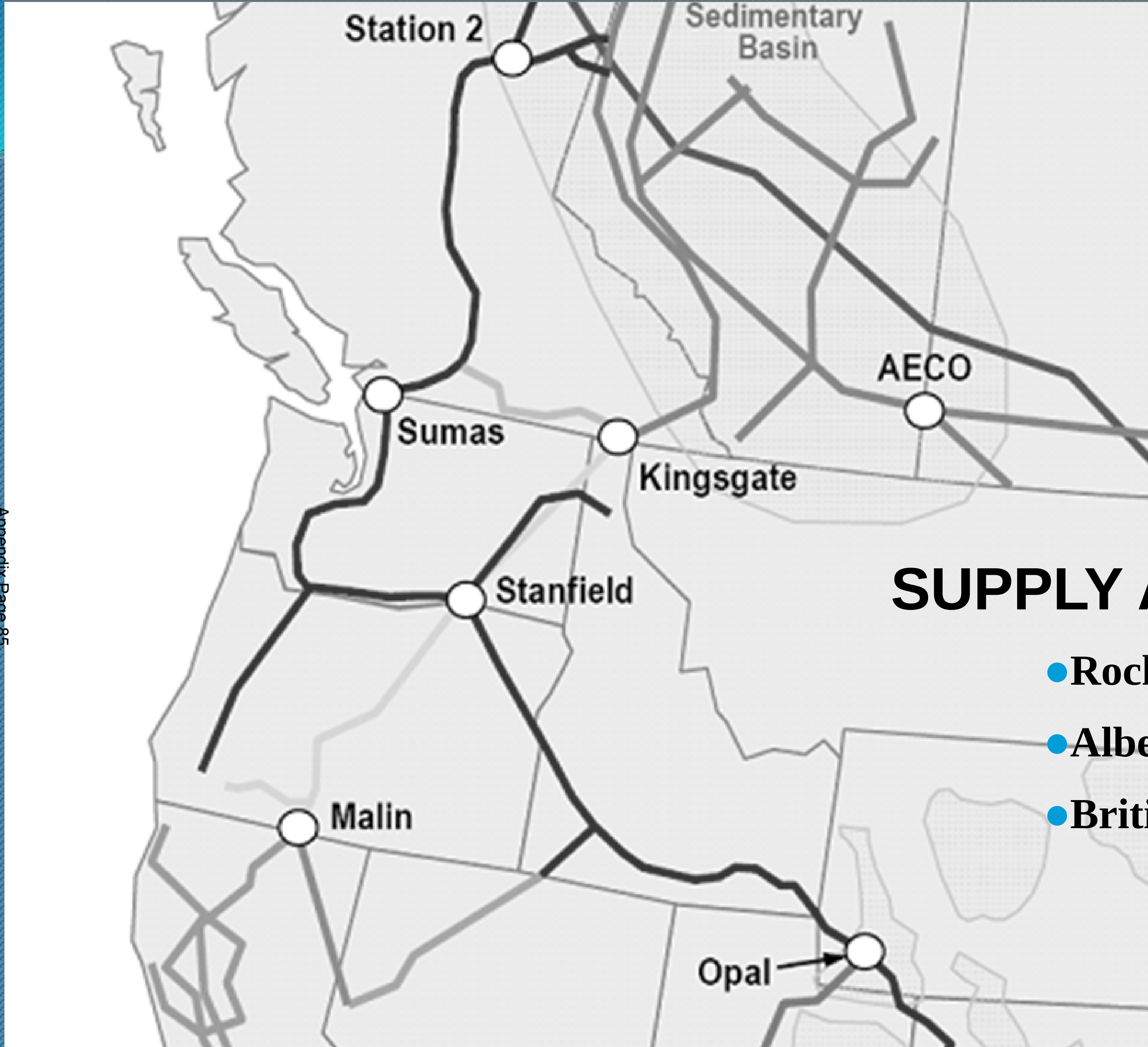
- Introductions
- Supply Side Resources
- Existing
- Challenges and Alternatives
- Production
- Price Forecast
- Proposed Scenarios and Model Elements for Supply Resources
- Closing Discussion
  - Future meeting dates/Other Comments

Supply Side Resource Overview

Mark Sellers-Vaughn
Manager, Supply Resource Planning

SUPPLY AREAS

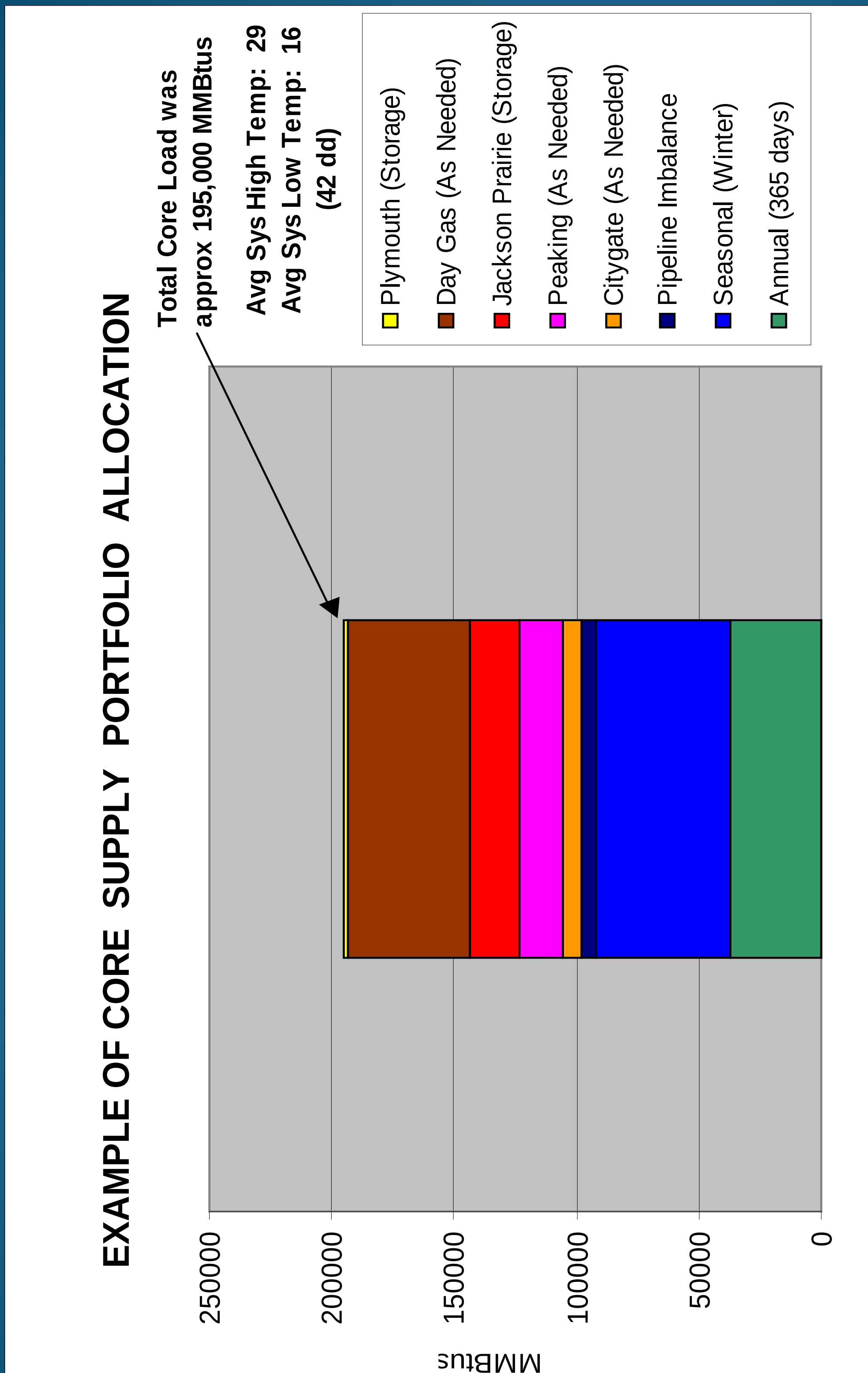
- Rocky Mountains
- Alberta
- British Columbia

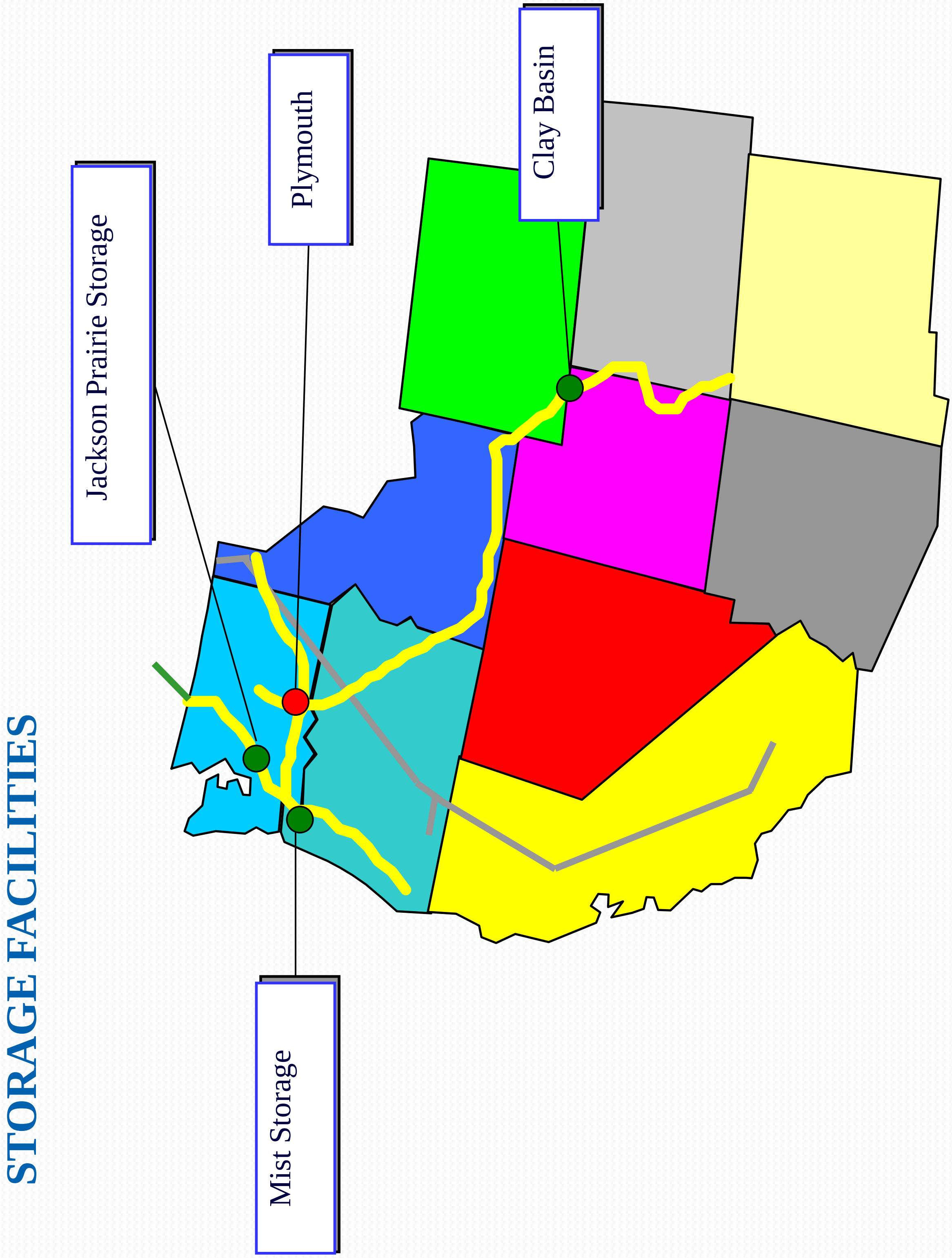


SUPPLY

Firm, Diversified Supply Contracts Based on Warmer-than-Normal Weather

- –Annual Supplies (some of these are previously entered contracts expiring over the next few years)
- –Traditional Seasonal Supplies (November – March)
- –Off-Seasonal Supplies (Spring, Summer, etc)
- –First of Month (Spot, Just-in-time, Day Gas)
- –City gate Deliveries
- –Peaking Supplies
- –Storage


EXAMPLE OF CORE SUPPLY PORTFOLIO ALLOCATION
Total Core Load was approx 195,000 MMBtus
Avg Sys High Temp: 29
Avg Sys Low Temp: 16
(42 dd)
MMBtus
250000
200000
150000
100000
50000
0
Plymouth (Storage)
Day Gas (As Needed)
Jackson Prairie (Storage)
Peaking (As Needed)
Citygate (As Needed)
Pipeline Imbalance
Seasonal (Winter)
Annual (365 days)


STORAGE FACILITIES
Jackson Prairie Storage
Plymouth
Clay Basin
Mist Storage

Storage

- Jackson Prairie #1
  - Seasonal Qty of 604,351 dths
  - Withdrawal capability 16,789 dths
  - Expires 10/31/2019
- Jackson Prairie #2
  - Seasonal Qty of 350,000 dths (2012)
  - Withdrawal capability 30,000 dths
  - Expires 10/31/2060
- Plymouth LNG
  - Seasonal Qty of 562,000 dths
  - Withdrawal capability of 60,000 dths
  - Expires 10/31/2019

Storage Management

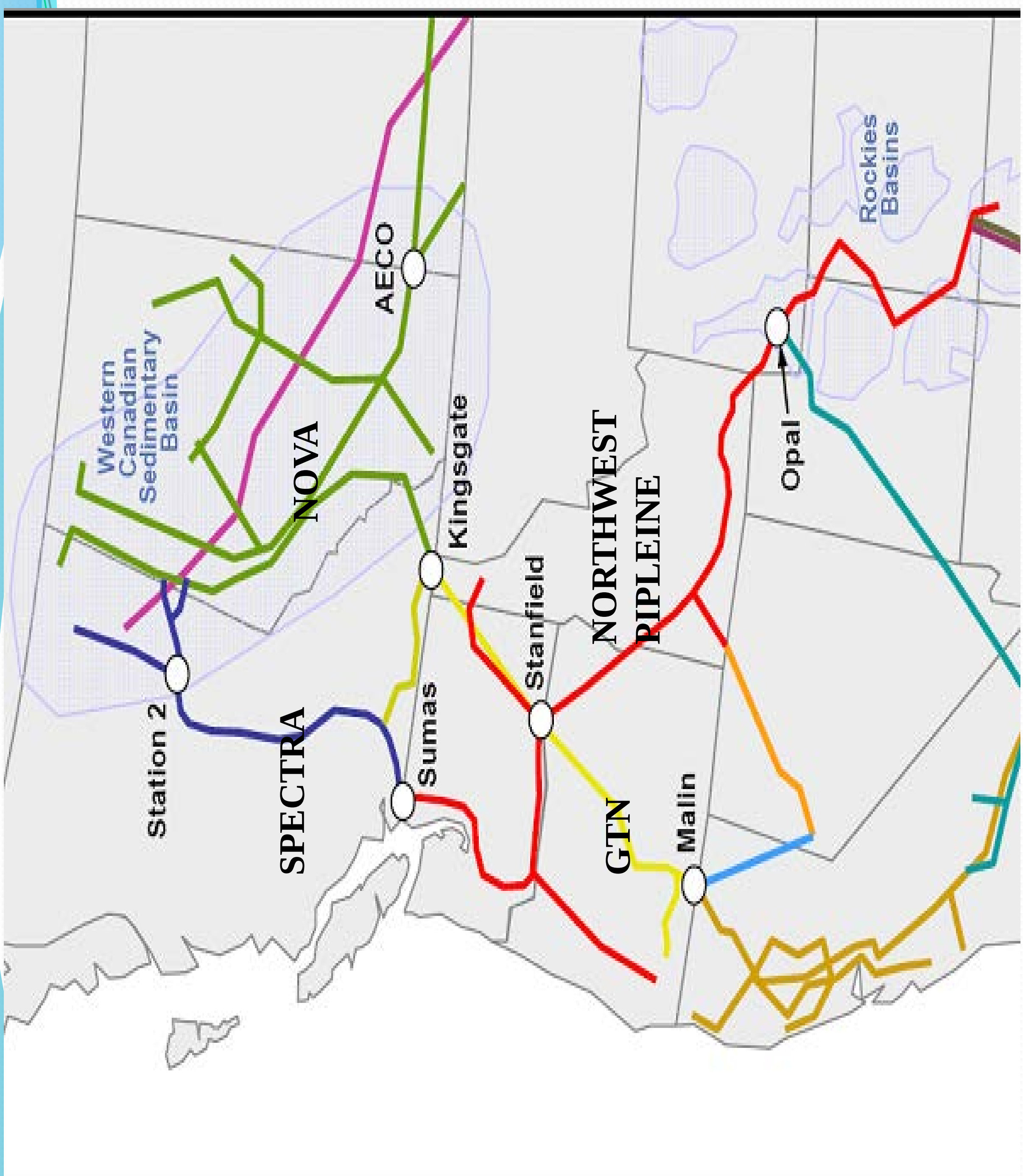
- We weigh storage usage versus Spot/Daily Supply Costs and operational conditions
- Typically CNG uses storage withdrawals in the winter and inject in the summer
- CNG allows others to manage our risk for a profit to the bottom line

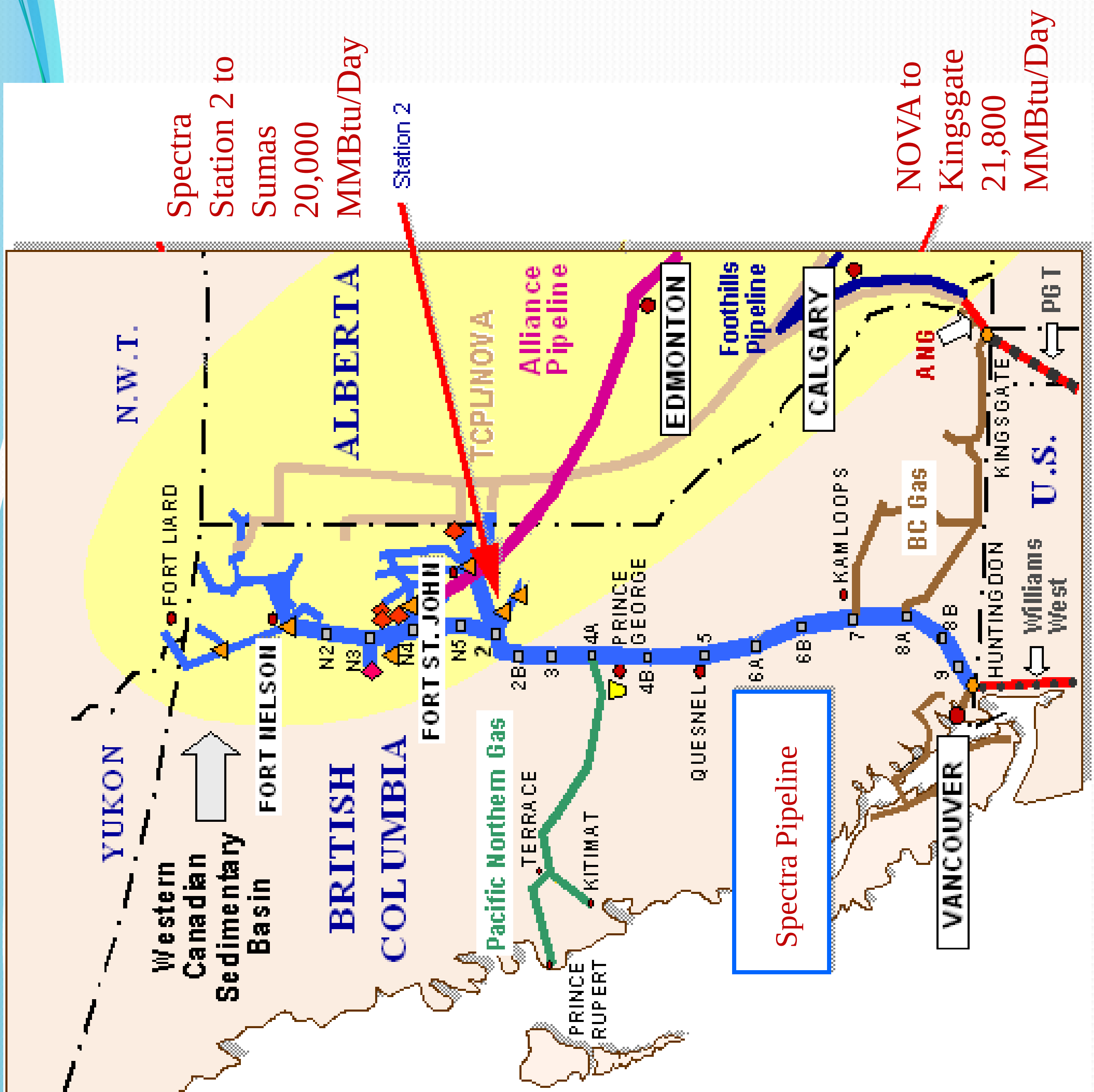
CAPACITY RESOURCES

INTERSTATE PIPELINE TRANSPORTATION

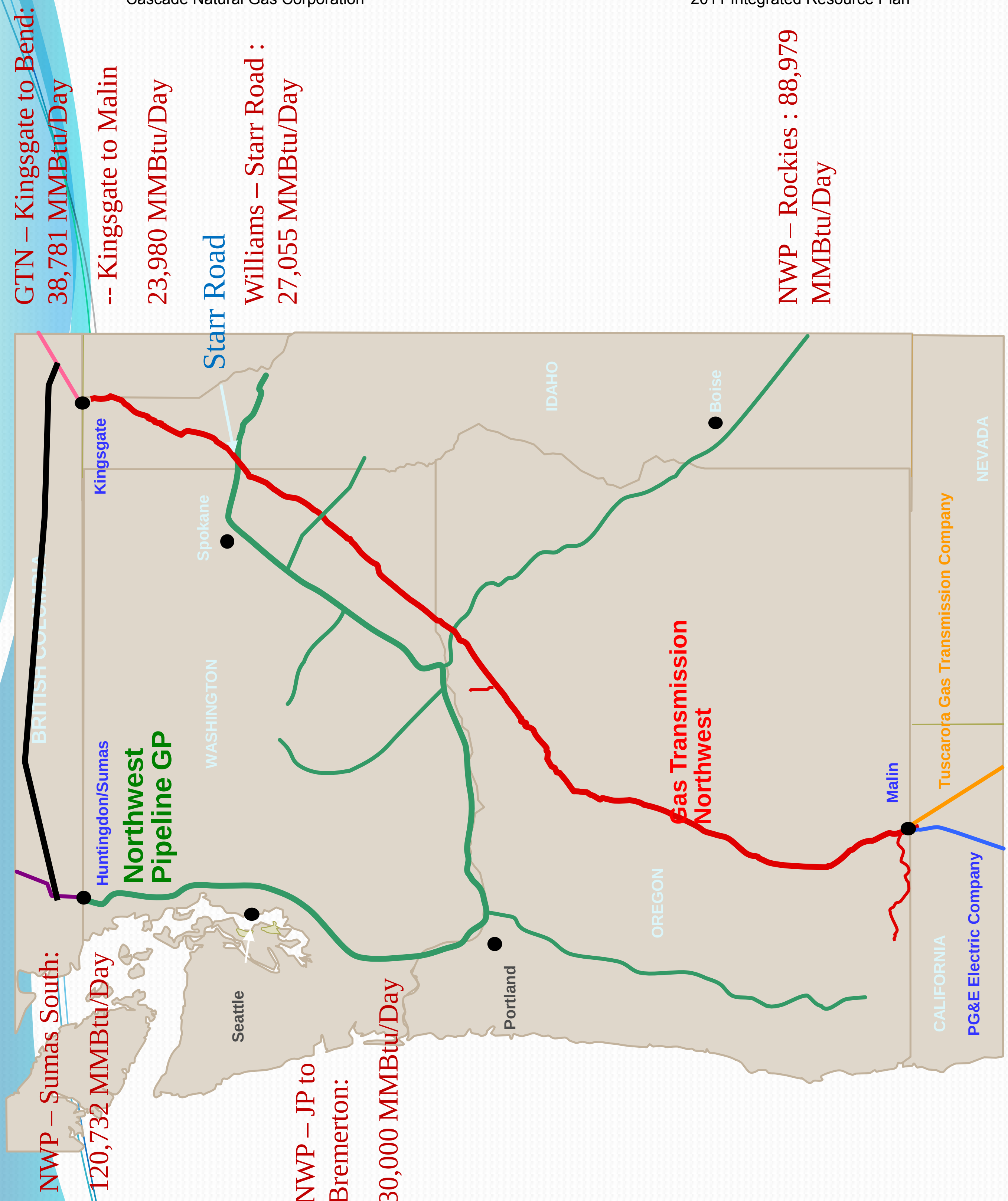
- NORTHWEST PIPELINE
- SPECTRA ENERGY (WESTCOAST)
- GAS TRANSMISSION NORTHWEST (GTN)
- FOOTHILLS PIPELINE (ANG)
- NOVA (NGTL)

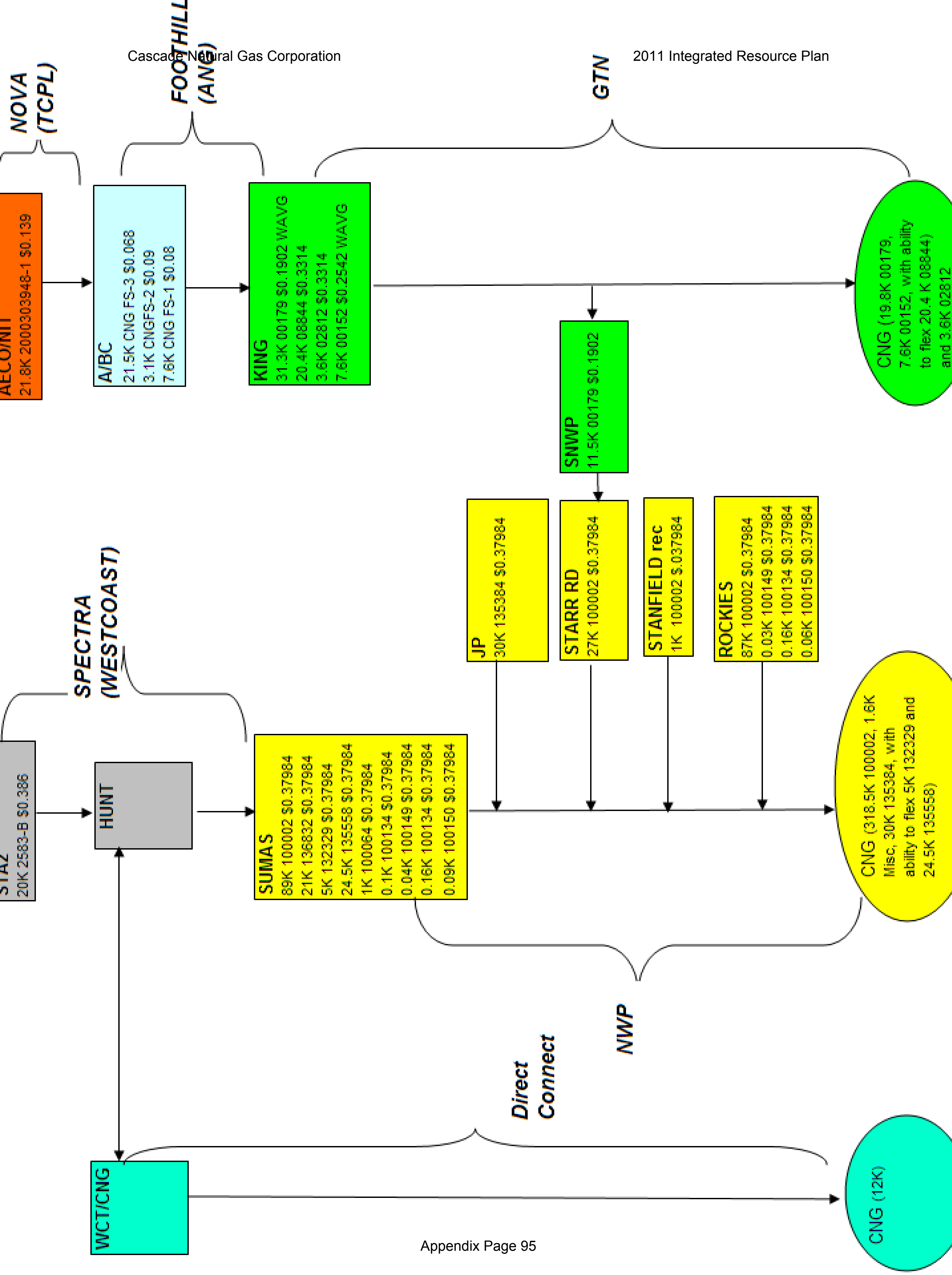
CAPACITY RELEASE ELECTRONIC BULLETIN BOARDS (EBB)


Western Canadian Sedimentary Basin
NOVA
AECO
Kingsgate
Station 2
SPECTRA
Sumas
Stanfield
NORTHWEST PIPLEINE
GTN
Malin
Opal
Rockies Basins

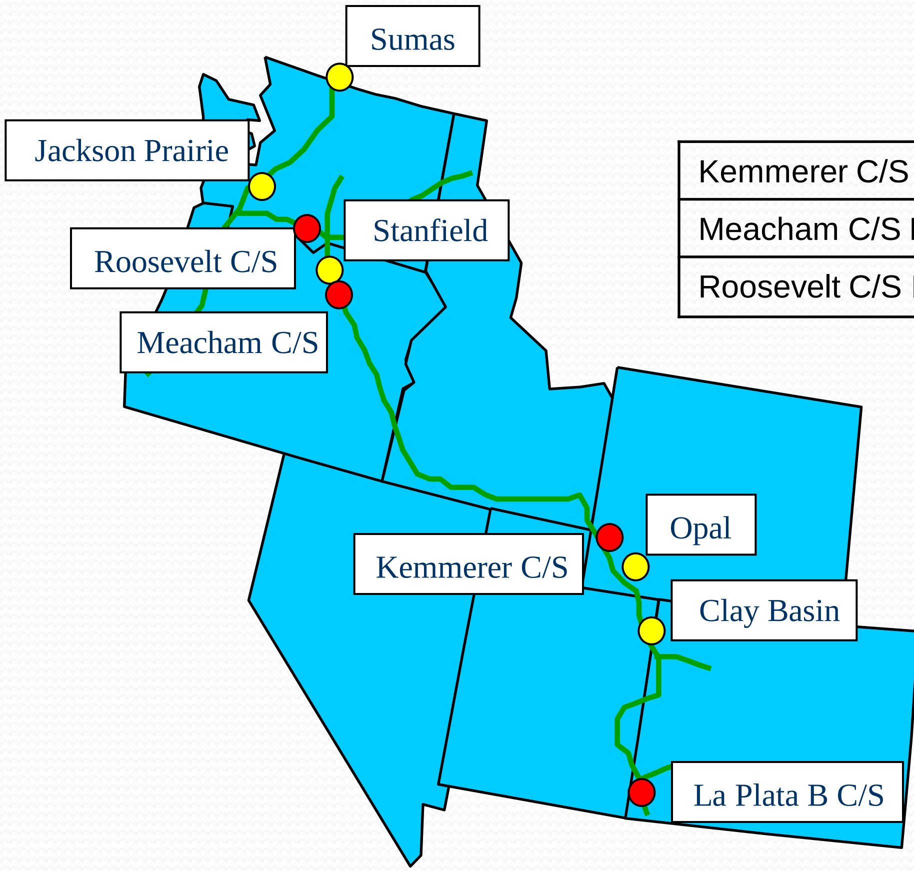


Spectra
Station 2 to
Sumas
20,000
MMBtu/Day
Station 2
NOVA to
Kingsgate
21,800
MMBtu/Day
N.W.T.
ALBERTA
TCPL/NOVA
Alliance
Pipeline
EDMONTON
Foothills
Pipeline
CALGARY
ANG
PGT
KINGSGATE
U.S.
BC Gas
KAMLOOPS
HUNTINGDON
Williams
West
VANCOUVER
Spectra Pipeline
QUESNEL
PRINCE
GEORGE
FORT ST. JOHN
FORT NELSON
FORT LIARD
N2
N3
N4
N5
2
2B
3
4A
4B
5
6A
6B
7
8A
8B
9
YUKON
Western
Canadian
Sedimentary
Basin
BRITISH
COLUMBIA
Pacific Northern Gas
TERRACE
KITIMAT
PRINCE
RUPERT


GTN – Kingsgate to Bend:
38,781 MMBtu/Day
-- Kingsgate to Malin
23,980 MMBtu/Day
Starr Road
Williams – Starr Road :
27,055 MMBtu/Day
NWP – Rockies : 88,979
MMBtu/Day
Kingsgate
IDAHO
Boise
NEVADA
Spokane
BRITISH COLUMBIA
WASHINGTON
Gas Transmission
Northwest
Tuscarora Gas Transmission Company
Malin
Huntingdon/Sumas
Northwest
Pipeline GP
OREGON
Seattle
Portland
CALIFORNIA
PG&E Electric Company
NWP – Sumas South:
120,732 MMBtu/Day
NWP – JP to
Bremerton:
30,000 MMBtu/Day

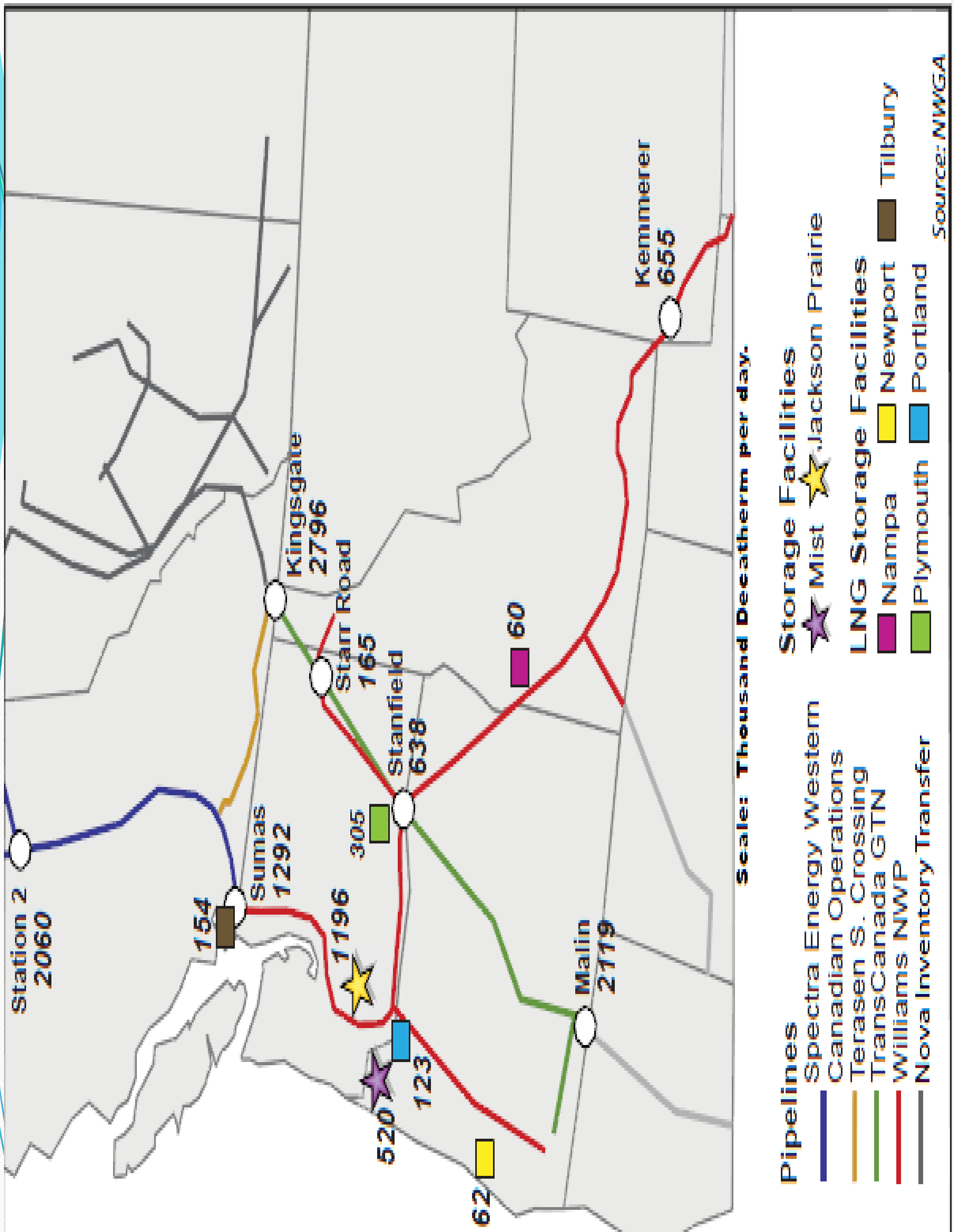

NOVA (TCPL)
FOOTHILLS (ANG)
GTN
AECO/NIT 21.8K 2000303948-1 $0.139
A/BC 21.5K CNG FS-3 $0.068 3.1K CNGFS-2 $0.09 7.6K CNG FS-1 $0.08
KING 31.3K 00179 $0.1902 WAVG 20.4K 08844 $0.3314 3.6K 02812 $0.3314 7.6K 00152 $0.2542 WAVG
CNG (19.8K 00179, 7.6K 00152, with ability to flex 20.4 K 08844) and 3.6K 02812
SNWP 11.5K 00179 $0.1902
JP 30K 135384 $0.37984
STARR RD 27K 100002 $0.37984
STANFIELD rec 1K 100002 $.037984
ROCKIES 87K 100002 $0.37984 0.03K 100149 $0.37984 0.16K 100134 $0.37984 0.06K 100150 $0.37984
SPECTRA (WESTCOAST)
STA2 20K 2583-B $0.386
HUNT
SUMAS 89K 100002 $0.37984 21K 136832 $0.37984 5K 132329 $0.37984 24.5K 135558 $0.37984 1K 100064 $0.37984 0.1K 100134 $0.37984 0.04K 100149 $0.37984 0.16K 100134 $0.37984 0.09K 100150 $0.37984
CNG (318.5K 100002, 1.6K Misc, 30K 135384, with ability to flex 5K 132329 and 24.5K 135558)
NWP
Direct Connect
WCT/CNG
CNG (12K)

Illustrative Constraint Points



	Physical Capacity	Primary Rights
Kemmerer C/S North Flow	655 MDth	721 MDth
Meacham C/S North Flow	440 MDth	573 MDth
Roosevelt C/S North Flow	544 MDth	804 MDth

	Physical Capacity	Primary Rights
Chehalis C/S South Flow	629 MDth	803 MDth
Roosevelt C/S South Flow	396 MDth	725 MDth
La Plata C/S South Flow	348 MDth	411 MDth


Station 2
2060
154
Sumas
1292
1196
305
Kingsgate
2796
Starr Road
165
Stanfield
638
520
123
62
60
Malin
2119
Kemmerer
655
Scale: Thousand Decatherm per day.
Pipelines
Spectra Energy Western
Canadian Operations
Terasen S. Crossing
TransCanada GTN
Williams NWP
Nova Inventory Transfer
Storage Facilities
Mist
Jackson Prairie
LNG Storage Facilities
Nampa
Newport
Tilbury
Plymouth
Portland
Source: NWGA

SUPPPLY SIDE RESOURCE OPTIONS and UNCERTAINTIES

STORAGE OPTIONS

Short Range Possibilities

- NWN MIST
- ON-SITE LIQUIFIED NATURAL GAS (SATELLITE LNG)
- TRUCKED-IN LNG
- POST ID2 EXCHANGES ABOVE THE BORDER
- CLAY BASIN

STORAGE OPTIONS

Longer Range Possibilities:

- ACQUISTION OF AECO STORAGE
- PACIFIC NORTHWEST LNG
- CALIFORNIA STORAGE
- JACKSON PRAIRIE EXPANSION
- PARTNERING WITH OTHERS TO BUILD STORAGE FACILITY

PROPOSED LNG TERMINALS AND PIPELINES

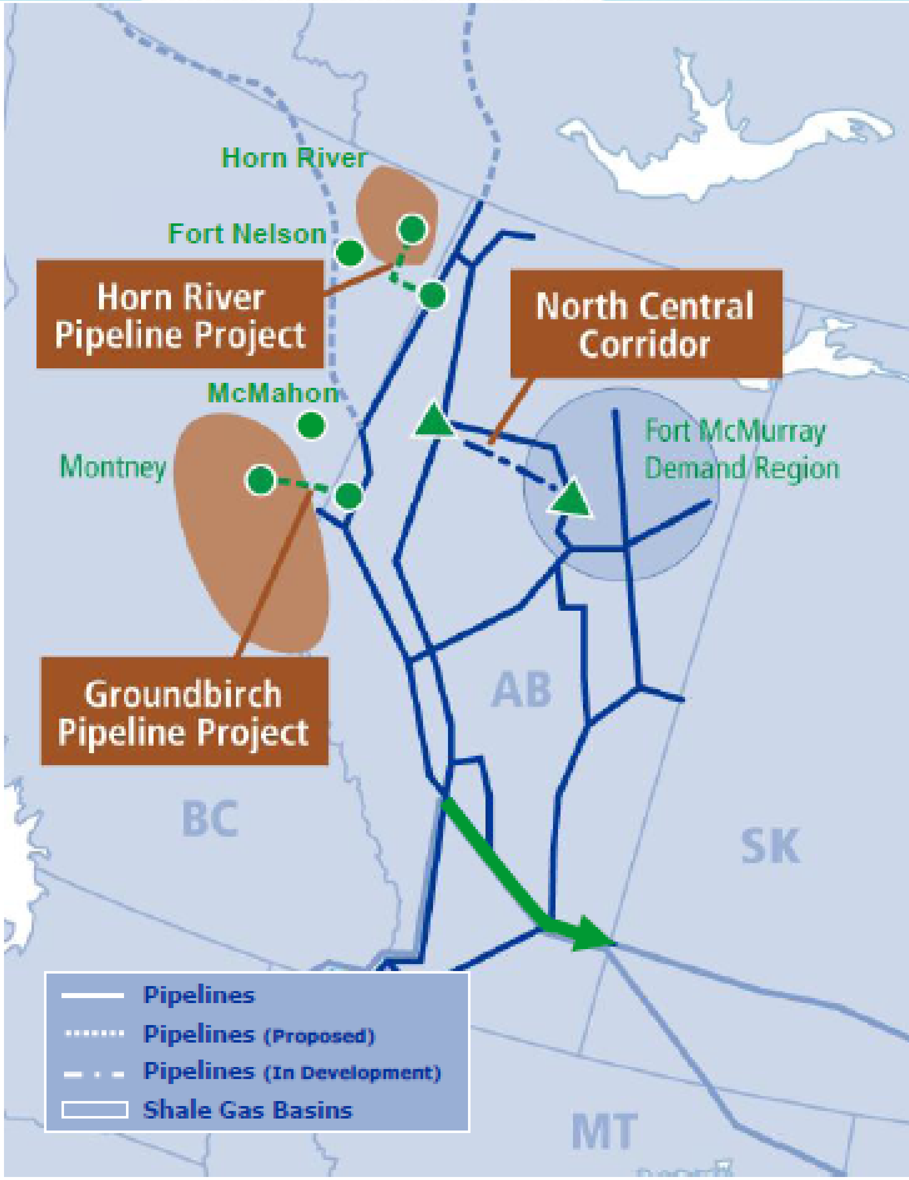
KITIMAT LNG--EXPORT
The 291-mile Pacific Trail Pipeline would connect natural gas from Spectra Energy Transmission's pipeline at Summit Lake, north of Prince George, BC, to the proposed Kitimat LNG export terminal in BC's Bish Cove.

OREGON LNG
117-mile pipeline would connect a terminal in Warrenton, Ore., to the existing NW Natural and Northwest Pipeline systems near Molalla, Ore.

JORDAN COVE
231-mile Pacific Connector Gas Pipeline would extend from the proposed terminal in Coos Bay, Ore., across southwest Oregon to the California border at Malin, Ore., to serve the Pacific Northwest and California markets.

BUT WILL LNG EVER ARRIVE IN THE PACIFIC NORTHWEST?

Alberta System Update



North Central Corridor
- 300 km of 42-inch pipe
- 26 MW of compression
- Approximately $925 million
- In-service 2010

Groundbirch Pipeline Project
- Commitments for 1.1 Bcf/d by 2014
- 77 km, 36-inch pipe
- Approximately $250 million
- Expected in-service Q4 2010

Horn River Pipeline Project
- Commitments for 378 MMcf/d in 2013
- 155 km combination of NPS 30 and existing pipe
- Approximately $340 million
- Expected in-service Q2 2012

AB Jurisdiction Application Approved
- Extend Alberta system across provincial borders
- Integrated service to AB and BC customers, and Northern gas producers

TransCanada

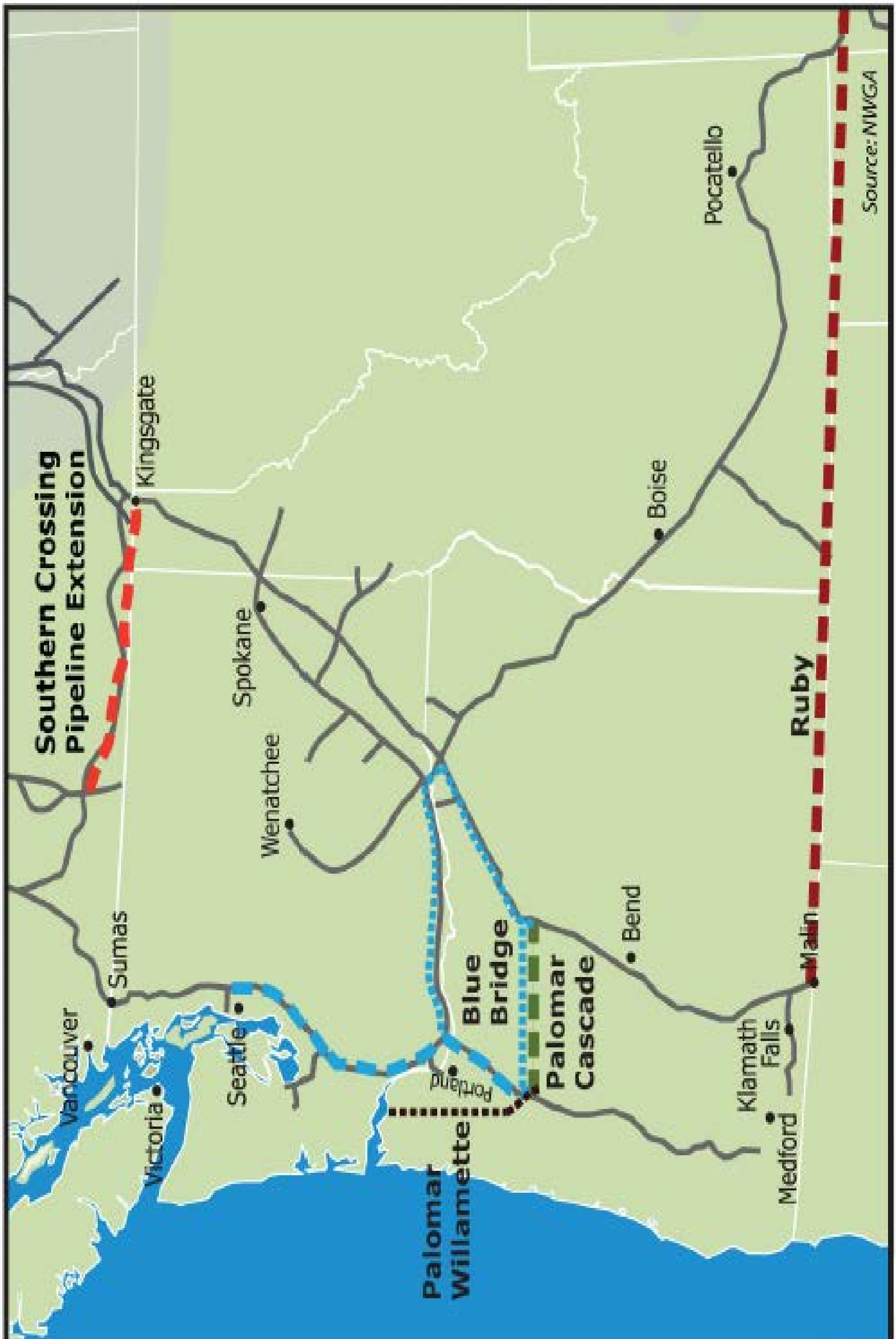
CAPACITY OPTIONS

- EXTENSION OF TERM FOR CITYGATE PURCHASES
- CONTINUE TO RECALL X85 CAPACITY, SPECIFICALLY ALONG THE WENATCHEE LATERAL WHICH ENSURES CORE WILL HAVE SUFFICIENT FIRM RIGHTS
  - EVEN AS GROWTH HAS TAPERED OFF THE LATERAL IS CONSTRAINED ON AN OVERALL BASIS, SO WE CONTINUE TO ENGAGE PARTIES
- TCPL-NOVA ADDITIONAL CAPACITY
- NWP RELINQUISHED CAPACITY OR EXPANSION
- PROPOSED PIPELINES

CAPACITY OPTIONS

Long Range Possibilities

- EXPAND CNG SYSTEM TO INTERCONNECT WITH OTHER NEAR-BY PIPELINES
- ACQUIRING CAPACITY ON OTHER ROCKIES PIPELINES (OVERTHRUST, CIG, ETC) TO ACCESS SUPPLIES
- POSSIBLE GTN EXPANSIONS ACROSS WASHINGTON (MOSES LAKE LINE), OREGON, OR BC (TCPL-GTN)
- EXTEND DIRECT CONNECT LINE FROM SPECTRA


Southern Crossing
Pipeline Extension
Kingsgate
Spokane
Wenatchee
Sumas
Vancouver
Victoria
Seattle
Portland
Blue
Bridge
Palomar
Cascade
Palomar
Willamette
Bend
Boise
Pocatello
Ruby
Malin
Klamath
Falls
Medford
Source: NWGA

SOUTHERN CROSSING PIPELINE EXTENSION

- Terasen Gas is developing
- Extend Southern Crossing from Oliver to Kingsvale BC
- 200 MMcf/d, possible expansion to 400 MMcf/d
- Bi-directional; new production from northern BC could flow to east via GTN or move AB gas into I-5 via Westcoast Spectra

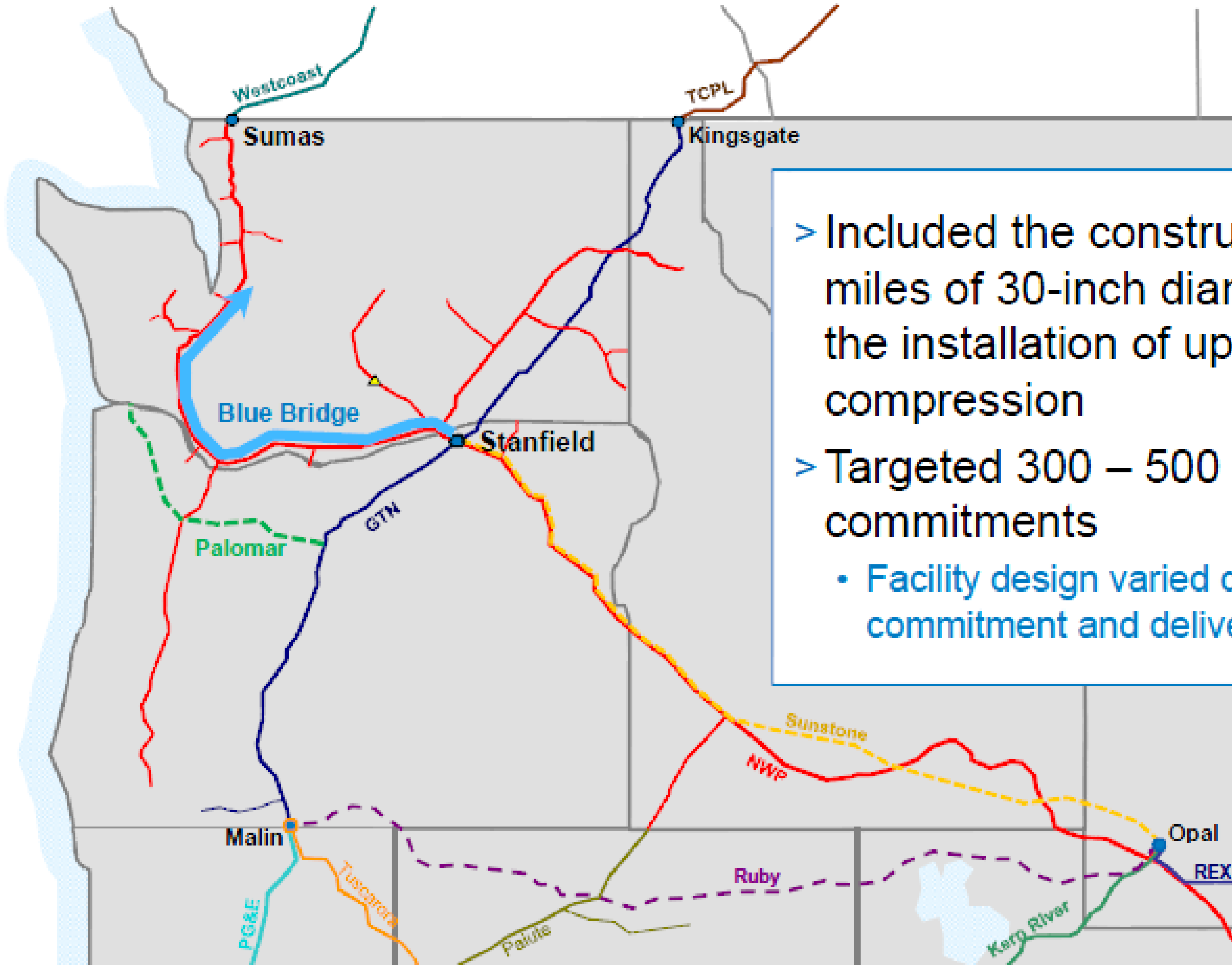
RUBY PIPELINE PROJECT

- Development by El Paso Natural Gas
- Approximately 675 miles of 42-inch diameter pipe
- From Opal Hub to Malin OR
- Initially 1.5 Bcf/day
- May have possible backhaul into GTN
- Construction is expected pending financial and final regulatory and environmental approval

PALOMAR PIPELINE PROJECT

- Joint development between TransCanada and Northwest Natural
- Approximately 217 miles of 36-inch diameter pipe
- GTN Mainline near Madras to Columbia River
- Interconnect with proposed Bradwood Landing LNG facility
- Pipeline planned irrespective of LNG facility online
- Bi-directional capacity of up to 1 Bcf/day
- Connects to Mist underground storage

Original Blue Bridge Expansion proposed in early-2008



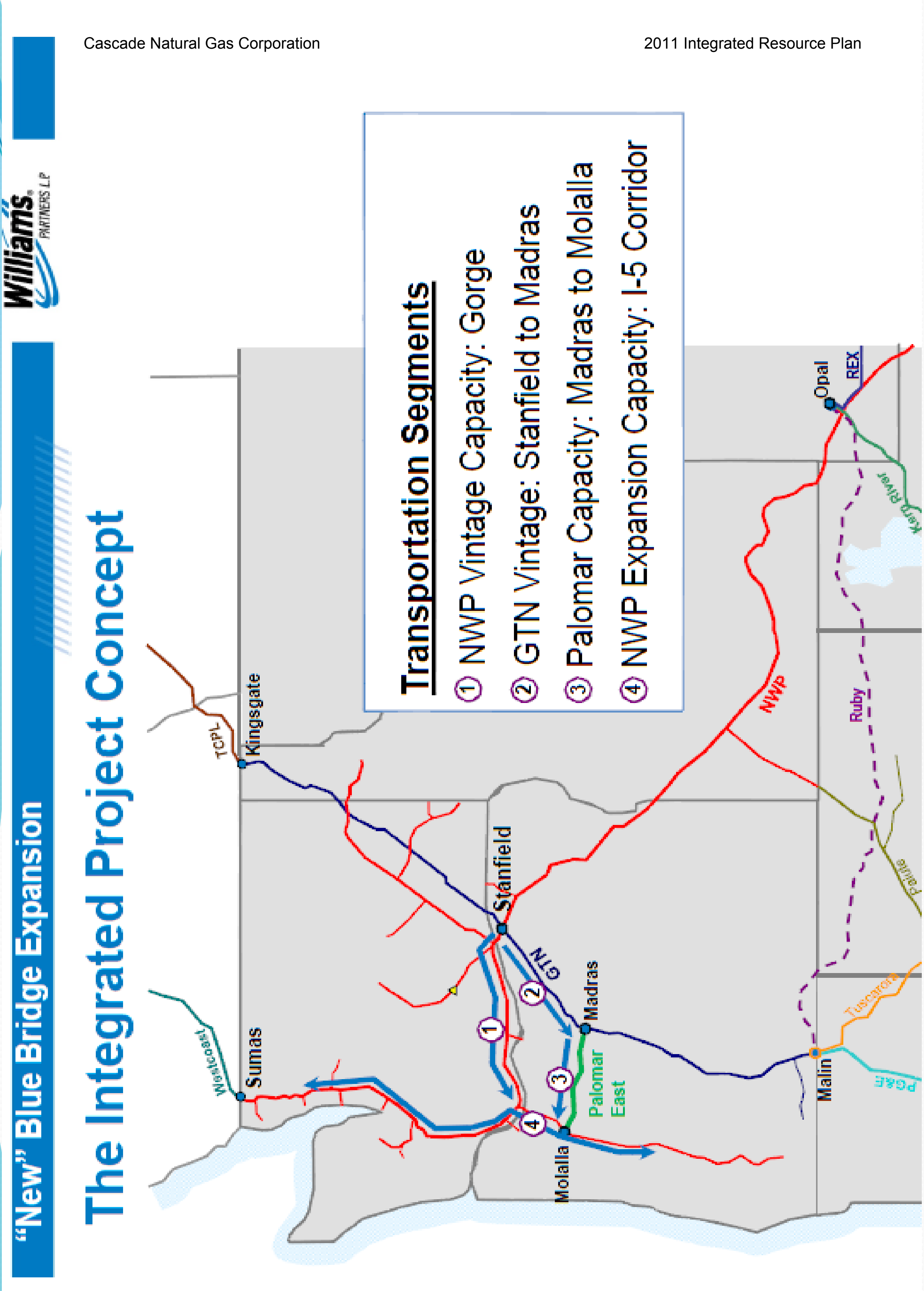
- > Included the construction of up to 156 miles of 30-inch diameter pipeline and the installation of up to 20,000 HP of compression
- > Targeted 300 – 500 MDth/d of commitments
  - Facility design varied depending on volume commitment and delivery pattern

"New" Blue Bridge Expansion

Project Reset – Regional Solution

> Northwest Pipeline entered into an MOU with Northwest Natural and TransCanada to explore the development of a new project
  - Applying the Blue Bridge concept using GTN and Palomar as the east-west leg

> The integrated project accomplishes several objectives:
  - Combines Oregon and Washington incremental gas demand in a single project
  - Later project timing is designed to meet the new growth forecasts
    - Replacement of coal-fired generation with gas-fired is a major wildcard
  - Ensures potential NW Natural turn-back capacity is utilized as part of the project to improve economics


"New" Blue Bridge Expansion
The Integrated Project Concept
Williams Partners L.P.
Transportation Segments
1 NWP Vintage Capacity: Gorge
2 GTN Vintage: Stanfield to Madras
3 Palomar Capacity: Madras to Molalla
4 NWP Expansion Capacity: I-5 Corridor
Westcoast
Sumas
TCPL
Kingsgate
Stanfield
GTN
Madras
Palomar East
Molalla
NWP
Ruby
Opal
REX
Kern River
Paiute
Tuscarora
Malin
PG&E

- Initiate Open Season in Spring 2011
- Approval of Precedent Agreements
- Revise FERC application and resume NEPA process
- Re-evaluate timing based on revised demand forecasts and better information on siting of new generation
- Adjust schedule below as needed

Schedule (based on earliest in-service date)

Spring 2011 – Open Season

2011/2012 – Revise FERC Application; Resume NEPA Process; DEIS; Comment Period and Public Meetings

2012/2013 – FERC Final EIS issued; FERC Certificate

2013/2014 – Obtain other required federal/state/local approvals

2013/2014 – ROW acquisition

2015/2016 – Construction

November 2016 – Earliest In-service date

CAPACITY ISSUES

TCPL-GTN

- **–Cannot file another rate filing before June 30, 2011 for a January 1, 2012 effective date**
- **–De-contracting continues to be an on-going concern, particularly if Ruby Pipeline happens or there is no firm backhaul capability**

TCPL-NOVA

- **–Mainline rate design will have an impact**
- **–Concerns regarding extraction rights**
- **–Significant issues Ft Nelson and McMahon expansions may impact rates and liquidity**

NWP

- **Must file a rate filing no later than July 1, 2012**

SPECTRA PIPELINE

- **Impacts to Station 2 as a result of TransCanada activities in BC**

OTHER SUPPLY SIDE RESOURCE OPTIONS

- NEGOTIATE ALTERNATE FUEL CONTRACTS WITH NON-CORE CUSTOMERS
- PROPANE AIR PLANTS
- ALASKAN GAS VIA SPECTRA AND/OR TCPL
- BIO-FUELS

Bio-fuels

- **Biofuels meet most of the growth in liquid fuels supply**
- **Biofuels grow, but fall short of the 36 billion gallon renewable fuels standards target in 2022, exceed it in 2035**
- **New light duty vehicle efficiency reaches 40 mpg by 2035**
- **As of today, we have yet to see a viable proposal for our service territory, however we continue to monitor activities in the area**

CARBON AND ENERGY POLICES

Policy makers continue to address climate change

Designed to change how we produce and use energy

Reduction greenhouse gas emissions, via technology, consumer grants, tax credits

Natural gas, as cleanest fossil fuel will be critical

CARBON AND ENERGY POLICES

Non-fossil energy use grows rapidly, but fossil fuels still provide the vast majority of total energy use in 2035

Demand increase

Pressure on supplies

To achieve emission goals there is the potential for increased prices via fees and taxes, or as a result of increased gas demand and competition for the resource

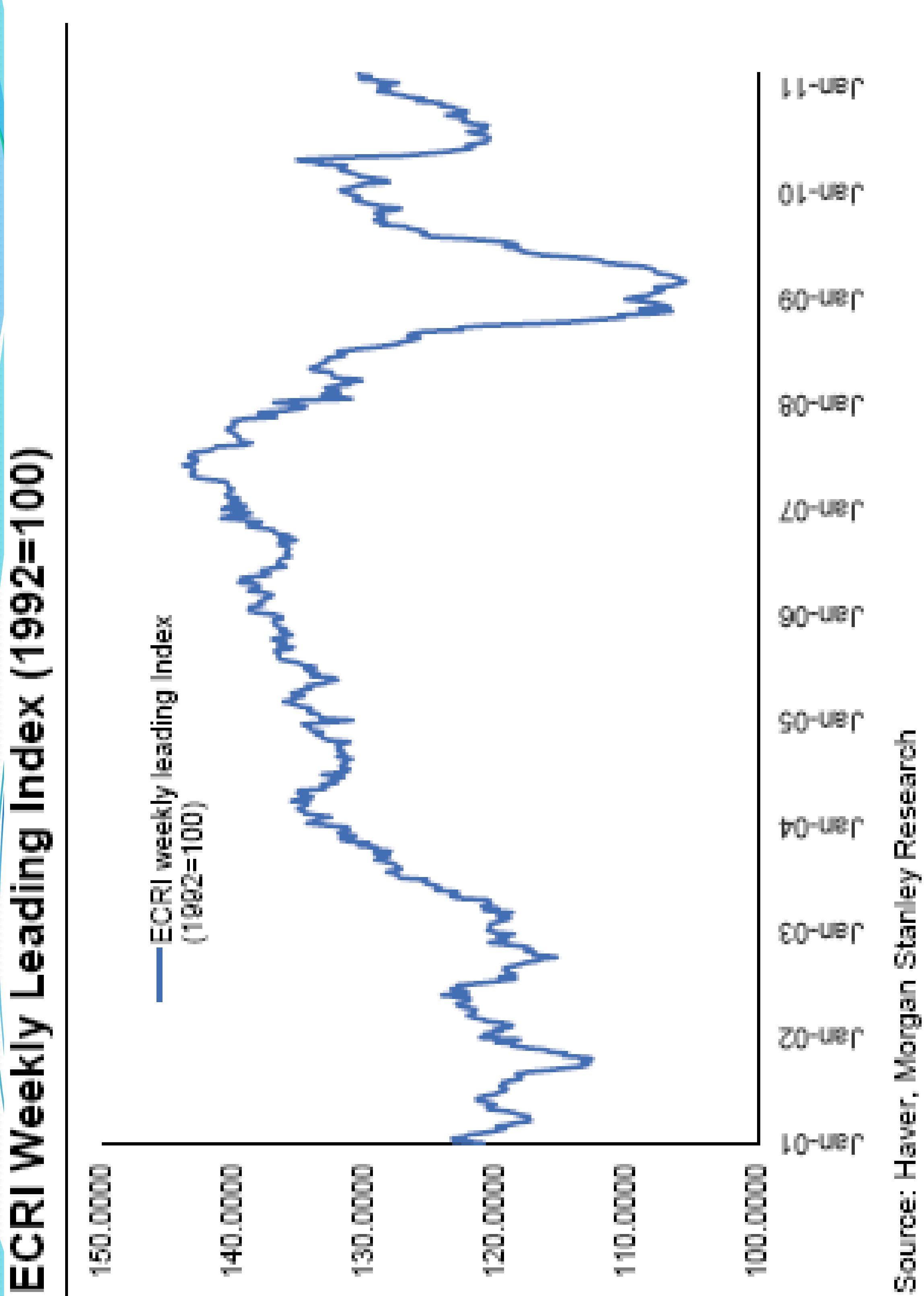
PRICING FORECAST

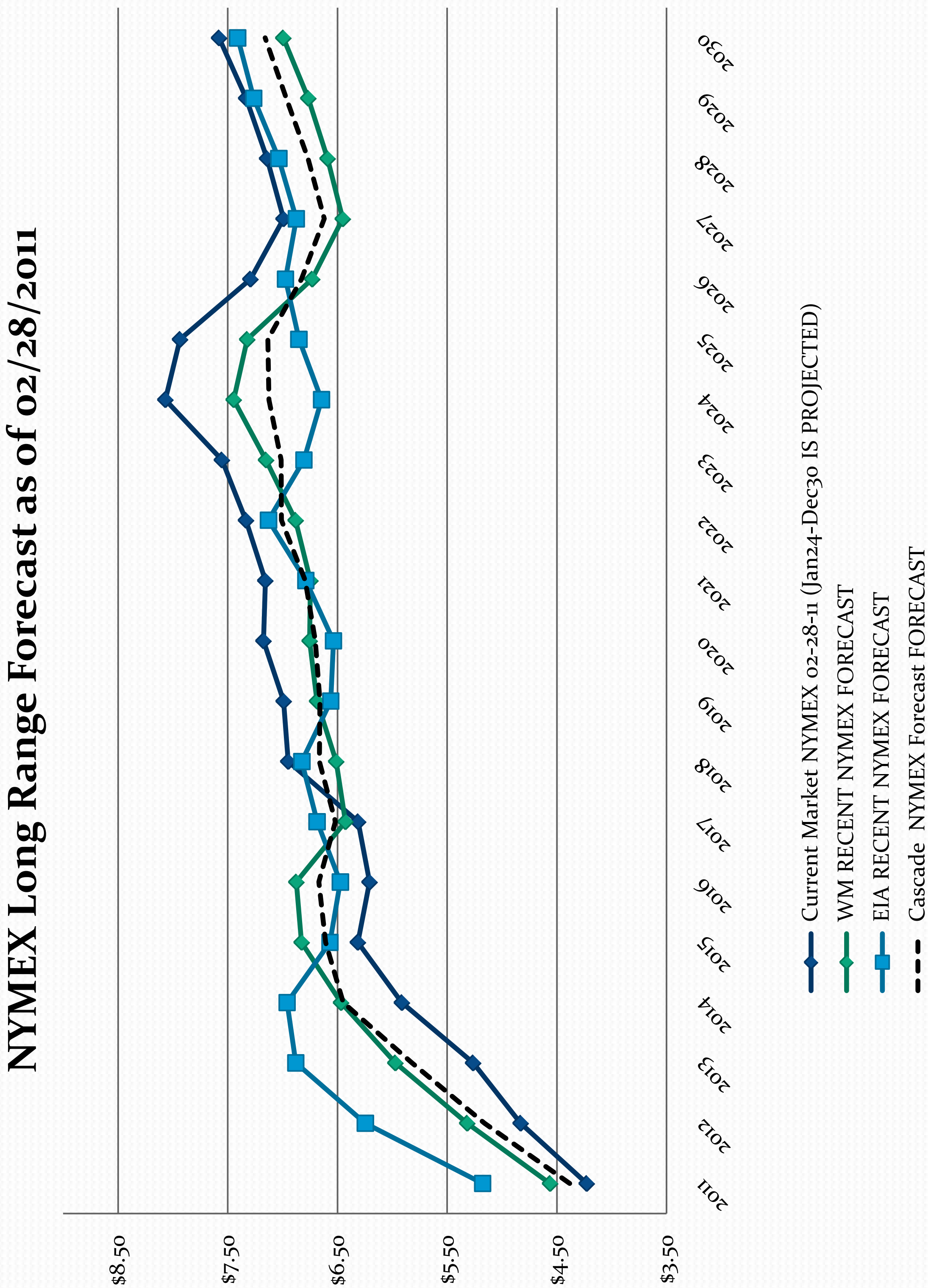
Natural Gas Price Drivers

Price Pressures

Natural Gas

- **Episodes of cold weather** *(upward price pressure)*
  Increased demand for space heating.
- **Coal-to-gas switching in power generation** *(upward price pressure)*
  If natural gas prices are sufficiently competitive to displace more coal as fuel for power generation; in some cases, gas units are moving from peaking service to baseload generation.
- **High levels of natural gas in storage** *(downward price pressure)*
- **Steady production levels of natural gas** *(downward price pressure)*
- **Larger than anticipated imports of LNG** *(downward price pressure)*
  Should European and Asian markets be unable to absorb available global LNG volumes, North America may become a market of last resort for some excess LNG cargoes).


ECRI Weekly Leading Index (1992=100)
ECRI weekly leading Index (1992=100)
150.0000
140.0000
130.0000
120.0000
110.0000
100.0000
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Source: Haver, Morgan Stanley Research


NYMEX Long Range Forecast as of 02/28/2011
$8.50
$7.50
$6.50
$5.50
$4.50
$3.50
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
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2029
2030
Current Market NYMEX 02-28-11 (Jan24-Dec30 IS PROJECTED)
WM RECENT NYMEX FORECAST
EIA RECENT NYMEX FORECAST
Cascade NYMEX Forecast FORECAST

WEIGHTS FOR PRICING SOURCES

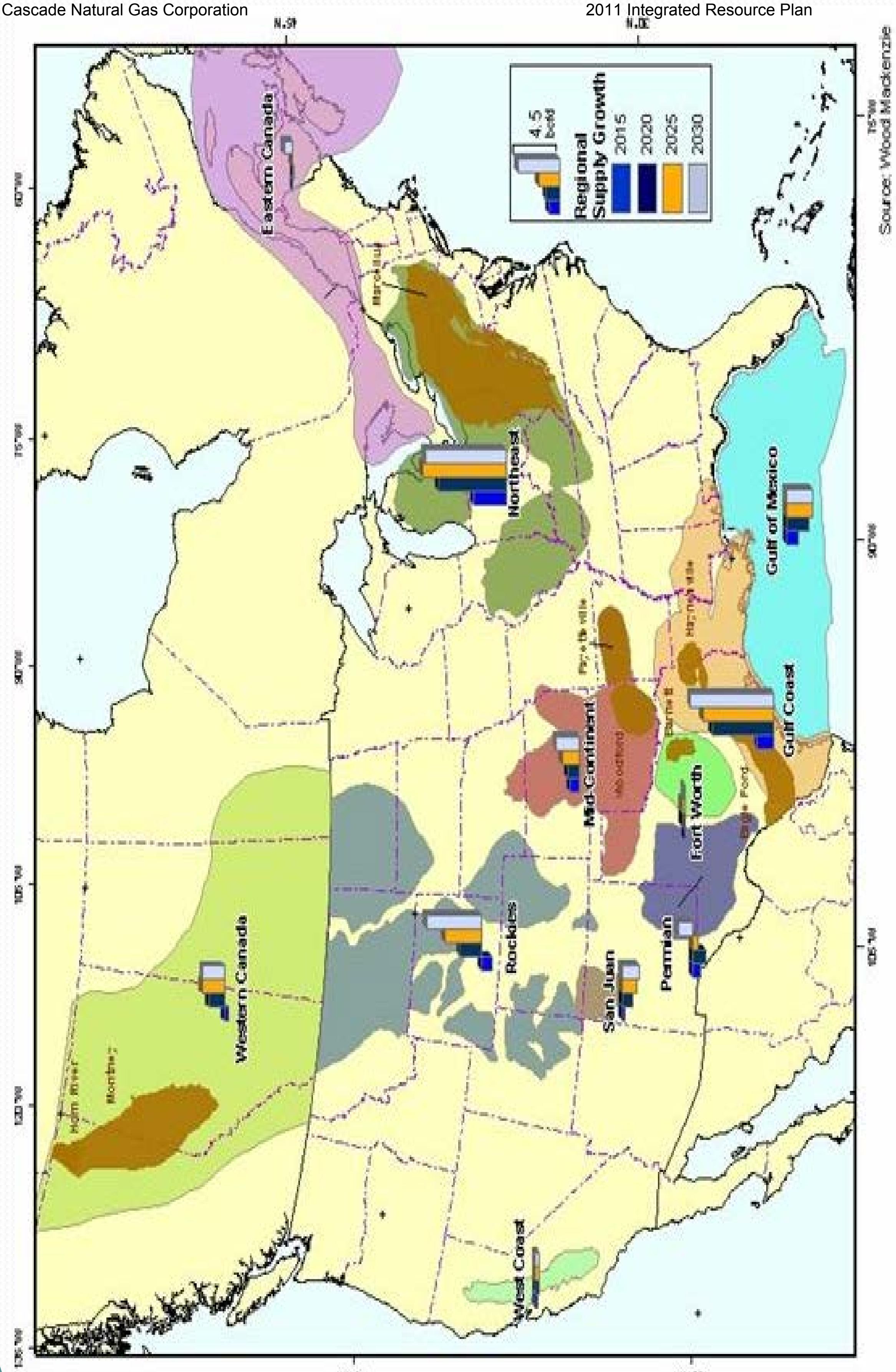
PERIOD	CURRENT NYMEX	WM DEC 10	FFC	OTHER	EIA
2011	70%	19%	1%	0%	10%
2012	60%	24%	1%	0%	15%
2013	50%	25%	1%	0%	24%
2014	33%	33%	0%	0%	33%
2015	25%	40%	0%	0%	35%
2016	8%	54%	0%	0%	39%
2017	8%	54%	0%	0%	39%
2018	8%	54%	0%	0%	39%
2019	8%	54%	0%	0%	39%
2020	8%	54%	0%	0%	39%
2021	8%	54%	0%	0%	39%
2022	8%	54%	0%	0%	39%
2023	0%	60%	0%	0%	40%
2024	0%	60%	0%	0%	40%
2025	0%	60%	0%	0%	40%
2026	0%	60%	0%	0%	40%
2027	0%	60%	0%	0%	40%
2028	0%	60%	0%	0%	40%
2029	0%	60%	0%	0%	40%
2030	0%	60%	0%	0%	40%

LONG-TERM FORECAST

	2010	2011	2012	2013	2014	2015	2020	2025	2030
US gas demand (bcfd)	65.3	65.1	64.4	63.7	65.0	66.5	76.2	80.4	88.1
US power sector gas demand (bcfd)	20.4	20.1	19.5	18.9	20.0	21.3	28.9	31.0	35.9
US gas supply (bcfd)	57.8	58.5	57.0	57.6	58.5	60.5	70.7	75.3	84.8
US shale gas supply (bcfd)	11.6	15.3	17.3	18.7	20.2	22.1	29.0	32.4	38.6
Canada exports to the US (bcfd)	6.9	6.1	5.5	4.9	5.0	5.2	6.3	7.0	6.6
Mexico imports from the US (bcfd)	0.6	0.5	0.7	0.5	0.6	0.9	1.9	2.3	3.1
US LNG imports (bcfd)	1.2	1.7	1.5	1.4	1.4	1.4	0.9	0.5	0.3
Henry Hub price (2010 $/mmbtu)		$4.56	$5.32	$5.97	$6.47	$6.83	$6.75	$7.32	$6.99
Henry Hub price (nominal $/mmbtu)		$4.75	$5.75	$6.78	$7.79	$8.38	$9.16	$10.96	$11.56
AECO price (2010 $/mmbtu)		$4.17	$4.92	$5.55	$6.03	$6.36	$6.04	$6.61	$6.03

Source: Wood Mackenzie

North American Supply Growth (Relative to 2010) by Region



PRODUCTION

- The Alaska pipeline project, designed to deliver 4.5 bcfd from Alaska’s North Slope into Alberta and/or the US Lower-48, is still not dead, with two competing projects still officially in the works.

- Lower-48 shale development has called into question the ultimate need for this project but indicators are that eventually it will get done around 2026Despite increased shale production, current pricing cannot sustain growth.

- Shale gas production, which accounts for about 14% of the US production this year, some sources believe shale is set to comprise more than a third of US production by the mid 2020’s—but not if the current modest pricing continues

PORTFOLIO PURCHASING STRATEGY

- **Ensure All Core Customers' Natural Gas Needs are Met -**
  - **–Through Disciplined Market Analysis and Supply Contracting**
- **Effectively Manage Wholesale and Retail Gas Prices –**
  - **–Through Cost-Effective Spot Purchases When Available**
  - **–Participating in pipeline regulatory proceedings to Ensure Lowest Pipeline Rates**
- **Mitigate Price Volatility for Customers -**
  - **–Through Multi-Year Hedging and a Diversified Portfolio, including both index and fixed price physical products**
- **Minimize Corporate Risk -**
  - **–Through the Use of Financial Derivatives**
- **Optimize Pipeline Capacity, Storage, and Other Core Resources -**
  - **–Through Available Release Mechanisms**

PROBABLE SCENARIOS

Reference case	Existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from various receipt points (AECO, Rockies, Sumas, Station 2, as well as behind the citygate. Incremental supplies also include satellite LNG (behind citygate), imported LNG, current upstream pipeline transport capacity, as well as proposed pipelines and extensions (Blue Bridge, Ruby, Palomar, Southern Crossing, etc.). We also include Cascade's current Jackson Prairie storage accounts and our Plymouth LNG account.
All Resources	Existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from various receipt points (AECO, Rockies, Sumas, Station 2, as well as behind the citygate (satellite LNG). Incremental supplies also include satellite LNG (behind citygate), imported LNG (Kitimat, Jordan Cove, Bradwood Landing), current upstream pipeline transport capacity, as well as proposed pipelines and extensions (Blue Bridge, Ruby, Palomar, etc). We also include Cascade's current Jackson Prairie storage accounts, our Plymouth LNG account, as well as the potential to obtain AECO and Mist storage.
Basecase Limited Canadian Imports	Model contains all the elements of the Basecase, but incremental Annual AECO and seasonal Sumas resources are unavailable to the model. Additionally, annual Sumas max is lowered from 100,000 to 50,000 dths. The intent to is to restrict the amount of Canadian imports by at least 20%

PROBABLE SCENARIOS

Basecase No Rockies price advantage	Model contains all the elements of the Basecase; however, all potential incremental resources were priced at NYMEX with no basis adder. In other words, incremental AECO, Sumas and Rockies all have the same price. Incremental resources at Station 2 were not available to the model. Transportation rates were not modified from their basecase levels.
Basecase AECO Storage	Model contains all the elements of the Basecase; however, AECO storage is added as a resource. The inventory is set at 300,000 dths, with daily withdrawal rights of 10,000 dths a day. This storage was setup like the existing Jackson Prairie to be 100% full at the start of each heating season. The model is set up so that Canadian withdrawals can use incremental GTN capacity.

IN ADDITION, WE WILL CREATE OTHER SCENARIOS

- The proposed pipelines at various discount pricing
- MIST storage
- Run each proposed pipeline separately
- Run various backhaul scenario
- Run pipeline stacking
- Give a price advantage to Sumas
- Look at a 20 year supply
- Create a short-term supply curtailment event for limited discussion

EXISTING SUPPLY RESOURCES

MODEL NAME	CATEGORY	OTHER CAT	RECEIPT	DELIVERY	PRICE INDEX	COMMODITY	DEMAND	BASE/SWIN	DEALSTAR	DEALENDDAT	MDQ IN DTHS	INDEX	FIXED
FIRM IFSUM	ANNUAL	EXISTING	SUMAS	NWP, GTN	IFERC SUMAS	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0400	
FIRM IF RM	ANNUAL	EXISTING	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0300	
FIRM NYM NIT	ANNUAL	EXISTING	AECO	NWP, GTN	NYMEX HH	YES		BASE	Pre-2011	2/28/2014	VARIABLE	$ 0.0150	
FIRM CGP NIT	ANNUAL	EXISTING	AECO	NWP, GTN	AECO (CGPR)	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0100	
FIRM FX NIT1	SEASONAL	EXISTING	AECO	NWP, GTN	FIXED			BASE	Pre-2011	2/28/2013	VARIABLE		$ 5.4900
FIRM CGP ST2	SEASONAL	EXISTING	STATION 2	NWP, GTN	AECO (CGPR)	YES		BASE	Pre-2011	4/1/2012	VARIABLE	$ 0.0467	
`	SEASONAL	EXISTING	SUMAS	NWP, GTN	FIXED			BASE	Pre-2011	10/31/2013	VARIABLE		$ 5.9800
PEAK 1	PEAKING	EXISTING	CITYGATE	NWP	GD SUMAS	YES	0.05	SWING	Pre-2011	3/1/2012	15000	$ 0.1800	
PEAK 2	PEAKING	EXISTING	CITYGATE	NWP	GD SUMAS			SWING	Pre-2011	4/1/2012	15000	FLAT	
PEAK 4	PEAKING	EXISTING	SUMAS	NWP	GD SUMAS	YES	0.03	SWING	Pre-2011	4/1/2012	5000	$ 0.0300	
FIRM I STAN	SEASONAL	EXISTING	STANIFIELD	NWP, GTN	IFERC SUMAS	YES		SWING	Pre-2011	3/31/2014	VARIABLE	$ (0.4700)	
PEAK 5	PEAKING	EXISTING	AECO	NWP, GTN	AECO (CGPR)	YES	0.1	SWING	Pre-2011	3/1/2011	5000	$ 0.0200	
FIRM FX NIT2	SEASONAL	EXISTING	AECO	NWP, GTN	FIXED			SWING	Pre-2011	2/29/2012	VARIABLE		$ 4.7800
FIRM FX ST2	SEASONAL	EXISTING	FIXED	NWP, GTN	FIXED			SWING	Pre-2011	12/1/2011	VARIABLE		$ 6.0800
FIRM GD ST2	SEASONAL	EXISTING	STATION 2	NWP, GTN	GD SUMAS	YES		SWING	Pre-2011	4/1/2012	10000	$ 0.0500	
FIRM FX RM2	SEASONAL	EXISTING	ROCKIES	NWP, GTN	FIXED			SWING	Pre-2011	3/31/2013	VARIABLE		$ 5.5000
FIRM STR RM	ANNUAL	EXISTING	ROCKIES	NWP, GTN	FIXED IF IF RM < $			BASE	Pre-2011	11/1/2014	1000 - 2500		
FIRM STR SUM	SEASONAL	EXISTING	SUMAS	NWP, GTN	IFSUM -.25 W/FLR			SWING	Pre-2011	3/1/2012	5000		
FIRM CG NIT	ANNUAL	EXISTING	CITYGATE	GTN	AECO (CGPR)	YES		BASE	Pre-2011	11/1/2014	VARIABLE	$ 0.3000	
FIRM GD SUM	SEASONAL	EXISTING	SUMAS	NWP, GTN	GD SUMAS	YES		SWING	Pre-2011	10/31/2012	VARIABLE	$ 0.0250	
FIRM CG SUM	SEASONAL	EXISTING	CITYGATE	NWP	IFERC SUMAS	YES		SWING	Pre-2011	3/1/2012	VARIABLE	$ 0.4200	

ALTERNATIVE SUPPLY RESOURCES

EL NAME	CATEGORY	OTHER CAT	RECEIPT	DELIVERY	PRICE INDEX	COMMODITY	DEMAND	BASE/SWIN	DEALSTAR	DEALENDDAT	MDQ IN DTHS	INDEX	FIXED
SPT SUM	SEASONAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
SPT NIT	SEASONAL	RMIX	AECO	GTN	AECO (CGPR)	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
SPT RM	SEASONAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
. SUM A	ANNUAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. RM A	ANNUAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. NIT A	ANNUAL	RMIX	AECO	GTN	AECO (CGPR)	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. SUM S	SEASONAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. RM S	SEASONAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. NIT S	SEASONAL	RMIX	AECO	GTN	AECO (CGPR)	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. ST2	SEASONAL	RMIX	STATION 2	NWP, GTN	GD SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
STRU SU	ANNUAL	RMIX	SUMAS	NWP, GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
STRU RM	ANNUAL	RMIX	ROCKIES	NWP, GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. STRU AE	ANNUAL	RMIX	AECO	GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. SUM FX	ANNUAL	RMIX	SUMAS	NWP, GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
. RM FX	ANNUAL	RMIX	ROCKIES	NWP, GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
. NIT FX	ANNUAL	RMIX	AECO	GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
. MAL	SEASONAL	RMIX	MALIN	BACKHAULS	MALIN	YES		SWING	11/1/2012	INCREMENTAL	VARIABLE	VARIABLE	
.NG	SEASONAL	RMIX	ZONAL	ZONAL	NYMEX HH	YES		SWING	11/1/2012	INCREMENTAL	VARIABLE	VARIABLE	
NG NOR	SEASONAL	RMIX	PALOMAR	BACKHAULS	NYMEX HH	YES		SWING	11/1/2015	INCREMENTAL	VARIABLE	VARIABLE	
NG SOR	SEASONAL	RMIX	PACIFIC CO	BACKHAULS	NYMEX HH	YES		SWING	11/1/2016	INCREMENTAL	VARIABLE	VARIABLE	
'ROP	SEASONAL	RMIX	ZONAL	ZONAL	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
. CG NWP	SEASONAL	RMIX	CITYGATE	NWP	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
	SEASONAL	RMIX	CITYGATE	GTN	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.0[illegible] < $0.15
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	Pre-2011	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	Partial access until 2012 when 350,000 is avail	2060	NA	300,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	Pre-2011	2014	NA	562,207	60,000	YES	SGS	YES
STORAGE 4	AECO STORAGE	Undergound	AECO	Yes	NA	2013	2030	NA	300,000	10,000	YES	AECO C STRG	YES
STORAGE 5	MIST STORAGE	Undergound	Mist	Yes	NA	2013	2030	NA	300,000	10,000	YES	MIST	YES
STORAGE 6	JP-SURPLUS	Undergound	Jackson Prairie	Yes	Yes	2012	2030	NA	300,000	5,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIABLE < $.10	FUEL < 3%
INCR-GTN	Nov-10	Oct-24	TBD	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000		YES	YES
INCR-NWP	Nov-10	Oct-24	TBD	Sumas to WA and OR citygates	NWP Rate X 3		NWP	UP TO 200,000		YES	YES
INCR-MAL	Oct-11	Dec-30	TBD	Malin backhaul to Central OR and Stanfield Interconnect	GTN Rate	2 years ?	GTN	UP TO 50,000		YES	YES
BLUEBRDIGE	Nov-11	Dec-30	TBD	Stanfield and/or Stanfield Interconnect to I-5 Corridor	NWP Rate X 3	2 years	NWP, PALOMAR ?	UP TO 50,000		YES	YES
RUBY XPORT	Nov-12	Dec-30	TBD	Opal Hub to Mailin	0.95	< 2 years	RUBY	UP TO 50,000		YES	YES
PALOMAR XPORT	Nov-15	Dec-30	TBD	Madras OR to Molalla OR (bi-directional)	NWP Rate X 3	> 3years	PALOMAR	UP TO 50,000		YES	YES
PAC CONNECT	Nov-15	Dec-30	TBD	Jordona Cove OR to Malin	NWP Rate X 3	> 4 years	PAC CONNECT	UP TO 50,000		YES	YES

Assumes runs WITH evergreen and WITHOUT evergreen provisions

Other thoughts, questions, concerns…

- **Are there other ideas or concerns that you feel need to be addressed?**
- **Are there other alternatives we should consider?**

2011 Integrated Resource Plan

PLANNED SUPPLY RESOURCES FOR 2011 IRP

MODEL NAME	CATEGORY	OTHER CAT	RECEIPT	DELIVERY	PRICE INDEX	COMMODITY	DEMAND	BASE/SWIN	DEALSTART	DEALENDDAT	MDQ IN DTHS	INDEX	FIXED
FIRM IFSUM	ANNUAL	EXISTING	SUMAS	NWP, GTN	IFERC SUMAS	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0400	
FIRM IF RM	ANNUAL	EXISTING	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0300	
FIRM NYM NIT	ANNUAL	EXISTING	AECO	NWP, GTN	NYMEX HH	YES		BASE	Pre-2011	2/28/2014	VARIABLE	$ 0.0150	
FIRM CGP NIT	ANNUAL	EXISTING	AECO	NWP, GTN	AECO (CGPR)	YES		BASE	Pre-2011	3/31/2014	VARIABLE	$ 0.0100	
FIRM FX NIT1	SEASONAL	EXISTING	AECO	NWP, GTN	FIXED			BASE	Pre-2011	2/28/2013	VARIABLE		$ 5.4900
FIRM CGP ST2	SEASONAL	EXISTING	STATION 2	NWP, GTN	AECO (CGPR)	YES		BASE	Pre-2011	4/1/2012	VARIABLE	$ 0.0467	
`	SEASONAL	EXISTING	SUMAS	NWP, GTN	FIXED			BASE	Pre-2011	10/31/2013	VARIABLE		$ 5.9800
PEAK 1	PEAKING	EXISTING	CITYGATE	NWP	GD SUMAS	YES	0.05	SWING	Pre-2011	3/1/2012	15000	$ 0.1800	
PEAK 2	PEAKING	EXISTING	CITYGATE	NWP	GD SUMAS			SWING	Pre-2011	4/1/2012	15000	FLAT	
PEAK 4	PEAKING	EXISTING	SUMAS	NWP	GD SUMAS	YES	0.03	SWING	Pre-2011	4/1/2012	5000	$ 0.0300	
FIRM I STAN	SEASONAL	EXISTING	STANIFIELD	NWP, GTN	IFERC SUMAS	YES		SWING	Pre-2011	3/31/2014	VARIABLE	$ (0.4700)	
PEAK 5	PEAKING	EXISTING	AECO	NWP, GTN	AECO (CGPR)	YES	0.1	SWING	Pre-2011	3/1/2011	5000	$ 0.0200	
FIRM FX NIT2	SEASONAL	EXISTING	AECO	NWP, GTN	FIXED			SWING	Pre-2011	2/29/2012	VARIABLE		$ 4.7800
FIRM FX ST2	SEASONAL	EXISTING	FIXED	NWP, GTN	FIXED			SWING	Pre-2011	12/1/2011	VARIABLE		$ 6.0800
FIRM GD ST2	SEASONAL	EXISTING	STATION 2	NWP, GTN	GD SUMAS	YES		SWING	Pre-2011	4/1/2012	10000	$ 0.0500	
FIRM FX RM2	SEASONAL	EXISTING	ROCKIES	NWP, GTN	FIXED			SWING	Pre-2011	3/31/2013	VARIABLE		$ 5.5000
FIRM STR RM	ANNUAL	EXISTING	ROCKIES	NWP, GTN	FIXED IF IF RM < $			BASE	Pre-2011	11/1/2014	1000 - 2500		
FIRM STR SUM	SEASONAL	EXISTING	SUMAS	NWP, GTN	IFSUM -.25 W/FLR			SWING	Pre-2011	3/1/2012	5000		
FIRM CG NIT	ANNUAL	EXISTING	CITYGATE	GTN	AECO (CGPR)	YES		BASE	Pre-2011	11/1/2014	VARIABLE	$ 0.3000	
FIRM GD SUM	SEASONAL	EXISTING	SUMAS	NWP, GTN	GD SUMAS	YES		SWING	Pre-2011	10/31/2012	VARIABLE	$ 0.0250	
FIRM CG SUM	SEASONAL	EXISTING	CITYGATE	NWP	IFERC SUMAS	YES		SWING	Pre-2011	3/1/2012	VARIABLE	$ 0.4200	
FIRM SPT SUM	SEASONAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
FIRM SPT NIT	SEASONAL	RMIX	AECO	GTN	AECO (CGPR)	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
FIRM SPT RM	SEASONAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE		
INCR SUM A	ANNUAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR RM A	ANNUAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR NIT A	ANNUAL	RMIX	AECO	GTN	AECO (CGPR)	YES		BASE	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR SUM S	SEASONAL	RMIX	SUMAS	NWP, GTN	IFERC SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR RM S	SEASONAL	RMIX	ROCKIES	NWP, GTN	IFERC ROCKIES	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR NIT S	SEASONAL	RMIX	AECO	GTN	AECO (CGPR)	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR ST2	SEASONAL	RMIX	STATION 2	NWP, GTN	GD SUMAS	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR STRU SU	ANNUAL	RMIX	SUMAS	NWP, GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR STRU RM	ANNUAL	RMIX	ROCKIES	NWP, GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR STRU AE	ANNUAL	RMIX	AECO	GTN	STRUCTURED			SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR SUM FX	ANNUAL	RMIX	SUMAS	NWP, GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
INCR RM FX	ANNUAL	RMIX	ROCKIES	NWP, GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
INCR NIT FX	ANNUAL	RMIX	AECO	GTN	FIXED			BASE	11/1/2011	INCREMENTAL	VARIABLE		
INCR MAL	SEASONAL	RMIX	MALIN	BACKHAULS	MALIN	YES		SWING	11/1/2012	INCREMENTAL	VARIABLE	VARIABLE	
SAT LNG	SEASONAL	RMIX	ZONAL	ZONAL	NYMEX HH	YES		SWING	11/1/2012	INCREMENTAL	VARIABLE	VARIABLE	
IMP LNG NOR	SEASONAL	RMIX	PALOMAR	BACKHAULS	NYMEX HH	YES		SWING	11/1/2015	INCREMENTAL	VARIABLE	VARIABLE	
IMP LNG SOR	SEASONAL	RMIX	PACIFIC CON	BACKHAULS	NYMEX HH	YES		SWING	11/1/2016	INCREMENTAL	VARIABLE	VARIABLE	
SAT PROP	SEASONAL	RMIX	ZONAL	ZONAL	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR CG NWP	SEASONAL	RMIX	CITYGATE	NWP	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	
INCR CG GTN	SEASONAL	RMIX	CITYGATE	GTN	NYMEX HH	YES		SWING	11/1/2011	INCREMENTAL	VARIABLE	VARIABLE	

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Potential and Existing Storage and Transport
2011 Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	Pre-2011	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	Partial access until 2012 when 350,000 is avail	2060	NA	300,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	Pre-2011	2014	NA	562,207	60,000	YES	SGS	YES
STORAGE 4	AECO STORAGE	Undergound	AECO	Yes	NA	2013	2030	NA	300,000	10,000	YES	AECO C STRG	YES
STORAGE 5	MIST STORAGE	Undergound	Mist	Yes	NA	2013	2030	NA	300,000	10,000	YES	MIST	YES
STORAGE 6	JP-SURPLUS	Undergound	Jackson Prairie	Yes	Yes	2012	2030	NA	300,000	5,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIABLE < $.10	FUEL < 3%
INCR-GTN	Nov-10	Oct-24	TBD	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000		YES	YES
INCR-NWP	Nov-10	Oct-24	TBD	Sumas to WA and OR citygates	NWP Rate X 3		NWP	UP TO 200,000		YES	YES
INCR-MAL	Oct-11	Dec-30	TBD	Malin backhaul to Central OR and Stanfield Interconnect	GTN Rate	2 years ?	GTN	UP TO 50,000		YES	YES
BLUEBRDIGE	Nov-11	Dec-30	TBD	Stanfield and/or Stanfield Interconnect to I-5 Corridor	NWP Rate X 3	2 years	NWP, PALOMAR?	UP TO 50,000		YES	YES
RUBY XPORT	Nov-12	Dec-30	TBD	Opal Hub to Mailin	0.95	< 2 years	RUBY	UP TO 50,000		YES	YES
PALOMAR XPORT	Nov-15	Dec-30	TBD	Madras OR to Molalla OR (bi-directional)	NWP Rate X 3	> 3years	PALOMAR	UP TO 50,000		YES	YES
PAC CONNECT	Nov-15	Dec-30	TBD	Jordona Cove OR to Malin	NWP Rate X 3	> 4 years	PAC CONNECT	UP TO 50,000		YES	YES

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Assumes runs WITH evergreen and WITHOUT evergreen provisions

Table 5-3
RESIDENTIAL CONSERVATION MEASURES
TECHNICAL POTENTIAL BY 2030

OREGON			
Measure Code	Measure Description	Gas Savings Therms	Levelized Cost ($/th)
R-GH115	AFUE 90 to hydrocoil combo, Z 1	308,136	$0.09
R-GH118	AFUE 90 to hydrocoil combo, Z 2	302,706	$0.09
R-GH116	Boiler to Polaris Combo radiant, Z 1	715,671	$0.55
R-GH119	Boiler to Polaris Combo radiant, Z 2	684,763	$0.57
R-GH125	Duct Sealing and AFUE 90+ , Z 2	1,728,412	$0.20
R-GH114	Duct Sealing, Z 1	80,756	$0.28
R-GH117	Duct Sealing, Z 2	73,292	$0.30
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 1)	2,686,054	$0.24
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 2)	2,024,871	$0.31
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 1)	2,130,840	$0.40
N-GH134	E* Insulation, Ducts, DHW, Lights (Gas Z 2)	1,522,719	$0.56
N-A103	Estar Dishwasher, New	886	$0.63
R-A103	Estar Dishwasher, Replacement	65,592	$0.63
N-GH130	Heating upgrade (AFUE 90) (Z 1)	198,215	$0.16
N-GH135	Heating upgrade (AFUE 90) (Z 2)	149,424	$0.21
N-A105	Hi-eff Washer	2,033	-$2.15
N-GH132	HRV, E* (Gas Z 1)	1,963,928	$0.22
N-GH137	HRV, E* (Gas Z 2)	1,480,499	$0.29
N-A102	MEF 2.0 Washer, New	4,611	-$1.63
R-A102	MEF 2.0 Washer, Replacement	154,270	-$1.63
R-GD113	Solar hot water heater (50 gal) - With gas backup.	134,556	$0.93
N-GH139	Tank upgrade (50 gal gas)	390,983	$0.63
N-GD106	Tank upgrade (50 gal gas) Hi Eff Alternative, New	223,054	$0.02
R-GD111	Tank upgrade (50 gal gas) Hi Eff Alternative, Replacement	872,299	$0.02
N-GD108	Tankless Gas heater	1,258,603	$0.83
R-GD110	Tankless Gas heater replace	229,289	$0.32
N-GD109	Upgrade to Navien Tankless Gas heater	182,129	$0.39
N-GD109	Upgrade to Navien Tankless Gas heater	33,492	$0.39
R-GW123	Wx insulation (add walls), Z 1	143,816	$0.19
R-GW128	Wx insulation (add walls), Z 2	952,980	$0.18
R-GW122	Wx insulation (ceiling, floor), Z 1	156,318	$0.24
R-GW127	Wx insulation (ceiling, floor), Z 2	1,028,694	$0.24

TOTAL TECHNICAL POTENTIAL **21,883,891**

Oregon Residential Conservation Measures
Technical Potential by 2030
2011 Stellar Study

Measure Code	Measure Description	Gas Savings Therms	Level Cost, $/th
R-GD116	Low Flow Shower	978	-$21.406
N-A105	Gas Hi-eff Washer	4,283	-$2.207
N-A102	Gas MEF 2.0 Washer	322	-$2.095
R-A105	Gas Hi-eff Washer	48,769	-$1.899
N-A103	Gas ETO Dishwasher	138	-$1.505
R-A103	Gas ETO Dishwasher	8,459	-$1.457
R-A102	Gas MEF 2.0 Washer	1,660	-$1.272
N-GH137	Heating upgrade (AFUE 95) (Z C)	9,721	-$0.715
N-GH131	Heating upgrade (AFUE 95) (Z B)	13,874	-$0.501
N-GH142	MF Corridor Ventilation	6,460	$0.000
N-GH145	AFUE 92 to condensing combo hydrocoil, Z C	24,026	$0.043
N-GH144	AFUE 92 to condensing combo hydrocoil, Z B	21,650	$0.048
R-GW124	Window, retro (U=.35), Z B	694,784	$0.050
R-GW129	Window, retro (U=.35), Z C	499,806	$0.071
R-GH122	AFUE 95 Furnace, Z B	984,463	$0.098
R-GW125	Window, retro (U=.20), Z B	387,586	$0.104
R-GH124	AFUE 95 Furnace, Z C	704,387	$0.135
R-GW130	Window, retro (U=.20), Z C	233,490	$0.191
R-GD113	Solar hot water heater (50 gal) - With gas backup.	71,316	$0.242
R-GH114	Duct Sealing, Z B	57,164	$0.266
N-GH130	E* Insulation, Ducts, DHW, Lights (Gas Z B)	2,384,201	$0.278
R-GD114	Tankless Gas heater replace after 2015	330,041	$0.285
N-GD111	Tankless Gas heater after 2015	288,598	$0.289
N-GH136	E* Insulation, Ducts, DHW, Lights (Gas Z C)	1,747,428	$0.290
R-GH117	Duct Sealing, Z C	52,961	$0.299
N-GD106	Tankless Gas heater	95,322	$0.338
R-GD110	Tankless Gas heater replace	338,676	$0.339
R-GH126	Upgrade Gas Hearth	5,988	$0.460
N-GH135	Near Net Zero (Gas Z B)	1,310,649	$0.485
R-GW126	HRV, Z B	196,522	$0.531
R-GD115	Solar hot water heater (50 gal) - With gas backup aft 2015	86,586	$0.564
N-GD105	Tank upgrade (50 gal gas)	77,004	$0.604
N-GH141	Near Net Zero (Gas Z C)	281,389	$0.610

10,968,703

Cascade Natural Gas Corporation®

2011 Integrated Resource Plan

Technical Advisory Group Meeting
April 13, 2011

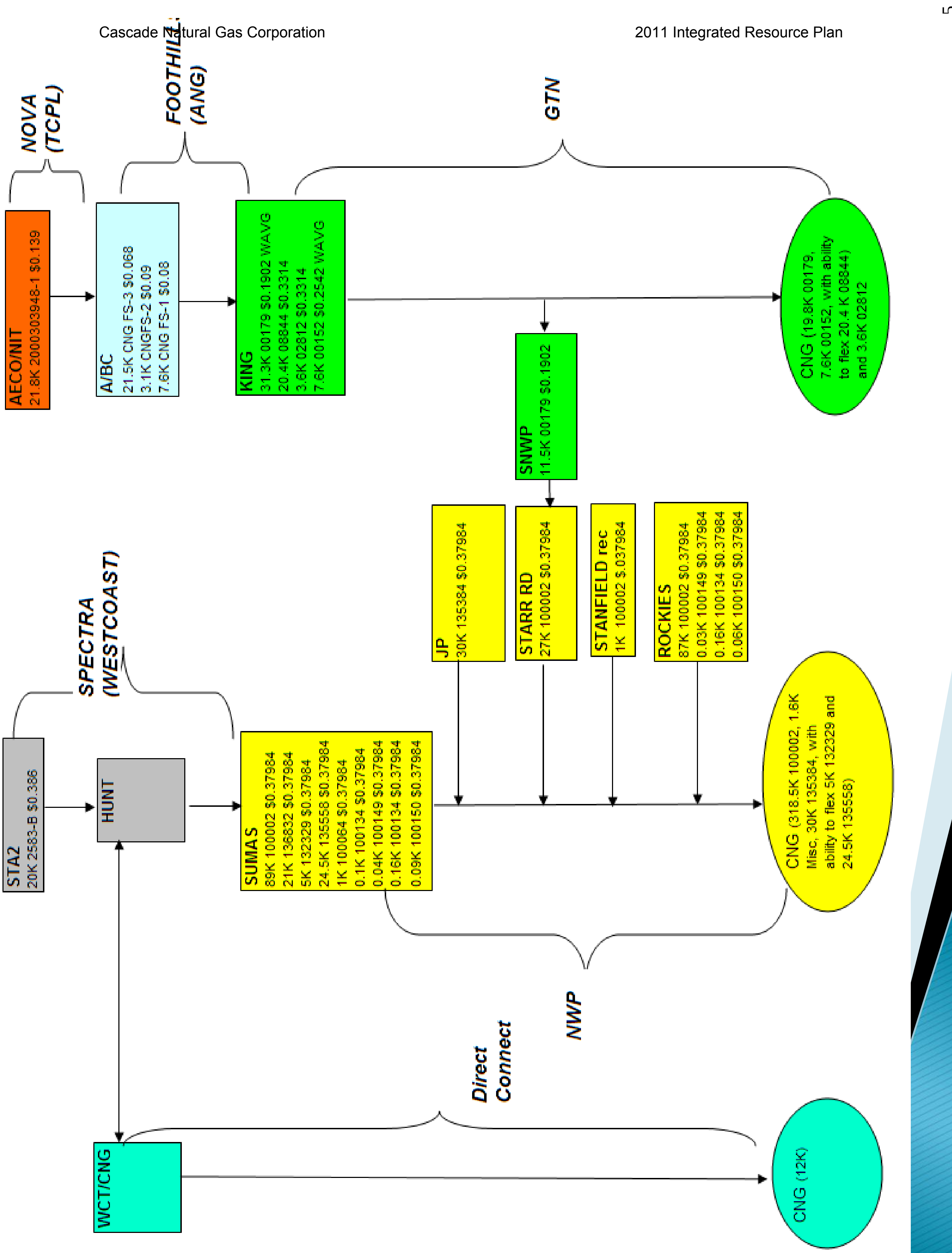
Agenda

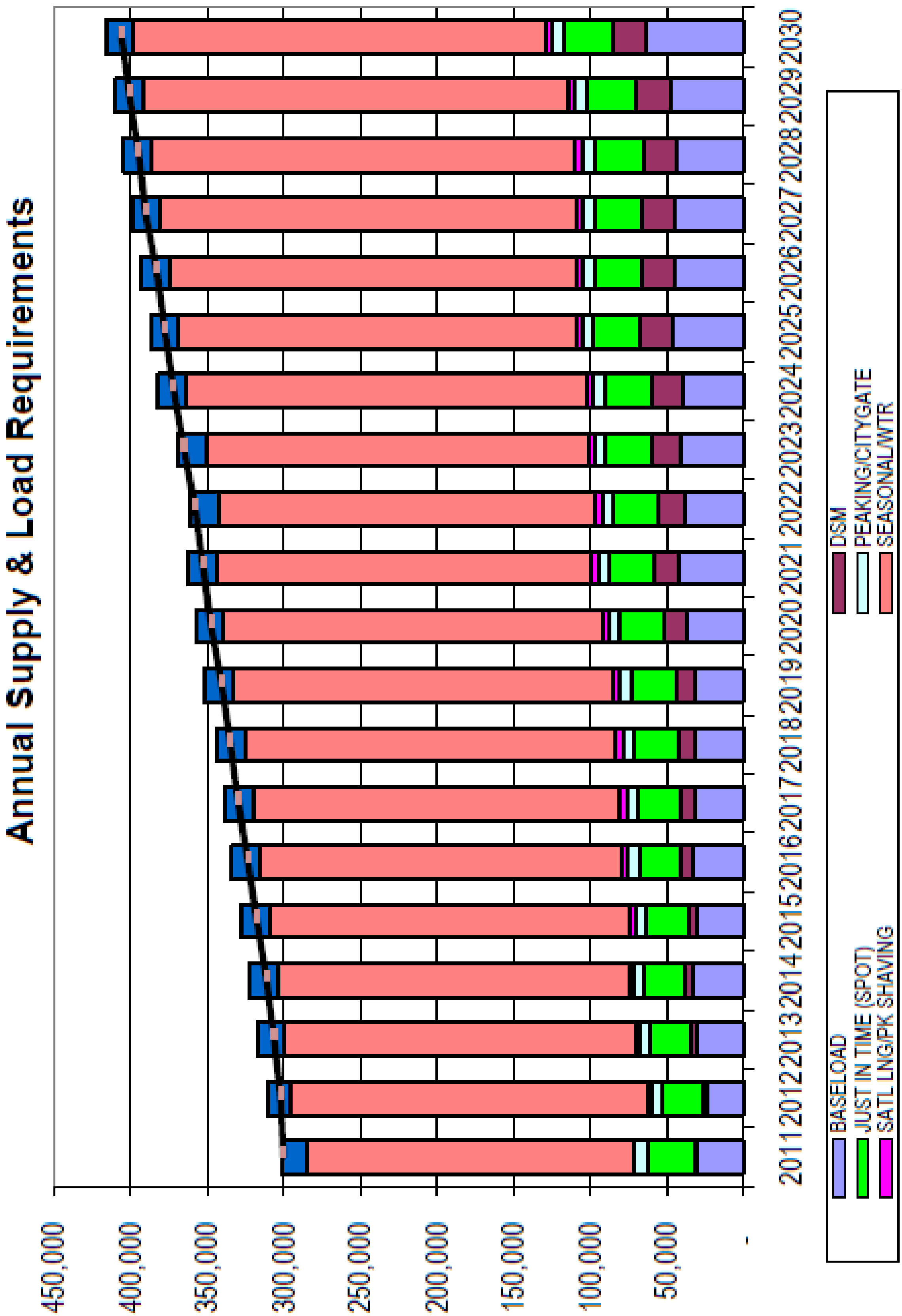
- Introductions
- Capacity vs Load Projections
- Distribution System Analysis
- Conservation
- Integrated Resource Scenario Runs
- Concerns regarding significant changes to proposed pipeline projects and events that may directly impact resource selection
- Closing Discussion
  - Future meeting dates/Other Comments

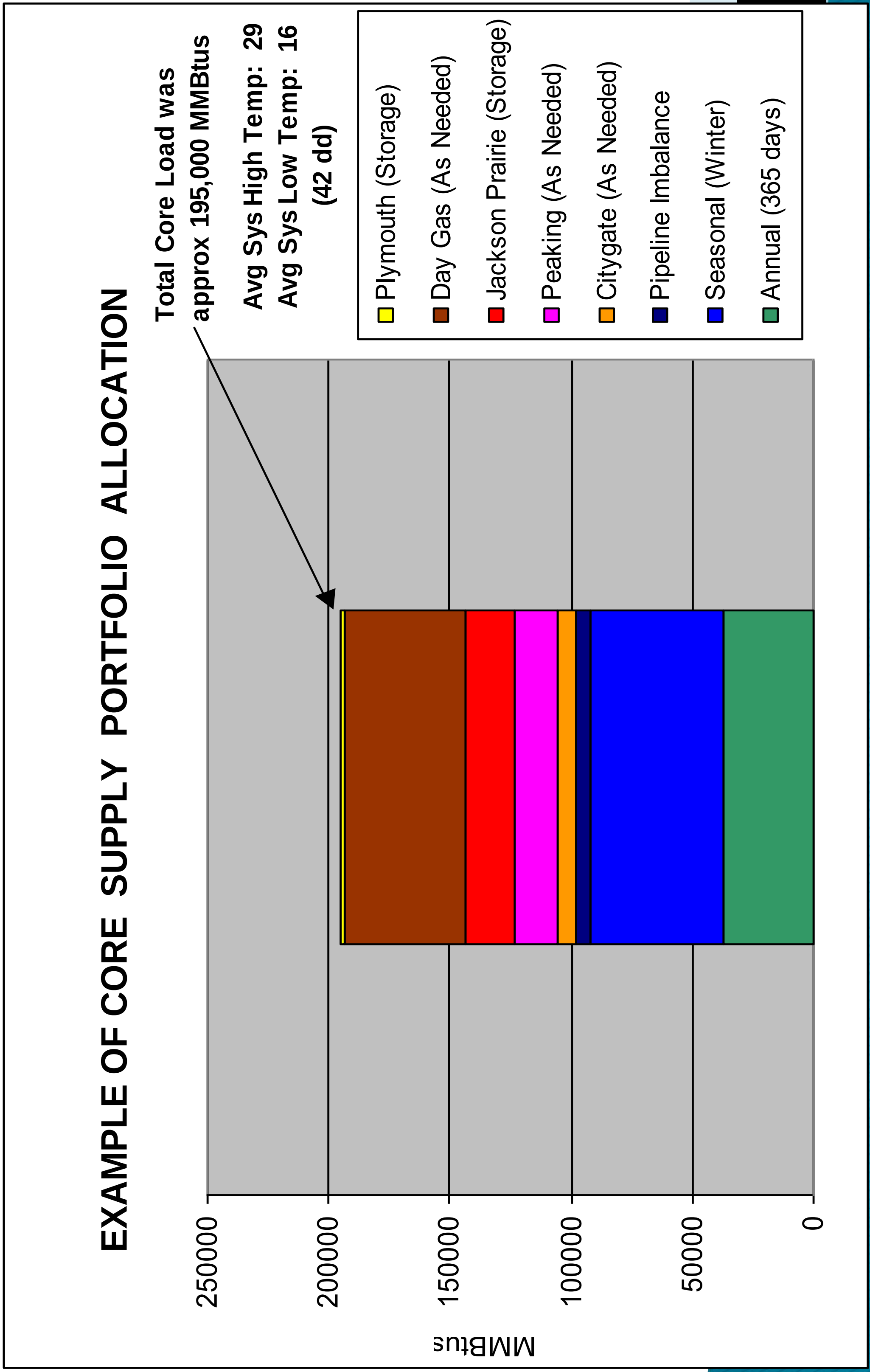
Capacity vs Load Projections

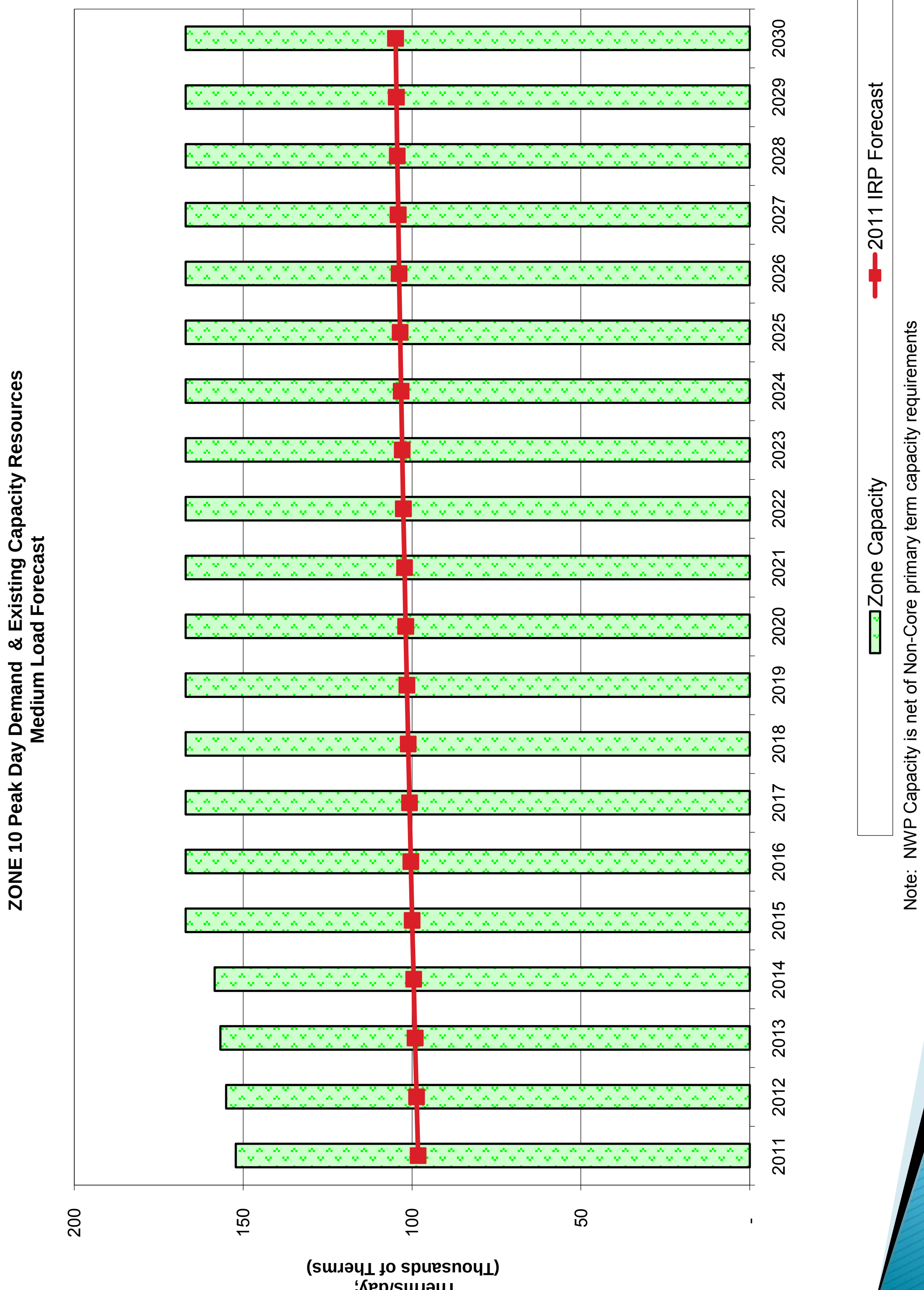
3

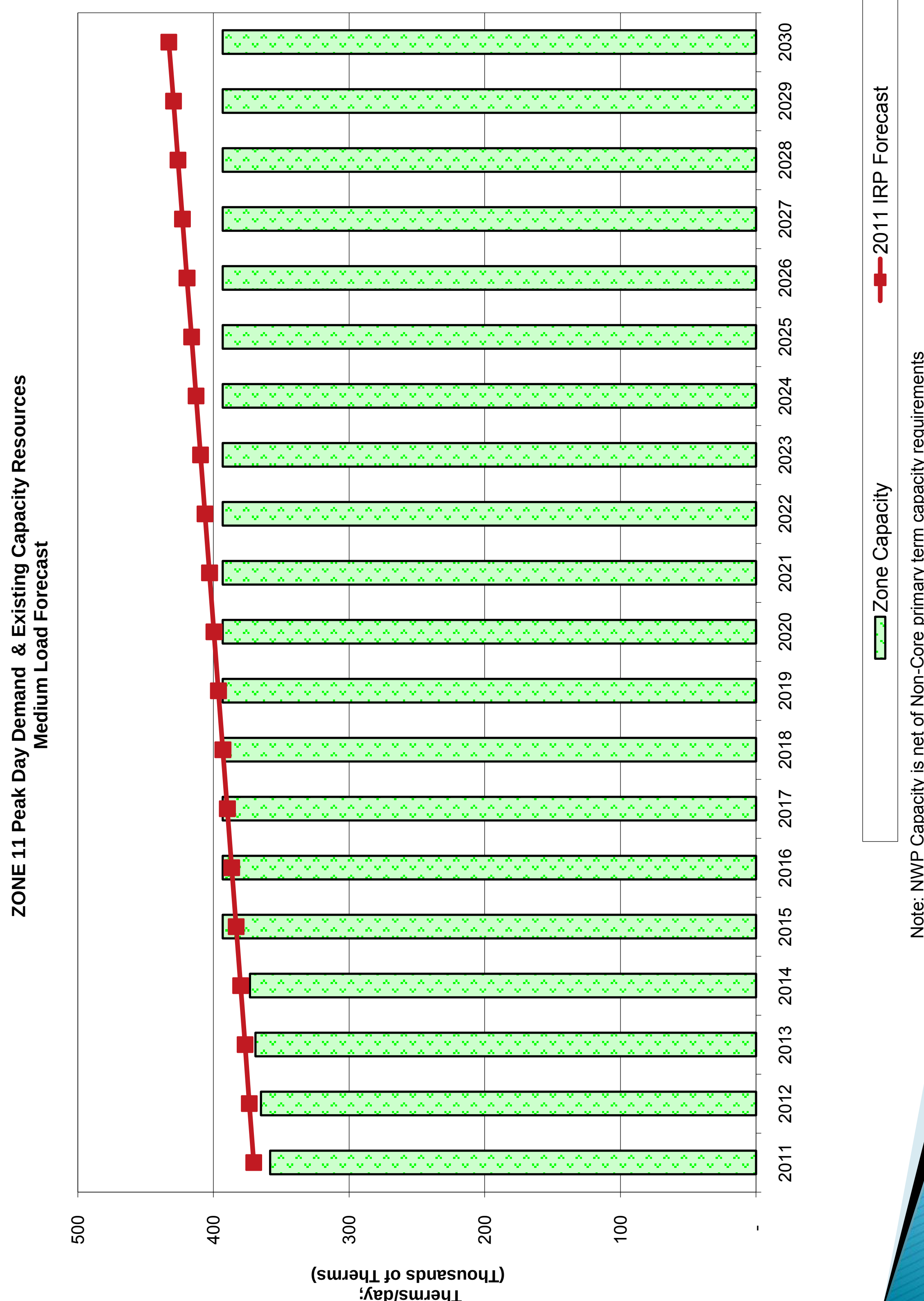

4
Kingsgate
Huntingdon/Sumas
Northwest Pipeline GP
BRITISH COLUMBIA
Spokane
Seattle
Portland
IDAHO
Boise
OREGON
NEVADA
CALIFORNIA
Malin
Gas Transmission Northwest
Tuscarora Gas Transmission Company
PG&E Electric Company
Zone 20
Zone ME-WA
Zone ME-OR
Zone 24
Zone 11
Zone 10
Zone GTN
Zone 30-W
Zone 30-S
Zone 26

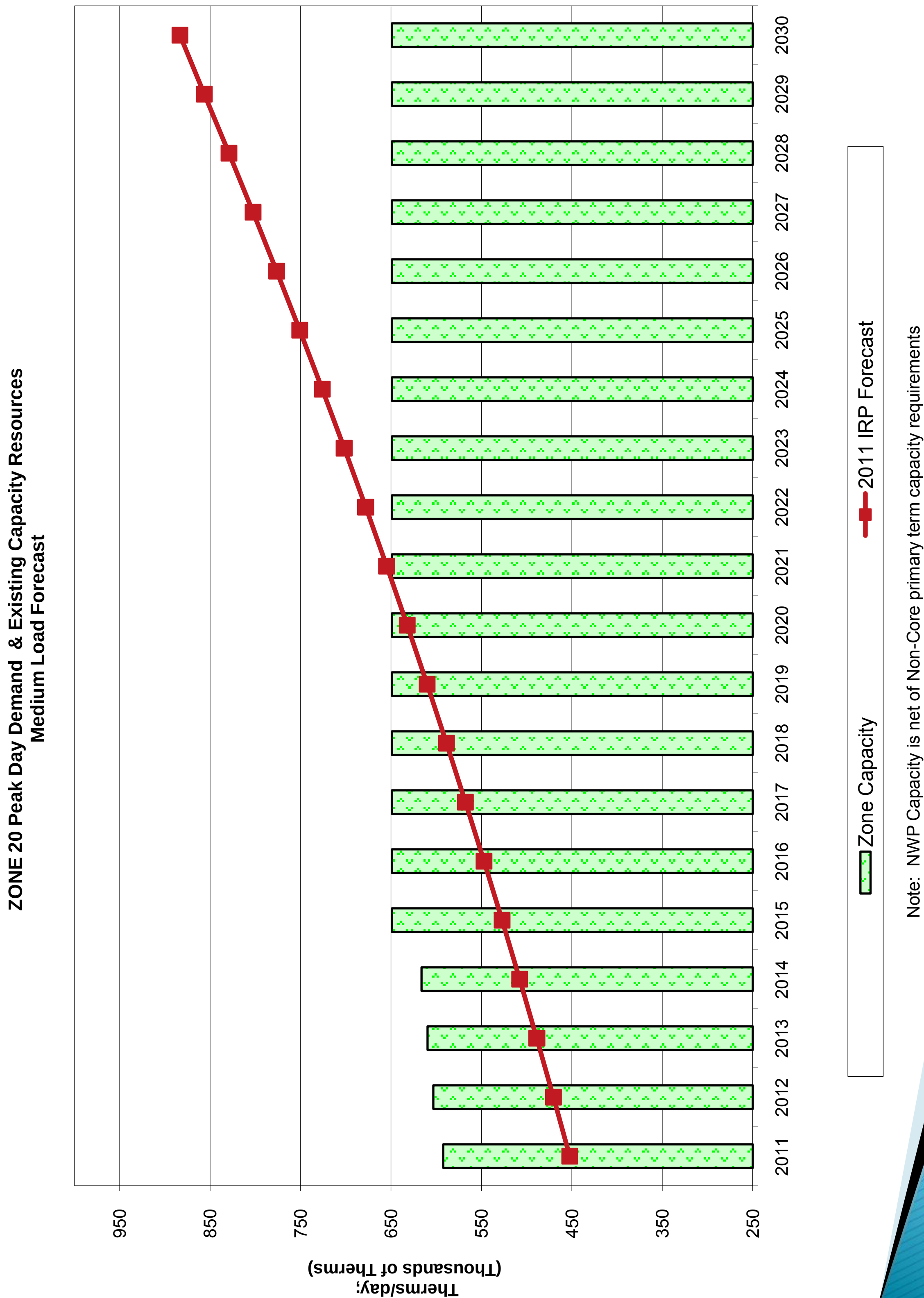

5
NOVA (TCPL)
FOOTHILLS (ANG)
GTN
AECO/NIT
21.8K 2000303948-1 $0.139
A/BC
21.5K CNG FS-3 $0.068
3.1K CNGFS-2 $0.09
7.6K CNG FS-1 $0.08
KING
31.3K 00179 $0.1902 WAVG
20.4K 08844 $0.3314
3.6K 02812 $0.3314
7.6K 00152 $0.2542 WAVG
CNG (19.8K 00179, 7.6K 00152, with ability to flex 20.4 K 08844) and 3.6K 02812
SNWP
11.5K 00179 $0.1902
JP
30K 135384 $0.37984
STARR RD
27K 100002 $0.37984
STANFIELD rec
1K 100002 $.037984
ROCKIES
87K 100002 $0.37984
0.03K 100149 $0.37984
0.16K 100134 $0.37984
0.06K 100150 $0.37984
SPECTRA (WESTCOAST)
STA2
20K 2583-B $0.386
HUNT
SUMAS
89K 100002 $0.37984
21K 136832 $0.37984
5K 132329 $0.37984
24.5K 135558 $0.37984
1K 100064 $0.37984
0.1K 100134 $0.37984
0.04K 100149 $0.37984
0.16K 100134 $0.37984
0.09K 100150 $0.37984
CNG (318.5K 100002, 1.6K Misc, 30K 135384, with ability to flex 5K 132329 and 24.5K 135558)
NWP
Direct Connect
WCT/CNG
CNG (12K)

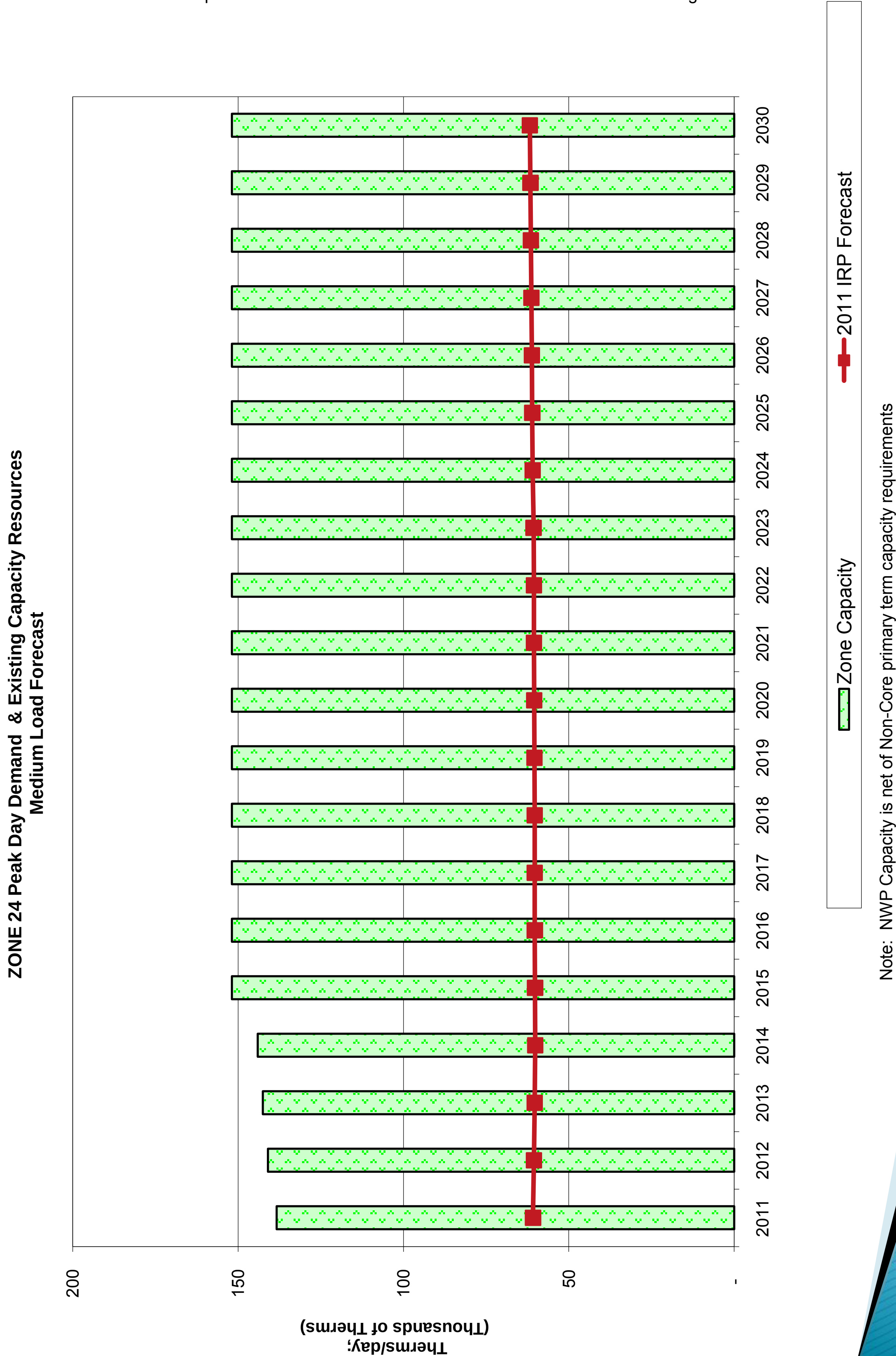

Annual Supply & Load Requirements
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
BASELOAD
JUST IN TIME (SPOT)
SATL LNG/PK SHAVING
DSM
PEAKING/CITYGATE
SEASONAL/WTR

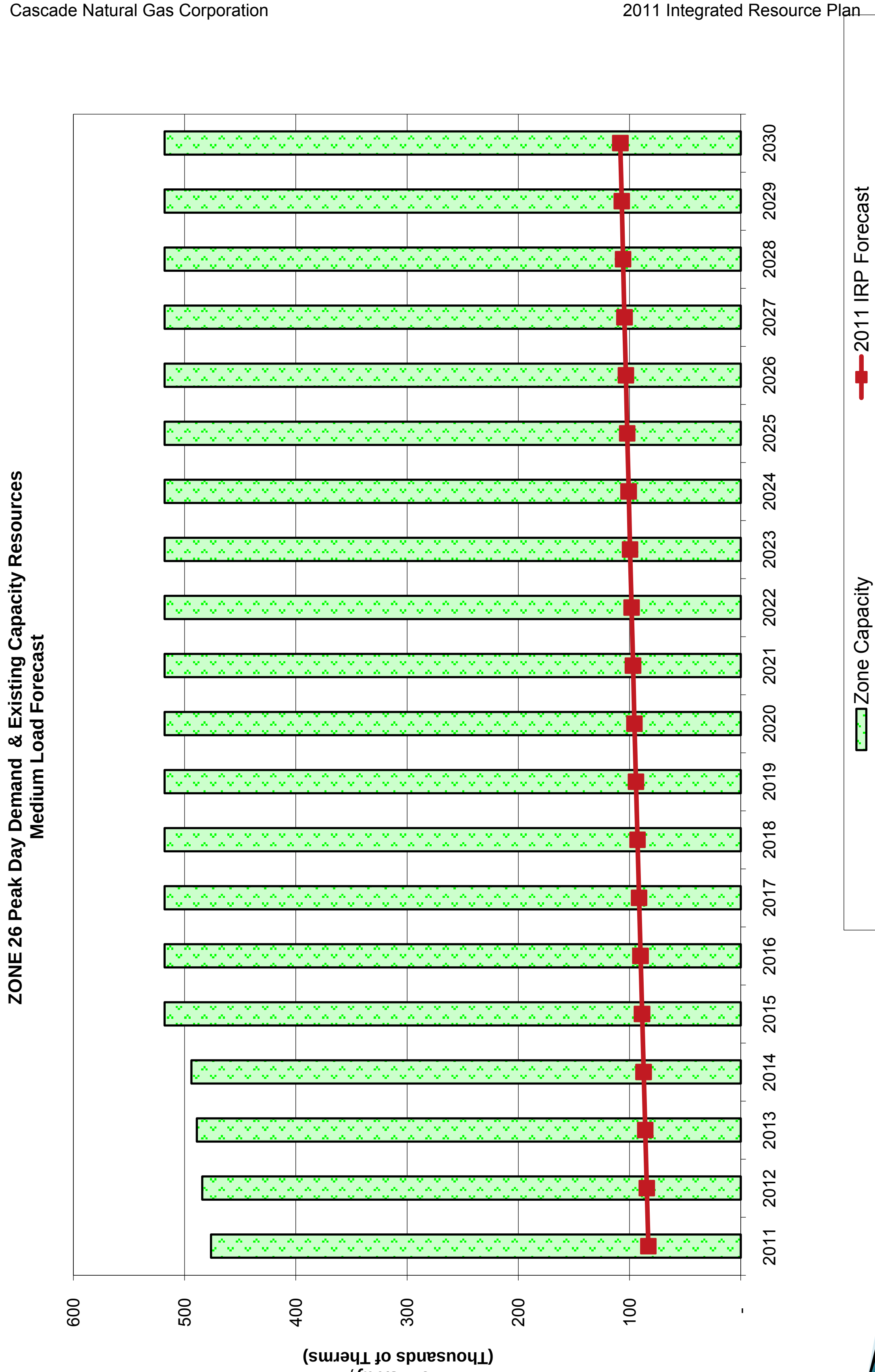

EXAMPLE OF CORE SUPPLY PORTFOLIO ALLOCATION
Total Core Load was approx 195,000 MMBtus
Avg Sys High Temp: 29
Avg Sys Low Temp: 16
(42 dd)
Plymouth (Storage)
Day Gas (As Needed)
Jackson Prairie (Storage)
Peaking (As Needed)
Citygate (As Needed)
Pipeline Imbalance
Seasonal (Winter)
Annual (365 days)
MMBtus
250000
200000
150000
100000
50000
0


ZONE 10 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
200
150
100
50
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

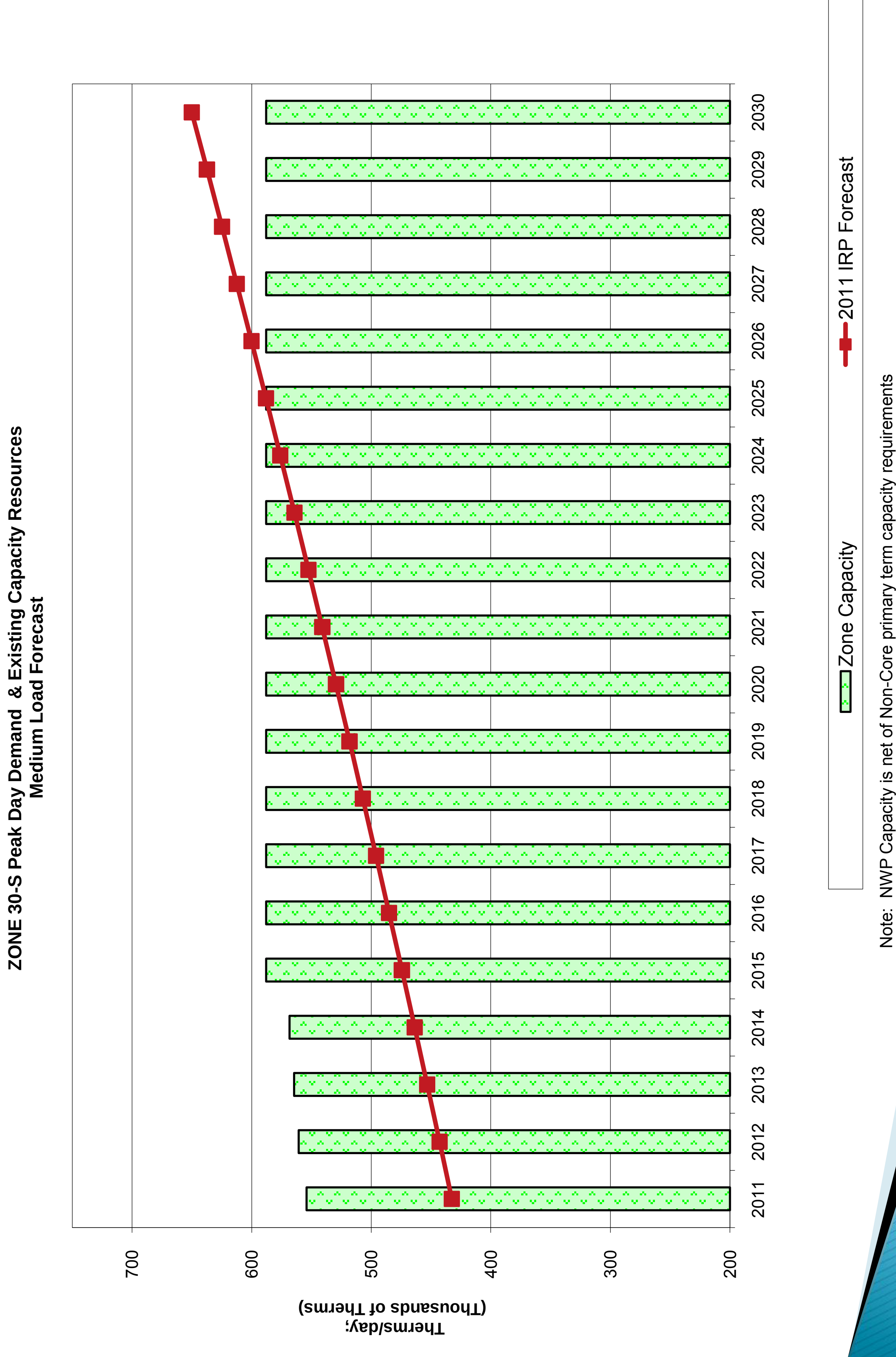

ZONE 11 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
500
400
300
200
100
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

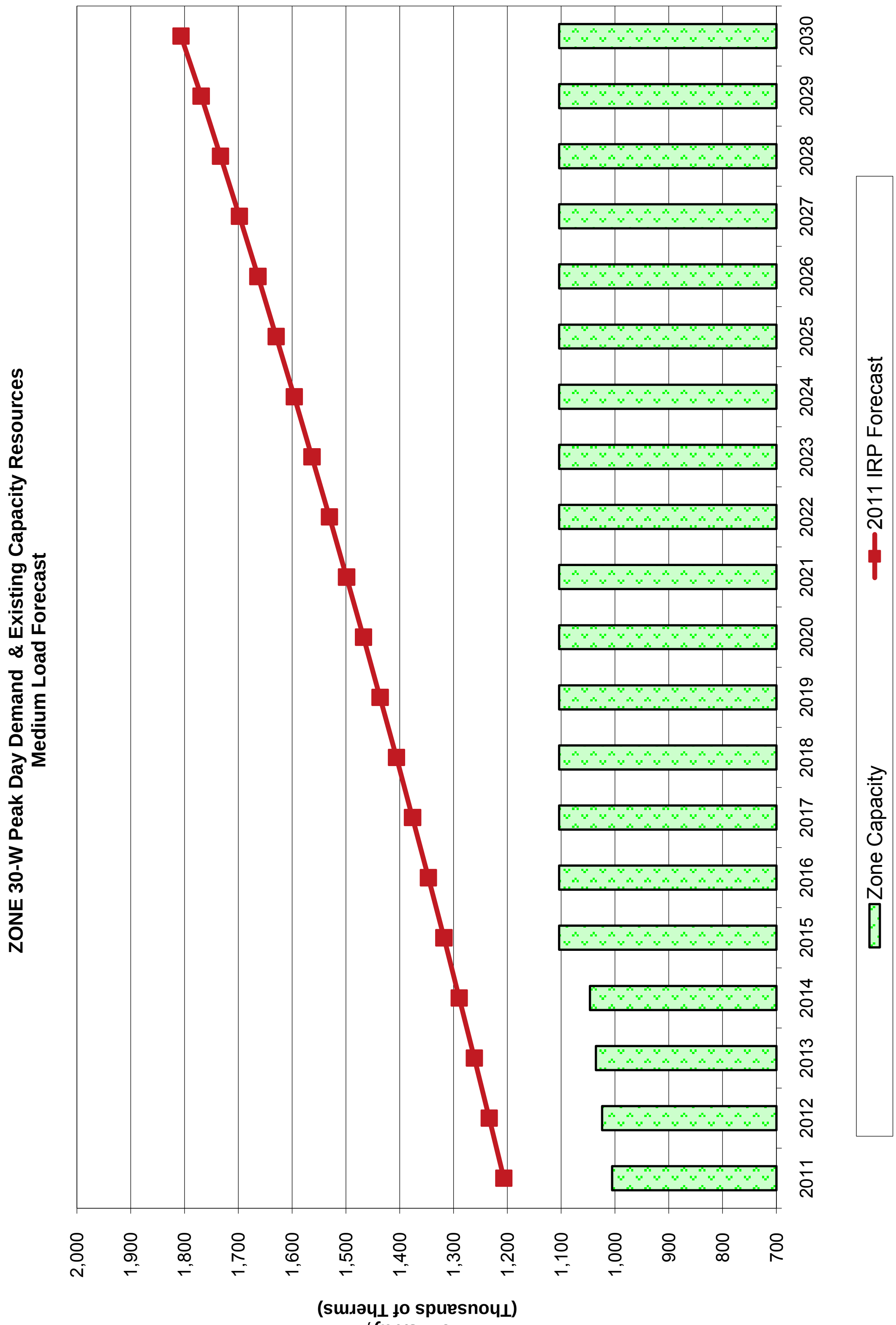

ZONE 20 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
950
850
750
650
550
450
350
250
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE 24 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
200
150
100
50
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

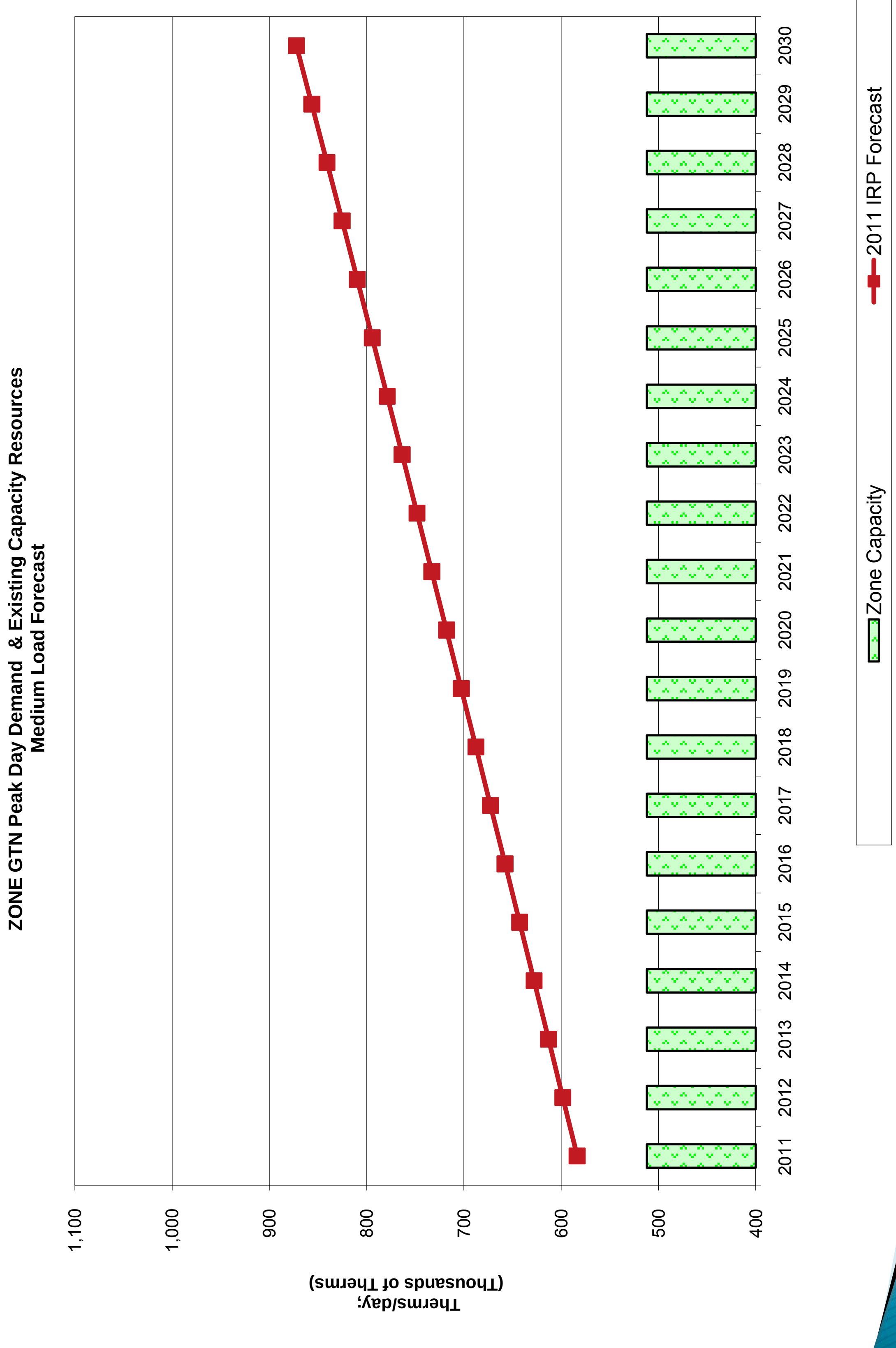


Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE 30-S Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
700
600
500
400
300
200
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements



Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE GTN Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
1,100
1,000
900
800
700
600
500
400
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
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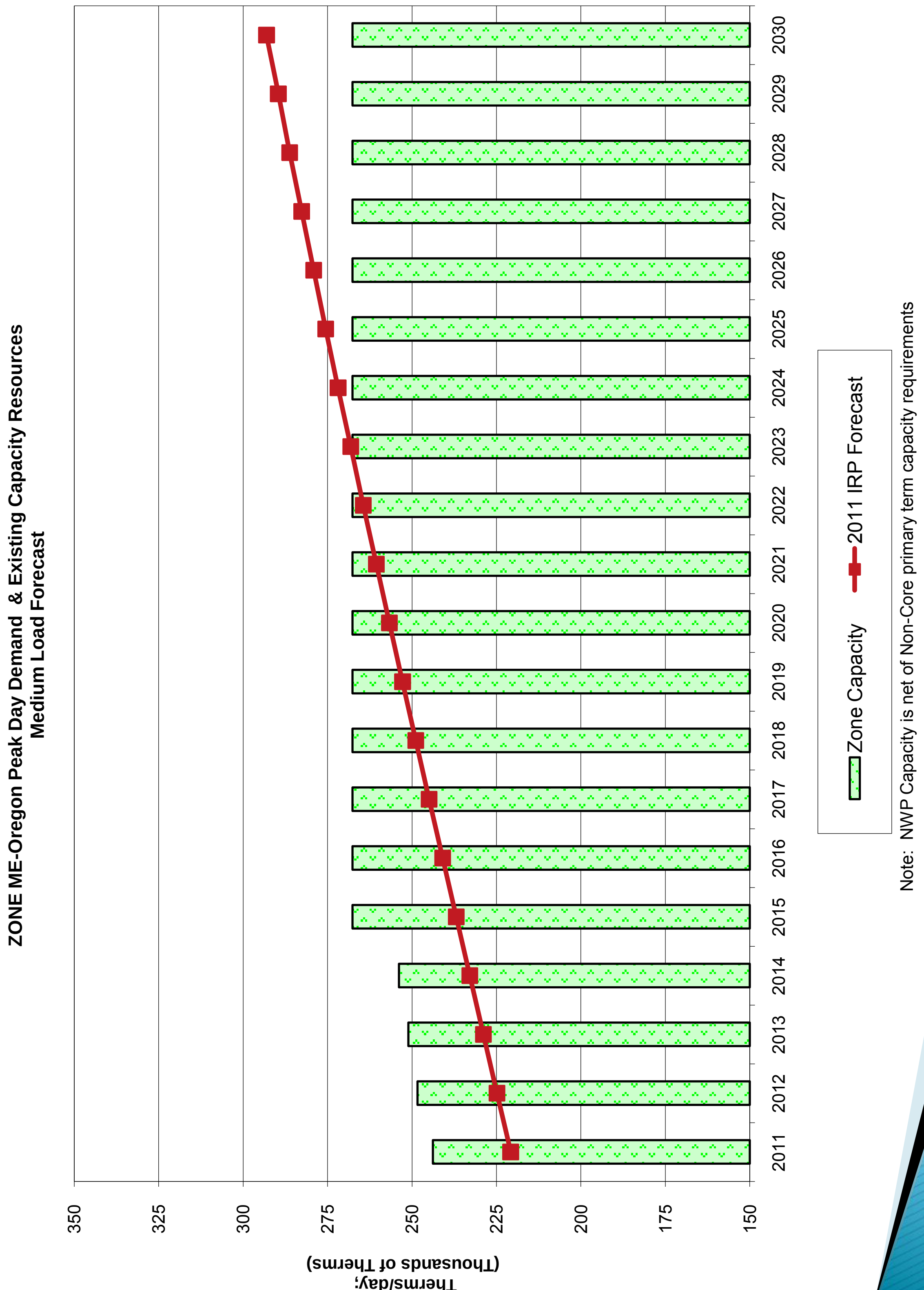
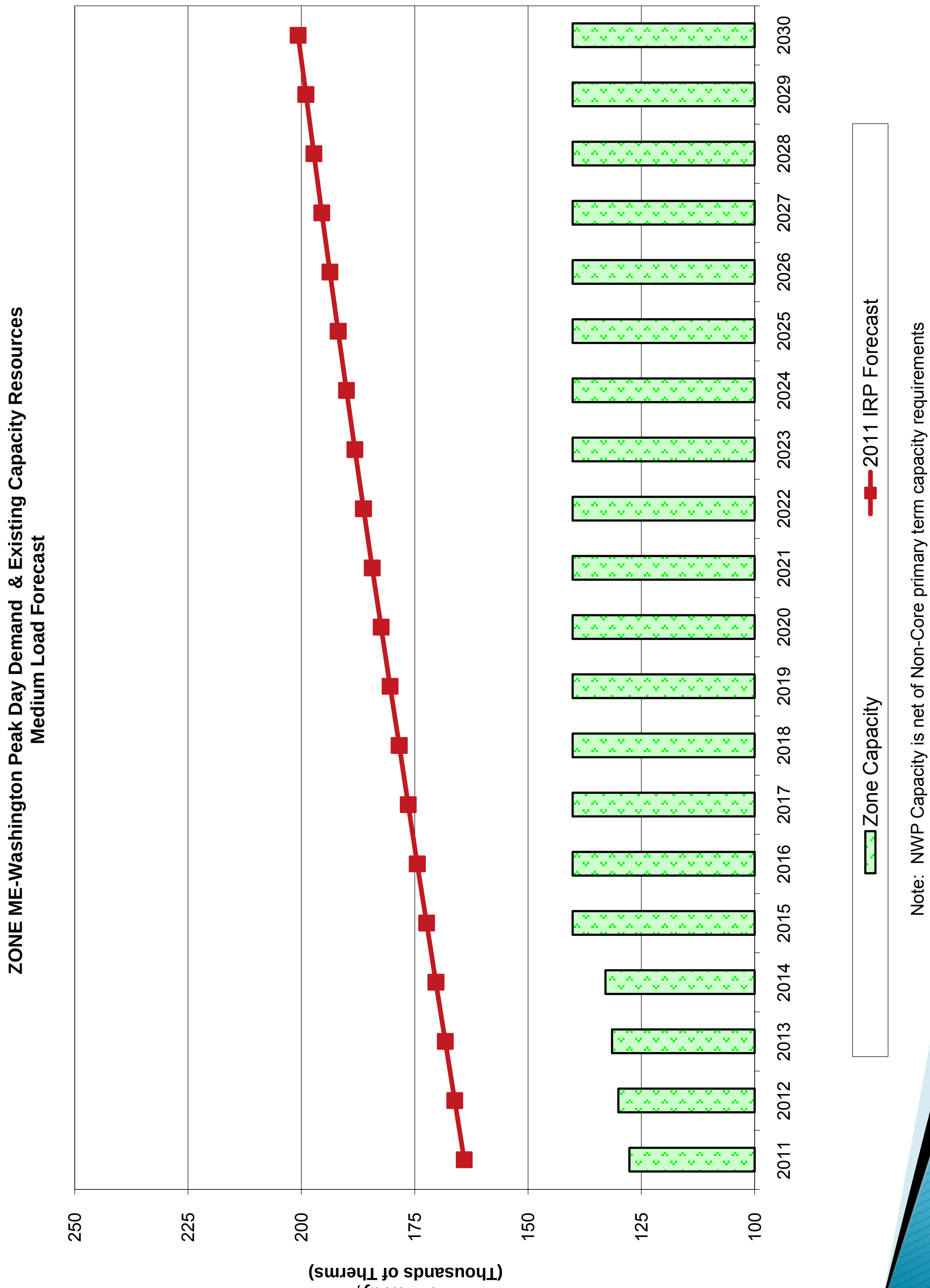
2028
2029
2030
Zone Capacity
2011 IRP Forecast


ZONE ME-Oregon Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
350
325
300
275
250
225
200
175
150
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE ME-Washington Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
250
225
200
175
150
125
100
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

Distribution System Planning to Support IRP Growth

Cascade Natural Gas Corp.
4/27/10

Distribution System Modelling

- CNG maintains two models of each distribution system
  - Calibrated Model: Each model is calibrated annually to the peak hour which occurred over the past year
  - Design Day Model: A second model is created by increasing the Calibrated Model loads to simulate the coldest day we plan for

Design Day Model Function

- Evaluate system for capability to support new customers
- Plan necessary reinforcements to support system on peak winter days
- IRP Planning

Modelling for the IRP

- Loads in Design Day models are increased per the IRP forecast (medium scenario)
- Model is examined for areas of low pressure
- Footage and diameter of pipe needed to correct low pressure areas are estimated
- Average total cost of pipe installation (by diameter) is used to predict total cost of reinforcements

System Model Examples

- Redmond Distribution System Model (Demonstration)

Reinforcement Planning

- Is the predicted pressure problem in a small localized area?
- Is the predicted pressure problem related to problems with the high-pressure system?

QUESTIONS?

Conservation Materials

- DSM Objectives and Approach
- Oregon Conservation Technical Potential Scenarios
- Carbon Legislation & Impact Scenarios
- Preliminary Conservation Curves

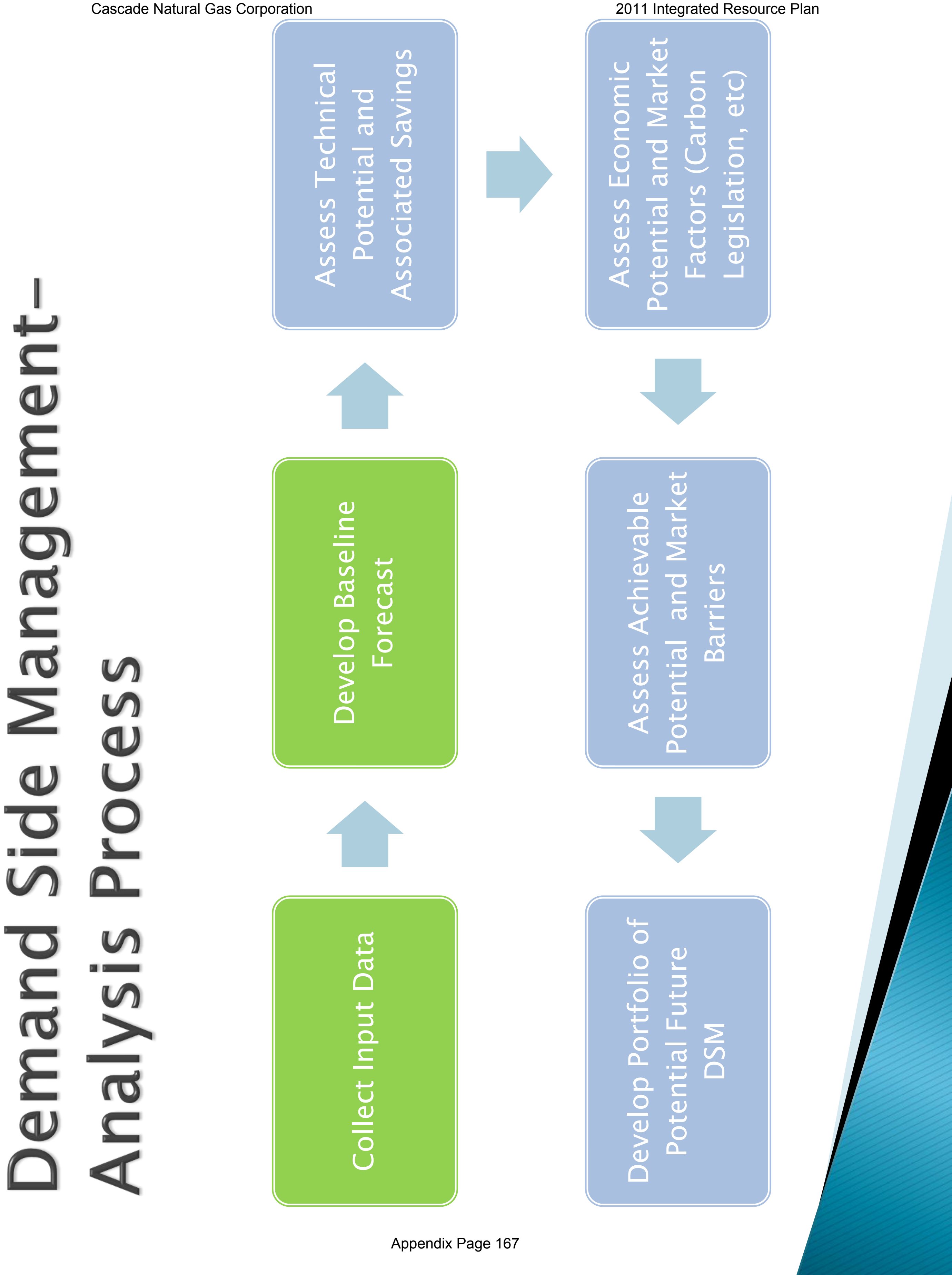
DSM Objectives and Approach

Partner with ETO to acquire <u>cost-effective</u> demand side resources that meet the needs of the Company's core customers.

Cost effectiveness based on both Total Resource Cost and Utility Cost Tests.

Energy Trust is the primary agent for determining appropriate portfolio of measures and program modifications.

ETO model focuses on both an incentive based approach involving "hard" therm savings measures and equipment and behavioral/market transformation.


Demand Side Management–
Analysis Process
Collect Input Data
Develop Baseline Forecast
Assess Technical Potential and Associated Savings
Assess Economic Potential and Market Factors (Carbon Legislation, etc)
Assess Achievable Potential and Market Barriers
Develop Portfolio of Potential Future DSM

Baseline Development and Analysis of Potential—(ETO Resource Assessment)

- **Technical Potential**
  - As of January 25, 2011, ETO has developed update to Energy Efficiency and Conservation Measure Resource Assessment for the Years 2010-2030
    - This has impacts on technical potential to be further discussed and analyzed between the Company and ETO
    - Study quantifies the current energy used by sector and customer type; estimates energy consumption by end use for each customer type; and applies forecasted growth rate to estimate the customer base available in future years
    - Cascade working closely with ETO to fully analyze changes and impacts on measures in the portfolio.
- **Deemed energy savings and associated costs**
  - Study identifies deemed savings by climate zone, and offers technical and potential supply curve savings out to 2030

OR Residential Technical Potential –Draft Result

- Potential Listed in initial OR Residential Assessment Screen at $.70 or less for 2011 IRP was estimated to be 20,490,732 therms based on the Stellar Report dated February 2009
- Recent updates to the Stellar Report (January 25, 2011) indicate potential therm savings at 10,968,703 at the same screen level of $.70 or less.
- See Handout for Comparison between prior recognized (2009) and 2011 IRP

Technical to Achievable

- Technical Potential: The estimate of all energy savings that could be accomplished without the influence of any market barriers such as costs and customer awareness
- Achievable Potential: "a realistic assessment of what can be expected taking into account not all consumers can be persuaded"

LET's Talk Carbon!

- Although momentum has slowed for these initiatives *for the time being*, Carbon Legislation could have the potential impacts on Avoided Costs
- Cap & Trade or Carbon Tax, essentially the same for an LDC
  - LDC's deliver Gas and every molecule has an Emission that would result in a cost (tax)
  - Allowances under a Cap & Trade just lower the amount of the credits that would need to be purchases
  - LDC's do not have "carbon-free" alternatives for their portfolio (no wind/solar)

Legislation

- Federal Legislation appears to have lost momentum and may not have anticipated impacts (pending outcomes of 2012 elections).
- On September 23, 2008, the Western Climate Initiative (WCI) released its Greenhouse Gas Cap and Trade design recommendations.
  - WCI participants including Oregon and Washington have a certain amount of flexibility in setting requirements for implementation, compliance, and enforcement.
  - Outcomes for OR yet to be determined although there is a greater likelihood that such initiatives would be pursued at the state versus the national level.
- General WCI goals would include reductions to GHG emissions to 15% below 2005 levels by 2020
- No set date for allowance allocations, but they will be established prior to 2012 and the Company will continue to closely monitor these developments.

Issues to Consider

- Building Code Impacts:
  - Should code changes be included in Potential and resulting targets?
- Market Transformation
  - At what point should measures be discontinued from the portfolio commensurate with "market transformation findings"
  - Are market transformation findings homogenous throughout our service territory and if not, how should they be treated?
- Carbon Scenarios
  - At what point should gas utilities incorporate carbon costs into TRC screening
  - Are the costs for carbon "known & measurable"

Avoided Costs--Baseline

- With 10% Conservation Credit
  - 30 Year Avoided Costs$10.92 vs $13.20 from 2009
  - Cost Effectiveness Limit $.64 vs $.78/therm

- ETO 30 year Avoided Cost
  - Includes Carbon Adder beginning at 2016
    - 16/ton in 2010$ for CO2
    - .012 for nox
  - Adds total of 10.49 cents/therm to cost effectiveness limit
  - ETO's 30 year Avoided costs
    - $13.09 which includes total of $1.42 for Carbon

Avoided Costs—Carbon impact

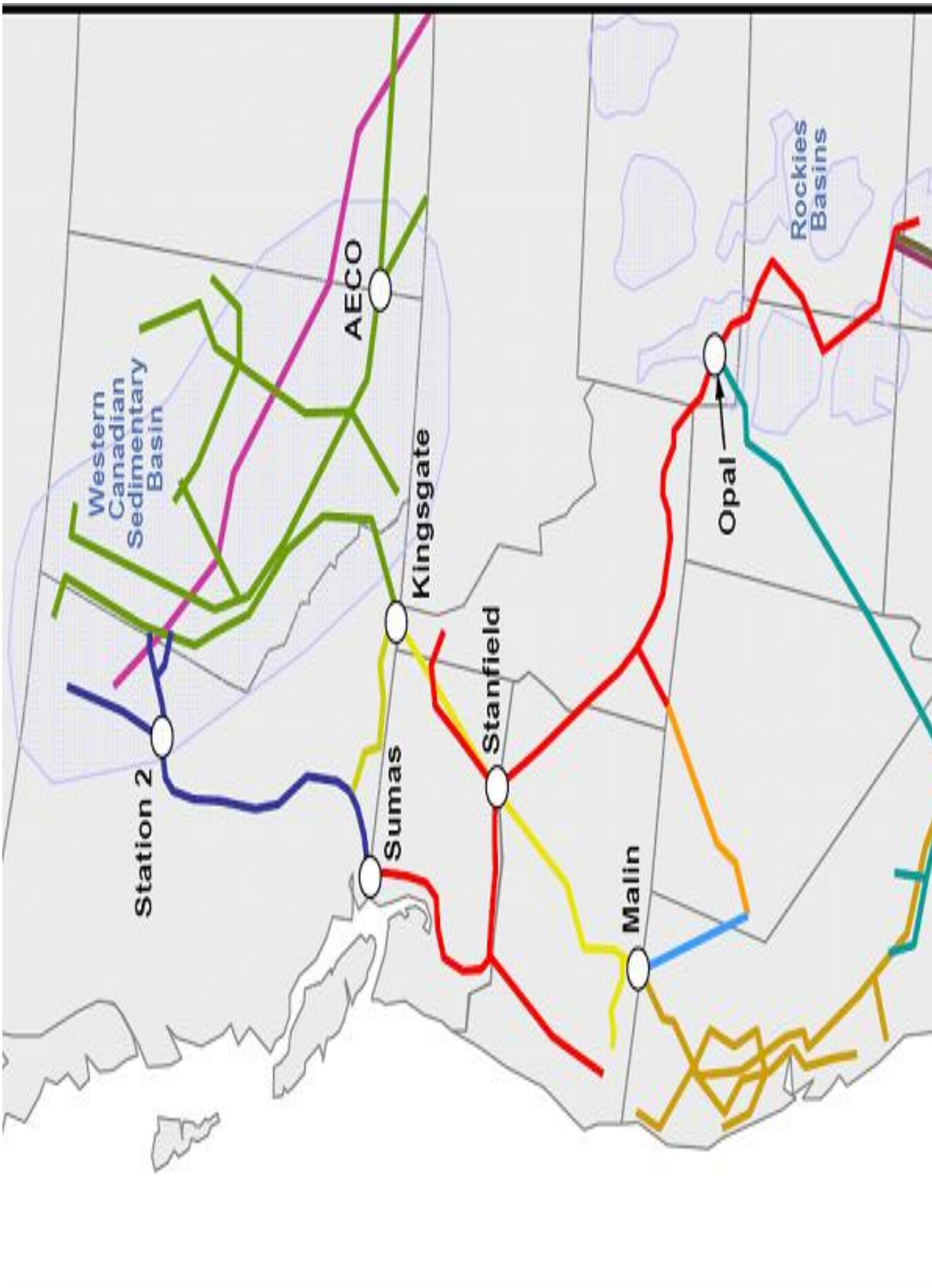
- 6 scenarios ranging from $12/ton to $30/ton
  - Assume starts in 2016 (consistent with WCI)
  - Assumes 3.5% annual increase in costs for inflation
  - Assumes NO ALLOWANCES

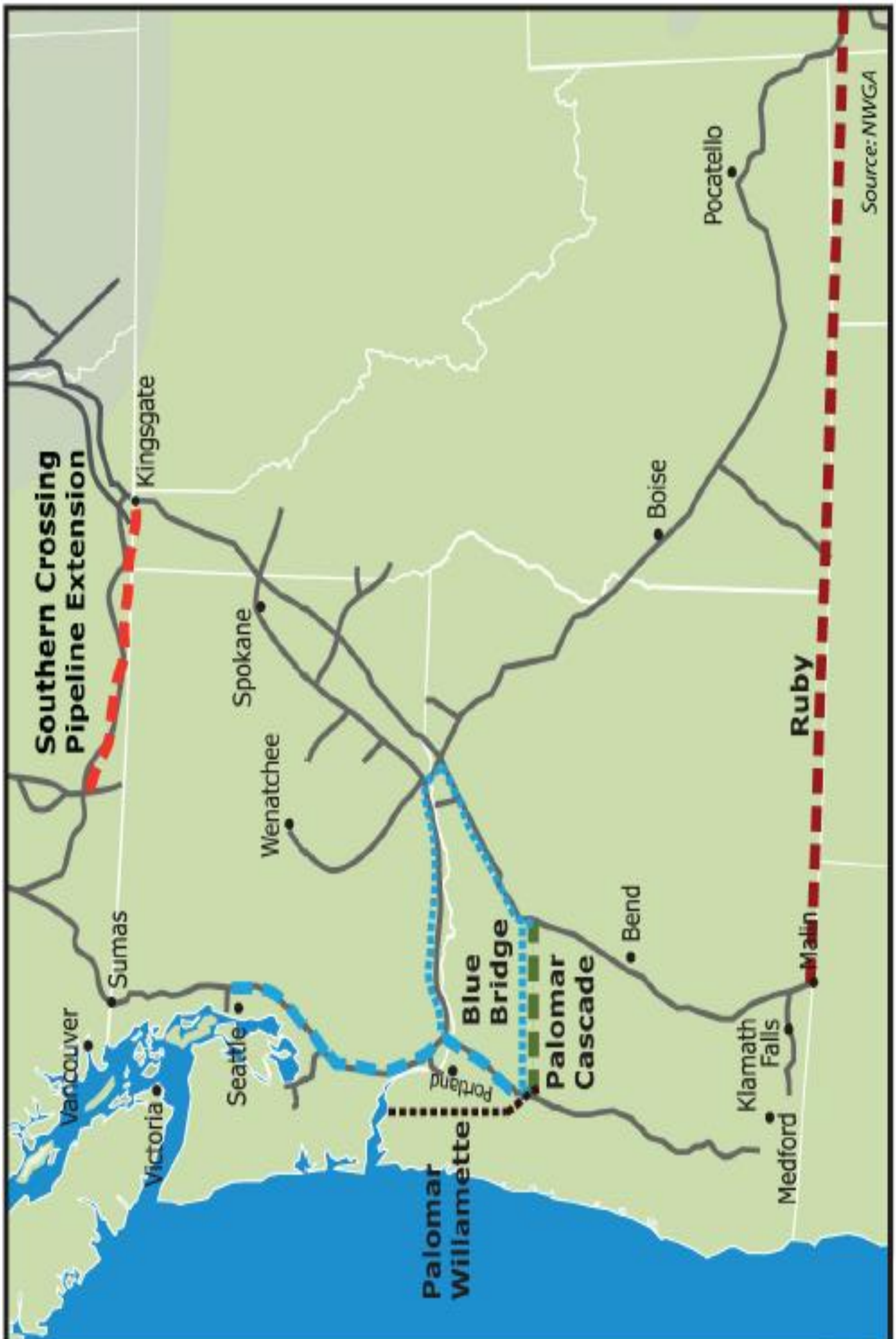
Avoided Costs- Carbon Impact (cont)

- $12/Ton Scenario
  - 30 Year Avoided Costs increase by $.98 to $11.90
  - Cost Effectiveness Limit increases by .06 to $.70/thm
- $30/Ton Scenario
  - 30 Year Avoided Costs increase by $1.86 to $12.78
  - Cost Effectiveness Limit increases by .11 to $.75/thm

2011 Integrated Resource Plan

Scenario Runs


Western Canadian Sedimentary Basin
AECO
Kingsgate
Station 2
Sumas
Stanfield
Malin
Opal
Rockies Basins


Southern Crossing
Pipeline Extension
Kingsgate
Spokane
Wenatchee
Boise
Pocatello
Sumas
Vancouver
Victoria
Seattle
Portland
Blue
Bridge
Palomar
Cascade
Palomar
Willamette
Bend
Malin
Klamath
Falls
Medford
Ruby
Source: NWGA

All Resources	Existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from various receipt points (AECO, Rockies, Sumas, Station 2, Malin, as well as behind the citygate (satellite LNG). Incremental supplies also include propane, satellite LNG (behind citygate), imported LNG (Jordan Cove, Oregon LNG), current upstream pipeline transport capacity, as well as proposed pipelines and extensions ("New Blue Bridge", Ruby, Southern Crossing, Pacific Connector, and Palomar). We also included Cascade's current Jackson Prairie storage accounts, our Plymouth LNG account, as well as the potential to obtain a third party's Jackson Prairie account, as well as AECO and Mist storage.	The all resource run allows the company to determine the likely basecase although, the company still runs sensitivities on the various pipeline projects. Malin exchanges seem to be preferred to capacity acquisition due to rate stacking with the Palomar and Ruby options, based on their tariffed recourse rates and assumption of GTN backhaul capability flowing on secondary firm capacity at existing forward haul rates. Satellite LNG facilities located within Cascade's distribution system may also be an attractive alternative to incremental pipeline capacity in areas where physical limitations at the gate stations would result in even higher costs associated with a pipeline solution. There may be additional advantages to such a strategy to the extent a facility could be strategically located on a portion of the distribution system that will eliminate or reduce distribution system

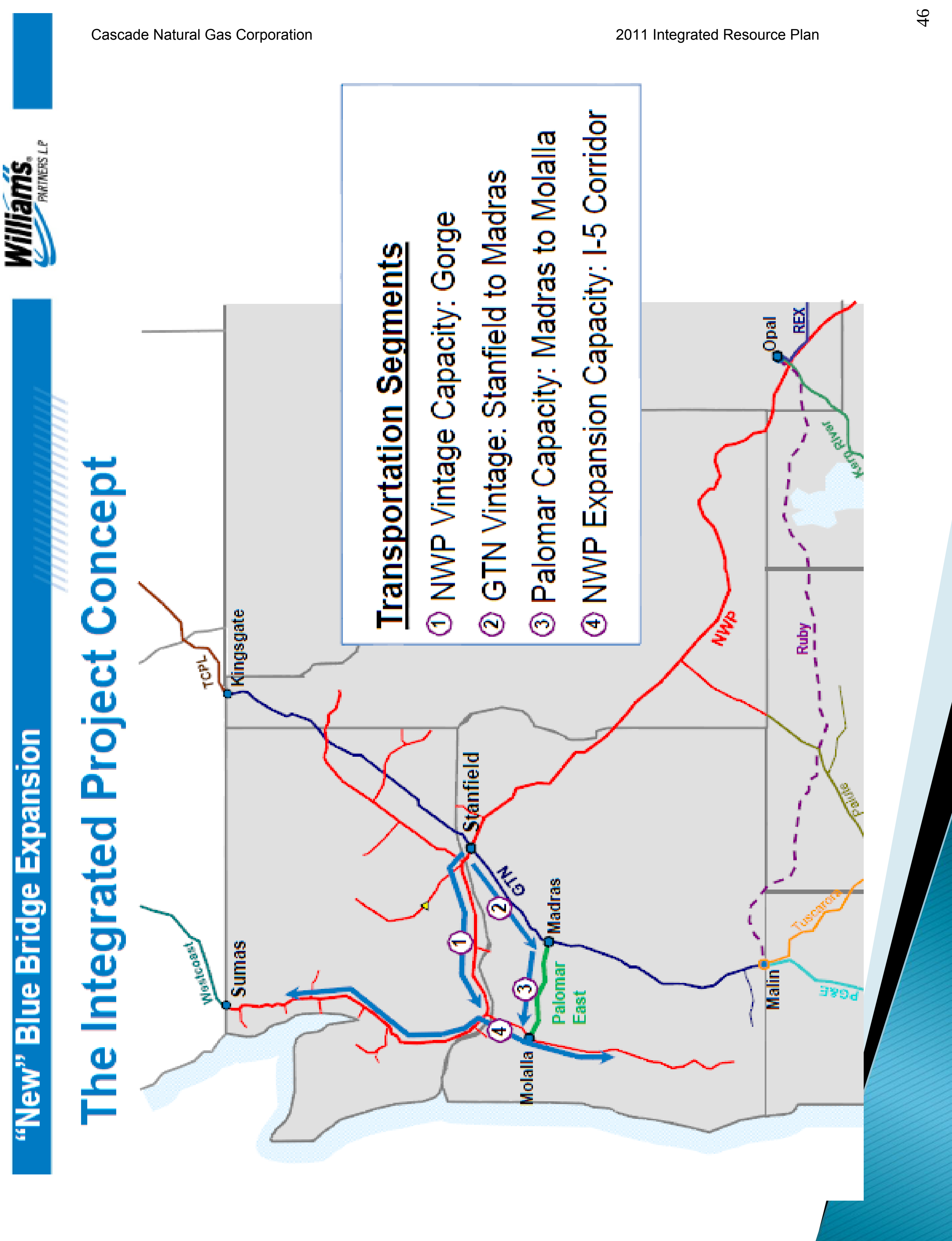
Reference case	Existing supply contracts, incremental supplies (peaking, annual, seasonal and citygate) from various receipt points (AECO, Rockies, Sumas, Station 2, Malin (via backhaul for spot purchases only) as well as behind the citygate. Incremental supplies also include satellite LNG (behind citygate), imported LNG, current upstream pipeline transport capacity. We also include Cascade's current Jackson Prairie storage accounts and our Plymouth LNG account, and incremental storage at Mist and JP. As we will discuss later, at this time it seems imprudent to include Ruby, Palomar, Blue Bridge and GTN backhaul (for purposes other than spot). Palomar recently filed to withdraw their current project filing with FERC; they anticipate filing a new proposal which involves Northwest Natural, Northwest Pipeline and TransCanada which could create something of an Oregon "loop" or "hub". This will directly impact Palomar east/west connection at Madras. Ultimately, secondary firm exists on GTN, but they plan to announce a new firm backhaul service in the next few months; additionally, GTN is expected to file a rate case that may have rate methodology implications that may shift the flow and pricing throughout the Pacific Northwest

Limited British Columbia	Model contains all the elements of the Basecase, but incremental supplies at Station 2 and Sumas include an adder between $1 and $2 to reflect the potential of competition for BC gas supplies being exported at Kitimatt or shipped to Alberta via Groundbirch. It should be noted there are some concerns about the steep decline in shale after it comes on line (in some cases 75%).	• Most believe that while imports may lessen, they will be available (at a price). • Natural gas is expected to grow as a result of Horn River, but there are increasing options for markets as TransCanada and Kitimatt may increase competition for the resources, especially if Station 2 has limited access to Horn River production • The other storage options may provide some other sourcing possibilities. • More AECO gas flows to the distribution system. • At a low rate, the Southern Crossing option of moving gas from Kingsgate to Sumas is also an option. • This scenario also suggests that Sumas capacity should be turned back.

No Rockies price advantage	All potential incremental resources except Rockies are priced at NYMEX flat with no basis adder. In other words, incremental AECO, Sumas and Mailin all have the same price. Rockies is prices with a $0.25 adder. This scenario is designed to look at the possibilities of significantly reduced drilling in the Rockies, coupled with increased competition to move gas on REX and head east. There are some concerns in the industry that despite the large amounts of shale, that due to its steep recovery decline supplies will tighten.	In this run, the model chose to slightly increase the incremental volumes from Canada. Ruby was made available to this scenario, but was not selected, unless steeply discounted. A small amount of Malin exchange was accepted by the model.

Ruby Pipeline	Ruby Pipeline is added as an additional resource. For modeling purposes we assume the $0.95 rate (the max rate identified in their tariff) The model is set up so that Ruby becomes an option to move Rockies gas to GTN, where it would require incremental GTN capacity (backhaul) to move to Cascade's citygates, likely in Central Oregon, although it is possible to move the gas to Stanfield for transport on NWP	• Rate stacking • Basis parity would mean this provides transportation diversity as opposed to supply diversity • It is unknown what GTN backhaul offering would be available. Currently, GTN does offer a secondary firm backhaul from Malin at a price comparable to the forward haul rate. • At certain discount levels, some incremental GTN primary backhaul capacity was selected by the model. • Potential bottleneck at Stanfield and/or Malin if there isn't sufficient displacement on GTN's system for the backhaul.

Pacific Connector	Pacific Connector is added as an additional resource. In addition, we will add incremental LNG (Jordan Cove) as a potential resource. For modeling purposes we started with Pacific Connector transport priced at approximately 3 times the current NWP rate. The model is set up so that Pacific Connector becomes an option to move imported LNG to GTN, where it would require incremental GTN capacity (backhaul) to move to Cascade's citygates.	• Unknown if facility will ever get built • GTN backhaul offering • Rate stacking • Potential bottleneck at Stanfield and/or • Malin • At certain discount levels, some incremental GTN primary backhaul capacity was selected by the model.


“New” Blue Bridge Expansion
The Integrated Project Concept
Transportation Segments
① NWP Vintage Capacity: Gorge
② GTN Vintage: Stanfield to Madras
③ Palomar Capacity: Madras to Molalla
④ NWP Expansion Capacity: I-5 Corridor
Westcoast
Sumas
TCPL
Kingsgate
Stanfield
GTN
Madras
Palomar East
Molalla
NWP
Ruby
Opal
REX
Kern River
Paiute
Tuscarora
Malin
PG&E
46

AECO Storage	Model contains all the elements of the reference case; however, AECO storage is added as a resource. The inventory is set at 300,000 dths, with daily withdrawal rights of 10,000 dths a day. This storage will be setup like the existing Jackson Prairie to be 100% full at the start of each heating season. The model is set up so that Canadian withdrawals can use incremental GTN capacity.	• Competition with Alberta for re-fill volumes • Rate stacking • Likely best to seek outside party to "mimic" this service

Mist Storage	Model contains all the elements of the reference case; however, Mist storage is added as a resource. The inventory is set at 300,000 dths, with daily withdrawal rights of 10,000 dths a day. This storage will be setup like the existing Jackson Prairie to be 100% full at the start of each heating season. The model is set up receipts are available from both Canada and Rockies via Palomar.	• NWP mainline needed to flow north; treated as incremental • Palomar • GTN backhaul • Rate stacking • Madras interconnect has not been agreed to by GTN and Palomar.

Incremental JP storage	Model contains all the elements of the Basecase; however, JP expansion storage is added as a resource. The inventory is set at 300,000 dths, with daily withdrawal rights of 10,000 dths a day. This storage will be setup like the existing Jackson Prairie Expansion to be 100% full at the start of each heating season. The model is set up so that withdrawals can use incremental NWP capacity.	• A level of storage is consistently elected by the storage based on the rate criteria.

CONCERNS WITH MULTIPLE UNCERTAINTIES OF PROJECTS and PIPELINE EVENTS THAT WILL DIRECTLY IMPACT THE INTEGRATED RESOURCE PLAN

As mentioned earlier, at this time it seems imprudent to include Ruby, Southern Crossing, Palomar, Blue Bridge and GTN backhaul (for purposes other than spot). Fortis' Southern Crossing is anticipating another open season utilize Spectra T-South capacity that would allow supplies to move between Kingsgate and Sumas at the T-South rate. Palomar recently filed to withdraw their current project filing with FERC; they anticipate filing a new proposal which involves Northwest Natural, Northwest Pipeline and TransCanada which could create something of an Oregon "loop" or "hub". This will directly impact Palomar east/west connection at Madras. Ultimately, secondary firm exists on GTN, but they plan to announce a new firm backhaul service in the next few months; additionally, GTN is expected to file a rate case that may have rate methodology implications that may shift the flow and pricing throughout the Pacific Northwest.

Should Cascade postpone the draft IRP until later this summer when many of these items will be known and can be properly modeled and analyzed for their impact on the resource plan?

ABOUT RESOURCE DECISIONS…

- SENDOUT relies on a series of inputs or assumptions and then solves for the least cost solution based on the information provided to the model. The results of each of these scenarios provide an answer or a least cost solution, which the optimization model has solved based on its' ***perfect knowledge***.
- The Basecase scenario represents the scenario Cascade considers most likely to be experienced over the planning horizon. In addition to the 200 draws, the Company prepared several sensitivity scenarios to test the resource selections when the baseline conditions are changed.
- Analysis of optimization model results and other operational and contractual constraints allows Cascade to make more informed resource decisions.
- The IRP optimization model output and Monte-Carlo simulation analysis will provide the quantifiable output from numerous model inputs.
- The model does not prescribe the ultimate resource portfolio. It can only determine the least cost set of resources given their specific pricing and quantifiable constraint characteristics.
- However, there are many other combinations of resources that may be available over the planning horizon.
- Cascade must still make subjective risk judgments about unquantifiable and intangible issues related to resource selections. These will include future flexibility, supplier deliverability risk, pipeline(s) risk, financial risk to the utility and its ratepayers, operational constraints, regulatory risk, etc.
- The risk judgments are combined with the quantitative IRP analysis to form actual resource decisions.

Other thoughts, questions, concerns…

- Are there other ideas or concerns that you feel need to be addressed?
- Are there other alternatives we should consider?

Appendix A-3

IRP Guidelines & Rules

Guideline 1: Substantive Requirements

a. All resources must be evaluated on a consistent and comparable basis.

- All known resources for meeting the utility's load should be considered, including supply-side options which focus on the generation, purchase and transmission of power – or gas purchases, transportation, and storage – and demand-side options which focus on conservation and demand response.

  Explanation: Cascade made every effort to include all known supply and demand side options. Supply side options studied include not only the gas itself, but also the pipeline capacity required to transport the gas, the Company's gas storage options, and the system enhancements necessary to distribute the gas. The demand side study looked at all the potential energy savings potentially available within the Company's service territory. Section 6 focuses on supply side resources, while Sections 3 and 5 focused on demand side options including conservation and demand response options. The use of a resource integration model which allows the utility to compare resources on a consistent and comparable basis. The results of the integration modeling can be found in Section 7.

- Utilities should compare different resource fuel types, technologies, lead times, in-service dates, durations and locations in portfolio risk modeling.

  Explanation: Sections 5 and 6 of the text focus on the demand side and supply side alternatives. Section 5 discusses Demand side resources available including an assessment of the conservation potential that would be available over the planning horizon. The complete list of measures available in Cascade's Oregon service territory is provided in Appendices D-1 and D-2.

  On the supply side, Section 6 discusses the supply resources available over the planning horizon. The supply-side options range from existing and proposed interstate pipeline capacity options, various storage options, including leased underground storage alternatives, imported LNG, as well as Satellite LNG facilities located at various locations within the Company's service territory, and unconventional supplies such as Bio-gas. Appendix E clearly defines each resource's availability, pricing assumptions, location and assumed in-service date.

- Consistent assumptions and methods should be used for evaluation of all resources.

Explanation: To the best of its ability, Cascade evaluated all resources, both supply and demand side, on a consistent basis and objectively applied the same common assumptions, approaches and methodology to each option. The resource integration analysis was accomplished through the use of the SENDOUT model. Section 7 contains the specific descriptions of the resource evaluation methodology.

- The after-tax marginal weighted-average cost of capital (WACC) should be used to discount all future resource costs.

  Explanation: In the 2011 IRP, the Company uses a real after-tax discount rate of 4.17 percent.

b. Risk and Uncertainty must be considered.

- At a minimum, utilities should address the following sources of risk and uncertainty:
  Natural gas utilities: demand (peak, swing and baseload), commodity supply and price, transportation availability and price, and cost to comply with any regulation of greenhouse gas emissions.

  Explanation: This Plan (study) is characterized by risk and uncertainty because the Company cannot perfectly predict the contributing data such as future customer counts, economic conditions, market changes and weather conditions. However, this study analyzes risk-related data such that the Company can make reasonable assumptions. Cascade utilized low, medium, and high demand scenarios with low, medium, and high supply cost and availability scenarios to evaluate a range of potential future environments. These scenarios were run through Monte Carlo analysis in the Sendout program to analyze variations in inputs and subsequent demand sensitivities, pricing, and resource timing and selection. Additionally, the company ran several scenarios that capture the range of costs associated with complying with potential greenhouse gas emissions. The company incorporated a range of scenarios that include varying implementation timelines, ranges of throughput subject to potential cap and trade legislation, along with a range of costs associated with purchasing carbon credits.

- Utilities should identify in their plans any additional sources of risk and uncertainty.

  Explanation: Various sources of risk and uncertainty are explained in Sections 3 (with respect to the Demand Forecast), 5 (Demand Side Resources), and 6 (Supply Side Resources).

c. The primary goal must be the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers.

- The planning horizon for analyzing resource choices should be at least 20 years and account for end effects. Utilities should consider all costs with a reasonable likelihood of being included in rates over the long term, which extends beyond the planning horizon and the life of the resource.

  Explanation: This IRP contains the Company's long-range analysis of load and resources spanning a 20-year horizon.

- Utilities should use present value of revenue requirement (PVRR) as the key cost metric. The plan should include analysis of current and estimated future costs for all long-lived resources such as power plants, gas storage facilities, and pipelines, as well as all short-lived resources such as gas supply and short-term power purchases.

  Explanation: The Company's SENDOUT® modeling software uses a PVRR cost metric methodology, which provides resource portfolio costs in both nominal and real (present value) dollars that is applied to resources of varying expected lives.

- To address risk, the plan should include, at a minimum:

  1. Two measures of PVRR risk: one that measures the variability of costs and one that measures the severity of bad outcomes.

     Explanation: Through application of the SENDOUT® software, the Company modeled 200 scenarios around varying gas price and weather inputs via Monte Carlo iterations thereby developing a distribution of annual cost estimates utilizing SENDOUT®'s PVRR methodology. Section 7 further describes this analysis while Figure 7-J summarizes this analysis graphically. The variability of costs is plotted against the Basecase while the scenarios beyond the 95th percentile capture the severity of bad outcomes.

  2. Discussion of the proposed use and impact on costs and risks of physical and financial hedging.

     Explanation: Section 6 discusses Cascade's physical and financial hedging methodology.

- The utility should explain in its plan how its resource choices appropriately balance cost and risk.

Explanation: Section 7 discusses Cascade's cost/risk trade off analysis.

d. The plan must be consistent with the long-run public interest as expressed in Oregon and federal energy policies.

Explanation: In preparing this plan, Cascade considered the guidelines contained in OPUC Order No. 07-047 as evidenced in this appendix and discussed in greater detail throughout the Plan.

Cascade considered both current and expected state and federal energy policies in portfolio modeling. Section 2 describes the decision making process used to derive portfolios which are consistent with state resource policy directions.

Guideline 2: Procedural Requirements

a. The public, which includes other utilities, should be allowed significant involvement in the preparation of the IRP. Involvement includes opportunities to contribute information and ideas, as well as to receive information. Parties must have an opportunity to make relevant inquiries of the utility formulating the plan. Disputes about whether information requests are relevant or unreasonably burdensome, or whether a utility is being properly responsive, may be submitted to the Commission for resolution.

Explanation: The public has been given considerable opportunities to participate in the development of Cascade's 2011 IRP. Section 1 discusses an overview of the public process.

b. While confidential information must be protected, the utility should make public, in its plan, any non-confidential information that is relevant to its resource evaluation and action plan. Confidential information may be protected through use of a protective order, through aggregation or shielding of data, or through any other mechanism approved by the Commission.

Explanation: As evidenced by the material included throughout the plan, the Company has put forth all relevant non-confidential information necessary to produce a comprehensive Plan.

c. The utility must provide a draft IRP for public review and comment prior to filing a final plan with the Commission.

Explanation: On June 10, 2011, Cascade Natural Gas (Cascade or Company) filed a request with the Commission to extend its 2011 IRP filing date from August 9, 2011, to March 15, 2012. In July 2011 the Commission extended the deadline to December 30, 2011. In its extension request, Cascade stated that providing additional time would ensure that the supply resource analysis and preferred portfolio analyses would be better informed. The Company believed that the outcome of its IRP analysis would be significantly different once more information about several unknown factors (ranging from NWP and GTN rate cases as well as new pipeline projects) became clearer. While Cascade sincerely appreciated the extension—we were unfortunately, unable to produce a draft IRP that would allow us sufficient time to adequately address any comments prior to the December 30 deadline.

Guideline 3: Plan Filing, Review, and Updates

a. The utility must file an IRP for within two years of its previous IRP acknowledgement order.

Explanation: Cascade's most recent Integrated Resource Plan for Oregon was acknowledged by the OPUC in August 2009, which based on the 2 year filing requirement, another plan was not due to be filed until August 2010. On June 10, 2011, Cascade Natural Gas (Cascade or Company) filed a request with the Commission to extend its 2011 IRP filing date from August 9, 2011, to March 15, 2012. In July 2011 the Commission extended the deadline to December 30, 2011.

b. The utility must present the results of its filed plan to the Commission at a public meeting prior to the deadline for written public comment.

Explanation: Cascade will adhere to this guideline.

c. Commission Staff and parties should complete their comments and recommendations within six months of IRP filing.

Explanation: The Company looks forward to working with Staff and interested parties in their review of this Plan.

Guideline 4: Plan Components

At a minimum the plan must include the following elements:

a. An explanation of how the utility met each of the substantive and procedural requirements.

Explanation: This Appendix is intended to comply with this guideline by providing an itemized response to each of the substantive and procedural requirements.

b. Analysis of high and low load growth scenarios in addition to stochastic load risk analysis with an explanation of major assumptions.

Explanation: The Base Case demand forecast uses the Company's projected customer growth and projected prices. This IRP considers two departures from the Base Case demand forecast, including low, medium, and high demand growth forecasts, as well as stochastic risk analysis. Section 3 discusses the Demand Forecast scenarios and their assumptions and Section 7 provides the scenario and risk analysis results.

c. For electric utilities … (Not applicable)

d. For natural gas utilities, a determination of the peaking, swing and base-load gas supply and associated transportation and storage expected for each year of the plan, given existing resources; and identification of gas supplies (peak, swing and base-load), transportation and storage needed to bridge the gap between expected loads and resources.

Explanation: Section 6 details determination of gas supply and associated transportation and storage options, while Section 7 incorporates the forecasted demand load and necessary options to meet that load.

e. Identification and estimated costs of all supply-side and demand-side resource options, taking into account anticipated advances in technology.

Explanation: Section 5 along with Appendix D 1 through 4 identifies the demand side resources options included in this plan. Section 6 along with Appendix E details all supply-side options included in this plan.

f. Analysis of measures the utility intends to take to provide reliable service, including cost-risk tradeoffs.

Explanation: Sections 3 and 4 discusses the modeling tools, customer growth forecasting and cost-risk considerations used to maintain and plan a reliable gas delivery system. Section 6 discusses the diversified infrastructure and multiple supply basin approach that acts to mitigate certain reliability risks.

g. Identification of key assumptions about the future (e.g., fuel prices and environmental compliance costs) and alternative scenarios considered.

Explanation: Section 7 details the key assumptions and alternative scenarios considered in the Plan.

h. Construction of a representative set of resource portfolios to test various operating characteristics, resource types, fuels and sources, technologies, lead times, in-service dates, durations and general locations - system-wide or delivered to a specific portion of the system.

Explanation: This Plan documents the development and results for resource options evaluated in this IRP. See also guideline 1c for further discussion on resource mix alternatives to portfolios.

i. Evaluation of the performance of the candidate portfolios over the range of identified risks and uncertainties.

Explanation: The Company evaluated its preferred portfolio by performing stochastic analysis using the Monte Carlo functionality within the SENDOUT model. The analysis allowed for varying price and weather scenarios under 200 different scenarios. Additionally the portfolio of options was reviewed under deterministic scenarios where demand and price vary. For resources selected, we considered other risk factors such as varying lead times required and potential changes in costs in order to test the Basecase scenario assumptions.

j. Results of testing and rank ordering of the portfolios by cost and risk metric, and interpretation of those results.

Explanation: Section 7 describes the resource options evaluated, including discussion on uncertainties in lead times and costs as well as viability and resource availability. Figures in Section 7 proved the testing and rank ordering of the portfolios and the interpretation of those results.

k. Analysis of the uncertainties associated with each portfolio evaluated.

Explanation: The See the responses to 1.b above.

l. Selection of a portfolio that represents the best combination of cost and risk for the utility and its customers.

Explanation: Cascade evaluated cost/risk tradeoffs for each of the risk analysis portfolios considered. Section 7 shows the company's portfolio risk analysis, as well as the process and determination of the preferred portfolio.

m. Identification and explanation of any inconsistencies of the selected portfolio with any state and federal energy policies that may affect a utility's plan and any barriers to implementation.

Explanation: This IRP has presumed no inconsistencies with existing policies. Potential barriers to implementation of the Plan relate to the ultimate availability and timing of certain incremental resources selected (e.g. both Satellite and Import LNG, the Rockies pipeline expansion projects along with BNG alternatives within CNG's distribution system).

n. An action plan with resource activities the utility intends to undertake over the next two to four years to acquire the identified resources, regardless of whether the activity was acknowledged in a previous IRP, with the key attributes of each resource specified as in portfolio testing.

Explanation: Section 8 presents the Company's 2-year action plan, which identifies the short term actions the Company plans to pursue.

Guideline 5: Transmission

Portfolio analysis should include costs to the utility for the fuel transportation and electric transmission required for each resource being considered. In addition, utilities should consider fuel transportation and electric transmission facilities as resource options, taking into account their value for making additional purchases and sales, accessing less costly resources in remote locations, acquiring alternative fuel supplies, and improving reliability.

Explanation: Not applicable to Cascade's gas utility operations

Guideline 6: Conservation

a. Each utility should ensure that a conservation potential study is conducted periodically for its entire service territory.

Explanation: As discussed in Section 6, Cascade retained the services of Stellar Processes to analyze the potential energy savings it can cost-effectively procure within its Washington service territory for this IRP and continues to use this model. A similar study was prepared by Stellar Processes for the ETO, in consultation with Cascade, to assess the potential energy savings within Cascade's Oregon service territory. The ETO and Cascade continue to work with Stellar Processes (Stellar) to review existing demographic and energy efficiency measures data sources to identify and quantify technical and achievable resource potential.

b. To the extent that a utility controls the level of funding for conservation programs in its service territory, the utility should include in its action plan all best cost/risk portfolio conservation resources for meeting projected resource needs, specifying annual savings targets.

Explanation: Achievable potential DSM savings per customer class in Cascade's Oregon and Washington service territories with cost-effective screening at the Company's Base Case avoided cost is summarized in Section 6.

c. To the extent that an outside party administers conservation programs in a utility's service territory at a level of funding that is beyond the utility's control, the utility should: 1) determine the amount of conservation resources in the best cost/ risk portfolio without regard to any limits on funding of conservation programs; and 2) identify the preferred portfolio and action plan consistent with the outside party's projection of conservation acquisition.

Explanation: Because the Company believes funding options are available and understands Staff agrees with this assumption, this guideline is being treated as not applicable.

Guideline 7: Demand Response

Plans should evaluate demand response resources, including voluntary rate programs, on par with other options for meeting energy, capacity, and transmission needs (for electric utilities) or gas supply and transportation needs (for natural gas utilities).

Explanation: Cascade has addressed periodically evaluated conceptual approaches to meeting capacity constraints using demand-response and similar voluntary programs. Interruptible sales service is the most reliable method of achieving demand response (see discussion in Section 6).

Guideline 8: Environmental Costs (As revised in UM1302)

Utilities should include, in their base-case analyses, the regulatory compliance costs they expect for CO2, NOx, SO2, and Hg emissions.

Explanation: Unlike electric utilities, environmental costs rarely impact a gas utility's supply-side resource choices. Section 6 discusses Cascade's assumptions regarding expected environmental costs through a range of possibilities. In Section 7, the Company discusses the impact on system costs based on alternative implementation time lines, cost adders and varying levels of allowances.

Guideline 9: Direct Access Loads

Explanation: Not applicable to natural gas utility.

Guideline 10: Multi-state Utilities

Multi-state utilities should plan their generation and transmission systems, or gas supply and delivery, on an integrated-system basis that achieves a best cost/risk portfolio for all their retail customers.

Explanation: Cascade's 2011 IRP includes its Oregon and Washington service territories and utilizes an integrated approach in determination of demand, supply, and cost/risk portfolios.

Guideline 11: Reliability

Natural gas utilities should analyze, on an integrated basis, gas supply, transportation, and storage, along with demand-side resources, to reliably meet peak, swing, and base-load system requirements. Electric and natural gas utility plans should demonstrate that the utility's chosen portfolio achieves its stated reliability, cost and risk objectives.

Explanation: Cascade analyzes on an integrated basis, gas supply, transportation, and storage along with demand-side resources to reliably meet peak, swing and base-load system requirements. As discussed throughout the Plan, Cascade's strategy is to reliably serve our firm gas sales customers in a way that minimizes costs over the long term and the Company believes that its basecase portfolio meets these objectives.

Guideline 12: Distributed Generation

Explanation: Not applicable to natural gas utility.

Guideline 13: Resource Acquisition

a. Electric utilities … (Not applicable)

b. Natural gas utilities should either describe in the IRP their bidding practices for gas supply and transportation, or provide a description of those practices following IRP acknowledgment.

Explanation: Cascade's gas procurement strategy is outlined in Section 5

Appendix A-4

Comments from Stakeholders and Cascade Responses

Request No. 1

Date prepared: April 3, 2012

Preparer: Mark Sellers-Vaughn

Telephone: (206) 617-2708

1. Action Item 3 from last IRP: The Company has not found the data to be statistically valid - can we get this data?

   RESPONSE: We require additional information in order to properly address this question. Is CUB referring to the incorporation of price elasticity in future forecasts of demand? What specific data does CUB believe that Cascade does not believe to be statistically valid?

Request No. 2

Date prepared: March 29, 2012

Preparer: Mike Hardesty

Telephone: (509) 734-4550

2. Distribution System (Section 4/Appendix C):
   a. Will the Company please provide any data from local field personnel that may have impacted the forecasts by town? (pg. 25)
   b. Appendix C - what do "PE", "HP", "S" "regs/upra" and "new reg" stand for? And how has the company determined the best solution for each gate?
   c. Appendix C - why is there a substantive entry for "reinforcement needed" at the Kennewick plant if the Company has concluded in column 2 that no reinforcement is needed? (this chart has other, similar errors)
   d. The Company has indicated that reinforcement is needed as Selah, but has not provided any detail in Appendix C. Is that information now available?
   e. On Table 4-1, the Company has not included any yearly reinforcement costs by gate for Sedro Woolley, Stanwood, Sumas Boarder, Sunriver, Umatilla, Walla Walla, and Yakima, yet there is a grand total for each of these gates in the final column—does the company have yearly reinforcement costs for each of these gates?
   f. On Table 4-1, what is the specific breakdown of costs for each gate?

RESPONSE: Table 4-1 and Appendix have been updated to address these questions and is part of the 2011 IRP Replacement filing.

Request No. 3

Date prepared: April 12, 2012

Preparer: Allison Spector

Telephone: (360) 788-2356

3. Demand Side Resources (Section 6/Appendix D)
   a. Will the Company please provide the 2011 Stellar Assessment entitled "Energy Efficiency and Conservation Measure Resource Assessment for the years 2010-2030"?

RESPONSE: Yes, the updated Stellar Study will be published with the 2011 IRP addendum/replacement filing.

   b. Conservation Measures
      i. 2008 ETO Stellar Study Update—is the company working to update this information currently given this economic climate? If so, when will this information be available?
         1. Is there a concern that this information may not be relevant in light of recent economic conditions?

RESPONSE: The measure spread developed by the Energy Trust of Oregon was informed not only by the 2008 Stellar Study Update, but by the 2011 Stellar Assessment referenced by CUB in question 1. The revised assessment and subsequent, regularly performed, refinements to the Stellar Document post 2008 reflect the current economic climate and is presented in this iteration of the IRP. The Company is confident that the ETO has taken its best understanding of current economic conditions into account in the development of its most recent listing of measures capable of capturing the technical and achievable potential reflected in the Integrated Resources Plan. That being said, it is the Company's understanding that not all conservation measures listed as viable in the IRP are ultimately implemented by the ETO in its program portfolio. Likewise, there may be additional measures added to the program that are not explicitly outlined as viable by Stellar. These differences are explained in the DSM section of the IRP as well as in 2011 Stellar Assessment.

c. Interruptible Service

    i. Need more information regarding frequency of service interruption events and participation rates

RESPONSE: Rate Schedules 170 (Oregon), 570 and 577 (Washington) customers were last interrupted on gas day January 5, 2004. Records indicate there were 2 customers in Oregon and 11 in Washington.

d. The Company states "As a natural gas distribution company, the Company's only supply-side energy resource is natural gas. However, environmental externality costs do make a difference in the comparison between supply-side and demand-side resources." (pg 69)

    i. Is the Company planning to model Oregon's pending plan to reduce greenhouse gas emissions to 10% below 1990 levels? Or other relevant, current law?

    ii. How has this analysis impacted the Company's portfolio options?

RESPONSE: Please refer to Table 7-2 on page 88 as well as the discussion on pages 104-107 of the 2011 IRP Addendum/replacement filing.

    iii. Need to update to incorporate Gov. Kitzhaber's 10 Year Energy Plan

RESPONSE: Page 61 of the 2011 IRP Addendum/replacement filing of the 2011 IRP describes the Company's acknowledgment - and general awareness of - the Governor's 10 Year Energy Plan.

Request No. 4

Date prepared: April 14, 2012

Preparer: Mark Sellers-Vaughn

Telephone: (206) 617-2708

4. Supply Side Resources (Section 5/Appendix E/Appendix F)
   a. Supply side resources:
      i. Jordan Cove and Bradwood Landing are not on track to be LNG import facilities at this time; Jordan Cove just filed with FERC saying it is to be an export facility - Bradwood Landing filed for bankruptcy in May 2010; general rumor circulating now is that the facilities slated to be import will actually be export due to shale gas and other domestic reserves

RESPONSE: Cascade is aware that Jordan Cove is no longer on track to be an import facility and that they will need to file with FERC to become an export facility. The initial SENDOUT scenarios were run last summer but it was still unclear as to what type of facility would be built; even as late as November 2011 the pipeline and terminal still had FERC approval for imported natural gas. We are also aware of rumors that made the newspapers in December 2011 about the Clifton Terminal development on the Landing site. We agree that several passages in Sections 5 and 7 contain contradictions regarding both Jordan Cove and Bradwood, which will be cleared up as part of the 2011 IRP Addendum/Replacement Filing.

      ii. Palomar Pipeline and Blue Ridge Pipeline are not moving forward; Pacific Connector Gas Pipeline (designed to transport nat gas from Jordan Cove to mkts in the region)—what's the status of this given that Jordan Cove is filing to be an export facility?

RESPONSE: While the proposed Palomar and Palomar/Bluebridge projects do not seem to be moving forwards, Northwest Natural still has the option to propose these projects again or a similar cross- Cascade Pipeline in the future. Northwest Natural also plans to prepare or participate in a "regional analysis" of a cross-Cascade pipeline. Cascade has requested and Northwest Natural has agreed to allow Cascade to participate in this analysis.

iii. Storage – Has the company investigated adding additional storage capacity? What percentage of total volume is the industry norm for storage?

RESPONSE: Our modeling has consistently shown SENDOUT selecting additional storage, if the option is made available to it in similar shape and pricing as the Jackson Prairie accounts. The model has also selected storage at Mist or Aiken Creek, but typically only at steeply discounted rates. Cascade has had discussions with NW Natural Gas Storage LLC regarding Mist expansion or available short-term space they may have available. Recently, we have been analyzing Ryckman Creek's planned expansion in the Opal region, which would tie into Ruby and Northwest Pipeline. Regarding percentage of an industry norm for storage: that is difficult to quantify as much depends on regionally available (and viable) storage facilities and the infrastructure being located near a distribution system.

b. When the company works to negotiate contract terms that "make sense" for both parties, what are the criteria? And what factors determine whether a project is viable? (IRP pg. 35).

RESPONSE: There are numerous criteria that go into determining if a project or a resource is viable. As with any resource, it must be capable of being utilized and supplies delivered to meet load on the distribution system in a timely manner and consistent any upstream pipelines' tariff provisions regarding quality, title, operating conditions, etc.; the resource must be attractively priced and operationally viable compared to other potential options (risk/benefit analysis); the resource must be backed by a party whose financial standing meets Cascade's creditworthiness standards; also, the resource should be analyzed (via SENDOUT, for example) to determine it meets the company's set goals for a balanced, responsibly priced, reliable portfolio to serve our customers. There are also some subjective considerations which must be considered such as past performance, administrative difficulties, etc.

c. How much firm pipeline capacity is being used for non-core customers at this time? And projected over the IRP planning period? (pg 38)

RESPONSE: Currently there are six Washington (Rate Schedule 685) customers who have capacity released to them or their third party supplier. This number drops to one in 2015. There are no Oregon customers receiving capacity release under Rate Schedule 185. The breakdown by year and volume (in dths/day):

Year	2012	2013	2014	2015	2016
Volume	26,707	22,888	19,072	1,000	1,000

d. How much, if any, of the company's firm transportation capacity is the company currently trading through the Electronic Bulletin Board? How much will that change over the planning period? (pg 38)

RESPONSE: See item c above. Also, since Cascade's monthly load demand changes (due to weather influences, for example), the amount of excess capacity that is available to post each month will vary depending on that load, anticipated weather events (near term), balancing activities with the upstream pipeline and market demand for capacity by others (usually to take advantage basis differentials).

e. The company states that "Some of the growth will require Cascade to look at alternatives to pipeline mainline capacity such as LNG satellite facilities located near or within the Company's distribution system. The Company is continuing to study the viability of LNG satellite facilities to meet these needs." Where is the Company with these studies? (pg 39)

RESPONSE: In recent years Cascade has worked with parties such as Northwest Pipeline and Northstar Industries LLC to scope out various satellite LNG facilities. In the coming year we will be having discussions with Northwest Pipeline about trucking in LNG from Plymouth, as well following up on a 2010 study regarding a propane air facility. To date we have not identified a specific project to become part of the portfolio within the next three years.

f. The Company concludes that it needs to acquire additional capacity resources as customer count and loads continue to grow—does this hold true across the board or are there areas that need expansion and others that don't? (pg. 39)

   i. Appendix F shows shortfalls in the zones below, but not in others throughout the 20 year planning period (what are these zones?)***

      1. Zone 11 (current and future)
      2. Zone 12 (starting in 2028)
      3. Zone 30-W (current and future)

4. Zone GTN (current and future)
5. Zone ME-WA (current and future)

RESPONSE: Section 5 of the 2011 IRP Addendum/replacement filing expands the discussion on the specifc zones that have projected peak day capacity shortfalls. As noted in your question not all zones have shortfalls. Please see figure 7-A on page 85 of the 2011 IRP Addendum/replacement filing for a map of the zones references used throughout the IRP.

Request No. 5

Date prepared: April 13, 2012

Preparer: Mark Sellers-Vaughn

Telephone: (206) 617-2708

5. Resource Integration (Section 7)
   a. General concern that the 2011 IRP contains assumptions that either have been or are likely to be rendered invalid…
      i. Basecase - Jordan Cove is not an import facility/Bradwood Landing is bankrupt; satellite LNG (Company has not determined whether this is viable - needs additional analysis); Blue Ridge and Palomar Pipelines are not being built/other pipelines are uncertain at best at this point

RESPONSE: We believe the cause of CUBs concern here is due in part to mistaken statements that were erroneously missed during Cascade's internal edit of the IRP text prior to filing. We regret any confusion our insufficient editing has caused. As indicated in our response to Request No. 4, we agree that Blue Bridge is not viable product; the IRP does mention the September shelving of the project on page 37 of the IRP but then erroneously states on page 75 that it was part of the basecase scenario. These contradictions are corrected in the 2011 IRP Addendum/Replacement Filing.

It is also important to bear in mind that alternative resources considered in the integrated resource plan are considered in part based on the best information available at the time the plan is being developed. Naturally, these proposed projects evolve over time; often these resources, such as an incremental pipeline proposal, do not become available or operate as originally envisioned; in 2011 there were an unusual number of infrastructure proposals where information on the resources changed rapidly or was changed in ways that created significant complications with the timing of the IRP development. It was because of the unusual amount of uncertainty and change for many of the alternative resources that prompted Cascade to request the initial extension for filing the IRP until March 2012.

Cascade's Integrated Resource Plan provides the strategic direction guiding the Company's long-term resource acquisition process. The plan does not commit Cascade to the acquisition of a specific resource type or facility, nor does it preclude the Company from pursuing a particular resource or technology. Rather, the plan identifies key factors related to resource decisions and provides a method for evaluating resources in terms of their cost and risk. Cascade recognizes that integrated resource planning is a dynamic process reflecting changing market forces and a changing regulatory environment. Other factors, some subjective, must also be considered when determining which resource(s) will create the optimum portfolio.

April 30, 2012

Citizens' Utility Board of Oregon

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Public Utility Commission of Oregon
PUC Filing Center
PO Box 2148
Salem, OR 97308

RE: **LC 54 CUB's OPENING COMMENTS**

Dear Filing Center:

The Citizens' Utility Board of Oregon ("CUB") appreciates the opportunity to comment on Cascade Natural Gas Corporation's ("Cascade") 2011 IRP.

CUB has reviewed both the original IRP and the supplemental filings. CUB provided written comments and questions and participated at the workshop with the company on April 2, 2012. CUB also attended the public meeting on April 10, 2012 during which Cascade presented its IRP to the Commission. Additionally, CUB met with Company employees on April 18, 2012 to further discuss the IRP.

Given CUB's participation in the docket to date, and the willingness of the Company to address CUB's concerns thus far, CUB has no specific comments to file with the Commission at this time.

CUB will continue to participate in the LC 54 docket. Sincerely,

G. Catriona McCracken, Attorney #933587
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c. Service List LC 54

LC 54 – CERTIFICATE OF SERVICE

I hereby certify that, on this 30th day of April, 2012, I served the foregoing **OPENING COMMENTS OF THE CITIZENS' UTILITY BOARD OF OREGON** in docket LC 54 upon each party listed in the LC 54 OPUC Service List by email and,
where paper service is not waived, by U.S. mail, postage prepaid, and upon the Commission by email and by sending one original and five copies by U.S. mail, postage prepaid, to the Commission's Salem offices.

(W denotes waiver of paper service) (C denotes service of Confidential material authorized)

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Respectfully submitted,

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LC 54 - Certificate of Service OPENING COMMENTS OF THE CITIZENS' UTILITY BOARD OF OREGON

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 54

In the Matter of
Cascade Natural Gas
2011 Integrated Resource Plan

)
) STAFF'S COMMENTS
)
)

Following are Staff's initial comments and recommendations on the Cascade Natural Gas (Cascade or Company) 2011 Integrated Resource Plan (IRP or plan). Staff's comments are organized by subject and address Staff's primary concerns at this time. Staff will continue to evaluate the Company's recently updated plan, responses to data requests and parties' comments, prior to issuing final comments, recommendations and a proposed order for this plan in mid-June 2012.

Background

Cascade filed its 2011 IRP, LC 54, with the Commission on January 3, 2012. A workshop was held on April 2, 2012, allowing Cascade, Staff, Citizens' Utility Board, and Northwest Industrial Gas Users to discuss areas of the plan requiring further explanation. Following the workshop, Cascade filed updates covering multiple sections of its IRP, including a replacement of its Action Plan. On April 10, 2012, Cascade provided the Commission with an informational overview of LC 54, answering Commissioners' questions, as part of the regular public meeting.

Staff's Initial Comments

While staff will not file final comments and a draft proposed order until June, the following is an overview of staff's concerns at this time.

Demand Forecast
Section 3

Staff notes that Cascade has increased the reliability of the methodology used in its load forecast modeling by changing from its use of town data inputs in some models and district data inputs in other models, as was done in previous IRPs, to the consistent use of district data inputs. This change is described on page 17, in Section 3 of LC 54.

Staff's review of the demand forecast indicates that Cascade evaluates baseload and peak demand but it does not evaluate swing demand. Staff notes that the Company does evaluate swing supply as part of its plan.[1] Staff recommends that Cascade also evaluate swing demand and include its findings in an update to its plan. Staff supports the Company's approach to its peak day forecast.[2]

Staff recommends that Cascade provide additional explanation regarding its development of the plan's high and low load growth scenarios.[3] At this time, Staff finds the Company's expected load growth for residential and commercial classes to be too high. Peak load growth also appears to be too optimistic. Staff recommends that Cascade provide further explanation of these results along with additional information regarding the forecast for the industrial class. While load growth forecasts require further explanation, Staff finds the Company's forecast of reduction in therm usage to be reasonable.

Staff's review of Appendix B, Demand Forecast model Escalation Rates, reveals multiple inconsistencies requiring explanation and potential correction by way of update. These inconsistencies are as follows:

- Page 302, in the high growth scenario, projected employment growth is missing for Adams, WA.
- Pages 305-307 are duplicates of pages 302-304 thus need to be deleted.
- Page 308, in the medium growth scenario for Aberdeen 2012-2015, the results for the medium growth scenario are actually lower than the low growth scenario on page 312.
- Page 316, in the high growth scenario for Kennewick, peak daily baseload is lower than the medium growth scenario in years 2024 and beyond.
- Page 308, in the medium growth scenario for Longview 2012-2015, the results for the medium growth scenario are actually lower than the low growth scenario on page 312. Additional explanation is also needed about baseload peak during years 2012-2016, therm usage by residential class during years 2012-2016, and residential customer growth in 2013.
- Page 309, in the medium growth scenario for Moses Lake 2012-2015, the results are actually lower than the low growth scenario on page 313.

[1] LC 54 Appendices, page 232 Confidential.
[2] Cascade's peak day forecast is developed by adjusting the therm usage on the coldest day in recent history [January 5, 2004 at 56 heating degree days (HDD)] upwards to an estimate of therm usage that would have been had that day been 61 HDD.
[3] Cascade created the high and low scenarios by examining the best and poorest performing years from the historical data period, 1980 to 2009.

- Page 313, in the low growth scenario for Walla Walla, the low growth total therm usage is greater than the high growth for some years and is greater than the medium growth scenario for all years. Additionally, further explanation is required with regard to the customer forecast in this area beyond 2020.

- Page 337, the customer forecast graph for Wenatchee might be improved by changing the scale of the vertical axis. As the graph currently exists, there is no variability in the growth; however, the data indicates there is variability.
- Page 314, in the low growth scenario for Yakima, therm usage is greater in all years than the medium and high growth scenarios on pages 310 and 318.
- Page 340, Staff requests that Cascade provide explanation of the customer count modeling for Baker during 2012 – 2014.
- Page 344, Staff requests that Cascade provide explanation of the customer count modeling for Ontario during 2012 – 2018. Explanation of total therm usage modeling for the entire IRP period is also requested for Ontario, page 345.
- Page 349, Staff requests explanation of total therm usage modeling for the entire IRP period for Pendleton.

Staff recommends that Cascade consider including a glossary of formula components, as part of the plan's appendices, to improve understanding of the document for parties and the general public.

Demand Side Resources
Section 6

Staff requests that Cascade revise information surrounding Energy Trust of Oregon (ETO) costs and measures, on page 55 of Section 6, relating to the Stellar Study Report,[4] updated by the Company following the workshop on April 2, 2012. Cascade should provide confirmation that the information in the body of the IRP reflects the updated appendices.

Cascade indicates, on page 56 of Section 6, that demand side management (DSM) goals are expected to be achievable despite the ETO's significant downward revisions to the 20-year therm savings potential for the Company, and more stringent performance metrics from the PUC. Staff requests explanation of how this may be impacted by whether Commission adoption of key performance measures (KPM) for levelized cost of $0.52/therm in UM 1565 is inclusive or exclusive of the program management, program incentives, program payroll and related expenses.

[4] Stellar Study Report – Resource Assessment for Energy Trust of Oregon, in Appendix D-5 of LC 54.

Staff recommends that Cascade clarify the discussion surrounding levelized cost on page 67 of Section 6. The back and forth reference of measure screening between the $1.00/therm and the $0.52/therms causes confusion. If the ETO is guided by the Commission KPM of $0.52/therm, the Company should focus the discussion and target savings on that basis, contingent upon verification of whether the $0.52/therm includes program costs and related expenses.

Staff requests that Cascade provide the following avoided cost information in correlation with the Stellar Study Update:

- What is the date of the price forecast used in the calculation of the avoided cost? Provide the source, if and when it was updated.
  - What other components are included in the avoided cost? Provide details and reference source of data.

- What year is the Company using for the avoided cost calculations in Appendix H?

  - Please explain how the company ensured in LC 54 that the DSM therm savings and funding level is in sync with the avoided cost calculation.

Two-year Action Plan
Section 8

Staff's review of Cascade's updated Action Plan resulted in the following requests for additional details in future updates:

Distribution Enhancements actions to be taken in the near term to meet core growth

- Qualitative and quantitative analysis of the anticipated enhancements, including additional needs expected in Cascade's Distribution Integrity Management Program.

NWN delivery rights re-alignment and incremental vintage capacity acquisition program:

- Ongoing analysis associated with re-aligning vintage capacity acquisitions with future pipeline capacity shortfalls.

Securing Ruby Capacity to meet load growth and add supply diversity:

- Provide ongoing analysis of the level and impact associated with the addition of this supply diversity.

Securing incremental Gas Transmission Northwest Pipeline (GTN) firm backhaul capacity to meet load growth and add supply diversity:

- Details surrounding the backhaul agreement once it becomes available.

<u>Securing incremental storage to meet load growth and mitigate price volatility over the 20 year planning horizon:</u>

- Provide estimate of daily deliverability associated with acquisition of incremental storage.

- Are peak day short falls potentially met by acquisition of incremental storage, design or average peak days?

Staff appreciates Cascade's willingness to work collaboratively with the parties to prepare and submit updates to its 2011 IRP with the goal of seeking the most reasonable resource plan for Cascade customers and Oregon as a whole.

This concludes staff's comments.

Dated at Salem, Oregon, the 30th day of April, 2011.

Lisa Gorsuch

Lisa Gorsuch
Utility Analyst
Electric & Natural Gas Division

CERTIFICATE OF SERVICE

LC 54

I certify that I have, this day, served the foregoing document upon all parties of record in this proceeding by delivering a copy in person or by mailing a copy properly addressed with first class postage prepaid, or by electronic mail pursuant to OAR 860-001-0180, to the following parties or attorneys of parties.

Dated this 30th day of April, 2012 at Salem, Oregon

Kay Barnes

Kay Barnes
Public Utility Commission
Regulatory Operations
550 Capitol St NE Ste 215
Salem, Oregon 97301-2551
Telephone: (503) 378-5763

SERVICE LIST (PARTIES)
LC 54

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NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
1	Demand Forecast	Staff's review of the demand forecast indicates that Cascade evaluates baseload and peak demand but it does not evaluate swing demand. Staff notes that the Company does evaluate swing supply as part of its plan. Staff recommends that Cascade also evaluate swing demand and include its findings in an update to its plan. Staff supports the Company's approach to its peak day forecast.	Cascade agrees with Staff's conclusion regarding the evaluation of swing demand. Cascade will address swing demand in our annual update to this IRP and will include swing demand modeling in our next full IRP.
2	Demand Forecast	Staff recommends that Cascade provide additional explanation regarding its development of the plan's high and low load growth scenarios. At this time, Staff finds the Company's expected load growth for residential and commercial classes to be too high. Peak load growth also appears to be too optimistic. Staff recommends that Cascade provide further explanation of these results along with additional information regarding the forecast for the industrial class. While load growth forecasts require further explanation, Staff finds the Company's forecast of reduction in therm usage to be reasonable.	Please see Cascade's response to Comment 5.
3	Appendix B, Page 302	Page 302, in the high growth scenario, projected employment growth is missing for Adams, WA.	An error in the lookup array formula resulted in of the cells in the Projected Employment, Household and Income Growth charts from calculating properly, including Adams WA. These charts have been

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			updated in the replacement filing.
4	Appendix B, Page 305-307	Pages 305-307 are duplicates of pages 302-304 thus need to be deleted.	Redundant pages have been deleted.
5	Appendix B, Page 308	Page 308, in the medium growth scenario for Aberdeen 2012-2015, the results for the medium growth scenario are actually lower than the low growth scenario on page 312.	As we delved deeper into the formulas and calculation of the forecast that were developed prior to our sizeable staff transition in mid-2011, the information in the various workbooks indicate that industrial customer therms per customer values are higher in the low scenario because the coefficients to the median household income are negative. At the time the demand forecast was developed the logic seem to be that low income growth (cheaper labor) means industry is less likely to leave/will hire more people. In hindsight we do not necessarily agree with this—or least not to the level the current charts in the IRP indicate. The individual item noted by Staff actually appears to be prevalent throughout the medium forecast charts in the Appendix B. In the case of several of the medium forecast charts we have recently discovered an issue with how the industrial therms per customer were calculated. While the perceived discrepancy between the low and the medium forecasts can be explained by certain theories (see Cascade's response to Comment 13) below, we agree with Staff that at this time the forecast contains flaws. For example, the medium industrial therms per customer are 2 million therms lower across most locations over the course of the 20 year horizon. We have also discovered a situation in the commercial high forecast where the therms per customer rises dramatically without apparent reason in the last few years of the planning horizon.

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			Cascade will identify the source of the issue, correct the formulas where appropriate and provide changes in the IRP update and ensure more thoroughly document the forecast process in the next formal IRP filing.
6	Appendix B, Page 316	Page 316, in the high growth scenario for Kennewick, peak daily baseload is lower than the medium growth scenario in years 2024 and beyond.	Please see Cascade's response to Comment 5.
7	Appendix B, Page 308	Page 308, in the medium growth scenario for Longview 2012-2015, the results for the medium growth scenario are actually lower than the low growth scenario on page 312. Additional explanation is also needed about baseload peak during years 2012-2016, therm usage by residential class during years 2012-2016, and residential customer growth in 2013.	Regarding the item on page 308, please see Cascade's response to Comment 5. Regarding the baseload peak, please note the theories expressed in Cascade's response to Comment 13.
8	Appendix B, Page 309	Page 309, in the medium growth scenario for Moses Lake 2012-2015, the results are actually lower than the low growth scenario on page 313	Please see Cascade's response to Comment 5.
9	Appendix B, Page 313	Page 313, in the low growth scenario for Walla Walla, the low growth total therm usage is greater than the high growth for some years and is greater than the medium growth scenario for all years. Additionally, further explanation is required with regard to the customer forecast in this area beyond 2020.	Please see Cascade's response to Comment 5.
10	Appendix B, Page 337	Page 337, the customer forecast graph for Wenatchee might be improved by changing the scale of the vertical axis. As the graph currently exists,	The chart has been replaced with a chart where the vertical axis has been modified to improve readability.

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
		there is no variability in the growth; however, the data indicates there is variability.	
11	Appendix B, Page 314	Page 314, in the low growth scenario for Yakima, therm usage is greater in all years than the medium and high growth scenarios on pages 310 and 318	Please see Cascade's response to Comment 5.
12	Appendix B, Page 340	Page 340, Staff requests that Cascade provide explanation of the customer count modeling for Baker during 2012 – 2014	Customer counts start with the 2010 monthly core customer counts as by class in each zone. Growth rates are derived from various sources including the mortgage rates, prime interest forecasts, Treasury bond growth rates and Woods & Poole. In some cases in the short term, Cascade adjusts the Woods & Poole's numbers by the Bureau of Labor Statistics' latest information. There lower commercial and industrial therm usage in the short term. Unfortunately, customer industrial therm usage cannot be reasonably determined with regressions, so to an extent Cascade has to make some subjective decisions on observed and expected local trends. In future IRPs, Cascade commits to expanding explanations of customer count modeling, particularly where there are unique nuances.
13	Appendix B, Page 340	Page 344, Staff requests that Cascade provide explanation of the customer count modeling for Ontario during 2012 – 2018. Explanation of total therm usage modeling for the entire IRP period is also requested for Ontario, page 345	We have added the following note to the beginning of Exhibit B (Demand Forecast) regarding the Low, Medium & High Scenarios: "Included in the following pages are tables and charts illustrating Cascade's best guess estimate of future therm demand under low, medium and high scenarios. To form these scenarios, the underlying economic variables (employment, income and number of households) that form the basis for Cascade's forecasts are modified based on economic patterns from the past three decades. Simply put, a medium

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			forecast is created then these base economic variables are decreased or increased and the regressions re-run to create low and high scenarios, respectively. Further details about how these scenarios are created can be found in the text of this IRP under the chapter entitled "Demand Forecast." A somewhat counter-intuitive result of this method of constructing the low and high scenarios is that Cascade's customers' estimated requirements under the high scenario, which represents good economic conditions, can be *lower* than estimated requirements under the medium scenario (see the charts for Kennewick, Walla Walla and Yakima). What the high scenario represents under this methodology is a historically-based representation of the load during good economic times. Under certain circumstances high economic growth can lead to lower or negative demand growth among certain classes of customers. The non-linear appearance of forecasted load is primarily a result of the response of industrial customers to robust growth in the underlying economic indicators. There are several hypotheses that can be used to explain this phenomenon. First, high exogenous income growth may have a negative effect on industrial output. As labor becomes more expensive, factories can become victim to decreased competitiveness and may scale back production as a response. Alternatively, high endogenous income growth can result from increased production on the part of industrial customers who may be able to save money by taking their increased gas demand to non-core rate schedules.

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			The pattern of divergence between scenarios across Cascade's districts is illustrative of the structural diversity of the regional economies within Cascade's geographically disparate service territory. While we do not know the true cause of decreased demand that can occur under a strong economy in some districts, the projections published here are based on the relationship between Cascade's historic load and the economics that produced these loads and are Cascade's best estimate of future load."
14	Appendix B, Page 340	Page 349, Staff requests explanation of total therm usage modeling for the entire IRP period for Pendleton	Please see Cascade's response to Comments 5 and 13. It should also be noted that Woods & Poole lowered most projection growth estimates through 2030, so the new customer counts are naturally lower. Two exceptions were Snohomish and Cowlitz counties, so those districts have higher growth, most everywhere else is lower. For Oregon, Deschutes County has significantly reduced growth and Eastern Oregon has little to no growth, but Pendleton is slightly higher. In the end, Oregon has lower growth than the 2008 and 2010 IRPs, mostly due to lowered Woods & Poole estimates for Bend.
15	New component	Staff recommends that Cascade consider including a glossary of formula components, as part of the plan's appendices, to improve understanding of the document for parties and the general public	Cascade concurs with Staff and will include a Glossary in our next formal IRP filing.
16	DSM Section 6	What is the date of the price forecast used in the calculation of the avoided cost? Provide the source, if and when it was updated.	The 20 year price forecast was locked into SENDOUT in October 2011 in order to keep consistency with the scenarios run during the summer and those run in November and December 2011 for Ruby. Section 5

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			of the IRP spells out the specific method used to generate the price forecast. Exhibit E contains the tables by basin for the entire 20 year forecast.
17	DSM Section 6	What other components are included in the avoided cost? Provide details and reference source of data	Cascade has attached to this filing an electronic version of the workbook model based on the series of spreadsheets developed by former Cascade staff. Please note that we have since noted an error in the calculation that will be corrected in the update or next formal IRP filing.
18	Appendix H	What year is the Company using for the avoided cost calculations in Appendix H	2010
19	DSM Section 6	Please explain how the company ensured in LC 54 that the DSM therm savings and funding level is in sync with the avoided cost calculation	Cascade will provide the requested information in the annual update or next formal IRP
20	2 Year Action Plan, Section 8	**<u>Distribution Enhancements actions to be taken in the near term to meet core growth</u>** • Qualitative and quantitative analysis of the anticipated enhancements, including additional needs expected in Cascade's Distribution Integrity Management Program.	Cascade concurs and will expand discussion on the subject in future updates and in the next formal IRP filing.
21	2 Year Action Plan, Section 8	**<u>NW[P] delivery rights re-alignment and incremental vintage capacity acquisition program:</u>** • Ongoing analysis associated with re-aligning vintage capacity acquisitions with future pipeline capacity shortfalls.	Cascade concurs and will expand discussion on the subject in future updates and in the next formal IRP filing.
22	2 Year Action	**<u>Securing Ruby Capacity to</u>**	Cascade concurs and will expand

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
	Plan, Section 8	**meet load growth and add supply diversity:** • Provide ongoing analysis of the level and impact associated with the addition of this supply diversity.	discussion on the subject in future updates and in the next formal IRP filing.
23	2 Year Action Plan, Section 8	**Securing incremental Gas Transmission Northwest Pipeline (GTN) firm backhaul capacity to meet load growth and add supply diversity:** • Details surrounding the backhaul agreement once it becomes available.	Cascade concurs and will expand discussion on the subject in future updates and in the next formal IRP filing.
24	2 Year Action Plan, Section 8	**Securing incremental storage to meet load growth and mitigate price volatility over the 20 year planning horizon:** • Provide estimate of daily deliverability associated with acquisition of incremental storage. • Are peak day short falls potentially met by acquisition of incremental storage, design or average peak days?	Cascade concurs and will expand discussion on the subject in future updates and in the next formal IRP filing.
25	DSM Section 6	Re: Stellar Study	Additional comment not found in text: The Stellar Report was last updated in July 2011. The results of the study have not been updated since. The only change made in the latest

NBR	LOCATION	STAFF'S COMMENT	CASCADE'S RESPONSE
			version of the 2011 Integrated Resource Plan was the inclusion of a cut off line of $0.52/th levelized but no resources were added or removed
26	DSM Section 6	Re: Stellar Study	Additional comment not found in text: The DSM resources identified in the resource assessment (Stellar Study) used a cost screen of $1.00/th and avoided costs previously approved by the OPUC in 2007 for the TRC screening. Measures which passed this screen moved forward into the deployment scenario provided to Cascade which then incorporated those annual savings achievement estimates into their 20 year integrated resource plan. The screen is meant to reflect estimated avoided costs for study purposes in a reasonable way. Actual implementation of DSM programs will employ updated avoided costs and measure costs to ensure that the individual projects are cost effective.

Appendix B-1

Demand Forecast Model Escalation Rates

Cascade Natural Gas
2011 IRP Demand Forecast
Economic Indicators

PROJECTED EMPLOYMENT GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
	2011	0.05%	0.29%	0.25%	0.38%	0.35%	0.10%	0.31%	0.22%	0.30%	0.29%	0.32%	0.31%	0.23%	0.35%	0.29%	0.20%	0.33%	0.30%	0.18%	0.36%	0.29%	0.23%	0.37%
	2012	0.05%	0.11%	0.08%	0.21%	0.17%	0.10%	0.17%	0.22%	0.13%	0.12%	0.15%	0.13%	0.09%	0.18%	0.12%	0.04%	0.15%	0.13%	0.18%	0.18%	0.12%	0.07%	0.20%
	2013	0.05%	0.86%	0.60%	1.59%	1.30%	0.72%	1.30%	1.68%	0.94%	0.89%	1.10%	1.01%	0.62%	1.33%	0.93%	0.28%	1.15%	0.89%	1.33%	1.38%	0.90%	0.49%	1.46%
	2014	0.05%	1.15%	0.78%	2.11%	1.72%	0.94%	1.70%	2.24%	1.28%	1.17%	1.46%	1.33%	0.83%	1.77%	1.24%	0.41%	1.52%	1.17%	1.77%	1.84%	1.18%	0.64%	1.95%
	2015	0.05%	1.10%	0.77%	2.11%	1.72%	0.94%	1.75%	2.24%	1.20%	1.20%	1.46%	1.34%	0.74%	1.76%	1.25%	0.39%	1.50%	1.22%	1.76%	1.84%	1.18%	0.66%	1.93%
	2016	0.05%	1.16%	0.73%	2.11%	1.70%	0.92%	1.74%	2.24%	1.26%	1.16%	1.45%	1.34%	0.85%	1.76%	1.25%	0.39%	1.51%	1.26%	1.76%	1.84%	1.16%	0.63%	1.93%
	2017	0.05%	1.13%	0.77%	2.10%	1.71%	0.91%	1.73%	2.24%	1.24%	1.17%	1.44%	1.33%	0.76%	1.76%	1.26%	0.37%	1.49%	1.12%	1.75%	1.83%	1.17%	0.64%	1.92%
	2018	0.05%	1.12%	0.73%	2.10%	1.69%	0.89%	1.77%	2.24%	1.24%	1.16%	1.44%	1.34%	0.81%	1.75%	1.26%	0.39%	1.47%	1.16%	1.75%	1.83%	1.15%	0.62%	1.92%
	2019	0.05%	1.13%	0.75%	2.09%	1.68%	0.89%	1.77%	2.24%	1.21%	1.14%	1.44%	1.32%	0.78%	1.75%	1.27%	0.36%	1.47%	1.17%	1.75%	1.83%	1.16%	0.63%	1.91%
	2020	0.05%	1.11%	0.71%	2.09%	1.67%	0.88%	1.77%	2.24%	1.20%	1.17%	1.44%	1.33%	0.79%	1.74%	1.26%	0.39%	1.47%	1.14%	1.74%	1.83%	1.13%	0.61%	1.90%
	2021	0.05%	1.15%	0.74%	2.08%	1.67%	0.86%	1.80%	2.23%	1.23%	1.15%	1.44%	1.33%	0.78%	1.74%	1.27%	0.36%	1.46%	1.21%	1.73%	1.82%	1.13%	0.62%	1.89%
	2022	0.05%	1.14%	0.71%	2.08%	1.66%	0.86%	1.77%	2.24%	1.20%	1.15%	1.42%	1.32%	0.78%	1.73%	1.27%	0.40%	1.45%	1.10%	1.73%	1.82%	1.12%	0.61%	1.88%
HIGH	2023	0.05%	1.13%	0.70%	2.07%	1.65%	0.83%	1.85%	2.22%	1.19%	1.12%	1.43%	1.32%	0.74%	1.73%	1.29%	0.36%	1.45%	1.15%	1.73%	1.82%	1.12%	0.60%	1.88%
	2024	0.05%	1.09%	0.72%	2.06%	1.64%	0.82%	1.79%	2.23%	1.18%	1.13%	1.41%	1.31%	0.81%	1.72%	1.29%	0.36%	1.43%	1.17%	1.72%	1.82%	1.11%	0.61%	1.87%
	2025	0.05%	1.16%	0.70%	2.06%	1.64%	0.82%	1.81%	2.22%	1.23%	1.13%	1.42%	1.32%	0.78%	1.72%	1.29%	0.37%	1.42%	1.11%	1.72%	1.81%	1.09%	0.60%	1.86%
	2026	0.05%	1.11%	0.65%	2.05%	1.62%	0.80%	1.82%	2.23%	1.16%	1.11%	1.40%	1.31%	0.76%	1.71%	1.30%	0.36%	1.42%	1.12%	1.71%	1.81%	1.08%	0.59%	1.85%
	2027	0.05%	1.10%	0.74%	2.05%	1.62%	0.79%	1.84%	2.22%	1.16%	1.12%	1.41%	1.31%	0.77%	1.70%	1.30%	0.37%	1.41%	1.11%	1.70%	1.81%	1.09%	0.60%	1.85%
	2028	0.05%	1.14%	0.61%	2.04%	1.62%	0.78%	1.88%	2.22%	1.18%	1.11%	1.41%	1.31%	0.75%	1.70%	1.31%	0.35%	1.39%	1.10%	1.70%	1.81%	1.07%	0.59%	1.83%
	2029	0.05%	1.13%	0.70%	2.03%	1.59%	0.77%	1.84%	2.22%	1.16%	1.09%	1.40%	1.31%	0.74%	1.69%	1.31%	0.35%	1.40%	1.10%	1.69%	1.80%	1.07%	0.57%	1.83%
	2030	0.05%	1.13%	0.60%	2.02%	1.60%	0.75%	1.87%	2.22%	1.18%	1.10%	1.39%	1.30%	0.76%	1.69%	1.32%	0.34%	1.39%	1.09%	1.69%	1.80%	1.05%	0.58%	1.82%
	2031	0.05%	1.09%	0.68%	2.02%	1.58%	0.74%	1.88%	2.22%	1.14%	1.09%	1.39%	1.31%	0.71%	1.68%	1.33%	0.38%	1.38%	1.07%	1.69%	1.80%	1.04%	0.58%	1.81%
	2032	0.05%	1.13%	0.66%	2.01%	1.57%	0.73%	1.93%	2.21%	1.15%	1.08%	1.39%	1.30%	0.76%	1.68%	1.34%	0.34%	1.37%	1.06%	1.68%	1.79%	1.05%	0.58%	1.81%
	2033	0.05%	1.13%	0.58%	2.01%	1.57%	0.72%	1.87%	2.21%	1.14%	1.08%	1.38%	1.30%	0.74%	1.67%	1.32%	0.33%	1.36%	1.15%	1.67%	1.79%	1.03%	0.57%	1.80%
	2034	0.05%	1.11%	0.65%	2.00%	1.56%	0.70%	1.91%	2.21%	1.14%	1.07%	1.38%	1.29%	0.71%	1.67%	1.35%	0.33%	1.36%	1.04%	1.67%	1.79%	1.03%	0.56%	1.79%
	2035	0.05%	1.08%	0.65%	1.99%	1.55%	0.69%	1.90%	2.21%	1.13%	1.07%	1.38%	1.29%	0.73%	1.66%	1.35%	0.35%	1.32%	1.01%	1.66%	1.78%	1.01%	0.56%	1.79%
	2011	0.24%	0.21%	0.31%	0.28%	0.08%	0.25%	0.18%	0.25%	0.23%	0.26%	0.23%	0.19%	0.29%	0.24%	0.16%	0.27%	0.24%	0.14%	0.29%	0.24%	0.18%	0.30%	0.20%
	2012	0.09%	0.06%	0.17%	0.14%	0.08%	0.14%	0.18%	0.10%	0.10%	0.12%	0.08%	0.07%	0.14%	0.10%	0.03%	0.12%	0.10%	0.14%	0.15%	0.10%	0.05%	0.16%	0.07%
	2013	0.69%	0.48%	1.28%	1.04%	0.58%	1.04%	1.35%	0.75%	0.72%	0.88%	0.62%	0.50%	1.07%	0.75%	0.23%	0.93%	0.72%	1.07%	1.11%	0.73%	0.39%	1.17%	0.53%
	2014	0.92%	0.63%	1.69%	1.38%	0.76%	1.37%	1.79%	1.03%	0.94%	1.17%	0.83%	0.67%	1.42%	1.00%	0.33%	1.22%	0.94%	1.42%	1.47%	0.95%	0.52%	1.56%	0.70%
	2015	0.89%	0.62%	1.69%	1.38%	0.76%	1.41%	1.79%	0.97%	0.96%	1.17%	0.82%	0.60%	1.41%	1.00%	0.32%	1.20%	0.98%	1.41%	1.47%	0.95%	0.53%	1.55%	0.69%
	2016	0.94%	0.59%	1.69%	1.36%	0.74%	1.40%	1.79%	1.02%	0.93%	1.16%	0.81%	0.69%	1.41%	1.01%	0.32%	1.21%	1.02%	1.41%	1.47%	0.94%	0.51%	1.54%	0.69%
	2017	0.91%	0.63%	1.68%	1.37%	0.74%	1.39%	1.79%	1.00%	0.94%	1.16%	0.81%	0.61%	1.41%	1.01%	0.30%	1.20%	0.90%	1.40%	1.47%	0.94%	0.51%	1.53%	0.69%
	2018	0.90%	0.59%	1.67%	1.36%	0.72%	1.42%	1.78%	1.00%	0.93%	1.16%	0.79%	0.65%	1.40%	1.02%	0.31%	1.18%	0.94%	1.40%	1.47%	0.93%	0.50%	1.53%	0.68%
	2019	0.91%	0.61%	1.67%	1.35%	0.72%	1.42%	1.79%	0.97%	0.92%	1.15%	0.79%	0.63%	1.40%	1.02%	0.30%	1.18%	0.94%	1.40%	1.46%	0.93%	0.51%	1.53%	0.67%
	2020	0.89%	0.57%	1.67%	1.34%	0.71%	1.42%	1.78%	0.97%	0.94%	1.16%	0.79%	0.63%	1.39%	1.01%	0.32%	1.18%	0.92%	1.39%	1.46%	0.91%	0.50%	1.52%	0.67%
	2021	0.92%	0.60%	1.66%	1.34%	0.69%	1.44%	1.78%	0.99%	0.92%	1.15%	0.78%	0.63%	1.39%	1.02%	0.29%	1.18%	0.97%	1.39%	1.46%	0.91%	0.50%	1.51%	0.66%
	2022	0.91%	0.58%	1.66%	1.33%	0.69%	1.42%	1.79%	0.96%	0.93%	1.14%	0.77%	0.63%	1.39%	1.02%	0.32%	1.16%	0.89%	1.39%	1.46%	0.90%	0.49%	1.51%	0.66%
MID	2023	0.91%	0.56%	1.65%	1.32%	0.67%	1.48%	1.78%	0.96%	0.90%	1.15%	0.77%	0.60%	1.38%	1.04%	0.29%	1.16%	0.92%	1.39%	1.46%	0.90%	0.49%	1.50%	0.65%
	2024	0.88%	0.58%	1.65%	1.31%	0.66%	1.43%	1.78%	0.95%	0.91%	1.13%	0.76%	0.65%	1.38%	1.04%	0.29%	1.15%	0.94%	1.38%	1.45%	0.89%	0.49%	1.49%	0.65%
	2025	0.94%	0.57%	1.64%	1.31%	0.66%	1.45%	1.77%	0.99%	0.91%	1.14%	0.76%	0.63%	1.38%	1.04%	0.30%	1.14%	0.89%	1.38%	1.45%	0.88%	0.48%	1.49%	0.65%
	2026	0.89%	0.53%	1.64%	1.30%	0.65%	1.46%	1.78%	0.93%	0.89%	1.13%	0.75%	0.61%	1.37%	1.04%	0.29%	1.14%	0.90%	1.37%	1.45%	0.87%	0.48%	1.49%	0.63%
	2027	0.88%	0.60%	1.64%	1.30%	0.63%	1.48%	1.77%	0.94%	0.90%	1.13%	0.74%	0.62%	1.37%	1.05%	0.30%	1.14%	0.89%	1.37%	1.45%	0.88%	0.48%	1.48%	0.64%
	2028	0.92%	0.49%	1.63%	1.30%	0.63%	1.50%	1.77%	0.95%	0.89%	1.13%	0.74%	0.60%	1.36%	1.05%	0.28%	1.12%	0.88%	1.36%	1.45%	0.86%	0.48%	1.47%	0.63%
	2029	0.91%	0.56%	1.63%	1.28%	0.62%	1.47%	1.77%	0.93%	0.88%	1.13%	0.73%	0.60%	1.36%	1.06%	0.28%	1.12%	0.89%	1.36%	1.44%	0.86%	0.46%	1.47%	0.62%
	2030	0.91%	0.49%	1.62%	1.28%	0.61%	1.50%	1.77%	0.95%	0.89%	1.12%	0.72%	0.62%	1.35%	1.06%	0.28%	1.11%	0.88%	1.35%	1.44%	0.85%	0.47%	1.46%	0.62%
	2031	0.88%	0.55%	1.62%	1.27%	0.60%	1.50%	1.77%	0.91%	0.88%	1.12%	0.72%	0.57%	1.35%	1.07%	0.31%	1.11%	0.86%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2032	0.91%	0.54%	1.61%	1.26%	0.59%	1.54%	1.77%	0.93%	0.87%	1.12%	0.70%	0.61%	1.35%	1.07%	0.28%	1.10%	0.85%	1.35%	1.44%	0.84%	0.47%	1.45%	0.61%
	2033	0.91%	0.47%	1.60%	1.26%	0.58%	1.50%	1.76%	0.92%	0.87%	1.11%	0.70%	0.60%	1.34%	1.06%	0.27%	1.10%	0.92%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2034	0.90%	0.52%	1.60%	1.25%	0.57%	1.53%	1.77%	0.92%	0.86%	1.11%	0.70%	0.57%	1.34%	1.08%	0.27%	1.09%	0.84%	1.34%	1.43%	0.83%	0.46%	1.44%	0.60%
	2035	0.87%	0.53%	1.59%	1.25%	0.56%	1.52%	1.76%	0.91%	0.86%	1.11%	0.70%	0.59%	1.33%	1.09%	0.29%	1.06%	0.82%	1.33%	1.43%	0.82%	0.45%	1.43%	0.59%
	2011	0.05%	0.18%	0.15%	0.23%	0.21%	0.06%	0.19%	0.13%	0.18%	0.17%	0.19%	0.19%	0.14%	0.21%	0.17%	0.12%	0.20%	0.18%	0.11%	0.21%	0.18%	0.14%	0.22%
	2012	0.05%	0.07%	0.05%	0.13%	0.10%	0.06%	0.10%	0.13%	0.08%	0.07%	0.09%	0.08%	0.05%	0.11%	0.07%	0.02%	0.09%	0.08%	0.11%	0.11%	0.07%	0.04%	0.12%
	2013	0.05%	0.52%	0.36%	0.96%	0.78%	0.43%	0.78%	1.01%	0.56%	0.53%	0.66%	0.60%	0.37%	0.80%	0.56%	0.17%	0.69%	0.53%	0.80%	0.83%	0.54%	0.29%	0.88%
	2014	0.05%	0.69%	0.47%	1.27%	1.03%	0.56%	1.02%	1.35%	0.77%	0.70%	0.87%	0.80%	0.50%	1.06%	0.74%	0.25%	0.91%	0.70%	1.06%	1.10%	0.71%	0.38%	1.17%
	2015	0.05%	0.66%	0.46%	1.27%	1.03%	0.56%	1.05%	1.35%	0.72%	0.72%	0.87%	0.81%	0.44%	1.06%	0.75%	0.23%	0.90%	0.73%	1.06%	1.10%	0.71%	0.40%	1.16%
	2016	0.05%	0.70%	0.44%	1.27%	1.02%	0.55%	1.04%	1.34%	0.76%	0.70%	0.87%	0.80%	0.51%	1.06%	0.75%	0.24%	0.91%	0.76%	1.06%	1.10%	0.70%	0.38%	1.16%
	2017	0.05%	0.68%	0.46%	1.26%	1.02%	0.55%	1.04%	1.34%	0.74%	0.70%	0.87%	0.80%	0.45%	1.06%	0.76%	0.22%	0.90%	0.67%	1.05%	1.10%	0.70%	0.38%	1.15%
	2018	0.05%	0.67%	0.44%	1.26%	1.02%	0.54%	1.06%	1.34%	0.74%	0.70%	0.86%	0.80%	0.49%	1.05%	0.76%	0.23%	0.88%	0.70%	1.05%	1.10%	0.69%	0.37%	1.15%
	2019	0.05%	0.68%	0.45%	1.25%	1.01%	0.53%	1.06%	1.34%	0.72%	0.69%	0.86%	0.79%	0.47%	1.05%	0.76%	0.22%	0.88%	0.70%	1.05%	1.10%	0.69%	0.38%	1.14%
	2020	0.05%	0.67%	0.43%	1.25%	1.00%	0.53%	1.06%	1.34%	0.72%	0.70%	0.86%	0.80%	0.47%	1.04%	0.76%	0.23%	0.88%	0.69%	1.04%	1.10%	0.68%	0.37%	1.14%
	2021	0.05%	0.69%	0.45%	1.25%	1.00%	0.51%	1.08%	1.34%	0.74%	0.69%	0.86%	0.80%	0.47%	1.04%	0.76%	0.21%	0.88%	0.72%	1.04%	1.09%	0.68%	0.37%	1.13%
	2022	0.05%	0.68%	0.43%	1.25%	1.00%	0.52%	1.06%	1.34%	0.72%	0.69%	0.85%	0.79%	0.47%	1.04%	0.76%	0.24%	0.87%	0.66%	1.04%	1.09%	0.67%	0.36%	1.13%
LOW	2023	0.05%	0.68%	0.42%	1.24%	0.99%	0.50%	1.11%	1.33%	0.72%	0.67%	0.86%	0.79%	0.45%	1.04%	0.78%	0.22%	0.87%	0.69%	1.04%	1.09%	0.67%	0.36%	1.13%
	2024	0.05%	0.66%	0.43%	1.24%	0.98%	0.49%	1.07%	1.34%	0.71%	0.68%	0.84%	0.79%	0.48%	1.03%	0.78%	0.22%	0.86%	0.70%	1.03%	1.09%	0.66%	0.37%	1.12%
	2025	0.05%	0.70%	0.42%	1.23%	0.98%	0.49%	1.09%	1.33%	0.74%	0.68%	0.85%	0.79%	0.47%	1.03%	0.77%	0.22%	0.85%	0.67%	1.03%	1.09%	0.66%	0.36%	1.12%
	2026	0.05%	0.66%	0.39%	1.23%	0.97%	0.48%	1.09%	1.34%	0.70%	0.67%	0.84%	0.79%	0.45%	1.03%	0.78%	0.22%	0.85%	0.67%	1.02%	1.09%	0.65%	0.35%	1.11%
	2027	0.05%	0.66%	0.45%	1.23%	0.97%	0.47%	1.11%	1.33%	0.70%	0.67%	0.85%	0.79%	0.46%	1.02%	0.78%	0.22%	0.85%	0.66%	1.02%	1.08%	0.66%	0.36%	1.11%
	2028	0.05%	0.68%	0.36%	1.22%	0.97%	0.47%	1.13%	1.33%	0.71%	0.67%	0.85%	0.79%	0.45%	1.02%	0.78%	0.21%	0.83%	0.66%	1.02%	1.08%	0.64%	0.36%	1.10%
	2029	0.05%	0.68%	0.42%	1.22%	0.95%	0.46%	1.10%	1.33%	0.69%	0.65%	0.84%	0.79%	0.45%	1.02%	0.79%	0.21%	0.84%	0.66%	1.01%	1.08%	0.64%	0.34%	1.10%
	2030	0.05%	0.68%	0.36%	1.21%	0.96%	0.45%	1.12%	1.33%	0.71%	0.66%	0.84%	0.78%	0.46%	1.01%	0.79%	0.20%	0.83%	0.66%	1.01%	1.08%	0.63%	0.35%	1.09%
	2031	0.05%	0.65%	0.41%	1.21%	0.95%	0.44%	1.13%	1.33%	0.68%	0.66%	0.83%	0.78%	0.42%	1.01%	0.80%	0.23%	0.83%	0.64%	1.01%	1.08%	0.62%	0.35%	1.09%
	2032	0.05%	0.68%	0.40%	1.21%	0.94%	0.44%	1.16%	1.33%	0.69%	0.65%	0.84%	0.78%	0.45%	1.01%	0.80%	0.21%	0.82%	0.63%	1.01%	1.08%	0.63%	0.35%	1.08%
	2033	0.05%	0.68%	0.35%	1.20%	0.94%	0.43%	1.12%	1.33%	0.69%	0.65%	0.83%	0.78%	0.44%	1.00%	0.79%	0.20%	0.82%	0.69%	1.00%	1.07%	0.62%	0.34%	1.08%
	2034	0.05%	0.67%	0.39%	1.20%	0.93%	0.42%	1.15%	1.33%	0.68%	0.64%	0.83%	0.77%	0.42%	1.00%	0.81%	0.20%	0.82%	0.62%	1.00%	1.07%	0.62%	0.34%	1.08%
	2035	0.05%	0.65%	0.39%	1.19%	0.93%	0.41%	1.14%	1.33%	0.68%	0.64%	0.83%	0.77%	0.44%	1.00%	0.81%	0.21%	0.79%	0.61%	1.00%	1.07%	0.61%	0.33%	1.07%

Cascade Natural Gas
2011 IRP Demand Forecast
Economic Indicators

PROJECTED HOUSEHOLDS GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
HIGH	2011	0.05%	0.90%	0.02%	2.56%	1.54%	-99.90%	2.12%	3.14%	1.67%	2.25%	1.75%	1.71%	1.23%	2.14%	1.14%	-0.05%	2.18%	0.93%	2.26%	2.45%	0.70%	0.58%	3.03%
HIGH	2012	0.05%	1.04%	0.33%	2.41%	1.59%	0.88%	2.07%	2.87%	1.69%	2.15%	1.76%	1.72%	1.34%	2.07%	1.25%	0.19%	2.11%	1.07%	2.16%	2.32%	0.89%	0.80%	2.79%
HIGH	2013	0.05%	0.98%	0.26%	2.30%	1.51%	0.92%	1.96%	2.75%	1.60%	2.06%	1.67%	1.63%	1.24%	1.98%	1.17%	0.16%	2.01%	1.01%	2.07%	2.21%	0.81%	0.72%	2.67%
HIGH	2014	0.05%	0.95%	0.23%	2.24%	1.47%	0.95%	1.91%	2.67%	1.57%	2.01%	1.63%	1.60%	1.23%	1.93%	1.15%	0.17%	1.96%	0.97%	2.02%	2.16%	0.79%	0.71%	2.59%
HIGH	2015	0.05%	0.93%	0.22%	2.18%	1.43%	0.98%	1.86%	2.60%	1.53%	1.96%	1.59%	1.55%	1.20%	1.88%	1.12%	0.09%	1.91%	0.97%	1.97%	2.10%	0.75%	0.68%	2.52%
HIGH	2016	0.05%	0.88%	0.20%	2.12%	1.40%	1.01%	1.81%	2.52%	1.49%	1.91%	1.55%	1.51%	1.18%	1.83%	1.09%	0.12%	1.86%	0.90%	1.91%	2.05%	0.73%	0.66%	2.45%
HIGH	2017	0.05%	0.88%	0.17%	2.07%	1.37%	1.04%	1.77%	2.45%	1.46%	1.86%	1.51%	1.47%	1.15%	1.79%	1.07%	0.13%	1.81%	0.90%	1.86%	1.99%	0.70%	0.63%	2.38%
HIGH	2018	0.05%	0.83%	0.14%	2.01%	1.33%	1.07%	1.70%	2.39%	1.43%	1.81%	1.46%	1.43%	1.11%	1.74%	1.04%	0.05%	1.76%	0.87%	1.82%	1.94%	0.67%	0.60%	2.31%
HIGH	2019	0.05%	0.81%	0.13%	1.96%	1.30%	1.10%	1.68%	2.32%	1.40%	1.77%	1.43%	1.40%	1.09%	1.70%	1.01%	0.07%	1.72%	0.86%	1.77%	1.89%	0.63%	0.58%	2.26%
HIGH	2020	0.05%	0.79%	0.11%	1.92%	1.27%	1.11%	1.63%	2.27%	1.37%	1.73%	1.40%	1.37%	1.08%	1.66%	0.99%	0.07%	1.68%	0.83%	1.73%	1.85%	0.61%	0.56%	2.20%
HIGH	2021	0.05%	0.77%	0.10%	1.88%	1.25%	1.14%	1.60%	2.22%	1.35%	1.69%	1.37%	1.34%	1.05%	1.62%	0.98%	0.05%	1.64%	0.80%	1.70%	1.81%	0.59%	0.54%	2.15%
HIGH	2022	0.05%	0.77%	0.08%	1.83%	1.23%	1.15%	1.55%	2.16%	1.32%	1.66%	1.34%	1.31%	1.03%	1.58%	0.96%	0.05%	1.60%	0.80%	1.66%	1.76%	0.55%	0.51%	2.09%
HIGH	2023	0.05%	0.72%	0.05%	1.78%	1.19%	1.18%	1.52%	2.11%	1.29%	1.62%	1.31%	1.27%	1.01%	1.54%	0.93%	0.00%	1.55%	0.77%	1.62%	1.72%	0.52%	0.48%	2.04%
HIGH	2024	0.05%	0.71%	0.02%	1.74%	1.17%	1.20%	1.48%	2.05%	1.26%	1.58%	1.27%	1.25%	0.98%	1.51%	0.91%	0.02%	1.52%	0.74%	1.58%	1.67%	0.49%	0.45%	1.99%
HIGH	2025	0.05%	0.67%	0.01%	1.70%	1.14%	1.22%	1.44%	2.00%	1.24%	1.54%	1.24%	1.21%	0.96%	1.46%	0.88%	0.03%	1.47%	0.74%	1.54%	1.63%	0.44%	0.42%	1.93%
HIGH	2026	0.05%	0.65%	0.00%	1.66%	1.11%	1.24%	1.39%	1.95%	1.20%	1.50%	1.20%	1.18%	0.94%	1.43%	0.86%	-0.01%	1.43%	0.71%	1.50%	1.59%	0.41%	0.39%	1.88%
HIGH	2027	0.05%	0.63%	-0.02%	1.61%	1.08%	1.26%	1.37%	1.90%	1.17%	1.46%	1.18%	1.15%	0.91%	1.39%	0.83%	-0.04%	1.40%	0.68%	1.46%	1.55%	0.38%	0.37%	1.84%
HIGH	2028	0.05%	0.61%	-0.05%	1.58%	1.06%	1.28%	1.32%	1.85%	1.16%	1.43%	1.14%	1.12%	0.90%	1.36%	0.82%	-0.02%	1.35%	0.65%	1.43%	1.51%	0.35%	0.35%	1.79%
HIGH	2029	0.05%	0.58%	-0.06%	1.54%	1.03%	1.29%	1.29%	1.81%	1.13%	1.40%	1.12%	1.10%	0.87%	1.32%	0.80%	-0.04%	1.32%	0.65%	1.40%	1.47%	0.32%	0.32%	1.75%
HIGH	2030	0.05%	0.56%	-0.08%	1.50%	1.01%	1.30%	1.27%	1.77%	1.10%	1.36%	1.09%	1.07%	0.85%	1.29%	0.78%	-0.08%	1.29%	0.63%	1.37%	1.44%	0.29%	0.30%	1.71%
HIGH	2031	0.05%	0.53%	-0.10%	1.47%	0.98%	1.31%	1.23%	1.73%	1.08%	1.33%	1.06%	1.05%	0.85%	1.26%	0.76%	-0.05%	1.26%	0.60%	1.33%	1.40%	0.27%	0.28%	1.67%
HIGH	2032	0.05%	0.53%	-0.11%	1.44%	0.97%	1.32%	1.19%	1.69%	1.06%	1.30%	1.04%	1.03%	0.82%	1.23%	0.74%	-0.07%	1.22%	0.60%	1.30%	1.37%	0.23%	0.26%	1.63%
HIGH	2033	0.05%	0.49%	-0.14%	1.40%	0.94%	1.33%	1.16%	1.65%	1.03%	1.27%	1.01%	1.00%	0.80%	1.20%	0.72%	-0.10%	1.20%	0.57%	1.27%	1.33%	0.21%	0.25%	1.59%
HIGH	2034	0.05%	0.48%	-0.15%	1.37%	0.92%	1.34%	1.14%	1.61%	1.01%	1.24%	0.98%	0.97%	0.78%	1.18%	0.71%	-0.11%	1.17%	0.55%	1.24%	1.30%	0.18%	0.23%	1.55%
HIGH	2035	0.05%	0.44%	-0.17%	1.33%	0.89%	1.36%	1.11%	1.56%	0.98%	1.21%	0.95%	0.95%	0.75%	1.14%	0.68%	-0.11%	1.13%	0.53%	1.21%	1.26%	0.15%	0.21%	1.51%
MID	2011	0.75%	0.01%	2.11%	1.28%	0.88%	1.76%	2.58%	1.39%	1.86%	1.46%	0.50%	1.02%	1.77%	0.95%	-0.06%	1.81%	0.78%	1.87%	2.02%	0.59%	0.49%	2.49%	0.53%
MID	2012	0.98%	0.28%	2.31%	1.52%	0.88%	1.99%	2.76%	1.62%	2.07%	1.69%	0.74%	1.28%	1.99%	1.19%	0.17%	2.03%	1.01%	2.08%	2.23%	0.84%	0.74%	2.68%	0.78%
MID	2013	0.97%	0.27%	2.26%	1.49%	0.91%	1.93%	2.69%	1.58%	2.03%	1.65%	0.72%	1.24%	1.95%	1.17%	0.16%	1.98%	1.00%	2.03%	2.18%	0.81%	0.72%	2.61%	0.76%
MID	2014	0.95%	0.24%	2.20%	1.46%	0.94%	1.88%	2.61%	1.55%	1.98%	1.61%	0.70%	1.22%	1.90%	1.14%	0.17%	1.93%	0.97%	1.98%	2.12%	0.79%	0.71%	2.54%	0.74%
MID	2015	0.92%	0.22%	2.14%	1.42%	0.97%	1.84%	2.54%	1.52%	1.93%	1.57%	0.67%	1.19%	1.86%	1.11%	0.10%	1.88%	0.96%	1.94%	2.07%	0.76%	0.68%	2.47%	0.72%
MID	2016	0.88%	0.21%	2.09%	1.39%	1.00%	1.79%	2.47%	1.48%	1.88%	1.53%	0.65%	1.17%	1.81%	1.09%	0.12%	1.83%	0.90%	1.89%	2.01%	0.73%	0.66%	2.40%	0.70%
MID	2017	0.87%	0.18%	2.03%	1.35%	1.03%	1.74%	2.41%	1.45%	1.84%	1.49%	0.62%	1.14%	1.76%	1.06%	0.13%	1.79%	0.90%	1.84%	1.96%	0.70%	0.63%	2.34%	0.68%
MID	2018	0.84%	0.15%	1.98%	1.32%	1.05%	1.69%	2.34%	1.41%	1.79%	1.45%	0.59%	1.10%	1.72%	1.03%	0.06%	1.74%	0.87%	1.79%	1.91%	0.67%	0.60%	2.27%	0.65%
MID	2019	0.81%	0.13%	1.93%	1.29%	1.08%	1.66%	2.28%	1.38%	1.75%	1.42%	0.57%	1.08%	1.68%	1.01%	0.07%	1.70%	0.86%	1.75%	1.86%	0.64%	0.58%	2.22%	0.63%
MID	2020	0.79%	0.12%	1.89%	1.26%	1.10%	1.61%	2.23%	1.36%	1.71%	1.39%	0.55%	1.07%	1.64%	0.99%	0.07%	1.66%	0.83%	1.71%	1.82%	0.61%	0.56%	2.16%	0.62%
MID	2021	0.77%	0.10%	1.85%	1.24%	1.12%	1.58%	2.18%	1.33%	1.67%	1.36%	0.54%	1.04%	1.60%	0.97%	0.05%	1.62%	0.80%	1.68%	1.78%	0.59%	0.54%	2.11%	0.60%
MID	2022	0.76%	0.09%	1.81%	1.22%	1.14%	1.54%	2.13%	1.31%	1.64%	1.33%	0.52%	1.02%	1.57%	0.95%	0.05%	1.58%	0.79%	1.64%	1.74%	0.55%	0.51%	2.06%	0.59%
MID	2023	0.73%	0.06%	1.76%	1.18%	1.16%	1.50%	2.07%	1.28%	1.60%	1.30%	0.49%	1.00%	1.53%	0.93%	0.01%	1.54%	0.77%	1.60%	1.70%	0.52%	0.48%	2.01%	0.57%
MID	2024	0.71%	0.03%	1.72%	1.16%	1.18%	1.46%	2.02%	1.25%	1.56%	1.26%	0.48%	0.98%	1.49%	0.90%	0.02%	1.50%	0.74%	1.56%	1.65%	0.49%	0.45%	1.96%	0.55%
MID	2025	0.67%	0.01%	1.68%	1.13%	1.20%	1.43%	1.97%	1.23%	1.52%	1.23%	0.45%	0.96%	1.45%	0.88%	0.03%	1.46%	0.73%	1.52%	1.61%	0.45%	0.43%	1.91%	0.53%
MID	2026	0.65%	0.00%	1.64%	1.10%	1.22%	1.38%	1.92%	1.20%	1.48%	1.20%	0.43%	0.94%	1.41%	0.86%	-0.01%	1.42%	0.71%	1.49%	1.57%	0.42%	0.39%	1.86%	0.51%
MID	2027	0.63%	-0.03%	1.60%	1.07%	1.24%	1.35%	1.87%	1.16%	1.45%	1.17%	0.41%	0.91%	1.38%	0.83%	-0.05%	1.38%	0.68%	1.45%	1.53%	0.39%	0.38%	1.81%	0.49%
MID	2028	0.61%	-0.06%	1.56%	1.05%	1.26%	1.31%	1.83%	1.15%	1.41%	1.14%	0.39%	0.90%	1.34%	0.81%	-0.01%	1.34%	0.65%	1.42%	1.49%	0.35%	0.35%	1.77%	0.47%
MID	2029	0.58%	-0.06%	1.52%	1.03%	1.27%	1.28%	1.79%	1.12%	1.38%	1.11%	0.38%	0.87%	1.31%	0.79%	-0.04%	1.31%	0.65%	1.38%	1.46%	0.33%	0.33%	1.72%	0.46%
MID	2030	0.56%	-0.09%	1.49%	1.00%	1.28%	1.25%	1.74%	1.09%	1.35%	1.08%	0.36%	0.85%	1.28%	0.78%	-0.09%	1.28%	0.63%	1.35%	1.42%	0.29%	0.30%	1.68%	0.45%
MID	2031	0.53%	-0.10%	1.46%	0.98%	1.29%	1.22%	1.71%	1.08%	1.32%	1.06%	0.35%	0.84%	1.25%	0.76%	-0.04%	1.25%	0.60%	1.32%	1.39%	0.27%	0.29%	1.65%	0.43%
MID	2032	0.53%	-0.12%	1.42%	0.96%	1.30%	1.19%	1.67%	1.05%	1.29%	1.03%	0.33%	0.81%	1.22%	0.74%	-0.08%	1.22%	0.60%	1.29%	1.36%	0.24%	0.27%	1.61%	0.42%
MID	2033	0.49%	-0.15%	1.39%	0.93%	1.31%	1.16%	1.63%	1.03%	1.26%	1.00%	0.32%	0.80%	1.20%	0.72%	-0.11%	1.19%	0.57%	1.26%	1.32%	0.21%	0.25%	1.57%	0.40%
MID	2034	0.48%	-0.15%	1.36%	0.91%	1.32%	1.13%	1.59%	1.01%	1.23%	0.98%	0.30%	0.78%	1.17%	0.70%	-0.11%	1.16%	0.55%	1.23%	1.29%	0.18%	0.23%	1.53%	0.38%
MID	2035	0.45%	-0.18%	1.32%	0.89%	1.33%	1.10%	1.55%	0.98%	1.20%	0.95%	0.28%	0.75%	1.14%	0.68%	-0.11%	1.12%	0.53%	1.20%	1.25%	0.16%	0.21%	1.49%	0.37%
LOW	2011	0.05%	0.65%	0.01%	1.84%	1.11%	-99.90%	1.52%	2.25%	1.20%	1.62%	1.26%	1.23%	0.88%	1.54%	0.82%	-0.11%	1.57%	0.67%	1.62%	1.76%	0.51%	0.42%	2.17%
LOW	2012	0.05%	0.96%	0.24%	2.34%	1.51%	0.88%	1.99%	2.81%	1.61%	2.08%	1.68%	1.65%	1.26%	2.00%	1.17%	0.20%	2.04%	0.99%	2.09%	2.25%	0.81%	0.71%	2.72%
LOW	2013	0.05%	0.99%	0.27%	2.32%	1.52%	0.91%	1.98%	2.77%	1.61%	2.08%	1.68%	1.65%	1.26%	1.99%	1.18%	0.16%	2.03%	1.01%	2.08%	2.23%	0.82%	0.73%	2.69%
LOW	2014	0.05%	0.96%	0.24%	2.26%	1.48%	0.94%	1.93%	2.70%	1.58%	2.03%	1.64%	1.61%	1.24%	1.95%	1.16%	0.17%	1.98%	0.98%	2.03%	2.18%	0.80%	0.71%	2.62%
LOW	2015	0.05%	0.94%	0.22%	2.20%	1.45%	0.97%	1.88%	2.62%	1.55%	1.98%	1.60%	1.57%	1.21%	1.90%	1.13%	0.11%	1.93%	0.97%	1.98%	2.12%	0.77%	0.69%	2.54%
LOW	2016	0.05%	0.90%	0.21%	2.14%	1.41%	1.00%	1.83%	2.55%	1.50%	1.92%	1.56%	1.52%	1.18%	1.85%	1.10%	0.12%	1.88%	0.92%	1.93%	2.06%	0.74%	0.67%	2.47%
LOW	2017	0.05%	0.88%	0.18%	2.08%	1.38%	1.03%	1.78%	2.48%	1.47%	1.88%	1.52%	1.49%	1.16%	1.80%	1.08%	0.13%	1.83%	0.91%	1.88%	2.01%	0.71%	0.64%	2.40%
LOW	2018	0.05%	0.85%	0.15%	2.03%	1.34%	1.06%	1.72%	2.41%	1.44%	1.83%	1.48%	1.45%	1.12%	1.75%	1.05%	0.07%	1.78%	0.88%	1.83%	1.96%	0.68%	0.61%	2.34%
LOW	2019	0.05%	0.82%	0.13%	1.98%	1.31%	1.09%	1.69%	2.35%	1.41%	1.78%	1.44%	1.41%	1.09%	1.71%	1.02%	0.07%	1.73%	0.87%	1.79%	1.91%	0.65%	0.59%	2.28%
LOW	2020	0.05%	0.80%	0.12%	1.93%	1.28%	1.11%	1.65%	2.29%	1.38%	1.74%	1.41%	1.38%	1.08%	1.67%	1.00%	0.07%	1.69%	0.84%	1.75%	1.86%	0.62%	0.57%	2.22%
LOW	2021	0.05%	0.78%	0.10%	1.89%	1.26%	1.13%	1.61%	2.23%	1.36%	1.70%	1.38%	1.35%	1.06%	1.64%	0.98%	0.05%	1.65%	0.81%	1.71%	1.82%	0.59%	0.55%	2.17%
LOW	2022	0.05%	0.77%	0.09%	1.85%	1.24%	1.15%	1.57%	2.18%	1.33%	1.67%	1.35%	1.32%	1.04%	1.60%	0.96%	0.05%	1.61%	0.80%	1.67%	1.78%	0.56%	0.52%	2.11%
LOW	2023	0.05%	0.74%	0.06%	1.80%	1.20%	1.17%	1.53%	2.12%	1.30%	1.63%	1.32%	1.29%	1.01%	1.56%	0.94%	0.02%	1.57%	0.78%	1.63%	1.73%	0.53%	0.49%	2.06%
LOW	2024	0.05%	0.71%	0.03%	1.76%	1.18%	1.19%	1.49%	2.07%	1.27%	1.59%	1.28%	1.26%	0.99%	1.52%	0.92%	0.02%	1.53%	0.75%	1.59%	1.69%	0.50%	0.46%	2.00%
LOW	2025	0.05%	0.68%	0.02%	1.71%	1.15%	1.21%	1.45%	2.02%	1.25%	1.55%	1.25%	1.22%	0.97%	1.48%	0.89%	0.03%	1.48%	0.74%	1.55%	1.64%	0.46%	0.43%	1.95%
LOW	2026	0.05%	0.66%	0.00%	1.67%	1.12%	1.24%	1.41%	1.96%	1.21%	1.51%	1.22%	1.19%	0.95%	1.44%	0.87%	-0.01%	1.44%	0.72%	1.51%	1.60%	0.42%	0.40%	1.90%
LOW	2027	0.05%	0.64%	-0.05%	1.63%	1.09%	1.25%	1.38%	1.92%	1.18%	1.47%	1.19%	1.16%	0.92%	1.40%	0.84%	-0.08%	1.41%	0.69%	1.48%	1.56%	0.39%	0.38%	1.85%
LOW	2028	0.05%	0.62%	-0.08%	1.59%	1.06%	1.27%	1.34%	1.87%	1.16%	1.44%	1.15%	1.13%	0.91%	1.37%	0.82%	0.02%	1.37%	0.66%	1.44%	1.52%	0.36%	0.35%	1.80%
LOW	2029	0.05%	0.59%	-0.06%	1.55%	1.04%	1.29%	1.30%	1.82%	1.14%	1.41%	1.13%	1.11%	0.88%	1.33%	0.80%	-0.07%	1.33%	0.66%	1.41%	1.48%	0.33%	0.33%	1.76%
LOW	2030	0.05%	0.57%	-0.11%	1.52%	1.02%	1.30%	1.27%	1.78%	1.11%	1.37%	1.10%	1.08%	0.86%	1.30%	0.78%	-0.13%	1.30%	0.63%	1.38%	1.45%	0.30%	0.31%	1.72%
LOW	2031	0.05%	0.54%	-0.11%	1.48%	0.99%	1.31%	1.24%	1.74%	1.09%	1.34%	1.07%	1.06%	0.85%	1.27%	0.77%	0.00%	1.27%	0.61%	1.35%	1.41%	0.27%	0.29%	1.68%
LOW	2032	0.05%	0.53%	-0.13%	1.45%	0.97%	1.32%	1.21%	1.70%	1.07%	1.31%	1.05%	1.03%	0.82%	1.24%	0.75%	-0.11%	1.24%	0.60%	1.31%	1.38%	0.24%	0.27%	1.64%
LOW	2033	0.05%	0.50%	-0.17%	1.41%	0.95%	1.33%	1.17%	1.66%	1.04%	1.28%	1.02%	1.01%	0.81%	1.21%	0.73%	-0.14%	1.21%	0.58%	1.28%	1.34%	0.22%	0.26%	1.60%
LOW	2034	0.05%	0.48%	-0.15%	1.38%	0.93%	1.34%	1.14%	1.62%	1.02%	1.25%	0.99%	0.98%	0.79%	1.18%	0.71%	-0.11%	1.18%	0.56%	1.25%	1.31%	0.19%	0.24%	1.56%
LOW	2035	0.05%	0.45%	-0.20%	1.34%	0.90%	1.35%	1.12%	1.58%	0.99%	1.22%	0.96%	0.96%	0.76%	1.15%	0.69%	-0.11%	1.14%	0.53%	1.22%	1.27%	0.16%	0.22%	1.52%

Cascade Natural Gas
2011 IRP Demand Forecast
Economic Indicators

PROJECTED INCOME GROWTH

		ADAMS, WA	BAKER, OR	BENTON, WA	CHELAN, WA	COWLITZ, WA	CROOK, OR	DESCHUTES, OR	DOUGLAS, WA	FRANKLIN, WA	GRANT, WA	GRAYS HARBOR, WA	JEFFERSON, OR	KITSAP, WA	KLAMATH, OR	MALHEUR, OR	MASON, WA	MORROW, OR	SKAGIT, WA	SNOHOMISH, WA	UMATILLA, OR	WALLA WALLA, WA	WHATCOM, WA	YAKIMA, WA
HIGH	2011	0.05%	-1.03%	0.59%	-0.69%	0.23%	0.19%	0.91%	0.05%	0.16%	0.02%	0.10%	0.40%	0.05%	0.21%	-0.11%	0.28%	0.28%	0.61%	0.44%	0.21%	-0.23%	0.45%	0.24%
	2012	0.05%	0.14%	0.21%	0.09%	0.12%	0.16%	0.19%	0.14%	0.09%	0.02%	0.07%	0.10%	0.19%	0.14%	0.14%	0.21%	0.10%	0.12%	0.10%	0.02%	0.17%	0.12%	0.17%
	2013	0.05%	0.14%	0.21%	0.10%	0.14%	0.16%	0.21%	0.16%	0.09%	0.02%	0.09%	0.10%	0.19%	0.14%	0.14%	0.23%	0.10%	0.12%	0.10%	0.03%	0.17%	0.12%	0.17%
	2014	0.05%	1.53%	2.18%	1.11%	1.46%	1.65%	2.21%	1.63%	0.96%	0.30%	0.95%	1.18%	1.96%	1.55%	1.51%	2.29%	1.12%	1.33%	1.17%	0.37%	1.84%	1.28%	1.81%
	2015	0.05%	1.60%	2.21%	1.21%	1.54%	1.70%	2.29%	1.75%	1.02%	0.39%	1.04%	1.25%	2.03%	1.61%	1.58%	2.46%	1.19%	1.35%	1.26%	0.45%	1.91%	1.34%	1.88%
	2016	0.05%	1.69%	2.26%	1.31%	1.61%	1.76%	2.41%	1.86%	1.10%	0.49%	1.12%	1.32%	2.08%	1.68%	1.66%	2.46%	1.26%	1.47%	1.35%	0.55%	1.96%	1.40%	1.94%
	2017	0.05%	1.72%	2.32%	1.39%	1.67%	1.81%	2.48%	1.97%	1.14%	0.57%	1.19%	1.38%	2.14%	1.74%	1.71%	2.48%	1.33%	1.50%	1.43%	0.64%	2.01%	1.45%	2.00%
	2018	0.05%	1.80%	2.38%	1.49%	1.73%	1.86%	2.60%	2.07%	1.21%	0.66%	1.28%	1.45%	2.22%	1.80%	1.79%	2.63%	1.41%	1.56%	1.51%	0.74%	2.06%	1.51%	2.06%
	2019	0.05%	1.87%	2.41%	1.56%	1.79%	1.91%	2.65%	2.17%	1.27%	0.74%	1.34%	1.51%	2.28%	1.86%	1.85%	2.65%	1.48%	1.58%	1.59%	0.83%	2.12%	1.56%	2.11%
	2020	0.05%	1.92%	2.46%	1.64%	1.84%	1.94%	2.75%	2.26%	1.32%	0.82%	1.41%	1.57%	2.32%	1.91%	1.90%	2.67%	1.54%	1.66%	1.66%	0.91%	2.16%	1.60%	2.16%
	2021	0.05%	1.98%	2.48%	1.70%	1.88%	1.98%	2.82%	2.34%	1.37%	0.89%	1.47%	1.62%	2.38%	1.95%	1.95%	2.73%	1.60%	1.71%	1.72%	0.99%	2.21%	1.64%	2.20%
	2022	0.05%	1.99%	2.51%	1.76%	1.93%	2.01%	2.90%	2.42%	1.42%	0.95%	1.53%	1.67%	2.43%	2.00%	2.00%	2.76%	1.66%	1.73%	1.78%	1.06%	2.25%	1.67%	2.25%
	2023	0.05%	2.07%	2.56%	1.84%	1.98%	2.05%	2.96%	2.50%	1.47%	1.02%	1.59%	1.73%	2.48%	2.05%	2.06%	2.85%	1.73%	1.79%	1.85%	1.14%	2.29%	1.73%	2.30%
	2024	0.05%	2.11%	2.62%	1.90%	2.02%	2.08%	3.04%	2.58%	1.54%	1.09%	1.65%	1.78%	2.53%	2.10%	2.10%	2.85%	1.78%	1.85%	1.91%	1.22%	2.33%	1.77%	2.35%
	2025	0.05%	2.19%	2.64%	1.97%	2.07%	2.13%	3.12%	2.66%	1.58%	1.16%	1.71%	1.84%	2.58%	2.15%	2.17%	2.86%	1.85%	1.86%	1.99%	1.29%	2.39%	1.81%	2.39%
	2026	0.05%	2.22%	2.66%	2.03%	2.12%	2.16%	3.20%	2.74%	1.63%	1.23%	1.77%	1.89%	2.63%	2.20%	2.21%	2.95%	1.90%	1.92%	2.05%	1.37%	2.43%	1.86%	2.44%
	2027	0.05%	2.27%	2.72%	2.09%	2.16%	2.19%	3.25%	2.81%	1.69%	1.29%	1.82%	1.93%	2.69%	2.24%	2.27%	3.04%	1.96%	1.96%	2.10%	1.44%	2.47%	1.89%	2.48%
	2028	0.05%	2.30%	2.75%	2.14%	2.20%	2.23%	3.32%	2.87%	1.72%	1.34%	1.88%	1.99%	2.71%	2.28%	2.31%	2.98%	2.01%	2.01%	2.16%	1.50%	2.51%	1.93%	2.52%
	2029	0.05%	2.36%	2.76%	2.19%	2.24%	2.25%	3.38%	2.93%	1.76%	1.39%	1.92%	2.03%	2.76%	2.32%	2.35%	3.05%	2.05%	2.02%	2.21%	1.57%	2.54%	1.96%	2.56%
	2030	0.05%	2.39%	2.79%	2.24%	2.27%	2.27%	3.42%	2.99%	1.81%	1.45%	1.96%	2.06%	2.80%	2.35%	2.38%	3.14%	2.09%	2.06%	2.25%	1.62%	2.57%	1.99%	2.60%
	2031	0.05%	2.44%	2.81%	2.28%	2.30%	2.29%	3.46%	3.04%	1.83%	1.49%	2.00%	2.10%	2.81%	2.38%	2.42%	3.06%	2.13%	2.10%	2.30%	1.67%	2.59%	2.01%	2.62%
	2032	0.05%	2.43%	2.83%	2.32%	2.32%	2.30%	3.52%	3.09%	1.86%	1.53%	2.03%	2.13%	2.85%	2.42%	2.44%	3.13%	2.16%	2.10%	2.34%	1.73%	2.63%	2.04%	2.65%
	2033	0.05%	2.49%	2.86%	2.36%	2.36%	2.32%	3.57%	3.14%	1.90%	1.57%	2.07%	2.17%	2.88%	2.45%	2.47%	3.19%	2.19%	2.14%	2.38%	1.78%	2.64%	2.05%	2.68%
	2034	0.05%	2.50%	2.85%	2.40%	2.38%	2.33%	3.60%	3.19%	1.92%	1.61%	2.10%	2.21%	2.90%	2.48%	2.50%	3.20%	2.23%	2.18%	2.42%	1.83%	2.68%	2.09%	2.71%
	2035	0.05%	2.55%	2.90%	2.45%	2.41%	2.36%	3.65%	3.24%	1.97%	1.66%	2.15%	2.24%	2.95%	2.51%	2.54%	3.20%	2.27%	2.21%	2.47%	1.89%	2.71%	2.11%	2.75%
MID	2011	-1.83%	0.34%	-1.21%	0.13%	0.11%	0.52%	0.03%	0.09%	0.01%	0.06%	0.37%	0.03%	0.12%	-0.20%	0.16%	0.16%	0.35%	0.25%	0.12%	-0.40%	0.26%	0.14%	0.08%
	2012	0.08%	0.12%	0.05%	0.07%	0.09%	0.11%	0.08%	0.05%	0.01%	0.04%	0.10%	0.11%	0.08%	0.08%	0.12%	0.06%	0.07%	0.06%	0.01%	0.10%	0.07%	0.10%	0.08%
	2013	0.08%	0.12%	0.06%	0.08%	0.09%	0.12%	0.09%	0.05%	0.01%	0.05%	0.10%	0.11%	0.08%	0.08%	0.13%	0.06%	0.07%	0.06%	0.02%	0.10%	0.07%	0.10%	0.09%
	2014	0.87%	1.24%	0.63%	0.83%	0.94%	1.25%	0.93%	0.55%	0.17%	0.54%	1.06%	1.11%	0.88%	0.86%	1.30%	0.64%	0.75%	0.67%	0.21%	1.04%	0.73%	1.03%	0.88%
	2015	0.91%	1.25%	0.69%	0.87%	0.97%	1.30%	0.99%	0.58%	0.22%	0.59%	1.09%	1.15%	0.91%	0.90%	1.39%	0.68%	0.77%	0.72%	0.26%	1.08%	0.76%	1.06%	0.92%
	2016	0.96%	1.28%	0.74%	0.91%	1.00%	1.36%	1.06%	0.62%	0.28%	0.64%	1.13%	1.18%	0.95%	0.94%	1.39%	0.72%	0.83%	0.77%	0.31%	1.11%	0.79%	1.10%	0.95%
	2017	0.98%	1.31%	0.79%	0.95%	1.03%	1.40%	1.12%	0.65%	0.33%	0.68%	1.16%	1.21%	0.99%	0.97%	1.40%	0.76%	0.85%	0.81%	0.37%	1.14%	0.83%	1.13%	0.97%
	2018	1.02%	1.35%	0.84%	0.98%	1.05%	1.47%	1.17%	0.69%	0.38%	0.73%	1.19%	1.26%	1.02%	1.01%	1.48%	0.80%	0.89%	0.86%	0.42%	1.17%	0.86%	1.17%	1.00%
	2019	1.06%	1.36%	0.89%	1.02%	1.08%	1.50%	1.23%	0.72%	0.42%	0.76%	1.22%	1.29%	1.05%	1.05%	1.49%	0.84%	0.90%	0.90%	0.47%	1.20%	0.89%	1.20%	1.03%
	2020	1.09%	1.39%	0.93%	1.04%	1.10%	1.55%	1.28%	0.75%	0.47%	0.80%	1.24%	1.31%	1.08%	1.08%	1.51%	0.88%	0.94%	0.94%	0.52%	1.22%	0.91%	1.23%	1.05%
	2021	1.12%	1.40%	0.97%	1.07%	1.12%	1.59%	1.32%	0.78%	0.50%	0.83%	1.27%	1.34%	1.11%	1.11%	1.54%	0.91%	0.97%	0.98%	0.56%	1.25%	0.93%	1.25%	1.07%
	2022	1.13%	1.42%	1.00%	1.09%	1.14%	1.63%	1.37%	0.81%	0.54%	0.87%	1.29%	1.37%	1.13%	1.13%	1.56%	0.94%	0.98%	1.01%	0.60%	1.27%	0.95%	1.27%	1.09%
	2023	1.17%	1.44%	1.04%	1.12%	1.16%	1.67%	1.41%	0.84%	0.58%	0.90%	1.32%	1.40%	1.16%	1.17%	1.61%	0.98%	1.01%	1.05%	0.65%	1.30%	0.98%	1.30%	1.12%
	2024	1.19%	1.48%	1.08%	1.15%	1.18%	1.71%	1.46%	0.87%	0.62%	0.94%	1.34%	1.43%	1.19%	1.19%	1.61%	1.01%	1.05%	1.09%	0.69%	1.32%	1.00%	1.33%	1.14%
	2025	1.24%	1.49%	1.12%	1.17%	1.20%	1.75%	1.50%	0.90%	0.66%	0.97%	1.37%	1.46%	1.22%	1.23%	1.61%	1.05%	1.06%	1.12%	0.74%	1.35%	1.03%	1.35%	1.16%
	2026	1.26%	1.50%	1.15%	1.20%	1.22%	1.80%	1.54%	0.93%	0.70%	1.01%	1.39%	1.48%	1.24%	1.25%	1.66%	1.08%	1.09%	1.16%	0.78%	1.37%	1.05%	1.38%	1.19%
	2027	1.28%	1.53%	1.18%	1.22%	1.24%	1.83%	1.58%	0.96%	0.73%	1.03%	1.41%	1.52%	1.27%	1.28%	1.71%	1.11%	1.11%	1.19%	0.82%	1.40%	1.07%	1.40%	1.20%
	2028	1.30%	1.55%	1.21%	1.25%	1.26%	1.87%	1.62%	0.98%	0.76%	1.06%	1.43%	1.53%	1.29%	1.31%	1.68%	1.14%	1.14%	1.22%	0.85%	1.42%	1.09%	1.43%	1.22%
	2029	1.33%	1.55%	1.24%	1.26%	1.27%	1.90%	1.65%	1.00%	0.79%	1.09%	1.44%	1.56%	1.31%	1.33%	1.72%	1.16%	1.15%	1.25%	0.89%	1.43%	1.11%	1.45%	1.24%
	2030	1.35%	1.57%	1.27%	1.28%	1.28%	1.92%	1.68%	1.03%	0.82%	1.11%	1.46%	1.58%	1.33%	1.35%	1.77%	1.18%	1.17%	1.27%	0.92%	1.45%	1.13%	1.47%	1.25%
	2031	1.38%	1.58%	1.29%	1.30%	1.29%	1.95%	1.71%	1.04%	0.84%	1.13%	1.47%	1.59%	1.35%	1.37%	1.73%	1.20%	1.19%	1.30%	0.95%	1.46%	1.14%	1.48%	1.26%
	2032	1.38%	1.60%	1.31%	1.31%	1.30%	1.98%	1.74%	1.05%	0.87%	1.15%	1.48%	1.61%	1.37%	1.38%	1.76%	1.22%	1.19%	1.32%	0.98%	1.48%	1.16%	1.50%	1.27%
	2033	1.40%	1.61%	1.33%	1.33%	1.31%	2.00%	1.77%	1.08%	0.89%	1.17%	1.49%	1.62%	1.38%	1.40%	1.80%	1.24%	1.21%	1.34%	1.01%	1.49%	1.16%	1.51%	1.28%
	2034	1.41%	1.61%	1.36%	1.34%	1.32%	2.02%	1.79%	1.09%	0.91%	1.19%	1.50%	1.64%	1.40%	1.41%	1.80%	1.26%	1.23%	1.37%	1.04%	1.51%	1.18%	1.53%	1.30%
	2035	1.44%	1.63%	1.38%	1.36%	1.33%	2.05%	1.82%	1.12%	0.94%	1.21%	1.51%	1.66%	1.42%	1.44%	1.80%	1.28%	1.25%	1.39%	1.07%	1.53%	1.20%	1.55%	1.31%
LOW	2011	0.05%	-2.81%	0.19%	-1.87%	0.07%	0.06%	0.29%	0.02%	0.05%	0.01%	0.03%	0.13%	0.02%	0.07%	-0.31%	0.09%	0.09%	0.20%	0.14%	0.07%	-0.62%	0.15%	0.08%
	2012	0.05%	0.04%	0.07%	0.03%	0.04%	0.05%	0.06%	0.04%	0.03%	0.01%	0.02%	0.03%	0.06%	0.04%	0.04%	0.07%	0.03%	0.04%	0.03%	0.01%	0.06%	0.04%	0.06%
	2013	0.05%	0.04%	0.07%	0.03%	0.04%	0.05%	0.07%	0.05%	0.03%	0.01%	0.03%	0.03%	0.06%	0.04%	0.04%	0.07%	0.03%	0.04%	0.03%	0.01%	0.06%	0.04%	0.06%
	2014	0.05%	0.49%	0.70%	0.36%	0.47%	0.53%	0.71%	0.53%	0.31%	0.10%	0.31%	0.38%	0.63%	0.50%	0.49%	0.74%	0.36%	0.43%	0.38%	0.12%	0.59%	0.41%	0.58%
	2015	0.05%	0.51%	0.71%	0.39%	0.50%	0.55%	0.74%	0.56%	0.33%	0.13%	0.33%	0.40%	0.65%	0.52%	0.51%	0.79%	0.38%	0.43%	0.41%	0.15%	0.61%	0.43%	0.60%
	2016	0.05%	0.54%	0.73%	0.42%	0.52%	0.57%	0.77%	0.60%	0.35%	0.16%	0.36%	0.42%	0.67%	0.54%	0.53%	0.79%	0.41%	0.47%	0.43%	0.18%	0.63%	0.45%	0.63%
	2017	0.05%	0.55%	0.75%	0.45%	0.54%	0.58%	0.80%	0.64%	0.37%	0.18%	0.38%	0.44%	0.69%	0.56%	0.55%	0.80%	0.43%	0.48%	0.46%	0.21%	0.65%	0.47%	0.64%
	2018	0.05%	0.58%	0.77%	0.48%	0.56%	0.60%	0.84%	0.67%	0.39%	0.21%	0.41%	0.47%	0.72%	0.58%	0.58%	0.85%	0.45%	0.50%	0.49%	0.24%	0.66%	0.49%	0.66%
	2019	0.05%	0.60%	0.78%	0.50%	0.58%	0.61%	0.85%	0.70%	0.41%	0.24%	0.43%	0.49%	0.74%	0.60%	0.60%	0.85%	0.48%	0.51%	0.51%	0.27%	0.68%	0.50%	0.68%
	2020	0.05%	0.62%	0.79%	0.53%	0.59%	0.62%	0.89%	0.73%	0.43%	0.26%	0.45%	0.50%	0.75%	0.61%	0.61%	0.86%	0.50%	0.53%	0.53%	0.29%	0.70%	0.51%	0.70%
	2021	0.05%	0.64%	0.80%	0.55%	0.61%	0.64%	0.91%	0.75%	0.44%	0.29%	0.47%	0.52%	0.77%	0.63%	0.63%	0.88%	0.52%	0.55%	0.55%	0.32%	0.71%	0.53%	0.71%
	2022	0.05%	0.64%	0.81%	0.57%	0.62%	0.65%	0.93%	0.78%	0.46%	0.31%	0.49%	0.54%	0.78%	0.64%	0.64%	0.89%	0.53%	0.56%	0.58%	0.34%	0.72%	0.54%	0.72%
	2023	0.05%	0.67%	0.82%	0.59%	0.64%	0.66%	0.95%	0.81%	0.47%	0.33%	0.51%	0.56%	0.80%	0.66%	0.66%	0.92%	0.56%	0.58%	0.60%	0.37%	0.74%	0.56%	0.74%
	2024	0.05%	0.68%	0.84%	0.61%	0.65%	0.67%	0.98%	0.83%	0.49%	0.35%	0.53%	0.57%	0.82%	0.68%	0.68%	0.92%	0.57%	0.59%	0.62%	0.39%	0.75%	0.57%	0.76%
	2025	0.05%	0.71%	0.85%	0.63%	0.67%	0.69%	1.00%	0.86%	0.51%	0.37%	0.55%	0.59%	0.83%	0.69%	0.70%	0.92%	0.60%	0.60%	0.64%	0.42%	0.77%	0.58%	0.77%
	2026	0.05%	0.72%	0.86%	0.65%	0.68%	0.70%	1.03%	0.88%	0.53%	0.39%	0.57%	0.61%	0.85%	0.71%	0.71%	0.95%	0.61%	0.62%	0.66%	0.44%	0.78%	0.60%	0.79%
	2027	0.05%	0.73%	0.88%	0.67%	0.70%	0.71%	1.05%	0.90%	0.55%	0.41%	0.59%	0.62%	0.87%	0.72%	0.73%	0.98%	0.63%	0.63%	0.68%	0.46%	0.80%	0.61%	0.80%
	2028	0.05%	0.74%	0.89%	0.69%	0.71%	0.72%	1.07%	0.93%	0.56%	0.43%	0.60%	0.64%	0.87%	0.74%	0.74%	0.96%	0.65%	0.65%	0.70%	0.48%	0.81%	0.62%	0.81%
	2029	0.05%	0.76%	0.89%	0.71%	0.72%	0.72%	1.09%	0.94%	0.57%	0.45%	0.62%	0.65%	0.89%	0.75%	0.76%	0.98%	0.66%	0.65%	0.71%	0.50%	0.82%	0.63%	0.83%
	2030	0.05%	0.77%	0.90%	0.72%	0.73%	0.73%	1.10%	0.96%	0.58%	0.47%	0.63%	0.66%	0.90%	0.76%	0.77%	1.01%	0.67%	0.66%	0.73%	0.52%	0.83%	0.64%	0.84%
	2031	0.05%	0.79%	0.91%	0.73%	0.74%	0.74%	1.12%	0.98%	0.59%	0.48%	0.64%	0.68%	0.91%	0.77%	0.78%	0.99%	0.68%	0.68%	0.74%	0.54%	0.83%	0.65%	0.85%
	2032	0.05%	0.78%	0.91%	0.75%	0.75%	0.74%	1.14%	0.99%	0.60%	0.49%	0.65%	0.69%	0.92%	0.78%	0.79%	1.01%	0.70%	0.68%	0.75%	0.56%	0.85%	0.66%	0.85%
	2033	0.05%	0.80%	0.92%	0.76%	0.76%	0.75%	1.15%	1.01%	0.61%	0.51%	0.67%	0.70%	0.93%	0.79%	0.80%	1.03%	0.71%	0.69%	0.77%	0.57%	0.85%	0.66%	0.86%
	2034	0.05%	0.81%	0.92%	0.77%	0.77%	0.75%	1.16%	1.03%	0.62%	0.52%	0.68%	0.71%	0.94%	0.80%	0.81%	1.03%	0.72%	0.70%	0.78%	0.59%	0.86%	0.67%	0.87%
	2035	0.05%	0.82%	0.93%	0.79%	0.78%	0.76%	1.18%	1.04%	0.63%	0.53%	0.69%	0.72%	0.95%	0.81%	0.82%	1.03%	0.73%	0.71%	0.79%	0.61%	0.87%	0.68%	0.89%

Appendix B-2

Demand Forecast Model Results & Summary Tables

A Note on Low, Medium & High Scenarios

Included in the following pages are tables and charts illustrating Cascade's best guess estimate of future therm demand under low, medium and high scenarios. To form these scenarios, the underlying economic variables (employment, income and number of households) that form the basis for Cascade's forecasts are modified based on economic patterns from the past three decades. Simply put, a medium forecast is created then these base economic variables are decreased or increased and the regressions re-run to create low and high scenarios, respectively. Further details about how these scenarios are created can be found in the text of this IRP under the chapter entitled "Demand Forecast."

A somewhat counter-intuitive result of this method of constructing the low and high scenarios is that Cascade's customers' estimated requirements under the high scenario, which represents good economic conditions, can be *lower* than estimated requirements under the medium scenario (see the charts for Aberdeen, Baker and Yakima). What the high scenario represents under this methodology is a historically-based representation of the load during good economic times. Under certain circumstances high economic growth can lead to lower or negative demand growth among certain classes of customers. The non-linear appearance of forecasted load is primarily a result of the response of industrial customers to robust growth in the underlying economic indicators.

There are several hypotheses that can be used to explain this phenomenon. First, high exogenous income growth may have a negative effect on industrial output. As labor becomes more expensive, factories can become victim to decreased competitiveness and may scale back production as a response. Alternatively, high endogenous income growth can result from increased production on the part of industrial customers who may be able to save money by taking their increased gas demand to non-core rate schedules.

The pattern of divergence between scenarios across Cascade's districts is illustrative of the structural diversity of the regional economies within Cascade's geographically disparate service territory. While we do not know the true cause of decreased demand that can occur under a strong economy in some districts, the projections published here are based on the relationship between Cascade's historic load and the economics that produced these loads and are Cascade's best estimate of future load.

Cascade Natural Gas
2011 IRP Demand Forecast
Medium Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Aberdeen																						
Total Therms Pct. Growth		1.82%	4.06%	0.08%	0.36%	0.45%	0.50%	0.48%	0.43%	0.45%	0.48%	0.47%	0.42%	0.44%	0.50%	0.52%	0.43%	0.44%	0.46%	0.44%	0.02%	0.44%
Residential Therms	3,518,892	3,536,329	3,919,079	3,911,693	3,922,975	3,935,530	3,950,566	3,966,570	3,978,035	3,988,223	3,999,631	4,011,391	4,019,068	4,025,241	4,033,905	4,048,020	4,052,991	4,057,063	4,063,677	4,067,469	4,069,456	4,070,974
Commercial Therms	5,012,117	5,035,732	5,080,783	5,124,677	5,166,491	5,203,766	5,239,481	5,281,307	5,324,463	5,365,212	5,405,529	5,451,003	5,498,225	5,542,044	5,576,754	5,624,088	5,671,512	5,716,024	5,764,074	5,813,934	5,813,934	5,864,044
Industrial Therms	119,051	249,104	209,061	180,185	162,862	157,989	157,517	147,683	136,427	131,779	129,103	119,658	108,567	104,109	112,488	104,980	98,196	95,646	90,193	83,760	83,760	77,475
Ind., Inst., & Cmcl. Interrup. Therms	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299
Total Core Therms	9,389,359	9,560,463	9,948,220	9,955,854	9,991,627	10,036,584	10,086,862	10,134,858	10,178,224	10,224,513	10,273,561	10,321,350	10,365,159	10,410,692	10,462,446	10,516,386	10,561,997	10,608,031	10,657,243	10,704,461	10,706,448	10,751,792
Daily Baseload Therms	7,985	8,131	8,461	8,467	8,498	8,536	8,579	8,619	8,656	8,696	8,737	8,778	8,815	8,854	8,898	8,944	8,983	9,022	9,064	9,104	9,105	9,144
Peak Day Therms	82,192	82,735	82,987	83,241	83,805	84,358	84,898	85,442	85,971	86,502	87,022	87,542	88,049	88,557	89,066	89,563	90,047	90,517	91,002	91,475	91,847	92,306
Therms Per Residential Customer	671	671	741	738	735	732	730	728	726	723	720	718	715	712	710	708	705	702	700	697	693	690
Therms Per Commercial Customer	4,408	4,372	4,389	4,405	4,418	4,426	4,434	4,445	4,458	4,469	4,478	4,492	4,507	4,519	4,523	4,537	4,551	4,563	4,577	4,592	4,592	4,608
Therms Per Industrial Customer	9,158	17,188	14,557	12,648	11,506	11,217	11,226	10,544	9,747	9,409	9,203	8,507	7,696	7,345	7,892	7,313	6,789	6,556	6,122	5,626	5,626	5,149
Residential Customers	5,247	5,273	5,287	5,301	5,339	5,376	5,412	5,448	5,483	5,518	5,552	5,586	5,619	5,652	5,685	5,717	5,748	5,778	5,809	5,839	5,868	5,897
Commercial Customers	1,137	1,152	1,158	1,163	1,170	1,176	1,182	1,188	1,194	1,201	1,207	1,214	1,220	1,227	1,233	1,240	1,246	1,253	1,259	1,266	1,266	1,273
Industrial Customers	13	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	15	15	15	15
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	6,400	6,442	6,462	6,482	6,526	6,569	6,611	6,653	6,694	6,736	6,776	6,817	6,856	6,896	6,935	6,974	7,012	7,048	7,086	7,123	7,152	7,188
Bellingham																						
Total Therms Pct. Growth		14.73%	0.66%	0.84%	1.59%	2.39%	2.55%	1.86%	1.84%	2.26%	2.09%	1.63%	1.50%	2.25%	2.80%	1.58%	1.65%	1.87%	1.61%	1.32%	1.07%	2.36%
Residential Therms	26,890,852	29,857,331	30,085,035	30,340,350	30,862,300	31,645,600	32,479,433	33,128,476	33,824,208	34,668,083	35,415,960	36,063,027	36,707,310	37,672,866	38,704,410	39,407,890	40,167,332	40,985,558	41,745,627	42,383,940	43,081,184	43,724,920
Commercial Therms	13,256,906	16,198,008	16,386,934	16,604,937	16,882,704	17,257,737	17,670,962	17,985,798	18,271,256	18,621,610	18,991,152	19,266,207	19,499,989	19,819,252	20,342,200	20,605,468	20,866,067	21,194,285	21,456,903	21,684,973	21,684,973	21,899,794
Industrial Therms	881,544	1,044,490	941,832	867,374	828,625	836,031	861,896	847,802	825,182	831,237	846,799	827,098	795,416	798,038	877,529	862,772	850,171	864,415	857,318	840,612	840,612	822,167
Ind., Inst., & Cmcl. Interrup. Therms	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424
Total Core Therms	41,198,726	47,269,254	47,583,225	47,982,085	48,743,053	49,908,792	51,181,715	52,131,501	53,090,070	54,290,355	55,423,335	56,325,756	57,172,139	58,459,580	60,093,563	61,045,555	62,052,994	63,213,683	64,229,273	65,078,950	65,776,194	66,616,305
Daily Baseload Therms	40,559	46,535	46,844	47,237	47,986	49,134	50,387	51,322	52,266	53,447	54,563	55,451	56,284	57,552	59,160	60,097	61,089	62,232	63,232	64,068	64,755	65,582
Peak Day Therms	695,389	710,136	724,012	737,824	756,752	775,748	794,829	813,963	833,194	852,494	871,863	891,352	910,924	930,530	950,203	969,925	989,694	1,009,498	1,029,335	1,049,238	1,067,505	1,087,811
Therms Per Residential Customer	663	721	713	706	700	700	701	698	696	697	696	693	690	693	697	695	694	694	693	690	688	685
Therms Per Commercial Customer	2,760	3,316	3,273	3,238	3,216	3,213	3,218	3,206	3,189	3,184	3,183	3,167	3,144	3,137	3,162	3,146	3,132	3,128	3,115	3,098	3,098	3,079
Therms Per Industrial Customer	22,604	26,654	24,227	22,479	21,622	21,955	22,767	22,515	22,020	22,280	22,789	22,340	21,555	21,689	23,911	23,561	23,259	23,686	23,521	23,085	23,085	22,594
Residential Customers	40,531	41,411	42,195	42,975	44,089	45,208	46,333	47,462	48,598	49,739	50,885	52,039	53,199	54,362	55,530	56,702	57,878	59,057	60,239	61,426	62,618	63,832
Commercial Customers	4,803	4,885	5,007	5,129	5,250	5,371	5,491	5,611	5,730	5,848	5,967	6,084	6,202	6,318	6,434	6,549	6,663	6,776	6,889	7,001	7,001	7,112
Industrial Customers	39	39	39	39	38	38	38	38	37	37	37	37	37	37	37	37	37	36	36	36	36	36
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	45,377	46,339	47,245	48,146	49,381	50,621	51,866	53,114	54,369	55,629	56,893	58,164	59,442	60,721	62,005	63,292	64,582	65,874	67,168	68,467	69,659	70,984
Bremerton																						
Total Therms Pct. Growth		10.16%	1.08%	1.25%	1.92%	2.40%	2.45%	2.19%	2.26%	2.40%	2.27%	2.11%	2.11%	2.40%	2.39%	2.11%	2.08%	2.21%	2.03%	1.94%	0.93%	2.87%
Residential Therms	18,579,097	20,368,359	20,315,617	20,316,912	20,535,102	20,926,863	21,352,880	21,693,340	22,066,916	22,507,710	22,920,930	23,274,084	23,629,820	24,122,976	24,658,191	25,060,870	25,466,571	25,948,370	26,361,329	26,740,861	27,159,820	27,546,816
Commercial Therms	9,011,610	10,022,705	10,404,061	10,789,598	11,175,827	11,557,058	11,939,625	12,339,297	12,747,354	13,153,858	13,563,909	13,992,126	14,431,223	14,864,496	15,277,242	15,727,177	16,182,013	16,632,855	17,096,932	17,570,842	17,570,842	18,051,659
Industrial Therms	107,569	157,905	162,547	166,307	168,496	168,294	167,065	167,629	168,493	167,826	166,584	166,970	167,895	166,966	162,262	161,968	161,483	159,680	158,772	158,238	158,238	157,730
Ind., Inst., & Cmcl. Interrup. Therms	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625
Total Core Therms	28,055,901	30,906,594	31,239,849	31,630,442	32,237,050	33,009,839	33,817,194	34,557,891	35,340,388	36,187,019	37,009,047	37,790,805	38,586,563	39,512,062	40,455,319	41,307,639	42,167,692	43,098,529	43,974,657	44,827,566	45,246,525	46,113,830
Daily Baseload Therms	31,620	34,832	35,208	35,648	36,332	37,203	38,113	38,947	39,829	40,784	41,710	42,591	43,488	44,531	45,594	46,555	47,524	48,573	49,560	50,522	50,994	51,971
Peak Day Therms	344,667	344,630	347,432	350,237	357,416	364,663	371,989	379,405	386,898	394,481	402,132	409,886	417,730	425,636	433,631	441,711	449,864	458,092	466,394	474,793	482,080	490,678
Therms Per Residential Customer	662	727	721	717	711	711	712	710	709	710	710	708	706	708	711	710	709	710	709	707	706	704
Therms Per Commercial Customer	3,569	3,888	3,902	3,914	3,924	3,931	3,936	3,945	3,955	3,962	3,970	3,980	3,992	4,002	4,004	4,015	4,027	4,036	4,047	4,060	4,060	4,073
Therms Per Industrial Customer	107,569	152,445	153,630	153,934	152,773	149,518	145,474	143,093	141,038	137,779	134,160	131,938	130,197	127,087	121,248	118,834	116,352	113,007	110,381	108,085	108,085	105,870
Residential Customers	28,073	28,017	28,177	28,336	28,882	29,433	29,990	30,554	31,124	31,701	32,283	32,873	33,470	34,072	34,681	35,297	35,919	36,547	37,181	37,823	38,470	39,129
Commercial Customers	2,525	2,578	2,666	2,756	2,848	2,940	3,034	3,128	3,223	3,320	3,417	3,515	3,615	3,715	3,815	3,917	4,019	4,121	4,224	4,328	4,328	4,432
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	30,602	30,599	30,847	31,097	31,734	32,377	33,028	33,686	34,352	35,025	35,704	36,393	37,089	37,791	38,501	39,218	39,942	40,673	41,410	42,155	42,802	43,566
Kennewick																						
Total Therms Pct. Growth		7.65%	3.97%	2.49%	3.32%	3.56%	3.68%	3.41%	3.14%	3.18%	3.23%	2.99%	2.74%	2.80%	3.23%	2.89%	2.55%	2.62%	2.52%	2.35%	1.38%	3.66%
Residential Therms	11,151,277	11,439,814	12,066,276	12,305,182	12,747,446	13,220,273	13,738,737	14,283,187	14,801,648	15,319,909	15,874,655	16,450,029	16,998,937	17,541,128	18,129,647	18,816,408	19,404,022	20,001,865	20,640,495	21,261,593	21,876,581	22,504,999
Commercial Therms	12,529,798	13,795,646	14,259,155	14,732,153	15,227,399	15,759,708	16,306,083	16,809,438	17,295,461	17,806,117	18,321,971	18,794,206	19,244,823	19,726,883	20,295,917	20,741,386	21,178,698	21,639,746	22,063,973	22,464,932	22,464,932	22,851,974
Industrial Therms	237,748	528,210	470,034	429,870	411,969	423,360	447,372	445,636	438,167	450,180	469,358	464,063	450,033	460,636	529,722	528,813	529,539	551,945	557,573	555,294	555,294	551,363
Ind., Inst., & Cmcl. Interrup. Therms	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385
Total Core Therms	24,120,208	25,965,055	26,996,850	27,668,590	28,588,199	29,604,726	30,693,577	31,739,646	32,736,661	33,777,591	34,867,368	35,909,684	36,895,178	37,930,031	39,156,671	40,287,992	41,313,644	42,394,941	43,463,425	44,483,203	45,098,192	46,109,721
Daily Baseload Therms	19,422	20,907	21,738	22,279	23,019	23,838	24,715	25,557	26,360	27,198	28,075	28,915	29,708	30,542	31,529	32,440	33,266	34,137	34,997	35,818	36,313	37,128
Peak Day Therms	370,867	381,648	392,722	403,847	420,559	437,668	455,175	473,096	491,393	510,106	529,250	548,861	568,905	589,359	610,244	631,555	653,259	675,408	697,982	721,000	741,312	765,406
Therms Per Residential Customer	550	550	565	561	558	556	556	556	555	553	553	552	550	548	547	549	547	545	544	543	541	539
Therms Per Commercial Customer	4,091	4,286	4,243	4,202	4,167	4,142	4,118	4,083	4,044	4,011	3,978	3,935	3,889	3,849	3,827	3,781	3,735	3,694	3,648	3,599	3,599	3,550
Therms Per Industrial Customer	14,859	32,275	28,712	26,231	25,097	25,730	27,105	26,900	26,337	26,929	27,928	27,455	26,460	26,905	30,723	30,441	30,244	31,262	31,310	30,904	30,904	30,402
Residential Customers	20,290	20,815	21,371	21,927	22,832	23,759	24,708	25,680	26,673	27,689	28,729	29,795	30,885	31,998	33,135	34,296	35,479	36,687	37,919	39,176	40,456	41,778
Commercial Customers	3,063	3,219	3,361	3,506	3,654	3,805	3,959	4,117	4,277	4,440	4,606	4,776	4,949	5,125	5,304	5,485	5,670	5,858	6,048	6,241	6,241	6,438
Industrial Customers	16	16	16	16	16	16	17	17	17	17	17	17	17	17	17	17	18	18	18	18	18	18
Interruptible Customers	2																					
Total Core Customers	23,371	24,050	24,748	25,449	26,502	27,581	28,684	29,813	30,966	32,145	33,352	34,588	35,851	37,140	38,456	39,799	41,167	42,562	43,985	45,435	46,715	48,234
Longview																						
Total Therms Pct. Growth		8.98%	2.55%	-0.54%	0.32%	0.82%	1.01%	0.66%	0.56%	0.84%	0.93%	0.62%	0.54%	0.79%	1.46%	0.70%	0.67%	0.88%	0.73%	0.65%	0.15%	0.76%
Residential Therms	1,361,463	1,340,811	1,560,962	1,531,351	1,537,797	1,546,264	1,555,996	1,567,352	1,577,198	1,587,760	1,599,061	1,611,115	1,622,994	1,633,622	1,645,847	1,661,156	1,673,583	1,685,850	1,699,438	1,712,670	1,724,766	1,737,196
Commercial Therms	4,560,755	4,931,111	4,989,926	5,047,585	5,099,319	5,143,676	5,184,838	5,236,088	5,289,383	5,337,806	5,384,917	5,439,904	5,499,979	5,550,953	5,584,879	5,641,725	5,697,830	5,747,827	5,803,662	5,862,269	5,862,269	5,920,680
Industrial Therms	532,335	773,077	677,064	609,226	574,628	581,752	605,380	592,112	570,739	575,097	587,768	568,231	538,102	538,178	606,479	590,139	575,568	584,534	574,432	555,873	555,873	535,901
Ind., Inst., & Cmcl. Interrup. Therms	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545
Total Core Therms	6,572,098	7,162,544	7,345,497	7,305,707	7,329,289	7,389,237	7,463,760	7,513,097	7,554,865	7,618,209	7,689,291	7,736,794	7,778,619	7,840,298	7,954,749	8,010,565	8,064,525	8,135,756	8,195,076	8,248,357	8,260,453	8,311,321
Daily Baseload Therms	7,571	8,251	8,461	8,416	8,443	8,512	8,598	8,655	8,703	8,776	8,857	8,912	8,960	9,031	9,163	9,228	9,290	9,372	9,440	9,501	9,515	9,574
Peak Day Therms	81,619	80,949	80,239	79,624	80,251	80,931	81,612	82,343	83,073	83,851	84,631	85,431	86,284	87,107	87,953	88,827	89,718	90,608	91,522	92,458	93,156	94,087
Therms Per Residential Customer	530	530	627	624	622	619	618	617	615	613	611	609	607	605	603	602	599	597	595	593	591	588
Therms Per Commercial Customer	3,990	4,285	4,305	4,322	4,334	4,338	4,340	4,348	4,359	4,364	4,368	4,379	4,392	4,399	4,392	4,403	4,413	4,419	4,429	4,440	4,440	4,453
Therms Per Industrial Customer	18,356	26,216	22,909	20,557	19,331	19,502	20,217	19,692	18,898	18,953	19,275	18,540	17,463	17,370	19,465	18,830	18,256	18,428	17,997	17,305	17,305	16,578
Residential Customers	2,571	2,532	2,491	2,454	2,474	2,496	2,518	2,542	2,566	2,592	2,618	2,645	2,674	2,702	2,731	2,761	2,792	2,823	2,855	2,888	2,920	2,953
Commercial Customers	1,143	1,151	1,159	1,168	1,177	1,186	1,195	1,204	1,213	1,223	1,233	1,242	1,252	1,262	1,271	1,281	1,291	1,301	1,310	1,320	1,320	1,330
Industrial Customers	29	29	30	30	30	30	30	30	30	30	30	31	31	31	31	31	32	32	32	32	32	32
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	3,745	3,714	3,682	3,653	3,682	3,713	3,745	3,778	3,812	3,847	3,883	3,920	3,959	3,997	4,036	4,076	4,117	4,157	4,199	4,242	4,274	4,317

Cascade Natural Gas
2011 IRP Demand Forecast
Medium Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Moses Lake																						
Total Therms Pct. Growth		1.08%	2.63%	0.68%	0.89%	1.26%	1.48%	1.30%	1.09%	1.21%	1.35%	1.16%	0.96%	1.12%	1.63%	1.31%	1.02%	1.18%	1.11%	1.00%	-0.11%	0.82%
Residential Therms	986,252	989,458	1,061,174	1,051,646	1,043,649	1,040,051	1,041,706	1,046,030	1,044,182	1,040,800	1,041,041	1,042,288	1,038,553	1,032,858	1,031,133	1,039,983	1,035,502	1,031,566	1,030,408	1,026,807	1,021,257	1,015,293
Commercial Therms	2,392,003	2,409,645	2,417,129	2,428,264	2,446,238	2,474,776	2,507,477	2,530,361	2,550,647	2,577,826	2,607,233	2,627,496	2,644,101	2,669,510	2,714,821	2,735,391	2,756,007	2,783,436	2,804,969	2,823,597	2,823,597	2,841,304
Industrial Therms	574,965	596,949	622,913	649,323	676,287	703,862	731,896	760,290	789,122	818,554	848,596	879,074	909,900	941,462	973,574	1,006,141	1,038,859	1,072,402	1,106,472	1,140,983	1,140,983	1,175,903
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	3,953,221	3,996,053	4,101,217	4,129,234	4,166,174	4,218,691	4,281,080	4,336,681	4,383,952	4,437,180	4,496,871	4,548,859	4,592,555	4,643,831	4,719,529	4,781,516	4,830,369	4,887,405	4,941,850	4,991,389	4,985,838	5,032,501
Daily Baseload Therms	3,462	3,500	3,592	3,616	3,649	3,695	3,749	3,798	3,839	3,886	3,938	3,984	4,022	4,067	4,133	4,188	4,230	4,280	4,328	4,371	4,367	4,407
Peak Day Therms	79,367	79,830	80,267	80,735	81,170	81,635	82,067	82,529	82,957	83,384	83,811	84,236	84,661	85,084	85,473	85,894	86,280	86,697	87,080	87,495	87,653	88,035
Therms Per Residential Customer	534	534	571	564	558	554	553	553	550	547	545	544	541	536	534	537	533	529	527	524	520	515
Therms Per Commercial Customer	3,732	3,717	3,689	3,667	3,657	3,662	3,674	3,672	3,667	3,672	3,680	3,676	3,667	3,671	3,702	3,699	3,697	3,705	3,705	3,701	3,701	3,697
Therms Per Industrial Customer	33,821	32,537	32,456	32,368	32,276	32,183	32,086	31,976	31,858	31,739	31,615	31,482	31,343	31,203	31,069	30,918	30,762	30,606	30,444	30,277	30,277	30,108
Residential Customers	1,846	1,852	1,858	1,865	1,871	1,878	1,884	1,891	1,897	1,903	1,909	1,915	1,921	1,927	1,932	1,938	1,943	1,949	1,954	1,960	1,965	1,970
Commercial Customers	641	648	655	662	669	676	682	689	696	702	708	715	721	727	733	739	745	751	757	763	763	769
Industrial Customers	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33	34	35	36	38	38	39
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	2,505	2,520	2,533	2,548	2,562	2,577	2,590	2,605	2,618	2,632	2,645	2,659	2,672	2,685	2,698	2,711	2,723	2,736	2,748	2,762	2,767	2,779
Mount Vernon																						
Total Therms Pct. Growth		4.67%	8.80%	0.82%	1.77%	1.93%	2.03%	1.91%	1.82%	1.88%	1.92%	1.81%	1.71%	1.78%	2.02%	1.83%	1.68%	1.74%	1.69%	1.60%	0.98%	2.55%
Residential Therms	22,864,684	23,066,867	26,441,936	26,617,541	27,162,083	27,724,195	28,313,886	28,913,072	29,491,048	30,063,317	30,653,628	31,252,114	31,828,441	32,396,922	32,987,244	33,633,686	34,211,027	34,788,685	35,386,141	35,964,702	36,537,595	37,114,972
Commercial Therms	13,992,239	15,308,828	15,569,059	15,850,328	16,169,092	16,545,572	16,948,668	17,303,446	17,648,581	18,034,383	18,435,959	18,791,698	19,129,991	19,521,591	20,030,742	20,403,314	20,778,210	21,196,723	21,584,454	21,956,666	21,956,666	22,327,391
Industrial Therms	1,267,068	1,536,180	1,423,459	1,323,335	1,236,023	1,161,683	1,095,592	1,030,670	970,136	917,102	868,882	821,160	775,964	736,876	706,126	671,051	638,603	610,072	582,225	555,700	555,700	530,774
Ind., Inst., & Cmcl. Interrup. Therms	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981
Total Core Therms	38,248,972	40,036,856	43,559,435	43,916,185	44,692,180	45,556,432	46,483,127	47,372,169	48,234,746	49,139,783	50,083,450	50,989,953	51,859,378	52,780,370	53,849,093	54,833,032	55,752,821	56,720,461	57,677,800	58,602,050	59,174,942	60,098,117
Daily Baseload Therms	37,470	39,222	42,672	43,022	43,782	44,629	45,537	46,408	47,253	48,139	49,064	49,952	50,803	51,706	52,753	53,716	54,618	55,565	56,503	57,409	57,970	58,874
Peak Day Therms	490,697	494,900	500,555	506,272	518,139	530,147	542,312	554,580	567,027	579,616	592,344	605,241	618,290	631,506	644,835	658,342	671,934	685,665	699,561	713,542	726,096	740,512
Therms Per Residential Customer	642	642	728	726	724	722	721	720	718	716	714	712	710	708	706	705	702	700	697	695	692	689
Therms Per Commercial Customer	3,054	3,316	3,294	3,276	3,266	3,266	3,271	3,265	3,258	3,257	3,258	3,251	3,240	3,237	3,253	3,246	3,239	3,239	3,233	3,225	3,225	3,216
Therms Per Industrial Customer	13,924	17,950	17,801	17,684	17,623	17,644	17,697	17,678	17,641	17,657	17,688	17,655	17,598	17,604	17,750	17,724	17,701	17,726	17,712	17,680	17,680	17,644
Residential Customers	35,623	35,938	36,298	36,661	37,527	38,403	39,290	40,184	41,091	42,008	42,935	43,874	44,824	45,786	46,756	47,739	48,728	49,727	50,738	51,755	52,786	53,837
Commercial Customers	4,581	4,617	4,727	4,838	4,951	5,066	5,182	5,299	5,417	5,537	5,658	5,781	5,905	6,031	6,157	6,286	6,414	6,545	6,676	6,809	6,809	6,943
Industrial Customers	91	86	80	75	70	66	62	58	55	52	49	47	44	42	40	38	36	34	33	31	31	30
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	40,297	40,642	41,107	41,576	42,551	43,537	44,536	45,543	46,565	47,599	48,644	49,704	50,775	51,861	52,955	54,064	55,181	56,308	57,449	58,597	59,628	60,812
Sunnyside																						
Total Therms Pct. Growth		0.07%	3.53%	-0.49%	-0.32%	-0.04%	0.21%	0.19%	-0.03%	-0.01%	0.16%	0.12%	-0.10%	-0.08%	0.26%	0.43%	-0.04%	0.01%	0.10%	-0.03%	0.06%	-0.04%
Residential Therms	2,840,914	2,844,688	3,182,298	3,161,549	3,147,998	3,148,428	3,167,750	3,195,145	3,205,026	3,210,264	3,228,388	3,250,802	3,256,608	3,256,420	3,271,748	3,322,520	3,330,128	3,337,970	3,358,058	3,368,404	3,373,583	3,377,712
Commercial Therms	4,464,731	4,574,176	4,591,817	4,608,701	4,624,851	4,640,031	4,654,324	4,667,774	4,680,366	4,692,191	4,703,361	4,714,014	4,724,131	4,733,344	4,741,839	4,749,574	4,756,568	4,762,802	4,768,423	4,773,447	4,773,447	4,777,953
Industrial Therms	1,357,639	1,250,962	1,204,161	1,163,711	1,132,192	1,112,577	1,097,736	1,074,255	1,049,467	1,031,714	1,016,438	993,990	969,445	952,850	952,136	932,736	914,200	901,220	884,597	866,621	866,621	848,734
Ind., Inst., & Cmcl. Interrup. Therms	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360
Total Core Therms	8,740,644	8,747,187	9,055,635	9,011,321	8,982,400	8,978,395	8,997,170	9,014,535	9,012,220	9,011,529	9,025,547	9,036,166	9,027,545	9,019,974	9,043,083	9,082,190	9,078,256	9,079,351	9,088,438	9,085,833	9,091,012	9,081,758
Daily Baseload Therms	6,124	6,129	6,345	6,314	6,293	6,291	6,304	6,316	6,314	6,314	6,324	6,331	6,325	6,320	6,336	6,363	6,361	6,361	6,368	6,366	6,369	6,363
Peak Day Therms	98,552	98,638	99,015	99,375	99,719	100,074	100,398	100,718	101,036	101,337	101,636	101,933	102,213	102,491	102,752	103,010	103,266	103,504	103,740	103,974	104,152	104,369
Therms Per Residential Customer	539	539	601	595	590	588	590	593	593	592	594	596	596	594	595	603	603	603	605	606	605	605
Therms Per Commercial Customer	3,310	3,393	3,390	3,388	3,385	3,382	3,379	3,376	3,373	3,370	3,367	3,363	3,360	3,357	3,353	3,350	3,346	3,342	3,339	3,335	3,335	3,331
Therms Per Industrial Customer	28,284	26,299	25,681	25,164	24,811	24,694	24,665	24,422	24,127	23,977	23,869	23,578	23,220	23,036	23,225	22,946	22,674	22,526	22,276	21,979	21,979	21,673
Residential Customers	5,269	5,276	5,296	5,315	5,333	5,352	5,369	5,386	5,403	5,419	5,435	5,451	5,466	5,481	5,495	5,509	5,523	5,536	5,549	5,562	5,574	5,586
Commercial Customers	1,349	1,348	1,354	1,360	1,366	1,372	1,377	1,383	1,388	1,392	1,397	1,402	1,406	1,410	1,414	1,418	1,422	1,425	1,428	1,431	1,431	1,434
Industrial Customers	48	48	47	46	46	45	45	44	43	43	43	42	42	41	41	41	40	40	40	39	39	39
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	6,668	6,674	6,699	6,724	6,747	6,771	6,793	6,815	6,836	6,856	6,877	6,897	6,916	6,935	6,952	6,970	6,987	7,003	7,019	7,035	7,047	7,062
Walla Walla																						
Total Therms Pct. Growth		5.88%	0.69%	0.70%	0.62%	0.97%	0.79%	0.77%	0.76%	0.75%	0.71%	0.58%	0.69%	0.86%	0.63%	0.54%	0.61%	0.52%	0.44%	0.43%	0.31%	0.62%
Residential Therms	6,012,829	6,338,901	6,369,762	6,408,766	6,449,652	6,543,215	6,624,730	6,692,598	6,758,421	6,833,139	6,906,671	6,955,479	7,013,330	7,103,408	7,192,152	7,241,716	7,300,423	7,357,351	7,399,408	7,438,326	7,475,300	7,499,940
Commercial Therms	3,915,927	4,132,770	4,171,914	4,206,346	4,232,788	4,247,734	4,257,153	4,276,131	4,296,571	4,309,381	4,319,255	4,337,862	4,359,233	4,370,809	4,362,213	4,377,145	4,390,902	4,397,649	4,409,310	4,422,770	4,422,770	4,436,575
Industrial Therms	69,756	114,825	117,371	118,700	117,840	113,603	108,430	106,102	104,490	101,037	97,190	95,606	94,866	92,062	85,071	83,461	81,809	78,857	77,026	75,750	75,750	74,577
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	9,998,513	10,586,497	10,659,048	10,733,813	10,800,281	10,904,554	10,990,314	11,074,831	11,159,483	11,243,558	11,323,118	11,388,948	11,467,431	11,566,280	11,639,436	11,702,323	11,773,135	11,833,858	11,885,745	11,936,847	11,973,821	12,011,094
Daily Baseload Therms	6,881	7,285	7,335	7,387	7,432	7,504	7,563	7,621	7,679	7,737	7,792	7,837	7,891	7,959	8,010	8,053	8,102	8,144	8,179	8,214	8,240	8,266
Peak Day Therms	162,143	162,674	164,690	166,677	168,732	170,760	172,757	174,697	176,593	178,432	180,242	182,024	183,747	185,386	186,981	188,505	189,957	191,367	192,720	194,000	195,168	196,420
Therms Per Residential Customer	578	607	602	598	594	595	595	594	593	593	593	591	590	592	594	593	593	593	592	591	590	588
Therms Per Commercial Customer	3,125	3,295	3,307	3,316	3,319	3,313	3,303	3,300	3,300	3,294	3,285	3,284	3,285	3,279	3,259	3,256	3,253	3,245	3,241	3,238	3,238	3,236
Therms Per Industrial Customer	23,252	40,883	42,945	44,616	45,470	45,026	44,087	44,264	44,701	44,334	43,715	44,084	44,830	44,583	42,237	42,468	42,654	42,141	42,190	42,501	42,501	42,877
Residential Customers	10,406	10,443	10,581	10,717	10,858	10,997	11,134	11,267	11,397	11,523	11,647	11,769	11,887	11,999	12,108	12,212	12,311	12,407	12,499	12,586	12,670	12,755
Commercial Customers	1,253	1,254	1,261	1,269	1,275	1,282	1,289	1,296	1,302	1,308	1,315	1,321	1,327	1,333	1,339	1,344	1,350	1,355	1,361	1,366	1,366	1,371
Industrial Customers	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	11,663	11,701	11,846	11,989	12,137	12,283	12,426	12,566	12,702	12,835	12,965	13,093	13,217	13,335	13,450	13,559	13,664	13,765	13,862	13,955	14,039	14,129
Wenatchee																						
Total Therms Pct. Growth		-1.75%	2.33%	-0.71%	-0.88%	-1.12%	-1.13%	-0.84%	-0.92%	-1.15%	-1.14%	-0.90%	-0.92%	-1.20%	-1.62%	-0.78%	-1.09%	-1.27%	-1.06%	-1.06%	-0.07%	-1.16%
Residential Therms	664,824	667,884	819,450	809,251	801,229	797,356	800,450	806,236	805,690	803,589	805,878	809,025	806,495	802,324	803,095	815,416	813,277	811,322	812,936	811,151	807,767	803,986
Commercial Therms	3,580,768	3,850,150	3,806,459	3,758,783	3,705,475	3,644,852	3,581,194	3,522,483	3,464,212	3,401,900	3,338,368	3,279,453	3,222,259	3,160,451	3,090,155	3,030,788	2,971,091	2,908,867	2,849,250	2,791,084	2,791,084	2,733,672
Industrial Therms	1,279,349	908,697	929,696	947,611	959,547	961,847	960,528	967,530	976,710	979,874	981,043	990,024	1,002,024	1,006,373	993,733	1,001,949	1,010,035	1,012,221	1,019,165	1,028,622	1,028,622	1,038,545
Ind., Inst., & Cmcl. Interrup. Therms	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716
Total Core Therms	5,620,657	5,522,446	5,651,321	5,611,360	5,561,967	5,499,771	5,437,888	5,391,964	5,342,328	5,281,079	5,221,005	5,174,218	5,126,494	5,064,864	4,982,699	4,943,869	4,890,119	4,828,126	4,777,068	4,726,573	4,723,189	4,671,919
Daily Baseload Therms	5,026	4,938	5,053	5,017	4,973	4,917	4,862	4,821	4,777	4,722	4,668	4,626	4,584	4,529	4,455	4,420	4,372	4,317	4,271	4,226	4,223	4,177
Peak Day Therms	60,118	60,289	60,485	60,661	60,816	60,948	61,084	61,224	61,366	61,511	61,658	61,782	61,908	62,061	62,191	62,295	62,427	62,560	62,668	62,776	62,881	62,991
Therms Per Residential Customer	437	437	533	524	516	512	512	514	511	508	507	508	505	500	499	506	503	500	500	497	494	491
Therms Per Commercial Customer	4,712	5,066	5,018	4,963	4,899	4,824	4,744	4,670	4,596	4,515	4,432	4,355	4,279	4,197	4,104	4,024	3,944	3,860	3,780	3,701	3,701	3,623
Therms Per Industrial Customer	63,967	46,564	47,758	48,820	49,595	49,900	50,031	50,624	51,350	51,775	52,114	52,884	53,838	54,400	54,054	54,860	55,675	56,190	56,988	57,935	57,935	58,940
Residential Customers	1,521	1,528	1,537	1,545	1,552	1,558	1,564	1,570	1,576	1,582	1,588	1,593	1,598	1,604	1,609	1,613	1,618	1,623	1,627	1,631	1,635	1,639
Commercial Customers	760	760	759	757	756	756	755	754	754	753	753	753	753	753	753	753	753	754	754	754	754	754
Industrial Customers	20	20	19	19	19	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	2,303	2,310	2,317	2,324	2,330	2,335	2,340	2,345	2,351	2,356	2,362	2,367	2,372	2,377	2,382	2,386	2,391	2,397	2,401	2,405	2,409	2,413

Cascade Natural Gas
2011 IRP Demand Forecast
Medium Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Yakima										
Total Therms Pct. Growth		2.81%	-0.82%	-0.56%	-0.02%	0.63%	0.81%	0.21%	0.09%	0.55%
Residential Therms	11,854,531	11,745,783	11,745,837	11,762,062	11,832,984	11,940,860	12,046,352	12,108,096	12,166,784	12,263,872
Commercial Therms	11,913,848	13,085,021	12,955,103	12,869,077	12,859,078	12,963,413	13,112,643	13,157,836	13,176,993	13,269,255
Industrial Therms	2,915,647	2,606,117	2,509,530	2,425,571	2,359,495	2,317,299	2,284,689	2,234,724	2,182,210	2,143,854
Ind., Inst., & Cmcl. Interrup. Therms	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485
Total Core Therms	26,834,511	27,587,406	27,360,955	27,207,195	27,202,042	27,372,058	27,594,169	27,651,141	27,676,472	27,827,467
Daily Baseload Therms	19,376	19,919	19,756	19,645	19,641	19,764	19,924	19,965	19,984	20,093
Peak Day Therms	307,479	309,523	312,394	315,234	318,005	320,717	323,370	325,952	328,475	330,940
Therms Per Residential Customer	619	609	603	598	596	596	596	594	592	592
Therms Per Commercial Customer	3,518	3,833	3,772	3,725	3,701	3,710	3,732	3,725	3,711	3,718
Therms Per Industrial Customer	37,866	34,116	33,356	32,720	32,290	32,157	32,134	31,842	31,486	31,310
Residential Customers	19,163	19,287	19,479	19,669	19,854	20,035	20,212	20,384	20,552	20,716
Commercial Customers	3,387	3,414	3,434	3,455	3,475	3,494	3,514	3,532	3,551	3,569
Industrial Customers	77	76	75	74	73	72	71	70	69	68
Interruptible Customers	4	4	4	4	4	4	4	4	4	4
Total Core Customers	22,631	22,781	22,993	23,202	23,406	23,605	23,801	23,991	24,176	24,358
Baker										
Total Therms Pct. Growth		3.29%	-1.35%	-1.31%	-0.60%	-0.08%	0.11%	-0.15%	-0.15%	0.22%
Residential Therms	2,086,237	1,948,220	1,933,860	1,909,575	1,901,328	1,900,859	1,903,143	1,900,460	1,898,883	1,905,120
Commercial Therms	1,549,125	1,734,448	1,730,894	1,729,742	1,731,818	1,739,851	1,749,452	1,753,817	1,755,573	1,761,391
Industrial Therms	75,629	150,587	116,671	92,579	76,524	66,044	58,248	50,968	45,080	41,137
Ind., Inst., & Cmcl. Interrup. Therms	1									
Total Core Therms	3,710,992	3,833,254	3,781,426	3,731,896	3,709,670	3,706,754	3,710,843	3,705,246	3,699,535	3,707,648
Daily Baseload Therms	3,032	3,132	3,090	3,050	3,031	3,029	3,032	3,028	3,023	3,030
Peak Day Therms	26,215	26,306	26,195	26,086	26,125	26,179	26,225	26,292	26,371	26,464
Therms Per Residential Customer	622	580	579	575	572	571	571	569	567	567
Therms Per Commercial Customer	3,130	3,438	3,409	3,384	3,366	3,361	3,360	3,349	3,334	3,328
Therms Per Industrial Customer	18,907	37,735	35,183	33,208	32,017	31,888	32,158	31,502	30,642	30,417
Residential Customers	3,354	3,359	3,340	3,321	3,324	3,329	3,333	3,340	3,349	3,360
Commercial Customers	495	504	508	511	514	518	521	524	527	529
Industrial Customers	4	4	3	3	2	2	2	2	1	1
Interruptible Customers	1									
Total Core Customers	3,854	3,867	3,851	3,835	3,841	3,849	3,855	3,865	3,877	3,891
Bend										
Total Therms Pct. Growth		8.12%	0.36%	0.14%	1.14%	2.37%	2.51%	2.02%	1.94%	2.36%
Residential Therms	27,584,941	29,425,932	29,564,048	29,474,960	29,701,264	30,281,760	30,831,795	31,350,740	31,876,614	32,453,442
Commercial Therms	17,303,858	18,816,696	19,034,960	19,339,623	19,796,333	20,490,787	21,302,587	21,936,497	22,540,051	23,323,180
Industrial Therms	1,764,667	2,201,244	2,025,553	1,883,232	1,778,376	1,716,585	1,673,769	1,609,277	1,545,070	1,504,832
Ind., Inst., & Cmcl. Interrup. Therms	1									
Total Core Therms	46,653,467	50,443,873	50,624,561	50,697,815	51,275,974	52,489,132	53,808,151	54,896,514	55,961,735	57,281,454
Daily Baseload Therms	39,309	42,503	42,655	42,717	43,204	44,226	45,337	46,254	47,152	48,264
Peak Day Therms	571,037	581,170	584,337	587,562	598,848	610,321	621,962	633,801	645,810	658,018
Therms Per Residential Customer	738	774	776	772	764	765	765	764	763	763
Therms Per Commercial Customer	2,779	2,963	2,921	2,894	2,889	2,918	2,961	2,977	2,987	3,020
Therms Per Industrial Customer	32,085	41,395	39,984	38,898	38,321	38,474	38,912	38,701	38,338	38,433
Residential Customers	37,366	38,018	38,098	38,180	38,876	39,584	40,303	41,035	41,778	42,534
Commercial Customers	6,226	6,351	6,516	6,683	6,851	7,022	7,194	7,369	7,545	7,723
Industrial Customers	55	53	51	48	46	45	43	42	40	39
Interruptible Customers	1									
Total Core Customers	43,648	44,422	44,665	44,911	45,774	46,651	47,541	48,445	49,363	50,297
Ontario										
Total Therms Pct. Growth		15.28%	2.10%	-1.95%	-1.25%	-0.03%	0.45%	-0.39%	-0.50%	0.04%
Residential Therms	1,887,207	1,897,184	2,111,467	2,090,114	2,073,409	2,065,198	2,063,686	2,063,926	2,062,198	2,058,193
Commercial Therms	2,361,432	2,798,301	2,713,364	2,649,463	2,617,613	2,639,137	2,677,410	2,672,627	2,665,138	2,686,176
Industrial Therms	288,166	534,568	515,190	496,539	479,811	465,108	451,689	435,958	419,110	404,243
Ind., Inst., & Cmcl. Interrup. Therms										
Total Core Therms	4,536,805	5,230,053	5,340,020	5,236,116	5,170,832	5,169,443	5,192,785	5,172,511	5,146,446	5,148,612
Daily Baseload Therms	3,370	3,885	3,967	3,890	3,841	3,840	3,858	3,842	3,823	3,825
Peak Day Therms	30,432	30,665	30,590	30,521	30,471	30,476	30,470	30,447	30,493	30,529
Therms Per Residential Customer	525	525	586	582	578	576	575	576	575	573
Therms Per Commercial Customer	2,714	3,161	3,069	3,001	2,970	2,992	3,035	3,032	3,017	3,037
Therms Per Industrial Customer	28,817	53,357	50,876	48,533	46,459	44,618	42,956	41,117	39,208	37,523
Residential Customers	3,594	3,613	3,603	3,594	3,588	3,588	3,587	3,584	3,589	3,593
Commercial Customers	870	885	884	883	881	882	882	882	883	884
Industrial Customers	10	10	10	10	10	10	11	11	11	11
Interruptible Customers										
Total Core Customers	4,474	4,508	4,497	4,487	4,480	4,480	4,480	4,476	4,483	4,488
Pendleton										
Total Therms Pct. Growth		11.01%	0.69%	0.82%	1.09%	1.17%	1.16%	0.99%	0.94%	1.02%
Residential Therms	5,560,032	6,072,614	6,158,097	6,262,434	6,402,715	6,551,434	6,698,482	6,831,016	6,960,255	7,099,005
Commercial Therms	5,980,426	6,219,332	6,249,181	6,282,728	6,323,844	6,376,672	6,433,361	6,477,043	6,516,196	6,562,750
Industrial Therms	684,950	1,278,935	1,256,733	1,230,852	1,199,911	1,161,355	1,120,383	1,085,536	1,052,172	1,014,954
Ind., Inst., & Cmcl. Interrup. Therms										
Total Core Therms	12,225,408	13,570,881	13,664,011	13,776,014	13,926,470	14,089,461	14,252,226	14,393,596	14,528,624	14,676,709
Daily Baseload Therms	12,569	13,952	14,048	14,163	14,318	14,485	14,653	14,798	14,937	15,089
Peak Day Therms	196,962	199,999	204,246	208,460	213,083	217,624	222,112	226,535	230,873	235,129
Therms Per Residential Customer	526	566	561	558	557	557	557	556	555	555
Therms Per Commercial Customer	3,286	3,359	3,340	3,323	3,311	3,306	3,303	3,294	3,283	3,277
Therms Per Industrial Customer	29,780	55,489	54,448	53,249	51,832	50,091	48,252	46,682	45,182	43,523
Residential Customers	10,569	10,729	10,977	11,223	11,495	11,762	12,026	12,286	12,541	12,791
Commercial Customers	1,820	1,851	1,871	1,890	1,910	1,929	1,948	1,966	1,985	2,003
Industrial Customers	23	23	23	23	23	23	23	23	23	23
Interruptible Customers										
Total Core Customers	12,412	12,603	12,871	13,137	13,428	13,714	13,997	14,276	14,549	14,817

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Yakima												
Total Therms Pct. Growth	0.64%	0.01%	-0.07%	0.61%	1.44%	0.09%	0.17%	0.52%	0.20%	0.01%	0.09%	0.14%
Residential Therms	12,358,592	12,389,026	12,437,943	12,568,671	12,697,635	12,738,303	12,796,644	12,874,848	12,928,088	12,956,580	12,982,827	13,030,980
Commercial Therms	13,384,971	13,405,705	13,389,786	13,465,742	13,747,711	13,774,563	13,803,806	13,903,362	13,943,539	13,955,258	13,955,258	13,959,250
Industrial Therms	2,110,485	2,062,767	2,010,926	1,975,078	1,971,030	1,929,711	1,890,280	1,861,963	1,826,514	1,788,446	1,788,446	1,750,644
Ind., Inst., & Cmcl. Interrup. Therms	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485
Total Core Therms	28,004,534	28,007,983	27,989,140	28,159,976	28,566,861	28,593,062	28,641,215	28,790,659	28,848,627	28,850,769	28,877,016	28,891,359
Daily Baseload Therms	20,220	20,223	20,209	20,333	20,627	20,645	20,680	20,788	20,830	20,832	20,850	20,861
Peak Day Therms	333,347	335,725	338,060	340,322	342,525	344,670	346,728	348,743	350,684	352,568	354,212	356,051
Therms Per Residential Customer	592	589	587	589	591	589	588	588	587	585	583	582
Therms Per Commercial Customer	3,731	3,719	3,696	3,700	3,760	3,750	3,742	3,752	3,748	3,736	3,736	3,722
Therms Per Industrial Customer	31,189	30,837	30,401	30,183	30,438	30,101	29,772	29,601	29,299	28,939	28,939	28,566
Residential Customers	20,876	21,034	21,189	21,339	21,485	21,627	21,763	21,896	22,024	22,148	22,269	22,390
Commercial Customers	3,587	3,605	3,623	3,640	3,657	3,673	3,689	3,705	3,721	3,736	3,736	3,751
Industrial Customers	68	67	66	65	65	64	63	63	62	62	62	61
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	24,535	24,710	24,882	25,048	25,210	25,368	25,520	25,668	25,811	25,950	26,071	26,206
Baker												
Total Therms Pct. Growth	0.24%	-0.14%	0.00%	0.27%	0.82%	0.06%	0.12%	0.44%	0.16%	0.13%	0.26%	0.40%
Residential Therms	1,910,790	1,907,448	1,911,385	1,919,830	1,936,255	1,940,098	1,946,768	1,959,694	1,967,988	1,974,947	1,984,806	1,994,617
Commercial Therms	1,767,542	1,769,112	1,768,127	1,771,059	1,784,282	1,783,896	1,782,578	1,785,718	1,782,948	1,780,479	1,780,479	1,775,343
Industrial Therms	38,103	34,779	31,717	30,202	30,972	29,948	29,213	29,663	30,070	30,383	30,383	31,105
Ind., Inst., & Cmcl. Interrup. Therms												
Total Core Therms	3,716,435	3,711,339	3,711,229	3,721,091	3,751,509	3,753,942	3,758,559	3,775,075	3,781,006	3,785,809	3,795,668	3,801,065
Daily Baseload Therms	3,037	3,033	3,033	3,041	3,066	3,068	3,071	3,085	3,090	3,094	3,102	3,106
Peak Day Therms	26,549	26,649	26,754	26,872	27,002	27,146	27,280	27,450	27,601	27,783	27,947	28,117
Therms Per Residential Customer	567	564	563	563	565	563	562	562	561	559	558	557
Therms Per Commercial Customer	3,323	3,309	3,292	3,283	3,294	3,281	3,268	3,261	3,249	3,235	3,235	3,220
Therms Per Industrial Customer	30,384	29,578	28,514	28,185	29,429	28,709	28,035	27,886	27,313	26,563	26,563	25,785
Residential Customers	3,370	3,382	3,395	3,410	3,427	3,446	3,464	3,487	3,508	3,533	3,557	3,581
Commercial Customers	532	535	537	539	542	544	546	548	549	550	550	551
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers												
Total Core Customers	3,903	3,918	3,933	3,951	3,970	3,991	4,011	4,036	4,058	4,085	4,109	4,134
Bend												
Total Therms Pct. Growth	2.48%	1.94%	1.89%	2.52%	3.43%	2.13%	2.17%	2.55%	2.32%	2.07%	0.88%	2.94%
Residential Therms	33,040,189	33,546,402	34,108,040	34,811,208	35,530,584	36,118,894	36,718,494	37,375,338	38,042,850	38,620,160	39,256,239	39,850,751
Commercial Therms	24,189,133	24,871,616	25,494,221	26,356,509	27,761,775	28,581,923	29,440,146	30,516,829	31,472,634	32,381,705	32,381,705	33,298,726
Industrial Therms	1,474,523	1,425,848	1,374,225	1,346,533	1,365,335	1,333,069	1,305,172	1,293,946	1,273,720	1,250,629	1,250,629	1,228,611
Ind., Inst., & Cmcl. Interrup. Therms												
Total Core Therms	58,703,844	59,843,866	60,976,486	62,514,249	64,657,694	66,033,886	67,463,812	69,186,113	70,789,204	72,252,494	72,888,573	74,378,088
Daily Baseload Therms	49,462	50,423	51,377	52,673	54,479	55,638	56,843	58,294	59,645	60,878	61,414	62,669
Peak Day Therms	670,426	682,991	695,828	708,790	722,009	735,378	749,003	762,824	776,856	791,114	802,954	817,647
Therms Per Residential Customer	763	761	760	762	764	763	762	762	762	760	759	757
Therms Per Commercial Customer	3,060	3,076	3,082	3,116	3,211	3,234	3,260	3,308	3,340	3,366	3,366	3,390
Therms Per Industrial Customer	38,673	38,335	37,787	37,798	39,041	38,762	38,508	38,673	38,496	38,160	38,160	37,789
Residential Customers	43,303	44,082	44,879	45,684	46,506	47,338	48,187	49,049	49,925	50,816	51,721	52,643
Commercial Customers	7,904	8,086	8,271	8,458	8,647	8,837	9,030	9,225	9,422	9,621	9,621	9,822
Industrial Customers	38	37	36	36	35	34	34	33	33	33	33	33
Interruptible Customers												
Total Core Customers	51,245	52,205	53,187	54,177	55,188	56,210	57,251	58,307	59,380	60,470	61,375	62,498
Ontario												
Total Therms Pct. Growth	0.33%	-0.35%	-0.74%	0.10%	1.89%	0.03%	-0.11%	0.61%	0.08%	-0.08%	0.10%	0.08%
Residential Therms	2,058,262	2,061,508	2,058,259	2,055,636	2,058,089	2,072,564	2,073,792	2,077,992	2,082,971	2,087,334	2,092,759	2,097,624
Commercial Therms	2,717,490	2,712,235	2,693,606	2,715,608	2,820,443	2,821,930	2,829,142	2,869,978	2,882,497	2,887,011	2,887,011	2,894,026
Industrial Therms	390,013	374,067	357,735	343,277	332,718	318,202	303,935	290,866	277,783	264,593	264,593	251,551
Ind., Inst., & Cmcl. Interrup. Therms												
Total Core Therms	5,165,765	5,147,810	5,109,600	5,114,522	5,211,250	5,212,696	5,206,868	5,238,836	5,243,251	5,238,938	5,244,363	5,243,202
Daily Baseload Therms	3,837	3,824	3,796	3,799	3,871	3,872	3,868	3,892	3,895	3,892	3,896	3,895
Peak Day Therms	30,559	30,612	30,660	30,748	30,828	30,898	31,004	31,153	31,252	31,390	31,533	31,717
Therms Per Residential Customer	572	572	571	568	568	570	569	567	567	566	564	562
Therms Per Commercial Customer	3,068	3,056	3,028	3,043	3,151	3,145	3,141	3,169	3,171	3,161	3,161	3,148
Therms Per Industrial Customer	35,940	34,222	32,512	30,988	29,842	28,368	26,933	25,624	24,333	23,049	23,049	21,789
Residential Customers	3,596	3,602	3,607	3,617	3,626	3,634	3,646	3,663	3,674	3,690	3,711	3,732
Commercial Customers	886	888	889	892	895	897	901	906	909	913	913	919
Industrial Customers	11	11	11	11	11	11	11	11	11	11	11	12
Interruptible Customers												
Total Core Customers	4,493	4,500	4,507	4,520	4,532	4,543	4,558	4,580	4,594	4,615	4,636	4,663
Pendleton												
Total Therms Pct. Growth	1.08%	0.74%	0.77%	0.94%	1.10%	0.64%	0.68%	0.68%	0.60%	0.36%	0.54%	0.94%
Residential Therms	7,248,016	7,355,458	7,471,030	7,608,636	7,756,756	7,856,580	7,964,250	8,066,925	8,164,050	8,225,875	8,311,037	8,382,120
Commercial Therms	6,610,421	6,646,021	6,675,702	6,714,765	6,776,393	6,806,244	6,834,751	6,870,441	6,897,120	6,919,547	6,919,547	6,939,163
Industrial Therms	977,183	944,528	913,879	879,369	837,019	805,783	774,959	742,184	712,246	684,021	684,021	656,654
Ind., Inst., & Cmcl. Interrup. Therms												
Total Core Therms	14,835,621	14,946,007	15,060,611	15,202,771	15,370,168	15,468,607	15,573,960	15,679,550	15,773,416	15,829,443	15,914,605	15,977,937
Daily Baseload Therms	15,252	15,366	15,484	15,630	15,802	15,903	16,011	16,120	16,216	16,274	16,362	16,427
Peak Day Therms	239,301	243,406	247,379	251,204	254,913	258,425	261,755	264,940	267,958	270,814	273,257	275,963
Therms Per Residential Customer	556	554	553	554	556	555	555	555	555	553	553	552
Therms Per Commercial Customer	3,271	3,260	3,247	3,240	3,243	3,232	3,222	3,215	3,204	3,193	3,193	3,180
Therms Per Industrial Customer	41,846	40,393	39,034	37,515	35,669	34,303	32,961	31,541	30,247	29,029	29,029	27,852
Residential Customers	13,036	13,277	13,510	13,734	13,951	14,156	14,350	14,535	14,710	14,875	15,029	15,185
Commercial Customers	2,021	2,038	2,056	2,073	2,089	2,106	2,122	2,137	2,152	2,167	2,167	2,182
Industrial Customers	23	23	23	23	23	23	24	24	24	24	24	24
Interruptible Customers												
Total Core Customers	15,080	15,339	15,589	15,830	16,064	16,285	16,495	16,696	16,886	17,066	17,220	17,390

Cascade Natural Gas
2011 IRP Demand Forecast
Medium Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Washington											
Total Therms Pct. Growth		7.21%	2.83%	0.74%	1.40%	1.83%	1.96%	1.64%	1.57%	1.77%	1.76%
Residential Therms	106,725,615	112,196,225	117,567,426	118,216,303	120,043,215	122,468,636	125,072,487	127,400,101	129,719,155	132,286,666	134,804,435
Commercial Therms	84,630,702	93,343,792	94,632,340	96,020,449	97,589,261	99,438,324	101,402,448	103,109,959	104,745,288	106,569,540	108,456,623
Industrial Therms	9,342,671	9,766,517	9,267,666	8,881,212	8,627,965	8,538,298	8,518,101	8,374,433	8,211,144	8,148,254	8,122,247
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	202,732,810	217,340,355	223,501,254	225,151,786	228,294,263	232,479,080	237,026,858	240,918,314	244,709,408	249,038,282	253,417,127
Daily Baseload Therms	185,494	199,648	205,465	207,047	210,048	214,021	218,329	222,029	225,660	229,791	233,949
Peak Day Therms	2,773,089	2,805,952	2,844,798	2,883,729	2,945,363	3,007,650	3,070,491	3,133,948	3,197,982	3,262,654	3,327,937
Therms Per Residential Customer	626	651	673	669	665	664	664	662	661	660	659
Therms Per Commercial Customer	3,434	3,730	3,705	3,684	3,670	3,666	3,666	3,656	3,644	3,638	3,634
Therms Per Industrial Customer	26,392	27,842	26,964	26,332	26,031	26,175	26,497	26,399	26,198	26,282	26,457
Residential Customers	170,540	172,372	174,570	176,765	180,611	184,495	188,414	192,368	196,360	200,390	204,457
Commercial Customers	24,642	25,026	25,542	26,064	26,591	27,123	27,659	28,201	28,745	29,294	29,848
Industrial Customers	354	351	344	337	331	326	321	317	313	310	307
Interruptible Customers	28	24	24	24	24	24	24	24	24	24	24
Total Core Customers	195,564	197,773	200,479	203,190	207,557	211,968	216,419	220,910	225,442	230,018	234,636
Oregon											
Total Therms Pct. Growth		8.87%	0.45%	0.04%	0.87%	1.85%	2.00%	1.56%	1.49%	1.86%	1.99%
Residential Therms	37,118,417	39,343,950	39,767,472	39,737,083	40,078,716	40,799,251	41,497,106	42,146,142	42,797,950	43,515,760	44,257,257
Commercial Therms	27,194,841	29,568,777	29,728,399	30,001,557	30,469,608	31,246,446	32,162,811	32,839,985	33,476,958	34,333,497	35,284,586
Industrial Therms	2,813,412	4,165,334	3,914,147	3,703,201	3,534,622	3,409,093	3,304,088	3,181,740	3,061,432	2,965,167	2,879,822
Ind., Inst., & Cmcl. Interrup. Therms	2	0	0	0	0	0	0	0	0	0	0
Total Core Therms	67,126,672	73,078,061	73,410,018	73,441,841	74,082,946	75,454,790	76,964,005	78,167,867	79,336,340	80,814,423	82,421,665
Daily Baseload Therms	58,280	63,472	63,759	63,819	64,394	65,580	66,880	67,922	68,935	70,207	71,589
Peak Day Therms	824,646	838,141	845,368	852,628	868,528	884,600	900,769	917,075	933,547	950,141	966,835
Therms Per Residential Customer	676	706	710	706	700	700	700	700	699	699	699
Therms Per Commercial Customer	2,890	3,083	3,040	3,010	3,000	3,019	3,050	3,058	3,060	3,082	3,111
Therms Per Industrial Customer	30,581	46,162	44,896	43,799	42,961	42,456	42,058	41,290	40,416	39,747	39,135
Residential Customers	54,883	55,719	56,018	56,318	57,283	58,263	59,249	60,245	61,257	62,278	63,305
Commercial Customers	9,411	9,592	9,779	9,967	10,157	10,351	10,545	10,741	10,940	11,140	11,342
Industrial Customers	92	90	87	85	82	80	79	77	76	75	74
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	64,386	65,402	65,884	66,370	67,522	68,694	69,872	71,063	72,272	73,493	74,721
		3,224									
System											
Total Therms Pct. Growth		7.62%	2.24%	0.57%	1.27%	1.84%	1.97%	1.62%	1.55%	1.79%	1.81%
Residential Therms	143,844,032	151,540,174	157,334,898	157,953,386	160,121,931	163,267,887	166,569,592	169,546,243	172,517,105	175,802,426	179,061,693
Commercial Therms	111,825,543	122,912,569	124,360,739	126,022,005	128,058,869	130,684,770	133,565,259	135,949,943	138,222,246	140,903,036	143,741,209
Industrial Therms	12,156,083	13,931,851	13,181,813	12,584,413	12,162,587	11,947,391	11,822,190	11,556,173	11,272,575	11,113,421	11,002,070
Ind., Inst., & Cmcl. Interrup. Therms	2,033,824	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	269,859,482	290,418,416	296,911,272	298,593,626	302,377,209	307,933,870	313,990,862	319,086,182	324,045,748	329,852,705	335,838,792
Daily Baseload Therms	243,774	263,120	269,225	270,866	274,442	279,601	285,209	289,951	294,594	299,998	305,538
Peak Day Therms	3,597,736	3,644,093	3,690,166	3,736,357	3,813,892	3,892,249	3,971,260	4,051,023	4,131,530	4,212,795	4,294,772
Therms Per Residential Customer	638	664	682	678	673	673	673	671	670	669	669
Therms Per Commercial Customer	3,284	3,551	3,521	3,498	3,485	3,487	3,496	3,491	3,483	3,485	3,490
Therms Per Industrial Customer	27,256	31,590	30,592	29,833	29,397	29,391	29,553	29,309	28,965	28,894	28,909
Residential Customers	225,423	228,091	230,588	233,083	237,894	242,758	247,663	252,613	257,617	262,668	267,762
Commercial Customers	34,053	34,618	35,320	36,031	36,748	37,474	38,204	38,941	39,684	40,434	41,190
Industrial Customers	446	441	431	422	414	406	400	394	389	385	381
Interruptible Customers	28	24	24	24	24	24	24	24	24	24	24
Total Core Customers	259,950	263,174	266,363	269,560	275,080	280,662	286,291	291,972	297,715	303,511	309,357

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Washington											
Total Therms Pct. Growth	1.50%	1.41%	1.74%	2.09%	1.54%	1.46%	1.60%	1.46%	1.32%	0.82%	2.11%
Residential Therms	137,108,380	139,359,500	142,156,435	145,155,008	147,785,968	150,251,500	152,880,449	155,425,605	157,732,504	160,110,136	162,427,789
Commercial Therms	110,099,673	111,643,741	113,425,075	115,764,472	117,410,620	119,052,702	120,883,575	122,545,487	124,119,773	124,119,773	125,664,296
Industrial Therms	7,988,642	7,823,138	7,772,627	7,970,149	7,873,720	7,788,743	7,792,955	7,734,287	7,649,900	7,649,900	7,563,813
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	257,230,516	260,860,200	265,387,958	270,923,450	275,104,130	279,126,766	283,590,801	287,739,201	291,535,998	293,913,630	297,689,719
Daily Baseload Therms	237,600	241,091	245,423	250,658	254,650	258,514	262,791	266,772	270,431	272,702	276,347
Peak Day Therms	3,394,014	3,460,771	3,528,039	3,595,855	3,664,296	3,733,173	3,802,658	3,872,687	3,943,320	4,006,062	4,078,664
Therms Per Residential Customer	657	655	655	656	656	654	653	652	650	648	645
Therms Per Commercial Customer	3,621	3,605	3,596	3,605	3,592	3,579	3,572	3,559	3,545	3,545	3,529
Therms Per Industrial Customer	26,254	25,916	25,928	26,749	26,561	26,388	26,496	26,368	26,132	26,132	25,874
Residential Customers	208,574	212,732	216,922	221,147	225,411	229,702	234,030	238,394	242,794	247,231	251,766
Commercial Customers	30,408	30,972	31,539	32,111	32,686	33,263	33,844	34,428	35,015	35,015	35,606
Industrial Customers	304	302	300	298	296	295	294	293	293	293	292
Interruptible Customers	24	24	24	24	24	24	24	24	24	24	24
Total Core Customers	239,310	244,030	248,785	253,580	258,417	263,284	268,192	273,139	278,126	282,563	287,688
Oregon											
Total Therms Pct. Growth	1.49%	1.45%	2.00%	2.82%	1.66%	1.70%	2.04%	1.82%	1.59%	0.76%	2.36%
Residential Therms	44,870,816	45,548,714	46,395,310	47,281,684	47,988,136	48,703,304	49,479,949	50,257,859	50,908,316	51,644,841	52,325,112
Commercial Therms	35,998,984	36,631,656	37,557,942	39,142,894	39,993,993	40,886,618	42,042,966	43,035,199	43,968,742	43,968,742	44,907,258
Industrial Therms	2,779,222	2,677,557	2,599,381	2,566,045	2,487,002	2,413,278	2,356,659	2,293,820	2,229,626	2,229,626	2,167,921
Ind., Inst., & Cmcl. Interrup. Therms	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	83,649,022	84,857,926	86,552,633	88,990,622	90,469,131	92,003,200	93,879,575	95,586,877	97,106,684	97,843,209	99,400,291
Daily Baseload Therms	72,645	73,689	75,143	77,217	78,481	79,794	81,391	82,846	84,137	84,773	86,097
Peak Day Therms	983,658	1,000,621	1,017,614	1,034,752	1,051,847	1,069,042	1,086,368	1,103,667	1,121,101	1,135,691	1,153,443
Therms Per Residential Customer	697	697	698	700	700	699	700	700	698	698	696
Therms Per Commercial Customer	3,118	3,117	3,140	3,216	3,229	3,245	3,281	3,302	3,318	3,318	3,333
Therms Per Industrial Customer	38,237	37,242	36,501	36,326	35,457	34,608	33,956	33,171	32,332	32,332	31,492
Residential Customers	64,343	65,391	66,445	67,510	68,574	69,647	70,734	71,817	72,914	74,018	75,141
Commercial Customers	11,547	11,754	11,962	12,173	12,384	12,598	12,816	13,032	13,252	13,252	13,475
Industrial Customers	73	72	71	71	70	70	69	69	69	69	69
Interruptible Customers	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	75,962	77,216	78,479	79,754	81,028	82,315	83,619	84,918	86,235	87,339	88,685
System											
Total Therms Pct. Growth	1.50%	1.42%	1.80%	2.27%	1.57%	1.52%	1.71%	1.55%	1.39%	0.80%	2.17%
Residential Therms	181,979,196	184,908,214	188,551,745	192,436,692	195,774,104	198,954,804	202,360,398	205,683,464	208,640,820	211,754,977	214,752,901
Commercial Therms	146,098,658	148,275,396	150,983,017	154,907,365	157,404,613	159,939,319	162,926,542	165,580,686	168,088,514	168,088,514	170,571,554
Industrial Therms	10,767,863	10,500,695	10,372,008	10,536,194	10,360,722	10,202,021	10,149,614	10,028,107	9,879,526	9,879,526	9,731,734
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	340,879,539	345,718,127	351,940,591	359,914,073	365,573,261	371,129,966	377,470,375	383,326,079	388,642,682	391,756,839	397,090,010
Daily Baseload Therms	310,245	314,780	320,565	327,875	333,131	338,308	344,181	349,618	354,569	357,475	362,444
Peak Day Therms	4,377,672	4,461,392	4,545,653	4,630,607	4,716,143	4,802,215	4,889,025	4,976,354	5,064,421	5,141,753	5,232,108
Therms Per Residential Customer	667	665	665	667	666	665	664	663	661	659	657
Therms Per Commercial Customer	3,482	3,470	3,471	3,498	3,492	3,487	3,492	3,489	3,482	3,482	3,475
Therms Per Industrial Customer	28,565	28,094	27,957	28,584	28,263	27,959	27,920	27,666	27,314	27,314	26,945
Residential Customers	272,917	278,123	283,367	288,657	293,985	299,349	304,764	310,211	315,708	321,249	326,907
Commercial Customers	41,954	42,726	43,502	44,284	45,070	45,861	46,659	47,460	48,268	48,268	49,081
Industrial Customers	377	374	371	369	367	365	364	362	362	362	361
Interruptible Customers	24	24	24	24	24	24	24	24	24	24	24
Total Core Customers	315,272	321,246	327,264	333,333	339,445	345,599	351,811	358,058	364,361	369,902	376,373

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Aberdeen																						
Total Therms Pct. Growth		1.40%	4.50%	0.29%	0.32%	0.30%	0.31%	0.39%	0.35%	0.32%	0.33%	0.38%	0.36%	0.31%	0.25%	0.42%	0.34%	0.31%	0.35%	0.35%	0.44%	0.41%
Residential Therms	3,518,892	3,528,952	3,933,846	3,942,786	3,956,665	3,972,864	3,991,169	4,011,534	4,026,908	4,041,318	4,057,984	4,074,551	4,087,948	4,099,324	4,113,551	4,133,557	4,145,268	4,156,260	4,168,655	4,179,823	4,188,567	4,197,002
Commercial Therms	5,012,117	4,982,254	5,008,861	5,034,834	5,058,299	5,077,022	5,093,958	5,116,323	5,139,768	5,160,453	5,180,404	5,204,945	5,230,976	5,253,337	5,266,764	5,291,756	5,316,554	5,338,326	5,363,015	5,389,067	5,389,067	5,415,192
Industrial Therms	119,051	270,033	266,581	260,987	255,947	251,323	247,144	243,520	240,211	237,359	234,807	232,548	230,437	228,672	227,214	226,027	225,094	224,367	223,932	223,712	223,712	223,579
Ind., Inst., & Cmcl. Interrup. Therms	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299
Total Core Therms	9,389,359	9,520,537	9,948,587	9,977,905	10,010,209	10,040,507	10,071,570	10,110,676	10,146,186	10,178,428	10,212,493	10,251,342	10,288,660	10,320,632	10,346,827	10,390,638	10,426,214	10,458,252	10,494,900	10,531,901	10,540,644	10,575,072
Daily Baseload Therms	7,985	8,097	8,461	8,486	8,513	8,539	8,566	8,599	8,629	8,656	8,685	8,718	8,750	8,777	8,800	8,837	8,867	8,894	8,926	8,957	8,964	8,994
Peak Day Therms	82,192	82,505	82,660	83,035	83,476	83,919	84,336	84,769	85,176	85,584	85,994	86,391	86,788	87,173	87,559	87,933	88,306	88,667	89,016	89,378	89,660	89,996
Therms Per Residential Customer	671	671	746	744	743	741	741	740	739	738	738	737	736	734	734	734	733	731	731	730	728	727
Therms Per Commercial Customer	4,408	4,351	4,362	4,371	4,378	4,380	4,380	4,385	4,390	4,393	4,395	4,401	4,408	4,412	4,408	4,413	4,419	4,421	4,427	4,433	4,433	4,439
Therms Per Industrial Customer	9,158	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919	18,919
Residential Customers	5,247	5,262	5,271	5,297	5,328	5,359	5,388	5,418	5,446	5,474	5,502	5,529	5,556	5,582	5,608	5,633	5,658	5,682	5,705	5,729	5,751	5,773
Commercial Customers	1,137	1,145	1,148	1,152	1,155	1,159	1,163	1,167	1,171	1,175	1,179	1,183	1,187	1,191	1,195	1,199	1,203	1,207	1,212	1,216	1,216	1,220
Industrial Customers	13	14	14	14	14	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	6,400	6,424	6,436	6,466	6,500	6,534	6,567	6,601	6,632	6,664	6,696	6,727	6,758	6,788	6,818	6,847	6,876	6,904	6,931	6,960	6,982	7,008
Bellingham																						
Total Therms Pct. Growth		12.50%	0.33%	1.00%	1.74%	2.37%	2.31%	1.79%	1.79%	2.07%	2.07%	1.48%	1.47%	2.17%	2.59%	1.53%	1.60%	1.78%	1.45%	1.28%		2.06%
Residential Therms	26,890,852	29,136,464	29,113,350	29,351,400	29,880,385	30,625,098	31,326,876	31,889,270	32,494,596	33,192,621	33,892,008	34,390,246	34,933,420	35,787,574	36,701,814	37,294,754	37,939,524	38,638,542	39,220,168	39,739,304	40,252,260	40,771,042
Commercial Therms	13,256,906	15,995,152	16,182,316	16,423,343	16,725,148	17,125,541	17,565,822	17,910,224	18,227,519	18,610,752	19,015,198	19,326,119	19,597,820	19,957,752	20,524,647	20,832,305	21,139,100	21,515,949	21,828,275	22,106,848	22,106,848	22,373,420
Industrial Therms	881,544	1,047,659	1,036,211	1,024,256	1,013,036	1,002,476	992,563	983,250	974,539	966,357	958,637	951,378	944,523	938,082	932,039	926,375	921,090	916,143	911,498	907,180	907,180	903,142
Ind., Inst., & Cmcl. Interrup. Therms	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424
Total Core Therms	41,198,726	46,348,699	46,501,301	46,968,423	47,787,993	48,922,539	50,054,685	50,952,168	51,866,079	52,939,153	54,035,267	54,837,167	55,645,187	56,852,832	58,327,924	59,222,858	60,169,138	61,240,058	62,129,365	62,922,756	63,435,712	64,217,028
Daily Baseload Therms	40,559	45,629	45,779	46,239	47,046	48,163	49,277	50,161	51,061	52,117	53,196	53,986	54,781	55,970	57,422	58,303	59,235	60,289	61,164	61,946	62,451	63,220
Peak Day Therms	695,389	701,553	714,437	730,830	748,307	765,794	783,288	800,789	818,310	835,806	853,325	870,882	888,464	906,035	923,594	941,142	958,676	976,181	993,643	1,011,107	1,026,891	1,044,620
Therms Per Residential Customer	663	712	699	689	685	686	686	683	681	681	681	677	674	677	681	679	678	678	676	673	670	667
Therms Per Commercial Customer	2,760	3,323	3,284	3,254	3,237	3,239	3,250	3,242	3,231	3,232	3,237	3,226	3,209	3,208	3,240	3,230	3,222	3,225	3,218	3,207	3,207	3,195
Therms Per Industrial Customer	22,604	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629	26,629
Residential Customers	40,531	40,922	41,650	42,600	43,621	44,643	45,666	46,690	47,716	48,741	49,768	50,798	51,830	52,862	53,894	54,926	55,958	56,989	58,018	59,048	60,078	61,126
Commercial Customers	4,803	4,814	4,927	5,047	5,167	5,287	5,406	5,524	5,642	5,759	5,875	5,991	6,106	6,221	6,335	6,449	6,561	6,672	6,783	6,893	6,893	7,002
Industrial Customers	39	39	39	38	38	38	37	37	37	36	36	36	35	35	35	35	35	34	34	34	34	34
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	45,377	45,779	46,620	47,690	48,830	49,971	51,113	52,255	53,398	54,540	55,683	56,829	57,976	59,123	60,268	61,413	62,558	63,700	64,839	65,979	67,009	68,166
Bremerton																						
Total Therms Pct. Growth		7.56%	0.57%	1.23%	1.84%	2.16%	2.03%	1.85%	1.92%	1.97%	1.94%	1.77%	1.76%	2.07%	2.06%	1.76%	1.74%	1.78%	1.69%	1.59%	2.22%	2.20%
Residential Therms	18,579,097	19,846,854	19,693,206	19,714,458	19,930,513	20,262,452	20,567,624	20,814,540	21,091,668	21,401,029	21,711,768	21,961,329	22,210,440	22,591,995	23,010,120	23,297,157	23,585,328	23,908,688	24,198,888	24,453,815	24,708,891	24,966,141
Commercial Therms	9,011,610	9,813,979	10,138,076	10,487,318	10,834,858	11,175,456	11,514,961	11,868,275	12,227,372	12,581,735	12,936,686	13,305,874	13,683,117	14,052,542	14,399,180	14,778,492	15,159,209	15,532,826	15,915,956	16,304,678	16,304,678	16,696,688
Industrial Therms	107,569	158,971	161,680	164,412	167,150	169,884	172,621	175,366	178,110	180,862	183,618	186,385	189,159	191,941	194,732	197,534	200,343	203,160	205,990	208,830	208,830	211,679
Ind., Inst., & Cmcl. Interrup. Therms	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625
Total Core Therms	28,055,901	30,177,428	30,350,587	30,723,812	31,290,146	31,965,416	32,612,830	33,215,805	33,854,775	34,521,251	35,189,697	35,811,213	36,440,340	37,194,103	37,961,656	38,630,807	39,302,504	40,002,299	40,678,458	41,324,948	41,580,024	42,232,133
Daily Baseload Therms	31,620	34,011	34,206	34,626	35,265	36,026	36,755	37,435	38,155	38,906	39,660	40,360	41,069	41,919	42,784	43,538	44,295	45,083	45,845	46,574	46,862	47,596
Peak Day Therms	344,667	342,912	345,348	350,285	356,157	362,061	368,008	373,996	380,014	386,072	392,159	398,301	404,473	410,696	416,946	423,223	429,535	435,873	442,249	448,649	454,033	460,538
Therms Per Residential Customer	662	711	702	694	691	692	692	690	689	689	689	687	685	687	690	689	688	688	687	685	683	681
Therms Per Commercial Customer	3,569	3,882	3,891	3,899	3,904	3,906	3,906	3,909	3,914	3,916	3,917	3,922	3,928	3,930	3,927	3,931	3,936	3,938	3,942	3,947	3,947	3,952
Therms Per Industrial Customer	107,569	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917	154,917
Residential Customers	28,073	27,914	28,053	28,407	28,843	29,281	29,722	30,166	30,612	31,061	31,512	31,967	32,424	32,885	33,348	33,813	34,281	34,751	35,224	35,699	36,177	36,661
Commercial Customers	2,525	2,528	2,605	2,690	2,775	2,861	2,948	3,036	3,124	3,213	3,302	3,393	3,484	3,575	3,667	3,759	3,852	3,945	4,038	4,131	4,131	4,224
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	30,602	30,446	30,662	31,101	31,622	32,146	32,674	33,206	33,740	34,278	34,819	35,364	35,912	36,465	37,019	37,577	38,137	38,700	39,266	39,834	40,312	40,890
Kennewick																						
Total Therms Pct. Growth		5.79%	4.05%	3.09%	3.30%	3.45%	3.56%	3.40%	3.18%	3.17%	3.22%	3.06%	2.86%	2.87%	3.16%	3.01%	2.69%	2.72%	2.67%	2.52%	3.76%	3.67%
Residential Therms	11,151,277	11,272,737	11,873,368	12,216,636	12,614,064	13,040,575	13,510,456	14,003,102	14,468,705	14,931,828	15,428,758	15,942,426	16,429,405	16,908,008	17,429,635	18,043,806	18,561,826	19,086,718	19,648,781	20,192,452	20,728,810	21,276,144
Commercial Therms	12,529,798	13,516,768	13,952,895	14,433,178	14,941,486	15,494,427	16,068,652	16,608,153	17,139,539	17,702,586	18,279,300	18,819,991	19,347,511	19,917,049	20,583,178	21,135,617	21,689,009	22,276,834	22,836,157	23,381,297	23,381,297	23,921,393
Industrial Therms	237,748	526,455	523,098	519,358	515,984	513,004	510,415	508,164	506,216	504,579	503,222	502,107	501,226	500,568	500,147	499,942	499,953	500,190	500,604	501,214	501,214	501,985
Ind., Inst., & Cmcl. Interrup. Therms	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385
Total Core Therms	24,120,208	25,517,345	26,550,746	27,370,556	28,272,918	29,249,391	30,290,908	31,320,804	32,315,845	33,340,379	34,412,666	35,465,909	36,479,527	37,527,010	38,714,345	39,880,749	40,952,174	42,065,127	43,186,927	44,276,348	44,812,706	45,900,907
Daily Baseload Therms	19,422	20,547	21,379	22,039	22,766	23,552	24,390	25,220	26,021	26,846	27,709	28,557	29,374	30,217	31,173	32,112	32,975	33,871	34,774	35,652	36,084	36,960
Peak Day Therms	370,867	375,728	385,774	399,359	414,266	429,464	444,933	460,658	476,637	492,871	509,393	526,189	543,292	560,650	578,278	596,175	614,321	632,703	651,334	670,233	686,721	706,329
Therms Per Residential Customer	550	550	565	562	559	558	558	559	558	557	557	557	556	555	555	557	556	555	555	555	554	552
Therms Per Commercial Customer	4,091	4,294	4,265	4,241	4,223	4,217	4,214	4,200	4,183	4,173	4,164	4,146	4,124	4,111	4,116	4,097	4,078	4,065	4,047	4,026	4,026	4,004
Therms Per Industrial Customer	14,859	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213	32,213
Residential Customers	20,290	20,511	21,021	21,745	22,550	23,371	24,207	25,057	25,921	26,799	27,693	28,602	29,528	30,468	31,423	32,393	33,377	34,374	35,385	36,411	37,450	38,519
Commercial Customers	3,063	3,148	3,271	3,403	3,538	3,675	3,814	3,955	4,098	4,243	4,390	4,539	4,691	4,845	5,001	5,159	5,318	5,480	5,643	5,808	5,808	5,974
Industrial Customers	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	23,371	23,677	24,310	25,166	26,106	27,064	28,038	29,029	30,036	31,059	32,100	33,159	34,237	35,331	36,441	37,569	38,713	39,871	41,045	42,236	43,275	44,511
Longview																						
Total Therms Pct. Growth		8.50%	3.56%	0.29%	0.33%	0.25%	0.24%	0.40%	0.40%	0.35%	0.35%	0.45%	0.50%	0.38%	0.20%	0.51%	0.47%	0.40%	0.47%	0.50%	0.59%	0.58%
Residential Therms	1,361,463	1,335,515	1,556,739	1,547,162	1,546,255	1,546,907	1,549,599	1,554,065	1,556,559	1,560,565	1,565,449	1,570,594	1,575,762	1,579,824	1,586,235	1,595,160	1,601,510	1,608,477	1,616,273	1,623,924	1,631,192	1,638,338
Commercial Therms	4,560,755	4,906,183	4,938,582	4,969,401	4,994,385	5,011,687	5,025,820	5,049,348	5,074,819	5,095,258	5,114,256	5,140,701	5,171,345	5,193,640	5,199,853	5,227,020	5,253,457	5,274,159	5,299,898	5,327,937	5,327,937	5,355,858
Industrial Therms	532,335	771,708	772,175	772,477	773,056	773,989	775,190	776,698	778,416	780,393	782,586	784,937	787,540	790,231	793,098	796,173	799,376	802,710	806,208	809,841	809,841	813,536
Ind., Inst., & Cmcl. Interrup. Therms	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545
Total Core Therms	6,572,098	7,130,951	7,385,041	7,406,584	7,431,241	7,450,128	7,468,154	7,497,656	7,527,339	7,553,762	7,579,835	7,613,776	7,652,192	7,681,240	7,696,730	7,735,898	7,771,889	7,802,892	7,839,924	7,879,246	7,886,515	7,925,277
Daily Baseload Therms	7,571	8,214	8,507	8,532	8,560	8,582	8,603	8,637	8,671	8,701	8,731	8,770	8,815	8,848	8,866	8,911	8,953	8,988	9,031	9,076	9,085	9,129
Peak Day Therms	81,619	80,627	79,760	79,643	79,811	80,008	80,229	80,499	80,747	81,065	81,385	81,704	82,074	82,417	82,805	83,196	83,608	84,040	84,474	84,930	85,279	85,732
Therms Per Residential Customer	530	530	628	626	625	624	624	623	623	622	621	621	620	619	618	619	618	617	616	615	614	613
Therms Per Commercial Customer	3,990	4,280	4,296	4,310	4,318	4,318	4,315	4,319	4,324	4,325	4,325	4,330	4,338	4,340	4,328	4,333	4,338	4,338	4,343	4,348	4,348	4,355
Therms Per Industrial Customer	18,356	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414	26,414
Residential Customers	2,571	2,522	2,479	2,470	2,474	2,479	2,485	2,493	2,500	2,510	2,520	2,530	2,542	2,553	2,566	2,579	2,593	2,608	2,623	2,639	2,655	2,671
Commercial Customers	1,143	1,146	1,149	1,153	1,157	1,161	1,165	1,169	1,174	1,178	1,183	1,187	1,192	1,197	1,201	1,206	1,211	1,216	1,220	1,225	1,225	1,230
Industrial Customers	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	31	31	31	31
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	3,745	3,699	3,660	3,654	3,662	3,671	3,681	3,694	3,705	3,720	3,734	3,749	3,766	3,782	3,799	3,817	3,836	3,856	3,876	3,897	3,913	3,934

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

Moses Lake	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Therms Pct. Growth		0.39%	2.53%	0.59%	0.83%	1.17%	1.41%	1.23%	1.02%	1.15%	1.28%	1.08%	0.90%	1.05%	1.57%	1.27%	0.97%	1.11%	1.08%	0.94%	0.91%	0.85%
Residential Therms	986,252	988,389	1,062,780	1,054,304	1,048,672	1,046,492	1,050,343	1,057,075	1,057,738	1,057,024	1,060,120	1,063,835	1,063,145	1,060,551	1,062,152	1,074,814	1,073,845	1,073,014	1,076,281	1,076,001	1,074,298	1,072,220
Commercial Therms	2,392,003	2,393,908	2,397,807	2,407,654	2,424,183	2,451,147	2,482,147	2,503,342	2,521,934	2,547,183	2,574,549	2,592,810	2,607,401	2,630,648	2,673,424	2,691,735	2,710,077	2,734,984	2,754,045	2,770,143	2,770,143	2,785,307
Industrial Therms	574,965	586,312	608,324	631,019	654,087	677,565	701,388	725,611	750,267	775,338	800,900	826,941	853,365	880,334	907,603	935,562	963,800	992,654	1,022,090	1,051,998	1,051,998	1,082,362
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	3,953,221	3,968,610	4,068,913	4,092,978	4,126,944	4,175,205	4,233,879	4,286,030	4,329,940	4,379,546	4,435,570	4,483,587	4,523,912	4,571,533	4,643,180	4,702,112	4,747,722	4,800,654	4,852,416	4,898,143	4,896,440	4,939,890
Daily Baseload Therms	3,462	3,476	3,563	3,585	3,614	3,657	3,708	3,754	3,792	3,836	3,885	3,927	3,962	4,004	4,066	4,118	4,158	4,204	4,250	4,290	4,288	4,326
Peak Day Therms	79,367	79,626	80,062	80,485	80,937	81,357	81,774	82,221	82,634	83,044	83,453	83,829	84,235	84,639	85,009	85,409	85,775	86,139	86,532	86,891	87,050	87,408
Therms Per Residential Customer	534	534	572	566	561	558	558	560	558	556	556	556	554	551	551	555	554	552	552	550	548	545
Therms Per Commercial Customer	3,732	3,716	3,687	3,665	3,654	3,658	3,669	3,666	3,660	3,663	3,670	3,665	3,654	3,657	3,686	3,682	3,679	3,685	3,683	3,678	3,678	3,672
Therms Per Industrial Customer	33,821	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600	32,600
Residential Customers	1,846	1,850	1,857	1,863	1,870	1,876	1,882	1,889	1,895	1,901	1,907	1,912	1,918	1,924	1,929	1,935	1,940	1,945	1,951	1,956	1,961	1,966
Commercial Customers	641	644	650	657	664	670	676	683	689	695	701	707	713	719	725	731	737	742	748	753	753	759
Industrial Customers	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	29	30	30	31	32	32	33
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	2,505	2,513	2,527	2,540	2,555	2,568	2,581	2,595	2,608	2,621	2,634	2,646	2,659	2,671	2,683	2,696	2,707	2,719	2,731	2,743	2,748	2,759

Mount Vernon	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Therms Pct. Growth		3.96%	8.88%	1.22%	1.49%	1.66%	1.76%	1.66%	1.58%	1.63%	1.68%	1.58%	1.49%	1.56%	1.80%	1.63%	1.48%	1.54%	1.50%	1.43%	2.35%	2.31%
Residential Therms	22,864,684	22,867,251	26,297,921	26,690,184	27,166,437	27,660,697	28,182,582	28,714,714	29,225,362	29,730,034	30,253,051	30,784,434	31,294,407	31,797,328	32,321,839	32,902,789	33,416,475	33,931,572	34,465,757	34,983,947	35,495,202	36,011,526
Commercial Therms	13,992,239	15,170,491	15,367,725	15,600,266	15,868,844	16,193,036	16,541,934	16,842,530	17,132,431	17,460,451	17,802,382	18,098,573	18,377,163	18,705,917	19,145,876	19,453,923	19,763,392	20,113,063	20,432,220	20,735,883	20,735,883	21,036,646
Industrial Therms	1,267,068	1,600,171	1,501,809	1,403,453	1,313,560	1,231,376	1,156,195	1,087,367	1,024,234	966,192	912,675	863,200	817,390	775,000	735,750	699,370	665,650	634,331	605,199	578,060	578,060	552,727
Ind., Inst., & Cmcl. Interrup. Therms	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981
Total Core Therms	38,248,972	39,762,895	43,292,436	43,818,883	44,473,822	45,210,091	46,005,692	46,769,592	47,507,008	48,281,657	49,093,090	49,871,188	50,613,940	51,403,226	52,328,445	53,181,062	53,970,498	54,803,947	55,628,156	56,422,871	56,934,126	57,725,880
Daily Baseload Therms	37,470	38,953	42,411	42,927	43,568	44,289	45,069	45,817	46,540	47,298	48,093	48,856	49,583	50,356	51,263	52,098	52,871	53,688	54,495	55,274	55,775	56,550
Peak Day Therms	490,697	490,556	495,319	503,925	513,838	523,826	533,889	543,985	554,167	564,396	574,684	585,057	595,501	606,030	616,578	627,235	637,882	648,587	659,349	670,139	679,735	690,741
Therms Per Residential Customer	642	642	732	730	729	728	727	727	727	726	725	725	724	723	722	723	722	721	720	719	718	717
Therms Per Commercial Customer	3,054	3,322	3,301	3,284	3,275	3,277	3,284	3,280	3,274	3,276	3,279	3,273	3,265	3,264	3,283	3,278	3,274	3,276	3,273	3,268	3,268	3,261
Therms Per Industrial Customer	13,924	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951	17,951
Residential Customers	35,623	35,627	35,935	36,553	37,277	38,006	38,740	39,476	40,218	40,963	41,712	42,467	43,227	43,993	44,760	45,535	46,309	47,087	47,869	48,653	49,441	50,242
Commercial Customers	4,581	4,567	4,656	4,750	4,845	4,941	5,038	5,135	5,232	5,331	5,429	5,529	5,629	5,730	5,832	5,934	6,036	6,139	6,242	6,346	6,346	6,450
Industrial Customers	91	89	84	78	73	69	64	61	57	54	51	48	46	43	41	39	37	35	34	32	32	31
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	40,297	40,285	40,677	41,383	42,197	43,018	43,844	44,673	45,509	46,349	47,194	48,046	48,904	49,768	50,635	51,510	52,384	53,263	54,147	55,033	55,821	56,725

Sunnyside	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Therms Pct. Growth		0.08%	3.80%	-0.21%	-0.13%	0.01%	0.23%	0.31%	0.12%	0.07%	0.20%	0.25%	0.07%	0.00%	0.17%	0.54%	0.08%	0.08%	0.21%	0.10%	0.11%	0.04%
Residential Therms	2,840,914	2,841,453	3,173,935	3,151,431	3,136,027	3,133,300	3,150,444	3,174,904	3,181,844	3,184,664	3,199,580	3,218,646	3,221,772	3,218,316	3,230,693	3,277,359	3,281,313	3,285,411	3,302,075	3,308,481	3,309,749	3,309,941
Commercial Therms	4,464,731	4,569,529	4,585,561	4,607,338	4,628,471	4,648,857	4,668,448	4,687,298	4,705,402	4,722,728	4,739,412	4,755,595	4,771,328	4,786,400	4,800,685	4,814,408	4,827,431	4,839,671	4,851,357	4,862,431	4,862,431	4,872,983
Industrial Therms	1,357,639	1,259,662	1,243,753	1,225,075	1,207,289	1,190,381	1,174,346	1,159,148	1,144,720	1,131,015	1,117,944	1,105,439	1,093,435	1,081,970	1,071,057	1,060,679	1,050,813	1,041,466	1,032,546	1,024,057	1,024,057	1,015,941
Ind., Inst., & Cmcl. Interrup. Therms	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360
Total Core Therms	8,740,644	8,748,004	9,080,609	9,061,203	9,049,146	9,049,898	9,070,599	9,098,710	9,109,326	9,115,767	9,134,296	9,157,041	9,163,895	9,164,046	9,179,795	9,229,806	9,236,917	9,243,908	9,263,338	9,272,329	9,273,597	9,276,225
Daily Baseload Therms	6,124	6,129	6,362	6,349	6,340	6,341	6,355	6,375	6,382	6,387	6,400	6,416	6,421	6,421	6,432	6,467	6,472	6,477	6,490	6,496	6,497	6,499
Peak Day Therms	98,552	98,522	98,823	99,208	99,577	99,928	100,276	100,607	100,936	101,261	101,570	101,877	102,182	102,471	102,757	103,025	103,291	103,540	103,801	104,044	104,222	104,449
Therms Per Residential Customer	539	539	600	594	589	586	588	590	590	588	589	591	590	588	588	595	595	594	596	595	594	593
Therms Per Commercial Customer	3,310	3,394	3,394	3,393	3,392	3,391	3,390	3,389	3,388	3,387	3,386	3,385	3,383	3,382	3,381	3,380	3,379	3,377	3,376	3,375	3,375	3,373
Therms Per Industrial Customer	28,284	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408	26,408
Residential Customers	5,269	5,270	5,286	5,306	5,325	5,343	5,361	5,378	5,395	5,412	5,428	5,444	5,460	5,475	5,490	5,504	5,518	5,531	5,545	5,558	5,570	5,582
Commercial Customers	1,349	1,346	1,351	1,358	1,365	1,371	1,377	1,383	1,389	1,394	1,400	1,405	1,410	1,415	1,420	1,424	1,429	1,433	1,437	1,441	1,441	1,444
Industrial Customers	48	48	47	46	46	45	44	44	43	43	42	42	41	41	41	40	40	39	39	39	39	38
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	6,668	6,666	6,686	6,712	6,737	6,761	6,785	6,807	6,829	6,851	6,872	6,893	6,914	6,933	6,952	6,971	6,989	7,005	7,023	7,040	7,052	7,067

Walla Walla	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Therms Pct. Growth		4.96%	0.07%	0.49%	0.81%	0.99%	0.82%	0.68%	0.77%	0.88%	0.63%	0.58%	0.69%	0.90%	0.69%	0.56%	0.63%	0.54%	0.46%	0.34%	0.65%	0.64%
Residential Therms	6,012,829	6,246,794	6,219,552	6,238,556	6,299,024	6,391,125	6,470,685	6,526,102	6,590,568	6,675,350	6,736,068	6,783,100	6,839,727	6,929,587	7,016,405	7,065,480	7,123,680	7,179,552	7,220,668	7,246,185	7,282,800	7,307,136
Commercial Therms	3,915,927	4,129,309	4,166,028	4,200,533	4,227,180	4,242,472	4,252,527	4,272,277	4,293,753	4,307,664	4,318,721	4,338,636	4,361,541	4,374,852	4,367,993	4,384,865	4,400,776	4,409,607	4,423,558	4,439,470	4,439,470	4,455,780
Industrial Therms	69,756	117,879	115,310	113,073	110,934	108,805	106,815	104,853	102,974	101,110	99,317	97,553	95,844	94,171	92,491	90,861	89,271	87,682	86,123	84,623	84,623	83,127
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	9,998,513	10,493,983	10,500,891	10,552,163	10,637,139	10,742,403	10,830,028	10,903,233	10,987,297	11,084,125	11,154,106	11,219,290	11,297,113	11,398,611	11,476,890	11,541,207	11,613,728	11,676,842	11,730,350	11,770,279	11,806,894	11,846,043
Daily Baseload Therms	6,881	7,222	7,226	7,262	7,320	7,392	7,453	7,503	7,561	7,628	7,676	7,721	7,774	7,844	7,898	7,942	7,992	8,036	8,072	8,100	8,125	8,152
Peak Day Therms	162,143	161,933	163,566	165,596	167,625	169,640	171,610	173,538	175,422	177,249	179,046	180,801	182,512	184,166	185,735	187,261	188,715	190,112	191,452	192,720	193,902	195,155
Therms Per Residential Customer	578	601	592	586	584	585	585	583	582	583	582	580	579	581	583	582	582	582	581	579	578	576
Therms Per Commercial Customer	3,125	3,303	3,318	3,329	3,335	3,331	3,324	3,324	3,327	3,324	3,318	3,320	3,325	3,322	3,305	3,305	3,306	3,301	3,301	3,302	3,302	3,304
Therms Per Industrial Customer	23,252	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093	41,093
Residential Customers	10,406	10,394	10,506	10,646	10,786	10,925	11,061	11,194	11,324	11,450	11,574	11,695	11,813	11,927	12,035	12,140	12,240	12,336	12,428	12,515	12,600	12,686
Commercial Customers	1,253	1,250	1,256	1,262	1,268	1,274	1,279	1,285	1,291	1,296	1,301	1,307	1,312	1,317	1,322	1,327	1,331	1,336	1,340	1,344	1,344	1,349
Industrial Customers	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	11,663	11,648	11,765	11,911	12,057	12,202	12,344	12,483	12,618	12,750	12,879	13,005	13,128	13,247	13,360	13,470	13,574	13,675	13,771	13,862	13,947	14,038

Wenatchee	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Therms Pct. Growth		-1.10%	2.48%	-0.41%	-0.46%	-0.49%	-0.42%	-0.28%	-0.38%	-0.48%	-0.44%	-0.33%	-0.40%	-0.54%	-0.63%	-0.19%	-0.47%	-0.55%	-0.43%	-0.47%	-0.49%	-0.53%
Residential Therms	664,824	664,824	816,953	807,835	800,935	798,745	803,594	811,218	812,014	811,807	815,567	820,765	820,239	817,550	820,452	835,223	835,250	834,985	838,945	839,433	838,281	836,727
Commercial Therms	3,580,768	3,892,514	3,876,307	3,859,090	3,837,592	3,809,749	3,779,500	3,754,991	3,731,679	3,704,434	3,676,037	3,652,610	3,631,073	3,604,662	3,568,200	3,544,127	3,519,641	3,491,777	3,466,594	3,442,607	3,442,607	3,418,956
Industrial Therms	1,279,349	905,512	907,477	910,356	912,912	915,037	916,869	918,226	919,306	920,116	920,613	920,842	920,826	920,595	920,118	919,357	918,429	917,184	915,706	914,158	914,158	912,329
Ind., Inst., & Cmcl. Interrup. Therms	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716
Total Core Therms	5,620,657	5,558,565	5,696,453	5,672,997	5,647,155	5,619,246	5,595,680	5,580,152	5,558,715	5,532,073	5,507,932	5,489,933	5,467,854	5,438,523	5,404,486	5,394,423	5,369,035	5,339,662	5,316,961	5,291,913	5,290,762	5,263,728
Daily Baseload Therms	5,026	4,970	5,093	5,072	5,049	5,024	5,003	4,989	4,970	4,946	4,925	4,909	4,889	4,863	4,832	4,823	4,801	4,774	4,754	4,732	4,731	4,706
Peak Day Therms	60,118	60,046	60,198	60,363	60,508	60,656	60,808	60,963	61,095	61,256	61,393	61,533	61,674	61,818	61,963	62,083	62,231	62,354	62,477	62,602	62,732	62,858
Therms Per Residential Customer	437	437	534	526	519	515	516	518	517	514	515	516	514	510	510	518	516	514	515	514	511	509
Therms Per Commercial Customer	4,712	5,138	5,131	5,120	5,102	5,074	5,042	5,017	4,992	4,961	4,928	4,901	4,876	4,844	4,798	4,768	4,737	4,701	4,668	4,637	4,637	4,606
Therms Per Industrial Customer	63,967	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179	46,179
Residential Customers	1,521	1,521	1,529	1,537	1,544	1,551	1,558	1,565	1,571	1,578	1,584	1,590	1,596	1,602	1,608	1,613	1,619	1,624	1,629	1,634	1,639	1,644
Commercial Customers	760	758	755	754	752	751	750	749	748	747	746	745	745	744	744	743	743	743	743	742	742	742
Industrial Customers	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	2,303	2,300	2,306	2,312	2,318	2,324	2,329	2,335	2,340	2,347	2,352	2,357	2,363	2,368	2,374	2,378	2,384	2,389	2,393	2,398	2,403	2,408

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Yakima																						
Total Therms Pct. Growth		1.37%	-0.99%	-0.51%	0.06%	0.55%	0.78%	0.17%	0.22%	0.48%	0.63%	0.05%	0.00%	0.55%	1.43%	0.13%	0.21%	0.52%	0.15%	0.05%	0.14%	0.03%
Residential Therms	11,854,531	11,381,449	11,294,560	11,288,918	11,358,144	11,444,225	11,547,725	11,588,148	11,665,530	11,740,290	11,833,200	11,861,640	11,909,070	12,016,746	12,165,789	12,205,242	12,262,956	12,339,932	12,370,212	12,397,720	12,423,040	12,426,113
Commercial Therms	11,913,848	13,038,870	12,889,849	12,798,120	12,782,062	12,879,832	13,022,101	13,060,935	13,073,980	13,159,353	13,267,780	13,281,867	13,259,730	13,328,903	13,601,641	13,622,025	13,644,824	13,736,858	13,770,283	13,775,471	13,775,471	13,773,005
Industrial Therms	2,915,647	2,631,606	2,599,238	2,560,016	2,522,413	2,486,426	2,452,108	2,419,381	2,388,176	2,358,402	2,329,864	2,302,412	2,275,949	2,250,564	2,226,326	2,203,143	2,181,073	2,160,043	2,139,931	2,120,708	2,120,708	2,102,270
Ind., Inst., & Cmcl. Interrup. Therms	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485
Total Core Therms	26,834,511	27,202,410	26,934,133	26,797,540	26,813,105	26,960,969	27,172,420	27,218,950	27,278,171	27,408,530	27,581,329	27,596,404	27,595,234	27,746,698	28,144,241	28,180,895	28,239,338	28,387,319	28,430,911	28,444,384	28,469,704	28,451,873
Daily Baseload Therms	19,376	19,641	19,448	19,349	19,360	19,467	19,620	19,653	19,696	19,790	19,915	19,926	19,925	20,034	20,321	20,348	20,390	20,497	20,528	20,538	20,556	20,543
Peak Day Therms	307,479	308,091	310,284	313,117	315,906	318,638	321,311	323,926	326,469	328,953	331,379	333,762	336,115	338,396	340,633	342,797	344,889	346,922	348,883	350,786	352,470	354,342
Therms Per Residential Customer	619	593	584	578	576	575	575	572	571	570	570	567	565	566	569	567	566	566	564	562	560	557
Therms Per Commercial Customer	3,518	3,832	3,772	3,724	3,700	3,709	3,731	3,723	3,709	3,716	3,729	3,716	3,693	3,696	3,756	3,746	3,738	3,748	3,743	3,731	3,731	3,717
Therms Per Industrial Customer	37,866	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246	34,246
Residential Customers	19,163	19,193	19,340	19,531	19,719	19,903	20,083	20,259	20,430	20,597	20,760	20,920	21,078	21,231	21,381	21,526	21,666	21,802	21,933	22,060	22,184	22,309
Commercial Customers	3,387	3,402	3,418	3,436	3,455	3,473	3,490	3,508	3,525	3,542	3,558	3,574	3,590	3,606	3,621	3,636	3,651	3,665	3,679	3,693	3,693	3,706
Industrial Customers	77	77	76	75	74	73	72	71	70	69	68	67	66	66	65	64	64	63	62	62	62	61
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	22,631	22,676	22,837	23,046	23,251	23,452	23,649	23,842	24,029	24,212	24,390	24,565	24,739	24,907	25,071	25,231	25,384	25,534	25,678	25,818	25,942	26,080
Baker																						
Total Therms Pct. Growth		0.21%	-1.21%	-1.28%	-0.78%	-0.30%	-0.08%	-0.40%	-0.28%	0.00%	0.12%	-0.33%	-0.18%	0.26%	0.71%	-0.03%	0.06%	0.27%	0.13%	-0.03%	0.06%	0.12%
Residential Therms	2,086,237	1,836,826	1,812,891	1,791,312	1,779,154	1,774,752	1,773,688	1,763,686	1,758,072	1,757,366	1,759,470	1,749,222	1,746,160	1,753,686	1,766,171	1,765,669	1,768,520	1,774,461	1,779,848	1,779,325	1,782,675	1,785,945
Commercial Therms	1,549,125	1,731,030	1,722,389	1,720,800	1,722,845	1,730,631	1,740,217	1,744,711	1,746,882	1,752,799	1,759,288	1,761,109	1,760,543	1,764,263	1,778,232	1,778,494	1,778,092	1,781,293	1,779,246	1,777,351	1,777,351	1,773,011
Industrial Therms	75,629	150,990	138,529	114,806	96,474	82,439	71,130	62,290	55,556	50,382	46,105	42,651	39,820	37,644	36,276	35,490	35,012	35,691	36,938	38,104	38,104	40,189
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	3,710,992	3,718,847	3,673,811	3,626,919	3,598,475	3,587,823	3,585,037	3,570,687	3,560,512	3,560,547	3,564,864	3,552,983	3,546,523	3,555,594	3,580,680	3,579,655	3,581,625	3,591,446	3,596,033	3,594,781	3,598,131	3,599,147
Daily Baseload Therms	3,032	3,039	3,002	2,964	2,940	2,932	2,930	2,918	2,909	2,909	2,913	2,903	2,898	2,905	2,926	2,925	2,927	2,935	2,938	2,937	2,940	2,941
Peak Day Therms	26,215	26,284	26,241	26,192	26,178	26,177	26,176	26,189	26,214	26,260	26,298	26,350	26,408	26,472	26,556	26,645	26,733	26,862	26,979	27,114	27,250	27,387
Therms Per Residential Customer	622	547	541	536	533	532	532	529	527	526	526	522	520	521	523	521	520	519	518	515	513	511
Therms Per Commercial Customer	3,130	3,454	3,429	3,409	3,398	3,398	3,403	3,397	3,389	3,388	3,390	3,382	3,370	3,368	3,386	3,379	3,372	3,372	3,367	3,359	3,359	3,350
Therms Per Industrial Customer	18,907	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587	38,587
Residential Customers	3,354	3,358	3,351	3,342	3,338	3,336	3,334	3,334	3,336	3,341	3,345	3,351	3,358	3,366	3,377	3,389	3,401	3,419	3,436	3,455	3,475	3,495
Commercial Customers	495	501	502	505	507	509	511	514	515	517	519	521	522	524	525	526	527	528	528	529	529	529
Industrial Customers	4	4	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	3,854	3,864	3,858	3,851	3,849	3,848	3,848	3,850	3,854	3,861	3,866	3,874	3,882	3,892	3,904	3,917	3,930	3,949	3,966	3,986	4,006	4,026
Bend																						
Total Therms Pct. Growth		6.35%	-0.04%	0.04%	0.84%	1.69%	1.80%	1.29%	1.29%	1.66%	1.76%	1.18%	1.21%	1.80%	2.68%	1.32%	1.50%	1.77%	1.40%	1.30%	1.89%	1.86%
Residential Therms	27,584,941	28,772,922	28,817,644	28,807,500	29,042,526	29,476,620	29,874,771	30,197,085	30,562,032	30,973,464	31,389,360	31,680,714	32,062,720	32,577,510	33,146,540	33,496,669	33,941,726	34,391,984	34,753,641	35,118,019	35,485,813	35,856,975
Commercial Therms	17,303,858	18,573,754	18,646,671	18,811,323	19,113,577	19,632,103	20,247,173	20,677,222	21,064,786	21,604,706	22,203,940	22,619,070	22,965,598	23,512,820	24,521,531	24,991,491	25,477,080	26,132,255	26,663,929	27,137,605	27,137,605	27,600,383
Industrial Therms	1,764,667	2,269,166	2,133,700	2,001,048	1,882,300	1,775,927	1,680,285	1,594,290	1,516,624	1,446,462	1,382,798	1,324,599	1,271,625	1,223,056	1,178,948	1,138,442	1,101,696	1,068,058	1,037,262	1,009,095	1,009,095	983,262
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	46,653,467	49,615,843	49,598,016	49,619,872	50,038,404	50,884,650	51,802,229	52,468,597	53,143,443	54,024,633	54,976,100	55,624,384	56,299,944	57,313,387	58,847,020	59,626,602	60,520,502	61,592,298	62,454,834	63,264,720	63,632,514	64,440,621
Daily Baseload Therms	39,309	41,805	41,790	41,808	42,161	42,874	43,647	44,209	44,777	45,520	46,321	46,868	47,437	48,291	49,583	50,240	50,993	51,896	52,623	53,305	53,615	54,296
Peak Day Therms	571,037	579,456	581,983	588,952	597,626	606,422	615,282	624,249	633,293	642,457	651,713	661,047	670,533	680,067	689,749	699,491	709,353	719,317	729,386	739,558	747,774	758,169
Therms Per Residential Customer	738	758	758	750	746	747	747	745	744	744	744	741	740	742	745	743	743	743	741	739	737	735
Therms Per Commercial Customer	2,779	2,959	2,907	2,868	2,852	2,867	2,894	2,895	2,889	2,904	2,925	2,922	2,909	2,922	2,990	2,991	2,994	3,015	3,022	3,021	3,021	3,019
Therms Per Industrial Customer	32,085	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402	41,402
Residential Customers	37,366	37,959	38,018	38,410	38,931	39,460	39,993	40,533	41,078	41,631	42,190	42,754	43,328	43,905	44,492	45,083	45,682	46,288	46,901	47,521	48,149	48,785
Commercial Customers	6,226	6,277	6,414	6,558	6,703	6,849	6,995	7,143	7,291	7,440	7,590	7,741	7,893	8,046	8,200	8,355	8,511	8,667	8,825	8,983	8,983	9,142
Industrial Customers	55	55	52	48	45	43	41	39	37	35	33	32	31	30	28	27	27	26	25	24	24	24
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	43,648	44,291	44,485	45,017	45,680	46,353	47,030	47,715	48,407	49,107	49,815	50,528	51,253	51,982	52,722	53,467	54,220	54,982	55,752	56,529	57,157	57,952
Ontario																						
Total Therms Pct. Growth		15.43%	2.82%	-1.55%	-0.89%	0.12%	0.72%	-0.06%	-0.32%	0.33%	0.56%	-0.08%	-0.42%	0.26%	1.93%	0.29%	0.07%	0.80%	0.24%	0.14%	0.30%	0.40%
Residential Therms	1,887,207	1,898,234	2,121,352	2,102,198	2,086,603	2,076,671	2,077,079	2,079,250	2,075,978	2,073,998	2,075,558	2,079,767	2,078,049	2,075,837	2,079,977	2,096,866	2,098,651	2,105,839	2,112,158	2,118,405	2,127,534	2,136,181
Commercial Therms	2,361,432	2,784,458	2,702,206	2,631,640	2,594,147	2,604,554	2,636,733	2,625,901	2,607,320	2,621,518	2,644,861	2,631,399	2,605,994	2,617,526	2,711,577	2,705,946	2,703,519	2,735,728	2,738,445	2,735,704	2,735,704	2,735,826
Industrial Therms	288,166	554,177	560,803	567,001	572,845	578,536	584,073	589,409	594,549	599,664	604,510	609,302	613,837	618,375	622,834	627,095	631,295	635,527	639,541	643,595	643,595	647,725
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	4,536,805	5,236,869	5,384,361	5,300,839	5,253,595	5,259,761	5,297,886	5,294,560	5,277,847	5,295,180	5,324,928	5,320,467	5,297,880	5,311,738	5,414,387	5,429,907	5,433,465	5,477,094	5,490,144	5,497,704	5,506,833	5,519,732
Daily Baseload Therms	3,370	3,890	4,000	3,938	3,903	3,907	3,936	3,933	3,921	3,934	3,956	3,952	3,936	3,946	4,022	4,034	4,036	4,069	4,078	4,084	4,091	4,100
Peak Day Therms	30,432	30,662	30,676	30,609	30,549	30,500	30,492	30,466	30,457	30,491	30,510	30,543	30,579	30,637	30,707	30,775	30,853	31,007	31,085	31,215	31,371	31,568
Therms Per Residential Customer	525	525	587	583	579	578	578	579	578	577	577	578	577	575	575	578	577	576	577	576	575	574
Therms Per Commercial Customer	2,714	3,154	3,058	2,985	2,948	2,965	3,003	2,993	2,973	2,987	3,011	2,993	2,960	2,968	3,067	3,054	3,043	3,064	3,059	3,042	3,042	3,022
Therms Per Industrial Customer	28,817	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096	55,096
Residential Customers	3,594	3,615	3,616	3,608	3,601	3,595	3,594	3,591	3,590	3,594	3,596	3,600	3,604	3,611	3,619	3,627	3,636	3,654	3,663	3,678	3,701	3,724
Commercial Customers	870	883	884	882	880	878	878	877	877	878	878	879	880	882	884	886	888	893	895	899	899	905
Industrial Customers	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	12	12	12	12	12
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	4,474	4,508	4,510	4,500	4,491	4,484	4,483	4,479	4,478	4,483	4,485	4,490	4,496	4,504	4,514	4,524	4,536	4,559	4,570	4,589	4,612	4,641
Pendleton																						
Total Therms Pct. Growth		8.37%	0.34%	0.81%	1.20%	1.43%	1.42%	1.13%	1.14%	1.26%	1.22%	0.93%	0.86%	1.25%	1.36%	0.84%	0.78%	0.88%	0.78%	0.53%	0.84%	0.88%
Residential Therms	5,560,032	5,786,265	5,808,192	5,881,356	5,999,389	6,137,987	6,274,998	6,385,659	6,505,042	6,634,438	6,760,152	6,857,588	6,950,952	7,093,388	7,231,974	7,324,800	7,410,932	7,506,300	7,596,428	7,651,476	7,700,680	7,765,278
Commercial Therms	5,980,426	6,184,763	6,207,935	6,241,301	6,282,250	6,335,621	6,393,027	6,437,834	6,478,505	6,526,871	6,576,584	6,614,542	6,647,158	6,689,387	6,754,334	6,788,299	6,821,083	6,861,193	6,892,757	6,920,124	6,920,124	6,945,134
Industrial Therms	684,950	1,277,756	1,278,175	1,279,652	1,281,167	1,282,722	1,284,247	1,285,768	1,287,245	1,288,687	1,290,057	1,291,399	1,292,680	1,293,864	1,294,949	1,295,920	1,296,751	1,297,489	1,298,093	1,298,600	1,298,600	1,298,988
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	12,225,408	13,248,784	13,294,302	13,402,310	13,562,806	13,756,331	13,952,272	14,109,261	14,270,792	14,449,996	14,626,793	14,763,530	14,890,790	15,076,640	15,281,257	15,409,019	15,528,766	15,664,982	15,787,278	15,870,199	15,919,403	16,009,400
Daily Baseload Therms	12,569	13,621	13,668	13,779	13,944	14,143	14,344	14,506	14,672	14,856	15,038	15,178	15,309	15,500	15,710	15,842	15,965	16,105	16,231	16,316	16,367	16,459
Peak Day Therms	196,962	198,054	201,452	205,845	210,314	214,732	219,097	223,396	227,611	231,759	235,790	239,754	243,619	247,351	250,935	254,370	257,607	260,698	263,623	266,368	268,765	271,377
Therms Per Residential Customer	526	545	537	531	529	529	529	527	526	526	526	524	522	524	526	525	524	524	524	522	520	519
Therms Per Commercial Customer	3,286	3,360	3,345	3,333	3,325	3,325	3,327	3,322	3,317	3,315	3,315	3,310	3,302	3,300	3,309	3,304	3,299	3,298	3,294	3,288	3,288	3,282
Therms Per Industrial Customer	29,780	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584	55,584
Residential Customers	10,569	10,617	10,816	11,076	11,341	11,603	11,862	12,117	12,367	12,613	12,852	13,087	13,316	13,537	13,749	13,952	14,143	14,325	14,497	14,658	14,809	14,962
Commercial Customers	1,820	1,841	1,856	1,873	1,889	1,906	1,922	1,938	1,953	1,969	1,984	1,998	2,013	2,027	2,041	2,054	2,067	2,080	2,092	2,104	2,104	2,116
Industrial Customers	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	12,412	12,481	12,695	12,972	13,253	13,532	13,807	14,078	14,343	14,605	14,859	15,109	15,352	15,587	15,813	16,030	16,234	16,428	16,613	16,786	16,937	17,101

Cascade Natural Gas
2011 IRP Demand Forecast
Low Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Washington																						
Total Therms Pct. Growth		5.77%	2.74%	0.97%	1.39%	1.71%	1.75%	1.52%	1.49%	1.60%	1.64%	1.39%	1.34%	1.62%	1.90%	1.46%	1.38%	1.48%	1.35%	1.25%	1.92%	1.88%
Residential Therms	106,725,615	110,110,683	115,036,211	116,003,668	117,737,121	119,922,480	122,151,098	124,144,673	126,171,493	128,326,530	130,553,553	132,471,566	134,385,335	136,806,804	139,458,684	141,725,339	143,826,975	146,043,151	148,126,702	150,041,085	151,933,091	153,812,331
Commercial Therms	84,630,702	92,408,956	93,504,007	94,821,074	96,322,508	98,109,225	100,015,871	101,673,697	103,268,195	105,052,596	106,904,724	108,517,720	110,039,005	111,805,701	114,131,441	115,776,273	117,423,469	119,264,054	120,941,357	122,535,832	122,535,832	124,105,227
Industrial Therms	9,342,671	9,875,967	9,735,657	9,584,481	9,446,368	9,320,265	9,205,654	9,101,583	9,007,170	8,921,723	8,844,183	8,773,742	8,709,692	8,652,127	8,600,573	8,555,022	8,514,892	8,479,933	8,449,826	8,424,379	8,424,379	8,402,677
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	202,732,810	214,429,428	220,309,696	222,443,045	225,539,819	229,385,792	233,406,445	236,953,775	240,480,679	244,334,671	248,336,282	251,796,850	255,167,854	259,298,454	264,224,520	268,090,456	271,799,158	275,820,960	279,551,707	283,035,117	284,927,123	288,354,056
Daily Baseload Therms	185,494	196,888	202,435	204,465	207,402	211,032	214,799	218,142	221,478	225,112	228,875	232,145	235,342	239,253	243,857	247,497	251,008	254,802	258,331	261,634	263,417	266,677
Peak Day Therms	2,773,089	2,782,098	2,816,231	2,865,847	2,920,408	2,975,290	3,030,462	3,085,952	3,141,607	3,197,558	3,253,781	3,310,326	3,367,311	3,424,493	3,481,856	3,539,480	3,597,229	3,655,117	3,713,209	3,771,480	3,822,695	3,882,167
Therms Per Residential Customer	626	644	665	659	657	656	656	655	654	653	653	651	649	650	652	651	650	650	649	647	645	643
Therms Per Commercial Customer	3,434	3,734	3,712	3,695	3,685	3,685	3,690	3,685	3,678	3,677	3,678	3,671	3,661	3,658	3,674	3,668	3,661	3,661	3,656	3,648	3,648	3,639
Therms Per Industrial Customer	26,392	27,871	28,033	28,203	28,366	28,522	28,670	28,810	28,944	29,070	29,191	29,306	29,415	29,519	29,617	29,710	29,798	29,881	29,960	30,034	30,034	30,105
Residential Customers	170,540	170,986	172,927	175,955	179,337	182,737	186,153	189,585	193,028	196,486	199,960	203,454	206,972	210,502	214,042	217,597	221,159	224,729	228,310	231,902	235,506	239,179
Commercial Customers	24,642	24,749	25,187	25,662	26,140	26,622	27,106	27,592	28,081	28,572	29,065	29,561	30,060	30,561	31,063	31,568	32,072	32,577	33,084	33,592	33,592	34,100
Industrial Customers	354	354	347	340	333	327	321	316	311	307	303	299	296	293	290	288	286	284	282	280	280	279
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	195,564	196,117	198,490	201,985	205,838	209,713	213,608	217,521	221,448	225,392	229,356	233,342	237,356	241,384	245,424	249,480	253,545	257,618	261,704	265,802	269,406	273,586
Oregon																						
Total Therms Pct. Growth		6.99%	0.18%	0.00%	0.70%	1.43%	1.56%	1.08%	1.07%	1.41%	1.50%	0.98%	0.98%	1.53%	2.30%	1.11%	1.21%	1.48%	1.16%	1.03%	1.52%	1.52%
Residential Therms	37,118,417	38,294,247	38,560,079	38,582,366	38,907,672	39,466,030	40,000,536	40,425,680	40,901,124	41,439,266	41,984,540	42,367,291	42,837,881	43,500,421	44,224,662	44,684,004	45,219,829	45,778,584	46,242,075	46,667,225	47,096,702	47,544,379
Commercial Therms	27,194,841	29,274,005	29,279,202	29,405,064	29,712,819	30,302,909	31,017,150	31,485,668	31,897,494	32,505,894	33,184,673	33,626,120	33,979,293	34,583,997	35,765,675	36,264,230	36,779,773	37,510,469	38,074,377	38,570,784	38,570,784	39,054,354
Industrial Therms	2,813,412	4,252,089	4,111,207	3,962,507	3,832,786	3,719,624	3,619,736	3,531,756	3,453,974	3,385,194	3,323,470	3,267,950	3,217,962	3,172,939	3,133,006	3,096,947	3,064,754	3,036,765	3,011,834	2,989,394	2,989,394	2,970,164
Ind., Inst., & Cmcl. Interrup. Therms	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Therms	67,126,672	71,820,343	71,950,489	71,949,940	72,453,280	73,488,565	74,637,423	75,443,107	76,252,595	77,330,356	78,492,685	79,261,363	80,035,138	81,257,359	83,123,345	84,045,183	85,064,359	86,325,820	87,328,289	88,227,404	88,656,882	89,568,899
Daily Baseload Therms	58,280	62,355	62,459	62,489	62,948	63,856	64,856	65,565	66,279	67,219	68,228	68,901	69,579	70,642	72,241	73,040	73,921	75,004	75,870	76,642	77,012	77,796
Peak Day Therms	824,646	834,456	840,352	851,599	864,667	877,830	891,047	904,300	917,576	930,967	944,311	957,694	971,139	984,528	997,947	1,011,282	1,024,547	1,037,885	1,051,073	1,064,255	1,075,160	1,088,500
Therms Per Residential Customer	676	689	691	684	680	681	680	679	677	677	677	675	673	675	678	677	676	676	675	673	672	670
Therms Per Commercial Customer	2,890	3,081	3,032	2,995	2,977	2,988	3,009	3,007	2,999	3,009	3,025	3,019	3,005	3,013	3,070	3,068	3,067	3,083	3,085	3,082	3,082	3,077
Therms Per Industrial Customer	30,581	46,336	46,560	46,827	47,080	47,318	47,545	47,758	47,958	48,146	48,324	48,492	48,651	48,801	48,940	49,070	49,190	49,298	49,397	49,489	49,489	49,572
Residential Customers	54,883	55,549	55,801	56,436	57,211	57,994	58,783	59,575	60,371	61,179	61,983	62,792	63,606	64,419	65,237	66,051	66,862	67,686	68,497	69,312	70,134	70,966
Commercial Customers	9,411	9,502	9,656	9,817	9,979	10,142	10,307	10,471	10,637	10,804	10,971	11,139	11,309	11,479	11,651	11,822	11,994	12,169	12,341	12,516	12,516	12,692
Industrial Customers	92	92	88	85	81	79	76	74	72	70	69	67	66	65	64	63	62	62	61	60	60	60
Interruptible Customers																						
Total Core Customers	64,386	65,142	65,545	66,338	67,272	68,215	69,166	70,120	71,080	72,053	73,023	73,999	74,981	75,963	76,952	77,936	78,918	79,916	80,899	81,888	82,710	83,718
System																						
Total Therms Pct. Growth		6.07%	2.10%	0.73%	1.22%	1.64%	1.71%	1.41%	1.39%	1.56%	1.61%	1.29%	1.25%	1.60%	1.99%	1.38%	1.34%	1.48%	1.31%	1.19%	1.83%	1.79%
Residential Therms	143,844,032	148,404,930	153,596,290	154,586,035	156,644,794	159,388,511	162,151,634	164,570,353	167,072,617	169,765,797	172,538,093	174,838,857	177,223,216	180,307,225	183,683,346	186,409,343	189,046,804	191,821,735	194,368,777	196,708,310	199,029,793	201,356,710
Commercial Therms	111,825,543	121,682,961	122,783,208	124,226,138	126,035,327	128,412,134	131,033,021	133,159,365	135,165,689	137,558,490	140,089,397	142,143,841	144,018,298	146,389,697	149,897,115	152,040,503	154,203,243	156,774,523	159,015,734	161,106,615	161,106,615	163,159,581
Industrial Therms	12,156,083	14,128,055	13,846,863	13,546,988	13,279,154	13,039,889	12,825,390	12,633,339	12,461,144	12,306,917	12,167,653	12,041,693	11,927,654	11,825,066	11,733,580	11,651,969	11,579,646	11,516,698	11,461,660	11,413,773	11,413,773	11,372,841
Ind., Inst., & Cmcl. Interrup. Therms	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824
Total Core Therms	269,859,482	286,249,771	292,260,185	294,392,984	297,993,099	302,874,358	308,043,869	312,396,881	316,733,274	321,665,027	326,828,967	331,058,214	335,202,992	340,555,813	347,347,865	352,135,639	356,863,517	362,146,780	366,879,996	371,262,522	373,584,005	377,922,956
Daily Baseload Therms	243,774	259,243	264,895	266,953	270,350	274,887	279,655	283,707	287,757	292,330	297,103	301,046	304,922	309,895	316,098	320,537	324,929	329,806	334,201	338,277	340,430	344,473
Peak Day Therms	3,597,736	3,616,554	3,656,583	3,717,445	3,785,075	3,853,120	3,921,510	3,990,253	4,059,184	4,128,525	4,198,093	4,268,020	4,338,450	4,409,020	4,479,803	4,550,761	4,621,776	4,693,002	4,764,281	4,835,735	4,897,855	4,970,667
Therms Per Residential Customer	638	655	672	665	662	662	662	661	659	659	659	657	655	656	658	657	656	656	655	653	651	649
Therms Per Commercial Customer	3,284	3,553	3,524	3,501	3,489	3,493	3,502	3,498	3,491	3,494	3,499	3,492	3,481	3,482	3,509	3,504	3,499	3,504	3,501	3,494	3,494	3,487
Therms Per Industrial Customer	27,256	31,669	31,788	31,916	32,042	32,166	32,287	32,404	32,517	32,626	32,731	32,831	32,928	33,020	33,108	33,191	33,270	33,344	33,415	33,482	33,482	33,545
Residential Customers	225,423	226,535	228,728	232,391	236,548	240,731	244,936	249,160	253,399	257,665	261,943	266,246	270,578	274,921	279,279	283,648	288,021	292,415	296,807	301,214	305,640	310,145
Commercial Customers	34,053	34,250	34,843	35,479	36,119	36,764	37,413	38,064	38,718	39,375	40,036	40,700	41,369	42,040	42,714	43,389	44,066	44,746	45,425	46,107	46,107	46,793
Industrial Customers	446	446	436	424	414	405	397	390	383	377	372	367	362	358	354	351	348	345	343	341	341	339
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	259,950	261,260	264,035	268,323	273,110	277,928	282,774	287,642	292,528	297,446	302,379	307,341	312,337	317,347	322,375	327,416	332,463	337,534	342,603	347,690	352,116	357,305

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Aberdeen																						
Total Therms Pct. Growth		2.27%	4.30%	0.62%	0.68%	0.64%	0.66%	0.73%	0.69%	0.66%	0.67%	0.73%	0.71%	0.66%	0.60%	0.78%	0.69%	0.67%	0.72%	0.72%	0.61%	0.60%
Residential Therms	3,518,892	3,547,730	3,896,347	3,892,667	3,895,996	3,899,456	3,905,602	3,912,209	3,913,157	3,913,100	3,913,859	3,914,582	3,911,693	3,905,662	3,902,327	3,903,989	3,896,432	3,888,439	3,881,258	3,871,806	3,860,477	3,848,536
Commercial Therms	5,012,117	5,100,835	5,168,116	5,233,573	5,297,704	5,357,833	5,416,999	5,483,386	5,551,761	5,618,470	5,685,433	5,758,570	5,834,139	5,906,965	5,970,808	6,048,969	6,127,970	6,204,583	6,285,887	6,369,955	6,369,955	6,454,910
Industrial Therms	119,051	214,546	211,898	212,667	213,742	215,227	216,955	219,088	221,497	224,110	226,965	230,025	233,205	236,966	240,775	245,184	249,650	254,438	259,646	265,020	265,020	270,565
Ind., Inst., & Cmcl. Interrup. Therms	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299	739,299
Total Core Therms	9,389,359	9,602,410	10,015,660	10,078,206	10,146,740	10,211,814	10,278,854	10,353,981	10,425,714	10,494,978	10,565,556	10,642,475	10,718,335	10,788,892	10,853,208	10,937,440	11,013,351	11,086,759	11,166,089	11,246,080	11,234,750	11,313,309
Daily Baseload Therms	7,985	8,167	8,518	8,571	8,629	8,685	8,742	8,806	8,867	8,926	8,986	9,051	9,116	9,176	9,230	9,302	9,367	9,429	9,496	9,564	9,555	9,622
Peak Day Therms	82,192	83,030	83,416	83,969	84,640	85,286	85,933	86,584	87,207	87,846	88,472	89,101	89,728	90,331	90,947	91,553	92,145	92,737	93,317	93,899	94,349	94,916
Therms Per Residential Customer	671	671	733	728	723	718	713	709	704	699	694	689	684	679	673	669	664	658	653	648	642	636
Therms Per Commercial Customer	4,408	4,405	4,432	4,458	4,481	4,501	4,519	4,542	4,567	4,590	4,612	4,639	4,667	4,693	4,711	4,739	4,768	4,795	4,825	4,856	4,856	4,888
Therms Per Industrial Customer	9,158	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811	14,811
Residential Customers	5,247	5,290	5,312	5,347	5,391	5,433	5,475	5,517	5,557	5,598	5,638	5,678	5,718	5,756	5,795	5,833	5,870	5,907	5,943	5,979	6,014	6,049
Commercial Customers	1,137	1,158	1,166	1,174	1,182	1,190	1,199	1,207	1,216	1,224	1,233	1,241	1,250	1,259	1,268	1,276	1,285	1,294	1,303	1,312	1,312	1,321
Industrial Customers	13	14	14	14	14	15	15	15	15	15	15	16	16	16	16	17	17	17	18	18	18	18
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	6,400	6,465	6,495	6,538	6,591	6,641	6,691	6,742	6,791	6,840	6,889	6,938	6,987	7,034	7,082	7,129	7,175	7,221	7,266	7,312	7,347	7,391
Bellingham																						
Total Therms Pct. Growth		18.04%	1.59%	1.24%	1.94%	2.36%	2.49%	1.98%	1.88%	2.25%	2.15%	1.68%	1.67%	2.25%	2.55%	1.62%	1.78%	1.85%	1.63%	1.46%	2.71%	2.66%
Residential Therms	26,890,852	30,913,542	31,504,548	31,946,500	32,687,256	33,565,434	34,499,326	35,295,120	36,091,706	37,047,194	37,958,167	38,717,700	39,530,610	40,625,937	41,736,960	42,563,758	43,512,236	44,467,894	45,363,873	46,200,440	47,038,749	47,885,129
Commercial Therms	13,256,906	16,512,539	16,699,469	16,876,419	17,111,492	17,441,653	17,807,279	18,070,768	18,301,463	18,595,383	18,905,402	19,119,794	19,290,052	19,541,504	19,991,085	20,181,433	20,366,637	20,615,758	20,798,243	20,945,455	20,945,455	21,077,961
Industrial Therms	881,544	1,034,198	1,027,958	1,024,096	1,020,842	1,018,124	1,015,892	1,014,127	1,012,904	1,012,028	1,011,509	1,011,317	1,011,510	1,012,103	1,012,981	1,014,234	1,015,834	1,017,694	1,019,819	1,022,242	1,022,242	1,024,920
Ind., Inst., & Cmcl. Interrup. Therms	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424	169,424
Total Core Therms	41,198,726	48,629,704	49,401,399	50,016,439	50,989,015	52,194,636	53,491,921	54,549,439	55,575,497	56,824,030	58,044,502	59,018,236	60,001,597	61,348,969	62,910,450	63,928,850	65,064,131	66,270,770	67,351,359	68,337,562	69,175,871	70,157,435
Daily Baseload Therms	40,559	47,874	48,634	49,240	50,197	51,384	52,661	53,702	54,712	55,942	57,143	58,102	59,070	60,396	61,933	62,936	64,054	65,242	66,305	67,276	68,102	69,068
Peak Day Therms	695,389	723,529	738,840	757,362	777,795	798,325	819,017	839,840	860,772	881,901	903,146	924,621	946,207	967,869	989,695	1,011,596	1,033,606	1,055,762	1,077,980	1,100,359	1,121,154	1,144,105
Therms Per Residential Customer	663	733	732	724	721	721	722	720	718	719	719	716	714	717	720	718	718	718	717	715	713	711
Therms Per Commercial Customer	2,760	3,305	3,255	3,212	3,183	3,172	3,169	3,148	3,123	3,110	3,100	3,075	3,044	3,028	3,042	3,018	2,994	2,980	2,958	2,932	2,932	2,904
Therms Per Industrial Customer	22,604	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693	26,693
Residential Customers	40,531	42,174	43,039	44,125	45,336	46,554	47,783	49,021	50,267	51,526	52,793	54,075	55,365	56,661	57,968	59,281	60,602	61,933	63,269	64,616	65,973	67,358
Commercial Customers	4,803	4,996	5,131	5,254	5,376	5,498	5,619	5,740	5,860	5,980	6,099	6,218	6,337	6,455	6,572	6,688	6,803	6,918	7,031	7,145	7,145	7,257
Industrial Customers	39	39	39	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	45,377	47,213	48,212	49,421	50,754	52,094	53,444	54,803	56,169	57,548	58,934	60,335	61,744	63,157	64,582	66,011	67,447	68,893	70,343	71,803	73,160	74,658
Bremerton																						
Total Therms Pct. Growth		14.35%	1.62%	1.98%	2.61%	2.72%	2.77%	2.61%	2.68%	2.64%	2.70%	2.54%	2.53%	2.65%	2.65%	2.45%	2.52%	2.47%	2.47%	2.38%	3.64%	3.63%
Residential Therms	18,579,097	21,234,902	21,290,850	21,502,190	21,929,645	22,421,511	22,952,400	23,430,505	23,945,404	24,469,219	25,034,112	25,541,368	26,054,588	26,645,466	27,283,390	27,819,648	28,401,456	28,990,704	29,588,880	30,155,398	30,769,859	31,362,558
Commercial Therms	9,011,610	10,334,123	10,795,538	11,226,342	11,661,075	12,093,471	12,530,614	12,989,564	13,460,599	13,934,871	14,417,140	14,923,428	15,444,709	15,963,170	16,465,001	17,010,572	17,566,614	18,123,862	18,700,159	19,293,212	19,293,212	19,899,135
Industrial Therms	107,569	155,282	159,208	163,132	167,112	171,133	175,205	179,336	183,513	187,749	192,038	196,391	200,798	205,264	209,791	214,382	219,033	223,742	228,519	233,363	233,363	238,267
Ind., Inst., & Cmcl. Interrup. Therms	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625	357,625
Total Core Therms	28,055,901	32,081,931	32,603,220	33,249,288	34,115,457	35,043,739	36,015,843	36,957,030	37,947,140	38,949,464	40,000,915	41,018,812	42,057,720	43,171,524	44,315,807	45,402,226	46,544,727	47,695,933	48,875,183	50,039,597	50,654,058	51,857,584
Daily Baseload Therms	31,620	36,157	36,745	37,473	38,449	39,495	40,591	41,651	42,767	43,897	45,082	46,229	47,400	48,655	49,945	51,169	52,457	53,754	55,083	56,396	57,088	58,445
Peak Day Therms	344,667	347,097	350,374	357,219	365,669	374,233	382,934	391,786	400,738	409,842	419,074	428,471	437,991	447,631	457,421	467,330	477,385	487,563	497,885	508,355	517,670	528,465
Therms Per Residential Customer	662	754	751	745	743	743	744	743	743	743	744	743	742	743	745	744	744	744	744	743	743	742
Therms Per Commercial Customer	3,569	3,899	3,919	3,939	3,956	3,970	3,984	4,001	4,020	4,037	4,054	4,075	4,097	4,117	4,130	4,153	4,175	4,196	4,220	4,245	4,245	4,271
Therms Per Industrial Customer	107,569	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613	148,613
Residential Customers	28,073	28,163	28,350	28,862	29,515	30,177	30,850	31,535	32,228	32,933	33,648	34,376	35,114	35,862	36,622	37,392	38,174	38,966	39,770	40,586	41,413	42,257
Commercial Customers	2,525	2,651	2,755	2,850	2,948	3,046	3,145	3,246	3,348	3,451	3,556	3,662	3,770	3,877	3,987	4,096	4,207	4,319	4,431	4,545	4,545	4,659
Industrial Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
Interruptible Customers	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Core Customers	30,602	30,818	31,109	31,716	32,467	33,227	34,000	34,786	35,580	36,389	37,208	38,043	38,888	39,744	40,613	41,493	42,386	43,289	44,206	45,135	45,962	46,921
Kennewick																						
Total Therms Pct. Growth		10.35%	4.28%	2.99%	3.24%	3.32%	3.38%	3.17%	2.89%	2.85%	2.86%	2.69%	2.45%	2.41%	2.66%	2.52%	2.15%	2.15%	2.10%	1.93%	3.49%	3.39%
Residential Therms	11,151,277	11,699,773	12,363,673	12,765,485	13,251,242	13,768,316	14,334,383	14,927,775	15,493,569	16,060,382	16,666,103	17,293,830	17,894,097	18,485,737	19,127,395	19,870,733	20,510,189	21,159,896	21,852,518	22,525,728	23,192,426	23,872,738
Commercial Therms	12,529,798	14,190,902	14,663,760	15,087,905	15,522,837	15,980,184	16,437,841	16,838,266	17,205,858	17,585,472	17,956,046	18,271,739	18,553,232	18,849,427	19,215,656	19,448,244	19,660,733	19,881,913	20,057,589	20,200,193	20,200,193	20,319,650
Industrial Therms	237,748	525,606	528,272	532,622	537,287	542,427	547,980	553,902	560,190	566,811	573,794	581,064	588,687	596,693	605,016	613,743	622,798	632,258	642,008	652,146	652,146	662,598
Ind., Inst., & Cmcl. Interrup. Therms	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385	201,385
Total Core Therms	24,120,208	26,617,665	27,757,090	28,587,397	29,512,750	30,492,313	31,521,589	32,521,328	33,461,002	34,414,050	35,397,327	36,348,017	37,237,401	38,133,242	39,149,453	40,134,106	40,995,105	41,875,452	42,753,500	43,579,452	44,246,150	45,056,371
Daily Baseload Therms	19,422	21,433	22,350	23,019	23,764	24,553	25,381	26,186	26,943	27,710	28,502	29,268	29,984	30,705	31,523	32,316	33,010	33,718	34,425	35,091	35,627	36,280
Peak Day Therms	370,867	390,801	403,298	419,701	438,437	457,673	477,481	497,843	518,704	540,174	562,251	584,972	608,300	632,158	656,676	681,739	707,422	733,741	760,696	788,287	812,931	842,045
Therms Per Residential Customer	550	550	564	560	557	554	553	552	550	547	545	544	541	538	535	536	533	530	527	524	521	518
Therms Per Commercial Customer	4,091	4,273	4,207	4,142	4,080	4,026	3,972	3,905	3,834	3,767	3,699	3,623	3,543	3,469	3,409	3,329	3,249	3,174	3,095	3,014	3,014	2,933
Therms Per Industrial Customer	14,859	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369	32,369
Residential Customers	20,290	21,288	21,911	22,787	23,806	24,853	25,932	27,042	28,180	29,352	30,558	31,800	33,076	34,382	35,725	37,099	38,508	39,953	41,434	42,951	44,504	46,113
Commercial Customers	3,063	3,321	3,485	3,643	3,804	3,969	4,139	4,312	4,488	4,669	4,854	5,043	5,237	5,434	5,636	5,841	6,050	6,264	6,481	6,702	6,702	6,928
Industrial Customers	16	16	16	16	17	17	17	17	17	18	18	18	18	18	19	19	19	20	20	20	20	20
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	23,371	24,627	25,415	26,448	27,629	28,841	30,089	31,373	32,687	34,040	35,431	36,863	38,333	39,837	41,382	42,961	44,580	46,238	47,937	49,676	51,229	53,063
Longview																						
Total Therms Pct. Growth		9.46%	4.24%	1.17%	1.25%	1.18%	1.15%	1.30%	1.30%	1.23%	1.22%	1.32%	1.38%	1.23%	1.03%	1.36%	1.29%	1.21%	1.29%	1.31%	1.47%	1.44%
Residential Therms	1,361,463	1,349,283	1,566,346	1,565,640	1,577,472	1,591,054	1,605,642	1,622,173	1,636,834	1,651,269	1,666,771	1,682,753	1,698,765	1,712,652	1,728,441	1,747,715	1,763,000	1,778,382	1,794,800	1,810,477	1,825,300	1,840,146
Commercial Therms	4,560,755	4,955,350	5,040,762	5,125,783	5,205,230	5,278,001	5,347,985	5,429,176	5,512,981	5,592,502	5,671,274	5,758,815	5,852,795	5,937,351	6,004,243	6,096,623	6,188,734	6,274,790	6,368,016	6,465,002	6,465,002	6,562,164
Industrial Therms	532,335	771,602	774,039	777,762	781,676	785,980	790,509	795,369	800,378	805,661	811,110	816,705	822,590	828,523	834,603	840,979	847,427	853,977	860,721	867,585	867,585	874,449
Ind., Inst., & Cmcl. Interrup. Therms	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545	117,545
Total Core Therms	6,572,098	7,193,781	7,498,692	7,586,730	7,681,924	7,772,580	7,861,681	7,964,263	8,067,737	8,166,977	8,266,699	8,375,818	8,491,695	8,596,072	8,684,832	8,802,862	8,916,707	9,024,694	9,141,081	9,260,609	9,275,432	9,394,305
Daily Baseload Therms	7,571	8,287	8,638	8,739	8,849	8,953	9,056	9,174	9,293	9,408	9,523	9,648	9,782	9,902	10,004	10,140	10,271	10,396	10,530	10,668	10,685	10,822
Peak Day Therms	81,619	81,383	80,792	81,433	82,508	83,638	84,768	85,973	87,175	88,405	89,660	90,935	92,286	93,584	94,928	96,323	97,713	99,123	100,559	102,017	103,151	104,625
Therms Per Residential Customer	530	530	625	620	616	612	609	606	602	598	595	591	587	583	579	576	572	567	564	559	555	551
Therms Per Commercial Customer	3,990	4,293	4,319	4,342	4,361	4,372	4,380	4,396	4,414	4,427	4,439	4,458	4,479	4,494	4,496	4,515	4,535	4,550	4,569	4,590	4,590	4,612
Therms Per Industrial Customer	18,356	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907	25,907
Residential Customers	2,571	2,548	2,508	2,524	2,560	2,598	2,636	2,677	2,718	2,760	2,803	2,847	2,894	2,939	2,986	3,035	3,084	3,134	3,185	3,237	3,289	3,342
Commercial Customers	1,143	1,154	1,167	1,180	1,194	1,207	1,221	1,235	1,249	1,263	1,278	1,292	1,307	1,321	1,335	1,350	1,365	1,379	1,394	1,408	1,408	1,423
Industrial Customers	29	30	30	30	30	30	31	31	31	31	31	32	32	32	32	32	33	33	33	33	33	34
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	3,745	3,734	3,707	3,736	3,786	3,838	3,889	3,945	4,000	4,056	4,114	4,172	4,234	4,294	4,356	4,420	4,483	4,548	4,614	4,681	4,733	4,801

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Moses Lake																						
Total Therms Pct. Growth		1.94%	2.83%	0.81%	1.03%	1.40%	1.64%	1.45%	1.28%	1.41%	1.55%	1.38%	1.20%	1.37%	1.90%	1.58%	1.33%	1.50%	1.45%	1.37%	1.16%	1.11%
Residential Therms	986,252	990,526	1,059,425	1,047,322	1,036,477	1,029,775	1,028,543	1,028,585	1,023,404	1,015,933	1,011,828	1,008,505	1,000,211	989,913	983,792	987,050	977,486	968,308	961,642	952,599	941,711	930,418
Commercial Therms	2,392,003	2,433,007	2,445,442	2,457,900	2,477,436	2,507,714	2,542,339	2,567,136	2,589,346	2,618,793	2,650,628	2,673,279	2,692,305	2,720,329	2,768,760	2,792,103	2,815,516	2,846,095	2,870,723	2,892,556	2,892,556	2,913,493
Industrial Therms	574,965	606,550	639,164	672,330	706,696	742,316	779,116	817,224	856,699	897,607	940,073	984,102	1,029,524	1,076,679	1,125,114	1,175,704	1,227,551	1,281,511	1,337,488	1,395,330	1,395,330	1,454,967
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	3,953,221	4,030,083	4,144,032	4,177,553	4,220,610	4,279,806	4,350,000	4,412,946	4,469,450	4,532,333	4,602,530	4,665,887	4,722,042	4,786,922	4,877,667	4,954,858	5,020,553	5,095,915	5,169,853	5,240,486	5,229,598	5,298,879
Daily Baseload Therms	3,462	3,529	3,629	3,659	3,696	3,748	3,810	3,865	3,914	3,969	4,031	4,086	4,135	4,192	4,272	4,339	4,397	4,463	4,528	4,590	4,580	4,641
Peak Day Therms	79,367	80,095	80,607	81,085	81,532	82,008	82,483	82,926	83,399	83,840	84,282	84,723	85,164	85,604	86,042	86,481	86,885	87,321	87,726	88,162	88,321	88,725
Therms Per Residential Customer	534	534	569	561	553	547	545	543	538	533	529	526	520	513	508	508	502	496	491	485	478	471
Therms Per Commercial Customer	3,732	3,718	3,692	3,671	3,662	3,669	3,683	3,682	3,679	3,686	3,696	3,694	3,687	3,693	3,726	3,726	3,727	3,737	3,740	3,739	3,739	3,738
Therms Per Industrial Customer	33,821	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438	32,438
Residential Customers	1,846	1,854	1,861	1,868	1,874	1,881	1,888	1,894	1,901	1,907	1,913	1,919	1,925	1,931	1,937	1,943	1,948	1,954	1,959	1,965	1,970	1,975
Commercial Customers	641	654	662	670	677	683	690	697	704	711	717	724	730	737	743	749	755	762	768	774	774	780
Industrial Customers	17	19	20	21	22	23	24	25	26	28	29	30	32	33	35	36	38	40	41	43	43	45
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	2,505	2,528	2,544	2,559	2,573	2,588	2,603	2,617	2,632	2,646	2,660	2,674	2,688	2,702	2,716	2,730	2,742	2,756	2,769	2,783	2,788	2,800
Mount Vernon																						
Total Therms Pct. Growth		5.71%	8.65%	1.58%	1.95%	2.09%	2.18%	2.05%	1.95%	1.99%	2.02%	1.91%	1.79%	1.85%	2.08%	1.88%	1.72%	1.77%	1.72%	1.63%	2.57%	2.52%
Residential Therms	22,864,684	23,376,882	26,654,657	27,112,354	27,702,268	28,306,824	28,936,883	29,573,253	30,184,115	30,786,657	31,404,971	32,028,498	32,625,995	33,211,121	33,815,268	34,472,257	35,053,854	35,632,683	36,227,122	36,798,527	37,360,488	37,924,229
Commercial Therms	13,992,239	15,490,573	15,812,424	16,131,774	16,489,538	16,906,542	17,351,269	17,747,045	18,133,620	18,562,780	19,008,982	19,408,854	19,790,761	20,228,026	20,787,869	21,206,248	21,627,268	22,094,249	22,529,726	22,949,129	22,949,129	23,368,024
Industrial Therms	1,267,068	1,440,278	1,336,258	1,252,775	1,176,446	1,106,511	1,042,512	983,691	929,537	879,480	833,087	789,984	750,101	713,220	678,899	647,176	617,627	590,104	564,432	540,454	540,454	517,925
Ind., Inst., & Cmcl. Interrup. Therms	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981	124,981
Total Core Therms	38,248,972	40,432,714	43,928,320	44,621,883	45,493,234	46,444,858	47,455,645	48,428,970	49,372,253	50,353,898	51,372,021	52,352,317	53,291,837	54,277,347	55,407,017	56,450,663	57,423,730	58,442,017	59,446,262	60,413,091	60,975,051	61,935,159
Daily Baseload Therms	37,470	39,609	43,034	43,713	44,567	45,499	46,489	47,443	48,367	49,329	50,326	51,286	52,207	53,172	54,279	55,301	56,254	57,252	58,236	59,183	59,733	60,674
Peak Day Therms	490,697	501,532	508,347	519,864	533,700	547,748	562,045	576,525	591,267	606,259	621,497	636,999	652,747	668,744	684,960	701,438	718,094	735,011	752,188	769,558	785,266	803,314
Therms Per Residential Customer	642	642	723	720	716	713	710	707	704	700	696	693	689	684	680	677	672	668	663	658	653	648
Therms Per Commercial Customer	3,054	3,307	3,283	3,263	3,250	3,248	3,250	3,242	3,232	3,228	3,226	3,215	3,200	3,194	3,206	3,195	3,185	3,180	3,170	3,158	3,158	3,145
Therms Per Industrial Customer	13,924	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947	17,947
Residential Customers	35,623	36,421	36,854	37,677	38,688	39,714	40,758	41,815	42,891	43,985	45,097	46,228	47,377	48,544	49,727	50,929	52,144	53,378	54,631	55,898	57,188	58,508
Commercial Customers	4,581	4,684	4,816	4,943	5,073	5,204	5,338	5,474	5,611	5,751	5,893	6,038	6,184	6,333	6,483	6,636	6,791	6,948	7,107	7,267	7,267	7,431
Industrial Customers	91	80	74	70	66	62	58	55	52	49	46	44	42	40	38	36	34	33	31	30	30	29
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	40,297	41,187	41,746	42,692	43,829	44,982	46,156	47,345	48,556	49,787	51,039	52,312	53,605	54,919	56,250	57,604	58,971	60,361	61,771	63,198	64,488	65,970
Sunnyside																						
Total Therms Pct. Growth		0.08%	3.94%	-0.24%	-0.16%	-0.01%	0.20%	0.29%	0.10%	0.04%	0.19%	0.23%	0.05%	-0.02%	0.15%	0.53%	0.05%	0.06%	0.19%	0.08%	0.20%	0.14%
Residential Therms	2,840,914	2,850,080	3,194,469	3,177,492	3,167,855	3,171,816	3,195,583	3,227,107	3,241,734	3,251,236	3,274,554	3,301,798	3,312,925	3,318,067	3,339,180	3,396,067	3,409,058	3,423,062	3,449,778	3,466,022	3,477,689	3,488,368
Commercial Therms	4,464,731	4,585,762	4,607,397	4,617,999	4,627,732	4,636,166	4,643,582	4,650,017	4,655,431	4,660,104	4,664,116	4,667,607	4,670,444	4,672,014	4,672,980	4,672,911	4,672,035	4,670,461	4,668,190	4,665,362	4,665,362	4,662,033
Industrial Therms	1,357,639	1,234,396	1,212,672	1,197,523	1,183,129	1,169,650	1,156,915	1,144,912	1,133,602	1,122,797	1,112,466	1,102,557	1,093,104	1,084,330	1,075,889	1,068,070	1,060,680	1,053,667	1,047,046	1,040,747	1,040,747	1,034,739
Ind., Inst., & Cmcl. Interrup. Therms	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360	77,360
Total Core Therms	8,740,644	8,747,598	9,091,899	9,070,374	9,056,075	9,054,992	9,073,439	9,099,396	9,108,126	9,111,496	9,128,496	9,149,322	9,153,833	9,151,770	9,165,409	9,214,407	9,219,133	9,224,550	9,242,373	9,249,491	9,261,158	9,262,501
Daily Baseload Therms	6,124	6,129	6,370	6,355	6,345	6,344	6,357	6,375	6,381	6,384	6,396	6,410	6,413	6,412	6,422	6,456	6,459	6,463	6,475	6,480	6,489	6,490
Peak Day Therms	98,552	98,847	99,314	99,665	99,999	100,329	100,642	100,937	101,244	101,520	101,809	102,082	102,353	102,620	102,872	103,104	103,335	103,563	103,790	103,999	104,177	104,385
Therms Per Residential Customer	539	539	602	596	592	591	594	598	599	599	601	605	605	604	607	615	616	617	621	622	623	624
Therms Per Commercial Customer	3,310	3,390	3,385	3,380	3,374	3,368	3,362	3,356	3,350	3,343	3,337	3,330	3,323	3,316	3,309	3,302	3,295	3,287	3,280	3,272	3,272	3,265
Therms Per Industrial Customer	28,284	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125	26,125
Residential Customers	5,269	5,286	5,310	5,329	5,347	5,365	5,382	5,398	5,415	5,430	5,446	5,461	5,476	5,491	5,505	5,518	5,531	5,544	5,557	5,569	5,581	5,593
Commercial Customers	1,349	1,353	1,361	1,366	1,372	1,376	1,381	1,386	1,390	1,394	1,398	1,402	1,405	1,409	1,412	1,415	1,418	1,421	1,423	1,426	1,426	1,428
Industrial Customers	48	47	46	46	45	45	44	44	43	43	43	42	42	42	41	41	41	40	40	40	40	40
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	6,668	6,688	6,720	6,743	6,766	6,788	6,809	6,829	6,850	6,869	6,888	6,907	6,925	6,943	6,960	6,976	6,992	7,007	7,022	7,037	7,049	7,063
Walla Walla																						
Total Therms Pct. Growth		7.36%	1.39%	0.55%	0.89%	0.85%	0.77%	0.73%	0.81%	0.72%	0.69%	0.64%	0.63%	0.81%	0.52%	0.59%	0.54%	0.48%	0.38%	0.37%	0.79%	0.72%
Residential Therms	6,012,829	6,490,840	6,602,517	6,634,080	6,710,613	6,795,542	6,878,638	6,947,900	7,025,370	7,101,620	7,177,870	7,239,792	7,298,432	7,388,930	7,465,809	7,528,131	7,586,787	7,644,832	7,687,220	7,726,992	7,776,930	7,808,442
Commercial Therms	3,915,927	4,130,971	4,171,667	4,203,692	4,227,543	4,239,629	4,245,840	4,261,320	4,277,877	4,286,710	4,292,534	4,306,813	4,323,506	4,330,171	4,316,790	4,326,474	4,334,683	4,336,037	4,341,945	4,349,443	4,349,443	4,357,180
Industrial Therms	69,756	112,205	108,855	105,300	101,951	98,625	95,554	92,551	89,706	86,929	84,306	81,748	79,290	76,914	74,573	72,338	70,185	68,085	66,042	64,112	64,112	62,215
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	9,998,513	10,734,017	10,883,040	10,943,072	11,040,109	11,133,797	11,220,032	11,301,772	11,392,954	11,475,260	11,554,710	11,628,354	11,701,229	11,796,017	11,857,173	11,926,944	11,991,656	12,048,955	12,095,208	12,140,548	12,190,486	12,227,838
Daily Baseload Therms	6,881	7,387	7,489	7,531	7,597	7,662	7,721	7,777	7,840	7,897	7,951	8,002	8,052	8,118	8,160	8,208	8,252	8,292	8,323	8,355	8,389	8,415
Peak Day Therms	162,143	163,809	166,448	168,488	170,581	172,620	174,613	176,550	178,414	180,251	182,085	183,864	185,570	187,176	188,741	190,247	191,668	193,075	194,410	195,688	196,828	198,063
Therms Per Residential Customer	578	617	617	612	611	611	611	610	610	610	610	609	608	610	611	611	611	611	610	609	609	608
Therms Per Commercial Customer	3,125	3,281	3,290	3,295	3,294	3,283	3,269	3,263	3,258	3,247	3,234	3,228	3,224	3,213	3,187	3,179	3,171	3,157	3,148	3,140	3,140	3,132
Therms Per Industrial Customer	23,252	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556	40,556
Residential Customers	10,406	10,520	10,701	10,840	10,983	11,122	11,258	11,390	11,517	11,642	11,767	11,888	12,004	12,113	12,219	12,321	12,417	12,512	12,602	12,688	12,770	12,853
Commercial Customers	1,253	1,259	1,268	1,276	1,283	1,291	1,299	1,306	1,313	1,320	1,327	1,334	1,341	1,348	1,354	1,361	1,367	1,373	1,379	1,385	1,385	1,391
Industrial Customers	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	11,663	11,783	11,973	12,119	12,270	12,417	12,560	12,699	12,833	12,966	13,097	13,225	13,348	13,464	13,576	13,685	13,787	13,888	13,984	14,076	14,158	14,247
Wenatchee																						
Total Therms Pct. Growth		-2.68%	1.05%	-2.08%	-2.21%	-2.32%	-2.30%	-2.20%	-2.37%	-2.51%	-2.49%	-2.41%	-2.52%	-2.70%	-2.75%	-2.31%	-2.69%	-2.76%	-2.64%	-2.70%	-2.87%	-2.94%
Residential Therms	664,824	672,255	822,489	810,059	799,763	794,058	794,695	798,410	795,272	790,539	790,066	790,367	785,573	778,186	776,522	785,945	780,867	775,937	774,386	770,038	763,693	756,976
Commercial Therms	3,580,768	3,780,034	3,692,381	3,597,313	3,495,822	3,386,931	3,275,524	3,169,348	3,064,098	2,956,283	2,848,773	2,746,954	2,648,219	2,546,973	2,440,967	2,345,512	2,251,519	2,157,674	2,067,875	1,981,329	1,981,329	1,897,483
Industrial Therms	1,279,349	921,779	916,758	909,331	901,681	893,601	885,470	876,915	868,236	859,521	850,639	841,723	832,676	823,504	814,347	805,025	795,729	786,298	776,812	767,533	767,533	758,081
Ind., Inst., & Cmcl. Interrup. Therms	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716	95,716
Total Core Therms	5,620,657	5,469,784	5,527,344	5,412,419	5,292,982	5,170,306	5,051,405	4,940,389	4,823,322	4,702,058	4,585,194	4,474,759	4,362,184	4,244,379	4,127,552	4,032,198	3,923,832	3,815,626	3,714,789	3,614,616	3,608,271	3,508,256
Daily Baseload Therms	5,026	4,891	4,942	4,839	4,733	4,623	4,517	4,417	4,313	4,204	4,100	4,001	3,900	3,795	3,691	3,605	3,508	3,412	3,321	3,232	3,226	3,137
Peak Day Therms	60,118	60,629	60,872	61,031	61,168	61,309	61,427	61,576	61,700	61,828	61,958	62,065	62,200	62,310	62,448	62,562	62,676	62,792	62,883	63,001	63,079	63,172
Therms Per Residential Customer	437	437	531	521	512	507	506	506	502	498	496	495	490	485	482	487	482	478	476	472	468	463
Therms Per Commercial Customer	4,712	4,954	4,843	4,723	4,593	4,452	4,308	4,169	4,031	3,888	3,746	3,611	3,479	3,345	3,203	3,076	2,950	2,825	2,705	2,589	2,589	2,477
Therms Per Industrial Customer	63,967	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179	47,179
Residential Customers	1,521	1,538	1,548	1,555	1,561	1,567	1,572	1,578	1,583	1,588	1,593	1,597	1,602	1,606	1,611	1,615	1,619	1,623	1,626	1,630	1,633	1,636
Commercial Customers	760	763	762	762	761	761	760	760	760	760	760	761	761	762	762	763	763	764	764	765	765	766
Industrial Customers	20	20	19	19	19	19	19	19	18	18	18	18	18	17	17	17	17	17	16	16	16	16
Interruptible Customers	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Total Core Customers	2,303	2,323	2,332	2,338	2,343	2,349	2,353	2,359	2,364	2,369	2,373	2,378	2,383	2,387	2,392	2,397	2,401	2,405	2,409	2,413	2,416	2,420

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Yakima																						
Total Therms Pct. Growth		5.10%	-0.16%	-0.21%	0.20%	0.67%	0.82%	0.37%	0.27%	0.60%	0.67%	0.19%	0.13%	0.58%	1.29%	0.25%	0.25%	0.56%	0.35%	0.10%	0.27%	0.33%
Residential Therms	11,854,531	12,342,495	12,451,664	12,508,923	12,603,332	12,713,860	12,821,248	12,905,541	12,986,370	13,085,904	13,184,186	13,238,784	13,311,641	13,422,864	13,533,125	13,596,336	13,656,160	13,735,281	13,811,910	13,842,090	13,892,340	13,949,443
Commercial Therms	11,913,848	13,145,187	13,041,232	12,959,908	12,955,131	13,065,252	13,220,747	13,271,485	13,295,909	13,394,440	13,516,942	13,543,807	13,533,544	13,615,633	13,906,540	13,939,202	13,974,267	14,080,909	14,127,346	14,145,176	14,145,176	14,155,264
Industrial Therms	2,915,647	2,565,201	2,514,899	2,479,250	2,445,064	2,412,706	2,381,857	2,352,455	2,324,519	2,297,632	2,271,709	2,246,620	2,222,514	2,199,865	2,177,958	2,157,328	2,137,717	2,118,850	2,100,899	2,083,629	2,083,629	2,067,015
Ind., Inst., & Cmcl. Interrup. Therms	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485	150,485
Total Core Therms	26,834,511	28,203,368	28,158,280	28,098,566	28,154,013	28,342,303	28,574,337	28,679,967	28,757,283	28,928,461	29,123,323	29,179,697	29,218,185	29,388,848	29,768,108	29,843,351	29,918,629	30,085,526	30,190,640	30,221,381	30,271,631	30,322,207
Daily Baseload Therms	19,376	20,364	20,332	20,288	20,328	20,464	20,632	20,708	20,764	20,888	21,028	21,069	21,097	21,220	21,494	21,548	21,603	21,723	21,799	21,821	21,857	21,894
Peak Day Therms	307,479	311,760	315,711	318,501	321,248	323,909	326,497	329,028	331,485	333,899	336,284	338,640	340,938	343,135	345,302	347,382	349,388	351,339	353,229	355,076	356,665	358,482
Therms Per Residential Customer	619	635	632	629	628	628	628	627	626	626	626	624	623	624	625	624	623	623	623	621	620	619
Therms Per Commercial Customer	3,518	3,833	3,773	3,726	3,702	3,712	3,734	3,727	3,714	3,721	3,735	3,723	3,701	3,704	3,765	3,756	3,748	3,759	3,755	3,743	3,743	3,730
Therms Per Industrial Customer	37,866	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912	33,912
Residential Customers	19,163	19,437	19,702	19,887	20,069	20,245	20,416	20,583	20,745	20,904	21,061	21,216	21,367	21,511	21,653	21,789	21,920	22,047	22,170	22,290	22,407	22,525
Commercial Customers	3,387	3,429	3,457	3,478	3,499	3,520	3,541	3,561	3,580	3,600	3,619	3,638	3,657	3,675	3,694	3,711	3,729	3,746	3,762	3,779	3,779	3,795
Industrial Customers	77	76	74	73	72	71	70	69	69	68	67	66	66	65	64	64	63	62	62	61	61	61
Interruptible Customers	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Total Core Customers	22,631	22,946	23,237	23,442	23,644	23,840	24,031	24,217	24,398	24,576	24,751	24,925	25,094	25,255	25,415	25,568	25,716	25,859	25,998	26,134	26,251	26,385
Baker																						
Total Therms Pct. Growth		7.96%	-1.33%	-0.69%	-0.20%	-0.01%	0.24%	0.07%	-0.04%	0.27%	0.35%	0.13%	0.16%	0.15%	0.73%	0.21%	0.27%	0.38%	0.37%	0.29%	0.71%	0.67%
Residential Therms	2,086,237	2,126,880	2,114,840	2,105,514	2,108,523	2,111,512	2,121,183	2,127,312	2,130,660	2,141,370	2,154,865	2,163,420	2,175,390	2,182,300	2,201,500	2,213,072	2,228,144	2,242,152	2,261,428	2,276,637	2,293,566	2,309,406
Commercial Therms	1,549,125	1,732,308	1,734,459	1,731,561	1,731,279	1,737,250	1,744,521	1,746,226	1,745,029	1,748,275	1,751,588	1,750,427	1,746,584	1,746,060	1,755,609	1,752,038	1,747,312	1,747,961	1,742,242	1,736,803	1,736,803	1,728,716
Industrial Therms	75,629	147,211	103,893	88,818	78,139	68,827	61,158	56,044	52,258	48,811	45,968	43,787	42,070	41,538	41,821	42,092	42,677	43,448	44,794	46,818	46,818	49,183
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	3,710,992	4,006,400	3,953,193	3,925,893	3,917,942	3,917,590	3,926,863	3,929,583	3,927,948	3,938,457	3,952,422	3,957,635	3,964,045	3,969,899	3,998,931	4,007,202	4,018,134	4,033,562	4,048,465	4,060,259	4,077,188	4,087,306
Daily Baseload Therms	3,032	3,274	3,230	3,208	3,202	3,201	3,209	3,211	3,210	3,218	3,230	3,234	3,239	3,244	3,268	3,274	3,283	3,296	3,308	3,318	3,332	3,340
Peak Day Therms	26,215	26,340	26,103	26,136	26,228	26,322	26,414	26,541	26,672	26,812	26,944	27,097	27,248	27,418	27,608	27,791	27,971	28,183	28,367	28,590	28,773	28,970
Therms Per Residential Customer	622	633	637	634	633	632	633	632	630	630	631	630	630	628	629	628	628	627	628	627	627	627
Therms Per Commercial Customer	3,130	3,415	3,377	3,344	3,318	3,304	3,294	3,274	3,251	3,235	3,221	3,198	3,171	3,153	3,154	3,132	3,109	3,093	3,072	3,048	3,048	3,024
Therms Per Industrial Customer	18,907	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449	36,449
Residential Customers	3,354	3,360	3,320	3,321	3,331	3,341	3,351	3,366	3,382	3,399	3,415	3,434	3,453	3,475	3,500	3,524	3,548	3,576	3,601	3,631	3,658	3,685
Commercial Customers	495	507	514	518	522	526	530	533	537	540	544	547	551	554	557	559	562	565	567	570	570	572
Industrial Customers	4	4	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	3,854	3,872	3,838	3,842	3,856	3,870	3,883	3,902	3,921	3,942	3,961	3,984	4,006	4,031	4,059	4,086	4,112	4,143	4,170	4,203	4,230	4,259
Bend																						
Total Therms Pct. Growth		10.81%	1.16%	1.23%	2.25%	3.03%	3.18%	2.77%	2.79%	3.12%	3.26%	2.85%	2.82%	3.29%	4.26%	3.04%	3.17%	3.50%	3.29%	3.14%	4.21%	4.23%
Residential Therms	27,584,941	30,478,400	30,750,195	30,957,074	31,528,152	32,271,435	32,989,320	33,679,892	34,426,252	35,189,286	35,968,994	36,715,900	37,528,725	38,403,398	39,349,464	40,161,810	41,045,055	41,945,790	42,864,015	43,747,812	44,647,486	45,587,554
Commercial Therms	17,303,858	19,158,795	19,569,435	20,060,141	20,727,438	21,667,339	22,759,737	23,691,635	24,618,315	25,772,229	27,053,053	28,162,628	29,236,786	30,621,868	32,688,514	34,117,596	35,637,323	37,472,349	39,212,733	40,947,723	40,947,723	42,745,999
Industrial Therms	1,764,667	2,058,052	1,976,707	1,921,513	1,873,305	1,831,733	1,796,024	1,765,514	1,739,855	1,718,482	1,701,089	1,686,260	1,675,766	1,668,368	1,664,431	1,663,461	1,666,021	1,670,992	1,678,992	1,689,551	1,689,551	1,702,693
Ind., Inst., & Cmcl. Interrup. Therms	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Therms	46,653,467	51,695,248	52,296,338	52,938,729	54,128,896	55,770,508	57,545,081	59,137,042	60,784,424	62,679,997	64,723,137	66,564,789	68,441,278	70,693,635	73,702,411	75,942,868	78,348,400	81,089,132	83,755,741	86,385,087	87,284,761	90,036,248
Daily Baseload Therms	39,309	43,557	44,063	44,605	45,607	46,991	48,486	49,827	51,215	52,812	54,534	56,086	57,667	59,564	62,100	63,987	66,014	68,323	70,570	72,786	73,544	75,862
Peak Day Therms	571,037	583,537	587,352	598,198	612,001	626,095	640,461	655,118	670,050	685,302	700,873	716,712	732,941	749,425	766,290	783,409	800,933	818,790	836,979	855,557	871,308	890,575
Therms Per Residential Customer	738	800	805	797	794	795	795	794	794	794	794	793	793	794	796	795	795	795	795	794	793	792
Therms Per Commercial Customer	2,779	2,968	2,944	2,935	2,951	3,002	3,070	3,112	3,150	3,213	3,287	3,336	3,377	3,450	3,593	3,660	3,732	3,831	3,915	3,993	3,993	4,072
Therms Per Industrial Customer	32,085	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384	41,384
Residential Customers	37,366	38,098	38,199	38,842	39,708	40,593	41,496	42,418	43,358	44,319	45,301	46,300	47,325	48,367	49,434	50,518	51,629	52,762	53,917	55,098	56,302	57,532
Commercial Customers	6,226	6,455	6,647	6,835	7,025	7,218	7,414	7,613	7,815	8,020	8,229	8,441	8,657	8,875	9,097	9,322	9,550	9,782	10,017	10,256	10,256	10,498
Industrial Customers	55	50	48	46	45	44	43	43	42	42	41	41	40	40	40	40	40	40	41	41	41	41
Interruptible Customers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Core Customers	43,648	44,603	44,895	45,724	46,779	47,856	48,954	50,075	51,216	52,382	53,572	54,783	56,023	57,283	58,572	59,881	61,220	62,585	63,976	65,396	66,600	68,072
Ontario																						
Total Therms Pct. Growth		14.95%	2.21%	-1.33%	-0.75%	0.72%	0.86%	0.09%	0.28%	0.51%	0.82%	0.24%	-0.20%	0.73%	2.25%	0.46%	0.46%	1.01%	0.61%	0.32%	0.33%	0.37%
Residential Therms	1,887,207	1,895,083	2,096,209	2,074,647	2,054,711	2,049,503	2,043,856	2,040,527	2,041,504	2,033,790	2,031,227	2,032,895	2,026,959	2,024,406	2,022,827	2,033,037	2,032,996	2,032,416	2,035,815	2,035,350	2,035,827	2,035,645
Commercial Therms	2,361,432	2,813,412	2,722,668	2,668,324	2,644,255	2,682,380	2,729,002	2,732,843	2,742,414	2,773,382	2,816,395	2,823,754	2,815,367	2,853,779	2,974,635	2,987,021	3,009,648	3,063,749	3,091,921	3,108,031	3,108,031	3,126,114
Industrial Therms	288,166	506,481	511,252	516,224	520,723	525,413	529,597	533,664	537,829	541,691	545,288	548,971	552,246	555,753	558,981	561,999	565,110	568,032	570,972	573,795	573,795	576,650
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	4,536,805	5,214,977	5,330,129	5,259,195	5,219,689	5,257,295	5,302,455	5,307,035	5,321,746	5,348,863	5,392,910	5,405,620	5,394,572	5,433,939	5,556,443	5,582,057	5,607,755	5,664,198	5,698,707	5,717,176	5,717,653	5,738,409
Daily Baseload Therms	3,370	3,874	3,960	3,907	3,877	3,905	3,939	3,942	3,953	3,973	4,006	4,016	4,007	4,037	4,128	4,147	4,166	4,208	4,233	4,247	4,247	4,263
Peak Day Therms	30,432	30,650	30,438	30,403	30,348	30,440	30,420	30,391	30,524	30,555	30,595	30,677	30,735	30,877	30,951	31,016	31,159	31,294	31,428	31,554	31,683	31,851
Therms Per Residential Customer	525	525	585	580	575	572	571	571	569	566	565	564	561	558	556	558	556	553	552	550	547	544
Therms Per Commercial Customer	2,714	3,172	3,088	3,027	3,004	3,035	3,088	3,093	3,089	3,118	3,160	3,158	3,140	3,166	3,290	3,294	3,301	3,343	3,357	3,358	3,358	3,357
Therms Per Industrial Customer	28,817	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725	50,725
Residential Customers	3,594	3,609	3,583	3,578	3,571	3,581	3,578	3,574	3,589	3,592	3,596	3,605	3,611	3,627	3,635	3,642	3,658	3,673	3,688	3,702	3,721	3,740
Commercial Customers	870	887	882	881	880	884	884	883	888	889	891	894	897	901	904	907	912	917	921	926	926	931
Industrial Customers	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	4,474	4,506	4,475	4,470	4,462	4,475	4,472	4,468	4,488	4,492	4,498	4,510	4,519	4,539	4,550	4,560	4,581	4,601	4,620	4,639	4,658	4,683
Pendleton																						
Total Therms Pct. Growth		15.19%	1.75%	1.40%	1.41%	1.42%	1.50%	1.21%	1.22%	1.22%	1.29%	1.01%	1.00%	1.01%	1.28%	0.75%	0.80%	0.79%	0.78%	0.55%	1.17%	1.15%
Residential Therms	5,560,032	6,543,600	6,752,836	6,924,204	7,092,764	7,254,702	7,428,357	7,574,364	7,730,282	7,881,384	8,044,623	8,178,772	8,319,038	8,453,886	8,613,040	8,719,983	8,836,965	8,947,917	9,066,644	9,151,128	9,258,112	9,343,938
Commercial Therms	5,980,426	6,258,738	6,292,655	6,319,823	6,354,523	6,399,685	6,448,382	6,483,417	6,513,361	6,550,067	6,587,577	6,612,605	6,630,894	6,658,051	6,707,191	6,723,812	6,738,903	6,760,742	6,773,143	6,781,249	6,781,249	6,786,006
Industrial Therms	684,950	1,280,017	1,283,684	1,285,824	1,288,099	1,290,246	1,292,427	1,294,581	1,296,685	1,298,731	1,300,760	1,302,765	1,304,606	1,306,355	1,308,033	1,309,495	1,310,877	1,312,177	1,313,324	1,314,415	1,314,415	1,315,341
Ind., Inst., & Cmcl. Interrup. Therms		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Therms	12,225,408	14,082,355	14,329,175	14,529,851	14,735,386	14,944,633	15,169,166	15,352,362	15,540,328	15,730,183	15,932,961	16,094,142	16,254,538	16,418,292	16,628,265	16,753,290	16,886,745	17,020,836	17,153,111	17,246,791	17,353,775	17,445,285
Daily Baseload Therms	12,569	14,478	14,732	14,938	15,149	15,364	15,595	15,784	15,977	16,172	16,380	16,546	16,711	16,879	17,095	17,224	17,361	17,499	17,635	17,731	17,841	17,935
Peak Day Therms	196,962	203,001	208,632	213,199	217,988	222,596	227,186	231,694	236,133	240,443	244,717	248,926	252,937	256,801	260,549	264,035	267,404	270,613	273,622	276,518	278,930	281,643
Therms Per Residential Customer	526	600	601	602	602	602	603	602	602	602	603	602	602	602	604	603	603	603	604	603	604	604
Therms Per Commercial Customer	3,286	3,359	3,333	3,309	3,290	3,277	3,266	3,249	3,231	3,216	3,203	3,184	3,162	3,146	3,141	3,121	3,102	3,086	3,067	3,047	3,047	3,026
Therms Per Industrial Customer	29,780	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344	55,344
Residential Customers	10,569	10,906	11,236	11,502	11,782	12,051	12,319	12,582	12,841	13,092	13,341	13,586	13,819	14,043	14,260	14,461	14,655	14,839	15,011	15,176	15,328	15,482
Commercial Customers	1,820	1,863	1,888	1,910	1,932	1,953	1,974	1,995	2,016	2,037	2,057	2,077	2,097	2,116	2,135	2,154	2,172	2,191	2,208	2,226	2,226	2,243
Industrial Customers	23	23	23	23	23	23	23	23	23	23	24	24	24	24	24	24	24	24	24	24	24	24
Interruptible Customers		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Core Customers	12,412	12,793	13,147	13,435	13,737	14,027	14,317	14,601	14,880	15,152	15,421	15,687	15,939	16,183	16,419	16,639	16,851	17,053	17,243	17,425	17,577	17,748

Cascade Natural Gas
2011 IRP Demand Forecast
High Scenario

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Washington											
Total Therms Pct. Growth		9.38%	3.28%	1.24%	1.67%	1.88%	1.98%	1.76%	1.68%	1.80%	1.82%
Residential Therms	106,725,615	115,468,307	121,406,986	122,962,712	125,361,919	128,057,646	130,952,942	133,668,578	136,336,934	139,173,052	142,082,486
Commercial Therms	84,630,702	94,659,282	96,138,188	97,518,608	99,071,541	100,893,378	102,820,020	104,477,513	106,048,943	107,805,807	109,617,270
Industrial Therms	9,342,671	9,581,643	9,429,981	9,326,786	9,235,629	9,156,299	9,087,963	9,029,569	8,980,780	8,940,325	8,907,694
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	202,732,810	221,743,055	229,008,977	231,841,928	235,702,910	240,141,144	244,894,747	249,209,482	253,400,477	257,953,005	262,641,272
Daily Baseload Therms	185,494	203,827	210,681	213,427	217,155	221,410	225,957	230,106	234,162	238,552	243,067
Peak Day Therms	2,773,089	2,842,512	2,888,020	2,948,317	3,017,277	3,087,077	3,157,841	3,229,566	3,302,105	3,375,765	3,450,518
Therms Per Residential Customer	626	662	686	680	677	676	675	674	672	670	669
Therms Per Commercial Customer	3,434	3,723	3,693	3,667	3,646	3,636	3,629	3,612	3,593	3,579	3,567
Therms Per Industrial Customer	26,392	27,818	27,987	28,123	28,250	28,370	28,482	28,586	28,684	28,776	28,863
Residential Customers	170,540	174,519	177,096	180,801	185,130	189,509	193,950	198,450	203,002	207,625	212,317
Commercial Customers	24,642	25,422	26,031	26,596	27,169	27,747	28,332	28,923	29,519	30,123	30,734
Industrial Customers	354	344	337	332	327	323	319	316	313	311	309
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	195,564	200,314	203,492	207,757	212,654	217,607	222,629	227,717	232,862	238,087	243,388
Oregon											
Total Therms Pct. Growth		11.73%	1.21%	0.98%	1.76%	2.42%	2.57%	2.18%	2.21%	2.48%	2.63%
Residential Therms	37,118,417	41,043,963	41,714,080	42,061,439	42,784,150	43,687,152	44,582,716	45,422,095	46,328,698	47,245,830	48,199,709
Commercial Therms	27,194,841	29,963,254	30,319,217	30,779,849	31,457,496	32,486,653	33,681,641	34,654,121	35,619,120	36,843,953	38,208,613
Industrial Therms	2,813,412	3,991,762	3,875,537	3,812,378	3,760,265	3,716,218	3,679,207	3,649,804	3,626,627	3,607,714	3,593,106
Ind., Inst., & Cmcl. Interrup. Therms	2	2	2	2	2	2	2	2	2	2	2
Total Core Therms	67,126,672	74,998,981	75,908,835	76,653,668	78,001,913	79,890,026	81,943,566	83,726,022	85,574,447	87,697,499	90,001,429
Daily Baseload Therms	58,280	65,183	65,985	66,657	67,836	69,462	71,229	72,764	74,355	76,176	78,150
Peak Day Therms	824,646	843,527	852,525	867,935	886,566	905,453	924,480	943,744	963,379	983,112	1,003,129
Therms Per Residential Customer	676	733	740	735	733	733	734	733	733	734	734
Therms Per Commercial Customer	2,890	3,085	3,053	3,034	3,037	3,070	3,118	3,143	3,164	3,207	3,260
Therms Per Industrial Customer	30,581	45,945	46,199	46,335	46,452	46,557	46,649	46,726	46,791	46,848	46,896
Residential Customers	54,883	55,973	56,338	57,243	58,392	59,566	60,744	61,940	63,170	64,402	65,653
Commercial Customers	9,411	9,712	9,931	10,144	10,359	10,581	10,802	11,025	11,256	11,487	11,721
Industrial Customers	92	87	84	82	81	80	79	78	78	77	77
Interruptible Customers											
Total Core Customers	64,386	65,772	66,353	67,469	68,832	70,227	71,624	73,043	74,503	75,966	77,451
System											
Total Therms Pct. Growth		9.96%	2.76%	1.17%	1.69%	2.02%	2.13%	1.87%	1.81%	1.97%	2.02%
Residential Therms	143,844,032	156,512,271	163,121,065	165,024,151	168,146,069	171,744,798	175,535,658	179,090,673	182,665,631	186,418,881	190,282,195
Commercial Therms	111,825,543	124,622,536	126,457,405	128,298,457	130,529,037	133,380,031	136,501,661	139,131,634	141,668,063	144,649,760	147,825,883
Industrial Therms	12,156,083	13,573,405	13,305,518	13,139,164	12,995,894	12,872,517	12,767,170	12,679,373	12,607,407	12,548,039	12,500,799
Ind., Inst., & Cmcl. Interrup. Therms	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824
Total Core Therms	269,859,482	296,742,036	304,917,812	308,495,596	313,704,824	320,031,170	326,838,313	332,935,504	338,974,924	345,650,504	352,642,702
Daily Baseload Therms	243,774	269,009	276,666	280,084	284,991	290,872	297,186	302,870	308,517	314,729	321,218
Peak Day Therms	3,597,736	3,686,039	3,740,545	3,816,252	3,903,843	3,992,530	4,082,321	4,173,310	4,265,485	4,358,877	4,453,647
Therms Per Residential Customer	638	679	699	693	690	690	689	688	686	685	685
Therms Per Commercial Customer	3,284	3,547	3,516	3,492	3,478	3,480	3,488	3,483	3,474	3,476	3,482
Therms Per Industrial Customer	27,256	31,469	31,618	31,743	31,863	31,976	32,083	32,183	32,277	32,366	32,449
Residential Customers	225,423	230,492	233,434	238,044	243,522	249,075	254,694	260,390	266,172	272,027	277,970
Commercial Customers	34,053	35,135	35,962	36,740	37,528	38,328	39,134	39,949	40,775	41,610	42,455
Industrial Customers	446	431	421	414	408	403	398	394	391	388	385
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	259,950	266,086	269,845	275,226	281,486	287,834	294,254	300,761	307,366	314,053	320,839

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Washington											
Total Therms Pct. Growth	1.60%	1.54%	1.74%	1.97%	1.60%	1.54%	1.60%	1.52%	1.40%	2.33%	2.30%
Residential Therms	144,757,976	147,424,529	150,484,534	153,692,210	156,671,630	159,547,526	162,465,418	165,393,386	168,120,118	170,899,662	173,666,984
Commercial Therms	111,179,660	112,633,707	114,311,563	116,540,700	118,068,288	119,585,975	121,286,332	122,815,698	124,256,813	124,256,813	125,667,297
Industrial Therms	8,882,236	8,864,000	8,854,062	8,849,946	8,854,165	8,864,231	8,880,624	8,903,433	8,932,160	8,932,160	8,965,741
Ind., Inst., & Cmcl. Interrup. Therms	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822	2,033,822
Total Core Therms	266,853,693	270,956,058	275,683,981	281,116,677	285,627,904	290,031,554	294,666,196	299,146,338	303,342,913	306,122,457	310,333,844
Daily Baseload Therms	247,153	251,156	255,743	260,952	265,321	269,632	274,143	278,523	282,655	285,331	289,485
Peak Day Therms	3,526,472	3,603,485	3,681,162	3,760,031	3,839,754	3,920,316	4,002,026	4,084,663	4,168,401	4,243,590	4,330,296
Therms Per Residential Customer	667	664	664	663	662	660	658	656	653	650	648
Therms Per Commercial Customer	3,546	3,522	3,506	3,505	3,484	3,463	3,447	3,426	3,404	3,404	3,380
Therms Per Industrial Customer	28,944	29,020	29,090	29,156	29,215	29,272	29,324	29,371	29,416	29,416	29,457
Residential Customers	217,085	221,918	226,796	231,748	236,755	241,817	246,951	252,146	257,409	262,742	268,209
Commercial Customers	31,354	31,980	32,609	33,246	33,888	34,534	35,186	35,844	36,508	36,508	37,178
Industrial Customers	307	305	304	304	303	303	303	303	304	304	304
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	248,774	254,231	259,738	265,326	270,974	276,681	282,468	288,321	294,249	299,582	305,720
Oregon											
Total Therms Pct. Growth	2.25%	2.21%	2.62%	3.49%	2.40%	2.52%	2.81%	2.64%	2.49%	3.41%	3.44%
Residential Therms	49,090,987	50,050,112	51,063,990	52,186,831	53,127,902	54,143,160	55,168,275	56,227,902	57,210,927	58,234,991	59,276,542
Commercial Therms	39,349,413	40,429,631	41,879,758	44,125,949	45,580,466	47,133,186	49,044,801	50,820,038	52,573,805	52,573,805	54,386,836
Industrial Therms	3,581,783	3,574,687	3,572,014	3,573,267	3,577,047	3,584,685	3,594,650	3,608,081	3,624,579	3,624,579	3,643,867
Ind., Inst., & Cmcl. Interrup. Therms	2	2	2	2	2	2	2	2	2	2	2
Total Core Therms	92,022,186	94,054,433	96,515,764	99,886,050	102,285,417	104,861,033	107,807,728	110,656,024	113,409,313	114,433,377	117,307,248
Daily Baseload Therms	79,881	81,624	83,725	86,590	88,632	90,824	93,326	95,747	98,082	98,964	101,400
Peak Day Therms	1,023,411	1,043,861	1,064,520	1,085,398	1,106,251	1,127,467	1,148,880	1,170,396	1,192,218	1,210,695	1,233,040
Therms Per Residential Customer	734	734	735	737	736	737	737	738	737	737	737
Therms Per Commercial Customer	3,290	3,314	3,365	3,476	3,522	3,572	3,645	3,706	3,761	3,761	3,818
Therms Per Industrial Customer	46,938	46,970	46,992	47,004	47,010	47,009	47,003	46,989	46,968	46,968	46,940
Residential Customers	66,925	68,208	69,512	70,829	72,145	73,490	74,850	76,217	77,607	79,009	80,439
Commercial Customers	11,960	12,201	12,446	12,694	12,942	13,196	13,454	13,714	13,977	13,977	14,244
Industrial Customers	76	76	76	76	76	76	76	77	77	77	78
Interruptible Customers											
Total Core Customers	78,961	80,485	82,034	83,599	85,163	86,762	88,381	90,007	91,661	93,063	94,760
System											
Total Therms Pct. Growth	1.77%	1.71%	1.97%	2.37%	1.81%	1.80%	1.92%	1.82%	1.70%	2.62%	2.61%
Residential Therms	193,848,963	197,474,642	201,548,524	205,879,041	209,799,532	213,690,686	217,633,693	221,621,288	225,331,045	229,134,653	232,943,526
Commercial Therms	150,529,073	153,063,338	156,191,321	160,666,649	163,648,754	166,719,162	170,331,133	173,635,736	176,830,618	176,830,618	180,054,133
Industrial Therms	12,464,019	12,438,687	12,426,076	12,423,213	12,431,211	12,448,916	12,475,274	12,511,514	12,556,740	12,556,740	12,609,608
Ind., Inst., & Cmcl. Interrup. Therms	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824	2,033,824
Total Core Therms	358,875,879	365,010,491	372,199,745	381,002,727	387,913,321	394,892,588	402,473,923	409,802,362	416,752,226	420,555,834	427,641,091
Daily Baseload Therms	327,034	332,780	339,468	347,543	353,953	360,456	367,469	374,270	380,737	384,295	390,885
Peak Day Therms	4,549,883	4,647,346	4,745,683	4,845,430	4,946,005	5,047,783	5,150,906	5,255,058	5,360,619	5,454,285	5,563,336
Therms Per Residential Customer	683	681	680	680	679	678	676	675	673	670	668
Therms Per Commercial Customer	3,475	3,464	3,467	3,497	3,495	3,493	3,502	3,504	3,503	3,503	3,502
Therms Per Industrial Customer	32,527	32,600	32,667	32,730	32,787	32,840	32,888	32,932	32,973	32,973	33,010
Residential Customers	284,010	290,126	296,308	302,577	308,900	315,307	321,801	328,363	335,016	341,751	348,648
Commercial Customers	43,314	44,181	45,056	45,940	46,830	47,730	48,640	49,558	50,485	50,485	51,422
Industrial Customers	383	382	380	380	379	379	379	380	381	381	382
Interruptible Customers	28	28	28	28	28	28	28	28	28	28	28
Total Core Customers	327,735	334,716	341,772	348,924	356,137	363,444	370,848	378,329	385,910	392,645	400,480

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Aberdeen

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	6,565,165	2,955,372	9,520,537	6,592,697	2,967,766	9,560,463	6,621,623	2,980,787	9,602,410	1.40%	1.40%	1.40%	1.82%	1.82%	1.82%	2.27%	2.27%	2.27%
2012	6,860,339	3,088,248	9,948,587	6,860,087	3,088,134	9,948,220	6,906,591	3,109,068	10,015,660	4.50%	4.50%	4.50%	4.06%	4.06%	4.06%	4.30%	4.30%	4.30%
2013	6,880,557	3,097,349	9,977,905	6,865,350	3,090,503	9,955,854	6,949,722	3,128,484	10,078,206	0.29%	0.29%	0.29%	0.08%	0.08%	0.08%	0.62%	0.62%	0.62%
2014	6,902,832	3,107,376	10,010,209	6,890,019	3,101,608	9,991,627	6,996,982	3,149,759	10,146,740	0.32%	0.32%	0.32%	0.36%	0.36%	0.36%	0.68%	0.68%	0.68%
2015	6,923,725	3,116,781	10,040,507	6,921,020	3,115,564	10,036,584	7,041,855	3,169,959	10,211,814	0.30%	0.30%	0.30%	0.45%	0.45%	0.45%	0.64%	0.64%	0.64%
2016	6,945,146	3,126,424	10,071,570	6,955,691	3,131,171	10,086,862	7,088,085	3,190,769	10,278,854	0.31%	0.31%	0.31%	0.50%	0.50%	0.50%	0.66%	0.66%	0.66%
2017	6,972,112	3,138,563	10,110,676	6,988,788	3,146,070	10,134,858	7,139,891	3,214,090	10,353,981	0.39%	0.39%	0.39%	0.48%	0.48%	0.48%	0.73%	0.73%	0.73%
2018	6,996,599	3,149,586	10,146,186	7,018,692	3,159,532	10,178,224	7,189,356	3,236,358	10,425,714	0.35%	0.35%	0.35%	0.43%	0.43%	0.43%	0.69%	0.69%	0.69%
2019	7,018,833	3,159,595	10,178,428	7,050,612	3,173,901	10,224,513	7,237,119	3,257,859	10,494,978	0.32%	0.32%	0.32%	0.45%	0.45%	0.45%	0.66%	0.66%	0.66%
2020	7,042,324	3,170,170	10,212,493	7,084,435	3,189,126	10,273,561	7,285,788	3,279,768	10,565,556	0.33%	0.33%	0.33%	0.48%	0.48%	0.48%	0.67%	0.67%	0.67%
2021	7,069,113	3,182,229	10,251,342	7,117,389	3,203,961	10,321,350	7,338,830	3,303,645	10,642,475	0.38%	0.38%	0.38%	0.47%	0.47%	0.47%	0.73%	0.73%	0.73%
2022	7,094,846	3,193,813	10,288,660	7,147,598	3,217,560	10,365,159	7,391,142	3,327,193	10,718,335	0.36%	0.36%	0.36%	0.42%	0.42%	0.42%	0.71%	0.71%	0.71%
2023	7,116,894	3,203,738	10,320,632	7,178,997	3,231,694	10,410,692	7,439,796	3,349,096	10,788,892	0.31%	0.31%	0.31%	0.44%	0.44%	0.44%	0.66%	0.66%	0.66%
2024	7,134,958	3,211,870	10,346,827	7,214,686	3,247,760	10,462,446	7,484,148	3,369,061	10,853,208	0.25%	0.25%	0.25%	0.50%	0.50%	0.50%	0.60%	0.60%	0.60%
2025	7,165,169	3,225,469	10,390,638	7,251,882	3,264,504	10,516,386	7,542,232	3,395,208	10,937,440	0.42%	0.42%	0.42%	0.52%	0.52%	0.52%	0.78%	0.78%	0.78%
2026	7,189,701	3,236,513	10,426,214	7,283,334	3,278,663	10,561,997	7,594,579	3,418,773	11,013,351	0.34%	0.34%	0.34%	0.43%	0.43%	0.43%	0.69%	0.69%	0.69%
2027	7,211,794	3,246,458	10,458,252	7,315,079	3,292,953	10,608,031	7,645,199	3,441,560	11,086,759	0.31%	0.31%	0.31%	0.44%	0.44%	0.44%	0.67%	0.67%	0.67%
2028	7,237,066	3,257,835	10,494,900	7,349,014	3,308,229	10,657,243	7,699,904	3,466,186	11,166,089	0.35%	0.35%	0.35%	0.46%	0.46%	0.46%	0.72%	0.72%	0.72%
2029	7,262,580	3,269,320	10,531,901	7,381,575	3,322,887	10,704,461	7,755,063	3,491,016	11,246,080	0.35%	0.35%	0.35%	0.44%	0.44%	0.44%	0.72%	0.72%	0.72%
2030	7,268,610	3,272,034	10,540,644	7,382,945	3,323,503	10,706,448	7,747,251	3,487,499	11,234,750	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	-0.10%	-0.10%	-0.10%
2031	7,292,350	3,282,722	10,575,072	7,414,213	3,337,579	10,751,792	7,801,423	3,511,886	11,313,309	0.33%	0.33%	0.33%	0.42%	0.42%	0.42%	0.70%	0.70%	0.70%

	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	8,097	74,408	82,505	8,131	74,604	82,735	8,167	74,864	83,030	1.40%	0.27%	0.38%	1.82%	0.54%	0.66%	2.27%	0.89%	1.02%
2012	8,461	74,199	82,660	8,461	74,527	82,987	8,518	74,898	83,416	4.50%	-0.28%	0.19%	4.06%	-0.10%	0.31%	4.30%	0.05%	0.46%
2013	8,486	74,549	83,035	8,467	74,774	83,241	8,571	75,397	83,969	0.29%	0.47%	0.45%	0.08%	0.33%	0.31%	0.62%	0.67%	0.66%
2014	8,513	74,963	83,476	8,498	75,308	83,805	8,629	76,010	84,640	0.32%	0.56%	0.53%	0.36%	0.71%	0.68%	0.68%	0.81%	0.80%
2015	8,539	75,380	83,919	8,536	75,822	84,358	8,685	76,602	85,286	0.30%	0.56%	0.53%	0.45%	0.68%	0.66%	0.64%	0.78%	0.76%
2016	8,566	75,771	84,336	8,579	76,320	84,898	8,742	77,191	85,933	0.31%	0.52%	0.50%	0.50%	0.66%	0.64%	0.66%	0.77%	0.76%
2017	8,599	76,170	84,769	8,619	76,822	85,442	8,806	77,778	86,584	0.39%	0.53%	0.51%	0.48%	0.66%	0.64%	0.73%	0.76%	0.76%
2018	8,629	76,547	85,176	8,656	77,315	85,971	8,867	78,340	87,207	0.35%	0.49%	0.48%	0.43%	0.64%	0.62%	0.69%	0.72%	0.72%
2019	8,656	76,928	85,584	8,696	77,807	86,502	8,926	78,920	87,846	0.32%	0.50%	0.48%	0.45%	0.64%	0.62%	0.66%	0.74%	0.73%
2020	8,685	77,308	85,994	8,737	78,284	87,022	8,986	79,487	88,472	0.33%	0.49%	0.48%	0.48%	0.61%	0.60%	0.67%	0.72%	0.71%
2021	8,718	77,673	86,391	8,778	78,764	87,542	9,051	80,050	89,101	0.38%	0.47%	0.46%	0.47%	0.61%	0.60%	0.73%	0.71%	0.71%
2022	8,750	78,038	86,788	8,815	79,234	88,049	9,116	80,612	89,728	0.36%	0.47%	0.46%	0.42%	0.60%	0.58%	0.71%	0.70%	0.70%
2023	8,777	78,396	87,173	8,854	79,703	88,557	9,176	81,155	90,331	0.31%	0.46%	0.44%	0.44%	0.59%	0.58%	0.66%	0.67%	0.67%
2024	8,800	78,759	87,559	8,898	80,168	89,066	9,230	81,717	90,947	0.25%	0.46%	0.44%	0.50%	0.58%	0.57%	0.60%	0.69%	0.68%
2025	8,837	79,096	87,933	8,944	80,619	89,563	9,302	82,251	91,553	0.42%	0.43%	0.43%	0.52%	0.56%	0.56%	0.78%	0.65%	0.67%
2026	8,867	79,439	88,306	8,983	81,064	90,047	9,367	82,778	92,145	0.34%	0.43%	0.42%	0.43%	0.55%	0.54%	0.69%	0.64%	0.65%
2027	8,894	79,773	88,667	9,022	81,496	90,517	9,429	83,308	92,737	0.31%	0.42%	0.41%	0.44%	0.53%	0.52%	0.67%	0.64%	0.64%
2028	8,926	80,090	89,016	9,064	81,939	91,002	9,496	83,821	93,317	0.35%	0.40%	0.39%	0.46%	0.54%	0.54%	0.72%	0.62%	0.63%
2029	8,957	80,421	89,378	9,104	82,371	91,475	9,564	84,335	93,899	0.35%	0.41%	0.41%	0.44%	0.53%	0.52%	0.72%	0.61%	0.62%
2030	8,964	80,696	89,660	9,105	82,742	91,847	9,555	84,794	94,349	0.08%	0.34%	0.32%	0.02%	0.45%	0.41%	-0.10%	0.54%	0.48%
2031	8,994	81,002	89,996	9,144	83,162	92,306	9,622	85,294	94,916	0.33%	0.38%	0.37%	0.42%	0.51%	0.50%	0.70%	0.59%	0.60%

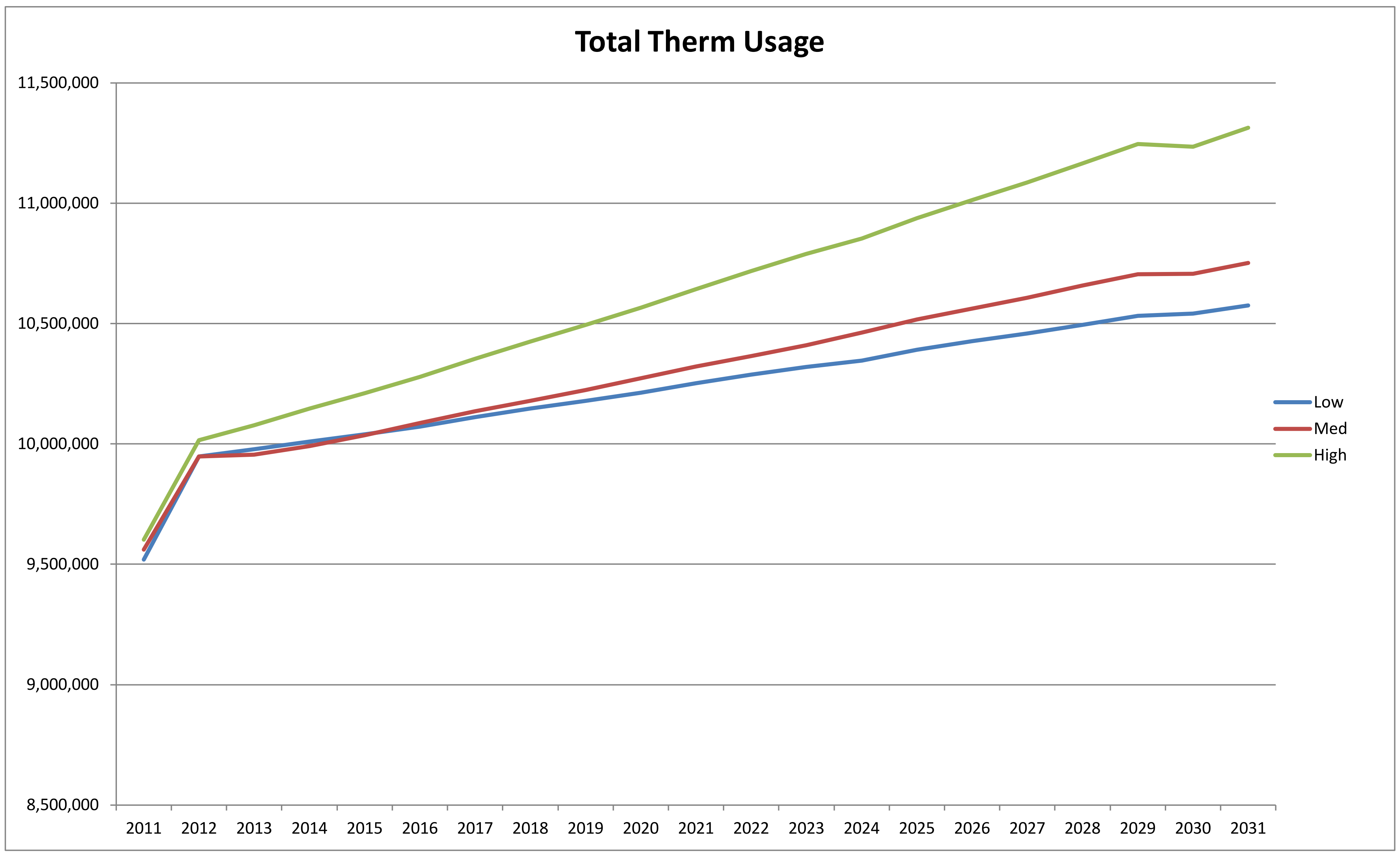
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3,528,952	5,991,585	9,520,537	3,536,329	6,024,134	9,560,463	3,547,730	6,054,680	9,602,410	0.29%	2.06%	1.40%	0.50%	2.62%	1.82%	0.82%	3.14%	2.27%
2012	3,933,846	6,014,740	9,948,587	3,919,079	6,029,142	9,948,220	3,896,347	6,119,313	10,015,660	11.47%	0.39%	4.50%	10.82%	0.08%	4.06%	9.83%	1.07%	4.30%
2013	3,942,786	6,035,120	9,977,905	3,911,693	6,044,161	9,955,854	3,892,667	6,185,539	10,078,206	0.23%	0.34%	0.29%	-0.19%	0.25%	0.08%	-0.09%	1.08%	0.62%
2014	3,956,665	6,053,544	10,010,209	3,922,975	6,068,652	9,991,627	3,895,996	6,250,745	10,146,740	0.35%	0.31%	0.32%	0.29%	0.41%	0.36%	0.09%	1.05%	0.68%
2015	3,972,864	6,067,643	10,040,507	3,935,530	6,101,053	10,036,584	3,899,456	6,312,359	10,211,814	0.41%	0.23%	0.30%	0.32%	0.53%	0.45%	0.09%	0.99%	0.64%
2016	3,991,169	6,080,401	10,071,570	3,950,566	6,136,296	10,086,862	3,905,602	6,373,253	10,278,854	0.46%	0.21%	0.31%	0.38%	0.58%	0.50%	0.16%	0.96%	0.66%
2017	4,011,534	6,099,141	10,110,676	3,966,570	6,168,288	10,134,858	3,912,209	6,441,773	10,353,981	0.51%	0.31%	0.39%	0.41%	0.52%	0.48%	0.17%	1.08%	0.73%
2018	4,026,908	6,119,278	10,146,186	3,978,035	6,200,188	10,178,224	3,913,157	6,512,557	10,425,714	0.38%	0.33%	0.35%	0.29%	0.52%	0.43%	0.02%	1.10%	0.69%
2019	4,041,318	6,137,110	10,178,428	3,988,223	6,236,290	10,224,513	3,913,100	6,581,878	10,494,978	0.36%	0.29%	0.32%	0.26%	0.58%	0.45%	0.00%	1.06%	0.66%
2020	4,057,984	6,154,509	10,212,493	3,999,631	6,273,930	10,273,561	3,913,859	6,651,697	10,565,556	0.41%	0.28%	0.33%	0.29%	0.60%	0.48%	0.02%	1.06%	0.67%
2021	4,074,551	6,176,791	10,251,342	4,011,391	6,309,960	10,321,350	3,914,582	6,727,893	10,642,475	0.41%	0.36%	0.38%	0.29%	0.57%	0.47%	0.02%	1.15%	0.73%
2022	4,087,948	6,200,711	10,288,660	4,019,068	6,346,091	10,365,159	3,911,693	6,806,643	10,718,335	0.33%	0.39%	0.36%	0.19%	0.57%	0.42%	-0.07%	1.17%	0.71%
2023	4,099,324	6,221,307	10,320,632	4,025,241	6,385,451	10,410,692	3,905,662	6,883,230	10,788,892	0.28%	0.33%	0.31%	0.15%	0.62%	0.44%	-0.15%	1.13%	0.66%
2024	4,113,551	6,233,276	10,346,827	4,033,905	6,428,540	10,462,446	3,902,327	6,950,881	10,853,208	0.35%	0.19%	0.25%	0.22%	0.67%	0.50%	-0.09%	0.98%	0.60%
2025	4,133,557	6,257,082	10,390,638	4,048,020	6,468,367	10,516,386	3,903,989	7,033,451	10,937,440	0.49%	0.38%	0.42%	0.35%	0.62%	0.52%	0.04%	1.19%	0.78%
2026	4,145,268	6,280,946	10,426,214	4,052,991	6,509,006	10,561,997	3,896,432	7,116,919	11,013,351	0.28%	0.38%	0.34%	0.12%	0.63%	0.43%	-0.19%	1.19%	0.69%
2027	4,156,260	6,301,992	10,458,252	4,057,063	6,550,968	10,608,031	3,888,439	7,198,320	11,086,759	0.27%	0.34%	0.31%	0.10%	0.64%	0.44%	-0.21%	1.14%	0.67%
2028	4,168,655	6,326,245	10,494,900	4,063,677	6,593,566	10,657,243	3,881,258	7,284,832	11,166,089	0.30%	0.38%	0.35%	0.16%	0.65%	0.46%	-0.18%	1.20%	0.72%
2029	4,179,823	6,352,077	10,531,901	4,067,469	6,636,992	10,704,461	3,871,806	7,374,273	11,246,080	0.27%	0.41%	0.35%	0.09%	0.66%	0.44%	-0.24%	1.23%	0.72%
2030	4,188,567	6,352,077	10,540,644	4,069,456	6,636,992	10,706,448	3,860,477	7,374,273	11,234,750	0.21%	0.00%	0.08%	0.05%	0.00%	0.02%	-0.29%	0.00%	-0.10%
2031	4,197,002	6,378,070	10,575,072	4,070,974	6,680,818	10,751,792	3,848,536	7,464,773	11,313,309	0.20%	0.41%	0.33%	0.04%	0.66%	0.42%	-0.31%	1.23%	0.70%

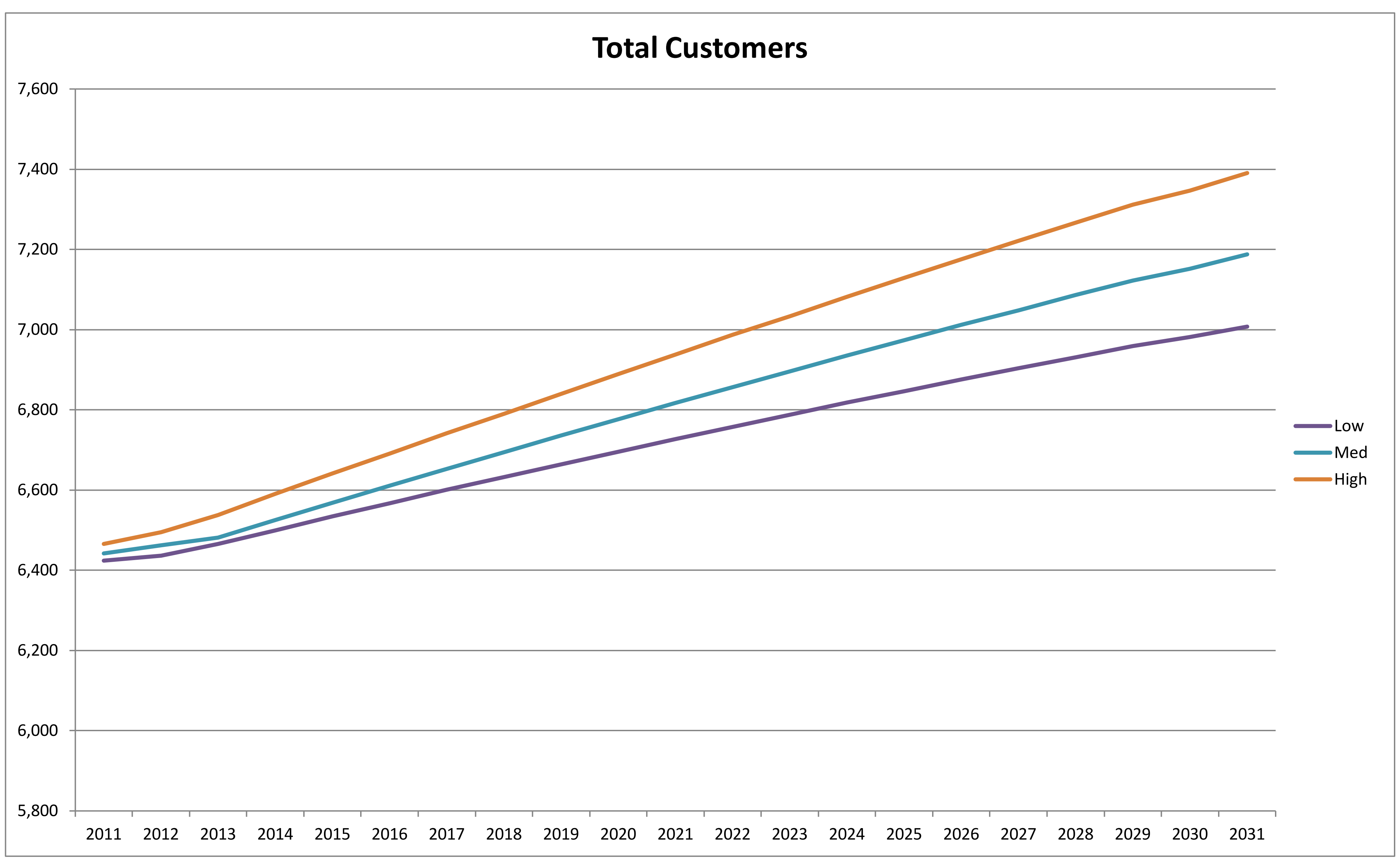
	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	5,262	1,162	6,424	5,273	1,169	6,442	5,290	1,175	6,465	0.29%	0.82%	0.38%	0.50%	1.41%	0.66%	0.82%	1.94%	1.02%
2012	5,271	1,165	6,436	5,287	1,175	6,462	5,312	1,183	6,495	0.17%	0.26%	0.19%	0.27%	0.49%	0.31%	0.42%	0.68%	0.46%
2013	5,297	1,169	6,466	5,301	1,181	6,482	5,347	1,191	6,538	0.49%	0.27%	0.45%	0.26%	0.49%	0.31%	0.66%	0.68%	0.66%
2014	5,328	1,172	6,500	5,339	1,187	6,526	5,391	1,200	6,591	0.59%	0.29%	0.53%	0.72%	0.51%	0.68%	0.82%	0.69%	0.80%
2015	5,359	1,175	6,534	5,376	1,193	6,569	5,433	1,208	6,641	0.58%	0.30%	0.53%	0.69%	0.51%	0.66%	0.78%	0.70%	0.76%
2016	5,388	1,179	6,567	5,412	1,199	6,611	5,475	1,216	6,691	0.54%	0.30%	0.50%	0.67%	0.51%	0.64%	0.77%	0.69%	0.76%
2017	5,418	1,183	6,601	5,448	1,205	6,653	5,517	1,225	6,742	0.56%	0.31%	0.51%	0.67%	0.53%	0.64%	0.77%	0.71%	0.76%
2018	5,446	1,186	6,632	5,483	1,211	6,694	5,557	1,234	6,791	0.52%	0.31%	0.48%	0.64%	0.52%	0.62%	0.73%	0.70%	0.72%
2019	5,474	1,190	6,664	5,518	1,218	6,736	5,598	1,242	6,840	0.51%	0.32%	0.48%	0.64%	0.53%	0.62%	0.74%	0.71%	0.73%
2020	5,502	1,194	6,696	5,552	1,224	6,776	5,638	1,251	6,889	0.51%	0.32%	0.48%	0.62%	0.53%	0.60%	0.71%	0.71%	0.71%
2021	5,529	1,198	6,727	5,586	1,231	6,817	5,678	1,260	6,938	0.49%	0.33%	0.46%	0.61%	0.53%	0.60%	0.71%	0.71%	0.71%
2022	5,556	1,202	6,758	5,619	1,237	6,856	5,718	1,269	6,987	0.49%	0.33%	0.46%	0.59%	0.52%	0.58%	0.70%	0.70%	0.70%
2023	5,582	1,206	6,788	5,652	1,244	6,896	5,756	1,278	7,034	0.47%	0.33%	0.44%	0.59%	0.53%	0.58%	0.66%	0.71%	0.67%
2024	5,608	1,210	6,818	5,685	1,250	6,935	5,795	1,287	7,082	0.47%	0.33%	0.44%	0.58%	0.53%	0.57%	0.68%	0.71%	0.68%
2025	5,633	1,214	6,847	5,717	1,257	6,974	5,833	1,296	7,129	0.45%	0.34%	0.43%	0.56%	0.54%	0.56%	0.66%	0.71%	0.67%
2026	5,658	1,218	6,876	5,748	1,264	7,012	5,870	1,305	7,175	0.44%	0.34%	0.42%	0.54%	0.53%	0.54%	0.63%	0.70%	0.65%
2027	5,682	1,222	6,904	5,778	1,270	7,048	5,907	1,314	7,221	0.42%	0.34%	0.41%	0.52%	0.53%	0.52%	0.63%	0.70%	0.64%
2028	5,705	1,226	6,931	5,809	1,277	7,086	5,943	1,323	7,266	0.40%	0.34%	0.39%	0.54%	0.53%	0.54%	0.61%	0.70%	0.63%
2029	5,729	1,231	6,960	5,839	1,284	7,123	5,979	1,333	7,312	0.42%	0.34%	0.41%	0.52%	0.53%	0.52%	0.61%	0.70%	0.62%
2030	5,751	1,231	6,982	5,868	1,284	7,152	6,014	1,333	7,347	0.38%	0.00%	0.32%	0.50%	0.00%	0.41%	0.59%	0.00%	0.48%
2031	5,773	1,235	7,008	5,897	1,291	7,188	6,049	1,342	7,391	0.38%	0.33%	0.37%	0.49%	0.52%	0.50%	0.58%	0.69%	0.60%

Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Aberdeen





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bellingham

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	29,694,159	16,654,540	46,348,699	30,283,930	16,985,324	47,269,254	31,155,527	17,474,176	48,629,704	12.50%	12.50%	12.50%	14.73%	14.73%	14.73%	18.04%	18.04%	18.04%
2012	29,791,926	16,709,375	46,501,301	30,485,081	17,098,144	47,583,225	31,649,928	17,751,471	49,401,399	0.33%	0.33%	0.33%	0.66%	0.66%	0.66%	1.59%	1.59%	1.59%
2013	30,091,197	16,877,226	46,968,423	30,740,618	17,241,467	47,982,085	32,043,965	17,972,474	50,016,439	1.00%	1.00%	1.00%	0.84%	0.84%	0.84%	1.24%	1.24%	1.24%
2014	30,616,270	17,171,723	47,787,993	31,228,147	17,514,906	48,743,053	32,667,064	18,321,951	50,989,015	1.74%	1.74%	1.74%	1.59%	1.59%	1.59%	1.94%	1.94%	1.94%
2015	31,343,137	17,579,401	48,922,539	31,974,999	17,933,793	49,908,792	33,439,467	18,755,168	52,194,636	2.37%	2.37%	2.37%	2.39%	2.39%	2.39%	2.36%	2.36%	2.36%
2016	32,068,468	17,986,217	50,054,685	32,790,521	18,391,194	51,181,715	34,270,598	19,221,324	53,491,921	2.31%	2.31%	2.31%	2.55%	2.55%	2.55%	2.49%	2.49%	2.49%
2017	32,643,457	18,308,711	50,952,168	33,399,019	18,732,482	52,131,501	34,948,116	19,601,323	54,549,439	1.79%	1.79%	1.79%	1.86%	1.86%	1.86%	1.98%	1.98%	1.98%
2018	33,228,971	18,637,107	51,866,079	34,013,144	19,076,926	53,090,070	35,605,480	19,970,018	55,575,497	1.79%	1.79%	1.79%	1.84%	1.84%	1.84%	1.88%	1.88%	1.88%
2019	33,916,457	19,022,697	52,939,153	34,782,129	19,508,226	54,290,355	36,405,376	20,418,655	56,824,030	2.07%	2.07%	2.07%	2.26%	2.26%	2.26%	2.25%	2.25%	2.25%
2020	34,618,702	19,416,565	54,035,267	35,507,994	19,915,341	55,423,335	37,187,293	20,857,208	58,044,502	2.07%	2.07%	2.07%	2.09%	2.09%	2.09%	2.15%	2.15%	2.15%
2021	35,132,455	19,704,713	54,837,167	36,086,147	20,239,609	56,325,756	37,811,134	21,207,101	59,018,236	1.48%	1.48%	1.48%	1.63%	1.63%	1.63%	1.68%	1.68%	1.68%
2022	35,650,128	19,995,059	55,645,187	36,628,398	20,543,741	57,172,139	38,441,143	21,560,454	60,001,597	1.47%	1.47%	1.47%	1.50%	1.50%	1.50%	1.67%	1.67%	1.67%
2023	36,423,828	20,429,004	56,852,832	37,453,221	21,006,359	58,459,580	39,304,362	22,044,607	61,348,969	2.17%	2.17%	2.17%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%
2024	37,368,873	20,959,051	58,327,924	38,500,063	21,593,500	60,093,563	40,304,754	22,605,696	62,910,450	2.59%	2.59%	2.59%	2.80%	2.80%	2.80%	2.55%	2.55%	2.55%
2025	37,942,229	21,280,629	59,222,858	39,109,974	21,935,581	61,045,555	40,957,211	22,971,639	63,928,850	1.53%	1.53%	1.53%	1.58%	1.58%	1.58%	1.62%	1.62%	1.62%
2026	38,548,481	21,620,657	60,169,138	39,755,409	22,297,585	62,052,994	41,684,550	23,379,581	65,064,131	1.60%	1.60%	1.60%	1.65%	1.65%	1.65%	1.78%	1.78%	1.78%
2027	39,234,586	22,005,472	61,240,058	40,499,026	22,714,657	63,213,683	42,457,606	23,813,164	66,270,770	1.78%	1.78%	1.78%	1.87%	1.87%	1.87%	1.85%	1.85%	1.85%
2028	39,804,337	22,325,028	62,129,365	41,149,682	23,079,590	64,229,273	43,149,905	24,201,454	67,351,359	1.45%	1.45%	1.45%	1.61%	1.61%	1.61%	1.63%	1.63%	1.63%
2029	40,312,638	22,610,118	62,922,756	41,694,044	23,384,906	65,078,950	43,781,734	24,555,827	68,337,562	1.28%	1.28%	1.28%	1.32%	1.32%	1.32%	1.46%	1.46%	1.46%
2030	40,641,273	22,794,439	63,435,712	42,140,746	23,635,448	65,776,194	44,318,813	24,857,058	69,175,871	0.82%	0.82%	0.82%	1.07%	1.07%	1.07%	1.23%	1.23%	1.23%
2031	41,141,838	23,075,191	64,217,028	42,678,979	23,937,326	66,616,305	44,947,670	25,209,765	70,157,435	1.23%	1.23%	1.23%	1.28%	1.28%	1.28%	1.42%	1.42%	1.42%

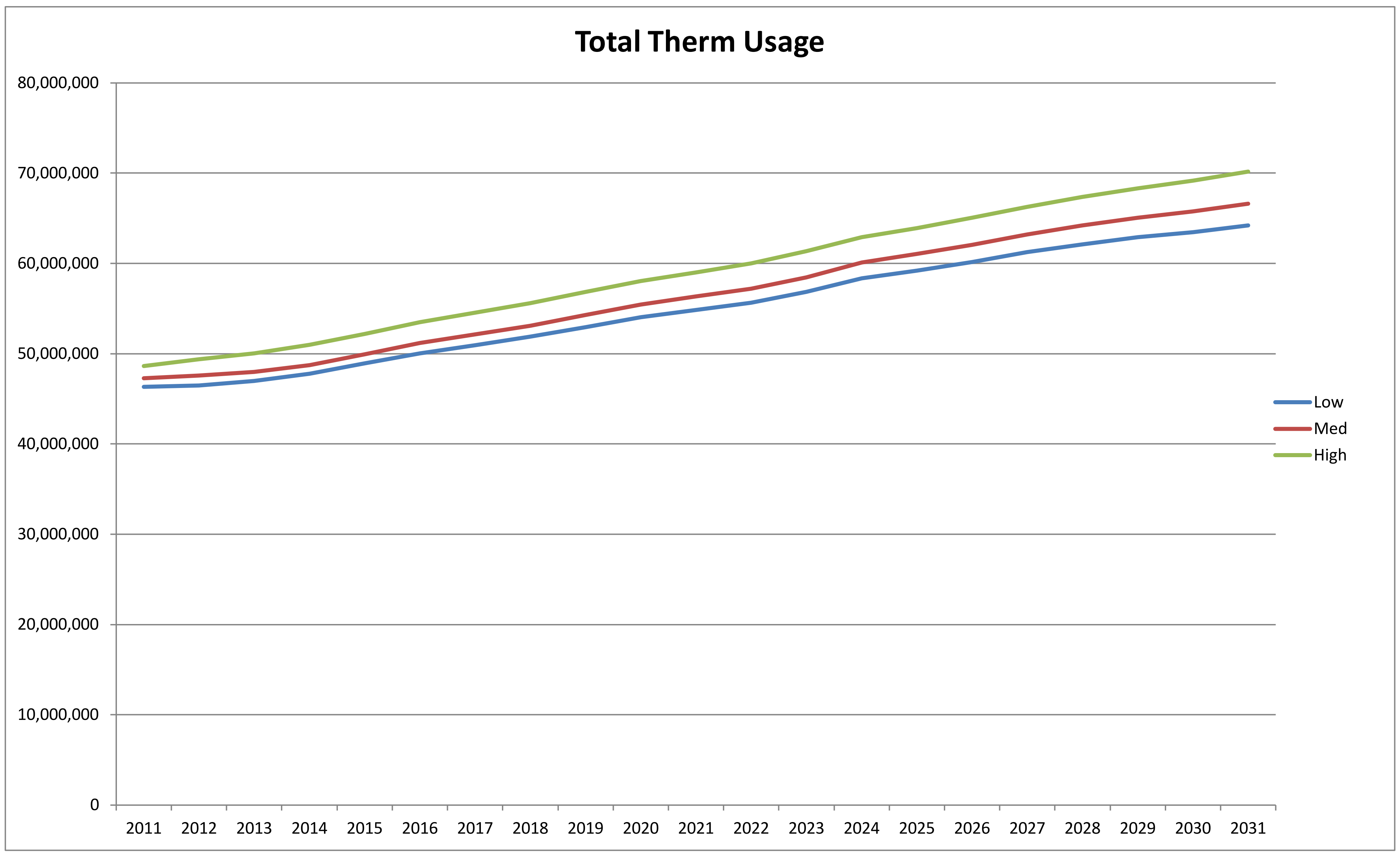
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	45,629	655,924	701,553	46,535	663,601	710,136	47,874	675,654	723,529	12.50%	0.17%	0.89%	14.73%	1.34%	2.12%	18.04%	3.18%	4.05%
2012	45,779	668,658	714,437	46,844	677,168	724,012	48,634	690,205	738,840	0.33%	1.94%	1.84%	0.66%	2.04%	1.95%	1.59%	2.15%	2.12%
2013	46,239	684,591	730,830	47,237	690,587	737,824	49,240	708,122	757,362	1.00%	2.38%	2.29%	0.84%	1.98%	1.91%	1.24%	2.60%	2.51%
2014	47,046	701,262	748,307	47,986	708,766	756,752	50,197	727,598	777,795	1.74%	2.44%	2.39%	1.59%	2.63%	2.57%	1.94%	2.75%	2.70%
2015	48,163	717,632	765,794	49,134	726,614	775,748	51,384	746,941	798,325	2.37%	2.33%	2.34%	2.39%	2.52%	2.51%	2.36%	2.66%	2.64%
2016	49,277	734,011	783,288	50,387	744,442	794,829	52,661	766,356	819,017	2.31%	2.28%	2.28%	2.55%	2.45%	2.46%	2.49%	2.60%	2.59%
2017	50,161	750,628	800,789	51,322	762,641	813,963	53,702	786,137	839,840	1.79%	2.26%	2.23%	1.86%	2.44%	2.41%	1.98%	2.58%	2.54%
2018	51,061	767,250	818,310	52,266	780,928	833,194	54,712	806,060	860,772	1.79%	2.21%	2.19%	1.84%	2.40%	2.36%	1.88%	2.53%	2.49%
2019	52,117	783,689	835,806	53,447	799,047	852,494	55,942	825,960	881,901	2.07%	2.14%	2.14%	2.26%	2.32%	2.32%	2.25%	2.47%	2.45%
2020	53,196	800,129	853,325	54,563	817,301	871,863	57,143	846,003	903,146	2.07%	2.10%	2.10%	2.09%	2.28%	2.27%	2.15%	2.43%	2.41%
2021	53,986	816,897	870,882	55,451	835,901	891,352	58,102	866,519	924,621	1.48%	2.10%	2.06%	1.63%	2.28%	2.24%	1.68%	2.43%	2.38%
2022	54,781	833,683	888,464	56,284	854,640	910,924	59,070	887,138	946,207	1.47%	2.05%	2.02%	1.50%	2.24%	2.20%	1.67%	2.38%	2.33%
2023	55,970	850,065	906,035	57,552	872,978	930,530	60,396	907,473	967,869	2.17%	1.97%	1.98%	2.25%	2.15%	2.15%	2.25%	2.29%	2.29%
2024	57,422	866,172	923,594	59,160	891,043	950,203	61,933	927,761	989,695	2.59%	1.89%	1.94%	2.80%	2.07%	2.11%	2.55%	2.24%	2.25%
2025	58,303	882,839	941,142	60,097	909,827	969,925	62,936	948,660	1,011,596	1.53%	1.92%	1.90%	1.58%	2.11%	2.08%	1.62%	2.25%	2.21%
2026	59,235	899,441	958,676	61,089	928,605	989,694	64,054	969,553	1,033,606	1.60%	1.88%	1.86%	1.65%	2.06%	2.04%	1.78%	2.20%	2.18%
2027	60,289	915,892	976,181	62,232	947,266	1,009,498	65,242	990,520	1,055,762	1.78%	1.83%	1.83%	1.87%	2.01%	2.00%	1.85%	2.16%	2.14%
2028	61,164	932,478	993,643	63,232	966,103	1,029,335	66,305	1,011,675	1,077,980	1.45%	1.81%	1.79%	1.61%	1.99%	1.97%	1.63%	2.14%	2.10%
2029	61,946	949,161	1,011,107	64,068	985,170	1,049,238	67,276	1,033,082	1,100,359	1.28%	1.79%	1.76%	1.32%	1.97%	1.93%	1.46%	2.12%	2.08%
2030	62,451	964,441	1,026,891	64,755	1,002,750	1,067,505	68,102	1,053,053	1,121,154	0.82%	1.61%	1.56%	1.07%	1.78%	1.74%	1.23%	1.93%	1.89%
2031	63,220	981,400	1,044,620	65,582	1,022,229	1,087,811	69,068	1,075,037	1,144,105	1.23%	1.76%	1.73%	1.28%	1.94%	1.90%	1.42%	2.09%	2.05%

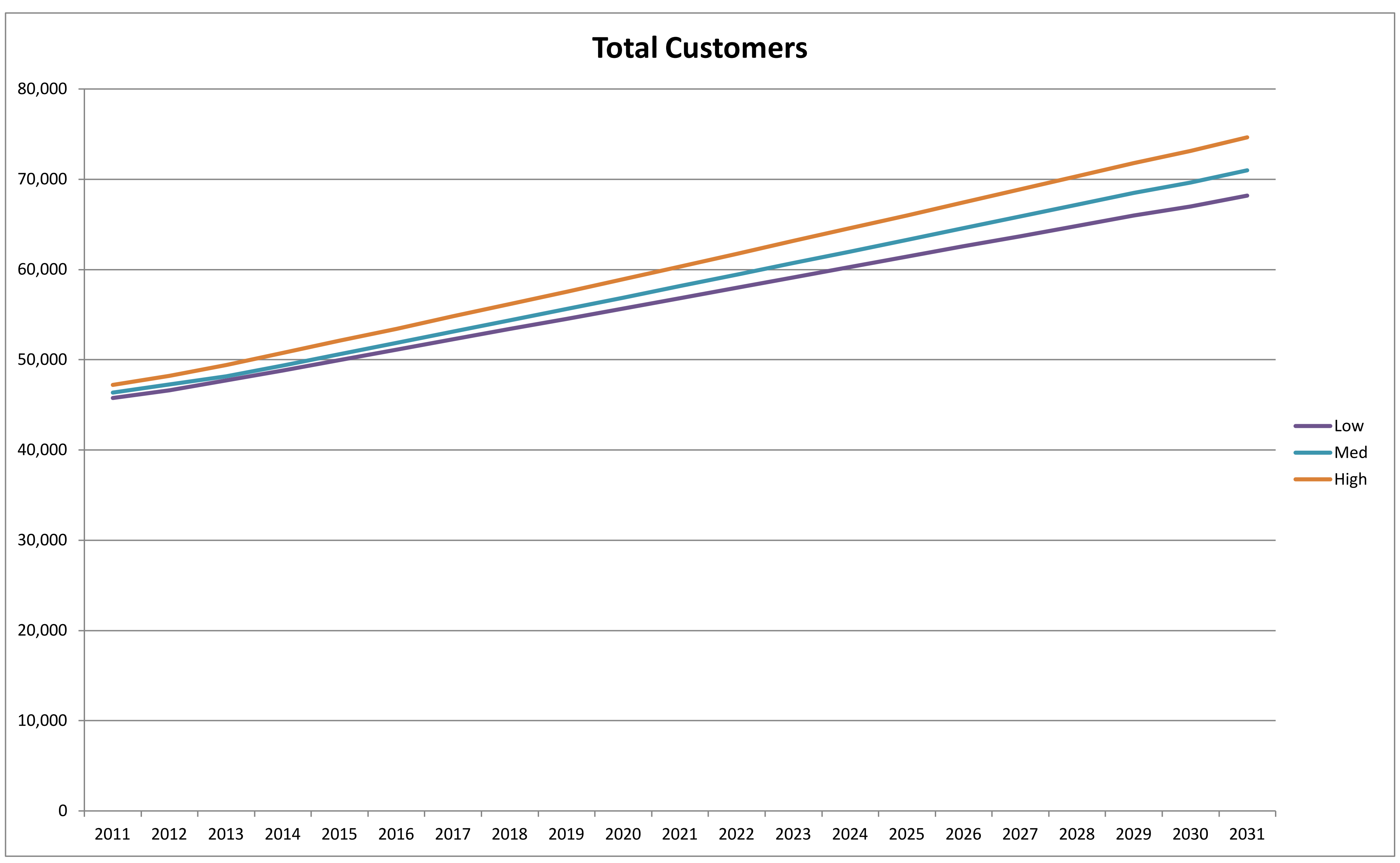
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	29,136,464	17,212,235	46,348,699	29,857,331	17,411,923	47,269,254	30,913,542	17,716,162	48,629,704	8.35%	20.30%	12.50%	11.03%	21.69%	14.73%	14.96%	23.82%	18.04%
2012	29,113,350	17,387,951	46,501,301	30,085,035	17,498,190	47,583,225	31,504,548	17,896,851	49,401,399	-0.08%	1.02%	0.33%	0.76%	0.50%	0.66%	1.91%	1.02%	1.59%
2013	29,351,400	17,617,023	46,968,423	30,340,350	17,641,735	47,982,085	31,946,500	18,069,939	50,016,439	0.82%	1.32%	1.00%	0.85%	0.82%	0.84%	1.40%	0.97%	1.24%
2014	29,880,385	17,907,608	47,787,993	30,862,300	17,880,753	48,743,053	32,687,256	18,301,759	50,989,015	1.80%	1.65%	1.74%	1.72%	1.35%	1.59%	2.32%	1.28%	1.94%
2015	30,625,098	18,297,441	48,922,539	31,645,600	18,263,192	49,908,792	33,565,434	18,629,202	52,194,636	2.49%	2.18%	2.37%	2.54%	2.14%	2.39%	2.69%	1.79%	2.36%
2016	31,326,876	18,727,809	50,054,685	32,479,433	18,702,282	51,181,715	34,499,326	18,992,595	53,491,921	2.29%	2.35%	2.31%	2.63%	2.40%	2.55%	2.78%	1.95%	2.49%
2017	31,889,270	19,062,898	50,952,168	33,128,476	19,003,025	52,131,501	35,295,120	19,254,319	54,549,439	1.80%	1.79%	1.79%	2.00%	1.61%	1.86%	2.31%	1.38%	1.98%
2018	32,494,596	19,371,483	51,866,079	33,824,208	19,265,862	53,090,070	36,091,706	19,483,791	55,575,497	1.90%	1.62%	1.79%	2.10%	1.38%	1.84%	2.26%	1.19%	1.88%
2019	33,192,621	19,746,532	52,939,153	34,668,083	19,622,272	54,290,355	37,047,194	19,776,836	56,824,030	2.15%	1.94%	2.07%	2.49%	1.85%	2.26%	2.65%	1.50%	2.25%
2020	33,892,008	20,143,259	54,035,267	35,415,960	20,007,375	55,423,335	37,958,167	20,086,335	58,044,502	2.11%	2.01%	2.07%	2.16%	1.96%	2.09%	2.46%	1.56%	2.15%
2021	34,390,246	20,446,921	54,837,167	36,063,027	20,262,729	56,325,756	38,717,700	20,300,536	59,018,236	1.47%	1.51%	1.48%	1.83%	1.28%	1.63%	2.00%	1.07%	1.68%
2022	34,933,420	20,711,767	55,645,187	36,707,310	20,464,829	57,172,139	39,530,610	20,470,987	60,001,597	1.58%	1.30%	1.47%	1.79%	1.00%	1.50%	2.10%	0.84%	1.67%
2023	35,787,574	21,065,258	56,852,832	37,672,866	20,786,714	58,459,580	40,625,937	20,723,032	61,348,969	2.45%	1.71%	2.17%	2.63%	1.57%	2.25%	2.77%	1.23%	2.25%
2024	36,701,814	21,626,110	58,327,924	38,704,410	21,389,153	60,093,563	41,736,960	21,173,490	62,910,450	2.55%	2.66%	2.59%	2.74%	2.90%	2.80%	2.73%	2.17%	2.55%
2025	37,294,754	21,928,104	59,222,858	39,407,890	21,637,665	61,045,555	42,563,758	21,365,092	63,928,850	1.62%	1.40%	1.53%	1.82%	1.16%	1.58%	1.98%	0.90%	1.62%
2026	37,939,524	22,229,614	60,169,138	40,167,332	21,885,662	62,052,994	43,512,236	21,551,895	65,064,131	1.73%	1.37%	1.60%	1.93%	1.15%	1.65%	2.23%	0.87%	1.78%
2027	38,638,542	22,601,516	61,240,058	40,985,558	22,228,125	63,213,683	44,467,894	21,802,876	66,270,770	1.84%	1.67%	1.78%	2.04%	1.56%	1.87%	2.20%	1.16%	1.85%
2028	39,220,168	22,909,197	62,129,365	41,745,627	22,483,646	64,229,273	45,363,873	21,987,486	67,351,359	1.51%	1.36%	1.45%	1.85%	1.15%	1.61%	2.01%	0.85%	1.63%
2029	39,739,304	23,183,452	62,922,756	42,383,940	22,695,010	65,078,950	46,200,440	22,137,122	68,337,562	1.32%	1.20%	1.28%	1.53%	0.94%	1.32%	1.84%	0.68%	1.46%
2030	40,252,260	23,183,452	63,435,712	43,081,184	22,695,010	65,776,194	47,038,749	22,137,122	69,175,871	1.29%	0.00%	0.82%	1.65%	0.00%	1.07%	1.81%	0.00%	1.23%
2031	40,771,042	23,445,986	64,217,028	43,724,920	22,891,385	66,616,305	47,885,129	22,272,306	70,157,435	1.29%	1.13%	1.23%	1.49%	0.87%	1.28%	1.80%	0.61%	1.42%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	40,922	4,857	45,779	41,411	4,928	46,339	42,174	5,039	47,213	0.96%	0.23%	0.89%	2.17%	1.70%	2.12%	4.05%	3.99%	4.05%
2012	41,650	4,970	46,620	42,195	5,050	47,245	43,039	5,173	48,212	1.78%	2.32%	1.84%	1.89%	2.46%	1.95%	2.05%	2.66%	2.12%
2013	42,600	5,090	47,690	42,975	5,171	48,146	44,125	5,296	49,421	2.28%	2.41%	2.29%	1.85%	2.40%	1.91%	2.52%	2.37%	2.51%
2014	43,621	5,209	48,830	44,089	5,292	49,381	45,336	5,418	50,754	2.40%	2.35%	2.39%	2.59%	2.34%	2.57%	2.74%	2.31%	2.70%
2015	44,643	5,328	49,971	45,208	5,413	50,621	46,554	5,540	52,094	2.34%	2.29%	2.34%	2.54%	2.28%	2.51%	2.69%	2.25%	2.64%
2016	45,666	5,447	51,113	46,333	5,533	51,866	47,783	5,661	53,444	2.29%	2.22%	2.28%	2.49%	2.22%	2.46%	2.64%	2.19%	2.59%
2017	46,690	5,565	52,255	47,462	5,652	53,114	49,021	5,782	54,803	2.24%	2.17%	2.23%	2.44%	2.16%	2.41%	2.59%	2.13%	2.54%
2018	47,716	5,682	53,398	48,598	5,771	54,369	50,267	5,902	56,169	2.20%	2.11%	2.19%	2.39%	2.10%	2.36%	2.54%	2.07%	2.49%
2019	48,741	5,799	54,540	49,739	5,890	55,629	51,526	6,022	57,548	2.15%	2.05%	2.14%	2.35%	2.05%	2.32%	2.50%	2.03%	2.45%
2020	49,768	5,915	55,683	50,885	6,008	56,893	52,793	6,141	58,934	2.11%	2.00%	2.10%	2.30%	2.00%	2.27%	2.46%	1.98%	2.41%
2021	50,798	6,031	56,829	52,039	6,125	58,164	54,075	6,260	60,335	2.07%	1.96%	2.06%	2.27%	1.96%	2.24%	2.43%	1.94%	2.38%
2022	51,830	6,146	57,976	53,199	6,243	59,442	55,365	6,379	61,744	2.03%	1.91%	2.02%	2.23%	1.91%	2.20%	2.39%	1.89%	2.33%
2023	52,862	6,261	59,123	54,362	6,359	60,721	56,661	6,496	63,157	1.99%	1.86%	1.98%	2.19%	1.86%	2.15%	2.34%	1.84%	2.29%
2024	53,894	6,374	60,268	55,530	6,475	62,005	57,968	6,614	64,582	1.95%	1.82%	1.94%	2.15%	1.82%	2.11%	2.31%	1.80%	2.25%
2025	54,926	6,487	61,413	56,702	6,590	63,292	59,281	6,730	66,011	1.91%	1.77%	1.90%	2.11%	1.77%	2.08%	2.27%	1.76%	2.21%
2026	55,958	6,600	62,558	57,878	6,704	64,582	60,602	6,845	67,447	1.88%	1.73%	1.86%	2.07%	1.73%	2.04%	2.23%	1.71%	2.18%
2027	56,989	6,711	63,700	59,057	6,817	65,874	61,933	6,960	68,893	1.84%	1.69%	1.83%	2.04%	1.69%	2.00%	2.20%	1.68%	2.14%
2028	58,018	6,821	64,839	60,239	6,929	67,168	63,269	7,074	70,343	1.81%	1.65%	1.79%	2.00%	1.65%	1.97%	2.16%	1.64%	2.10%
2029	59,048	6,931	65,979	61,426	7,041	68,467	64,616	7,187	71,803	1.78%	1.61%	1.76%	1.97%	1.61%	1.93%	2.13%	1.60%	2.08%
2030	60,078	6,931	67,009	62,618	7,041	69,659	65,973	7,187	73,160	1.74%	0.00%	1.56%	1.94%	0.00%	1.74%	2.10%	0.00%	1.89%
2031	61,126	7,040	68,166	63,832	7,152	70,984	67,358	7,300	74,658	1.74%	1.57%	1.73%	1.94%	1.58%	1.90%	2.10%	1.57%	2.05%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bellingham





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bremerton

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	17,763,561	12,413,867	30,177,428	18,192,775	12,713,818	30,906,594	18,884,623	13,197,308	32,081,931
2012	17,865,489	12,485,098	30,350,587	18,388,942	12,850,907	31,239,849	19,191,473	13,411,747	32,603,220
2013	18,085,184	12,638,629	30,723,812	18,618,859	13,011,582	31,630,442	19,571,773	13,677,515	33,249,288
2014	18,418,548	12,871,597	31,290,146	18,975,931	13,261,118	32,237,050	20,081,632	14,033,825	34,115,457
2015	18,816,038	13,149,378	31,965,416	19,430,824	13,579,015	33,009,839	20,628,054	14,415,685	35,043,739
2016	19,197,130	13,415,700	32,612,830	19,906,064	13,911,131	33,817,194	21,200,271	14,815,573	36,015,843
2017	19,552,063	13,663,741	33,215,805	20,342,065	14,215,826	34,557,891	21,754,288	15,202,742	36,957,030
2018	19,928,185	13,926,590	33,854,775	20,802,672	14,537,716	35,340,388	22,337,104	15,610,036	37,947,140
2019	20,320,498	14,200,753	34,521,251	21,301,031	14,885,988	36,187,019	22,927,109	16,022,355	38,949,464
2020	20,713,970	14,475,727	35,189,697	21,784,908	15,224,140	37,009,047	23,546,032	16,454,882	40,000,915
2021	21,079,817	14,731,395	35,811,213	22,245,079	15,545,725	37,790,805	24,145,205	16,873,607	41,018,812
2022	21,450,145	14,990,195	36,440,340	22,713,492	15,873,071	38,586,563	24,756,745	17,300,975	42,057,720
2023	21,893,838	15,300,265	37,194,103	23,258,275	16,253,786	39,512,062	25,412,371	17,759,152	43,171,524
2024	22,345,648	15,616,007	37,961,656	23,813,512	16,641,807	40,455,319	26,085,939	18,229,868	44,315,807
2025	22,739,536	15,891,271	38,630,807	24,315,219	16,992,420	41,307,639	26,725,446	18,676,780	45,402,226
2026	23,134,922	16,167,582	39,302,504	24,821,478	17,346,213	42,167,692	27,397,965	19,146,762	46,544,727
2027	23,546,847	16,455,452	40,002,299	25,369,404	17,729,125	43,098,529	28,075,607	19,620,325	47,695,933
2028	23,944,860	16,733,598	40,678,458	25,885,125	18,089,531	43,974,657	28,769,758	20,105,425	48,875,183
2029	24,325,408	16,999,540	41,324,948	26,387,180	18,440,386	44,827,566	29,455,176	20,584,421	50,039,597
2030	24,475,555	17,104,469	41,580,024	26,633,795	18,612,730	45,246,525	29,816,871	20,837,188	50,654,058
2031	24,859,411	17,372,722	42,232,133	27,144,323	18,969,507	46,113,830	30,525,311	21,332,273	51,857,584

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	7.56%	7.56%	7.56%	10.16%	10.16%	10.16%	14.35%	14.35%	14.35%
2012	0.57%	0.57%	0.57%	1.08%	1.08%	1.08%	1.62%	1.62%	1.62%
2013	1.23%	1.23%	1.23%	1.25%	1.25%	1.25%	1.98%	1.98%	1.98%
2014	1.84%	1.84%	1.84%	1.92%	1.92%	1.92%	2.61%	2.61%	2.61%
2015	2.16%	2.16%	2.16%	2.40%	2.40%	2.40%	2.72%	2.72%	2.72%
2016	2.03%	2.03%	2.03%	2.45%	2.45%	2.45%	2.77%	2.77%	2.77%
2017	1.85%	1.85%	1.85%	2.19%	2.19%	2.19%	2.61%	2.61%	2.61%
2018	1.92%	1.92%	1.92%	2.26%	2.26%	2.26%	2.68%	2.68%	2.68%
2019	1.97%	1.97%	1.97%	2.40%	2.40%	2.40%	2.64%	2.64%	2.64%
2020	1.94%	1.94%	1.94%	2.27%	2.27%	2.27%	2.70%	2.70%	2.70%
2021	1.77%	1.77%	1.77%	2.11%	2.11%	2.11%	2.54%	2.54%	2.54%
2022	1.76%	1.76%	1.76%	2.11%	2.11%	2.11%	2.53%	2.53%	2.53%
2023	2.07%	2.07%	2.07%	2.40%	2.40%	2.40%	2.65%	2.65%	2.65%
2024	2.06%	2.06%	2.06%	2.39%	2.39%	2.39%	2.65%	2.65%	2.65%
2025	1.76%	1.76%	1.76%	2.11%	2.11%	2.11%	2.45%	2.45%	2.45%
2026	1.74%	1.74%	1.74%	2.08%	2.08%	2.08%	2.52%	2.52%	2.52%
2027	1.78%	1.78%	1.78%	2.21%	2.21%	2.21%	2.47%	2.47%	2.47%
2028	1.69%	1.69%	1.69%	2.03%	2.03%	2.03%	2.47%	2.47%	2.47%
2029	1.59%	1.59%	1.59%	1.94%	1.94%	1.94%	2.38%	2.38%	2.38%
2030	0.62%	0.62%	0.62%	0.93%	0.93%	0.93%	1.23%	1.23%	1.23%
2031	1.57%	1.57%	1.57%	1.92%	1.92%	1.92%	2.38%	2.38%	2.38%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	34,011	308,902	342,912	34,832	309,797	344,630	36,157	310,940	347,097
2012	34,206	311,143	345,348	35,208	312,224	347,432	36,745	313,630	350,374
2013	34,626	315,659	350,285	35,648	314,589	350,237	37,473	319,746	357,219
2014	35,265	320,893	356,157	36,332	321,084	357,416	38,449	327,220	365,669
2015	36,026	326,036	362,061	37,203	327,460	364,663	39,495	334,738	374,233
2016	36,755	331,253	368,008	38,113	333,876	371,989	40,591	342,344	382,934
2017	37,435	336,561	373,996	38,947	340,458	379,405	41,651	350,135	391,786
2018	38,155	341,859	380,014	39,829	347,069	386,898	42,767	357,971	400,738
2019	38,906	347,165	386,072	40,784	353,698	394,481	43,897	365,945	409,842
2020	39,660	352,500	392,159	41,710	360,422	402,132	45,082	373,992	419,074
2021	40,360	357,941	398,301	42,591	367,295	409,886	46,229	382,242	428,471
2022	41,069	363,404	404,473	43,488	374,242	417,730	47,400	390,591	437,991
2023	41,919	368,778	410,696	44,531	381,105	425,636	48,655	398,976	447,631
2024	42,784	374,162	416,946	45,594	388,037	433,631	49,945	407,476	457,421
2025	43,538	379,685	423,223	46,555	395,156	441,711	51,169	416,161	467,330
2026	44,295	385,241	429,535	47,524	402,340	449,864	52,457	424,928	477,385
2027	45,083	390,790	435,873	48,573	409,519	458,092	53,754	433,809	487,563
2028	45,845	396,403	442,249	49,560	416,833	466,394	55,083	442,802	497,885
2029	46,574	402,075	448,649	50,522	424,271	474,793	56,396	451,960	508,355
2030	46,862	407,171	454,033	50,994	431,086	482,080	57,088	460,582	517,670
2031	47,596	412,942	460,538	51,971	438,706	490,678	58,445	470,021	528,465

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	7.56%	-1.32%	-0.51%	10.16%	-1.04%	-0.01%	14.35%	-0.67%	0.70%
2012	0.57%	0.73%	0.71%	1.08%	0.78%	0.81%	1.62%	0.86%	0.94%
2013	1.23%	1.45%	1.43%	1.25%	0.76%	0.81%	1.98%	1.95%	1.95%
2014	1.84%	1.66%	1.68%	1.92%	2.06%	2.05%	2.61%	2.34%	2.37%
2015	2.16%	1.60%	1.66%	2.40%	1.99%	2.03%	2.72%	2.30%	2.34%
2016	2.03%	1.60%	1.64%	2.45%	1.96%	2.01%	2.77%	2.27%	2.33%
2017	1.85%	1.60%	1.63%	2.19%	1.97%	1.99%	2.61%	2.28%	2.31%
2018	1.92%	1.57%	1.61%	2.26%	1.94%	1.97%	2.68%	2.24%	2.28%
2019	1.97%	1.55%	1.59%	2.40%	1.91%	1.96%	2.64%	2.23%	2.27%
2020	1.94%	1.54%	1.58%	2.27%	1.90%	1.94%	2.70%	2.20%	2.25%
2021	1.77%	1.54%	1.57%	2.11%	1.91%	1.93%	2.54%	2.21%	2.24%
2022	1.76%	1.53%	1.55%	2.11%	1.89%	1.91%	2.53%	2.18%	2.22%
2023	2.07%	1.48%	1.54%	2.40%	1.83%	1.89%	2.65%	2.15%	2.20%
2024	2.06%	1.46%	1.52%	2.39%	1.82%	1.88%	2.65%	2.13%	2.19%
2025	1.76%	1.48%	1.51%	2.11%	1.83%	1.86%	2.45%	2.13%	2.17%
2026	1.74%	1.46%	1.49%	2.08%	1.82%	1.85%	2.52%	2.11%	2.15%
2027	1.78%	1.44%	1.48%	2.21%	1.78%	1.83%	2.47%	2.09%	2.13%
2028	1.69%	1.44%	1.46%	2.03%	1.79%	1.81%	2.47%	2.07%	2.12%
2029	1.59%	1.43%	1.45%	1.94%	1.78%	1.80%	2.38%	2.07%	2.10%
2030	0.62%	1.27%	1.20%	0.93%	1.61%	1.53%	1.23%	1.91%	1.83%
2031	1.57%	1.42%	1.43%	1.92%	1.77%	1.78%	2.38%	2.05%	2.09%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	19,846,854	10,330,574	30,177,428	20,368,359	10,538,235	30,906,594	21,234,902	10,847,029	32,081,931
2012	19,693,206	10,657,381	30,350,587	20,315,617	10,924,232	31,239,849	21,290,850	11,312,370	32,603,220
2013	19,714,458	11,009,354	30,723,812	20,316,912	11,313,530	31,630,442	21,502,190	11,747,098	33,249,288
2014	19,930,513	11,359,633	31,290,146	20,535,102	11,701,948	32,237,050	21,929,645	12,185,812	34,115,457
2015	20,262,452	11,702,964	31,965,416	20,926,863	12,082,976	33,009,839	22,421,511	12,622,228	35,043,739
2016	20,567,624	12,045,206	32,612,830	21,352,880	12,464,314	33,817,194	22,952,400	13,063,443	36,015,843
2017	20,814,540	12,401,265	33,215,805	21,693,340	12,864,551	34,557,891	23,430,505	13,526,525	36,957,030
2018	21,091,668	12,763,107	33,854,775	22,066,916	13,273,472	35,340,388	23,945,404	14,001,736	37,947,140
2019	21,401,029	13,120,222	34,521,251	22,507,710	13,679,309	36,187,019	24,469,219	14,480,245	38,949,464
2020	21,711,768	13,477,929	35,189,697	22,920,930	14,088,117	37,009,047	25,034,112	14,966,803	40,000,915
2021	21,961,329	13,849,884	35,811,213	23,274,084	14,516,721	37,790,805	25,541,368	15,477,444	41,018,812
2022	22,210,440	14,229,900	36,440,340	23,629,820	14,956,743	38,586,563	26,054,588	16,003,132	42,057,720
2023	22,591,995	14,602,108	37,194,103	24,122,976	15,389,086	39,512,062	26,645,466	16,526,058	43,171,524
2024	23,010,120	14,951,536	37,961,656	24,658,191	15,797,128	40,455,319	27,283,390	17,032,417	44,315,807
2025	23,297,157	15,333,650	38,630,807	25,060,870	16,246,769	41,307,639	27,819,648	17,582,578	45,402,226
2026	23,585,328	15,717,176	39,302,504	25,466,571	16,701,121	42,167,692	28,401,456	18,143,271	46,544,727
2027	23,908,688	16,093,611	40,002,299	25,948,370	17,150,159	43,098,529	28,990,704	18,705,229	47,695,933
2028	24,198,888	16,479,570	40,678,458	26,361,329	17,613,328	43,974,657	29,588,880	19,286,303	48,875,183
2029	24,453,815	16,871,133	41,324,948	26,740,861	18,086,705	44,827,566	30,155,398	19,884,199	50,039,597
2030	24,708,891	16,871,133	41,580,024	27,159,820	18,086,705	45,246,525	30,769,859	19,884,199	50,654,058
2031	24,966,141	17,265,992	42,232,133	27,546,816	18,567,014	46,113,830	31,362,558	20,495,026	51,857,584

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	6.82%	9.01%	7.56%	9.63%	11.20%	10.16%	14.29%	14.46%	14.35%
2012	-0.77%	3.16%	0.57%	-0.26%	3.66%	1.08%	0.26%	4.29%	1.62%
2013	0.11%	3.30%	1.23%	0.01%	3.56%	1.25%	0.99%	3.84%	1.98%
2014	1.10%	3.18%	1.84%	1.07%	3.43%	1.92%	1.99%	3.73%	2.61%
2015	1.67%	3.02%	2.16%	1.91%	3.26%	2.40%	2.24%	3.58%	2.72%
2016	1.51%	2.92%	2.03%	2.04%	3.16%	2.45%	2.37%	3.50%	2.77%
2017	1.20%	2.96%	1.85%	1.59%	3.21%	2.19%	2.08%	3.54%	2.61%
2018	1.33%	2.92%	1.92%	1.72%	3.18%	2.26%	2.20%	3.51%	2.68%
2019	1.47%	2.80%	1.97%	2.00%	3.06%	2.40%	2.19%	3.42%	2.64%
2020	1.45%	2.73%	1.94%	1.84%	2.99%	2.27%	2.31%	3.36%	2.70%
2021	1.15%	2.76%	1.77%	1.54%	3.04%	2.11%	2.03%	3.41%	2.54%
2022	1.13%	2.74%	1.76%	1.53%	3.03%	2.11%	2.01%	3.40%	2.53%
2023	1.72%	2.62%	2.07%	2.09%	2.89%	2.40%	2.27%	3.27%	2.65%
2024	1.85%	2.39%	2.06%	2.22%	2.65%	2.39%	2.39%	3.06%	2.65%
2025	1.25%	2.56%	1.76%	1.63%	2.85%	2.11%	1.97%	3.23%	2.45%
2026	1.24%	2.50%	1.74%	1.62%	2.80%	2.08%	2.09%	3.19%	2.52%
2027	1.37%	2.40%	1.78%	1.89%	2.69%	2.21%	2.07%	3.10%	2.47%
2028	1.21%	2.40%	1.69%	1.59%	2.70%	2.03%	2.06%	3.11%	2.47%
2029	1.05%	2.38%	1.59%	1.44%	2.69%	1.94%	1.91%	3.10%	2.38%
2030	1.04%	0.00%	0.62%	1.57%	0.00%	0.93%	2.04%	0.00%	1.23%
2031	1.04%	2.34%	1.57%	1.42%	2.66%	1.92%	1.93%	3.07%	2.38%

Customer Count Forecast

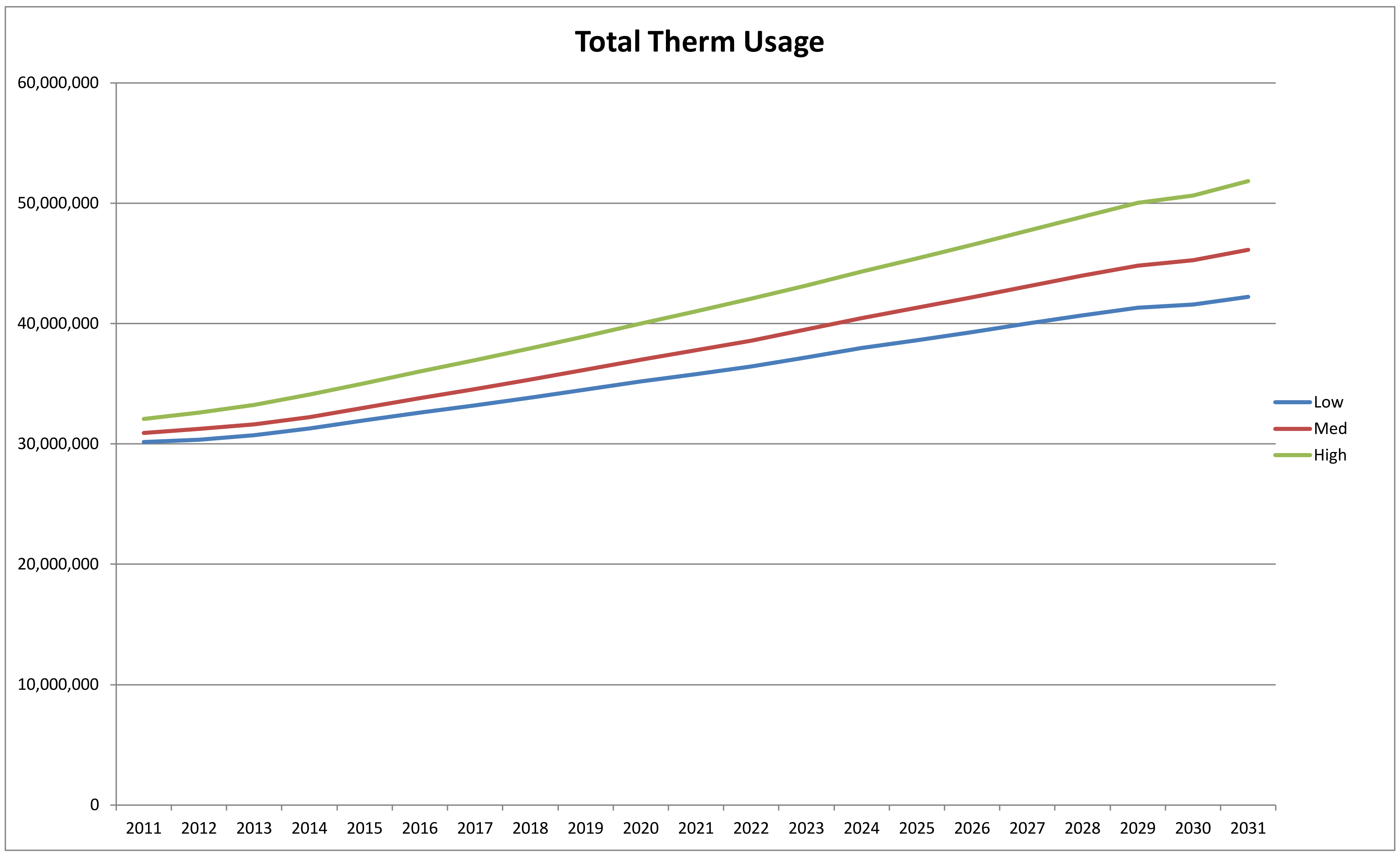
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	27,914	2,532	30,446	28,017	2,582	30,599	28,163	2,655	30,818
2012	28,053	2,609	30,662	28,177	2,670	30,847	28,350	2,759	31,109
2013	28,407	2,694	31,101	28,336	2,761	31,097	28,862	2,854	31,716
2014	28,843	2,779	31,622	28,882	2,852	31,734	29,515	2,952	32,467
2015	29,281	2,865	32,146	29,433	2,944	32,377	30,177	3,050	33,227
2016	29,722	2,952	32,674	29,990	3,038	33,028	30,850	3,150	34,000
2017	30,166	3,040	33,206	30,554	3,132	33,686	31,535	3,251	34,786
2018	30,612	3,128	33,740	31,124	3,228	34,352	32,228	3,352	35,580
2019	31,061	3,217	34,278	31,701	3,324	35,025	32,933	3,456	36,389
2020	31,512	3,307	34,819	32,283	3,421	35,704	33,648	3,560	37,208
2021	31,967	3,397	35,364	32,873	3,520	36,393	34,376	3,667	38,043
2022	32,424	3,488	35,912	33,470	3,619	37,089	35,114	3,774	38,888
2023	32,885	3,580	36,465	34,072	3,719	37,791	35,862	3,882	39,744
2024	33,348	3,671	37,019	34,681	3,820	38,501	36,622	3,991	40,613
2025	33,813	3,764	37,577	35,297	3,921	39,218	37,392	4,101	41,493
2026	34,281	3,856	38,137	35,919	4,023	39,942	38,174	4,212	42,386
2027	34,751	3,949	38,700	36,547	4,126	40,673	38,966	4,323	43,289
2028	35,224	4,042	39,266	37,181	4,229	41,410	39,770	4,436	44,206
2029	35,699	4,135	39,834	37,823	4,332	42,155	40,586	4,549	45,135
2030	36,177	4,135	40,312	38,470	4,332	42,802	41,413	4,549	45,962
2031	36,661	4,229	40,890	39,129	4,437	43,566	42,257	4,664	46,921

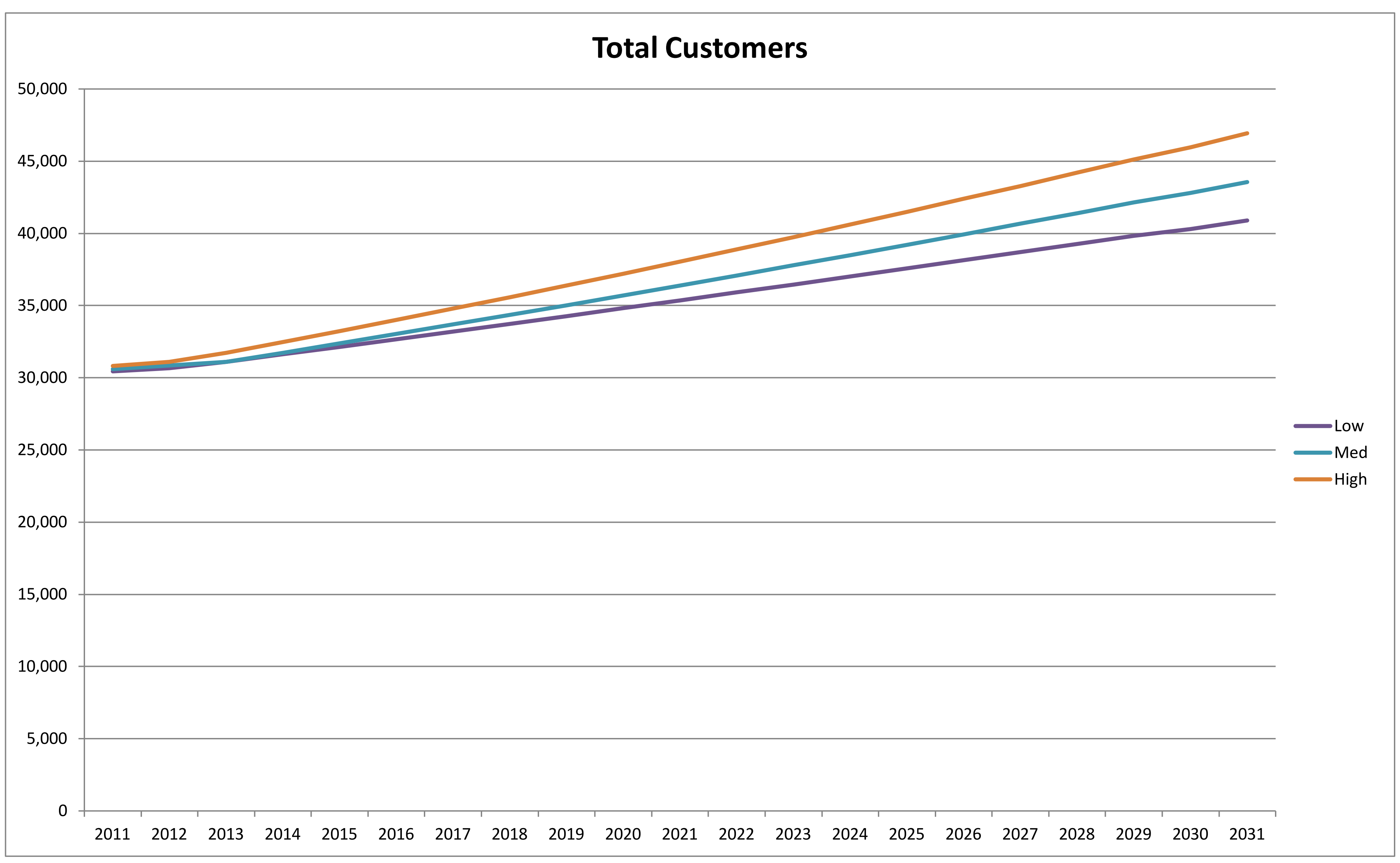
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	-0.57%	0.13%	-0.51%	-0.20%	2.08%	-0.01%	0.32%	4.97%	0.70%
2012	0.50%	3.05%	0.71%	0.57%	3.44%	0.81%	0.66%	3.92%	0.94%
2013	1.26%	3.23%	1.43%	0.56%	3.37%	0.81%	1.81%	3.47%	1.95%
2014	1.53%	3.17%	1.68%	1.93%	3.31%	2.05%	2.26%	3.41%	2.37%
2015	1.52%	3.10%	1.66%	1.91%	3.24%	2.03%	2.24%	3.33%	2.34%
2016	1.51%	3.04%	1.64%	1.89%	3.17%	2.01%	2.23%	3.27%	2.33%
2017	1.49%	2.97%	1.63%	1.88%	3.11%	1.99%	2.22%	3.20%	2.31%
2018	1.48%	2.90%	1.61%	1.87%	3.04%	1.97%	2.20%	3.13%	2.28%
2019	1.47%	2.84%	1.59%	1.85%	2.98%	1.96%	2.19%	3.08%	2.27%
2020	1.45%	2.78%	1.58%	1.84%	2.93%	1.94%	2.17%	3.03%	2.25%
2021	1.44%	2.73%	1.57%	1.83%	2.88%	1.93%	2.16%	2.99%	2.24%
2022	1.43%	2.68%	1.55%	1.82%	2.82%	1.91%	2.15%	2.93%	2.22%
2023	1.42%	2.62%	1.54%	1.80%	2.76%	1.89%	2.13%	2.86%	2.20%
2024	1.41%	2.57%	1.52%	1.79%	2.71%	1.88%	2.12%	2.81%	2.19%
2025	1.39%	2.51%	1.51%	1.78%	2.65%	1.86%	2.10%	2.75%	2.17%
2026	1.38%	2.46%	1.49%	1.76%	2.60%	1.85%	2.09%	2.70%	2.15%
2027	1.37%	2.40%	1.48%	1.75%	2.55%	1.83%	2.07%	2.65%	2.13%
2028	1.36%	2.36%	1.46%	1.73%	2.50%	1.81%	2.06%	2.60%	2.12%
2029	1.35%	2.31%	1.45%	1.73%	2.45%	1.80%	2.05%	2.56%	2.10%
2030	1.34%	0.00%	1.20%	1.71%	0.00%	1.53%	2.04%	0.00%	1.83%
2031	1.34%	2.26%	1.43%	1.71%	2.41%	1.78%	2.04%	2.52%	2.09%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bremerton





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Kennewick

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	18,017,773	7,499,572	25,517,345	18,333,901	7,631,154	25,965,055	18,794,708	7,822,957	26,617,665	5.79%	5.79%	5.79%	7.65%	7.65%	7.65%	10.35%	10.35%	10.35%
2012	18,747,457	7,803,289	26,550,746	19,062,450	7,934,400	26,996,850	19,599,255	8,157,835	27,757,090	4.05%	4.05%	4.05%	3.97%	3.97%	3.97%	4.28%	4.28%	4.28%
2013	19,326,324	8,044,232	27,370,556	19,536,765	8,131,825	27,668,590	20,185,534	8,401,863	28,587,397	3.09%	3.09%	3.09%	2.49%	2.49%	2.49%	2.99%	2.99%	2.99%
2014	19,963,481	8,309,438	28,272,918	20,186,100	8,402,099	28,588,199	20,838,925	8,673,825	29,512,750	3.30%	3.30%	3.30%	3.32%	3.32%	3.32%	3.24%	3.24%	3.24%
2015	20,652,967	8,596,424	29,249,391	20,903,869	8,700,857	29,604,726	21,530,593	8,961,720	30,492,313	3.45%	3.45%	3.45%	3.56%	3.56%	3.56%	3.32%	3.32%	3.32%
2016	21,388,382	8,902,527	30,290,908	21,672,706	9,020,872	30,693,577	22,257,364	9,264,225	31,521,589	3.56%	3.56%	3.56%	3.68%	3.68%	3.68%	3.38%	3.38%	3.38%
2017	22,115,590	9,205,214	31,320,804	22,411,334	9,328,312	31,739,646	22,963,279	9,558,049	32,521,328	3.40%	3.40%	3.40%	3.41%	3.41%	3.41%	3.17%	3.17%	3.17%
2018	22,818,188	9,497,658	32,315,845	23,115,325	9,621,336	32,736,661	23,626,781	9,834,220	33,461,002	3.18%	3.18%	3.18%	3.14%	3.14%	3.14%	2.89%	2.89%	2.89%
2019	23,541,610	9,798,769	33,340,379	23,850,325	9,927,266	33,777,591	24,299,728	10,114,322	34,414,050	3.17%	3.17%	3.17%	3.18%	3.18%	3.18%	2.85%	2.85%	2.85%
2020	24,298,750	10,113,915	34,412,666	24,619,816	10,247,553	34,867,368	24,994,019	10,403,308	35,397,327	3.22%	3.22%	3.22%	3.23%	3.23%	3.23%	2.86%	2.86%	2.86%
2021	25,042,444	10,423,464	35,465,909	25,355,794	10,553,890	35,909,684	25,665,301	10,682,717	36,348,017	3.06%	3.06%	3.06%	2.99%	2.99%	2.99%	2.69%	2.69%	2.69%
2022	25,758,159	10,721,367	36,479,527	26,051,651	10,843,528	36,895,178	26,293,294	10,944,107	37,237,401	2.86%	2.86%	2.86%	2.74%	2.74%	2.74%	2.45%	2.45%	2.45%
2023	26,497,786	11,029,224	37,527,010	26,782,359	11,147,672	37,930,031	26,925,846	11,207,396	38,133,242	2.87%	2.87%	2.87%	2.80%	2.80%	2.80%	2.41%	2.41%	2.41%
2024	27,336,162	11,378,183	38,714,345	27,648,488	11,508,183	39,156,671	27,643,391	11,506,061	39,149,453	3.16%	3.16%	3.16%	3.23%	3.23%	3.23%	2.66%	2.66%	2.66%
2025	28,159,759	11,720,990	39,880,749	28,447,313	11,840,679	40,287,992	28,338,654	11,795,452	40,134,106	3.01%	3.01%	3.01%	2.89%	2.89%	2.89%	2.52%	2.52%	2.52%
2026	28,916,291	12,035,883	40,952,174	29,171,525	12,142,119	41,313,644	28,946,605	12,048,500	40,995,105	2.69%	2.69%	2.69%	2.55%	2.55%	2.55%	2.15%	2.15%	2.15%
2027	29,702,147	12,362,981	42,065,127	29,935,027	12,459,913	42,394,941	29,568,217	12,307,235	41,875,452	2.72%	2.72%	2.72%	2.62%	2.62%	2.62%	2.15%	2.15%	2.15%
2028	30,494,248	12,692,679	43,186,927	30,689,483	12,773,942	43,463,425	30,188,206	12,565,294	42,753,500	2.67%	2.67%	2.67%	2.52%	2.52%	2.52%	2.10%	2.10%	2.10%
2029	31,263,487	13,012,861	44,276,348	31,409,548	13,073,656	44,483,203	30,771,410	12,808,042	43,579,452	2.52%	2.52%	2.52%	2.35%	2.35%	2.35%	1.93%	1.93%	1.93%
2030	31,642,209	13,170,497	44,812,706	31,843,791	13,254,401	45,098,192	31,242,165	13,003,985	44,246,150	1.21%	1.21%	1.21%	1.38%	1.38%	1.38%	1.53%	1.53%	1.53%
2031	32,410,587	13,490,320	45,900,907	32,558,030	13,551,691	46,109,721	31,814,261	13,242,110	45,056,371	2.43%	2.43%	2.43%	2.24%	2.24%	2.24%	1.83%	1.83%	1.83%

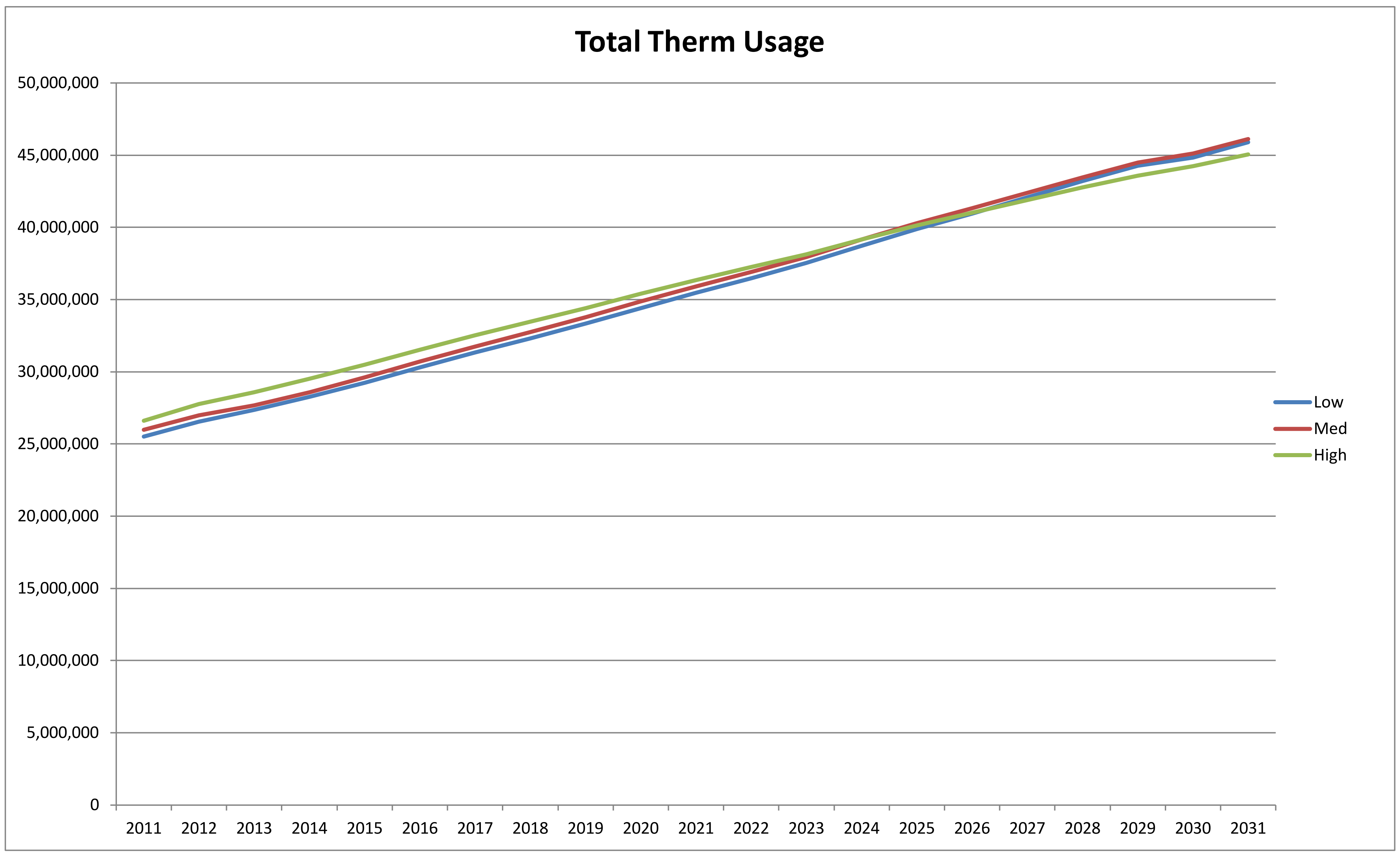
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	20,547	355,181	375,728	20,907	360,741	381,648	21,433	369,368	390,801	5.79%	1.06%	1.31%	7.65%	2.64%	2.91%	10.35%	5.10%	5.37%
2012	21,379	364,395	385,774	21,738	370,984	392,722	22,350	380,947	403,298	4.05%	2.59%	2.67%	3.97%	2.84%	2.90%	4.28%	3.13%	3.20%
2013	22,039	377,320	399,359	22,279	381,568	403,847	23,019	396,682	419,701	3.09%	3.55%	3.52%	2.49%	2.85%	2.83%	2.99%	4.13%	4.07%
2014	22,766	391,500	414,266	23,019	397,540	420,559	23,764	414,673	438,437	3.30%	3.76%	3.73%	3.32%	4.19%	4.14%	3.24%	4.54%	4.46%
2015	23,552	405,912	429,464	23,838	413,830	437,668	24,553	433,120	457,673	3.45%	3.68%	3.67%	3.56%	4.10%	4.07%	3.32%	4.45%	4.39%
2016	24,390	420,543	444,933	24,715	430,461	455,175	25,381	452,099	477,481	3.56%	3.60%	3.60%	3.68%	4.02%	4.00%	3.38%	4.38%	4.33%
2017	25,220	435,439	460,658	25,557	447,539	473,096	26,186	471,656	497,843	3.40%	3.54%	3.53%	3.41%	3.97%	3.94%	3.17%	4.33%	4.26%
2018	26,021	450,616	476,637	26,360	465,033	491,393	26,943	491,761	518,704	3.18%	3.49%	3.47%	3.14%	3.91%	3.87%	2.89%	4.26%	4.19%
2019	26,846	466,025	492,871	27,198	482,908	510,106	27,710	512,464	540,174	3.17%	3.42%	3.41%	3.18%	3.84%	3.81%	2.85%	4.21%	4.14%
2020	27,709	481,684	509,393	28,075	501,175	529,250	28,502	533,749	562,251	3.22%	3.36%	3.35%	3.23%	3.78%	3.75%	2.86%	4.15%	4.09%
2021	28,557	497,631	526,189	28,915	519,946	548,861	29,268	555,705	584,972	3.06%	3.31%	3.30%	2.99%	3.75%	3.71%	2.69%	4.11%	4.04%
2022	29,374	513,918	543,292	29,708	539,196	568,905	29,984	578,316	608,300	2.86%	3.27%	3.25%	2.74%	3.70%	3.65%	2.45%	4.07%	3.99%
2023	30,217	530,433	560,650	30,542	558,817	589,359	30,705	601,452	632,158	2.87%	3.21%	3.20%	2.80%	3.64%	3.60%	2.41%	4.00%	3.92%
2024	31,173	547,105	578,278	31,529	578,715	610,244	31,523	625,152	656,676	3.16%	3.14%	3.14%	3.23%	3.56%	3.54%	2.66%	3.94%	3.88%
2025	32,112	564,062	596,175	32,440	599,114	631,555	32,316	649,422	681,739	3.01%	3.10%	3.09%	2.89%	3.52%	3.49%	2.52%	3.88%	3.82%
2026	32,975	581,346	614,321	33,266	619,993	653,259	33,010	674,412	707,422	2.69%	3.06%	3.04%	2.55%	3.48%	3.44%	2.15%	3.85%	3.77%
2027	33,871	598,832	632,703	34,137	641,271	675,408	33,718	700,022	733,741	2.72%	3.01%	2.99%	2.62%	3.43%	3.39%	2.15%	3.80%	3.72%
2028	34,774	616,560	651,334	34,997	662,985	697,982	34,425	726,270	760,696	2.67%	2.96%	2.94%	2.52%	3.39%	3.34%	2.10%	3.75%	3.67%
2029	35,652	634,582	670,233	35,818	685,182	721,000	35,091	753,197	788,287	2.52%	2.92%	2.90%	2.35%	3.35%	3.30%	1.93%	3.71%	3.63%
2030	36,084	650,637	686,721	36,313	704,999	741,312	35,627	777,304	812,931	1.21%	2.53%	2.46%	1.38%	2.89%	2.82%	1.53%	3.20%	3.13%
2031	36,960	669,369	706,329	37,128	728,278	765,406	36,280	805,765	842,045	2.43%	2.88%	2.86%	2.24%	3.30%	3.25%	1.83%	3.66%	3.58%

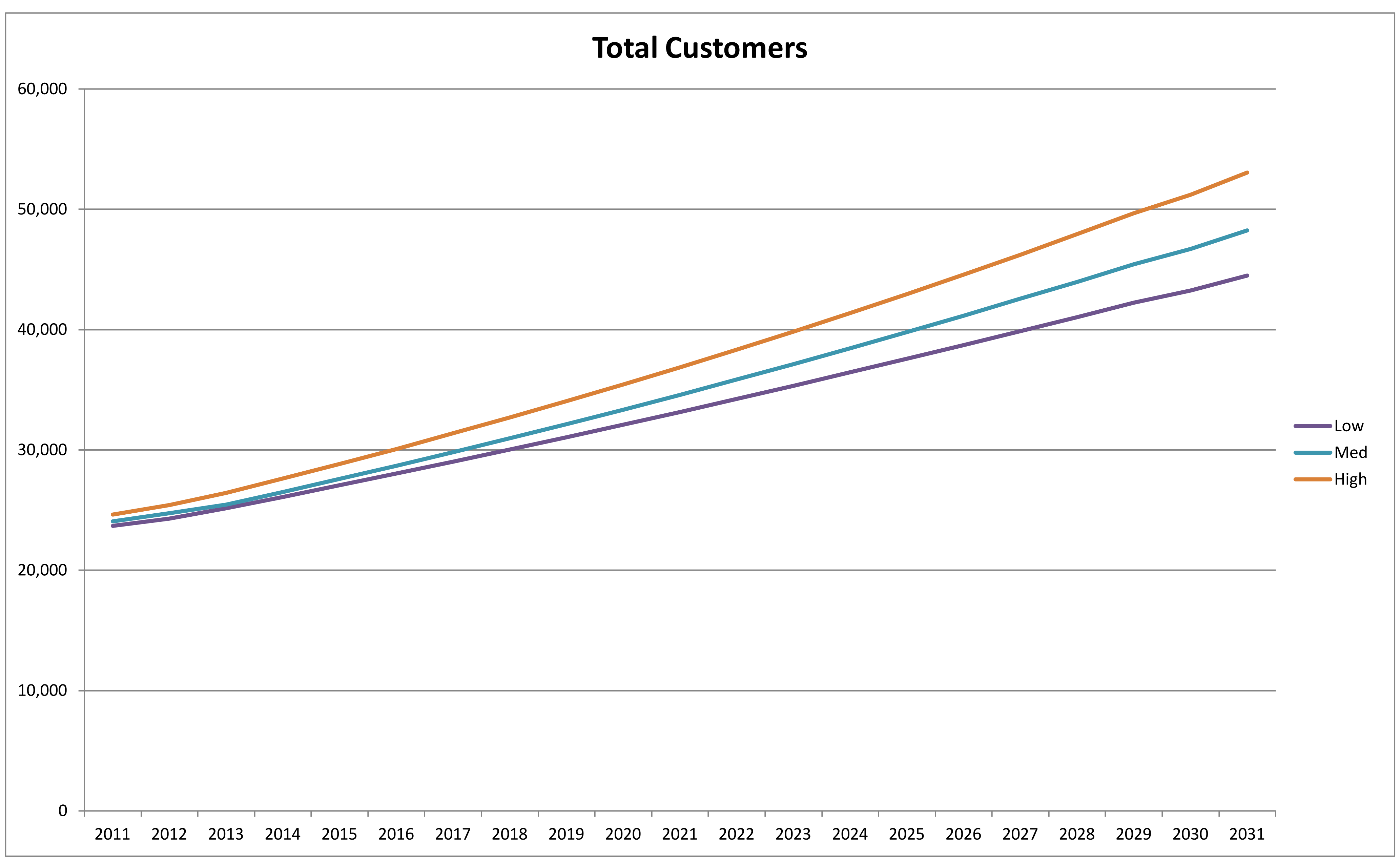
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	11,272,737	14,244,608	25,517,345	11,439,814	14,525,241	25,965,055	11,699,773	14,917,892	26,617,665	1.09%	9.84%	5.79%	2.59%	12.00%	7.65%	4.92%	15.03%	10.35%
2012	11,873,368	14,677,378	26,550,746	12,066,276	14,930,573	26,996,850	12,363,673	15,393,417	27,757,090	5.33%	3.04%	4.05%	5.48%	2.79%	3.97%	5.67%	3.19%	4.28%
2013	12,216,636	15,153,921	27,370,556	12,305,182	15,363,407	27,668,590	12,765,485	15,821,912	28,587,397	2.89%	3.25%	3.09%	1.98%	2.90%	2.49%	3.25%	2.78%	2.99%
2014	12,614,064	15,658,855	28,272,918	12,747,446	15,840,753	28,588,199	13,251,242	16,261,509	29,512,750	3.25%	3.33%	3.30%	3.59%	3.11%	3.32%	3.81%	2.78%	3.24%
2015	13,040,575	16,208,816	29,249,391	13,220,273	16,384,454	29,604,726	13,768,316	16,723,996	30,492,313	3.38%	3.51%	3.45%	3.71%	3.43%	3.56%	3.90%	2.84%	3.32%
2016	13,510,456	16,780,452	30,290,908	13,738,737	16,954,840	30,693,577	14,334,383	17,187,206	31,521,589	3.60%	3.53%	3.56%	3.92%	3.48%	3.68%	4.11%	2.77%	3.38%
2017	14,003,102	17,317,702	31,320,804	14,283,187	17,456,460	31,739,646	14,927,775	17,593,553	32,521,328	3.65%	3.20%	3.40%	3.96%	2.96%	3.41%	4.14%	2.36%	3.17%
2018	14,468,705	17,847,140	32,315,845	14,801,648	17,935,013	32,736,661	15,493,569	17,967,433	33,461,002	3.32%	3.06%	3.18%	3.63%	2.74%	3.14%	3.79%	2.13%	2.89%
2019	14,931,828	18,408,550	33,340,379	15,319,909	18,457,682	33,777,591	16,060,382	18,353,668	34,414,050	3.20%	3.15%	3.17%	3.50%	2.91%	3.18%	3.66%	2.15%	2.85%
2020	15,428,758	18,983,907	34,412,666	15,874,655	18,992,714	34,867,368	16,666,103	18,731,224	35,397,327	3.33%	3.13%	3.22%	3.62%	2.90%	3.23%	3.77%	2.06%	2.86%
2021	15,942,426	19,523,483	35,465,909	16,450,029	19,459,655	35,909,684	17,293,830	19,054,187	36,348,017	3.33%	2.84%	3.06%	3.62%	2.46%	2.99%	3.77%	1.72%	2.69%
2022	16,429,405	20,050,122	36,479,527	16,998,937	19,896,241	36,895,178	17,894,097	19,343,304	37,237,401	3.05%	2.70%	2.86%	3.34%	2.24%	2.74%	3.47%	1.52%	2.45%
2023	16,908,008	20,619,002	37,527,010	17,541,128	20,388,904	37,930,031	18,485,737	19,647,506	38,133,242	2.91%	2.84%	2.87%	3.19%	2.48%	2.80%	3.31%	1.57%	2.41%
2024	17,429,635	21,284,710	38,714,345	18,129,647	21,027,024	39,156,671	19,127,395	20,022,057	39,149,453	3.09%	3.23%	3.16%	3.36%	3.13%	3.23%	3.47%	1.91%	2.66%
2025	18,043,806	21,836,943	39,880,749	18,816,408	21,471,584	40,287,992	19,870,733	20,263,372	40,134,106	3.52%	2.59%	3.01%	3.79%	2.11%	2.89%	3.89%	1.21%	2.52%
2026	18,561,826	22,390,347	40,952,174	19,404,022	21,909,621	41,313,644	20,510,189	20,484,916	40,995,105	2.87%	2.53%	2.69%	3.12%	2.04%	2.55%	3.22%	1.09%	2.15%
2027	19,086,718	22,978,409	42,065,127	20,001,865	22,393,075	42,394,941	21,159,896	20,715,556	41,875,452	2.83%	2.63%	2.72%	3.08%	2.21%	2.62%	3.17%	1.13%	2.15%
2028	19,648,781	23,538,146	43,186,927	20,640,495	22,822,930	43,463,425	21,852,518	20,900,983	42,753,500	2.94%	2.44%	2.67%	3.19%	1.92%	2.52%	3.27%	0.90%	2.10%
2029	20,192,452	24,083,896	44,276,348	21,261,593	23,221,611	44,483,203	22,525,728	21,053,724	43,579,452	2.77%	2.32%	2.52%	3.01%	1.75%	2.35%	3.08%	0.73%	1.93%
2030	20,728,810	24,083,896	44,812,706	21,876,581	23,221,611	45,098,192	23,192,426	21,053,724	44,246,150	2.66%	0.00%	1.21%	2.89%	0.00%	1.38%	2.96%	0.00%	1.53%
2031	21,276,144	24,624,763	45,900,907	22,504,999	23,604,722	46,109,721	23,872,738	21,183,633	45,056,371	2.64%	2.25%	2.43%	2.87%	1.65%	2.24%	2.93%	0.62%	1.83%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	20,511	3,166	23,677	20,815	3,235	24,050	21,288	3,339	24,627	1.09%	2.77%	1.31%	2.59%	5.01%	2.91%	4.92%	8.38%	5.37%
2012	21,021	3,289	24,310	21,371	3,377	24,748	21,911	3,504	25,415	2.49%	3.89%	2.67%	2.67%	4.38%	2.90%	2.93%	4.93%	3.20%
2013	21,745	3,421	25,166	21,927	3,522	25,449	22,787	3,661	26,448	3.44%	4.02%	3.52%	2.60%	4.29%	2.83%	4.00%	4.50%	4.07%
2014	22,550	3,556	26,106	22,832	3,670	26,502	23,806	3,823	27,629	3.70%	3.93%	3.73%	4.13%	4.21%	4.14%	4.47%	4.42%	4.46%
2015	23,371	3,693	27,064	23,759	3,822	27,581	24,853	3,988	28,841	3.64%	3.84%	3.67%	4.06%	4.12%	4.07%	4.40%	4.32%	4.39%
2016	24,207	3,831	28,038	24,708	3,976	28,684	25,932	4,157	30,089	3.58%	3.76%	3.60%	3.99%	4.04%	4.00%	4.34%	4.24%	4.33%
2017	25,057	3,972	29,029	25,680	4,133	29,813	27,042	4,331	31,373	3.51%	3.68%	3.53%	3.93%	3.96%	3.94%	4.28%	4.17%	4.26%
2018	25,921	4,115	30,036	26,673	4,293	30,966	28,180	4,507	32,687	3.45%	3.60%	3.47%	3.87%	3.87%	3.87%	4.21%	4.08%	4.19%
2019	26,799	4,260	31,059	27,689	4,456	32,145	29,352	4,688	34,040	3.39%	3.52%	3.41%	3.81%	3.80%	3.81%	4.16%	4.02%	4.14%
2020	27,693	4,407	32,100	28,729	4,623	33,352	30,558	4,873	35,431	3.34%	3.45%	3.35%	3.76%	3.73%	3.75%	4.11%	3.95%	4.09%
2021	28,602	4,557	33,159	29,795	4,793	34,588	31,800	5,063	36,863	3.28%	3.39%	3.30%	3.71%	3.67%	3.71%	4.06%	3.89%	4.04%
2022	29,528	4,709	34,237	30,885	4,966	35,851	33,076	5,257	38,333	3.24%	3.33%	3.25%	3.66%	3.61%	3.65%	4.01%	3.83%	3.99%
2023	30,468	4,863	35,331	31,998	5,142	37,140	34,382	5,455	39,837	3.18%	3.27%	3.20%	3.60%	3.54%	3.60%	3.95%	3.76%	3.92%
2024	31,423	5,018	36,441	33,135	5,321	38,456	35,725	5,657	41,382	3.13%	3.20%	3.14%	3.55%	3.48%	3.54%	3.91%	3.70%	3.88%
2025	32,393	5,176	37,569	34,296	5,503	39,799	37,099	5,862	42,961	3.09%	3.14%	3.09%	3.50%	3.42%	3.49%	3.85%	3.63%	3.82%
2026	33,377	5,336	38,713	35,479	5,688	41,167	38,508	6,072	44,580	3.04%	3.08%	3.04%	3.45%	3.36%	3.44%	3.80%	3.57%	3.77%
2027	34,374	5,497	39,871	36,687	5,875	42,562	39,953	6,285	46,238	2.99%	3.02%	2.99%	3.40%	3.30%	3.39%	3.75%	3.52%	3.72%
2028	35,385	5,660	41,045	37,919	6,066	43,985	41,434	6,503	47,937	2.94%	2.97%	2.94%	3.36%	3.24%	3.34%	3.71%	3.46%	3.67%
2029	36,411	5,825	42,236	39,176	6,259	45,435	42,951	6,725	49,676	2.90%	2.91%	2.90%	3.31%	3.19%	3.30%	3.66%	3.41%	3.63%
2030	37,450	5,825	43,275	40,456	6,259	46,715	44,504	6,725	51,229	2.85%	0.00%	2.46%	3.27%	0.00%	2.82%	3.62%	0.00%	3.13%
2031	38,519	5,992	44,511	41,778	6,456	48,234	46,113	6,950	53,063	2.85%	2.86%	2.86%	3.27%	3.14%	3.25%	3.62%	3.36%	3.58%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Kennewick





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Longview

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	4,132,729	2,998,222	7,130,951	4,151,039	3,011,505	7,162,544	4,169,142	3,024,639	7,193,781	8.50%	8.50%	8.50%	8.98%	8.98%	8.98%	9.46%	9.46%	9.46%
2012	4,279,986	3,105,055	7,385,041	4,257,069	3,088,428	7,345,497	4,345,853	3,152,839	7,498,692	3.56%	3.56%	3.56%	2.55%	2.55%	2.55%	4.24%	4.24%	4.24%
2013	4,292,472	3,114,112	7,406,584	4,234,009	3,071,698	7,305,707	4,396,875	3,189,855	7,586,730	0.29%	0.29%	0.29%	-0.54%	-0.54%	-0.54%	1.17%	1.17%	1.17%
2014	4,306,762	3,124,480	7,431,241	4,247,676	3,081,614	7,329,289	4,452,045	3,229,880	7,681,924	0.33%	0.33%	0.33%	0.32%	0.32%	0.32%	1.25%	1.25%	1.25%
2015	4,317,707	3,132,421	7,450,128	4,282,418	3,106,819	7,389,237	4,504,584	3,267,996	7,772,580	0.25%	0.25%	0.25%	0.82%	0.82%	0.82%	1.18%	1.18%	1.18%
2016	4,328,155	3,140,000	7,468,154	4,325,608	3,138,152	7,463,760	4,556,222	3,305,459	7,861,681	0.24%	0.24%	0.24%	1.01%	1.01%	1.01%	1.15%	1.15%	1.15%
2017	4,345,252	3,152,404	7,497,656	4,354,201	3,158,896	7,513,097	4,615,673	3,348,590	7,964,263	0.40%	0.40%	0.40%	0.66%	0.66%	0.66%	1.30%	1.30%	1.30%
2018	4,362,455	3,164,884	7,527,339	4,378,408	3,176,457	7,554,865	4,675,642	3,392,096	8,067,737	0.40%	0.40%	0.40%	0.56%	0.56%	0.56%	1.30%	1.30%	1.30%
2019	4,377,768	3,175,994	7,553,762	4,415,118	3,203,090	7,618,209	4,733,156	3,433,821	8,166,977	0.35%	0.35%	0.35%	0.84%	0.84%	0.84%	1.23%	1.23%	1.23%
2020	4,392,879	3,186,956	7,579,835	4,456,314	3,232,977	7,689,291	4,790,949	3,475,749	8,266,699	0.35%	0.35%	0.35%	0.93%	0.93%	0.93%	1.22%	1.22%	1.22%
2021	4,412,550	3,201,227	7,613,776	4,483,844	3,252,950	7,736,794	4,854,189	3,521,629	8,375,818	0.45%	0.45%	0.45%	0.62%	0.62%	0.62%	1.32%	1.32%	1.32%
2022	4,434,813	3,217,379	7,652,192	4,508,084	3,270,535	7,778,619	4,921,345	3,570,349	8,491,695	0.50%	0.50%	0.50%	0.54%	0.54%	0.54%	1.38%	1.38%	1.38%
2023	4,451,648	3,229,592	7,681,240	4,543,830	3,296,468	7,840,298	4,981,837	3,614,235	8,596,072	0.38%	0.38%	0.38%	0.79%	0.79%	0.79%	1.23%	1.23%	1.23%
2024	4,460,625	3,236,105	7,696,730	4,610,160	3,344,590	7,954,749	5,033,278	3,651,554	8,684,832	0.20%	0.20%	0.20%	1.46%	1.46%	1.46%	1.03%	1.03%	1.03%
2025	4,483,325	3,252,573	7,735,898	4,642,508	3,368,057	8,010,565	5,101,682	3,701,180	8,802,862	0.51%	0.51%	0.51%	0.70%	0.70%	0.70%	1.36%	1.36%	1.36%
2026	4,504,183	3,267,705	7,771,889	4,673,780	3,390,745	8,064,525	5,167,660	3,749,046	8,916,707	0.47%	0.47%	0.47%	0.67%	0.67%	0.67%	1.29%	1.29%	1.29%
2027	4,522,151	3,280,741	7,802,892	4,715,062	3,420,694	8,135,756	5,230,244	3,794,450	9,024,694	0.40%	0.40%	0.40%	0.88%	0.88%	0.88%	1.21%	1.21%	1.21%
2028	4,543,613	3,296,311	7,839,924	4,749,441	3,445,635	8,195,076	5,297,696	3,843,385	9,141,081	0.47%	0.47%	0.47%	0.73%	0.73%	0.73%	1.29%	1.29%	1.29%
2029	4,566,402	3,312,844	7,879,246	4,780,320	3,468,038	8,248,357	5,366,968	3,893,641	9,260,609	0.50%	0.50%	0.50%	0.65%	0.65%	0.65%	1.31%	1.31%	1.31%
2030	4,570,614	3,315,900	7,886,515	4,787,330	3,473,123	8,260,453	5,375,559	3,899,873	9,275,432	0.09%	0.09%	0.09%	0.15%	0.15%	0.15%	0.16%	0.16%	0.16%
2031	4,593,079	3,332,198	7,925,277	4,816,810	3,494,511	8,311,321	5,444,451	3,949,853	9,394,305	0.49%	0.49%	0.49%	0.62%	0.62%	0.62%	1.28%	1.28%	1.28%

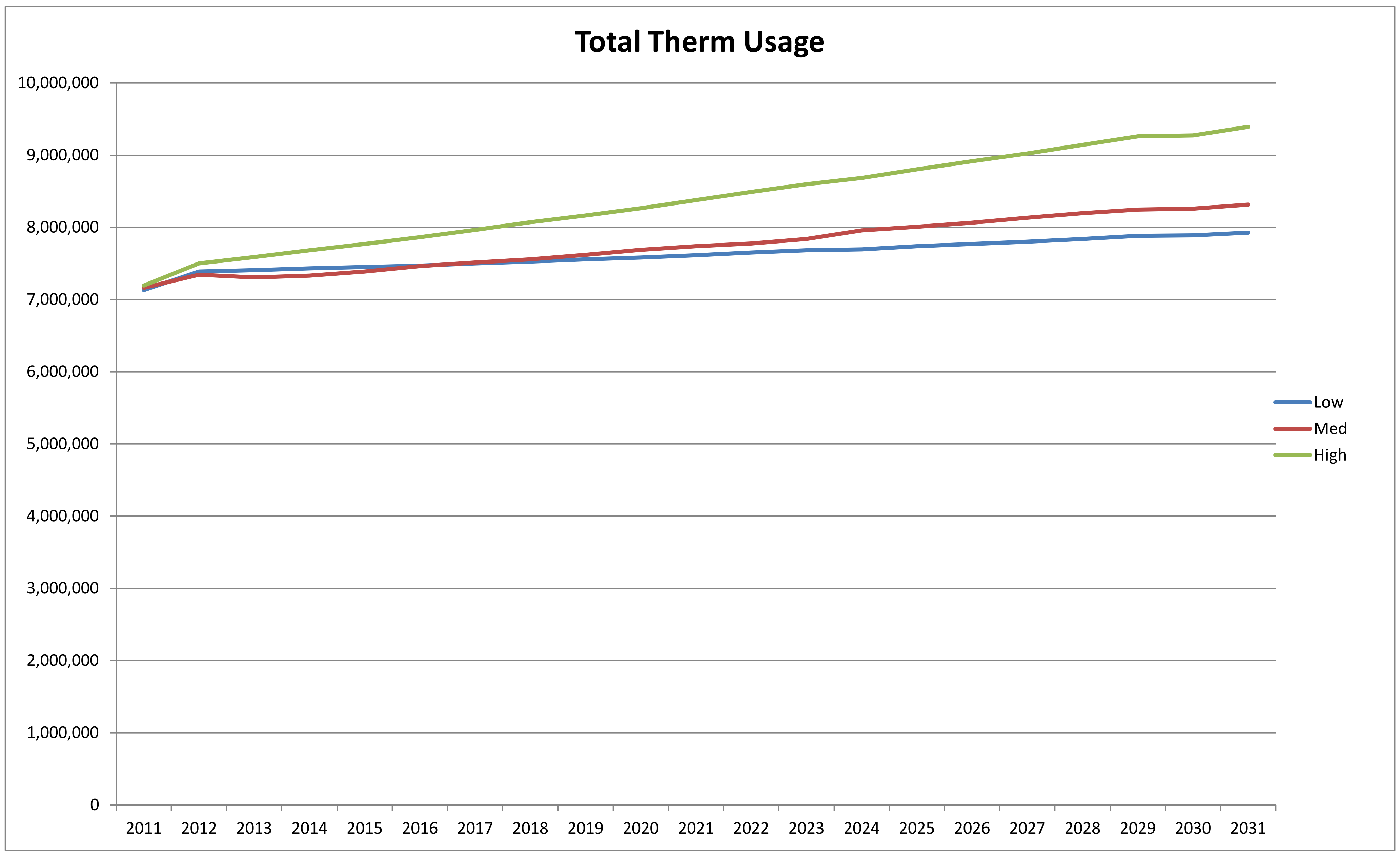
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	8,214	72,412	80,627	8,251	72,698	80,949	8,287	73,096	81,383	8.50%	-2.21%	-1.22%	8.98%	-1.82%	-0.82%	9.46%	-1.29%	-0.29%
2012	8,507	71,253	79,760	8,461	71,777	80,239	8,638	72,155	80,792	3.56%	-1.60%	-1.07%	2.55%	-1.27%	-0.88%	4.24%	-1.29%	-0.73%
2013	8,532	71,112	79,643	8,416	71,209	79,624	8,739	72,694	81,433	0.29%	-0.20%	-0.15%	-0.54%	-0.79%	-0.77%	1.17%	0.75%	0.79%
2014	8,560	71,251	79,811	8,443	71,809	80,251	8,849	73,659	82,508	0.33%	0.20%	0.21%	0.32%	0.84%	0.79%	1.25%	1.33%	1.32%
2015	8,582	71,426	80,008	8,512	72,419	80,931	8,953	74,684	83,638	0.25%	0.25%	0.25%	0.82%	0.85%	0.85%	1.18%	1.39%	1.37%
2016	8,603	71,626	80,229	8,598	73,014	81,612	9,056	75,712	84,768	0.24%	0.28%	0.28%	1.01%	0.82%	0.84%	1.15%	1.38%	1.35%
2017	8,637	71,862	80,499	8,655	73,689	82,343	9,174	76,799	85,973	0.40%	0.33%	0.34%	0.66%	0.92%	0.90%	1.30%	1.43%	1.42%
2018	8,671	72,076	80,747	8,703	74,370	83,073	9,293	77,882	87,175	0.40%	0.30%	0.31%	0.56%	0.92%	0.89%	1.30%	1.41%	1.40%
2019	8,701	72,364	81,065	8,776	75,075	83,851	9,408	78,997	88,405	0.35%	0.40%	0.39%	0.84%	0.95%	0.94%	1.23%	1.43%	1.41%
2020	8,731	72,653	81,385	8,857	75,773	84,631	9,523	80,137	89,660	0.35%	0.40%	0.39%	0.93%	0.93%	0.93%	1.22%	1.44%	1.42%
2021	8,770	72,934	81,704	8,912	76,519	85,431	9,648	81,287	90,935	0.45%	0.39%	0.39%	0.62%	0.98%	0.95%	1.32%	1.43%	1.42%
2022	8,815	73,259	82,074	8,960	77,324	86,284	9,782	82,505	92,286	0.50%	0.45%	0.45%	0.54%	1.05%	1.00%	1.38%	1.50%	1.49%
2023	8,848	73,569	82,417	9,031	78,076	87,107	9,902	83,682	93,584	0.38%	0.42%	0.42%	0.79%	0.97%	0.95%	1.23%	1.43%	1.41%
2024	8,866	73,939	82,805	9,163	78,790	87,953	10,004	84,924	94,928	0.20%	0.50%	0.47%	1.46%	0.91%	0.97%	1.03%	1.48%	1.44%
2025	8,911	74,285	83,196	9,228	79,599	88,827	10,140	86,182	96,323	0.51%	0.47%	0.47%	0.70%	1.03%	0.99%	1.36%	1.48%	1.47%
2026	8,953	74,655	83,608	9,290	80,428	89,718	10,271	87,441	97,713	0.47%	0.50%	0.49%	0.67%	1.04%	1.00%	1.29%	1.46%	1.44%
2027	8,988	75,051	84,040	9,372	81,236	90,608	10,396	88,727	99,123	0.40%	0.53%	0.52%	0.88%	1.00%	0.99%	1.21%	1.47%	1.44%
2028	9,031	75,443	84,474	9,440	82,082	91,522	10,530	90,029	100,559	0.47%	0.52%	0.52%	0.73%	1.04%	1.01%	1.29%	1.47%	1.45%
2029	9,076	75,854	84,930	9,501	82,957	92,458	10,668	91,350	102,017	0.50%	0.55%	0.54%	0.65%	1.07%	1.02%	1.31%	1.47%	1.45%
2030	9,085	76,195	85,279	9,515	83,640	93,156	10,685	92,466	103,151	0.09%	0.45%	0.41%	0.15%	0.82%	0.75%	0.16%	1.22%	1.11%
2031	9,129	76,603	85,732	9,574	84,513	94,087	10,822	93,803	104,625	0.49%	0.54%	0.53%	0.62%	1.04%	1.00%	1.28%	1.45%	1.43%

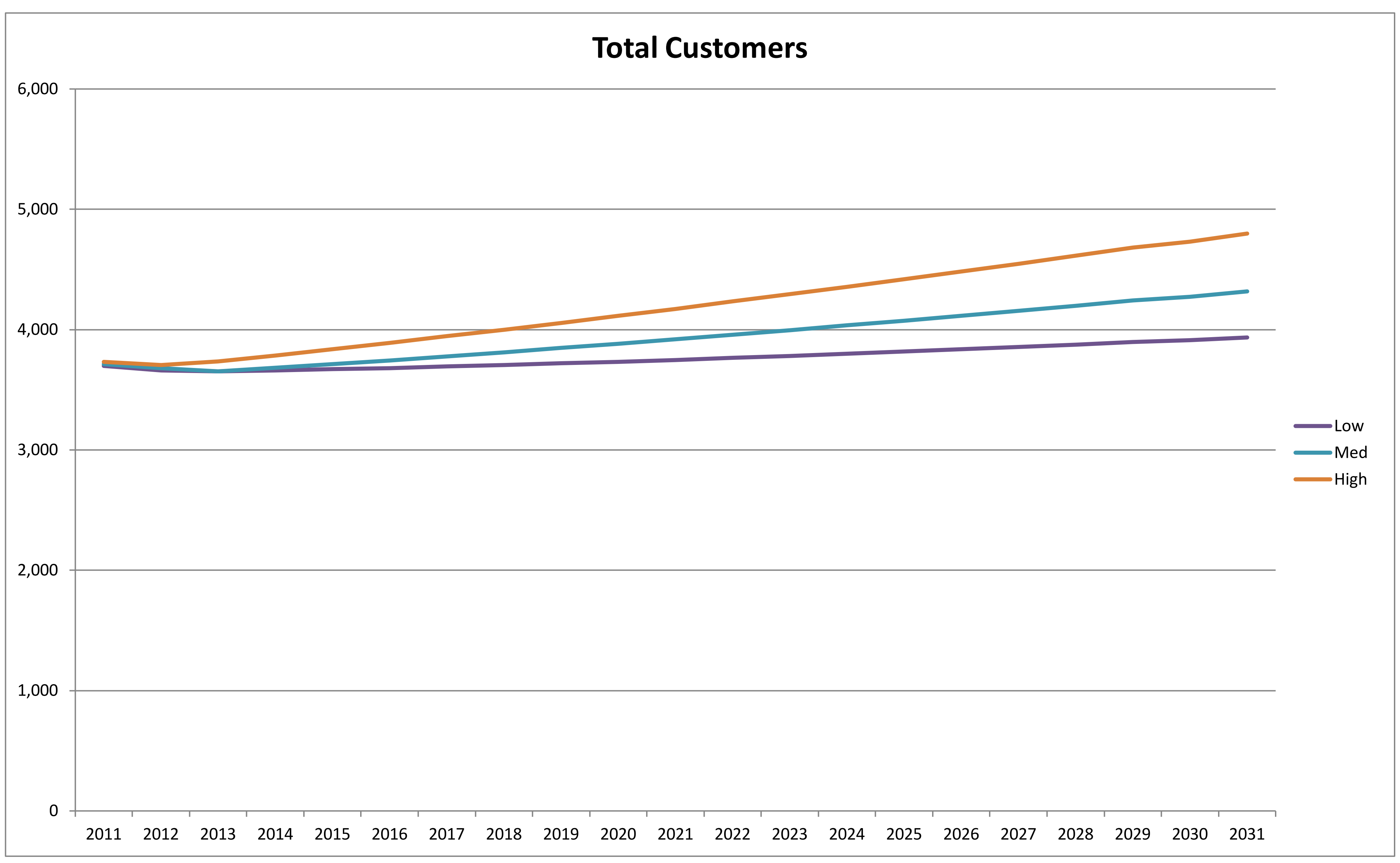
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1,335,515	5,795,435	7,130,951	1,340,811	5,821,733	7,162,544	1,349,283	5,844,497	7,193,781	-1.91%	11.22%	8.50%	-1.52%	11.73%	8.98%	-0.89%	12.16%	9.46%
2012	1,556,739	5,828,301	7,385,041	1,560,962	5,784,535	7,345,497	1,566,346	5,932,346	7,498,692	16.56%	0.57%	3.56%	16.42%	-0.64%	2.55%	16.09%	1.50%	4.24%
2013	1,547,162	5,859,423	7,406,584	1,531,351	5,774,356	7,305,707	1,565,640	6,021,090	7,586,730	-0.62%	0.53%	0.29%	-1.90%	-0.18%	-0.54%	-0.05%	1.50%	1.17%
2014	1,546,255	5,884,986	7,431,241	1,537,797	5,791,492	7,329,289	1,577,472	6,104,452	7,681,924	-0.06%	0.44%	0.33%	0.42%	0.30%	0.32%	0.76%	1.38%	1.25%
2015	1,546,907	5,903,221	7,450,128	1,546,264	5,842,973	7,389,237	1,591,054	6,181,526	7,772,580	0.04%	0.31%	0.25%	0.55%	0.89%	0.82%	0.86%	1.26%	1.18%
2016	1,549,599	5,918,555	7,468,154	1,555,996	5,907,764	7,463,760	1,605,642	6,256,039	7,861,681	0.17%	0.26%	0.24%	0.63%	1.11%	1.01%	0.92%	1.21%	1.15%
2017	1,554,065	5,943,591	7,497,656	1,567,352	5,945,744	7,513,097	1,622,173	6,342,090	7,964,263	0.29%	0.42%	0.40%	0.73%	0.64%	0.66%	1.03%	1.38%	1.30%
2018	1,556,559	5,970,780	7,527,339	1,577,198	5,977,667	7,554,865	1,636,834	6,430,904	8,067,737	0.16%	0.46%	0.40%	0.63%	0.54%	0.56%	0.90%	1.40%	1.30%
2019	1,560,565	5,993,196	7,553,762	1,587,760	6,030,448	7,618,209	1,651,269	6,515,708	8,166,977	0.26%	0.38%	0.35%	0.67%	0.88%	0.84%	0.88%	1.32%	1.23%
2020	1,565,449	6,014,387	7,579,835	1,599,061	6,090,230	7,689,291	1,666,771	6,599,928	8,266,699	0.31%	0.35%	0.35%	0.71%	0.99%	0.93%	0.94%	1.29%	1.22%
2021	1,570,594	6,043,183	7,613,776	1,611,115	6,125,679	7,736,794	1,682,753	6,693,065	8,375,818	0.33%	0.48%	0.45%	0.75%	0.58%	0.62%	0.96%	1.41%	1.32%
2022	1,575,762	6,076,430	7,652,192	1,622,994	6,155,625	7,778,619	1,698,765	6,792,930	8,491,695	0.33%	0.55%	0.50%	0.74%	0.49%	0.54%	0.95%	1.49%	1.38%
2023	1,579,824	6,101,416	7,681,240	1,633,622	6,206,676	7,840,298	1,712,652	6,883,419	8,596,072	0.26%	0.41%	0.38%	0.65%	0.83%	0.79%	0.82%	1.33%	1.23%
2024	1,586,235	6,110,496	7,696,730	1,645,847	6,308,903	7,954,749	1,728,441	6,956,391	8,684,832	0.41%	0.15%	0.20%	0.75%	1.65%	1.46%	0.92%	1.06%	1.03%
2025	1,595,160	6,140,739	7,735,898	1,661,156	6,349,409	8,010,565	1,747,715	7,055,147	8,802,862	0.56%	0.49%	0.51%	0.93%	0.64%	0.70%	1.12%	1.42%	1.36%
2026	1,601,510	6,170,378	7,771,889	1,673,583	6,390,942	8,064,525	1,763,000	7,153,706	8,916,707	0.40%	0.48%	0.47%	0.75%	0.65%	0.67%	0.87%	1.40%	1.29%
2027	1,608,477	6,194,415	7,802,892	1,685,850	6,449,907	8,135,756	1,778,382	7,246,312	9,024,694	0.43%	0.39%	0.40%	0.73%	0.92%	0.88%	0.87%	1.29%	1.21%
2028	1,616,273	6,223,651	7,839,924	1,699,438	6,495,638	8,195,076	1,794,800	7,346,282	9,141,081	0.48%	0.47%	0.47%	0.81%	0.71%	0.73%	0.92%	1.38%	1.29%
2029	1,623,924	6,255,323	7,879,246	1,712,670	6,535,687	8,248,357	1,810,477	7,450,132	9,260,609	0.47%	0.51%	0.50%	0.78%	0.62%	0.65%	0.87%	1.41%	1.31%
2030	1,631,192	6,255,323	7,886,515	1,724,766	6,535,687	8,260,453	1,825,300	7,450,132	9,275,432	0.45%	0.00%	0.09%	0.71%	0.00%	0.15%	0.82%	0.00%	0.16%
2031	1,638,338	6,286,939	7,925,277	1,737,196	6,574,125	8,311,321	1,840,146	7,554,158	9,394,305	0.44%	0.51%	0.49%	0.72%	0.59%	0.62%	0.81%	1.40%	1.28%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	2,522	1,177	3,699	2,532	1,182	3,714	2,548	1,186	3,734	-1.91%	0.29%	-1.22%	-1.52%	0.70%	-0.82%	-0.89%	1.03%	-0.29%
2012	2,479	1,181	3,660	2,491	1,191	3,682	2,508	1,199	3,707	-1.70%	0.28%	-1.07%	-1.62%	0.71%	-0.88%	-1.57%	1.09%	-0.73%
2013	2,470	1,184	3,654	2,454	1,199	3,653	2,524	1,212	3,736	-0.36%	0.31%	-0.15%	-1.49%	0.74%	-0.77%	0.64%	1.12%	0.79%
2014	2,474	1,188	3,662	2,474	1,208	3,682	2,560	1,226	3,786	0.16%	0.31%	0.21%	0.81%	0.73%	0.79%	1.43%	1.10%	1.32%
2015	2,479	1,192	3,671	2,496	1,217	3,713	2,598	1,240	3,838	0.20%	0.34%	0.25%	0.89%	0.76%	0.85%	1.48%	1.13%	1.37%
2016	2,485	1,196	3,681	2,518	1,227	3,745	2,636	1,253	3,889	0.24%	0.35%	0.28%	0.88%	0.76%	0.84%	1.46%	1.12%	1.35%
2017	2,493	1,201	3,694	2,542	1,236	3,778	2,677	1,268	3,945	0.32%	0.37%	0.34%	0.95%	0.78%	0.90%	1.56%	1.14%	1.42%
2018	2,500	1,205	3,705	2,566	1,246	3,812	2,718	1,282	4,000	0.28%	0.37%	0.31%	0.94%	0.77%	0.89%	1.53%	1.12%	1.40%
2019	2,510	1,210	3,720	2,592	1,255	3,847	2,760	1,296	4,056	0.40%	0.38%	0.39%	1.01%	0.78%	0.94%	1.55%	1.13%	1.41%
2020	2,520	1,214	3,734	2,618	1,265	3,883	2,803	1,311	4,114	0.40%	0.39%	0.39%	1.00%	0.78%	0.93%	1.56%	1.12%	1.42%
2021	2,530	1,219	3,749	2,645	1,275	3,920	2,847	1,325	4,172	0.40%	0.38%	0.39%	1.03%	0.77%	0.95%	1.57%	1.11%	1.42%
2022	2,542	1,224	3,766	2,674	1,285	3,959	2,894	1,340	4,234	0.47%	0.41%	0.45%	1.10%	0.79%	1.00%	1.65%	1.13%	1.49%
2023	2,553	1,229	3,782	2,702	1,295	3,997	2,939	1,355	4,294	0.43%	0.39%	0.42%	1.05%	0.76%	0.95%	1.55%	1.09%	1.41%
2024	2,566	1,233	3,799	2,731	1,305	4,036	2,986	1,370	4,356	0.51%	0.39%	0.47%	1.07%	0.76%	0.97%	1.60%	1.08%	1.44%
2025	2,579	1,238	3,817	2,761	1,315	4,076	3,035	1,385	4,420	0.51%	0.40%	0.47%	1.10%	0.77%	0.99%	1.64%	1.09%	1.47%
2026	2,593	1,243	3,836	2,792	1,325	4,117	3,084	1,399	4,483	0.54%	0.39%	0.49%	1.12%	0.75%	1.00%	1.61%	1.07%	1.44%
2027	2,608	1,248	3,856	2,823	1,334	4,157	3,134	1,414	4,548	0.58%	0.39%	0.52%	1.11%	0.74%	0.99%	1.62%	1.05%	1.44%
2028	2,623	1,253	3,876	2,855	1,344	4,199	3,185	1,429	4,614	0.58%	0.39%	0.52%	1.13%	0.75%	1.01%	1.63%	1.05%	1.45%
2029	2,639	1,258	3,897	2,888	1,354	4,242	3,237	1,444	4,681	0.61%	0.39%	0.54%	1.16%	0.74%	1.02%	1.63%	1.05%	1.45%
2030	2,655	1,258	3,913	2,920	1,354	4,274	3,289	1,444	4,733	0.61%	0.00%	0.41%	1.11%	0.00%	0.75%	1.61%	0.00%	1.11%
2031	2,671	1,263	3,934	2,953	1,364	4,317	3,342	1,459	4,801	0.60%	0.38%	0.53%	1.13%	0.72%	1.00%	1.61%	1.01%	1.43%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Longview





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Moses Lake

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	2,700,004	1,268,606	3,968,610	2,718,675	1,277,378	3,996,053	2,741,827	1,288,256	4,030,083	0.39%	0.39%	0.39%	1.08%	1.08%	1.08%	1.94%	1.94%	1.94%
2012	2,768,244	1,300,669	4,068,913	2,790,222	1,310,995	4,101,217	2,819,351	1,324,681	4,144,032	2.53%	2.53%	2.53%	2.63%	2.63%	2.63%	2.83%	2.83%	2.83%
2013	2,784,617	1,308,361	4,092,978	2,809,283	1,319,951	4,129,234	2,842,156	1,335,396	4,177,553	0.59%	0.59%	0.59%	0.68%	0.68%	0.68%	0.81%	0.81%	0.81%
2014	2,807,725	1,319,219	4,126,944	2,834,415	1,331,759	4,166,174	2,871,450	1,349,160	4,220,610	0.83%	0.83%	0.83%	0.89%	0.89%	0.89%	1.03%	1.03%	1.03%
2015	2,840,559	1,334,646	4,175,205	2,870,144	1,348,547	4,218,691	2,911,724	1,368,083	4,279,806	1.17%	1.17%	1.17%	1.26%	1.26%	1.26%	1.40%	1.40%	1.40%
2016	2,880,477	1,353,402	4,233,879	2,912,590	1,368,490	4,281,080	2,959,479	1,390,521	4,350,000	1.41%	1.41%	1.41%	1.48%	1.48%	1.48%	1.64%	1.64%	1.64%
2017	2,915,958	1,370,072	4,286,030	2,950,418	1,386,264	4,336,681	3,002,304	1,410,642	4,412,946	1.23%	1.23%	1.23%	1.30%	1.30%	1.30%	1.45%	1.45%	1.45%
2018	2,945,831	1,384,108	4,329,940	2,982,578	1,401,374	4,383,952	3,040,745	1,428,704	4,469,450	1.02%	1.02%	1.02%	1.09%	1.09%	1.09%	1.28%	1.28%	1.28%
2019	2,979,580	1,399,966	4,379,546	3,018,791	1,418,389	4,437,180	3,083,528	1,448,806	4,532,333	1.15%	1.15%	1.15%	1.21%	1.21%	1.21%	1.41%	1.41%	1.41%
2020	3,017,696	1,417,874	4,435,570	3,059,401	1,437,470	4,496,871	3,131,286	1,471,245	4,602,530	1.28%	1.28%	1.28%	1.35%	1.35%	1.35%	1.55%	1.55%	1.55%
2021	3,050,364	1,433,223	4,483,587	3,094,771	1,454,088	4,548,859	3,174,390	1,491,497	4,665,887	1.08%	1.08%	1.08%	1.16%	1.16%	1.16%	1.38%	1.38%	1.38%
2022	3,077,798	1,446,114	4,523,912	3,124,499	1,468,056	4,592,555	3,212,594	1,509,448	4,722,042	0.90%	0.90%	0.90%	0.96%	0.96%	0.96%	1.20%	1.20%	1.20%
2023	3,110,197	1,461,336	4,571,533	3,159,384	1,484,447	4,643,831	3,256,735	1,530,187	4,786,922	1.05%	1.05%	1.05%	1.12%	1.12%	1.12%	1.37%	1.37%	1.37%
2024	3,158,941	1,484,239	4,643,180	3,210,884	1,508,644	4,719,529	3,318,472	1,559,195	4,877,667	1.57%	1.57%	1.57%	1.63%	1.63%	1.63%	1.90%	1.90%	1.90%
2025	3,199,035	1,503,077	4,702,112	3,253,057	1,528,459	4,781,516	3,370,988	1,583,870	4,954,858	1.27%	1.27%	1.27%	1.31%	1.31%	1.31%	1.58%	1.58%	1.58%
2026	3,230,065	1,517,657	4,747,722	3,286,293	1,544,076	4,830,369	3,415,683	1,604,870	5,020,553	0.97%	0.97%	0.97%	1.02%	1.02%	1.02%	1.33%	1.33%	1.33%
2027	3,266,077	1,534,577	4,800,654	3,325,097	1,562,308	4,887,405	3,466,955	1,628,960	5,095,915	1.11%	1.11%	1.11%	1.18%	1.18%	1.18%	1.50%	1.50%	1.50%
2028	3,301,293	1,551,123	4,852,416	3,362,138	1,579,712	4,941,850	3,517,258	1,652,595	5,169,853	1.08%	1.08%	1.08%	1.11%	1.11%	1.11%	1.45%	1.45%	1.45%
2029	3,332,403	1,565,740	4,898,143	3,395,841	1,595,547	4,991,389	3,565,313	1,675,174	5,240,486	0.94%	0.94%	0.94%	1.00%	1.00%	1.00%	1.37%	1.37%	1.37%
2030	3,331,244	1,565,196	4,896,440	3,392,065	1,593,773	4,985,838	3,557,904	1,671,693	5,229,598	-0.03%	-0.03%	-0.03%	-0.11%	-0.11%	-0.11%	-0.21%	-0.21%	-0.21%
2031	3,360,805	1,579,085	4,939,890	3,423,812	1,608,689	5,032,501	3,605,039	1,693,840	5,298,879	0.89%	0.89%	0.89%	0.94%	0.94%	0.94%	1.32%	1.32%	1.32%

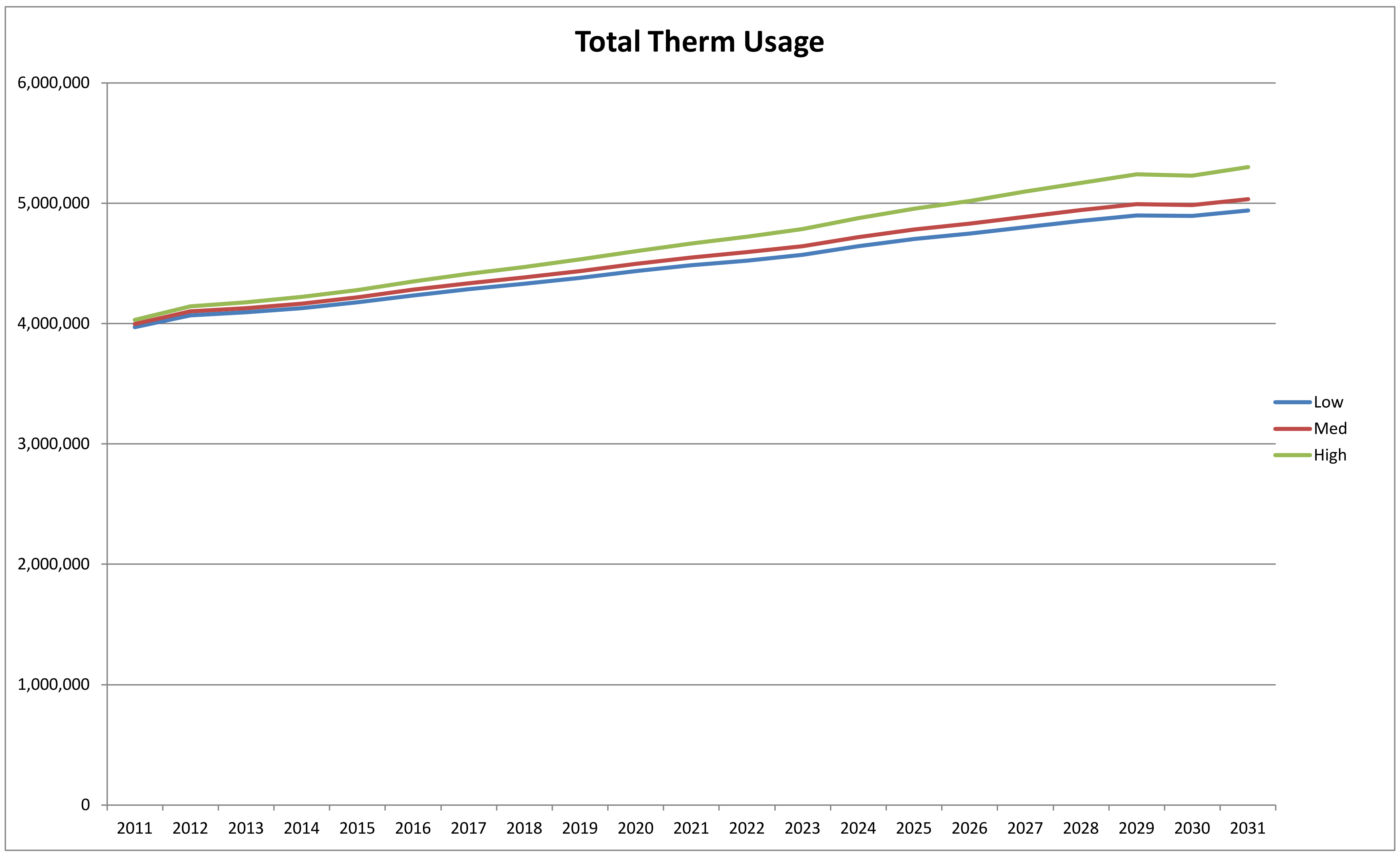
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	3,476	76,150	79,626	3,500	76,330	79,830	3,529	76,566	80,095	0.39%	0.32%	0.33%	1.08%	0.56%	0.58%	1.94%	0.87%	0.92%
2012	3,563	76,498	80,062	3,592	76,675	80,267	3,629	76,978	80,607	2.53%	0.46%	0.55%	2.63%	0.45%	0.55%	2.83%	0.54%	0.64%
2013	3,585	76,900	80,485	3,616	77,119	80,735	3,659	77,426	81,085	0.59%	0.53%	0.53%	0.68%	0.58%	0.58%	0.81%	0.58%	0.59%
2014	3,614	77,323	80,937	3,649	77,521	81,170	3,696	77,835	81,532	0.83%	0.55%	0.56%	0.89%	0.52%	0.54%	1.03%	0.53%	0.55%
2015	3,657	77,700	81,357	3,695	77,940	81,635	3,748	78,260	82,008	1.17%	0.49%	0.52%	1.26%	0.54%	0.57%	1.40%	0.55%	0.58%
2016	3,708	78,066	81,774	3,749	78,317	82,067	3,810	78,674	82,483	1.41%	0.47%	0.51%	1.48%	0.48%	0.53%	1.64%	0.53%	0.58%
2017	3,754	78,467	82,221	3,798	78,731	82,529	3,865	79,061	82,926	1.23%	0.51%	0.55%	1.30%	0.53%	0.56%	1.45%	0.49%	0.54%
2018	3,792	78,842	82,634	3,839	79,118	82,957	3,914	79,484	83,399	1.02%	0.48%	0.50%	1.09%	0.49%	0.52%	1.28%	0.53%	0.57%
2019	3,836	79,209	83,044	3,886	79,498	83,384	3,969	79,871	83,840	1.15%	0.47%	0.50%	1.21%	0.48%	0.51%	1.41%	0.49%	0.53%
2020	3,885	79,569	83,453	3,938	79,872	83,811	4,031	80,251	84,282	1.28%	0.45%	0.49%	1.35%	0.47%	0.51%	1.55%	0.48%	0.53%
2021	3,927	79,902	83,829	3,984	80,252	84,236	4,086	80,637	84,723	1.08%	0.42%	0.45%	1.16%	0.48%	0.51%	1.38%	0.48%	0.52%
2022	3,962	80,273	84,235	4,022	80,638	84,661	4,135	81,028	85,164	0.90%	0.46%	0.48%	0.96%	0.48%	0.50%	1.20%	0.49%	0.52%
2023	4,004	80,635	84,639	4,067	81,017	85,084	4,192	81,411	85,604	1.05%	0.45%	0.48%	1.12%	0.47%	0.50%	1.37%	0.47%	0.52%
2024	4,066	80,943	85,009	4,133	81,340	85,473	4,272	81,770	86,042	1.57%	0.38%	0.44%	1.63%	0.40%	0.46%	1.90%	0.44%	0.51%
2025	4,118	81,291	85,409	4,188	81,706	85,894	4,339	82,141	86,481	1.27%	0.43%	0.47%	1.31%	0.45%	0.49%	1.58%	0.45%	0.51%
2026	4,158	81,617	85,775	4,230	82,049	86,280	4,397	82,488	86,885	0.97%	0.40%	0.43%	1.02%	0.42%	0.45%	1.33%	0.42%	0.47%
2027	4,204	81,934	86,139	4,280	82,416	86,697	4,463	82,859	87,321	1.11%	0.39%	0.42%	1.18%	0.45%	0.48%	1.50%	0.45%	0.50%
2028	4,250	82,282	86,532	4,328	82,752	87,080	4,528	83,198	87,726	1.08%	0.42%	0.46%	1.11%	0.41%	0.44%	1.45%	0.41%	0.46%
2029	4,290	82,602	86,891	4,371	83,124	87,495	4,590	83,573	88,162	0.94%	0.39%	0.42%	1.00%	0.45%	0.48%	1.37%	0.45%	0.50%
2030	4,288	82,762	87,050	4,367	83,287	87,653	4,580	83,741	88,321	-0.03%	0.19%	0.18%	-0.11%	0.20%	0.18%	-0.21%	0.20%	0.18%
2031	4,326	83,081	87,408	4,407	83,628	88,035	4,641	84,084	88,725	0.89%	0.39%	0.41%	0.94%	0.41%	0.44%	1.32%	0.41%	0.46%

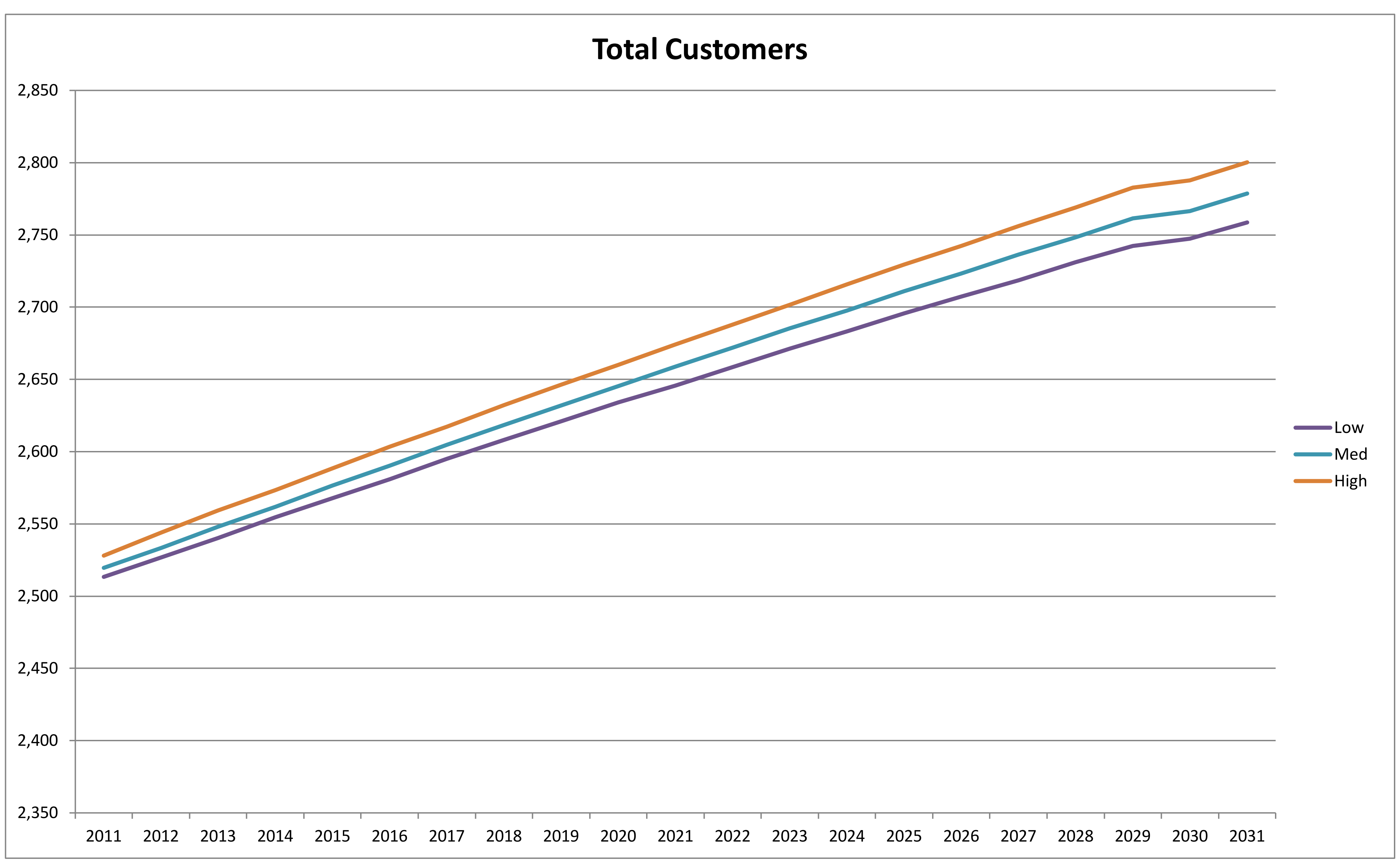
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	988,389	2,980,221	3,968,610	989,458	3,006,596	3,996,053	990,526	3,039,557	4,030,083	0.22%	0.45%	0.39%	0.33%	1.34%	1.08%	0.43%	2.45%	1.94%
2012	1,062,780	3,006,132	4,068,913	1,061,174	3,040,043	4,101,217	1,059,425	3,084,607	4,144,032	7.53%	0.87%	2.53%	7.25%	1.11%	2.63%	6.96%	1.48%	2.83%
2013	1,054,304	3,038,674	4,092,978	1,051,646	3,077,588	4,129,234	1,047,322	3,130,231	4,177,553	-0.80%	1.08%	0.59%	-0.90%	1.24%	0.68%	-1.14%	1.48%	0.81%
2014	1,048,672	3,078,271	4,126,944	1,043,649	3,122,526	4,166,174	1,036,477	3,184,133	4,220,610	-0.53%	1.30%	0.83%	-0.76%	1.46%	0.89%	-1.04%	1.72%	1.03%
2015	1,046,492	3,128,713	4,175,205	1,040,051	3,178,640	4,218,691	1,029,775	3,250,031	4,279,806	-0.21%	1.64%	1.17%	-0.34%	1.80%	1.26%	-0.65%	2.07%	1.40%
2016	1,050,343	3,183,535	4,233,879	1,041,706	3,239,375	4,281,080	1,028,543	3,321,457	4,350,000	0.37%	1.75%	1.41%	0.16%	1.91%	1.48%	-0.12%	2.20%	1.64%
2017	1,057,075	3,228,955	4,286,030	1,046,030	3,290,652	4,336,681	1,028,585	3,384,361	4,412,946	0.64%	1.43%	1.23%	0.42%	1.58%	1.30%	0.00%	1.89%	1.45%
2018	1,057,738	3,272,201	4,329,940	1,044,182	3,339,770	4,383,952	1,023,404	3,446,046	4,469,450	0.06%	1.34%	1.02%	-0.18%	1.49%	1.09%	-0.50%	1.82%	1.28%
2019	1,057,024	3,322,522	4,379,546	1,040,800	3,396,380	4,437,180	1,015,933	3,516,400	4,532,333	-0.07%	1.54%	1.15%	-0.32%	1.70%	1.21%	-0.73%	2.04%	1.41%
2020	1,060,120	3,375,450	4,435,570	1,041,041	3,455,830	4,496,871	1,011,828	3,590,702	4,602,530	0.29%	1.59%	1.28%	0.02%	1.75%	1.35%	-0.40%	2.11%	1.55%
2021	1,063,835	3,419,752	4,483,587	1,042,288	3,506,571	4,548,859	1,008,505	3,657,382	4,665,887	0.35%	1.31%	1.08%	0.12%	1.47%	1.16%	-0.33%	1.86%	1.38%
2022	1,063,145	3,460,767	4,523,912	1,038,553	3,554,002	4,592,555	1,000,211	3,721,830	4,722,042	-0.06%	1.20%	0.90%	-0.36%	1.35%	0.96%	-0.82%	1.76%	1.20%
2023	1,060,551	3,510,982	4,571,533	1,032,858	3,610,973	4,643,831	989,913	3,797,009	4,786,922	-0.24%	1.45%	1.05%	-0.55%	1.60%	1.12%	-1.03%	2.02%	1.37%
2024	1,062,152	3,581,028	4,643,180	1,031,133	3,688,396	4,719,529	983,792	3,893,875	4,877,667	0.15%	2.00%	1.57%	-0.17%	2.14%	1.63%	-0.62%	2.55%	1.90%
2025	1,074,814	3,627,298	4,702,112	1,039,983	3,741,533	4,781,516	987,050	3,967,808	4,954,858	1.19%	1.29%	1.27%	0.86%	1.44%	1.31%	0.33%	1.90%	1.58%
2026	1,073,845	3,673,878	4,747,722	1,035,502	3,794,867	4,830,369	977,486	4,043,068	5,020,553	-0.09%	1.28%	0.97%	-0.43%	1.43%	1.02%	-0.97%	1.90%	1.33%
2027	1,073,014	3,727,640	4,800,654	1,031,566	3,855,838	4,887,405	968,308	4,127,607	5,095,915	-0.08%	1.46%	1.11%	-0.38%	1.61%	1.18%	-0.94%	2.09%	1.50%
2028	1,076,281	3,776,135	4,852,416	1,030,408	3,911,442	4,941,850	961,642	4,208,211	5,169,853	0.30%	1.30%	1.08%	-0.11%	1.44%	1.11%	-0.69%	1.95%	1.45%
2029	1,076,001	3,822,142	4,898,143	1,026,807	3,964,582	4,991,389	952,599	4,287,887	5,240,486	-0.03%	1.22%	0.94%	-0.35%	1.36%	1.00%	-0.94%	1.89%	1.37%
2030	1,074,298	3,822,142	4,896,440	1,021,257	3,964,582	4,985,838	941,711	4,287,887	5,229,598	-0.16%	0.00%	-0.03%	-0.54%	0.00%	-0.11%	-1.14%	0.00%	-0.21%
2031	1,072,220	3,867,670	4,939,890	1,015,293	4,017,208	5,032,501	930,418	4,368,461	5,298,879	-0.19%	1.19%	0.89%	-0.58%	1.33%	0.94%	-1.20%	1.88%	1.32%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1,850	663	2,513	1,852	668	2,520	1,854	674	2,528	0.22%	0.64%	0.33%	0.33%	1.31%	0.58%	0.43%	2.28%	0.92%
2012	1,857	670	2,527	1,858	675	2,533	1,861	683	2,544	0.38%	1.02%	0.55%	0.32%	1.17%	0.55%	0.38%	1.36%	0.64%
2013	1,863	677	2,540	1,865	683	2,548	1,868	691	2,559	0.32%	1.10%	0.53%	0.38%	1.15%	0.58%	0.38%	1.18%	0.59%
2014	1,870	685	2,555	1,871	691	2,562	1,874	699	2,573	0.38%	1.08%	0.56%	0.32%	1.13%	0.54%	0.32%	1.17%	0.55%
2015	1,876	692	2,568	1,878	699	2,577	1,881	707	2,588	0.32%	1.06%	0.52%	0.37%	1.11%	0.57%	0.37%	1.15%	0.58%
2016	1,882	699	2,581	1,884	706	2,590	1,888	715	2,603	0.32%	1.04%	0.51%	0.32%	1.09%	0.53%	0.37%	1.13%	0.58%
2017	1,889	706	2,595	1,891	714	2,605	1,894	723	2,617	0.37%	1.02%	0.55%	0.37%	1.07%	0.56%	0.32%	1.12%	0.54%
2018	1,895	713	2,608	1,897	721	2,618	1,901	731	2,632	0.32%	1.00%	0.50%	0.32%	1.05%	0.52%	0.37%	1.09%	0.57%
2019	1,901	720	2,621	1,903	729	2,632	1,907	739	2,646	0.32%	0.98%	0.50%	0.32%	1.04%	0.51%	0.32%	1.09%	0.53%
2020	1,907	727	2,634	1,909	736	2,645	1,913	747	2,660	0.32%	0.96%	0.49%	0.32%	1.02%	0.51%	0.31%	1.07%	0.53%
2021	1,912	734	2,646	1,915	744	2,659	1,919	755	2,674	0.26%	0.94%	0.45%	0.31%	1.01%	0.51%	0.31%	1.06%	0.52%
2022	1,918	741	2,659	1,921	751	2,672	1,925	763	2,688	0.31%	0.93%	0.48%	0.31%	0.99%	0.50%	0.31%	1.05%	0.52%
2023	1,924	747	2,671	1,927	758	2,685	1,931	771	2,702	0.31%	0.91%	0.48%	0.31%	0.98%	0.50%	0.31%	1.03%	0.52%
2024	1,929	754	2,683	1,932	766	2,698	1,937	779	2,716	0.26%	0.89%	0.44%	0.26%	0.96%	0.46%	0.31%	1.02%	0.51%
2025	1,935	761	2,696	1,938	773	2,711	1,943	787	2,730	0.31%	0.88%	0.47%	0.31%	0.95%	0.49%	0.31%	1.01%	0.51%
2026	1,940	767	2,707	1,943	780	2,723	1,948	794	2,742	0.26%	0.86%	0.43%	0.26%	0.93%	0.45%	0.26%	0.99%	0.47%
2027	1,945	774	2,719	1,949	787	2,736	1,954	802	2,756	0.26%	0.84%	0.42%	0.31%	0.92%	0.48%	0.31%	0.98%	0.50%
2028	1,951	780	2,731	1,954	794	2,748	1,959	810	2,769	0.31%	0.83%	0.46%	0.26%	0.90%	0.44%	0.26%	0.97%	0.46%
2029	1,956	787	2,743	1,960	802	2,762	1,965	818	2,783	0.26%	0.81%	0.42%	0.31%	0.89%	0.48%	0.31%	0.96%	0.50%
2030	1,961	787	2,748	1,965	802	2,767	1,970	818	2,788	0.26%	0.00%	0.18%	0.26%	0.00%	0.18%	0.25%	0.00%	0.18%
2031	1,966	793	2,759	1,970	809	2,779	1,975	825	2,800	0.25%	0.80%	0.41%	0.25%	0.88%	0.44%	0.25%	0.95%	0.46%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Moses Lake





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Mount Vernon

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	25,544,979	14,217,915	39,762,895	25,720,981	14,315,875	40,036,856	25,975,293	14,457,421	40,432,714	3.96%	3.96%	3.96%	4.67%	4.67%	4.67%	5.71%	5.71%	5.71%
2012	27,812,472	15,479,964	43,292,436	27,984,001	15,575,434	43,559,435	28,220,985	15,707,336	43,928,320	8.88%	8.88%	8.88%	8.80%	8.80%	8.80%	8.65%	8.65%	8.65%
2013	28,150,679	15,668,205	43,818,883	28,213,189	15,702,997	43,916,185	28,666,552	15,955,331	44,621,883	1.22%	1.22%	1.22%	0.82%	0.82%	0.82%	1.58%	1.58%	1.58%
2014	28,571,433	15,902,389	44,473,822	28,711,713	15,980,467	44,692,180	29,226,336	16,266,898	45,493,234	1.49%	1.49%	1.49%	1.77%	1.77%	1.77%	1.95%	1.95%	1.95%
2015	29,044,436	16,165,655	45,210,091	29,266,937	16,289,495	45,556,432	29,837,691	16,607,168	46,444,858	1.66%	1.66%	1.66%	1.93%	1.93%	1.93%	2.09%	2.09%	2.09%
2016	29,555,556	16,450,136	46,005,692	29,862,276	16,620,851	46,483,127	30,487,053	16,968,592	47,455,645	1.76%	1.76%	1.76%	2.03%	2.03%	2.03%	2.18%	2.18%	2.18%
2017	30,046,310	16,723,282	46,769,592	30,433,425	16,938,744	47,372,169	31,112,349	17,316,622	48,428,970	1.66%	1.66%	1.66%	1.91%	1.91%	1.91%	2.05%	2.05%	2.05%
2018	30,520,050	16,986,958	47,507,008	30,987,573	17,247,173	48,234,746	31,718,344	17,653,909	49,372,253	1.58%	1.58%	1.58%	1.82%	1.82%	1.82%	1.95%	1.95%	1.95%
2019	31,017,710	17,263,947	48,281,657	31,568,998	17,570,785	49,139,783	32,348,985	18,004,913	50,353,898	1.63%	1.63%	1.63%	1.88%	1.88%	1.88%	1.99%	1.99%	1.99%
2020	31,539,001	17,554,089	49,093,090	32,175,241	17,908,210	50,083,450	33,003,060	18,368,960	51,372,021	1.68%	1.68%	1.68%	1.92%	1.92%	1.92%	2.02%	2.02%	2.02%
2021	32,038,876	17,832,311	49,871,188	32,757,607	18,232,345	50,989,953	33,632,834	18,719,482	52,352,317	1.58%	1.58%	1.58%	1.81%	1.81%	1.81%	1.91%	1.91%	1.91%
2022	32,516,045	18,097,895	50,613,940	33,316,154	18,543,223	51,859,378	34,236,413	19,055,424	53,291,837	1.49%	1.49%	1.49%	1.71%	1.71%	1.71%	1.79%	1.79%	1.79%
2023	33,023,108	18,380,118	51,403,226	33,907,830	18,872,540	52,780,370	34,869,537	19,407,810	54,277,347	1.56%	1.56%	1.56%	1.78%	1.78%	1.78%	1.85%	1.85%	1.85%
2024	33,617,499	18,710,947	52,328,445	34,594,412	19,254,681	53,849,093	35,595,273	19,811,743	55,407,017	1.80%	1.80%	1.80%	2.02%	2.02%	2.02%	2.08%	2.08%	2.08%
2025	34,165,248	19,015,815	53,181,062	35,226,527	19,606,505	54,833,032	36,265,745	20,184,917	56,450,663	1.63%	1.63%	1.63%	1.83%	1.83%	1.83%	1.88%	1.88%	1.88%
2026	34,672,407	19,298,091	53,970,498	35,817,429	19,935,392	55,752,821	36,890,876	20,532,854	57,423,730	1.48%	1.48%	1.48%	1.68%	1.68%	1.68%	1.72%	1.72%	1.72%
2027	35,207,841	19,596,105	54,803,947	36,439,073	20,281,388	56,720,461	37,545,056	20,896,961	58,442,017	1.54%	1.54%	1.54%	1.74%	1.74%	1.74%	1.77%	1.77%	1.77%
2028	35,737,341	19,890,816	55,628,156	37,054,099	20,623,702	57,677,800	38,190,216	21,256,046	59,446,262	1.50%	1.50%	1.50%	1.69%	1.69%	1.69%	1.72%	1.72%	1.72%
2029	36,247,891	20,174,980	56,422,871	37,647,867	20,954,183	58,602,050	38,811,338	21,601,752	60,413,091	1.43%	1.43%	1.43%	1.60%	1.60%	1.60%	1.63%	1.63%	1.63%
2030	36,576,338	20,357,788	56,934,126	38,015,911	21,159,031	59,174,942	39,172,360	21,802,691	60,975,051	0.91%	0.91%	0.91%	0.98%	0.98%	0.98%	0.93%	0.93%	0.93%
2031	37,084,987	20,640,893	57,725,880	38,608,989	21,489,128	60,098,117	39,789,165	22,145,994	61,935,159	1.39%	1.39%	1.39%	1.56%	1.56%	1.56%	1.57%	1.57%	1.57%

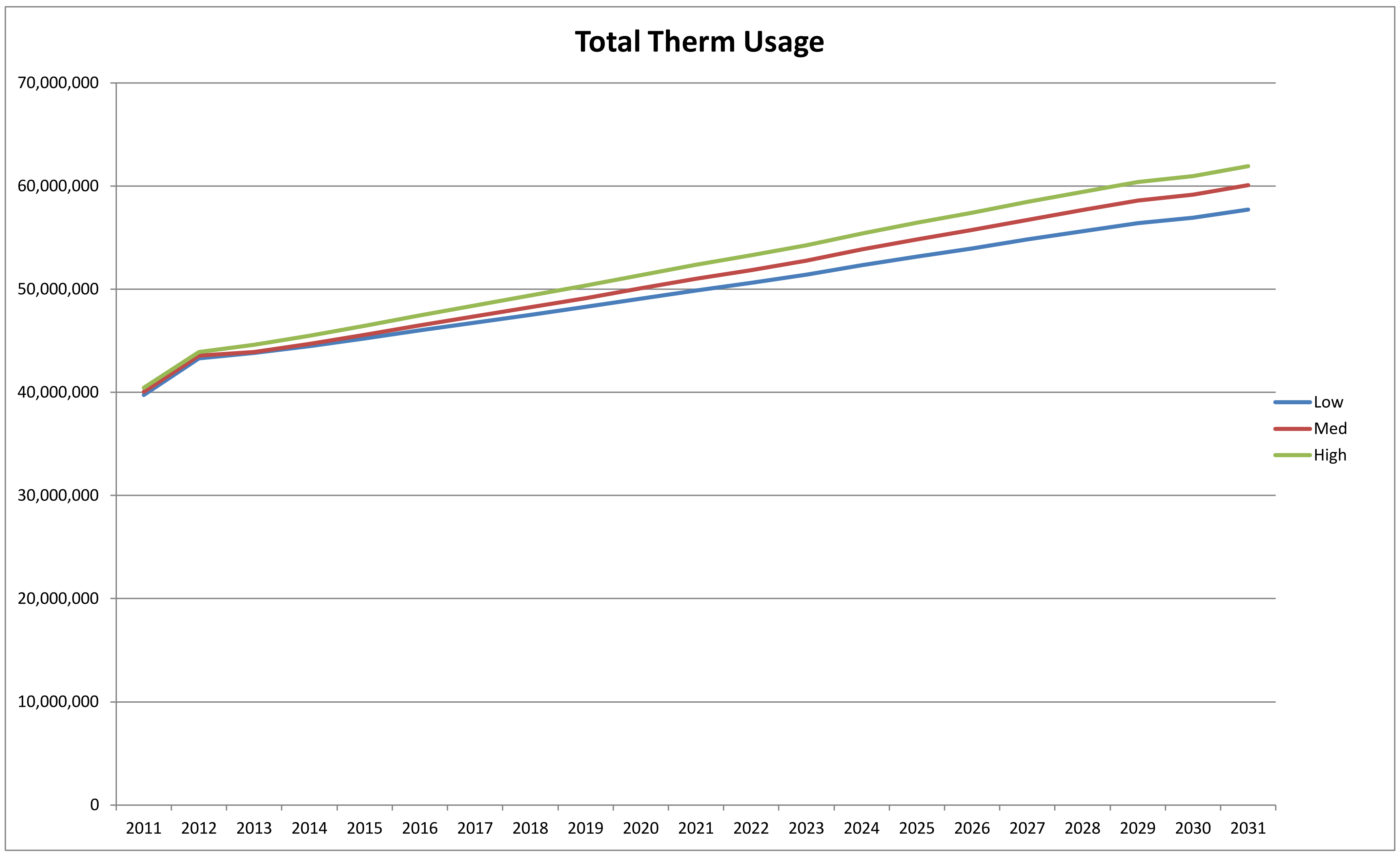
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	38,953	451,603	490,556	39,222	455,678	494,900	39,609	461,923	501,532	3.96%	-0.36%	-0.03%	4.67%	0.54%	0.86%	5.71%	1.92%	2.21%
2012	42,411	452,908	495,319	42,672	457,883	500,555	43,034	465,313	508,347	8.88%	0.29%	0.97%	8.80%	0.48%	1.14%	8.65%	0.73%	1.36%
2013	42,927	460,998	503,925	43,022	463,251	506,272	43,713	476,150	519,864	1.22%	1.79%	1.74%	0.82%	1.17%	1.14%	1.58%	2.33%	2.27%
2014	43,568	470,270	513,838	43,782	474,356	518,139	44,567	489,133	533,700	1.49%	2.01%	1.97%	1.77%	2.40%	2.34%	1.95%	2.73%	2.66%
2015	44,289	479,536	523,826	44,629	485,519	530,147	45,499	502,249	547,748	1.66%	1.97%	1.94%	1.93%	2.35%	2.32%	2.09%	2.68%	2.63%
2016	45,069	488,820	533,889	45,537	496,776	542,312	46,489	515,555	562,045	1.76%	1.94%	1.92%	2.03%	2.32%	2.29%	2.18%	2.65%	2.61%
2017	45,817	498,168	543,985	46,408	508,172	554,580	47,443	529,082	576,525	1.66%	1.91%	1.89%	1.91%	2.29%	2.26%	2.05%	2.62%	2.58%
2018	46,540	507,627	554,167	47,253	519,774	567,027	48,367	542,900	591,267	1.58%	1.90%	1.87%	1.82%	2.28%	2.24%	1.95%	2.61%	2.56%
2019	47,298	517,098	564,396	48,139	531,476	579,616	49,329	556,930	606,259	1.63%	1.87%	1.85%	1.88%	2.25%	2.22%	1.99%	2.58%	2.54%
2020	48,093	526,591	574,684	49,064	543,281	592,344	50,326	571,171	621,497	1.68%	1.84%	1.82%	1.92%	2.22%	2.20%	2.02%	2.56%	2.51%
2021	48,856	536,201	585,057	49,952	555,289	605,241	51,286	585,713	636,999	1.58%	1.83%	1.80%	1.81%	2.21%	2.18%	1.91%	2.55%	2.49%
2022	49,583	545,918	595,501	50,803	567,487	618,290	52,207	600,540	652,747	1.49%	1.81%	1.79%	1.71%	2.20%	2.16%	1.79%	2.53%	2.47%
2023	50,356	555,674	606,030	51,706	579,801	631,506	53,172	615,572	668,744	1.56%	1.79%	1.77%	1.78%	2.17%	2.14%	1.85%	2.50%	2.45%
2024	51,263	565,315	616,578	52,753	592,082	644,835	54,279	630,681	684,960	1.80%	1.74%	1.74%	2.02%	2.12%	2.11%	2.08%	2.45%	2.42%
2025	52,098	575,137	627,235	53,716	604,626	658,342	55,301	646,137	701,438	1.63%	1.74%	1.73%	1.83%	2.12%	2.09%	1.88%	2.45%	2.41%
2026	52,871	585,011	637,882	54,618	617,316	671,934	56,254	661,840	718,094	1.48%	1.72%	1.70%	1.68%	2.10%	2.06%	1.72%	2.43%	2.37%
2027	53,688	594,899	648,587	55,565	630,100	685,665	57,252	677,759	735,011	1.54%	1.69%	1.68%	1.74%	2.07%	2.04%	1.77%	2.41%	2.36%
2028	54,495	604,853	659,349	56,503	643,057	699,561	58,236	693,952	752,188	1.50%	1.67%	1.66%	1.69%	2.06%	2.03%	1.72%	2.39%	2.34%
2029	55,274	614,865	670,139	57,409	656,133	713,542	59,183	710,375	769,558	1.43%	1.66%	1.64%	1.60%	2.03%	2.00%	1.63%	2.37%	2.31%
2030	55,775	623,960	679,735	57,970	668,127	726,096	59,733	725,533	785,266	0.91%	1.48%	1.43%	0.98%	1.83%	1.76%	0.93%	2.13%	2.04%
2031	56,550	634,191	690,741	58,874	681,638	740,512	60,674	742,640	803,314	1.39%	1.64%	1.62%	1.56%	2.02%	1.99%	1.57%	2.36%	2.30%

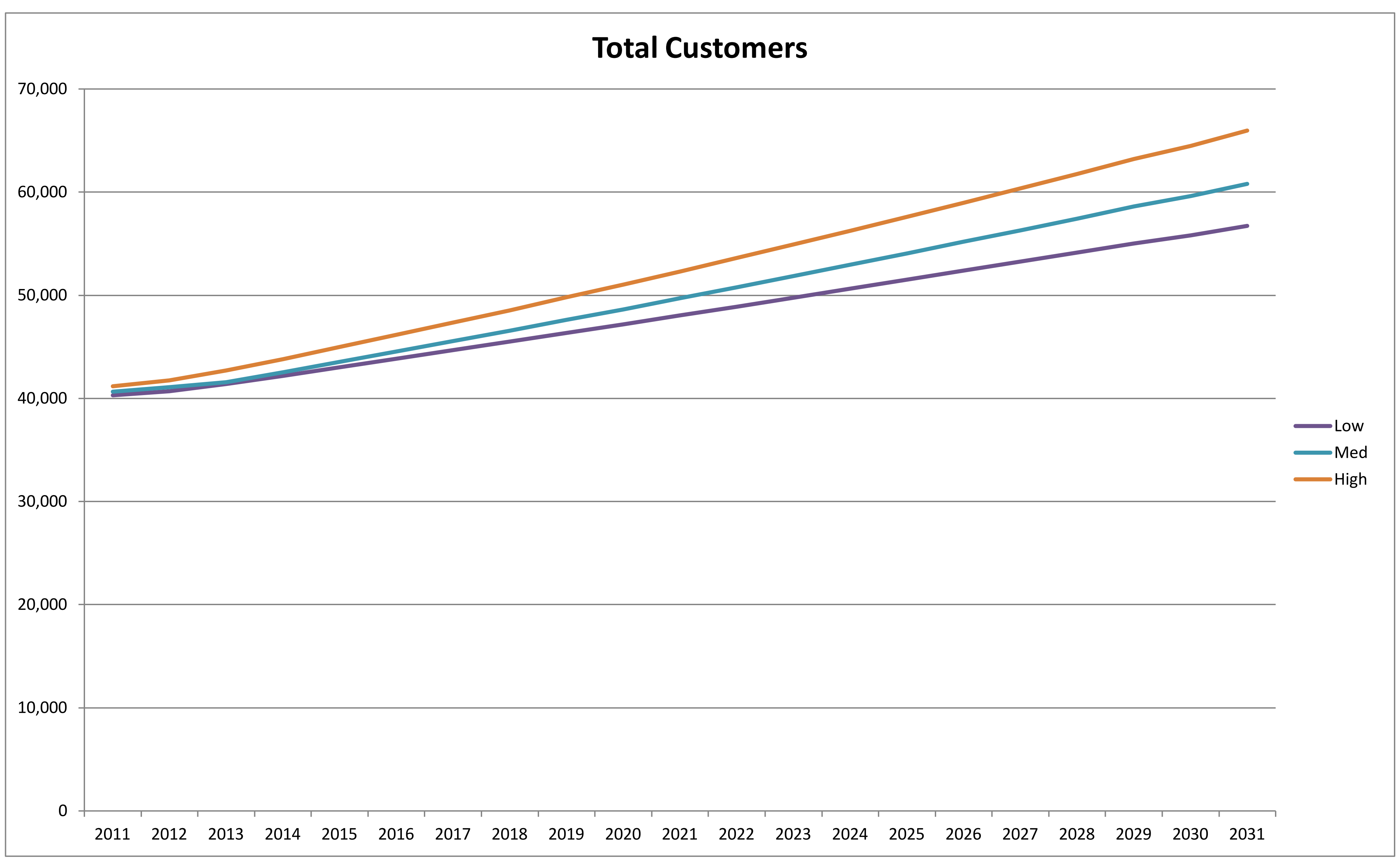
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	22,867,251	16,895,643	39,762,895	23,066,867	16,969,989	40,036,856	23,376,882	17,055,832	40,432,714	0.01%	9.82%	3.96%	0.88%	10.31%	4.67%	2.24%	10.87%	5.71%
2012	26,297,921	16,994,515	43,292,436	26,441,936	17,117,499	43,559,435	26,654,657	17,273,663	43,928,320	15.00%	0.59%	8.88%	14.63%	0.87%	8.80%	14.02%	1.28%	8.65%
2013	26,690,184	17,128,700	43,818,883	26,617,541	17,298,644	43,916,185	27,112,354	17,509,529	44,621,883	1.49%	0.79%	1.22%	0.66%	1.06%	0.82%	1.72%	1.37%	1.58%
2014	27,166,437	17,307,385	44,473,822	27,162,083	17,530,096	44,692,180	27,702,268	17,790,966	45,493,234	1.78%	1.04%	1.49%	2.05%	1.34%	1.77%	2.18%	1.61%	1.95%
2015	27,660,697	17,549,394	45,210,091	27,724,195	17,832,236	45,556,432	28,306,824	18,138,034	46,444,858	1.82%	1.40%	1.66%	2.07%	1.72%	1.93%	2.18%	1.95%	2.09%
2016	28,182,582	17,823,110	46,005,692	28,313,886	18,169,241	46,483,127	28,936,883	18,518,763	47,455,645	1.89%	1.56%	1.76%	2.13%	1.89%	2.03%	2.23%	2.10%	2.18%
2017	28,714,714	18,054,878	46,769,592	28,913,072	18,459,097	47,372,169	29,573,253	18,855,717	48,428,970	1.89%	1.30%	1.66%	2.12%	1.60%	1.91%	2.20%	1.82%	2.05%
2018	29,225,362	18,281,646	47,507,008	29,491,048	18,743,698	48,234,746	30,184,115	19,188,138	49,372,253	1.78%	1.26%	1.58%	2.00%	1.54%	1.82%	2.07%	1.76%	1.95%
2019	29,730,034	18,551,623	48,281,657	30,063,317	19,076,466	49,139,783	30,786,657	19,567,241	50,353,898	1.73%	1.48%	1.63%	1.94%	1.78%	1.88%	2.00%	1.98%	1.99%
2020	30,253,051	18,840,039	49,093,090	30,653,628	19,429,822	50,083,450	31,404,971	19,967,050	51,372,021	1.76%	1.55%	1.68%	1.96%	1.85%	1.92%	2.01%	2.04%	2.02%
2021	30,784,434	19,086,754	49,871,188	31,252,114	19,737,839	50,989,953	32,028,498	20,323,819	52,352,317	1.76%	1.31%	1.58%	1.95%	1.59%	1.81%	1.99%	1.79%	1.91%
2022	31,294,407	19,319,533	50,613,940	31,828,441	20,030,937	51,859,378	32,625,995	20,665,842	53,291,837	1.66%	1.22%	1.49%	1.84%	1.48%	1.71%	1.87%	1.68%	1.79%
2023	31,797,328	19,605,898	51,403,226	32,396,922	20,383,448	52,780,370	33,211,121	21,066,226	54,277,347	1.61%	1.48%	1.56%	1.79%	1.76%	1.78%	1.79%	1.94%	1.85%
2024	32,321,839	20,006,607	52,328,445	32,987,244	20,861,849	53,849,093	33,815,268	21,591,749	55,407,017	1.65%	2.04%	1.80%	1.82%	2.35%	2.02%	1.82%	2.49%	2.08%
2025	32,902,789	20,278,273	53,181,062	33,633,686	21,199,346	54,833,032	34,472,257	21,978,405	56,450,663	1.80%	1.36%	1.63%	1.96%	1.62%	1.83%	1.94%	1.79%	1.88%
2026	33,416,475	20,554,023	53,970,498	34,211,027	21,541,794	55,752,821	35,053,854	22,369,876	57,423,730	1.56%	1.36%	1.48%	1.72%	1.62%	1.68%	1.69%	1.78%	1.72%
2027	33,931,572	20,872,375	54,803,947	34,788,685	21,931,776	56,720,461	35,632,683	22,809,334	58,442,017	1.54%	1.55%	1.54%	1.69%	1.81%	1.74%	1.65%	1.96%	1.77%
2028	34,465,757	21,162,400	55,628,156	35,386,141	22,291,659	57,677,800	36,227,122	23,219,140	59,446,262	1.57%	1.39%	1.50%	1.72%	1.64%	1.69%	1.67%	1.80%	1.72%
2029	34,983,947	21,438,924	56,422,871	35,964,702	22,637,348	58,602,050	36,798,527	23,614,563	60,413,091	1.50%	1.31%	1.43%	1.63%	1.55%	1.60%	1.58%	1.70%	1.63%
2030	35,495,202	21,438,924	56,934,126	36,537,595	22,637,348	59,174,942	37,360,488	23,614,563	60,975,051	1.46%	0.00%	0.91%	1.59%	0.00%	0.98%	1.53%	0.00%	0.93%
2031	36,011,526	21,714,354	57,725,880	37,114,972	22,983,145	60,098,117	37,924,229	24,010,930	61,935,159	1.45%	1.28%	1.39%	1.58%	1.53%	1.56%	1.51%	1.68%	1.57%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	35,627	4,658	40,285	35,938	4,704	40,642	36,421	4,766	41,187	0.01%	-0.33%	-0.03%	0.88%	0.65%	0.86%	2.24%	1.96%	2.21%
2012	35,935	4,742	40,677	36,298	4,809	41,107	36,854	4,892	41,746	0.86%	1.79%	0.97%	1.00%	2.22%	1.14%	1.19%	2.66%	1.36%
2013	36,553	4,830	41,383	36,661	4,915	41,576	37,677	5,015	42,692	1.72%	1.87%	1.74%	1.00%	2.22%	1.14%	2.23%	2.51%	2.27%
2014	37,277	4,920	42,197	37,527	5,024	42,551	38,688	5,141	43,829	1.98%	1.87%	1.97%	2.36%	2.21%	2.34%	2.68%	2.50%	2.66%
2015	38,006	5,012	43,018	38,403	5,134	43,537	39,714	5,268	44,982	1.96%	1.85%	1.94%	2.33%	2.19%	2.32%	2.65%	2.48%	2.63%
2016	38,740	5,104	43,844	39,290	5,246	44,536	40,758	5,398	46,156	1.93%	1.84%	1.92%	2.31%	2.18%	2.29%	2.63%	2.47%	2.61%
2017	39,476	5,197	44,673	40,184	5,359	45,543	41,815	5,530	47,345	1.90%	1.82%	1.89%	2.28%	2.16%	2.26%	2.59%	2.45%	2.58%
2018	40,218	5,291	45,509	41,091	5,474	46,565	42,891	5,665	48,556	1.88%	1.81%	1.87%	2.26%	2.15%	2.24%	2.57%	2.44%	2.56%
2019	40,963	5,386	46,349	42,008	5,591	47,599	43,985	5,802	49,787	1.85%	1.80%	1.85%	2.23%	2.13%	2.22%	2.55%	2.42%	2.54%
2020	41,712	5,482	47,194	42,935	5,709	48,644	45,097	5,942	51,039	1.83%	1.78%	1.82%	2.21%	2.12%	2.20%	2.53%	2.40%	2.51%
2021	42,467	5,579	48,046	43,874	5,830	49,704	46,228	6,084	52,312	1.81%	1.77%	1.80%	2.19%	2.10%	2.18%	2.51%	2.39%	2.49%
2022	43,227	5,677	48,904	44,824	5,951	50,775	47,377	6,228	53,605	1.79%	1.75%	1.79%	2.17%	2.09%	2.16%	2.49%	2.37%	2.47%
2023	43,993	5,775	49,768	45,786	6,075	51,861	48,544	6,375	54,919	1.77%	1.74%	1.77%	2.15%	2.07%	2.14%	2.46%	2.36%	2.45%
2024	44,760	5,875	50,635	46,756	6,199	52,955	49,727	6,523	56,250	1.74%	1.72%	1.74%	2.12%	2.05%	2.11%	2.44%	2.33%	2.42%
2025	45,535	5,975	51,510	47,739	6,325	54,064	50,929	6,675	57,604	1.73%	1.71%	1.73%	2.10%	2.04%	2.09%	2.42%	2.32%	2.41%
2026	46,309	6,075	52,384	48,728	6,453	55,181	52,144	6,827	58,971	1.70%	1.68%	1.70%	2.07%	2.01%	2.06%	2.39%	2.29%	2.37%
2027	47,087	6,176	53,263	49,727	6,581	56,308	53,378	6,983	60,361	1.68%	1.66%	1.68%	2.05%	1.99%	2.04%	2.37%	2.27%	2.36%
2028	47,869	6,278	54,147	50,738	6,711	57,449	54,631	7,140	61,771	1.66%	1.65%	1.66%	2.03%	1.98%	2.03%	2.35%	2.26%	2.34%
2029	48,653	6,380	55,033	51,755	6,842	58,597	55,898	7,300	63,198	1.64%	1.63%	1.64%	2.00%	1.95%	2.00%	2.32%	2.23%	2.31%
2030	49,441	6,380	55,821	52,786	6,842	59,628	57,188	7,300	64,488	1.62%	0.00%	1.43%	1.99%	0.00%	1.76%	2.31%	0.00%	2.04%
2031	50,242	6,483	56,725	53,837	6,975	60,812	58,508	7,462	65,970	1.62%	1.61%	1.62%	1.99%	1.94%	1.99%	2.31%	2.22%	2.30%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Mount Vernon





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Walla Walla

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	6,510,875	2,237,129	8,748,004	6,510,266	2,236,920	8,747,187	6,510,573	2,237,026	8,747,598	0.08%	0.08%	0.08%	0.07%	0.07%	0.07%	0.08%	0.08%	0.08%
2012	6,758,422	2,322,186	9,080,609	6,739,835	2,315,800	9,055,635	6,766,825	2,325,074	9,091,899	3.80%	3.80%	3.80%	3.53%	3.53%	3.53%	3.94%	3.94%	3.94%
2013	6,743,979	2,317,224	9,061,203	6,706,854	2,304,468	9,011,321	6,750,805	2,319,569	9,070,374	-0.21%	-0.21%	-0.21%	-0.49%	-0.49%	-0.49%	-0.24%	-0.24%	-0.24%
2014	6,735,006	2,314,140	9,049,146	6,685,329	2,297,071	8,982,400	6,740,163	2,315,912	9,056,075	-0.13%	-0.13%	-0.13%	-0.32%	-0.32%	-0.32%	-0.16%	-0.16%	-0.16%
2015	6,735,565	2,314,333	9,049,898	6,682,348	2,296,047	8,978,395	6,739,357	2,315,635	9,054,992	0.01%	0.01%	0.01%	-0.04%	-0.04%	-0.04%	-0.01%	-0.01%	-0.01%
2016	6,750,972	2,319,626	9,070,599	6,696,321	2,300,849	8,997,170	6,753,087	2,320,353	9,073,439	0.23%	0.23%	0.23%	0.21%	0.21%	0.21%	0.20%	0.20%	0.20%
2017	6,771,894	2,326,815	9,098,710	6,709,245	2,305,289	9,014,535	6,772,405	2,326,991	9,099,396	0.31%	0.31%	0.31%	0.19%	0.19%	0.19%	0.29%	0.29%	0.29%
2018	6,779,796	2,329,530	9,109,326	6,707,522	2,304,697	9,012,220	6,778,903	2,329,223	9,108,126	0.12%	0.12%	0.12%	-0.03%	-0.03%	-0.03%	0.10%	0.10%	0.10%
2019	6,784,590	2,331,177	9,115,767	6,707,009	2,304,521	9,011,529	6,781,411	2,330,085	9,111,496	0.07%	0.07%	0.07%	-0.01%	-0.01%	-0.01%	0.04%	0.04%	0.04%
2020	6,798,380	2,335,916	9,134,296	6,717,441	2,308,105	9,025,547	6,794,063	2,334,433	9,128,496	0.20%	0.20%	0.20%	0.16%	0.16%	0.16%	0.19%	0.19%	0.19%
2021	6,815,309	2,341,732	9,157,041	6,725,345	2,310,821	9,036,166	6,809,563	2,339,758	9,149,322	0.25%	0.25%	0.25%	0.12%	0.12%	0.12%	0.23%	0.23%	0.23%
2022	6,820,410	2,343,485	9,163,895	6,718,928	2,308,616	9,027,545	6,812,921	2,340,912	9,153,833	0.07%	0.07%	0.07%	-0.10%	-0.10%	-0.10%	0.05%	0.05%	0.05%
2023	6,820,522	2,343,524	9,164,046	6,713,294	2,306,680	9,019,974	6,811,386	2,340,385	9,151,770	0.00%	0.00%	0.00%	-0.08%	-0.08%	-0.08%	-0.02%	-0.02%	-0.02%
2024	6,832,244	2,347,551	9,179,795	6,730,493	2,312,590	9,043,083	6,821,537	2,343,872	9,165,409	0.17%	0.17%	0.17%	0.26%	0.26%	0.26%	0.15%	0.15%	0.15%
2025	6,869,465	2,360,341	9,229,806	6,759,600	2,322,591	9,082,190	6,858,005	2,356,403	9,214,407	0.54%	0.54%	0.54%	0.43%	0.43%	0.43%	0.53%	0.53%	0.53%
2026	6,874,758	2,362,159	9,236,917	6,756,671	2,321,585	9,078,256	6,861,522	2,357,611	9,219,133	0.08%	0.08%	0.08%	-0.04%	-0.04%	-0.04%	0.05%	0.05%	0.05%
2027	6,879,961	2,363,947	9,243,908	6,757,486	2,321,865	9,079,351	6,865,554	2,358,997	9,224,550	0.08%	0.08%	0.08%	0.01%	0.01%	0.01%	0.06%	0.06%	0.06%
2028	6,894,422	2,368,916	9,263,338	6,764,249	2,324,189	9,088,438	6,878,819	2,363,554	9,242,373	0.21%	0.21%	0.21%	0.10%	0.10%	0.10%	0.19%	0.19%	0.19%
2029	6,901,114	2,371,215	9,272,329	6,762,311	2,323,522	9,085,833	6,884,116	2,365,375	9,249,491	0.10%	0.10%	0.10%	-0.03%	-0.03%	-0.03%	0.08%	0.08%	0.08%
2030	6,902,058	2,371,539	9,273,597	6,766,165	2,324,847	9,091,012	6,892,800	2,368,358	9,261,158	0.01%	0.01%	0.01%	0.06%	0.06%	0.06%	0.13%	0.13%	0.13%
2031	6,904,014	2,372,211	9,276,225	6,759,278	2,322,480	9,081,758	6,893,799	2,368,702	9,262,501	0.03%	0.03%	0.03%	-0.10%	-0.10%	-0.10%	0.01%	0.01%	0.01%

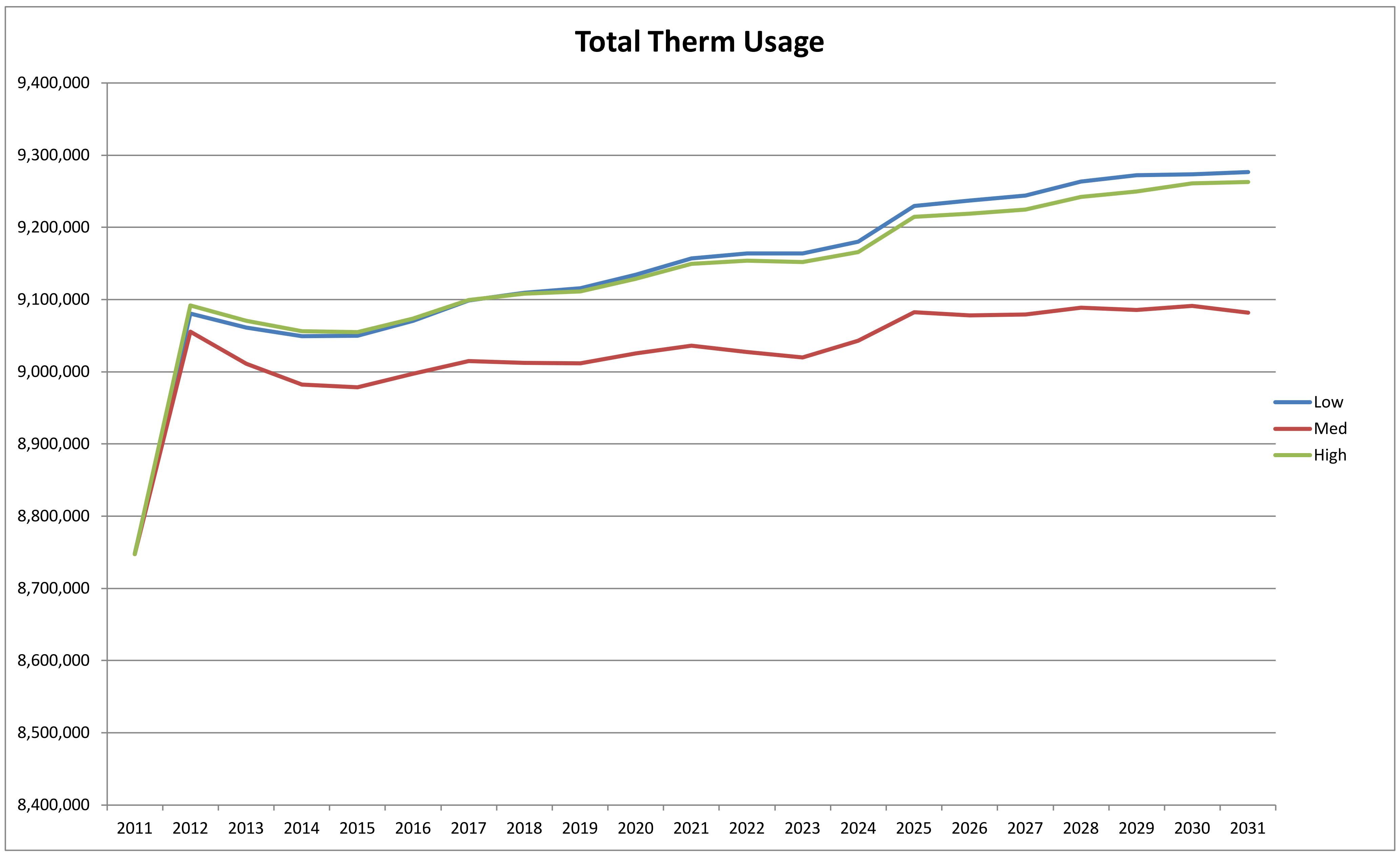
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	6,129	92,392	98,522	6,129	92,510	98,638	6,129	92,718	98,847	0.08%	-0.04%	-0.03%	0.07%	0.09%	0.09%	0.08%	0.31%	0.30%
2012	6,362	92,461	98,823	6,345	92,670	99,015	6,370	92,944	99,314	3.80%	0.07%	0.31%	3.53%	0.17%	0.38%	3.94%	0.24%	0.47%
2013	6,349	92,860	99,208	6,314	93,062	99,375	6,355	93,310	99,665	-0.21%	0.43%	0.39%	-0.49%	0.42%	0.36%	-0.24%	0.39%	0.35%
2014	6,340	93,236	99,577	6,293	93,425	99,719	6,345	93,654	99,999	-0.13%	0.41%	0.37%	-0.32%	0.39%	0.35%	-0.16%	0.37%	0.33%
2015	6,341	93,587	99,928	6,291	93,784	100,074	6,344	93,985	100,329	0.01%	0.38%	0.35%	-0.04%	0.38%	0.36%	-0.01%	0.35%	0.33%
2016	6,355	93,921	100,276	6,304	94,094	100,398	6,357	94,285	100,642	0.23%	0.36%	0.35%	0.21%	0.33%	0.32%	0.20%	0.32%	0.31%
2017	6,375	94,232	100,607	6,316	94,402	100,718	6,375	94,562	100,937	0.31%	0.33%	0.33%	0.19%	0.33%	0.32%	0.29%	0.29%	0.29%
2018	6,382	94,553	100,936	6,314	94,722	101,036	6,381	94,863	101,244	0.12%	0.34%	0.33%	-0.03%	0.34%	0.32%	0.10%	0.32%	0.30%
2019	6,387	94,875	101,261	6,314	95,023	101,337	6,384	95,136	101,520	0.07%	0.34%	0.32%	-0.01%	0.32%	0.30%	0.04%	0.29%	0.27%
2020	6,400	95,170	101,570	6,324	95,312	101,636	6,396	95,413	101,809	0.20%	0.31%	0.30%	0.16%	0.30%	0.29%	0.19%	0.29%	0.28%
2021	6,416	95,461	101,877	6,331	95,602	101,933	6,410	95,672	102,082	0.25%	0.31%	0.30%	0.12%	0.30%	0.29%	0.23%	0.27%	0.27%
2022	6,421	95,762	102,182	6,325	95,888	102,213	6,413	95,940	102,353	0.07%	0.31%	0.30%	-0.10%	0.30%	0.28%	0.05%	0.28%	0.27%
2023	6,421	96,050	102,471	6,320	96,171	102,491	6,412	96,208	102,620	0.00%	0.30%	0.28%	-0.08%	0.30%	0.27%	-0.02%	0.28%	0.26%
2024	6,432	96,325	102,757	6,336	96,416	102,752	6,422	96,450	102,872	0.17%	0.29%	0.28%	0.26%	0.25%	0.25%	0.15%	0.25%	0.24%
2025	6,467	96,558	103,025	6,363	96,647	103,010	6,456	96,649	103,104	0.54%	0.24%	0.26%	0.43%	0.24%	0.25%	0.53%	0.21%	0.23%
2026	6,472	96,819	103,291	6,361	96,905	103,266	6,459	96,876	103,335	0.08%	0.27%	0.26%	-0.04%	0.27%	0.25%	0.05%	0.23%	0.22%
2027	6,477	97,063	103,540	6,361	97,143	103,504	6,463	97,100	103,563	0.08%	0.25%	0.24%	0.01%	0.25%	0.23%	0.06%	0.23%	0.22%
2028	6,490	97,310	103,801	6,368	97,373	103,740	6,475	97,314	103,790	0.21%	0.25%	0.25%	0.10%	0.24%	0.23%	0.19%	0.22%	0.22%
2029	6,496	97,548	104,044	6,366	97,608	103,974	6,480	97,519	103,999	0.10%	0.24%	0.23%	-0.03%	0.24%	0.23%	0.08%	0.21%	0.20%
2030	6,497	97,724	104,222	6,369	97,782	104,152	6,489	97,688	104,177	0.01%	0.18%	0.17%	0.06%	0.18%	0.17%	0.13%	0.17%	0.17%
2031	6,499	97,950	104,449	6,363	98,006	104,369	6,490	97,895	104,385	0.03%	0.23%	0.22%	-0.10%	0.23%	0.21%	0.01%	0.21%	0.20%

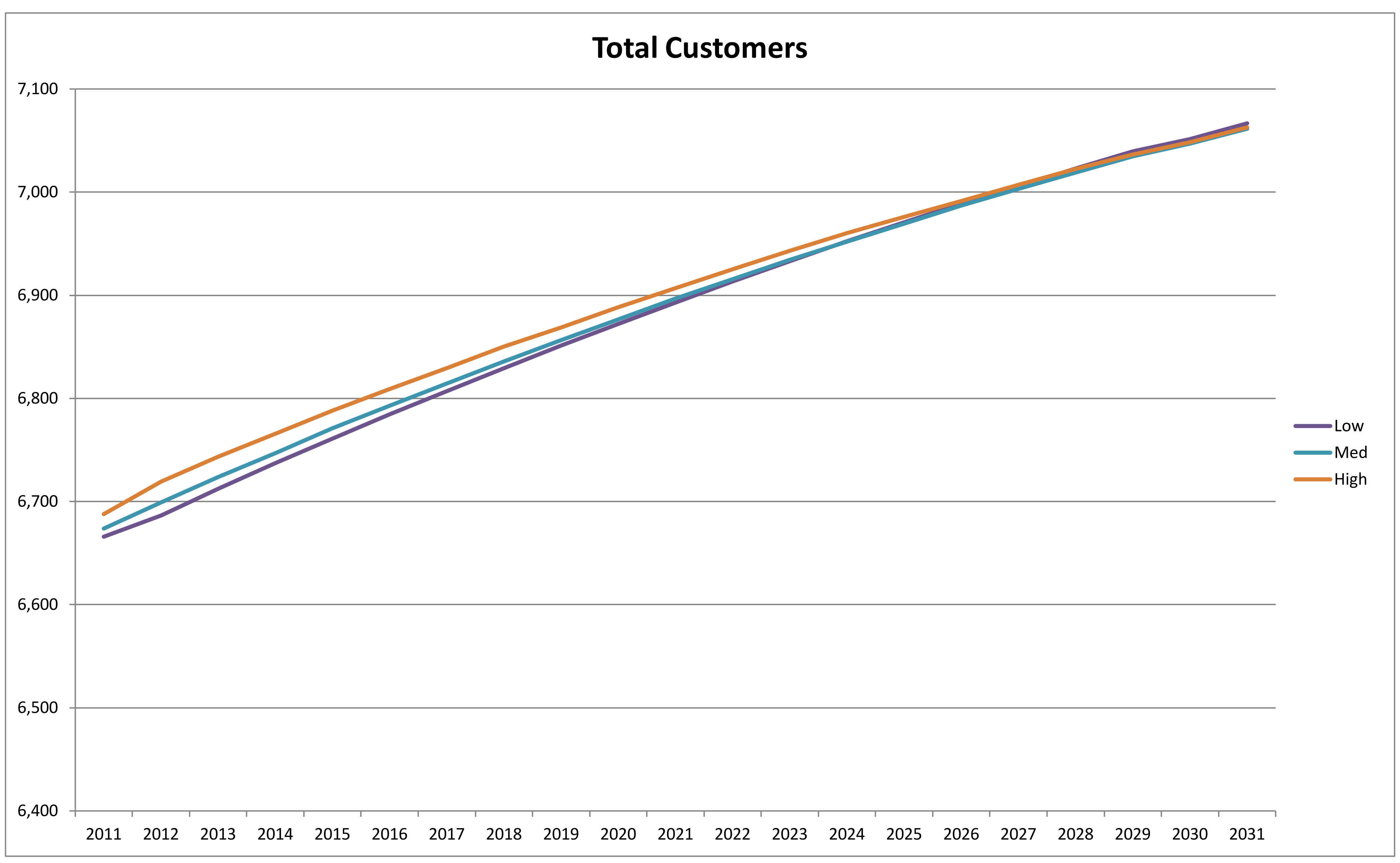
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	2,841,453	5,906,551	8,748,004	2,844,688	5,902,498	8,747,187	2,850,080	5,897,518	8,747,598	0.02%	0.12%	0.08%	0.13%	0.05%	0.07%	0.32%	-0.04%	0.08%
2012	3,173,935	5,906,674	9,080,609	3,182,298	5,873,337	9,055,635	3,194,469	5,897,429	9,091,899	11.70%	0.00%	3.80%	11.87%	-0.49%	3.53%	12.08%	0.00%	3.94%
2013	3,151,431	5,909,772	9,061,203	3,161,549	5,849,772	9,011,321	3,177,492	5,892,882	9,070,374	-0.71%	0.05%	-0.21%	-0.65%	-0.40%	-0.49%	-0.53%	-0.08%	-0.24%
2014	3,136,027	5,913,120	9,049,146	3,147,998	5,834,402	8,982,400	3,167,855	5,888,220	9,056,075	-0.49%	0.06%	-0.13%	-0.43%	-0.26%	-0.32%	-0.30%	-0.08%	-0.16%
2015	3,133,300	5,916,598	9,049,898	3,148,428	5,829,968	8,978,395	3,171,816	5,883,176	9,054,992	-0.09%	0.06%	0.01%	0.01%	-0.08%	-0.04%	0.13%	-0.09%	-0.01%
2016	3,150,444	5,920,154	9,070,599	3,167,750	5,829,420	8,997,170	3,195,583	5,877,857	9,073,439	0.55%	0.06%	0.23%	0.61%	-0.01%	0.21%	0.75%	-0.09%	0.20%
2017	3,174,904	5,923,805	9,098,710	3,195,145	5,819,389	9,014,535	3,227,107	5,872,289	9,099,396	0.78%	0.06%	0.31%	0.86%	-0.17%	0.19%	0.99%	-0.09%	0.29%
2018	3,181,844	5,927,482	9,109,326	3,205,026	5,807,194	9,012,220	3,241,734	5,866,393	9,108,126	0.22%	0.06%	0.12%	0.31%	-0.21%	-0.03%	0.45%	-0.10%	0.10%
2019	3,184,664	5,931,103	9,115,767	3,210,264	5,801,265	9,011,529	3,251,236	5,860,261	9,111,496	0.09%	0.06%	0.07%	0.16%	-0.10%	-0.01%	0.29%	-0.10%	0.04%
2020	3,199,580	5,934,716	9,134,296	3,228,388	5,797,159	9,025,547	3,274,554	5,853,942	9,128,496	0.47%	0.06%	0.20%	0.56%	-0.07%	0.16%	0.72%	-0.11%	0.19%
2021	3,218,646	5,938,395	9,157,041	3,250,802	5,785,364	9,036,166	3,301,798	5,847,524	9,149,322	0.60%	0.06%	0.25%	0.69%	-0.20%	0.12%	0.83%	-0.11%	0.23%
2022	3,221,772	5,942,123	9,163,895	3,256,608	5,770,937	9,027,545	3,312,925	5,840,908	9,153,833	0.10%	0.06%	0.07%	0.18%	-0.25%	-0.10%	0.34%	-0.11%	0.05%
2023	3,218,316	5,945,730	9,164,046	3,256,420	5,763,554	9,019,974	3,318,067	5,833,703	9,151,770	-0.11%	0.06%	0.00%	-0.01%	-0.13%	-0.08%	0.16%	-0.12%	-0.02%
2024	3,230,693	5,949,103	9,179,795	3,271,748	5,771,335	9,043,083	3,339,180	5,826,229	9,165,409	0.38%	0.06%	0.17%	0.47%	0.13%	0.26%	0.64%	-0.13%	0.15%
2025	3,277,359	5,952,447	9,229,806	3,322,520	5,759,670	9,082,190	3,396,067	5,818,340	9,214,407	1.44%	0.06%	0.54%	1.55%	-0.20%	0.43%	1.70%	-0.14%	0.53%
2026	3,281,313	5,955,604	9,236,917	3,330,128	5,748,128	9,078,256	3,409,058	5,810,075	9,219,133	0.12%	0.05%	0.08%	0.23%	-0.20%	-0.04%	0.38%	-0.14%	0.05%
2027	3,285,411	5,958,497	9,243,908	3,337,970	5,741,382	9,079,351	3,423,062	5,801,488	9,224,550	0.12%	0.05%	0.08%	0.24%	-0.12%	0.01%	0.41%	-0.15%	0.06%
2028	3,302,075	5,961,263	9,263,338	3,358,058	5,730,380	9,088,438	3,449,778	5,792,596	9,242,373	0.51%	0.05%	0.21%	0.60%	-0.19%	0.10%	0.78%	-0.15%	0.19%
2029	3,308,481	5,963,848	9,272,329	3,368,404	5,717,429	9,085,833	3,466,022	5,783,469	9,249,491	0.19%	0.04%	0.10%	0.31%	-0.23%	-0.03%	0.47%	-0.16%	0.08%
2030	3,309,749	5,963,848	9,273,597	3,373,583	5,717,429	9,091,012	3,477,689	5,783,469	9,261,158	0.04%	0.00%	0.01%	0.15%	0.00%	0.06%	0.34%	0.00%	0.13%
2031	3,309,941	5,966,284	9,276,225	3,377,712	5,704,047	9,081,758	3,488,368	5,774,132	9,262,501	0.01%	0.04%	0.03%	0.12%	-0.23%	-0.10%	0.31%	-0.16%	0.01%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	5,270	1,396	6,666	5,276	1,398	6,674	5,286	1,402	6,688	0.02%	-0.22%	-0.03%	0.13%	-0.09%	0.09%	0.32%	0.21%	0.30%
2012	5,286	1,400	6,686	5,296	1,403	6,699	5,310	1,410	6,720	0.30%	0.32%	0.31%	0.38%	0.39%	0.38%	0.45%	0.54%	0.47%
2013	5,306	1,406	6,712	5,315	1,409	6,724	5,329	1,414	6,743	0.38%	0.43%	0.39%	0.36%	0.38%	0.36%	0.36%	0.33%	0.35%
2014	5,325	1,412	6,737	5,333	1,414	6,747	5,347	1,419	6,766	0.36%	0.42%	0.37%	0.34%	0.37%	0.35%	0.34%	0.32%	0.33%
2015	5,343	1,418	6,761	5,352	1,419	6,771	5,365	1,423	6,788	0.34%	0.41%	0.35%	0.36%	0.36%	0.36%	0.34%	0.31%	0.33%
2016	5,361	1,424	6,785	5,369	1,424	6,793	5,382	1,427	6,809	0.34%	0.39%	0.35%	0.32%	0.34%	0.32%	0.32%	0.29%	0.31%
2017	5,378	1,429	6,807	5,386	1,429	6,815	5,398	1,431	6,829	0.32%	0.38%	0.33%	0.32%	0.33%	0.32%	0.30%	0.28%	0.29%
2018	5,395	1,434	6,829	5,403	1,433	6,836	5,415	1,435	6,850	0.32%	0.37%	0.33%	0.32%	0.32%	0.32%	0.31%	0.26%	0.30%
2019	5,412	1,439	6,851	5,419	1,437	6,856	5,430	1,439	6,869	0.32%	0.35%	0.32%	0.30%	0.30%	0.30%	0.28%	0.26%	0.27%
2020	5,428	1,444	6,872	5,435	1,442	6,877	5,446	1,442	6,888	0.30%	0.34%	0.30%	0.30%	0.29%	0.29%	0.29%	0.25%	0.28%
2021	5,444	1,449	6,893	5,451	1,446	6,897	5,461	1,446	6,907	0.29%	0.33%	0.30%	0.29%	0.28%	0.29%	0.28%	0.24%	0.27%
2022	5,460	1,454	6,914	5,466	1,450	6,916	5,476	1,449	6,925	0.29%	0.32%	0.30%	0.28%	0.28%	0.28%	0.27%	0.23%	0.27%
2023	5,475	1,458	6,933	5,481	1,454	6,935	5,491	1,452	6,943	0.27%	0.31%	0.28%	0.27%	0.26%	0.27%	0.27%	0.21%	0.26%
2024	5,490	1,462	6,952	5,495	1,457	6,952	5,505	1,455	6,960	0.27%	0.30%	0.28%	0.26%	0.25%	0.25%	0.25%	0.21%	0.24%
2025	5,504	1,467	6,971	5,509	1,461	6,970	5,518	1,458	6,976	0.26%	0.29%	0.26%	0.25%	0.24%	0.25%	0.24%	0.19%	0.23%
2026	5,518	1,471	6,989	5,523	1,464	6,987	5,531	1,461	6,992	0.25%	0.27%	0.26%	0.25%	0.23%	0.25%	0.24%	0.18%	0.22%
2027	5,531	1,474	7,005	5,536	1,467	7,003	5,544	1,463	7,007	0.24%	0.26%	0.24%	0.24%	0.21%	0.23%	0.24%	0.17%	0.22%
2028	5,545	1,478	7,023	5,549	1,470	7,019	5,557	1,465	7,022	0.25%	0.25%	0.25%	0.23%	0.20%	0.23%	0.23%	0.16%	0.22%
2029	5,558	1,482	7,040	5,562	1,473	7,035	5,569	1,468	7,037	0.23%	0.24%	0.23%	0.23%	0.19%	0.23%	0.22%	0.15%	0.20%
2030	5,570	1,482	7,052	5,574	1,473	7,047	5,581	1,468	7,049	0.22%	0.00%	0.17%	0.22%	0.00%	0.17%	0.22%	0.00%	0.17%
2031	5,582	1,485	7,067	5,586	1,476	7,062	5,593	1,470	7,063	0.22%	0.23%	0.22%	0.22%	0.18%	0.21%	0.22%	0.14%	0.20%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Walla Walla





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Wenatchee

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	7,858,126	2,635,857	10,493,983	7,927,403	2,659,095	10,586,497	8,037,869	2,696,148	10,734,017
2012	7,863,299	2,637,592	10,500,891	7,981,730	2,677,318	10,659,048	8,149,461	2,733,580	10,883,040
2013	7,901,692	2,650,471	10,552,163	8,037,716	2,696,097	10,733,813	8,194,414	2,748,658	10,943,072
2014	7,965,324	2,671,815	10,637,139	8,087,489	2,712,792	10,800,281	8,267,077	2,773,032	11,040,109
2015	8,044,148	2,698,255	10,742,403	8,165,571	2,738,983	10,904,554	8,337,233	2,796,564	11,133,797
2016	8,109,764	2,720,264	10,830,028	8,229,789	2,760,524	10,990,314	8,401,808	2,818,225	11,220,032
2017	8,164,582	2,738,652	10,903,233	8,293,078	2,781,753	11,074,831	8,463,016	2,838,756	11,301,772
2018	8,227,530	2,759,767	10,987,297	8,356,467	2,803,016	11,159,483	8,531,295	2,861,659	11,392,954
2019	8,300,037	2,784,088	11,084,125	8,419,425	2,824,134	11,243,558	8,592,928	2,882,332	11,475,260
2020	8,352,441	2,801,665	11,154,106	8,479,000	2,844,117	11,323,118	8,652,422	2,902,288	11,554,710
2021	8,401,252	2,818,038	11,219,290	8,528,295	2,860,652	11,388,948	8,707,568	2,920,786	11,628,354
2022	8,459,527	2,837,586	11,297,113	8,587,065	2,880,366	11,467,431	8,762,139	2,939,091	11,701,229
2023	8,535,531	2,863,080	11,398,611	8,661,086	2,905,194	11,566,280	8,833,117	2,962,899	11,796,017
2024	8,594,148	2,882,741	11,476,890	8,715,867	2,923,570	11,639,436	8,878,913	2,978,260	11,857,173
2025	8,642,310	2,898,897	11,541,207	8,762,958	2,939,365	11,702,323	8,931,159	2,995,785	11,926,944
2026	8,696,616	2,917,112	11,613,728	8,815,983	2,957,152	11,773,135	8,979,617	3,012,040	11,991,656
2027	8,743,877	2,932,965	11,676,842	8,861,454	2,972,404	11,833,858	9,022,523	3,026,432	12,048,955
2028	8,783,945	2,946,405	11,730,350	8,900,308	2,985,437	11,885,745	9,057,158	3,038,049	12,095,208
2029	8,813,845	2,956,434	11,770,279	8,938,574	2,998,273	11,936,847	9,091,110	3,049,438	12,140,548
2030	8,841,263	2,965,631	11,806,894	8,966,261	3,007,560	11,973,821	9,128,505	3,061,981	12,190,486
2031	8,870,579	2,975,465	11,846,043	8,994,172	3,016,922	12,011,094	9,156,475	3,071,363	12,227,838

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	4.96%	4.96%	4.96%	5.88%	5.88%	5.88%	7.36%	7.36%	7.36%
2012	0.07%	0.07%	0.07%	0.69%	0.69%	0.69%	1.39%	1.39%	1.39%
2013	0.49%	0.49%	0.49%	0.70%	0.70%	0.70%	0.55%	0.55%	0.55%
2014	0.81%	0.81%	0.81%	0.62%	0.62%	0.62%	0.89%	0.89%	0.89%
2015	0.99%	0.99%	0.99%	0.97%	0.97%	0.97%	0.85%	0.85%	0.85%
2016	0.82%	0.82%	0.82%	0.79%	0.79%	0.79%	0.77%	0.77%	0.77%
2017	0.68%	0.68%	0.68%	0.77%	0.77%	0.77%	0.73%	0.73%	0.73%
2018	0.77%	0.77%	0.77%	0.76%	0.76%	0.76%	0.81%	0.81%	0.81%
2019	0.88%	0.88%	0.88%	0.75%	0.75%	0.75%	0.72%	0.72%	0.72%
2020	0.63%	0.63%	0.63%	0.71%	0.71%	0.71%	0.69%	0.69%	0.69%
2021	0.58%	0.58%	0.58%	0.58%	0.58%	0.58%	0.64%	0.64%	0.64%
2022	0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	0.63%	0.63%	0.63%
2023	0.90%	0.90%	0.90%	0.86%	0.86%	0.86%	0.81%	0.81%	0.81%
2024	0.69%	0.69%	0.69%	0.63%	0.63%	0.63%	0.52%	0.52%	0.52%
2025	0.56%	0.56%	0.56%	0.54%	0.54%	0.54%	0.59%	0.59%	0.59%
2026	0.63%	0.63%	0.63%	0.61%	0.61%	0.61%	0.54%	0.54%	0.54%
2027	0.54%	0.54%	0.54%	0.52%	0.52%	0.52%	0.48%	0.48%	0.48%
2028	0.46%	0.46%	0.46%	0.44%	0.44%	0.44%	0.38%	0.38%	0.38%
2029	0.34%	0.34%	0.34%	0.43%	0.43%	0.43%	0.37%	0.37%	0.37%
2030	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.41%	0.41%	0.41%
2031	0.33%	0.33%	0.33%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	7,222	154,711	161,933	7,285	155,389	162,674	7,387	156,422	163,809
2012	7,226	156,339	163,566	7,335	157,355	164,690	7,489	158,959	166,448
2013	7,262	158,334	165,596	7,387	159,291	166,677	7,531	160,957	168,488
2014	7,320	160,305	167,625	7,432	161,300	168,732	7,597	162,984	170,581
2015	7,392	162,247	169,640	7,504	163,256	170,760	7,662	164,958	172,620
2016	7,453	164,157	171,610	7,563	165,194	172,757	7,721	166,892	174,613
2017	7,503	166,035	173,538	7,621	167,076	174,697	7,777	168,773	176,550
2018	7,561	167,861	175,422	7,679	168,913	176,593	7,840	170,574	178,414
2019	7,628	169,621	177,249	7,737	170,695	178,432	7,897	172,354	180,251
2020	7,676	171,370	179,046	7,792	172,450	180,242	7,951	174,134	182,085
2021	7,721	173,080	180,801	7,837	174,186	182,024	8,002	175,862	183,864
2022	7,774	174,738	182,512	7,891	175,856	183,747	8,052	177,518	185,570
2023	7,844	176,322	184,166	7,959	177,426	185,386	8,118	179,059	187,176
2024	7,898	177,837	185,735	8,010	178,972	186,981	8,160	180,581	188,741
2025	7,942	179,319	187,261	8,053	180,452	188,505	8,208	182,040	190,247
2026	7,992	180,722	188,715	8,102	181,855	189,957	8,252	183,416	191,668
2027	8,036	182,076	190,112	8,144	183,224	191,367	8,292	184,783	193,075
2028	8,072	183,379	191,452	8,179	184,541	192,720	8,323	186,087	194,410
2029	8,100	184,620	192,720	8,214	185,786	194,000	8,355	187,333	195,688
2030	8,125	185,777	193,902	8,240	186,928	195,168	8,389	188,439	196,828
2031	8,152	187,003	195,155	8,266	188,155	196,420	8,415	189,648	198,063

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	4.96%	-0.35%	-0.13%	5.88%	0.08%	0.33%	7.36%	0.75%	1.03%
2012	0.07%	1.05%	1.01%	0.69%	1.27%	1.24%	1.39%	1.62%	1.61%
2013	0.49%	1.28%	1.24%	0.70%	1.23%	1.21%	0.55%	1.26%	1.23%
2014	0.81%	1.24%	1.23%	0.62%	1.26%	1.23%	0.89%	1.26%	1.24%
2015	0.99%	1.21%	1.20%	0.97%	1.21%	1.20%	0.85%	1.21%	1.20%
2016	0.82%	1.18%	1.16%	0.79%	1.19%	1.17%	0.77%	1.17%	1.15%
2017	0.68%	1.14%	1.12%	0.77%	1.14%	1.12%	0.73%	1.13%	1.11%
2018	0.77%	1.10%	1.09%	0.76%	1.10%	1.09%	0.81%	1.07%	1.06%
2019	0.88%	1.05%	1.04%	0.75%	1.05%	1.04%	0.72%	1.04%	1.03%
2020	0.63%	1.03%	1.01%	0.71%	1.03%	1.01%	0.69%	1.03%	1.02%
2021	0.58%	1.00%	0.98%	0.58%	1.01%	0.99%	0.64%	0.99%	0.98%
2022	0.69%	0.96%	0.95%	0.69%	0.96%	0.95%	0.63%	0.94%	0.93%
2023	0.90%	0.91%	0.91%	0.86%	0.89%	0.89%	0.81%	0.87%	0.87%
2024	0.69%	0.86%	0.85%	0.63%	0.87%	0.86%	0.52%	0.85%	0.84%
2025	0.56%	0.83%	0.82%	0.54%	0.83%	0.81%	0.59%	0.81%	0.80%
2026	0.63%	0.78%	0.78%	0.61%	0.78%	0.77%	0.54%	0.76%	0.75%
2027	0.54%	0.75%	0.74%	0.52%	0.75%	0.74%	0.48%	0.75%	0.73%
2028	0.46%	0.72%	0.70%	0.44%	0.72%	0.71%	0.38%	0.71%	0.69%
2029	0.34%	0.68%	0.66%	0.43%	0.67%	0.66%	0.37%	0.67%	0.66%
2030	0.31%	0.63%	0.61%	0.31%	0.61%	0.60%	0.41%	0.59%	0.58%
2031	0.33%	0.66%	0.65%	0.31%	0.66%	0.64%	0.31%	0.64%	0.63%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	6,246,794	4,247,189	10,493,983	6,338,901	4,247,596	10,586,497	6,490,840	4,243,177	10,734,017
2012	6,219,552	4,281,339	10,500,891	6,369,762	4,289,286	10,659,048	6,602,517	4,280,523	10,883,040
2013	6,238,556	4,313,607	10,552,163	6,408,766	4,325,047	10,733,813	6,634,080	4,308,992	10,943,072
2014	6,299,024	4,338,115	10,637,139	6,449,652	4,350,629	10,800,281	6,710,613	4,329,496	11,040,109
2015	6,391,125	4,351,278	10,742,403	6,543,215	4,361,339	10,904,554	6,795,542	4,338,255	11,133,797
2016	6,470,685	4,359,343	10,830,028	6,624,730	4,365,584	10,990,314	6,878,638	4,341,394	11,220,032
2017	6,526,102	4,377,131	10,903,233	6,692,598	4,382,233	11,074,831	6,947,900	4,353,872	11,301,772
2018	6,590,568	4,396,729	10,987,297	6,758,421	4,401,062	11,159,483	7,025,370	4,367,584	11,392,954
2019	6,675,350	4,408,775	11,084,125	6,833,139	4,410,419	11,243,558	7,101,620	4,373,640	11,475,260
2020	6,736,068	4,418,038	11,154,106	6,906,671	4,416,447	11,323,118	7,177,870	4,376,840	11,554,710
2021	6,783,100	4,436,190	11,219,290	6,955,479	4,433,469	11,388,948	7,239,792	4,388,562	11,628,354
2022	6,839,727	4,457,386	11,297,113	7,013,330	4,454,101	11,467,431	7,298,432	4,402,797	11,701,229
2023	6,929,587	4,469,024	11,398,611	7,103,408	4,462,872	11,566,280	7,388,930	4,407,087	11,796,017
2024	7,016,405	4,460,485	11,476,890	7,192,152	4,447,284	11,639,436	7,465,809	4,391,364	11,857,173
2025	7,065,480	4,475,727	11,541,207	7,241,716	4,460,607	11,702,323	7,528,131	4,398,813	11,926,944
2026	7,123,680	4,490,048	11,613,728	7,300,423	4,472,712	11,773,135	7,586,787	4,404,869	11,991,656
2027	7,179,552	4,497,290	11,676,842	7,357,351	4,476,507	11,833,858	7,644,832	4,404,123	12,048,955
2028	7,220,668	4,509,682	11,730,350	7,399,408	4,486,337	11,885,745	7,687,220	4,407,988	12,095,208
2029	7,246,185	4,524,094	11,770,279	7,438,326	4,498,521	11,936,847	7,726,992	4,413,556	12,140,548
2030	7,282,800	4,524,094	11,806,894	7,475,300	4,498,521	11,973,821	7,776,930	4,413,556	12,190,486
2031	7,307,136	4,538,907	11,846,043	7,499,940	4,511,154	12,011,094	7,808,442	4,419,396	12,227,838

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3.89%	6.56%	4.96%	5.42%	6.57%	5.88%	7.95%	6.46%	7.36%
2012	-0.44%	0.80%	0.07%	0.49%	0.98%	0.69%	1.72%	0.88%	1.39%
2013	0.31%	0.75%	0.49%	0.61%	0.83%	0.70%	0.48%	0.67%	0.55%
2014	0.97%	0.57%	0.81%	0.64%	0.59%	0.62%	1.15%	0.48%	0.89%
2015	1.46%	0.30%	0.99%	1.45%	0.25%	0.97%	1.27%	0.20%	0.85%
2016	1.24%	0.19%	0.82%	1.25%	0.10%	0.79%	1.22%	0.07%	0.77%
2017	0.86%	0.41%	0.68%	1.02%	0.38%	0.77%	1.01%	0.29%	0.73%
2018	0.99%	0.45%	0.77%	0.98%	0.43%	0.76%	1.12%	0.31%	0.81%
2019	1.29%	0.27%	0.88%	1.11%	0.21%	0.75%	1.09%	0.14%	0.72%
2020	0.91%	0.21%	0.63%	1.08%	0.14%	0.71%	1.07%	0.07%	0.69%
2021	0.70%	0.41%	0.58%	0.71%	0.39%	0.58%	0.86%	0.27%	0.64%
2022	0.83%	0.48%	0.69%	0.83%	0.47%	0.69%	0.81%	0.32%	0.63%
2023	1.31%	0.26%	0.90%	1.28%	0.20%	0.86%	1.24%	0.10%	0.81%
2024	1.25%	-0.19%	0.69%	1.25%	-0.35%	0.63%	1.04%	-0.36%	0.52%
2025	0.70%	0.34%	0.56%	0.69%	0.30%	0.54%	0.83%	0.17%	0.59%
2026	0.82%	0.32%	0.63%	0.81%	0.27%	0.61%	0.78%	0.14%	0.54%
2027	0.78%	0.16%	0.54%	0.78%	0.08%	0.52%	0.77%	-0.02%	0.48%
2028	0.57%	0.28%	0.46%	0.57%	0.22%	0.44%	0.55%	0.09%	0.38%
2029	0.35%	0.32%	0.34%	0.53%	0.27%	0.43%	0.52%	0.13%	0.37%
2030	0.51%	0.00%	0.31%	0.50%	0.00%	0.31%	0.65%	0.00%	0.41%
2031	0.33%	0.33%	0.33%	0.33%	0.28%	0.31%	0.41%	0.13%	0.31%

Customer Count Forecast

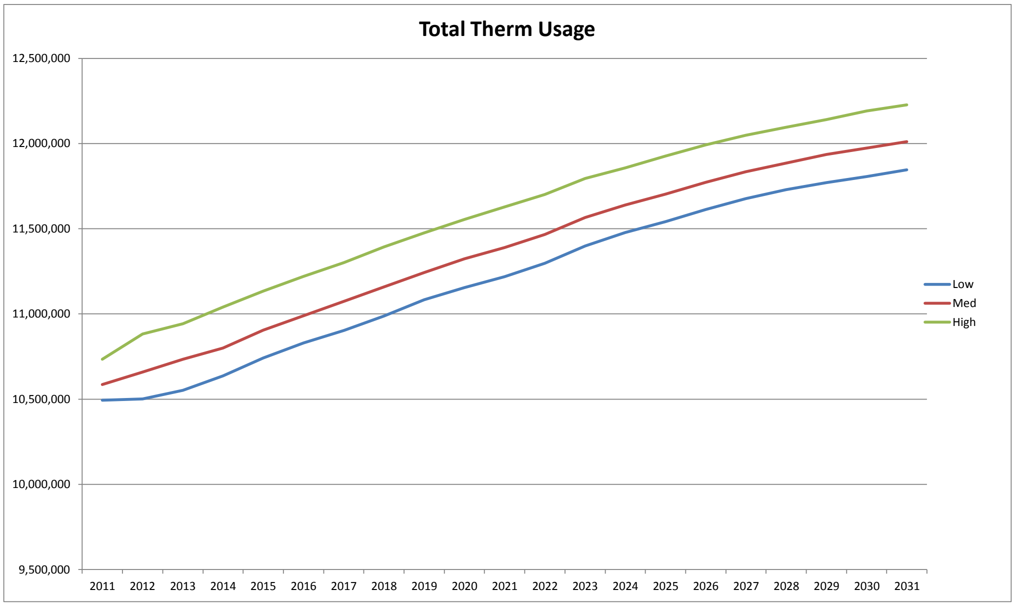
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	10,394	1,254	11,648	10,443	1,258	11,701	10,520	1,263	11,783
2012	10,506	1,259	11,765	10,581	1,265	11,846	10,701	1,272	11,973
2013	10,646	1,265	11,911	10,717	1,272	11,989	10,840	1,279	12,119
2014	10,786	1,271	12,057	10,858	1,279	12,137	10,983	1,287	12,270
2015	10,925	1,277	12,202	10,997	1,286	12,283	11,122	1,295	12,417
2016	11,061	1,283	12,344	11,134	1,292	12,426	11,258	1,302	12,560
2017	11,194	1,289	12,483	11,267	1,299	12,566	11,390	1,309	12,699
2018	11,324	1,294	12,618	11,397	1,305	12,702	11,517	1,316	12,833
2019	11,450	1,300	12,750	11,523	1,312	12,835	11,642	1,324	12,966
2020	11,574	1,305	12,879	11,647	1,318	12,965	11,767	1,330	13,097
2021	11,695	1,310	13,005	11,769	1,324	13,093	11,888	1,337	13,225
2022	11,813	1,315	13,128	11,887	1,330	13,217	12,004	1,344	13,348
2023	11,927	1,320	13,247	11,999	1,336	13,335	12,113	1,351	13,464
2024	12,035	1,325	13,360	12,108	1,342	13,450	12,219	1,357	13,576
2025	12,140	1,330	13,470	12,212	1,347	13,559	12,321	1,364	13,685
2026	12,240	1,334	13,574	12,311	1,353	13,664	12,417	1,370	13,787
2027	12,336	1,339	13,675	12,407	1,358	13,765	12,512	1,376	13,888
2028	12,428	1,343	13,771	12,499	1,363	13,862	12,602	1,382	13,984
2029	12,515	1,347	13,862	12,586	1,369	13,955	12,688	1,388	14,076
2030	12,600	1,347	13,947	12,670	1,369	14,039	12,770	1,388	14,158
2031	12,686	1,352	14,038	12,755	1,374	14,129	12,853	1,394	14,247

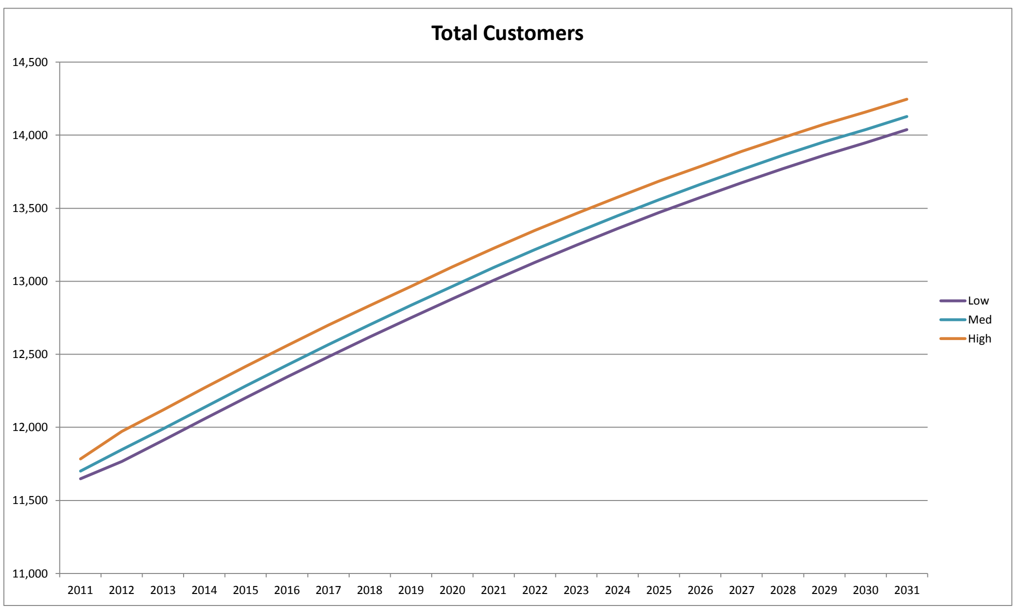
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	-0.12%	-0.25%	-0.13%	0.36%	0.10%	0.33%	1.10%	0.46%	1.03%
2012	1.08%	0.44%	1.01%	1.32%	0.56%	1.24%	1.72%	0.70%	1.61%
2013	1.33%	0.48%	1.24%	1.29%	0.55%	1.21%	1.30%	0.60%	1.23%
2014	1.32%	0.47%	1.23%	1.32%	0.54%	1.23%	1.32%	0.60%	1.24%
2015	1.29%	0.47%	1.20%	1.28%	0.54%	1.20%	1.27%	0.59%	1.20%
2016	1.24%	0.45%	1.16%	1.25%	0.52%	1.17%	1.22%	0.57%	1.15%
2017	1.20%	0.44%	1.12%	1.19%	0.51%	1.12%	1.17%	0.56%	1.11%
2018	1.16%	0.43%	1.09%	1.15%	0.49%	1.09%	1.12%	0.54%	1.06%
2019	1.11%	0.42%	1.04%	1.11%	0.48%	1.04%	1.09%	0.54%	1.03%
2020	1.08%	0.41%	1.01%	1.08%	0.47%	1.01%	1.07%	0.53%	1.02%
2021	1.05%	0.40%	0.98%	1.05%	0.47%	0.99%	1.03%	0.52%	0.98%
2022	1.01%	0.39%	0.95%	1.00%	0.45%	0.95%	0.98%	0.50%	0.93%
2023	0.97%	0.38%	0.91%	0.94%	0.44%	0.89%	0.91%	0.49%	0.87%
2024	0.91%	0.37%	0.85%	0.91%	0.43%	0.86%	0.88%	0.48%	0.84%
2025	0.87%	0.36%	0.82%	0.86%	0.42%	0.81%	0.83%	0.47%	0.80%
2026	0.82%	0.34%	0.78%	0.81%	0.40%	0.77%	0.78%	0.45%	0.75%
2027	0.78%	0.34%	0.74%	0.78%	0.40%	0.74%	0.77%	0.45%	0.73%
2028	0.75%	0.33%	0.70%	0.74%	0.39%	0.71%	0.72%	0.44%	0.69%
2029	0.70%	0.31%	0.66%	0.70%	0.38%	0.66%	0.68%	0.43%	0.66%
2030	0.68%	0.00%	0.61%	0.67%	0.00%	0.60%	0.65%	0.00%	0.58%
2031	0.68%	0.31%	0.65%	0.67%	0.37%	0.64%	0.65%	0.42%	0.63%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Wenatchee





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Yakima

Annual Requirements (Therms)

Year	Low Heating	Low Baseload	Low Total	Medium Heating	Medium Baseload	Medium Total	High Heating	High Baseload	High Total
2011	3,744,518	1,814,047	5,558,565	3,720,186	1,802,260	5,522,446	3,684,710	1,785,073	5,469,784
2012	3,837,406	1,859,047	5,696,453	3,807,003	1,844,319	5,651,321	3,723,486	1,803,858	5,527,344
2013	3,821,605	1,851,393	5,672,997	3,780,083	1,831,277	5,611,360	3,646,066	1,766,352	5,412,419
2014	3,804,196	1,842,959	5,647,155	3,746,810	1,815,158	5,561,967	3,565,608	1,727,374	5,292,982
2015	3,785,396	1,833,851	5,619,246	3,704,911	1,794,860	5,499,771	3,482,968	1,687,338	5,170,306
2016	3,769,520	1,826,160	5,595,680	3,663,224	1,774,664	5,437,888	3,402,870	1,648,535	5,051,405
2017	3,759,059	1,821,092	5,580,152	3,632,287	1,759,677	5,391,964	3,328,085	1,612,305	4,940,389
2018	3,744,619	1,814,096	5,558,715	3,598,850	1,743,478	5,342,328	3,249,222	1,574,099	4,823,322
2019	3,726,671	1,805,402	5,532,073	3,557,589	1,723,489	5,281,079	3,167,533	1,534,525	4,702,058
2020	3,710,409	1,797,523	5,507,932	3,517,121	1,703,884	5,221,005	3,088,808	1,496,386	4,585,194
2021	3,698,284	1,791,649	5,489,933	3,485,603	1,688,615	5,174,218	3,014,414	1,460,345	4,474,759
2022	3,683,410	1,784,444	5,467,854	3,453,454	1,673,040	5,126,494	2,938,577	1,423,606	4,362,184
2023	3,663,652	1,774,872	5,438,523	3,411,937	1,652,927	5,064,864	2,859,219	1,385,160	4,244,379
2024	3,640,723	1,763,763	5,404,486	3,356,587	1,626,113	4,982,699	2,780,518	1,347,034	4,127,552
2025	3,633,943	1,760,479	5,394,423	3,330,429	1,613,440	4,943,869	2,716,283	1,315,915	4,032,198
2026	3,616,841	1,752,194	5,369,035	3,294,220	1,595,899	4,890,119	2,643,282	1,280,549	3,923,832
2027	3,597,054	1,742,608	5,339,662	3,252,459	1,575,667	4,828,126	2,570,389	1,245,236	3,815,626
2028	3,581,762	1,735,200	5,316,961	3,218,063	1,559,004	4,777,068	2,502,461	1,212,328	3,714,789
2029	3,564,888	1,727,025	5,291,913	3,184,048	1,542,525	4,726,573	2,434,980	1,179,636	3,614,616
2030	3,564,112	1,726,649	5,290,762	3,181,768	1,541,421	4,723,189	2,430,705	1,177,565	3,608,271
2031	3,545,901	1,717,827	5,263,728	3,147,230	1,524,689	4,671,919	2,363,331	1,144,926	3,508,256

Annual Change

Year	Low Heating	Low Baseload	Low Total	Medium Heating	Medium Baseload	Medium Total	High Heating	High Baseload	High Total
2011	-1.10%	-1.10%	-1.10%	-1.75%	-1.75%	-1.75%	-2.68%	-2.68%	-2.68%
2012	2.48%	2.48%	2.48%	2.33%	2.33%	2.33%	1.05%	1.05%	1.05%
2013	-0.41%	-0.41%	-0.41%	-0.71%	-0.71%	-0.71%	-2.08%	-2.08%	-2.08%
2014	-0.46%	-0.46%	-0.46%	-0.88%	-0.88%	-0.88%	-2.21%	-2.21%	-2.21%
2015	-0.49%	-0.49%	-0.49%	-1.12%	-1.12%	-1.12%	-2.32%	-2.32%	-2.32%
2016	-0.42%	-0.42%	-0.42%	-1.13%	-1.13%	-1.13%	-2.30%	-2.30%	-2.30%
2017	-0.28%	-0.28%	-0.28%	-0.84%	-0.84%	-0.84%	-2.20%	-2.20%	-2.20%
2018	-0.38%	-0.38%	-0.38%	-0.92%	-0.92%	-0.92%	-2.37%	-2.37%	-2.37%
2019	-0.48%	-0.48%	-0.48%	-1.15%	-1.15%	-1.15%	-2.51%	-2.51%	-2.51%
2020	-0.44%	-0.44%	-0.44%	-1.14%	-1.14%	-1.14%	-2.49%	-2.49%	-2.49%
2021	-0.33%	-0.33%	-0.33%	-0.90%	-0.90%	-0.90%	-2.41%	-2.41%	-2.41%
2022	-0.40%	-0.40%	-0.40%	-0.92%	-0.92%	-0.92%	-2.52%	-2.52%	-2.52%
2023	-0.54%	-0.54%	-0.54%	-1.20%	-1.20%	-1.20%	-2.70%	-2.70%	-2.70%
2024	-0.63%	-0.63%	-0.63%	-1.62%	-1.62%	-1.62%	-2.75%	-2.75%	-2.75%
2025	-0.19%	-0.19%	-0.19%	-0.78%	-0.78%	-0.78%	-2.31%	-2.31%	-2.31%
2026	-0.47%	-0.47%	-0.47%	-1.09%	-1.09%	-1.09%	-2.69%	-2.69%	-2.69%
2027	-0.55%	-0.55%	-0.55%	-1.27%	-1.27%	-1.27%	-2.76%	-2.76%	-2.76%
2028	-0.43%	-0.43%	-0.43%	-1.06%	-1.06%	-1.06%	-2.64%	-2.64%	-2.64%
2029	-0.47%	-0.47%	-0.47%	-1.06%	-1.06%	-1.06%	-2.70%	-2.70%	-2.70%
2030	-0.02%	-0.02%	-0.02%	-0.07%	-0.07%	-0.07%	-0.18%	-0.18%	-0.18%
2031	-0.51%	-0.51%	-0.51%	-1.09%	-1.09%	-1.09%	-2.77%	-2.77%	-2.77%

Peak Day - Baseload

Year	Low Daily Baseload	Low Peak	Low Total Core Peak	Medium Daily Baseload	Medium Peak	Medium Total Core Peak	High Daily Baseload	High Peak	High Total Core Peak
2011	4,970	55,076	60,046	4,938	55,351	60,289	4,891	55,738	60,629
2012	5,093	55,105	60,198	5,053	55,433	60,485	4,942	55,930	60,872
2013	5,072	55,291	60,363	5,017	55,644	60,661	4,839	56,192	61,031
2014	5,049	55,458	60,508	4,973	55,843	60,816	4,733	56,435	61,168
2015	5,024	55,632	60,656	4,917	56,031	60,948	4,623	56,686	61,309
2016	5,003	55,805	60,808	4,862	56,222	61,084	4,517	56,911	61,427
2017	4,989	55,974	60,963	4,821	56,403	61,224	4,417	57,158	61,576
2018	4,970	56,125	61,095	4,777	56,589	61,366	4,313	57,388	61,700
2019	4,946	56,310	61,256	4,722	56,789	61,511	4,204	57,624	61,828
2020	4,925	56,468	61,393	4,668	56,990	61,658	4,100	57,858	61,958
2021	4,909	56,624	61,533	4,626	57,156	61,782	4,001	58,064	62,065
2022	4,889	56,785	61,674	4,584	57,324	61,908	3,900	58,300	62,200
2023	4,863	56,955	61,818	4,529	57,533	62,061	3,795	58,515	62,310
2024	4,832	57,131	61,963	4,455	57,735	62,191	3,691	58,758	62,448
2025	4,823	57,260	62,083	4,420	57,875	62,295	3,605	58,956	62,562
2026	4,801	57,430	62,231	4,372	58,054	62,427	3,508	59,167	62,676
2027	4,774	57,579	62,354	4,317	58,243	62,560	3,412	59,380	62,792
2028	4,754	57,723	62,477	4,271	58,396	62,668	3,321	59,562	62,883
2029	4,732	57,870	62,602	4,226	58,550	62,776	3,232	59,769	63,001
2030	4,731	58,002	62,732	4,223	58,658	62,881	3,226	59,853	63,079
2031	4,706	58,152	62,858	4,177	58,813	62,991	3,137	60,036	63,172

Annual Change

Year	Low Base	Low Peak	Low Total	Medium Base	Medium Peak	Medium Total	High Base	High Peak	High Total
2011	-1.10%	-0.03%	-0.12%	-1.75%	0.47%	0.28%	-2.68%	1.17%	0.85%
2012	2.48%	0.05%	0.25%	2.33%	0.15%	0.33%	1.05%	0.34%	0.40%
2013	-0.41%	0.34%	0.27%	-0.71%	0.38%	0.29%	-2.08%	0.47%	0.26%
2014	-0.46%	0.30%	0.24%	-0.88%	0.36%	0.25%	-2.21%	0.43%	0.22%
2015	-0.49%	0.31%	0.25%	-1.12%	0.34%	0.22%	-2.32%	0.44%	0.23%
2016	-0.42%	0.31%	0.25%	-1.13%	0.34%	0.22%	-2.30%	0.40%	0.19%
2017	-0.28%	0.30%	0.26%	-0.84%	0.32%	0.23%	-2.20%	0.44%	0.24%
2018	-0.38%	0.27%	0.22%	-0.92%	0.33%	0.23%	-2.37%	0.40%	0.20%
2019	-0.48%	0.33%	0.26%	-1.15%	0.35%	0.24%	-2.51%	0.41%	0.21%
2020	-0.44%	0.28%	0.22%	-1.14%	0.35%	0.24%	-2.49%	0.41%	0.21%
2021	-0.33%	0.28%	0.23%	-0.90%	0.29%	0.20%	-2.41%	0.36%	0.17%
2022	-0.40%	0.29%	0.23%	-0.92%	0.30%	0.20%	-2.52%	0.41%	0.22%
2023	-0.54%	0.30%	0.23%	-1.20%	0.36%	0.25%	-2.70%	0.37%	0.18%
2024	-0.63%	0.31%	0.23%	-1.62%	0.35%	0.21%	-2.75%	0.41%	0.22%
2025	-0.19%	0.23%	0.19%	-0.78%	0.24%	0.17%	-2.31%	0.34%	0.18%
2026	-0.47%	0.30%	0.24%	-1.09%	0.31%	0.21%	-2.69%	0.36%	0.18%
2027	-0.55%	0.26%	0.20%	-1.27%	0.32%	0.21%	-2.76%	0.36%	0.19%
2028	-0.43%	0.25%	0.20%	-1.06%	0.26%	0.17%	-2.64%	0.31%	0.15%
2029	-0.47%	0.25%	0.20%	-1.06%	0.26%	0.17%	-2.70%	0.35%	0.19%
2030	-0.02%	0.23%	0.21%	-0.07%	0.18%	0.17%	-0.18%	0.14%	0.12%
2031	-0.51%	0.26%	0.20%	-1.09%	0.27%	0.17%	-2.77%	0.30%	0.15%

Therm Usage by Class

Year	Low RES	Low COM/IND	Low Total	Medium RES	Medium COM/IND	Medium Total	High RES	High COM/IND	High Total
2011	664,824	4,893,741	5,558,565	667,884	4,854,562	5,522,446	672,255	4,797,529	5,469,784
2012	816,953	4,879,500	5,696,453	819,450	4,831,871	5,651,321	822,489	4,704,855	5,527,344
2013	807,835	4,865,162	5,672,997	809,251	4,802,109	5,611,360	810,059	4,602,360	5,412,419
2014	800,935	4,846,220	5,647,155	801,229	4,760,738	5,561,967	799,763	4,493,219	5,292,982
2015	798,745	4,820,502	5,619,246	797,356	4,702,415	5,499,771	794,058	4,376,248	5,170,306
2016	803,594	4,792,086	5,595,680	800,450	4,637,438	5,437,888	794,695	4,256,710	5,051,405
2017	811,218	4,768,933	5,580,152	806,236	4,585,728	5,391,964	798,410	4,141,979	4,940,389
2018	812,014	4,746,701	5,558,715	805,690	4,536,638	5,342,328	795,272	4,028,050	4,823,322
2019	811,807	4,720,266	5,532,073	803,589	4,477,490	5,281,079	790,539	3,911,519	4,702,058
2020	815,567	4,692,366	5,507,932	805,878	4,415,127	5,221,005	790,066	3,795,128	4,585,194
2021	820,765	4,669,168	5,489,933	809,025	4,365,193	5,174,218	790,367	3,684,392	4,474,759
2022	820,239	4,647,615	5,467,854	806,495	4,319,999	5,126,494	785,573	3,576,611	4,362,184
2023	817,550	4,620,973	5,438,523	802,324	4,262,540	5,064,864	778,186	3,466,193	4,244,379
2024	820,452	4,584,034	5,404,486	803,095	4,179,604	4,982,699	776,522	3,351,030	4,127,552
2025	835,223	4,559,200	5,394,423	815,416	4,128,452	4,943,869	785,945	3,246,253	4,032,198
2026	835,250	4,533,786	5,369,035	813,277	4,076,842	4,890,119	780,867	3,142,964	3,923,832
2027	834,985	4,504,677	5,339,662	811,322	4,016,804	4,828,126	775,937	3,039,689	3,815,626
2028	838,945	4,478,016	5,316,961	812,936	3,964,132	4,777,068	774,386	2,940,403	3,714,789
2029	839,433	4,452,481	5,291,913	811,151	3,915,422	4,726,573	770,038	2,844,578	3,614,616
2030	838,281	4,452,481	5,290,762	807,767	3,915,422	4,723,189	763,693	2,844,578	3,608,271
2031	836,727	4,427,001	5,263,728	803,986	3,867,933	4,671,919	756,976	2,751,280	3,508,256

Annual Change

Year	Low RES	Low COM/IND	Low Total	Medium RES	Medium COM/IND	Medium Total	High RES	High COM/IND	High Total
2011	0.00%	-1.25%	-1.10%	0.46%	-2.04%	-1.75%	1.12%	-3.19%	-2.68%
2012	22.88%	-0.29%	2.48%	22.69%	-0.47%	2.33%	22.35%	-1.93%	1.05%
2013	-1.12%	-0.29%	-0.41%	-1.24%	-0.62%	-0.71%	-1.51%	-2.18%	-2.08%
2014	-0.85%	-0.39%	-0.46%	-0.99%	-0.86%	-0.88%	-1.27%	-2.37%	-2.21%
2015	-0.27%	-0.53%	-0.49%	-0.48%	-1.23%	-1.12%	-0.71%	-2.60%	-2.32%
2016	0.61%	-0.59%	-0.42%	0.39%	-1.38%	-1.13%	0.08%	-2.73%	-2.30%
2017	0.95%	-0.48%	-0.28%	0.72%	-1.12%	-0.84%	0.47%	-2.70%	-2.20%
2018	0.10%	-0.47%	-0.38%	-0.07%	-1.07%	-0.92%	-0.39%	-2.75%	-2.37%
2019	-0.03%	-0.56%	-0.48%	-0.26%	-1.30%	-1.15%	-0.60%	-2.89%	-2.51%
2020	0.46%	-0.59%	-0.44%	0.28%	-1.39%	-1.14%	-0.06%	-2.98%	-2.49%
2021	0.64%	-0.49%	-0.33%	0.39%	-1.13%	-0.90%	0.04%	-2.92%	-2.41%
2022	-0.06%	-0.46%	-0.40%	-0.31%	-1.04%	-0.92%	-0.61%	-2.93%	-2.52%
2023	-0.33%	-0.57%	-0.54%	-0.52%	-1.33%	-1.20%	-0.94%	-3.09%	-2.70%
2024	0.35%	-0.80%	-0.63%	0.10%	-1.95%	-1.62%	-0.21%	-3.32%	-2.75%
2025	1.80%	-0.54%	-0.19%	1.53%	-1.22%	-0.78%	1.21%	-3.13%	-2.31%
2026	0.00%	-0.56%	-0.47%	-0.26%	-1.25%	-1.09%	-0.65%	-3.18%	-2.69%
2027	-0.03%	-0.64%	-0.55%	-0.24%	-1.47%	-1.27%	-0.63%	-3.29%	-2.76%
2028	0.47%	-0.59%	-0.43%	0.20%	-1.31%	-1.06%	-0.20%	-3.27%	-2.64%
2029	0.06%	-0.57%	-0.47%	-0.22%	-1.23%	-1.06%	-0.56%	-3.26%	-2.70%
2030	-0.14%	0.00%	-0.02%	-0.42%	0.00%	-0.07%	-0.82%	0.00%	-0.18%
2031	-0.19%	-0.57%	-0.51%	-0.47%	-1.21%	-1.09%	-0.88%	-3.28%	-2.77%

Customer Count Forecast

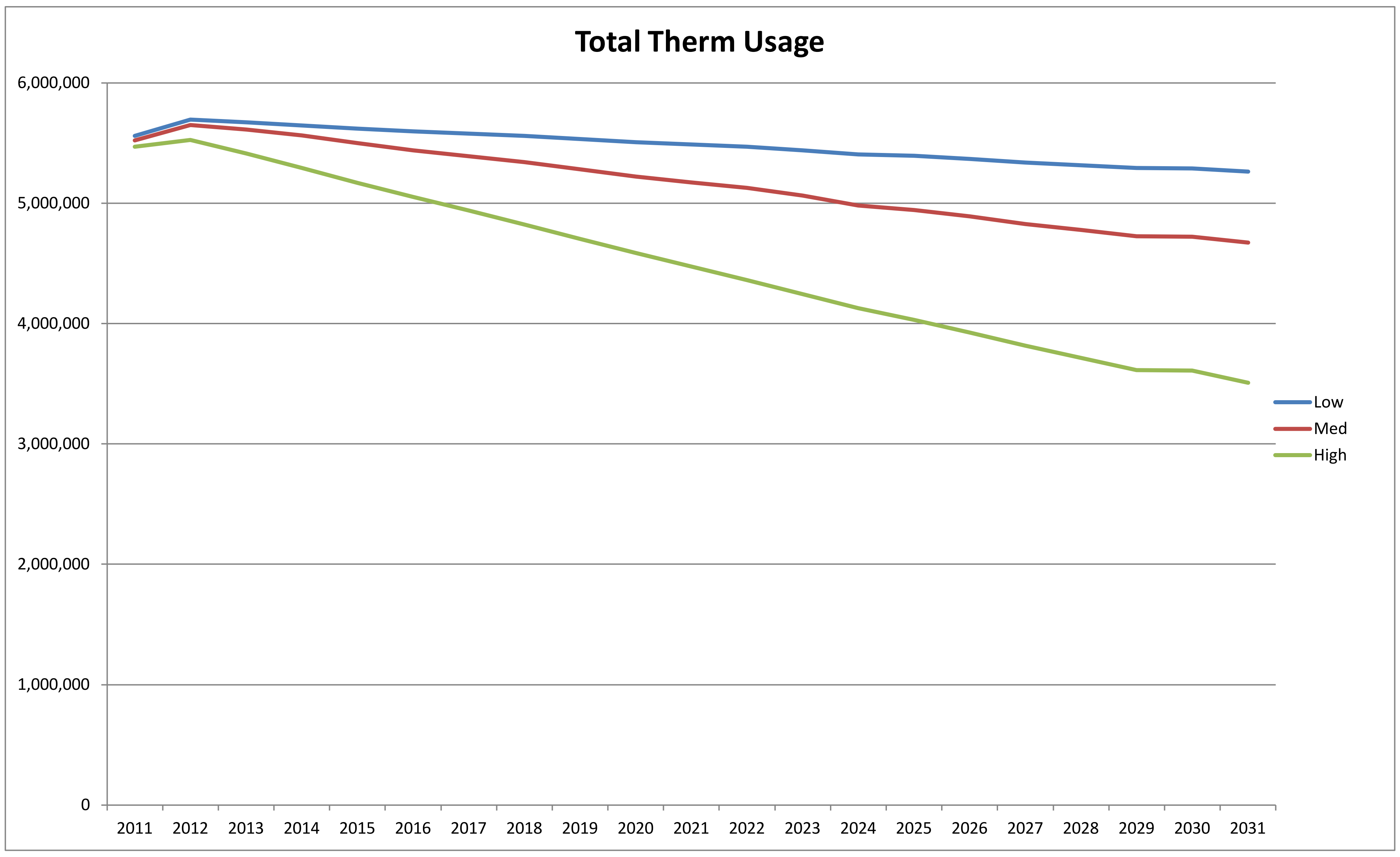
Year	Low RES	Low COM/IND	Low Total	Medium RES	Medium COM/IND	Medium Total	High RES	High COM/IND	High Total
2011	1,521	779	2,300	1,528	782	2,310	1,538	785	2,323
2012	1,529	777	2,306	1,537	780	2,317	1,548	784	2,332
2013	1,537	775	2,312	1,545	779	2,324	1,555	783	2,338
2014	1,544	774	2,318	1,552	778	2,330	1,561	782	2,343
2015	1,551	773	2,324	1,558	777	2,335	1,567	782	2,349
2016	1,558	771	2,329	1,564	776	2,340	1,572	781	2,353
2017	1,565	770	2,335	1,570	775	2,345	1,578	781	2,359
2018	1,571	769	2,340	1,576	775	2,351	1,583	781	2,364
2019	1,578	769	2,347	1,582	774	2,356	1,588	781	2,369
2020	1,584	768	2,352	1,588	774	2,362	1,593	780	2,373
2021	1,590	767	2,357	1,593	774	2,367	1,597	781	2,378
2022	1,596	767	2,363	1,598	774	2,372	1,602	781	2,383
2023	1,602	766	2,368	1,604	773	2,377	1,606	781	2,387
2024	1,608	766	2,374	1,609	773	2,382	1,611	781	2,392
2025	1,613	765	2,378	1,613	773	2,386	1,615	782	2,397
2026	1,619	765	2,384	1,618	773	2,391	1,619	782	2,401
2027	1,624	765	2,389	1,623	774	2,397	1,623	782	2,405
2028	1,629	764	2,393	1,627	774	2,401	1,626	783	2,409
2029	1,634	764	2,398	1,631	774	2,405	1,630	783	2,413
2030	1,639	764	2,403	1,635	774	2,409	1,633	783	2,416
2031	1,644	764	2,408	1,639	774	2,413	1,636	784	2,420

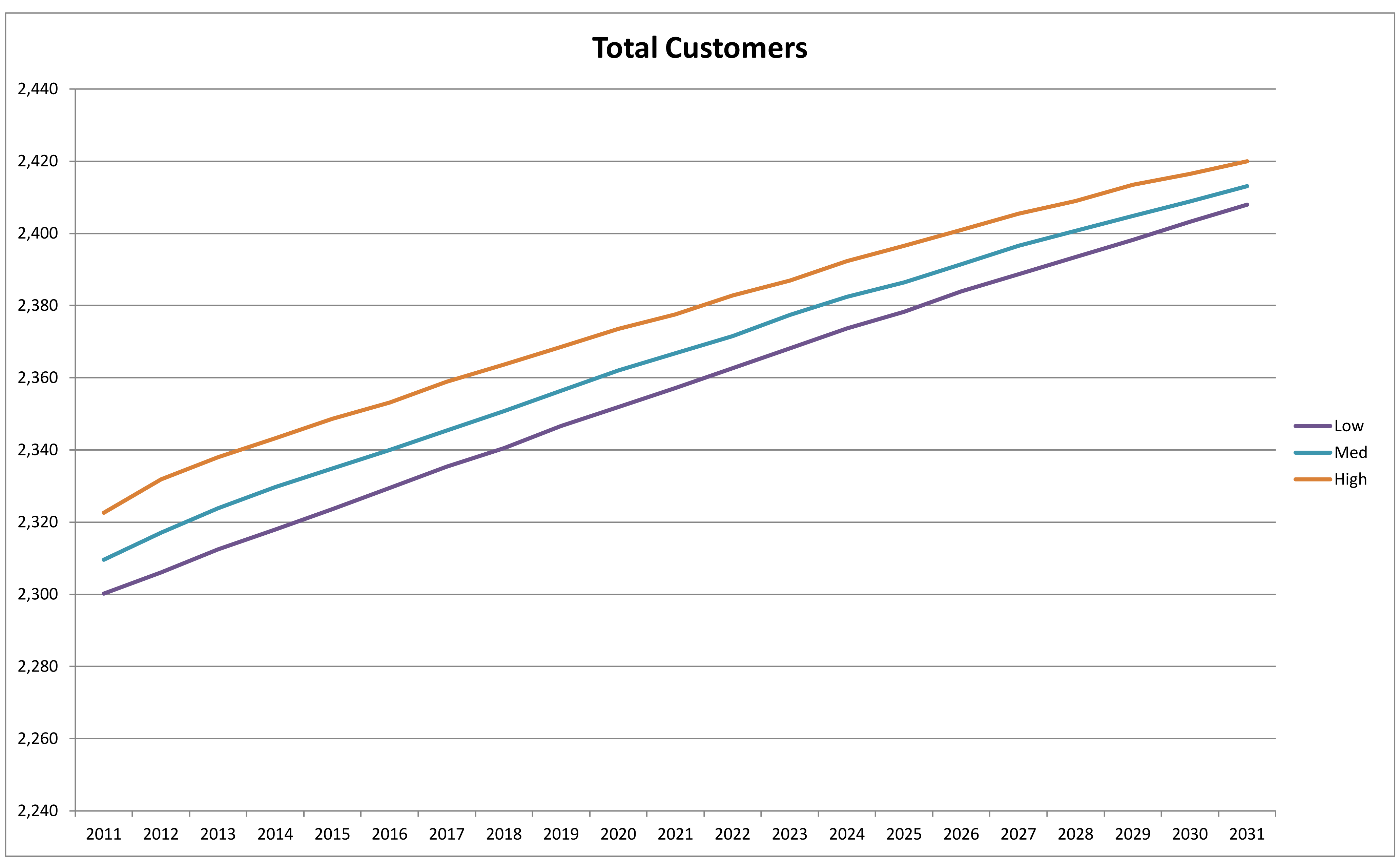
Annual Change

Year	Low RES	Low COM/IND	Low Total	Medium RES	Medium COM/IND	Medium Total	High RES	High COM/IND	High Total
2011	0.00%	-0.35%	-0.12%	0.46%	-0.06%	0.28%	1.12%	0.33%	0.85%
2012	0.53%	-0.28%	0.25%	0.59%	-0.19%	0.33%	0.65%	-0.09%	0.40%
2013	0.52%	-0.21%	0.27%	0.52%	-0.16%	0.29%	0.45%	-0.12%	0.26%
2014	0.46%	-0.19%	0.24%	0.45%	-0.14%	0.25%	0.39%	-0.10%	0.22%
2015	0.45%	-0.17%	0.25%	0.39%	-0.12%	0.22%	0.38%	-0.08%	0.23%
2016	0.45%	-0.15%	0.25%	0.39%	-0.10%	0.22%	0.32%	-0.06%	0.19%
2017	0.45%	-0.14%	0.26%	0.38%	-0.08%	0.23%	0.38%	-0.04%	0.24%
2018	0.38%	-0.12%	0.22%	0.38%	-0.07%	0.23%	0.32%	-0.03%	0.20%
2019	0.45%	-0.11%	0.26%	0.38%	-0.06%	0.24%	0.32%	-0.01%	0.21%
2020	0.38%	-0.10%	0.22%	0.38%	-0.05%	0.24%	0.31%	0.00%	0.21%
2021	0.38%	-0.09%	0.23%	0.31%	-0.03%	0.20%	0.25%	0.01%	0.17%
2022	0.38%	-0.07%	0.23%	0.31%	-0.02%	0.20%	0.31%	0.02%	0.22%
2023	0.38%	-0.07%	0.23%	0.38%	-0.02%	0.25%	0.25%	0.03%	0.18%
2024	0.37%	-0.06%	0.23%	0.31%	-0.01%	0.21%	0.31%	0.04%	0.22%
2025	0.31%	-0.05%	0.19%	0.25%	0.00%	0.17%	0.25%	0.04%	0.18%
2026	0.37%	-0.05%	0.24%	0.31%	0.00%	0.21%	0.25%	0.05%	0.18%
2027	0.31%	-0.04%	0.20%	0.31%	0.01%	0.21%	0.25%	0.06%	0.19%
2028	0.31%	-0.03%	0.20%	0.25%	0.02%	0.17%	0.18%	0.06%	0.15%
2029	0.31%	-0.03%	0.20%	0.25%	0.02%	0.17%	0.25%	0.07%	0.19%
2030	0.31%	0.00%	0.21%	0.25%	0.00%	0.17%	0.18%	0.00%	0.12%
2031	0.31%	-0.02%	0.20%	0.24%	0.03%	0.17%	0.18%	0.07%	0.15%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Yakima





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Baker

Annual Requirements (Therms) / Annual Change

	Low			Medium			High			Annual Change Low			Annual Change Medium			Annual Change High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	2,609,668	1,109,179	3,718,847	2,689,953	1,143,302	3,833,254	2,811,456	1,194,944	4,006,400	0.21%	0.21%	0.21%	3.29%	3.29%	3.29%	7.96%	7.96%	7.96%
2012	2,578,064	1,095,746	3,673,811	2,653,582	1,127,843	3,781,426	2,774,119	1,179,075	3,953,193	-1.21%	-1.21%	-1.21%	-1.35%	-1.35%	-1.35%	-1.33%	-1.33%	-1.33%
2013	2,545,158	1,081,760	3,626,919	2,618,825	1,113,071	3,731,896	2,754,961	1,170,932	3,925,893	-1.28%	-1.28%	-1.28%	-1.31%	-1.31%	-1.31%	-0.69%	-0.69%	-0.69%
2014	2,525,198	1,073,277	3,598,475	2,603,228	1,106,442	3,709,670	2,749,381	1,168,561	3,917,942	-0.78%	-0.78%	-0.78%	-0.60%	-0.60%	-0.60%	-0.20%	-0.20%	-0.20%
2015	2,517,723	1,070,100	3,587,823	2,601,182	1,105,572	3,706,754	2,749,134	1,168,456	3,917,590	-0.30%	-0.30%	-0.30%	-0.08%	-0.08%	-0.08%	-0.01%	-0.01%	-0.01%
2016	2,515,768	1,069,269	3,585,037	2,604,051	1,106,792	3,710,843	2,755,642	1,171,222	3,926,863	-0.08%	-0.08%	-0.08%	0.11%	0.11%	0.11%	0.24%	0.24%	0.24%
2017	2,505,698	1,064,989	3,570,687	2,600,124	1,105,122	3,705,246	2,757,551	1,172,033	3,929,583	-0.40%	-0.40%	-0.40%	-0.15%	-0.15%	-0.15%	0.07%	0.07%	0.07%
2018	2,498,558	1,061,954	3,560,512	2,596,116	1,103,419	3,699,535	2,756,403	1,171,545	3,927,948	-0.28%	-0.28%	-0.28%	-0.15%	-0.15%	-0.15%	-0.04%	-0.04%	-0.04%
2019	2,498,583	1,061,965	3,560,547	2,601,809	1,105,839	3,707,648	2,763,777	1,174,679	3,938,457	0.00%	0.00%	0.00%	0.22%	0.22%	0.22%	0.27%	0.27%	0.27%
2020	2,501,612	1,063,252	3,564,864	2,607,976	1,108,459	3,716,435	2,773,577	1,178,845	3,952,422	0.12%	0.12%	0.12%	0.24%	0.24%	0.24%	0.35%	0.35%	0.35%
2021	2,493,274	1,059,708	3,552,983	2,604,400	1,106,940	3,711,339	2,777,236	1,180,399	3,957,635	-0.33%	-0.33%	-0.33%	-0.14%	-0.14%	-0.14%	0.13%	0.13%	0.13%
2022	2,488,742	1,057,782	3,546,523	2,604,322	1,106,907	3,711,229	2,781,734	1,182,311	3,964,045	-0.18%	-0.18%	-0.18%	0.00%	0.00%	0.00%	0.16%	0.16%	0.16%
2023	2,495,107	1,060,487	3,555,594	2,611,243	1,109,848	3,721,091	2,785,842	1,184,057	3,969,899	0.26%	0.26%	0.26%	0.27%	0.27%	0.27%	0.15%	0.15%	0.15%
2024	2,512,711	1,067,969	3,580,680	2,632,589	1,118,921	3,751,509	2,806,215	1,192,716	3,998,931	0.71%	0.71%	0.71%	0.82%	0.82%	0.82%	0.73%	0.73%	0.73%
2025	2,511,991	1,067,664	3,579,655	2,634,295	1,119,646	3,753,942	2,812,019	1,195,183	4,007,202	-0.03%	-0.03%	-0.03%	0.06%	0.06%	0.06%	0.21%	0.21%	0.21%
2026	2,513,374	1,068,251	3,581,625	2,637,536	1,121,023	3,758,559	2,819,690	1,198,444	4,018,134	0.06%	0.06%	0.06%	0.12%	0.12%	0.12%	0.27%	0.27%	0.27%
2027	2,520,265	1,071,180	3,591,446	2,649,126	1,125,949	3,775,075	2,830,517	1,203,045	4,033,562	0.27%	0.27%	0.27%	0.44%	0.44%	0.44%	0.38%	0.38%	0.38%
2028	2,523,484	1,072,548	3,596,033	2,653,288	1,127,718	3,781,006	2,840,975	1,207,490	4,048,465	0.13%	0.13%	0.13%	0.16%	0.16%	0.16%	0.37%	0.37%	0.37%
2029	2,522,606	1,072,175	3,594,781	2,656,658	1,129,151	3,785,809	2,849,251	1,211,008	4,060,259	-0.03%	-0.03%	-0.03%	0.13%	0.13%	0.13%	0.29%	0.29%	0.29%
2030	2,524,957	1,073,174	3,598,131	2,663,577	1,132,091	3,795,668	2,861,131	1,216,057	4,077,188	0.09%	0.09%	0.09%	0.26%	0.26%	0.26%	0.42%	0.42%	0.42%
2031	2,525,669	1,073,477	3,599,147	2,667,364	1,133,701	3,801,065	2,868,231	1,219,075	4,087,306	0.03%	0.03%	0.03%	0.14%	0.14%	0.14%	0.25%	0.25%	0.25%

Peak Day - Baseload / Annual Change

	Low			Medium			High			Annual Change Low			Annual Change Medium			Annual Change High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	3,039	23,245	26,284	3,132	23,174	26,306	3,274	23,066	26,340	0.21%	0.27%	0.26%	3.29%	-0.04%	0.35%	7.96%	-0.50%	0.48%
2012	3,002	23,239	26,241	3,090	23,105	26,195	3,230	22,872	26,103	-1.21%	-0.02%	-0.16%	-1.35%	-0.30%	-0.42%	-1.33%	-0.84%	-0.90%
2013	2,964	23,229	26,192	3,050	23,036	26,086	3,208	22,927	26,136	-1.28%	-0.04%	-0.19%	-1.31%	-0.30%	-0.42%	-0.69%	0.24%	0.13%
2014	2,940	23,237	26,178	3,031	23,094	26,125	3,202	23,027	26,228	-0.78%	0.04%	-0.06%	-0.60%	0.25%	0.15%	-0.20%	0.43%	0.35%
2015	2,932	23,245	26,177	3,029	23,150	26,179	3,201	23,121	26,322	-0.30%	0.03%	0.00%	-0.08%	0.24%	0.21%	-0.01%	0.41%	0.36%
2016	2,930	23,246	26,176	3,032	23,193	26,225	3,209	23,205	26,414	-0.08%	0.00%	-0.01%	0.11%	0.18%	0.17%	0.24%	0.37%	0.35%
2017	2,918	23,271	26,189	3,028	23,264	26,292	3,211	23,330	26,541	-0.40%	0.11%	0.05%	-0.15%	0.31%	0.26%	0.07%	0.54%	0.48%
2018	2,909	23,305	26,214	3,023	23,348	26,371	3,210	23,463	26,672	-0.28%	0.14%	0.10%	-0.15%	0.36%	0.30%	-0.04%	0.57%	0.50%
2019	2,909	23,351	26,260	3,030	23,435	26,464	3,218	23,594	26,812	0.00%	0.20%	0.17%	0.22%	0.37%	0.35%	0.27%	0.56%	0.52%
2020	2,913	23,385	26,298	3,037	23,513	26,549	3,230	23,714	26,944	0.12%	0.15%	0.14%	0.24%	0.33%	0.32%	0.35%	0.51%	0.49%
2021	2,903	23,447	26,350	3,033	23,616	26,649	3,234	23,863	27,097	-0.33%	0.26%	0.20%	-0.14%	0.44%	0.38%	0.13%	0.63%	0.57%
2022	2,898	23,510	26,408	3,033	23,722	26,754	3,239	24,009	27,248	-0.18%	0.27%	0.22%	0.00%	0.45%	0.39%	0.16%	0.61%	0.56%
2023	2,905	23,567	26,472	3,041	23,831	26,872	3,244	24,174	27,418	0.26%	0.24%	0.24%	0.27%	0.46%	0.44%	0.15%	0.69%	0.62%
2024	2,926	23,630	26,556	3,066	23,937	27,002	3,268	24,340	27,608	0.71%	0.27%	0.32%	0.82%	0.44%	0.49%	0.73%	0.69%	0.69%
2025	2,925	23,720	26,645	3,068	24,078	27,146	3,274	24,516	27,791	-0.03%	0.38%	0.34%	0.06%	0.59%	0.53%	0.21%	0.72%	0.66%
2026	2,927	23,806	26,733	3,071	24,209	27,280	3,283	24,687	27,971	0.06%	0.36%	0.33%	0.12%	0.54%	0.50%	0.27%	0.70%	0.65%
2027	2,935	23,927	26,862	3,085	24,366	27,450	3,296	24,887	28,183	0.27%	0.51%	0.48%	0.44%	0.65%	0.63%	0.38%	0.81%	0.76%
2028	2,938	24,041	26,979	3,090	24,512	27,601	3,308	25,059	28,367	0.13%	0.48%	0.44%	0.16%	0.60%	0.55%	0.37%	0.69%	0.65%
2029	2,937	24,176	27,114	3,094	24,690	27,783	3,318	25,272	28,590	-0.03%	0.56%	0.50%	0.13%	0.73%	0.66%	0.29%	0.85%	0.78%
2030	2,940	24,309	27,250	3,102	24,845	27,947	3,332	25,442	28,773	0.09%	0.55%	0.50%	0.26%	0.63%	0.59%	0.42%	0.67%	0.64%
2031	2,941	24,446	27,387	3,106	25,011	28,117	3,340	25,630	28,970	0.03%	0.56%	0.50%	0.14%	0.67%	0.61%	0.25%	0.74%	0.68%

Therm Usage by Class / Annual Change

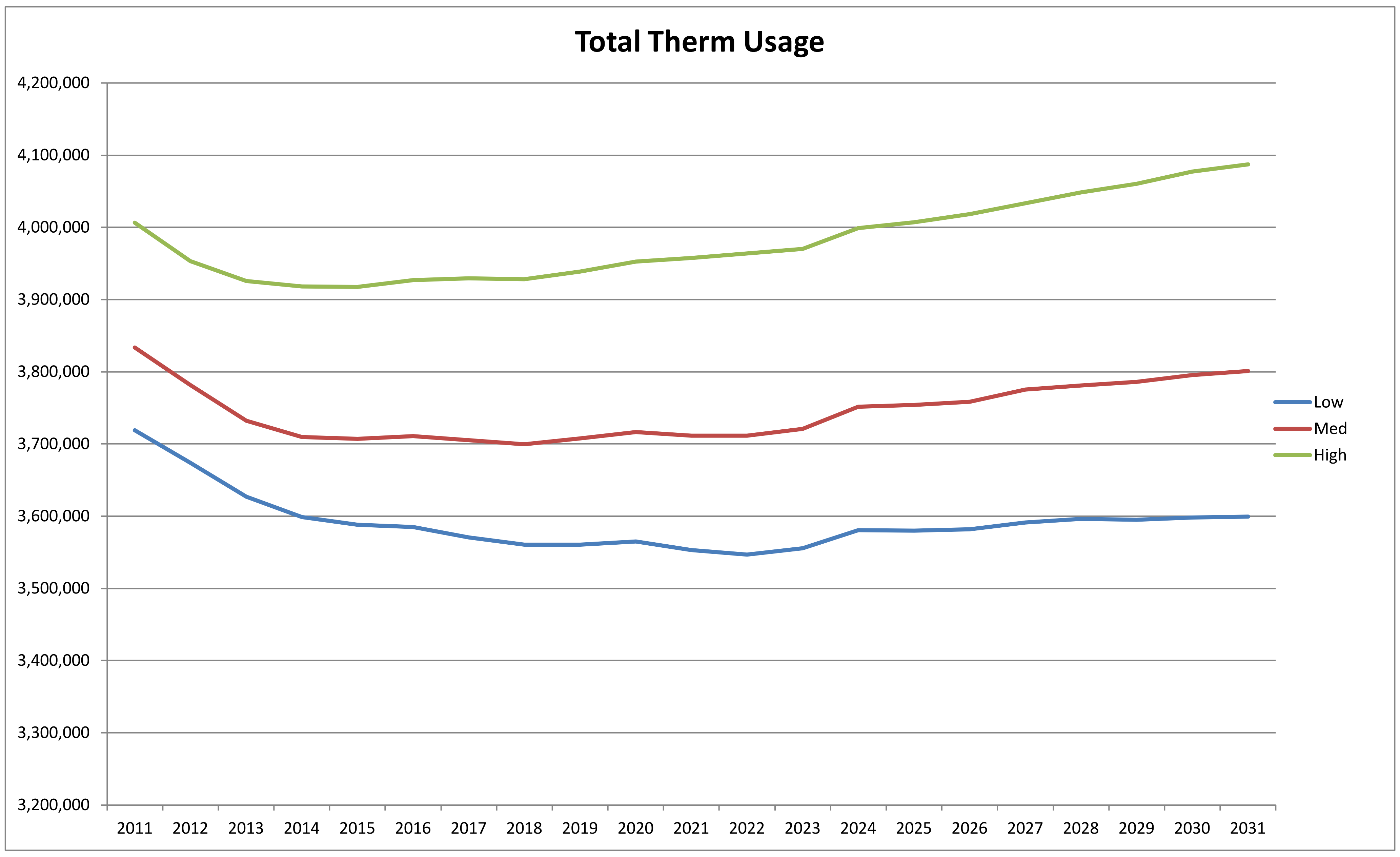
	Low			Medium			High			Annual Change Low			Annual Change Medium			Annual Change High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1,836,826	1,882,021	3,718,847	1,948,220	1,885,034	3,833,254	2,126,880	1,879,520	4,006,400	-11.96%	15.83%	0.21%	-6.62%	16.02%	3.29%	1.95%	15.68%	7.96%
2012	1,812,891	1,860,920	3,673,811	1,933,860	1,847,566	3,781,426	2,114,840	1,838,353	3,953,193	-1.30%	-1.12%	-1.21%	-0.74%	-1.99%	-1.35%	-0.57%	-2.19%	-1.33%
2013	1,791,312	1,835,607	3,626,919	1,909,575	1,822,321	3,731,896	2,105,514	1,820,379	3,925,893	-1.19%	-1.36%	-1.28%	-1.26%	-1.37%	-1.31%	-0.44%	-0.98%	-0.69%
2014	1,779,154	1,819,321	3,598,475	1,901,328	1,808,342	3,709,670	2,108,523	1,809,419	3,917,942	-0.68%	-0.89%	-0.78%	-0.43%	-0.77%	-0.60%	0.14%	-0.60%	-0.20%
2015	1,774,752	1,813,071	3,587,823	1,900,859	1,805,895	3,706,754	2,111,512	1,806,078	3,917,590	-0.25%	-0.34%	-0.30%	-0.02%	-0.14%	-0.08%	0.14%	-0.18%	-0.01%
2016	1,773,688	1,811,349	3,585,037	1,903,143	1,807,700	3,710,843	2,121,183	1,805,680	3,926,863	-0.06%	-0.10%	-0.08%	0.12%	0.10%	0.11%	0.46%	-0.02%	0.24%
2017	1,763,686	1,807,001	3,570,687	1,900,460	1,804,786	3,705,246	2,127,312	1,802,271	3,929,583	-0.56%	-0.24%	-0.40%	-0.14%	-0.16%	-0.15%	0.29%	-0.19%	0.07%
2018	1,758,072	1,802,440	3,560,512	1,898,883	1,800,652	3,699,535	2,130,660	1,797,288	3,927,948	-0.32%	-0.25%	-0.28%	-0.08%	-0.23%	-0.15%	0.16%	-0.28%	-0.04%
2019	1,757,366	1,803,181	3,560,547	1,905,120	1,802,528	3,707,648	2,141,370	1,797,087	3,938,457	-0.04%	0.04%	0.00%	0.33%	0.10%	0.22%	0.50%	-0.01%	0.27%
2020	1,759,470	1,805,394	3,564,864	1,910,790	1,805,645	3,716,435	2,154,865	1,797,557	3,952,422	0.12%	0.12%	0.12%	0.30%	0.17%	0.24%	0.63%	0.03%	0.35%
2021	1,749,222	1,803,761	3,552,983	1,907,448	1,803,891	3,711,339	2,163,420	1,794,215	3,957,635	-0.58%	-0.09%	-0.33%	-0.17%	-0.10%	-0.14%	0.40%	-0.19%	0.13%
2022	1,746,160	1,800,363	3,546,523	1,911,385	1,799,844	3,711,229	2,175,390	1,788,655	3,964,045	-0.18%	-0.19%	-0.18%	0.21%	-0.22%	0.00%	0.55%	-0.31%	0.16%
2023	1,753,686	1,801,908	3,555,594	1,919,830	1,801,261	3,721,091	2,182,300	1,787,599	3,969,899	0.43%	0.09%	0.26%	0.44%	0.08%	0.27%	0.32%	-0.06%	0.15%
2024	1,766,171	1,814,509	3,580,680	1,936,255	1,815,254	3,751,509	2,201,500	1,797,431	3,998,931	0.71%	0.70%	0.71%	0.86%	0.78%	0.82%	0.88%	0.55%	0.73%
2025	1,765,669	1,813,986	3,579,655	1,940,098	1,813,844	3,753,942	2,213,072	1,794,130	4,007,202	-0.03%	-0.03%	-0.03%	0.20%	-0.08%	0.06%	0.53%	-0.18%	0.21%
2026	1,768,520	1,813,105	3,581,625	1,946,768	1,811,791	3,758,559	2,228,144	1,789,990	4,018,134	0.16%	-0.05%	0.06%	0.34%	-0.11%	0.12%	0.68%	-0.23%	0.27%
2027	1,774,461	1,816,985	3,591,446	1,959,694	1,815,381	3,775,075	2,242,152	1,791,410	4,033,562	0.34%	0.21%	0.27%	0.66%	0.20%	0.44%	0.63%	0.08%	0.38%
2028	1,779,848	1,816,185	3,596,033	1,967,988	1,813,018	3,781,006	2,261,428	1,787,037	4,048,465	0.30%	-0.04%	0.13%	0.42%	-0.13%	0.16%	0.86%	-0.24%	0.37%
2029	1,779,325	1,815,456	3,594,781	1,974,947	1,810,862	3,785,809	2,276,637	1,783,622	4,060,259	-0.03%	-0.04%	-0.03%	0.35%	-0.12%	0.13%	0.67%	-0.19%	0.29%
2030	1,782,675	1,815,456	3,598,131	1,984,806	1,810,862	3,795,668	2,293,566	1,783,622	4,077,188	0.19%	0.00%	0.09%	0.50%	0.00%	0.26%	0.74%	0.00%	0.42%
2031	1,785,945	1,813,202	3,599,147	1,994,617	1,806,448	3,801,065	2,309,406	1,777,900	4,087,306	0.18%	-0.12%	0.03%	0.49%	-0.24%	0.14%	0.69%	-0.32%	0.25%

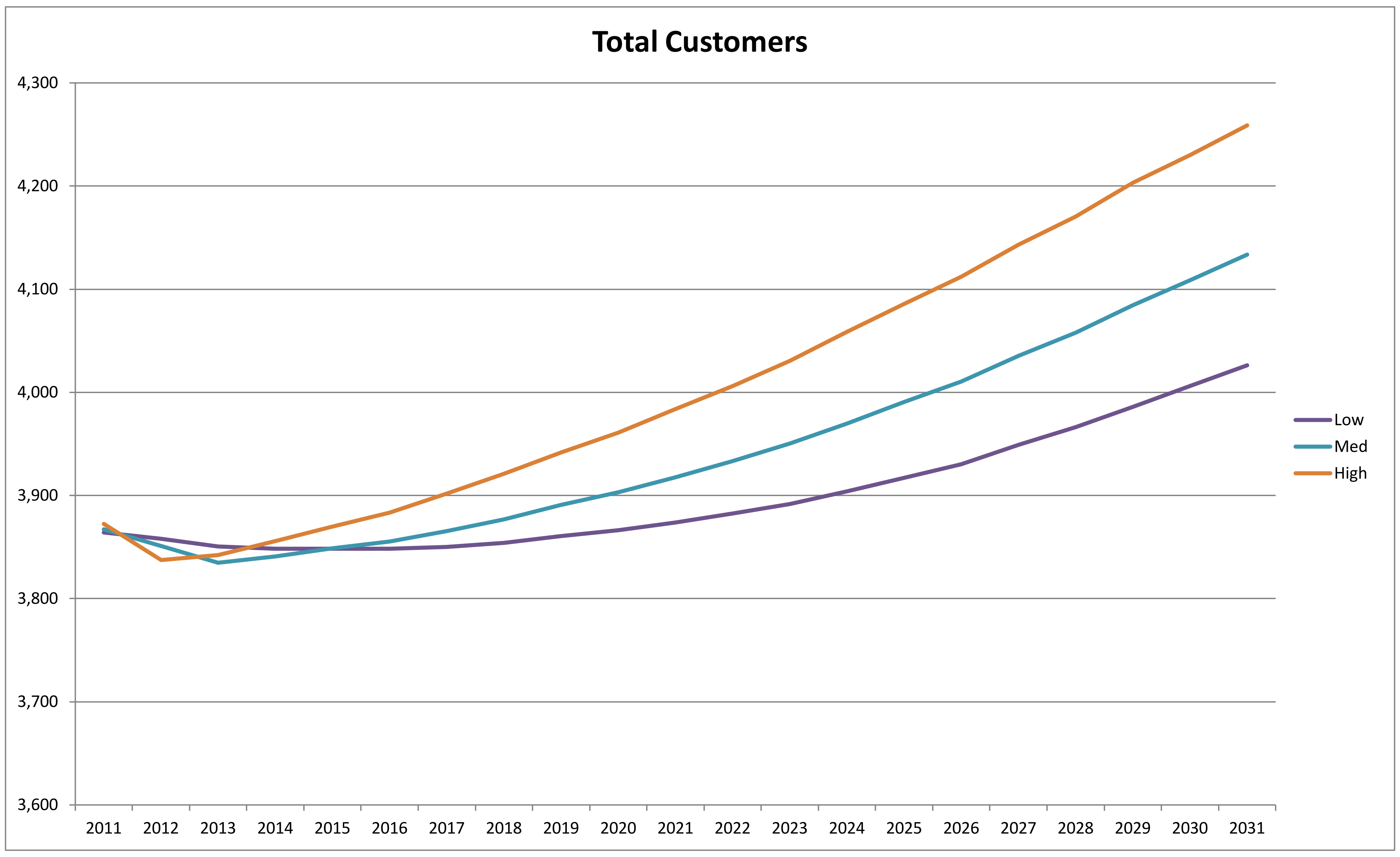
Customer Count Forecast / Annual Change

	Low			Medium			High			Annual Change Low			Annual Change Medium			Annual Change High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3,358	506	3,864	3,359	508	3,867	3,360	512	3,872	0.12%	1.23%	0.26%	0.15%	1.69%	0.35%	0.18%	2.47%	0.48%
2012	3,351	507	3,858	3,340	511	3,851	3,320	518	3,838	-0.21%	0.15%	-0.16%	-0.57%	0.53%	-0.42%	-1.19%	1.00%	-0.90%
2013	3,342	509	3,851	3,321	514	3,835	3,321	521	3,842	-0.27%	0.36%	-0.19%	-0.57%	0.56%	-0.42%	0.03%	0.74%	0.13%
2014	3,338	511	3,849	3,324	517	3,841	3,331	525	3,856	-0.12%	0.37%	-0.06%	0.09%	0.55%	0.15%	0.30%	0.70%	0.35%
2015	3,336	512	3,848	3,329	520	3,849	3,341	529	3,870	-0.06%	0.37%	0.00%	0.15%	0.56%	0.21%	0.30%	0.72%	0.36%
2016	3,334	514	3,848	3,333	522	3,855	3,351	532	3,883	-0.06%	0.35%	-0.01%	0.12%	0.53%	0.17%	0.30%	0.67%	0.35%
2017	3,334	516	3,850	3,340	525	3,865	3,366	536	3,902	0.00%	0.38%	0.05%	0.21%	0.56%	0.26%	0.45%	0.69%	0.48%
2018	3,336	518	3,854	3,349	528	3,877	3,382	539	3,921	0.06%	0.33%	0.10%	0.27%	0.50%	0.30%	0.48%	0.62%	0.50%
2019	3,341	520	3,861	3,360	531	3,891	3,399	543	3,942	0.15%	0.33%	0.17%	0.33%	0.51%	0.35%	0.50%	0.66%	0.52%
2020	3,345	521	3,866	3,370	533	3,903	3,415	546	3,961	0.12%	0.30%	0.14%	0.30%	0.47%	0.32%	0.47%	0.61%	0.49%
2021	3,351	523	3,874	3,382	536	3,918	3,434	550	3,984	0.18%	0.32%	0.20%	0.36%	0.50%	0.38%	0.56%	0.64%	0.57%
2022	3,358	524	3,882	3,395	538	3,933	3,453	553	4,006	0.21%	0.29%	0.22%	0.38%	0.46%	0.39%	0.55%	0.60%	0.56%
2023	3,366	526	3,892	3,410	541	3,951	3,475	556	4,031	0.24%	0.27%	0.24%	0.44%	0.42%	0.44%	0.64%	0.53%	0.62%
2024	3,377	527	3,904	3,427	543	3,970	3,500	559	4,059	0.33%	0.25%	0.32%	0.50%	0.41%	0.49%	0.72%	0.53%	0.69%
2025	3,389	528	3,917	3,446	545	3,991	3,524	562	4,086	0.36%	0.22%	0.34%	0.55%	0.38%	0.53%	0.69%	0.52%	0.66%
2026	3,401	529	3,930	3,464	547	4,011	3,548	564	4,112	0.35%	0.17%	0.33%	0.52%	0.32%	0.50%	0.68%	0.45%	0.65%
2027	3,419	530	3,949	3,487	549	4,036	3,576	567	4,143	0.53%	0.18%	0.48%	0.66%	0.38%	0.63%	0.79%	0.56%	0.76%
2028	3,436	530	3,966	3,508	550	4,058	3,601	569	4,170	0.50%	0.05%	0.44%	0.60%	0.22%	0.55%	0.70%	0.37%	0.65%
2029	3,455	531	3,986	3,533	552	4,085	3,631	572	4,203	0.55%	0.14%	0.50%	0.71%	0.31%	0.66%	0.83%	0.47%	0.78%
2030	3,475	531	4,006	3,557	552	4,109	3,658	572	4,230	0.58%	0.00%	0.50%	0.68%	0.00%	0.59%	0.74%	0.00%	0.64%
2031	3,495	531	4,026	3,581	553	4,134	3,685	574	4,259	0.58%	0.02%	0.50%	0.67%	0.19%	0.61%	0.74%	0.34%	0.68%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Baker





Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bend

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	34,357,055	15,258,788	49,615,843	34,930,433	15,513,439	50,443,873	35,796,963	15,898,286	51,695,248
2012	34,344,710	15,253,306	49,598,016	35,055,553	15,569,008	50,624,561	36,213,194	16,083,144	52,296,338
2013	34,359,845	15,260,027	49,619,872	35,106,279	15,591,536	50,697,815	36,658,025	16,280,704	52,938,729
2014	34,649,662	15,388,742	50,038,404	35,506,631	15,769,342	51,275,974	37,482,170	16,646,726	54,128,896
2015	35,235,655	15,648,995	50,884,650	36,346,696	16,142,435	52,489,132	38,618,923	17,151,585	55,770,508
2016	35,871,043	15,931,186	51,802,229	37,260,066	16,548,085	53,808,151	39,847,746	17,697,335	57,545,081
2017	36,332,477	16,136,120	52,468,597	38,013,716	16,882,799	54,896,514	40,950,117	18,186,925	59,137,042
2018	36,799,782	16,343,662	53,143,443	38,751,340	17,210,395	55,961,735	42,090,866	18,693,558	60,784,424
2019	37,409,971	16,614,661	54,024,633	39,665,194	17,616,260	57,281,454	43,403,477	19,276,520	62,679,997
2020	38,068,826	16,907,274	54,976,100	40,650,145	18,053,700	58,703,844	44,818,272	19,904,865	64,723,137
2021	38,517,737	17,106,647	55,624,384	41,439,566	18,404,300	59,843,866	46,093,545	20,471,244	66,564,789
2022	38,985,537	17,314,407	56,299,944	42,223,861	18,752,625	60,976,486	47,392,941	21,048,336	68,441,278
2023	39,687,306	17,626,080	57,313,387	43,288,703	19,225,546	62,514,249	48,952,612	21,741,023	70,693,635
2024	40,749,288	18,097,732	58,847,020	44,772,956	19,884,738	64,657,694	51,036,073	22,666,338	73,702,411
2025	41,289,119	18,337,483	59,626,602	45,725,915	20,307,971	66,033,886	52,587,503	23,355,365	75,942,868
2026	41,908,110	18,612,392	60,520,502	46,716,084	20,747,728	67,463,812	54,253,241	24,095,159	78,348,400
2027	42,650,287	18,942,011	61,592,298	47,908,711	21,277,402	69,186,113	56,151,092	24,938,040	81,089,132
2028	43,247,560	19,207,274	62,454,834	49,018,790	21,770,415	70,789,204	57,997,615	25,758,125	83,755,741
2029	43,808,375	19,456,345	63,264,720	50,032,061	22,220,433	72,252,494	59,818,336	26,566,751	86,385,087
2030	44,063,058	19,569,456	63,632,514	50,472,521	22,416,051	72,888,573	60,441,325	26,843,435	87,284,761
2031	44,622,641	19,817,980	64,440,621	51,503,953	22,874,135	74,378,088	62,346,624	27,689,624	90,036,248

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	6.35%	6.35%	6.35%	8.12%	8.12%	8.12%	10.81%	10.81%	10.81%
2012	-0.04%	-0.04%	-0.04%	0.36%	0.36%	0.36%	1.16%	1.16%	1.16%
2013	0.04%	0.04%	0.04%	0.14%	0.14%	0.14%	1.23%	1.23%	1.23%
2014	0.84%	0.84%	0.84%	1.14%	1.14%	1.14%	2.25%	2.25%	2.25%
2015	1.69%	1.69%	1.69%	2.37%	2.37%	2.37%	3.03%	3.03%	3.03%
2016	1.80%	1.80%	1.80%	2.51%	2.51%	2.51%	3.18%	3.18%	3.18%
2017	1.29%	1.29%	1.29%	2.02%	2.02%	2.02%	2.77%	2.77%	2.77%
2018	1.29%	1.29%	1.29%	1.94%	1.94%	1.94%	2.79%	2.79%	2.79%
2019	1.66%	1.66%	1.66%	2.36%	2.36%	2.36%	3.12%	3.12%	3.12%
2020	1.76%	1.76%	1.76%	2.48%	2.48%	2.48%	3.26%	3.26%	3.26%
2021	1.18%	1.18%	1.18%	1.94%	1.94%	1.94%	2.85%	2.85%	2.85%
2022	1.21%	1.21%	1.21%	1.89%	1.89%	1.89%	2.82%	2.82%	2.82%
2023	1.80%	1.80%	1.80%	2.52%	2.52%	2.52%	3.29%	3.29%	3.29%
2024	2.68%	2.68%	2.68%	3.43%	3.43%	3.43%	4.26%	4.26%	4.26%
2025	1.32%	1.32%	1.32%	2.13%	2.13%	2.13%	3.04%	3.04%	3.04%
2026	1.50%	1.50%	1.50%	2.17%	2.17%	2.17%	3.17%	3.17%	3.17%
2027	1.77%	1.77%	1.77%	2.55%	2.55%	2.55%	3.50%	3.50%	3.50%
2028	1.40%	1.40%	1.40%	2.32%	2.32%	2.32%	3.29%	3.29%	3.29%
2029	1.30%	1.30%	1.30%	2.07%	2.07%	2.07%	3.14%	3.14%	3.14%
2030	0.58%	0.58%	0.58%	0.88%	0.88%	0.88%	1.04%	1.04%	1.04%
2031	1.27%	1.27%	1.27%	2.04%	2.04%	2.04%	3.15%	3.15%	3.15%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	41,805	537,651	579,456	42,503	538,667	581,170	43,557	539,980	583,537
2012	41,790	540,193	581,983	42,655	541,682	584,337	44,063	543,289	587,352
2013	41,808	547,144	588,952	42,717	544,845	587,562	44,605	553,593	598,198
2014	42,161	555,465	597,626	43,204	555,644	598,848	45,607	566,394	612,001
2015	42,874	563,548	606,422	44,226	566,095	610,321	46,991	579,104	626,095
2016	43,647	571,635	615,282	45,337	576,625	621,962	48,486	591,975	640,461
2017	44,209	580,040	624,249	46,254	587,547	633,801	49,827	605,291	655,118
2018	44,777	588,516	633,293	47,152	598,658	645,810	51,215	618,834	670,050
2019	45,520	596,937	642,457	48,264	609,755	658,018	52,812	632,489	685,302
2020	46,321	605,392	651,713	49,462	620,963	670,426	54,534	646,339	700,873
2021	46,868	614,180	661,047	50,423	632,568	682,991	56,086	660,626	716,712
2022	47,437	623,096	670,533	51,377	644,451	695,828	57,667	675,274	732,941
2023	48,291	631,776	680,067	52,673	656,117	708,790	59,564	689,860	749,425
2024	49,583	640,166	689,749	54,479	667,530	722,009	62,100	704,191	766,290
2025	50,240	649,251	699,491	55,638	679,740	735,378	63,987	719,422	783,409
2026	50,993	658,360	709,353	56,843	692,160	749,003	66,014	734,919	800,933
2027	51,896	667,421	719,317	58,294	704,530	762,824	68,323	750,467	818,790
2028	52,623	676,763	729,386	59,645	717,211	776,856	70,570	766,408	836,979
2029	53,305	686,253	739,558	60,878	730,236	791,114	72,786	782,771	855,557
2030	53,615	694,159	747,774	61,414	741,540	802,954	73,544	797,765	871,308
2031	54,296	703,873	758,169	62,669	754,978	817,647	75,862	814,714	890,575

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	6.35%	1.11%	1.47%	8.12%	1.30%	1.77%	10.81%	1.55%	2.19%
2012	-0.04%	0.47%	0.44%	0.36%	0.56%	0.54%	1.16%	0.61%	0.65%
2013	0.04%	1.29%	1.20%	0.14%	0.58%	0.55%	1.23%	1.90%	1.85%
2014	0.84%	1.52%	1.47%	1.14%	1.98%	1.92%	2.25%	2.31%	2.31%
2015	1.69%	1.46%	1.47%	2.37%	1.88%	1.92%	3.03%	2.24%	2.30%
2016	1.80%	1.44%	1.46%	2.51%	1.86%	1.91%	3.18%	2.22%	2.29%
2017	1.29%	1.47%	1.46%	2.02%	1.89%	1.90%	2.77%	2.25%	2.29%
2018	1.29%	1.46%	1.45%	1.94%	1.89%	1.89%	2.79%	2.24%	2.28%
2019	1.66%	1.43%	1.45%	2.36%	1.85%	1.89%	3.12%	2.21%	2.28%
2020	1.76%	1.42%	1.44%	2.48%	1.84%	1.89%	3.26%	2.19%	2.27%
2021	1.18%	1.45%	1.43%	1.94%	1.87%	1.87%	2.85%	2.21%	2.26%
2022	1.21%	1.45%	1.43%	1.89%	1.88%	1.88%	2.82%	2.22%	2.26%
2023	1.80%	1.39%	1.42%	2.52%	1.81%	1.86%	3.29%	2.16%	2.25%
2024	2.68%	1.33%	1.42%	3.43%	1.74%	1.87%	4.26%	2.08%	2.25%
2025	1.32%	1.42%	1.41%	2.13%	1.83%	1.85%	3.04%	2.16%	2.23%
2026	1.50%	1.40%	1.41%	2.17%	1.83%	1.85%	3.17%	2.15%	2.24%
2027	1.77%	1.38%	1.40%	2.55%	1.79%	1.85%	3.50%	2.12%	2.23%
2028	1.40%	1.40%	1.40%	2.32%	1.80%	1.84%	3.29%	2.12%	2.22%
2029	1.30%	1.40%	1.39%	2.07%	1.82%	1.84%	3.14%	2.13%	2.22%
2030	0.58%	1.15%	1.11%	0.88%	1.55%	1.50%	1.04%	1.92%	1.84%
2031	1.27%	1.40%	1.39%	2.04%	1.81%	1.83%	3.15%	2.12%	2.21%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	28,772,922	20,842,921	49,615,843	29,425,932	21,017,941	50,443,873	30,478,400	21,216,848	51,695,248
2012	28,817,644	20,780,372	49,598,016	29,564,048	21,060,513	50,624,561	30,750,195	21,546,143	52,296,338
2013	28,807,500	20,812,372	49,619,872	29,474,960	21,222,855	50,697,815	30,957,074	21,981,655	52,938,729
2014	29,042,526	20,995,878	50,038,404	29,701,264	21,574,710	51,275,974	31,528,152	22,600,744	54,128,896
2015	29,476,620	21,408,030	50,884,650	30,281,760	22,207,372	52,489,132	32,271,435	23,499,073	55,770,508
2016	29,874,771	21,927,458	51,802,229	30,831,795	22,976,356	53,808,151	32,989,320	24,555,761	57,545,081
2017	30,197,085	22,271,512	52,468,597	31,350,740	23,545,774	54,896,514	33,679,892	25,457,150	59,137,042
2018	30,562,032	22,581,411	53,143,443	31,876,614	24,085,121	55,961,735	34,426,252	26,358,172	60,784,424
2019	30,973,464	23,051,169	54,024,633	32,453,442	24,828,012	57,281,454	35,189,286	27,490,711	62,679,997
2020	31,389,360	23,586,740	54,976,100	33,040,189	25,663,655	58,703,844	35,968,994	28,754,143	64,723,137
2021	31,680,714	23,943,670	55,624,384	33,546,402	26,297,464	59,843,866	36,715,900	29,848,889	66,564,789
2022	32,062,720	24,237,224	56,299,944	34,108,040	26,868,446	60,976,486	37,528,725	30,912,553	68,441,278
2023	32,577,510	24,735,877	57,313,387	34,811,208	27,703,041	62,514,249	38,403,398	32,290,237	70,693,635
2024	33,146,540	25,700,480	58,847,020	35,530,584	29,127,110	64,657,694	39,349,464	34,352,947	73,702,411
2025	33,496,669	26,129,933	59,626,602	36,118,894	29,914,992	66,033,886	40,161,810	35,781,058	75,942,868
2026	33,941,726	26,578,776	60,520,502	36,718,494	30,745,318	67,463,812	41,045,055	37,303,345	78,348,400
2027	34,391,984	27,200,314	61,592,298	37,375,338	31,810,775	69,186,113	41,945,790	39,143,342	81,089,132
2028	34,753,641	27,701,193	62,454,834	38,042,850	32,746,354	70,789,204	42,864,015	40,891,726	83,755,741
2029	35,118,019	28,146,701	63,264,720	38,620,160	33,632,334	72,252,494	43,747,812	42,637,275	86,385,087
2030	35,485,813	28,146,701	63,632,514	39,256,239	33,632,334	72,888,573	44,647,486	42,637,275	87,284,761
2031	35,856,975	28,583,646	64,440,621	39,850,751	34,527,337	74,378,088	45,587,554	44,448,693	90,036,248

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	4.31%	9.31%	6.35%	6.67%	10.22%	8.12%	10.49%	11.27%	10.81%
2012	0.16%	-0.30%	-0.04%	0.47%	0.20%	0.36%	0.89%	1.55%	1.16%
2013	-0.04%	0.15%	0.04%	-0.30%	0.77%	0.14%	0.67%	2.02%	1.23%
2014	0.82%	0.88%	0.84%	0.77%	1.66%	1.14%	1.84%	2.82%	2.25%
2015	1.49%	1.96%	1.69%	1.95%	2.93%	2.37%	2.36%	3.97%	3.03%
2016	1.35%	2.43%	1.80%	1.82%	3.46%	2.51%	2.22%	4.50%	3.18%
2017	1.08%	1.57%	1.29%	1.68%	2.48%	2.02%	2.09%	3.67%	2.77%
2018	1.21%	1.39%	1.29%	1.68%	2.29%	1.94%	2.22%	3.54%	2.79%
2019	1.35%	2.08%	1.66%	1.81%	3.08%	2.36%	2.22%	4.30%	3.12%
2020	1.34%	2.32%	1.76%	1.81%	3.37%	2.48%	2.22%	4.60%	3.26%
2021	0.93%	1.51%	1.18%	1.53%	2.47%	1.94%	2.08%	3.81%	2.85%
2022	1.21%	1.23%	1.21%	1.67%	2.17%	1.89%	2.21%	3.56%	2.82%
2023	1.61%	2.06%	1.80%	2.06%	3.11%	2.52%	2.33%	4.46%	3.29%
2024	1.75%	3.90%	2.68%	2.07%	5.14%	3.43%	2.46%	6.39%	4.26%
2025	1.06%	1.67%	1.32%	1.66%	2.70%	2.13%	2.06%	4.16%	3.04%
2026	1.33%	1.72%	1.50%	1.66%	2.78%	2.17%	2.20%	4.25%	3.17%
2027	1.33%	2.34%	1.77%	1.79%	3.47%	2.55%	2.19%	4.93%	3.50%
2028	1.05%	1.84%	1.40%	1.79%	2.94%	2.32%	2.19%	4.47%	3.29%
2029	1.05%	1.61%	1.30%	1.52%	2.71%	2.07%	2.06%	4.27%	3.14%
2030	1.05%	0.00%	0.58%	1.65%	0.00%	0.88%	2.06%	0.00%	1.04%
2031	1.05%	1.55%	1.27%	1.51%	2.66%	2.04%	2.11%	4.25%	3.15%

Customer Count Forecast

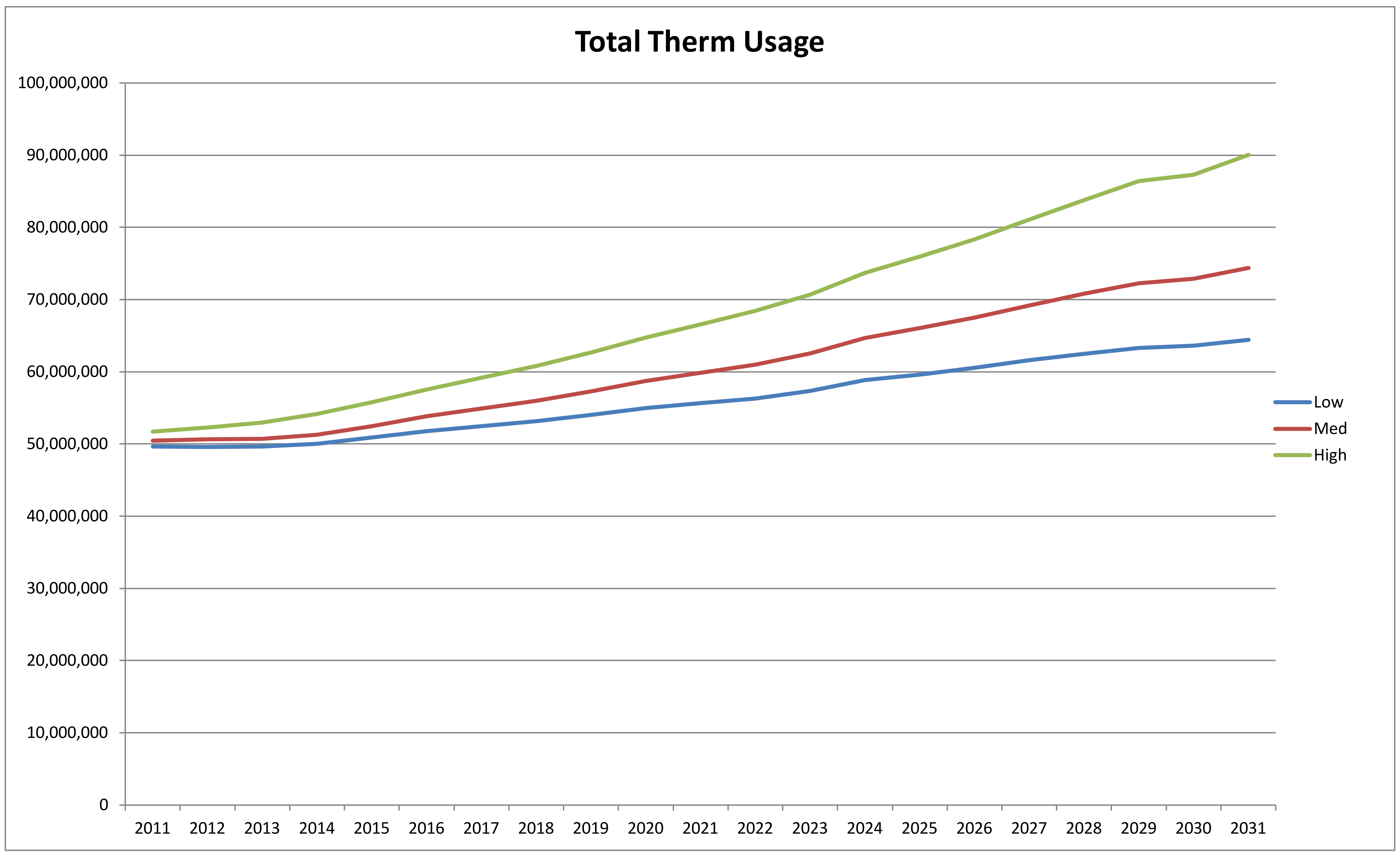
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	37,959	6,332	44,291	38,018	6,404	44,422	38,098	6,505	44,603
2012	38,018	6,467	44,485	38,098	6,567	44,665	38,199	6,696	44,895
2013	38,410	6,607	45,017	38,180	6,731	44,911	38,842	6,882	45,724
2014	38,931	6,749	45,680	38,876	6,898	45,774	39,708	7,071	46,779
2015	39,460	6,893	46,353	39,584	7,067	46,651	40,593	7,263	47,856
2016	39,993	7,037	47,030	40,303	7,238	47,541	41,496	7,458	48,954
2017	40,533	7,182	47,715	41,035	7,410	48,445	42,418	7,657	50,075
2018	41,078	7,329	48,407	41,778	7,585	49,363	43,358	7,858	51,216
2019	41,631	7,476	49,107	42,534	7,763	50,297	44,319	8,063	52,382
2020	42,190	7,625	49,815	43,303	7,942	51,245	45,301	8,271	53,572
2021	42,754	7,774	50,528	44,082	8,123	52,205	46,300	8,483	54,783
2022	43,328	7,925	51,253	44,879	8,308	53,187	47,325	8,698	56,023
2023	43,905	8,077	51,982	45,684	8,493	54,177	48,367	8,916	57,283
2024	44,492	8,230	52,722	46,506	8,682	55,188	49,434	9,138	58,572
2025	45,083	8,384	53,467	47,338	8,872	56,210	50,518	9,363	59,881
2026	45,682	8,538	54,220	48,187	9,064	57,251	51,629	9,591	61,220
2027	46,288	8,694	54,982	49,049	9,258	58,307	52,762	9,823	62,585
2028	46,901	8,851	55,752	49,925	9,455	59,380	53,917	10,059	63,976
2029	47,521	9,008	56,529	50,816	9,654	60,470	55,098	10,298	65,396
2030	48,149	9,008	57,157	51,721	9,654	61,375	56,302	10,298	66,600
2031	48,785	9,167	57,952	52,643	9,855	62,498	57,532	10,540	68,072

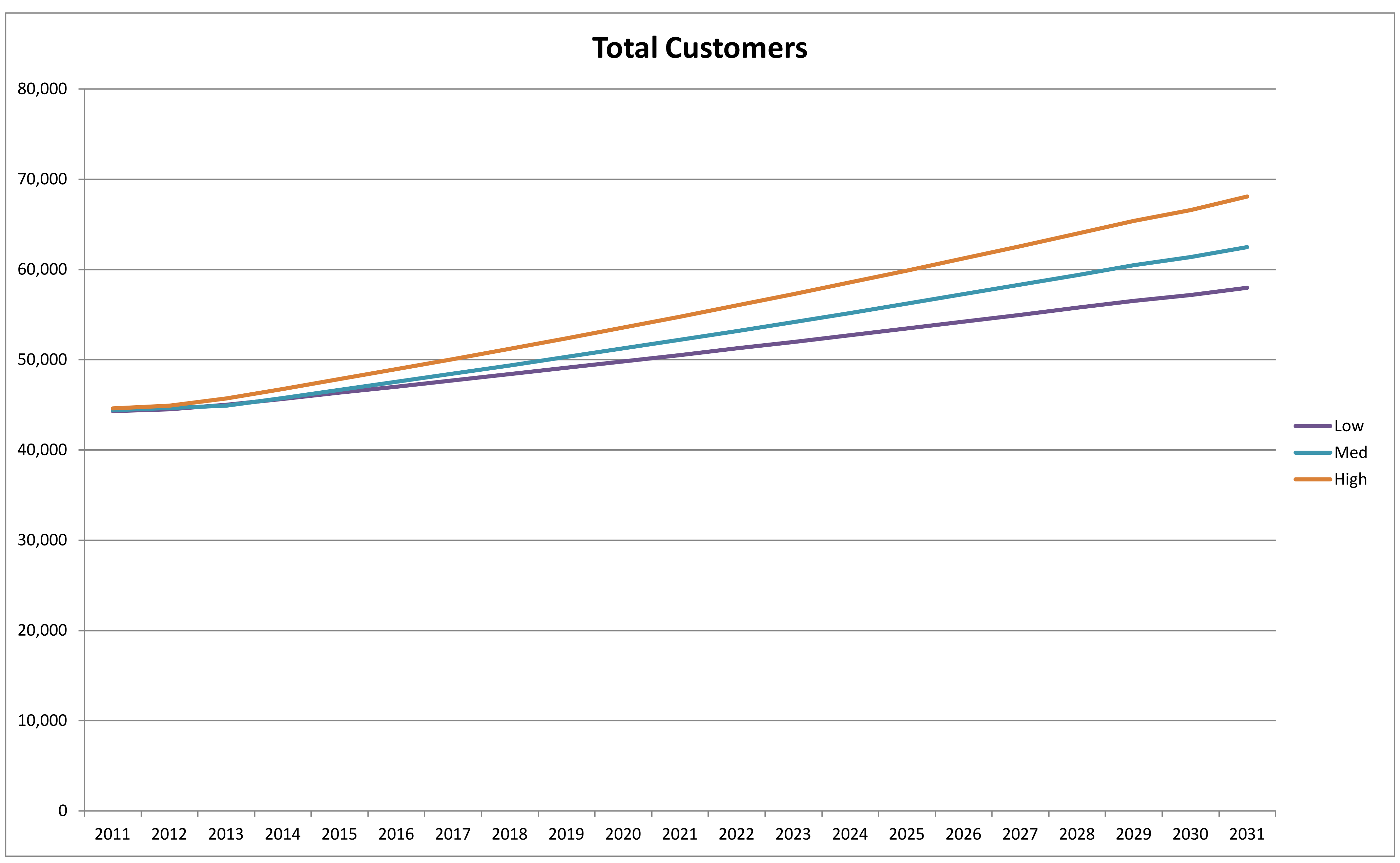
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.59%	0.80%	1.47%	1.74%	1.95%	1.77%	1.96%	3.56%	2.19%
2012	0.16%	2.12%	0.44%	0.21%	2.53%	0.54%	0.27%	2.93%	0.65%
2013	1.03%	2.18%	1.20%	0.22%	2.51%	0.55%	1.68%	2.78%	1.85%
2014	1.36%	2.15%	1.47%	1.82%	2.48%	1.92%	2.23%	2.75%	2.31%
2015	1.36%	2.12%	1.47%	1.82%	2.45%	1.92%	2.23%	2.72%	2.30%
2016	1.35%	2.09%	1.46%	1.82%	2.42%	1.91%	2.22%	2.69%	2.29%
2017	1.35%	2.07%	1.46%	1.82%	2.39%	1.90%	2.22%	2.66%	2.29%
2018	1.34%	2.04%	1.45%	1.81%	2.36%	1.89%	2.22%	2.63%	2.28%
2019	1.35%	2.01%	1.45%	1.81%	2.34%	1.89%	2.22%	2.61%	2.28%
2020	1.34%	1.99%	1.44%	1.81%	2.31%	1.89%	2.22%	2.58%	2.27%
2021	1.34%	1.96%	1.43%	1.80%	2.28%	1.87%	2.21%	2.56%	2.26%
2022	1.34%	1.94%	1.43%	1.81%	2.27%	1.88%	2.21%	2.54%	2.26%
2023	1.33%	1.91%	1.42%	1.79%	2.24%	1.86%	2.20%	2.51%	2.25%
2024	1.34%	1.89%	1.42%	1.80%	2.22%	1.87%	2.21%	2.49%	2.25%
2025	1.33%	1.87%	1.41%	1.79%	2.19%	1.85%	2.19%	2.46%	2.23%
2026	1.33%	1.85%	1.41%	1.79%	2.17%	1.85%	2.20%	2.44%	2.24%
2027	1.33%	1.82%	1.40%	1.79%	2.15%	1.85%	2.19%	2.42%	2.23%
2028	1.32%	1.80%	1.40%	1.79%	2.12%	1.84%	2.19%	2.39%	2.22%
2029	1.32%	1.78%	1.39%	1.78%	2.10%	1.84%	2.19%	2.38%	2.22%
2030	1.32%	0.00%	1.11%	1.78%	0.00%	1.50%	2.19%	0.00%	1.84%
2031	1.32%	1.76%	1.39%	1.78%	2.08%	1.83%	2.18%	2.36%	2.21%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Bend





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Ontario

Annual Requirements (Therms) / Annual Change

	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	3,816,926	1,419,943	5,236,869	3,811,958	1,418,095	5,230,053	3,800,970	1,414,008	5,214,977	15.43%	15.43%	15.43%	15.28%	15.28%	15.28%	14.95%	14.95%	14.95%
2012	3,924,426	1,459,935	5,384,361	3,892,108	1,447,912	5,340,020	3,884,899	1,445,230	5,330,129	2.82%	2.82%	2.82%	2.10%	2.10%	2.10%	2.21%	2.21%	2.21%
2013	3,863,550	1,437,288	5,300,839	3,816,377	1,419,739	5,236,116	3,833,198	1,425,997	5,259,195	-1.55%	-1.55%	-1.55%	-1.95%	-1.95%	-1.95%	-1.33%	-1.33%	-1.33%
2014	3,829,117	1,424,479	5,253,595	3,768,794	1,402,038	5,170,832	3,804,404	1,415,285	5,219,689	-0.89%	-0.89%	-0.89%	-1.25%	-1.25%	-1.25%	-0.75%	-0.75%	-0.75%
2015	3,833,611	1,426,151	5,259,761	3,767,782	1,401,661	5,169,443	3,831,813	1,425,482	5,257,295	0.12%	0.12%	0.12%	-0.03%	-0.03%	-0.03%	0.72%	0.72%	0.72%
2016	3,861,398	1,436,488	5,297,886	3,784,795	1,407,990	5,192,785	3,864,729	1,437,727	5,302,455	0.72%	0.72%	0.72%	0.45%	0.45%	0.45%	0.86%	0.86%	0.86%
2017	3,858,974	1,435,586	5,294,560	3,770,018	1,402,493	5,172,511	3,868,066	1,438,968	5,307,035	-0.06%	-0.06%	-0.06%	-0.39%	-0.39%	-0.39%	0.09%	0.09%	0.09%
2018	3,846,793	1,431,054	5,277,847	3,751,020	1,395,426	5,146,446	3,878,789	1,442,957	5,321,746	-0.32%	-0.32%	-0.32%	-0.50%	-0.50%	-0.50%	0.28%	0.28%	0.28%
2019	3,859,426	1,435,754	5,295,180	3,752,599	1,396,013	5,148,612	3,898,553	1,450,310	5,348,863	0.33%	0.33%	0.33%	0.04%	0.04%	0.04%	0.51%	0.51%	0.51%
2020	3,881,108	1,443,820	5,324,928	3,765,101	1,400,664	5,165,765	3,930,657	1,462,253	5,392,910	0.56%	0.56%	0.56%	0.33%	0.33%	0.33%	0.82%	0.82%	0.82%
2021	3,877,857	1,442,611	5,320,467	3,752,015	1,395,796	5,147,810	3,939,921	1,465,699	5,405,620	-0.08%	-0.08%	-0.08%	-0.35%	-0.35%	-0.35%	0.24%	0.24%	0.24%
2022	3,861,394	1,436,486	5,297,880	3,724,165	1,385,435	5,109,600	3,931,869	1,462,704	5,394,572	-0.42%	-0.42%	-0.42%	-0.74%	-0.74%	-0.74%	-0.20%	-0.20%	-0.20%
2023	3,871,495	1,440,244	5,311,738	3,727,752	1,386,770	5,114,522	3,960,561	1,473,378	5,433,939	0.26%	0.26%	0.26%	0.10%	0.10%	0.10%	0.73%	0.73%	0.73%
2024	3,946,311	1,468,076	5,414,387	3,798,253	1,412,997	5,211,250	4,049,849	1,506,594	5,556,443	1.93%	1.93%	1.93%	1.89%	1.89%	1.89%	2.25%	2.25%	2.25%
2025	3,957,622	1,472,284	5,429,907	3,799,307	1,413,389	5,212,696	4,068,518	1,513,539	5,582,057	0.29%	0.29%	0.29%	0.03%	0.03%	0.03%	0.46%	0.46%	0.46%
2026	3,960,216	1,473,249	5,433,465	3,795,059	1,411,809	5,206,868	4,087,248	1,520,507	5,607,755	0.07%	0.07%	0.07%	-0.11%	-0.11%	-0.11%	0.46%	0.46%	0.46%
2027	3,992,015	1,485,079	5,477,094	3,818,359	1,420,477	5,238,836	4,128,387	1,535,811	5,664,198	0.80%	0.80%	0.80%	0.61%	0.61%	0.61%	1.01%	1.01%	1.01%
2028	4,001,527	1,488,617	5,490,144	3,821,577	1,421,674	5,243,251	4,153,539	1,545,168	5,698,707	0.24%	0.24%	0.24%	0.08%	0.08%	0.08%	0.61%	0.61%	0.61%
2029	4,007,037	1,490,667	5,497,704	3,818,434	1,420,505	5,238,938	4,167,001	1,550,176	5,717,176	0.14%	0.14%	0.14%	-0.08%	-0.08%	-0.08%	0.32%	0.32%	0.32%
2030	4,013,691	1,493,143	5,506,833	3,822,388	1,421,975	5,244,363	4,167,348	1,550,305	5,717,653	0.17%	0.17%	0.17%	0.10%	0.10%	0.10%	0.01%	0.01%	0.01%
2031	4,023,092	1,496,640	5,519,732	3,821,541	1,421,661	5,243,202	4,182,476	1,555,933	5,738,409	0.23%	0.23%	0.23%	-0.02%	-0.02%	-0.02%	0.36%	0.36%	0.36%

Peak Day - Baseload / Annual Change

	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	3,890	26,772	30,662	3,885	26,780	30,665	3,874	26,776	30,650	15.43%	-1.07%	0.76%	15.28%	-1.04%	0.77%	14.95%	-1.06%	0.72%
2012	4,000	26,676	30,676	3,967	26,623	30,590	3,960	26,479	30,438	2.82%	-0.36%	0.04%	2.10%	-0.59%	-0.25%	2.21%	-1.11%	-0.69%
2013	3,938	26,671	30,609	3,890	26,631	30,521	3,907	26,496	30,403	-1.55%	-0.02%	-0.22%	-1.95%	0.03%	-0.22%	-1.33%	0.06%	-0.12%
2014	3,903	26,647	30,549	3,841	26,630	30,471	3,877	26,471	30,348	-0.89%	-0.09%	-0.19%	-1.25%	0.00%	-0.16%	-0.75%	-0.09%	-0.18%
2015	3,907	26,592	30,500	3,840	26,636	30,476	3,905	26,535	30,440	0.12%	-0.20%	-0.16%	-0.03%	0.02%	0.02%	0.72%	0.24%	0.30%
2016	3,936	26,556	30,492	3,858	26,613	30,470	3,939	26,481	30,420	0.72%	-0.14%	-0.03%	0.45%	-0.09%	-0.02%	0.86%	-0.20%	-0.07%
2017	3,933	26,533	30,466	3,842	26,604	30,447	3,942	26,449	30,391	-0.06%	-0.09%	-0.08%	-0.39%	-0.03%	-0.08%	0.09%	-0.12%	-0.09%
2018	3,921	26,537	30,457	3,823	26,670	30,493	3,953	26,571	30,524	-0.32%	0.01%	-0.03%	-0.50%	0.25%	0.15%	0.28%	0.46%	0.44%
2019	3,934	26,557	30,491	3,825	26,704	30,529	3,973	26,581	30,555	0.33%	0.08%	0.11%	0.04%	0.13%	0.12%	0.51%	0.04%	0.10%
2020	3,956	26,554	30,510	3,837	26,722	30,559	4,006	26,589	30,595	0.56%	-0.01%	0.06%	0.33%	0.06%	0.10%	0.82%	0.03%	0.13%
2021	3,952	26,590	30,543	3,824	26,788	30,612	4,016	26,661	30,677	-0.08%	0.14%	0.11%	-0.35%	0.25%	0.17%	0.24%	0.27%	0.27%
2022	3,936	26,643	30,579	3,796	26,864	30,660	4,007	26,728	30,735	-0.42%	0.20%	0.12%	-0.74%	0.28%	0.16%	-0.20%	0.25%	0.19%
2023	3,946	26,692	30,637	3,799	26,949	30,748	4,037	26,840	30,877	0.26%	0.18%	0.19%	0.10%	0.32%	0.29%	0.73%	0.42%	0.46%
2024	4,022	26,685	30,707	3,871	26,956	30,828	4,128	26,823	30,951	1.93%	-0.02%	0.23%	1.89%	0.03%	0.26%	2.25%	-0.06%	0.24%
2025	4,034	26,741	30,775	3,872	27,026	30,898	4,147	26,870	31,016	0.29%	0.21%	0.22%	0.03%	0.26%	0.23%	0.46%	0.17%	0.21%
2026	4,036	26,817	30,853	3,868	27,136	31,004	4,166	26,993	31,159	0.07%	0.28%	0.25%	-0.11%	0.41%	0.34%	0.46%	0.46%	0.46%
2027	4,069	26,938	31,007	3,892	27,262	31,153	4,208	27,086	31,294	0.80%	0.45%	0.50%	0.61%	0.46%	0.48%	1.01%	0.34%	0.43%
2028	4,078	27,006	31,085	3,895	27,357	31,252	4,233	27,195	31,428	0.24%	0.25%	0.25%	0.08%	0.35%	0.32%	0.61%	0.40%	0.43%
2029	4,084	27,131	31,215	3,892	27,499	31,390	4,247	27,307	31,554	0.14%	0.46%	0.42%	-0.08%	0.52%	0.44%	0.32%	0.41%	0.40%
2030	4,091	27,280	31,371	3,896	27,637	31,533	4,247	27,435	31,683	0.17%	0.55%	0.50%	0.10%	0.50%	0.46%	0.01%	0.47%	0.41%
2031	4,100	27,467	31,568	3,895	27,822	31,717	4,263	27,588	31,851	0.23%	0.68%	0.63%	-0.02%	0.67%	0.58%	0.36%	0.56%	0.53%

Therm Usage by Class / Annual Change

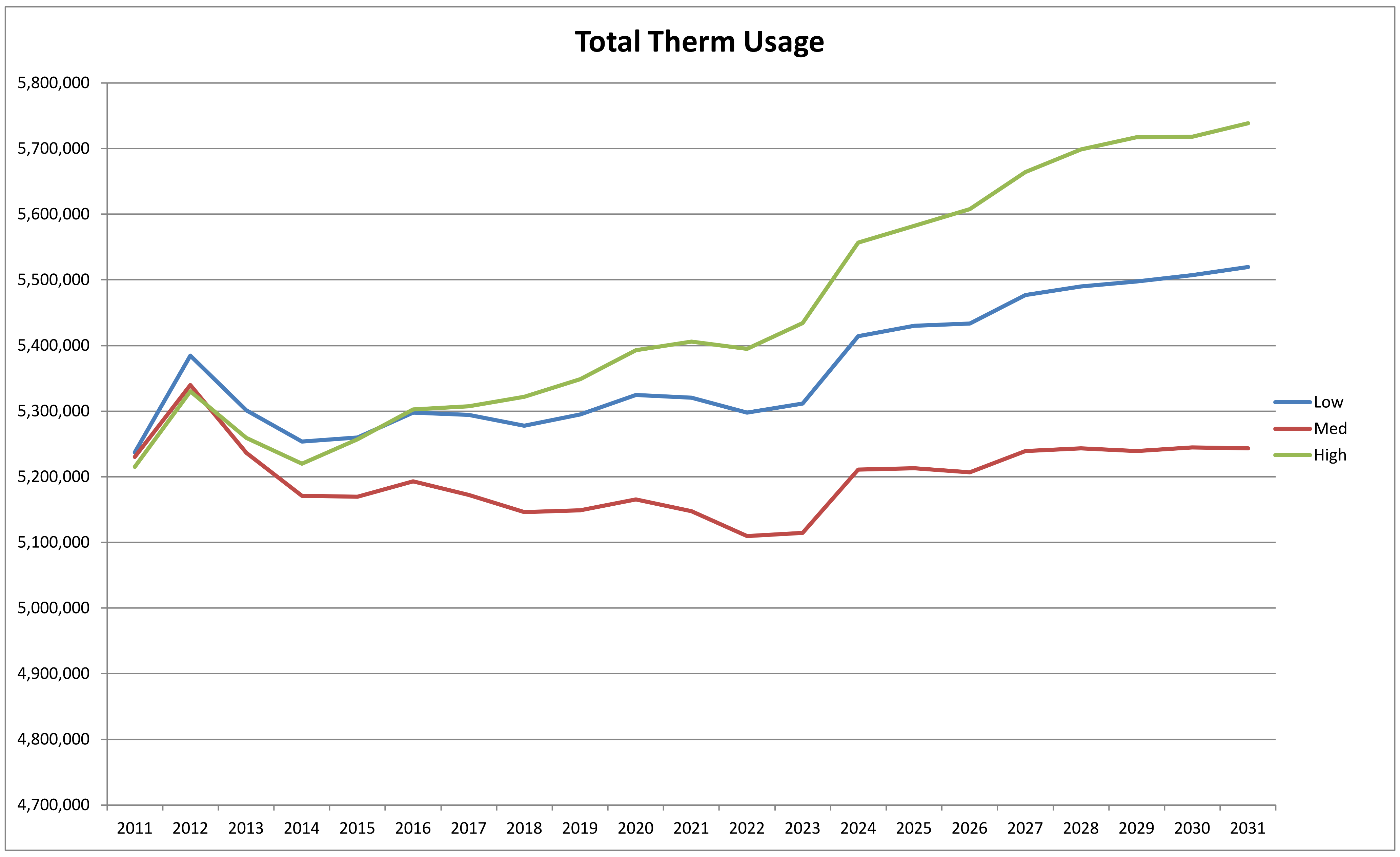
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1,898,234	3,338,635	5,236,869	1,897,184	3,332,869	5,230,053	1,895,083	3,319,894	5,214,977	0.58%	26.01%	15.43%	0.53%	25.79%	15.28%	0.42%	25.30%	14.95%
2012	2,121,352	3,263,009	5,384,361	2,111,467	3,228,553	5,340,020	2,096,209	3,233,920	5,330,129	11.75%	-2.27%	2.82%	11.29%	-3.13%	2.10%	10.61%	-2.59%	2.21%
2013	2,102,198	3,198,640	5,300,839	2,090,114	3,146,002	5,236,116	2,074,647	3,184,548	5,259,195	-0.90%	-1.97%	-1.55%	-1.01%	-2.56%	-1.95%	-1.03%	-1.53%	-1.33%
2014	2,086,603	3,166,992	5,253,595	2,073,409	3,097,423	5,170,832	2,054,711	3,164,978	5,219,689	-0.74%	-0.99%	-0.89%	-0.80%	-1.54%	-1.25%	-0.96%	-0.61%	-0.75%
2015	2,076,671	3,183,090	5,259,761	2,065,198	3,104,245	5,169,443	2,049,503	3,207,792	5,257,295	-0.48%	0.51%	0.12%	-0.40%	0.22%	-0.03%	-0.25%	1.35%	0.72%
2016	2,077,079	3,220,807	5,297,886	2,063,686	3,129,099	5,192,785	2,043,856	3,258,599	5,302,455	0.02%	1.18%	0.72%	-0.07%	0.80%	0.45%	-0.28%	1.58%	0.86%
2017	2,079,250	3,215,310	5,294,560	2,063,926	3,108,585	5,172,511	2,040,527	3,266,507	5,307,035	0.10%	-0.17%	-0.06%	0.01%	-0.66%	-0.39%	-0.16%	0.24%	0.09%
2018	2,075,978	3,201,869	5,277,847	2,062,198	3,084,248	5,146,446	2,041,504	3,280,243	5,321,746	-0.16%	-0.42%	-0.32%	-0.08%	-0.78%	-0.50%	0.05%	0.42%	0.28%
2019	2,073,998	3,221,182	5,295,180	2,058,193	3,090,419	5,148,612	2,033,790	3,315,073	5,348,863	-0.10%	0.60%	0.33%	-0.19%	0.20%	0.04%	-0.38%	1.06%	0.51%
2020	2,075,558	3,249,370	5,324,928	2,058,262	3,107,503	5,165,765	2,031,227	3,361,683	5,392,910	0.08%	0.88%	0.56%	0.00%	0.55%	0.33%	-0.13%	1.41%	0.82%
2021	2,079,767	3,240,701	5,320,467	2,061,508	3,086,302	5,147,810	2,032,895	3,372,725	5,405,620	0.20%	-0.27%	-0.08%	0.16%	-0.68%	-0.35%	0.08%	0.33%	0.24%
2022	2,078,049	3,219,831	5,297,880	2,058,259	3,051,342	5,109,600	2,026,959	3,367,613	5,394,572	-0.08%	-0.64%	-0.42%	-0.16%	-1.13%	-0.74%	-0.29%	-0.15%	-0.20%
2023	2,075,837	3,235,901	5,311,738	2,055,636	3,058,886	5,114,522	2,024,406	3,409,532	5,433,939	-0.11%	0.50%	0.26%	-0.13%	0.25%	0.10%	-0.13%	1.24%	0.73%
2024	2,079,977	3,334,411	5,414,387	2,058,089	3,153,161	5,211,250	2,022,827	3,533,616	5,556,443	0.20%	3.04%	1.93%	0.12%	3.08%	1.89%	-0.08%	3.64%	2.25%
2025	2,096,866	3,333,041	5,429,907	2,072,564	3,140,132	5,212,696	2,033,037	3,549,019	5,582,057	0.81%	-0.04%	0.29%	0.70%	-0.41%	0.03%	0.50%	0.44%	0.46%
2026	2,098,651	3,334,814	5,433,465	2,073,792	3,133,077	5,206,868	2,032,996	3,574,759	5,607,755	0.09%	0.05%	0.07%	0.06%	-0.22%	-0.11%	0.00%	0.73%	0.46%
2027	2,105,839	3,371,254	5,477,094	2,077,992	3,160,844	5,238,836	2,032,416	3,631,781	5,664,198	0.34%	1.09%	0.80%	0.20%	0.89%	0.61%	-0.03%	1.60%	1.01%
2028	2,112,158	3,377,986	5,490,144	2,082,971	3,160,280	5,243,251	2,035,815	3,662,892	5,698,707	0.30%	0.20%	0.24%	0.24%	-0.02%	0.08%	0.17%	0.86%	0.61%
2029	2,118,405	3,379,299	5,497,704	2,087,334	3,151,604	5,238,938	2,035,350	3,681,826	5,717,176	0.30%	0.04%	0.14%	0.21%	-0.27%	-0.08%	-0.02%	0.52%	0.32%
2030	2,127,534	3,379,299	5,506,833	2,092,759	3,151,604	5,244,363	2,035,827	3,681,826	5,717,653	0.43%	0.00%	0.17%	0.26%	0.00%	0.10%	0.02%	0.00%	0.01%
2031	2,136,181	3,383,550	5,519,732	2,097,624	3,145,578	5,243,202	2,035,645	3,702,764	5,738,409	0.41%	0.13%	0.23%	0.23%	-0.19%	-0.02%	-0.01%	0.57%	0.36%

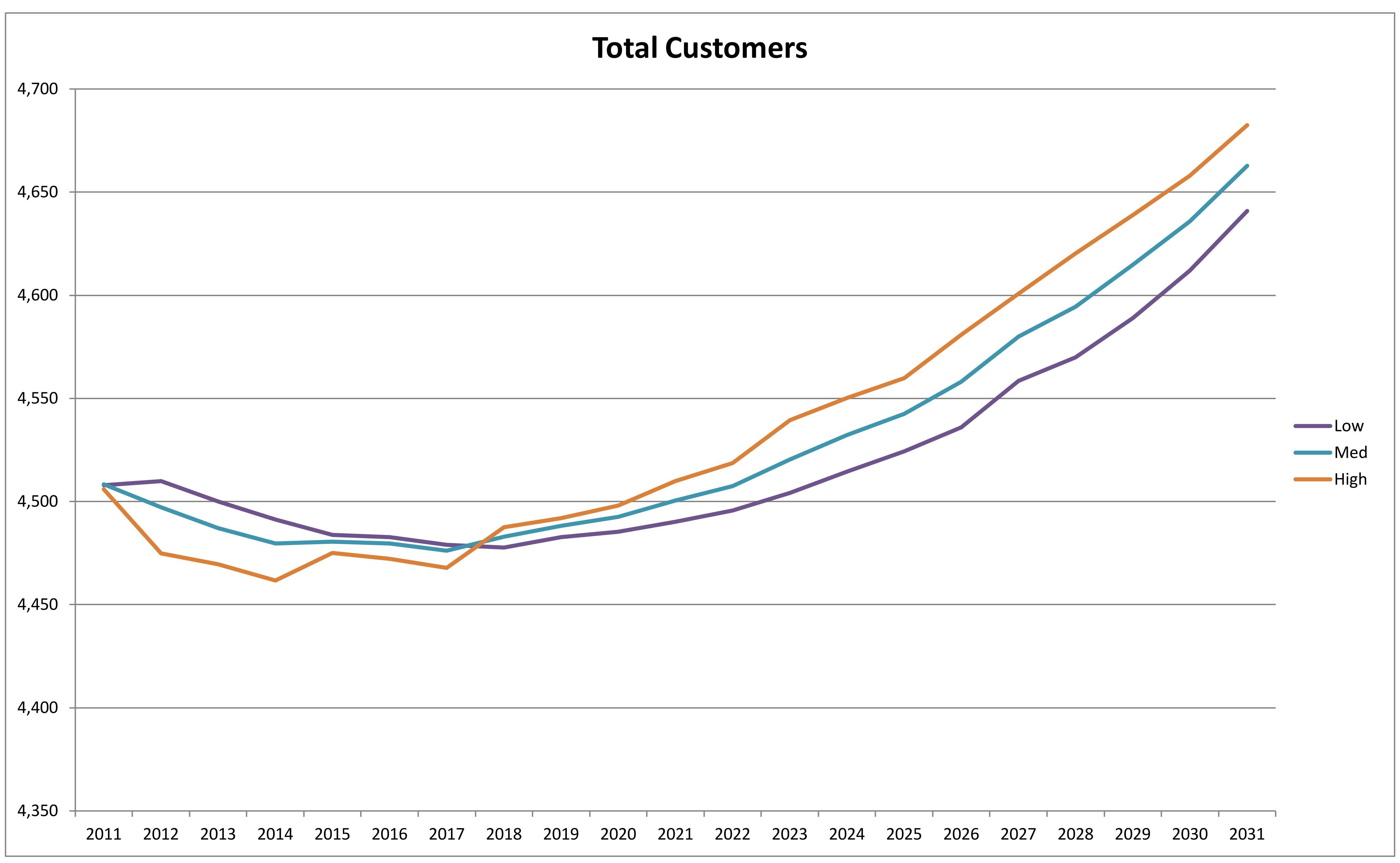
Customer Count Forecast / Annual Change

	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3,615	893	4,508	3,613	895	4,508	3,609	897	4,506	0.58%	1.46%	0.76%	0.53%	1.74%	0.77%	0.42%	1.94%	0.72%
2012	3,616	894	4,510	3,603	894	4,497	3,583	892	4,475	0.03%	0.11%	0.04%	-0.28%	-0.13%	-0.25%	-0.72%	-0.58%	-0.69%
2013	3,608	892	4,500	3,594	893	4,487	3,578	892	4,470	-0.22%	-0.21%	-0.22%	-0.25%	-0.12%	-0.22%	-0.14%	-0.03%	-0.12%
2014	3,601	890	4,491	3,588	892	4,480	3,571	891	4,462	-0.19%	-0.19%	-0.19%	-0.17%	-0.14%	-0.16%	-0.20%	-0.11%	-0.18%
2015	3,595	889	4,484	3,588	892	4,480	3,581	894	4,475	-0.17%	-0.15%	-0.16%	0.00%	0.08%	0.02%	0.28%	0.40%	0.30%
2016	3,594	889	4,483	3,587	893	4,480	3,578	894	4,472	-0.03%	-0.02%	-0.03%	-0.03%	0.01%	-0.02%	-0.08%	0.00%	-0.07%
2017	3,591	888	4,479	3,584	892	4,476	3,574	894	4,468	-0.08%	-0.09%	-0.08%	-0.08%	-0.05%	-0.08%	-0.11%	-0.02%	-0.09%
2018	3,590	888	4,478	3,589	894	4,483	3,589	899	4,488	-0.03%	-0.03%	-0.03%	0.14%	0.20%	0.15%	0.42%	0.51%	0.44%
2019	3,594	889	4,483	3,593	895	4,488	3,592	900	4,492	0.11%	0.10%	0.11%	0.11%	0.15%	0.12%	0.08%	0.17%	0.10%
2020	3,596	889	4,485	3,596	897	4,493	3,596	902	4,498	0.06%	0.09%	0.06%	0.08%	0.16%	0.10%	0.11%	0.22%	0.13%
2021	3,600	890	4,490	3,602	898	4,500	3,605	905	4,510	0.11%	0.09%	0.11%	0.17%	0.20%	0.17%	0.25%	0.33%	0.27%
2022	3,604	892	4,496	3,607	900	4,507	3,611	908	4,519	0.11%	0.15%	0.12%	0.14%	0.23%	0.16%	0.17%	0.29%	0.19%
2023	3,611	893	4,504	3,617	903	4,520	3,627	912	4,539	0.19%	0.18%	0.19%	0.28%	0.33%	0.29%	0.44%	0.53%	0.46%
2024	3,619	895	4,514	3,626	906	4,532	3,635	915	4,550	0.22%	0.25%	0.23%	0.25%	0.29%	0.26%	0.22%	0.31%	0.24%
2025	3,627	897	4,524	3,634	909	4,543	3,642	918	4,560	0.22%	0.22%	0.22%	0.22%	0.26%	0.23%	0.19%	0.29%	0.21%
2026	3,636	900	4,536	3,646	912	4,558	3,658	923	4,581	0.25%	0.27%	0.25%	0.33%	0.39%	0.34%	0.44%	0.54%	0.46%
2027	3,654	905	4,559	3,663	917	4,580	3,673	928	4,601	0.50%	0.52%	0.50%	0.47%	0.54%	0.48%	0.41%	0.53%	0.43%
2028	3,663	907	4,570	3,674	920	4,594	3,688	932	4,620	0.25%	0.27%	0.25%	0.30%	0.38%	0.32%	0.41%	0.50%	0.43%
2029	3,678	911	4,589	3,690	925	4,615	3,702	937	4,639	0.41%	0.45%	0.42%	0.44%	0.48%	0.44%	0.38%	0.48%	0.40%
2030	3,701	911	4,612	3,711	925	4,636	3,721	937	4,658	0.63%	0.00%	0.50%	0.57%	0.00%	0.46%	0.51%	0.00%	0.41%
2031	3,724	917	4,641	3,732	931	4,663	3,740	943	4,683	0.62%	0.64%	0.63%	0.57%	0.64%	0.58%	0.51%	0.61%	0.53%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Ontario





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

OR

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	49,060,810	22,759,533	71,820,343	49,910,734	23,167,327	73,078,061	51,207,322	23,791,659	74,998,981
2012	49,152,799	22,797,691	71,950,489	50,137,817	23,272,201	73,410,018	51,824,345	24,084,490	75,908,835
2013	49,141,630	22,808,310	71,949,940	50,148,028	23,293,813	73,441,841	52,323,690	24,329,978	76,653,668
2014	49,477,322	22,975,958	72,453,280	50,579,198	23,503,748	74,082,946	53,241,869	24,760,045	78,001,913
2015	50,181,239	23,307,326	73,488,565	51,518,033	23,936,757	75,454,790	54,536,511	25,353,515	79,890,026
2016	50,964,873	23,672,551	74,637,423	52,552,972	24,411,033	76,964,005	55,945,034	25,998,532	81,943,566
2017	51,511,893	23,931,214	75,443,107	53,376,238	24,791,629	78,167,867	57,167,103	26,558,919	83,726,022
2018	52,060,792	24,191,803	76,252,595	54,175,215	25,161,124	79,336,340	58,434,858	27,139,589	85,574,447
2019	52,795,597	24,534,759	77,330,356	55,188,858	25,625,565	80,814,423	59,893,219	27,804,280	87,697,499
2020	53,589,616	24,903,069	78,492,685	56,291,757	26,129,909	82,421,665	61,476,604	28,524,826	90,001,429
2021	54,112,365	25,148,999	79,261,363	57,133,479	26,515,544	83,649,022	62,865,496	29,156,690	92,022,186
2022	54,638,674	25,396,463	80,035,138	57,961,446	26,896,480	84,857,926	64,261,546	29,792,888	94,054,433
2023	55,473,019	25,784,339	81,257,359	59,125,610	27,427,023	86,552,633	65,956,321	30,559,443	96,515,764
2024	56,755,256	26,368,089	83,123,345	60,806,291	28,184,331	88,990,622	68,280,624	31,605,426	99,886,050
2025	57,385,497	26,659,685	84,045,183	61,823,511	28,645,620	90,469,131	69,934,636	32,350,781	102,285,417
2026	58,083,277	26,981,082	85,064,359	62,878,491	29,124,709	92,003,200	71,710,151	33,150,882	104,861,033
2027	58,949,246	27,376,574	86,325,820	64,171,975	29,707,599	93,879,575	73,743,741	34,063,987	107,807,728
2028	59,635,653	27,692,636	87,328,289	65,348,076	30,238,801	95,586,877	75,708,514	34,947,510	110,656,024
2029	60,252,905	27,974,500	88,227,404	66,396,578	30,710,107	97,106,684	77,609,499	35,799,815	113,409,313
2030	60,547,333	28,109,549	88,656,882	66,901,115	30,942,094	97,843,209	78,311,553	36,121,824	114,433,377
2031	61,173,255	28,395,645	89,568,899	67,975,054	31,425,238	99,400,291	80,296,251	37,010,997	117,307,248

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	6.99%	6.99%	6.99%	8.85%	8.91%	8.87%	11.67%	11.84%	11.73%
2012	0.19%	0.17%	0.18%	0.45%	0.45%	0.45%	1.20%	1.23%	1.21%
2013	-0.02%	0.05%	0.00%	0.02%	0.09%	0.04%	0.96%	1.02%	0.98%
2014	0.68%	0.74%	0.70%	0.86%	0.90%	0.87%	1.75%	1.77%	1.76%
2015	1.42%	1.44%	1.43%	1.86%	1.84%	1.85%	2.43%	2.40%	2.42%
2016	1.56%	1.57%	1.56%	2.01%	1.98%	2.00%	2.58%	2.54%	2.57%
2017	1.07%	1.09%	1.08%	1.57%	1.56%	1.56%	2.18%	2.16%	2.18%
2018	1.07%	1.09%	1.07%	1.50%	1.49%	1.49%	2.22%	2.19%	2.21%
2019	1.41%	1.42%	1.41%	1.87%	1.85%	1.86%	2.50%	2.45%	2.48%
2020	1.50%	1.50%	1.50%	2.00%	1.97%	1.99%	2.64%	2.59%	2.63%
2021	0.98%	0.99%	0.98%	1.50%	1.48%	1.49%	2.26%	2.22%	2.25%
2022	0.97%	0.98%	0.98%	1.45%	1.44%	1.45%	2.22%	2.18%	2.21%
2023	1.53%	1.53%	1.53%	2.01%	1.97%	2.00%	2.64%	2.57%	2.62%
2024	2.31%	2.26%	2.30%	2.84%	2.76%	2.82%	3.52%	3.42%	3.49%
2025	1.11%	1.11%	1.11%	1.67%	1.64%	1.66%	2.42%	2.36%	2.40%
2026	1.22%	1.21%	1.21%	1.71%	1.67%	1.70%	2.54%	2.47%	2.52%
2027	1.49%	1.47%	1.48%	2.06%	2.00%	2.04%	2.84%	2.75%	2.81%
2028	1.16%	1.15%	1.16%	1.83%	1.79%	1.82%	2.66%	2.59%	2.64%
2029	1.04%	1.02%	1.03%	1.60%	1.56%	1.59%	2.51%	2.44%	2.49%
2030	0.49%	0.48%	0.49%	0.76%	0.76%	0.76%	0.90%	0.90%	0.90%
2031	1.03%	1.02%	1.03%	1.61%	1.56%	1.59%	2.53%	2.46%	2.51%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	62,355	772,101	834,456	63,472	774,669	838,141	65,183	778,345	843,527
2012	62,459	777,893	840,352	63,759	781,609	845,368	65,985	786,540	852,525
2013	62,489	789,110	851,599	63,819	788,810	852,628	66,657	801,278	867,935
2014	62,948	801,719	864,667	64,394	804,134	868,528	67,836	818,730	886,566
2015	63,856	813,974	877,830	65,580	819,020	884,600	69,462	835,991	905,453
2016	64,856	826,191	891,047	66,880	833,889	900,769	71,229	853,251	924,480
2017	65,565	838,735	904,300	67,922	849,153	917,075	72,764	870,980	943,744
2018	66,279	851,298	917,576	68,935	864,613	933,547	74,355	889,024	963,379
2019	67,219	863,749	930,967	70,207	879,934	950,141	76,176	906,936	983,112
2020	68,228	876,084	944,311	71,589	895,246	966,835	78,150	924,979	1,003,129
2021	68,901	888,793	957,694	72,645	911,013	983,658	79,881	943,530	1,023,411
2022	69,579	901,560	971,139	73,689	926,932	1,000,621	81,624	962,237	1,043,861
2023	70,642	913,886	984,528	75,143	942,471	1,017,614	83,725	980,796	1,064,520
2024	72,241	925,706	997,947	77,217	957,535	1,034,752	86,590	998,808	1,085,398
2025	73,040	938,241	1,011,282	78,481	973,366	1,051,847	88,632	1,017,619	1,106,251
2026	73,921	950,626	1,024,547	79,794	989,248	1,069,042	90,824	1,036,642	1,127,467
2027	75,004	962,880	1,037,885	81,391	1,004,977	1,086,368	93,326	1,055,554	1,148,880
2028	75,870	975,202	1,051,073	82,846	1,020,821	1,103,667	95,747	1,074,649	1,170,396
2029	76,642	987,612	1,064,255	84,137	1,036,964	1,121,101	98,082	1,094,136	1,192,218
2030	77,012	998,147	1,075,160	84,773	1,050,918	1,135,691	98,964	1,111,731	1,210,695
2031	77,796	1,010,704	1,088,500	86,097	1,067,347	1,153,443	101,400	1,131,640	1,233,040

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	6.99%	0.75%	1.19%	8.91%	1.08%	1.64%	11.84%	1.56%	2.29%
2012	0.17%	0.75%	0.71%	0.45%	0.90%	0.86%	1.23%	1.05%	1.07%
2013	0.05%	1.44%	1.34%	0.09%	0.92%	0.86%	1.02%	1.87%	1.81%
2014	0.74%	1.60%	1.53%	0.90%	1.94%	1.86%	1.77%	2.18%	2.15%
2015	1.44%	1.53%	1.52%	1.84%	1.85%	1.85%	2.40%	2.11%	2.13%
2016	1.57%	1.50%	1.51%	1.98%	1.82%	1.83%	2.54%	2.06%	2.10%
2017	1.09%	1.52%	1.49%	1.56%	1.83%	1.81%	2.16%	2.08%	2.08%
2018	1.09%	1.50%	1.47%	1.49%	1.82%	1.80%	2.19%	2.07%	2.08%
2019	1.42%	1.46%	1.46%	1.85%	1.77%	1.78%	2.45%	2.01%	2.05%
2020	1.50%	1.43%	1.43%	1.97%	1.74%	1.76%	2.59%	1.99%	2.04%
2021	0.99%	1.45%	1.42%	1.48%	1.76%	1.74%	2.22%	2.01%	2.02%
2022	0.98%	1.44%	1.40%	1.44%	1.75%	1.72%	2.18%	1.98%	2.00%
2023	1.53%	1.37%	1.38%	1.97%	1.68%	1.70%	2.57%	1.93%	1.98%
2024	2.26%	1.29%	1.36%	2.76%	1.60%	1.68%	3.42%	1.84%	1.96%
2025	1.11%	1.35%	1.34%	1.64%	1.65%	1.65%	2.36%	1.88%	1.92%
2026	1.21%	1.32%	1.31%	1.67%	1.63%	1.63%	2.47%	1.87%	1.92%
2027	1.47%	1.29%	1.30%	2.00%	1.59%	1.62%	2.75%	1.82%	1.90%
2028	1.15%	1.28%	1.27%	1.79%	1.58%	1.59%	2.59%	1.81%	1.87%
2029	1.02%	1.27%	1.25%	1.56%	1.58%	1.58%	2.44%	1.81%	1.86%
2030	0.48%	1.07%	1.02%	0.76%	1.35%	1.30%	0.90%	1.61%	1.55%
2031	1.02%	1.26%	1.24%	1.56%	1.56%	1.56%	2.46%	1.79%	1.85%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	38,294,247	33,526,096	71,820,343	39,343,950	33,734,111	73,078,061	41,043,963	33,955,017	74,998,981
2012	38,560,079	33,390,410	71,950,489	39,767,472	33,642,546	73,410,018	41,714,080	34,194,755	75,908,835
2013	38,582,366	33,367,573	71,949,940	39,737,083	33,704,758	73,441,841	42,061,439	34,592,229	76,653,668
2014	38,907,672	33,545,608	72,453,280	40,078,716	34,004,230	74,082,946	42,784,150	35,217,763	78,001,913
2015	39,466,030	34,022,535	73,488,565	40,799,251	34,655,539	75,454,790	43,687,152	36,202,874	79,890,026
2016	40,000,536	34,636,888	74,637,423	41,497,106	35,466,899	76,964,005	44,582,716	37,360,850	81,943,566
2017	40,425,680	35,017,426	75,443,107	42,146,142	36,021,725	78,167,867	45,422,095	38,303,927	83,726,022
2018	40,901,124	35,351,470	76,252,595	42,797,950	36,538,390	79,336,340	46,328,698	39,245,749	85,574,447
2019	41,439,266	35,891,090	77,330,356	43,515,760	37,298,663	80,814,423	47,245,830	40,451,669	87,697,499
2020	41,984,540	36,508,145	78,492,685	44,257,257	38,164,408	82,421,665	48,199,709	41,801,720	90,001,429
2021	42,367,291	36,894,073	79,261,363	44,870,816	38,778,206	83,649,022	49,090,987	42,931,199	92,022,186
2022	42,837,881	37,197,257	80,035,138	45,548,714	39,309,213	84,857,926	50,050,112	44,004,321	94,054,433
2023	43,500,421	37,756,938	81,257,359	46,395,310	40,157,323	86,552,633	51,063,990	45,451,774	96,515,764
2024	44,224,662	38,898,683	83,123,345	47,281,684	41,708,939	88,990,622	52,186,831	47,699,219	99,886,050
2025	44,684,004	39,361,179	84,045,183	47,988,136	42,480,995	90,469,131	53,127,902	49,157,514	102,285,417
2026	45,219,829	39,844,530	85,064,359	48,703,304	43,299,896	92,003,200	54,143,160	50,717,874	104,861,033
2027	45,778,584	40,547,236	86,325,820	49,479,949	44,399,625	93,879,575	55,168,275	52,639,452	107,807,728
2028	46,242,075	41,086,213	87,328,289	50,257,859	45,329,019	95,586,877	56,227,902	54,428,122	110,656,024
2029	46,667,225	41,560,180	88,227,404	50,908,316	46,198,368	97,106,684	57,210,927	56,198,386	113,409,313
2030	47,096,702	41,560,180	88,656,882	51,644,841	46,198,368	97,843,209	58,234,991	56,198,386	114,433,377
2031	47,544,379	42,024,520	89,568,899	52,325,112	47,075,180	99,400,291	59,276,542	58,030,705	117,307,248

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	3.17%	11.72%	6.99%	6.00%	12.42%	8.87%	10.58%	13.15%	11.73%
2012	0.69%	-0.40%	0.18%	1.08%	-0.27%	0.45%	1.63%	0.71%	1.21%
2013	0.06%	-0.07%	0.00%	-0.08%	0.18%	0.04%	0.83%	1.16%	0.98%
2014	0.84%	0.53%	0.70%	0.86%	0.89%	0.87%	1.72%	1.81%	1.76%
2015	1.44%	1.42%	1.43%	1.80%	1.92%	1.85%	2.11%	2.80%	2.42%
2016	1.35%	1.81%	1.56%	1.71%	2.34%	2.00%	2.05%	3.20%	2.57%
2017	1.06%	1.10%	1.08%	1.56%	1.56%	1.56%	1.88%	2.52%	2.18%
2018	1.18%	0.95%	1.07%	1.55%	1.43%	1.49%	2.00%	2.46%	2.21%
2019	1.32%	1.53%	1.41%	1.68%	2.08%	1.86%	1.98%	3.07%	2.48%
2020	1.32%	1.72%	1.50%	1.70%	2.32%	1.99%	2.02%	3.34%	2.63%
2021	0.91%	1.06%	0.98%	1.39%	1.61%	1.49%	1.85%	2.70%	2.25%
2022	1.11%	0.82%	0.98%	1.51%	1.37%	1.45%	1.95%	2.50%	2.21%
2023	1.55%	1.50%	1.53%	1.86%	2.16%	2.00%	2.03%	3.29%	2.62%
2024	1.66%	3.02%	2.30%	1.91%	3.86%	2.82%	2.20%	4.94%	3.49%
2025	1.04%	1.19%	1.11%	1.49%	1.85%	1.66%	1.80%	3.06%	2.40%
2026	1.20%	1.23%	1.21%	1.49%	1.93%	1.70%	1.91%	3.17%	2.52%
2027	1.24%	1.76%	1.48%	1.59%	2.54%	2.04%	1.89%	3.79%	2.81%
2028	1.01%	1.33%	1.16%	1.57%	2.09%	1.82%	1.92%	3.40%	2.64%
2029	0.92%	1.15%	1.03%	1.29%	1.92%	1.59%	1.75%	3.25%	2.49%
2030	0.92%	0.00%	0.49%	1.45%	0.00%	0.76%	1.79%	0.00%	0.90%
2031	0.95%	1.12%	1.03%	1.32%	1.90%	1.59%	1.79%	3.26%	2.51%

Customer Count Forecast

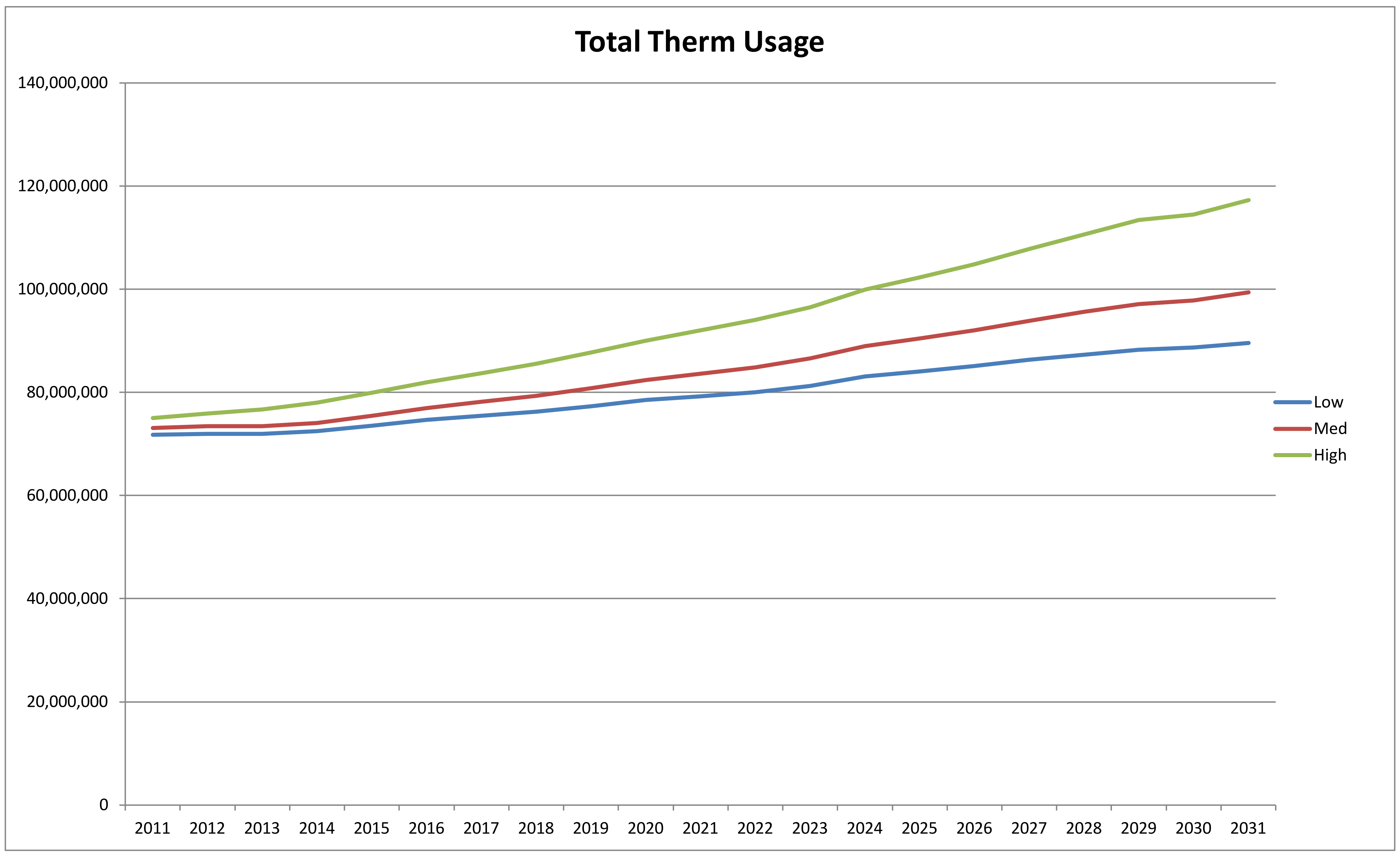
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	55,549	9,593	65,142	55,719	9,683	65,402	55,973	9,799	65,772
2012	55,801	9,744	65,545	56,018	9,866	65,884	56,338	10,015	66,353
2013	56,436	9,902	66,338	56,318	10,052	66,370	57,243	10,226	67,469
2014	57,211	10,061	67,272	57,283	10,239	67,522	58,392	10,440	68,832
2015	57,994	10,221	68,215	58,263	10,431	68,694	59,566	10,661	70,227
2016	58,783	10,383	69,166	59,249	10,623	69,872	60,744	10,880	71,624
2017	59,575	10,545	70,120	60,245	10,818	71,063	61,940	11,103	73,043
2018	60,371	10,709	71,080	61,257	11,015	72,272	63,170	11,333	74,503
2019	61,179	10,874	72,053	62,278	11,215	73,493	64,402	11,564	75,966
2020	61,983	11,040	73,023	63,305	11,416	74,721	65,653	11,798	77,451
2021	62,792	11,207	73,999	64,343	11,619	75,962	66,925	12,036	78,961
2022	63,606	11,375	74,981	65,391	11,825	77,216	68,208	12,277	80,485
2023	64,419	11,544	75,963	66,445	12,034	78,479	69,512	12,522	82,034
2024	65,237	11,715	76,952	67,510	12,244	79,754	70,829	12,770	83,599
2025	66,051	11,885	77,936	68,574	12,454	81,028	72,145	13,018	85,163
2026	66,862	12,056	78,918	69,647	12,668	82,315	73,490	13,272	86,762
2027	67,686	12,230	79,916	70,734	12,885	83,619	74,850	13,531	88,381
2028	68,497	12,402	80,899	71,817	13,101	84,918	76,217	13,790	90,007
2029	69,312	12,576	81,888	72,914	13,321	86,235	77,607	14,054	91,661
2030	70,134	12,576	82,710	74,018	13,321	87,339	79,009	14,054	93,063
2031	70,966	12,752	83,718	75,141	13,544	88,685	80,439	14,321	94,760

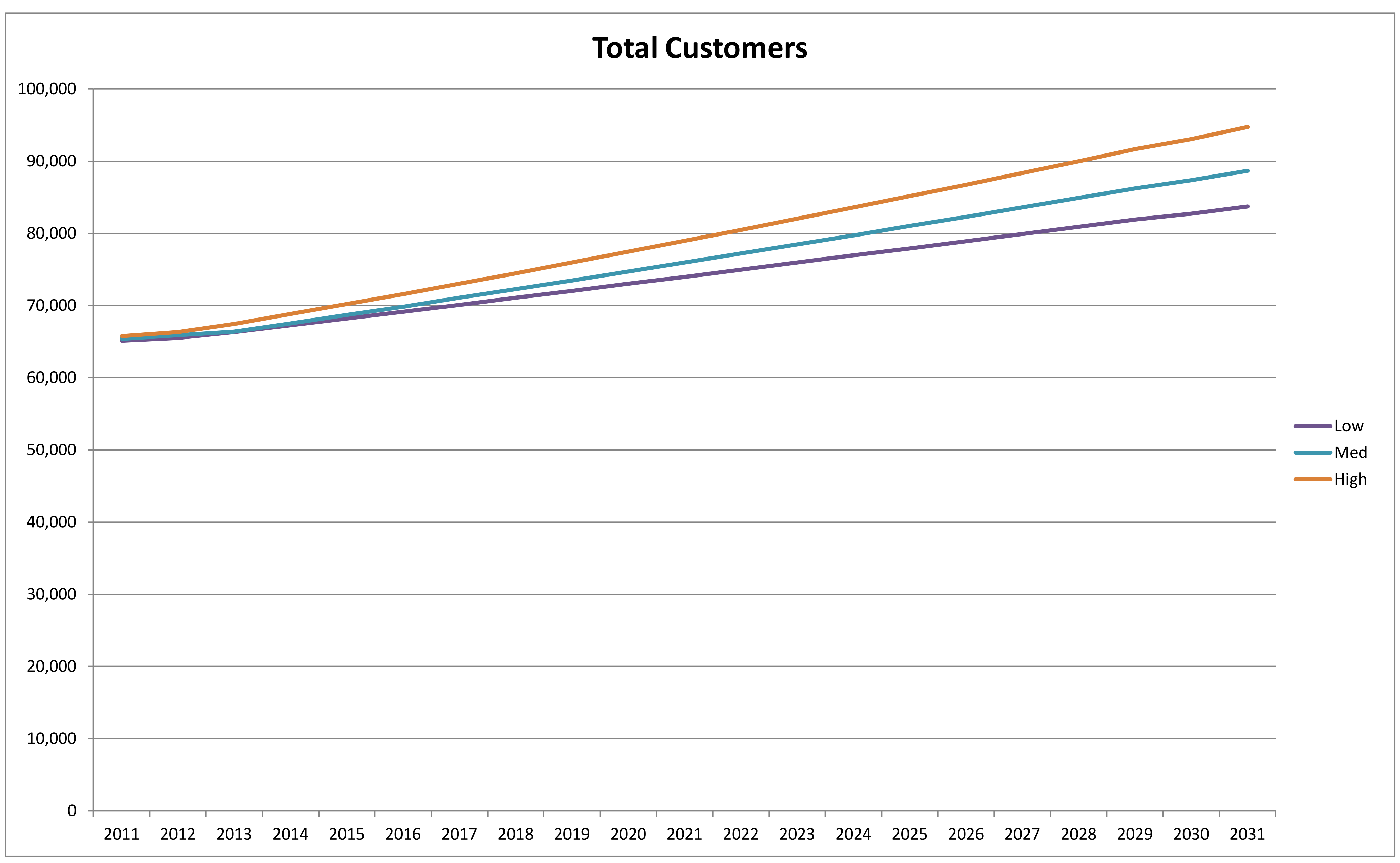
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	1.21%	0.95%	1.17%	1.52%	1.89%	1.58%	1.99%	3.12%	2.15%
2012	0.45%	1.57%	0.62%	0.54%	1.89%	0.74%	0.65%	2.20%	0.88%
2013	1.14%	1.62%	1.21%	0.54%	1.88%	0.74%	1.61%	2.11%	1.68%
2014	1.37%	1.60%	1.41%	1.71%	1.87%	1.74%	2.01%	2.09%	2.02%
2015	1.37%	1.59%	1.40%	1.71%	1.87%	1.74%	2.01%	2.12%	2.03%
2016	1.36%	1.59%	1.39%	1.69%	1.85%	1.72%	1.98%	2.06%	1.99%
2017	1.35%	1.56%	1.38%	1.68%	1.83%	1.70%	1.97%	2.05%	1.98%
2018	1.34%	1.55%	1.37%	1.68%	1.83%	1.70%	1.99%	2.07%	2.00%
2019	1.34%	1.55%	1.37%	1.67%	1.81%	1.69%	1.95%	2.03%	1.96%
2020	1.31%	1.53%	1.35%	1.65%	1.79%	1.67%	1.94%	2.02%	1.95%
2021	1.31%	1.51%	1.34%	1.64%	1.78%	1.66%	1.94%	2.02%	1.95%
2022	1.30%	1.50%	1.33%	1.63%	1.77%	1.65%	1.92%	2.00%	1.93%
2023	1.28%	1.49%	1.31%	1.61%	1.76%	1.63%	1.91%	2.00%	1.92%
2024	1.27%	1.48%	1.30%	1.60%	1.75%	1.62%	1.89%	1.97%	1.91%
2025	1.25%	1.45%	1.28%	1.58%	1.72%	1.60%	1.86%	1.95%	1.87%
2026	1.23%	1.44%	1.26%	1.56%	1.72%	1.59%	1.86%	1.95%	1.88%
2027	1.23%	1.44%	1.26%	1.56%	1.71%	1.58%	1.85%	1.95%	1.87%
2028	1.20%	1.40%	1.23%	1.53%	1.68%	1.55%	1.83%	1.92%	1.84%
2029	1.19%	1.41%	1.22%	1.53%	1.68%	1.55%	1.82%	1.91%	1.84%
2030	1.19%	0.00%	1.00%	1.51%	0.00%	1.28%	1.81%	0.00%	1.53%
2031	1.19%	1.40%	1.22%	1.52%	1.67%	1.54%	1.81%	1.90%	1.82%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

OR





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Pendleton

Annual Requirements (Therms)

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	8,277,161	4,971,623	13,248,784	8,478,391	5,092,490	13,570,881	8,797,934	5,284,422	14,082,355
2012	8,305,598	4,988,704	13,294,302	8,536,574	5,127,438	13,664,011	8,952,134	5,377,041	14,329,175
2013	8,373,076	5,029,234	13,402,310	8,606,547	5,169,467	13,776,014	9,077,506	5,452,345	14,529,851
2014	8,473,346	5,089,460	13,562,806	8,700,544	5,225,926	13,926,470	9,205,914	5,529,472	14,735,386
2015	8,594,250	5,162,081	13,756,331	8,802,373	5,287,088	14,089,461	9,336,640	5,607,992	14,944,633
2016	8,716,664	5,235,608	13,952,272	8,904,060	5,348,166	14,252,226	9,476,917	5,692,249	15,169,166
2017	8,814,743	5,294,518	14,109,261	8,992,381	5,401,215	14,393,596	9,591,369	5,760,993	15,352,362
2018	8,915,659	5,355,133	14,270,792	9,076,739	5,451,884	14,528,624	9,708,800	5,831,528	15,540,328
2019	9,027,617	5,422,379	14,449,996	9,169,255	5,507,454	14,676,709	9,827,412	5,902,771	15,730,183
2020	9,138,070	5,488,723	14,626,793	9,268,535	5,567,086	14,835,621	9,954,097	5,978,864	15,932,961
2021	9,223,496	5,540,033	14,763,530	9,337,499	5,608,508	14,946,007	10,054,795	6,039,347	16,094,142
2022	9,303,002	5,587,788	14,890,790	9,409,098	5,651,513	15,060,611	10,155,002	6,099,536	16,254,538
2023	9,419,111	5,657,528	15,076,640	9,497,912	5,704,859	15,202,771	10,257,307	6,160,985	16,418,292
2024	9,546,946	5,734,311	15,281,257	9,602,493	5,767,675	15,370,168	10,388,487	6,239,777	16,628,265
2025	9,626,765	5,782,254	15,409,019	9,663,993	5,804,614	15,468,607	10,466,597	6,286,693	16,753,290
2026	9,701,577	5,827,189	15,528,766	9,729,812	5,844,148	15,573,960	10,549,972	6,336,772	16,886,745
2027	9,786,678	5,878,305	15,664,982	9,795,779	5,883,771	15,679,550	10,633,746	6,387,090	17,020,836
2028	9,863,082	5,924,196	15,787,278	9,854,422	5,918,994	15,773,416	10,716,384	6,436,727	17,153,111
2029	9,914,887	5,955,312	15,870,199	9,889,424	5,940,019	15,829,443	10,774,911	6,471,880	17,246,791
2030	9,945,627	5,973,776	15,919,403	9,942,629	5,971,976	15,914,605	10,841,749	6,512,026	17,353,775
2031	10,001,853	6,007,548	16,009,400	9,982,196	5,995,741	15,977,937	10,898,920	6,546,365	17,445,285

Annual Change

	Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	8.37%	8.37%	8.37%	11.01%	11.01%	11.01%	15.19%	15.19%	15.19%
2012	0.34%	0.34%	0.34%	0.69%	0.69%	0.69%	1.75%	1.75%	1.75%
2013	0.81%	0.81%	0.81%	0.82%	0.82%	0.82%	1.40%	1.40%	1.40%
2014	1.20%	1.20%	1.20%	1.09%	1.09%	1.09%	1.41%	1.41%	1.41%
2015	1.43%	1.43%	1.43%	1.17%	1.17%	1.17%	1.42%	1.42%	1.42%
2016	1.42%	1.42%	1.42%	1.16%	1.16%	1.16%	1.50%	1.50%	1.50%
2017	1.13%	1.13%	1.13%	0.99%	0.99%	0.99%	1.21%	1.21%	1.21%
2018	1.14%	1.14%	1.14%	0.94%	0.94%	0.94%	1.22%	1.22%	1.22%
2019	1.26%	1.26%	1.26%	1.02%	1.02%	1.02%	1.22%	1.22%	1.22%
2020	1.22%	1.22%	1.22%	1.08%	1.08%	1.08%	1.29%	1.29%	1.29%
2021	0.93%	0.93%	0.93%	0.74%	0.74%	0.74%	1.01%	1.01%	1.01%
2022	0.86%	0.86%	0.86%	0.77%	0.77%	0.77%	1.00%	1.00%	1.00%
2023	1.25%	1.25%	1.25%	0.94%	0.94%	0.94%	1.01%	1.01%	1.01%
2024	1.36%	1.36%	1.36%	1.10%	1.10%	1.10%	1.28%	1.28%	1.28%
2025	0.84%	0.84%	0.84%	0.64%	0.64%	0.64%	0.75%	0.75%	0.75%
2026	0.78%	0.78%	0.78%	0.68%	0.68%	0.68%	0.80%	0.80%	0.80%
2027	0.88%	0.88%	0.88%	0.68%	0.68%	0.68%	0.79%	0.79%	0.79%
2028	0.78%	0.78%	0.78%	0.60%	0.60%	0.60%	0.78%	0.78%	0.78%
2029	0.53%	0.53%	0.53%	0.36%	0.36%	0.36%	0.55%	0.55%	0.55%
2030	0.31%	0.31%	0.31%	0.54%	0.54%	0.54%	0.62%	0.62%	0.62%
2031	0.57%	0.57%	0.57%	0.40%	0.40%	0.40%	0.53%	0.53%	0.53%

Peak Day - Baseload

	Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak
2011	13,621	184,434	198,054	13,952	186,047	199,999	14,478	188,523	203,001
2012	13,668	187,784	201,452	14,048	190,199	204,246	14,732	193,900	208,632
2013	13,779	192,066	205,845	14,163	194,297	208,460	14,938	198,261	213,199
2014	13,944	196,370	210,314	14,318	198,766	213,083	15,149	202,839	217,988
2015	14,143	200,589	214,732	14,485	203,138	217,624	15,364	207,232	222,596
2016	14,344	204,753	219,097	14,653	207,460	222,112	15,595	211,590	227,186
2017	14,506	208,891	223,396	14,798	211,737	226,535	15,784	215,910	231,694
2018	14,672	212,940	227,611	14,937	215,936	230,873	15,977	220,156	236,133
2019	14,856	216,903	231,759	15,089	220,041	235,129	16,172	224,271	240,443
2020	15,038	220,752	235,790	15,252	224,048	239,301	16,380	228,337	244,717
2021	15,178	224,576	239,754	15,366	228,040	243,406	16,546	232,380	248,926
2022	15,309	228,310	243,619	15,484	231,895	247,379	16,711	236,226	252,937
2023	15,500	231,851	247,351	15,630	235,574	251,204	16,879	239,921	256,801
2024	15,710	235,225	250,935	15,802	239,111	254,913	17,095	243,454	260,549
2025	15,842	238,528	254,370	15,903	242,522	258,425	17,224	246,811	264,035
2026	15,965	241,643	257,607	16,011	245,744	261,755	17,361	250,043	267,404
2027	16,105	244,593	260,698	16,120	248,820	264,940	17,499	253,114	270,613
2028	16,231	247,392	263,623	16,216	251,741	267,958	17,635	255,987	273,622
2029	16,316	250,053	266,368	16,274	254,539	270,814	17,731	258,787	276,518
2030	16,367	252,398	268,765	16,362	256,896	273,257	17,841	261,089	278,930
2031	16,459	254,918	271,377	16,427	259,536	275,963	17,935	263,708	281,643

Annual Change

	Low			Medium			High		
	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	8.37%	0.02%	0.55%	11.01%	0.90%	1.54%	15.19%	2.24%	3.07%
2012	0.34%	1.82%	1.72%	0.69%	2.23%	2.12%	1.75%	2.85%	2.77%
2013	0.81%	2.28%	2.18%	0.82%	2.15%	2.06%	1.40%	2.25%	2.19%
2014	1.20%	2.24%	2.17%	1.09%	2.30%	2.22%	1.41%	2.31%	2.25%
2015	1.43%	2.15%	2.10%	1.17%	2.20%	2.13%	1.42%	2.17%	2.11%
2016	1.42%	2.08%	2.03%	1.16%	2.13%	2.06%	1.50%	2.10%	2.06%
2017	1.13%	2.02%	1.96%	0.99%	2.06%	1.99%	1.21%	2.04%	1.98%
2018	1.14%	1.94%	1.89%	0.94%	1.98%	1.92%	1.22%	1.97%	1.92%
2019	1.26%	1.86%	1.82%	1.02%	1.90%	1.84%	1.22%	1.87%	1.83%
2020	1.22%	1.77%	1.74%	1.08%	1.82%	1.77%	1.29%	1.81%	1.78%
2021	0.93%	1.73%	1.68%	0.74%	1.78%	1.72%	1.01%	1.77%	1.72%
2022	0.86%	1.66%	1.61%	0.77%	1.69%	1.63%	1.00%	1.65%	1.61%
2023	1.25%	1.55%	1.53%	0.94%	1.59%	1.55%	1.01%	1.56%	1.53%
2024	1.36%	1.46%	1.45%	1.10%	1.50%	1.48%	1.28%	1.47%	1.46%
2025	0.84%	1.40%	1.37%	0.64%	1.43%	1.38%	0.75%	1.38%	1.34%
2026	0.78%	1.31%	1.27%	0.68%	1.33%	1.29%	0.80%	1.31%	1.28%
2027	0.88%	1.22%	1.20%	0.68%	1.25%	1.22%	0.79%	1.23%	1.20%
2028	0.78%	1.14%	1.12%	0.60%	1.17%	1.14%	0.78%	1.14%	1.11%
2029	0.53%	1.08%	1.04%	0.36%	1.11%	1.07%	0.55%	1.09%	1.06%
2030	0.31%	0.94%	0.90%	0.54%	0.93%	0.90%	0.62%	0.89%	0.87%
2031	0.57%	1.00%	0.97%	0.40%	1.03%	0.99%	0.53%	1.00%	0.97%

Therm Usage by Class

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	5,786,265	7,462,519	13,248,784	6,072,614	7,498,267	13,570,881	6,543,600	7,538,755	14,082,355
2012	5,808,192	7,486,110	13,294,302	6,158,097	7,505,914	13,664,011	6,752,836	7,576,339	14,329,175
2013	5,881,356	7,520,954	13,402,310	6,262,434	7,513,580	13,776,014	6,924,204	7,605,647	14,529,851
2014	5,999,389	7,563,417	13,562,806	6,402,715	7,523,755	13,926,470	7,092,764	7,642,622	14,735,386
2015	6,137,987	7,618,344	13,756,331	6,551,434	7,538,027	14,089,461	7,254,702	7,689,931	14,944,633
2016	6,274,998	7,677,274	13,952,272	6,698,482	7,553,744	14,252,226	7,428,357	7,740,809	15,169,166
2017	6,385,659	7,723,602	14,109,261	6,831,016	7,562,580	14,393,596	7,574,364	7,777,998	15,352,362
2018	6,505,042	7,765,750	14,270,792	6,960,255	7,568,369	14,528,624	7,730,282	7,810,046	15,540,328
2019	6,634,438	7,815,558	14,449,996	7,099,005	7,577,704	14,676,709	7,881,384	7,848,799	15,730,183
2020	6,760,152	7,866,641	14,626,793	7,248,016	7,587,605	14,835,621	8,044,623	7,888,338	15,932,961
2021	6,857,588	7,905,942	14,763,530	7,355,458	7,590,549	14,946,007	8,178,772	7,915,370	16,094,142
2022	6,950,952	7,939,838	14,890,790	7,471,030	7,589,581	15,060,611	8,319,038	7,935,500	16,254,538
2023	7,093,388	7,983,252	15,076,640	7,608,636	7,594,135	15,202,771	8,453,886	7,964,406	16,418,292
2024	7,231,974	8,049,283	15,281,257	7,756,756	7,613,412	15,370,168	8,613,040	8,015,225	16,628,265
2025	7,324,800	8,084,219	15,409,019	7,856,580	7,612,027	15,468,607	8,719,983	8,033,307	16,753,290
2026	7,410,932	8,117,834	15,528,766	7,964,250	7,609,710	15,573,960	8,836,965	8,049,780	16,886,745
2027	7,506,300	8,158,682	15,664,982	8,066,925	7,612,625	15,679,550	8,947,917	8,072,919	17,020,836
2028	7,596,428	8,190,850	15,787,278	8,164,050	7,609,366	15,773,416	9,066,644	8,086,467	17,153,111
2029	7,651,476	8,218,723	15,870,199	8,225,875	7,603,568	15,829,443	9,151,128	8,095,663	17,246,791
2030	7,700,680	8,218,723	15,919,403	8,311,037	7,603,568	15,914,605	9,258,112	8,095,663	17,353,775
2031	7,765,278	8,244,122	16,009,400	8,382,120	7,595,817	15,977,937	9,343,938	8,101,348	17,445,285

Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	4.07%	11.96%	8.37%	9.22%	12.50%	11.01%	17.69%	13.10%	15.19%
2012	0.38%	0.32%	0.34%	1.41%	0.10%	0.69%	3.20%	0.50%	1.75%
2013	1.26%	0.47%	0.81%	1.69%	0.10%	0.82%	2.54%	0.39%	1.40%
2014	2.01%	0.56%	1.20%	2.24%	0.14%	1.09%	2.43%	0.49%	1.41%
2015	2.31%	0.73%	1.43%	2.32%	0.19%	1.17%	2.28%	0.62%	1.42%
2016	2.23%	0.77%	1.42%	2.24%	0.21%	1.16%	2.39%	0.66%	1.50%
2017	1.76%	0.60%	1.13%	1.98%	0.12%	0.99%	1.97%	0.48%	1.21%
2018	1.87%	0.55%	1.14%	1.89%	0.08%	0.94%	2.06%	0.41%	1.22%
2019	1.99%	0.64%	1.26%	1.99%	0.12%	1.02%	1.95%	0.50%	1.22%
2020	1.89%	0.65%	1.22%	2.10%	0.13%	1.08%	2.07%	0.50%	1.29%
2021	1.44%	0.50%	0.93%	1.48%	0.04%	0.74%	1.67%	0.34%	1.01%
2022	1.36%	0.43%	0.86%	1.57%	-0.01%	0.77%	1.72%	0.25%	1.00%
2023	2.05%	0.55%	1.25%	1.84%	0.06%	0.94%	1.62%	0.36%	1.01%
2024	1.95%	0.83%	1.36%	1.95%	0.25%	1.10%	1.88%	0.64%	1.28%
2025	1.28%	0.43%	0.84%	1.29%	-0.02%	0.64%	1.24%	0.23%	0.75%
2026	1.18%	0.42%	0.78%	1.37%	-0.03%	0.68%	1.34%	0.21%	0.80%
2027	1.29%	0.50%	0.88%	1.29%	0.04%	0.68%	1.26%	0.29%	0.79%
2028	1.20%	0.39%	0.78%	1.20%	-0.04%	0.60%	1.33%	0.17%	0.78%
2029	0.72%	0.34%	0.53%	0.76%	-0.08%	0.36%	0.93%	0.11%	0.55%
2030	0.64%	0.00%	0.31%	1.04%	0.00%	0.54%	1.17%	0.00%	0.62%
2031	0.84%	0.31%	0.57%	0.86%	-0.10%	0.40%	0.93%	0.07%	0.53%

Customer Count Forecast

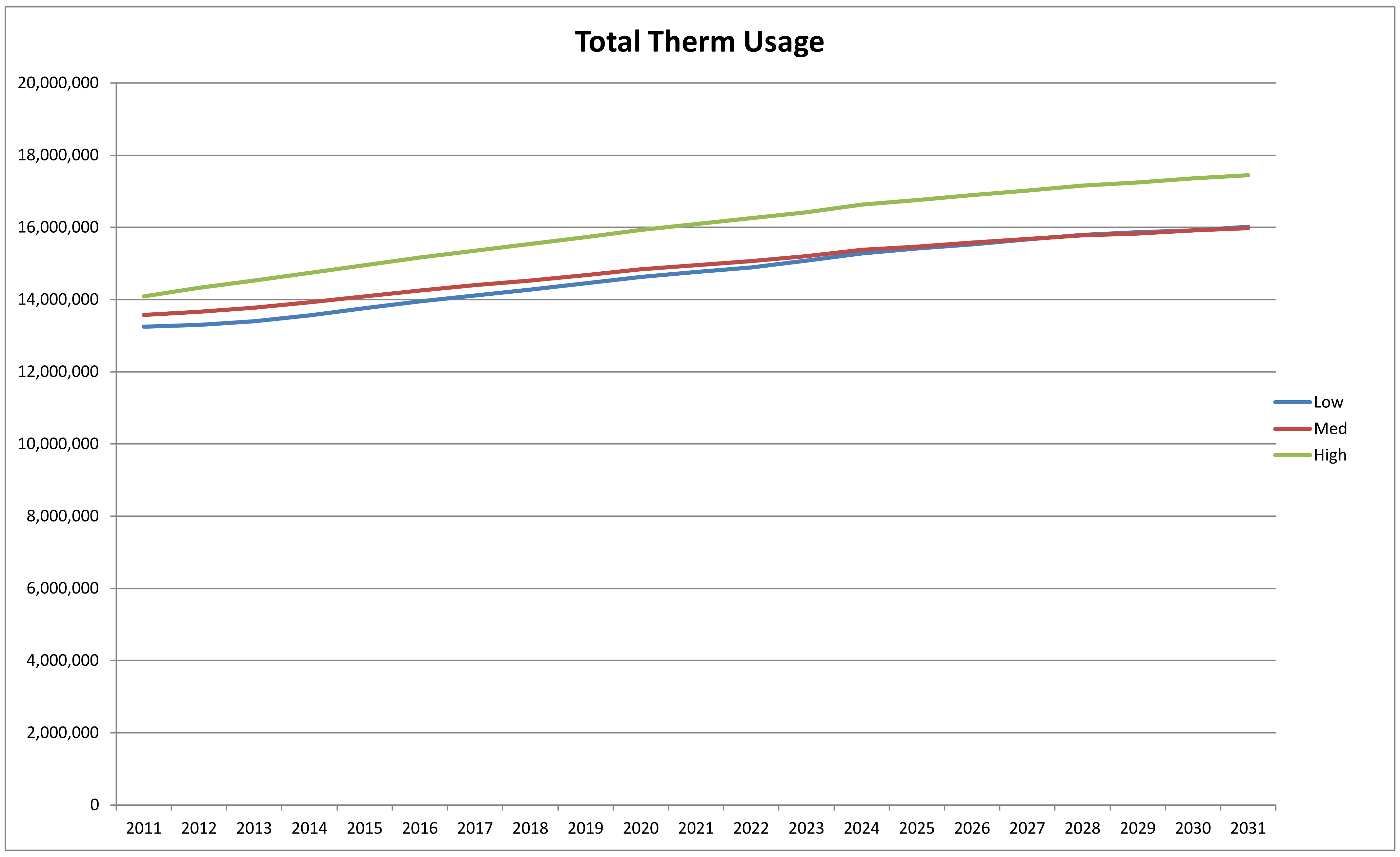
	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	10,617	1,864	12,481	10,729	1,874	12,603	10,906	1,887	12,793
2012	10,816	1,879	12,695	10,977	1,894	12,871	11,236	1,911	13,147
2013	11,076	1,896	12,972	11,223	1,914	13,137	11,502	1,933	13,435
2014	11,341	1,912	13,253	11,495	1,933	13,428	11,782	1,955	13,737
2015	11,603	1,929	13,532	11,762	1,952	13,714	12,051	1,976	14,027
2016	11,862	1,945	13,807	12,026	1,971	13,997	12,319	1,998	14,317
2017	12,117	1,961	14,078	12,286	1,990	14,276	12,582	2,019	14,601
2018	12,367	1,976	14,343	12,541	2,008	14,549	12,841	2,039	14,880
2019	12,613	1,992	14,605	12,791	2,026	14,817	13,092	2,060	15,152
2020	12,852	2,007	14,859	13,036	2,044	15,080	13,341	2,080	15,421
2021	13,087	2,022	15,109	13,277	2,062	15,339	13,586	2,101	15,687
2022	13,316	2,036	15,352	13,510	2,079	15,589	13,819	2,120	15,939
2023	13,537	2,050	15,587	13,734	2,096	15,830	14,043	2,140	16,183
2024	13,749	2,064	15,813	13,951	2,113	16,064	14,260	2,159	16,419
2025	13,952	2,078	16,030	14,156	2,129	16,285	14,461	2,178	16,639
2026	14,143	2,091	16,234	14,350	2,145	16,495	14,655	2,196	16,851
2027	14,325	2,103	16,428	14,535	2,161	16,696	14,839	2,214	17,053
2028	14,497	2,116	16,613	14,710	2,176	16,886	15,011	2,232	17,243
2029	14,658	2,128	16,786	14,875	2,191	17,066	15,176	2,249	17,425
2030	14,809	2,128	16,937	15,029	2,191	17,220	15,328	2,249	17,577
2031	14,962	2,139	17,101	15,185	2,205	17,390	15,482	2,266	17,748

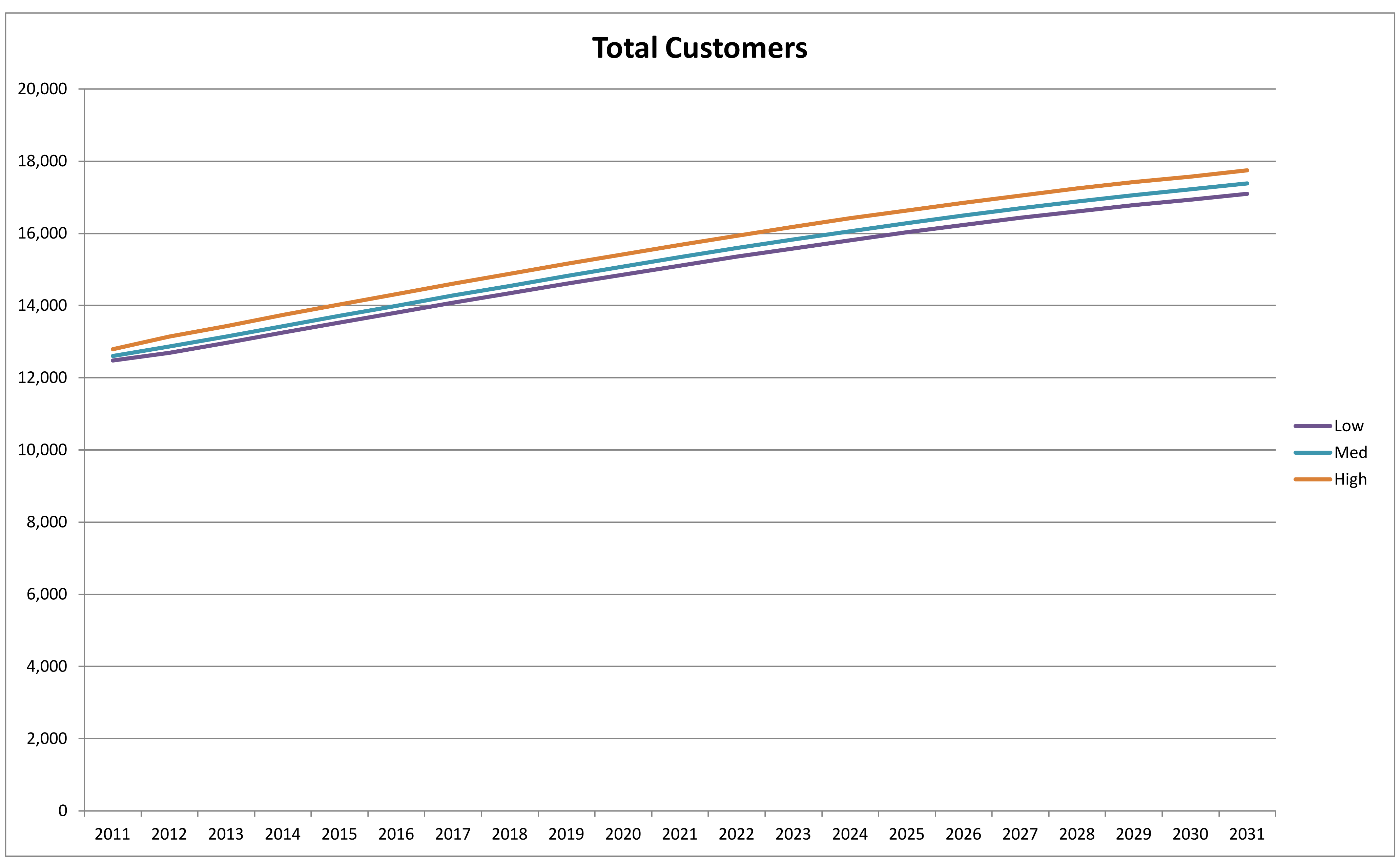
Annual Change

	Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	0.45%	1.13%	0.55%	1.51%	1.70%	1.54%	3.19%	2.36%	3.07%
2012	1.87%	0.81%	1.72%	2.31%	1.05%	2.12%	3.03%	1.32%	2.77%
2013	2.40%	0.90%	2.18%	2.24%	1.03%	2.06%	2.37%	1.14%	2.19%
2014	2.39%	0.87%	2.17%	2.42%	1.01%	2.22%	2.43%	1.13%	2.25%
2015	2.31%	0.86%	2.10%	2.32%	0.99%	2.13%	2.28%	1.09%	2.11%
2016	2.23%	0.83%	2.03%	2.24%	0.97%	2.06%	2.22%	1.07%	2.06%
2017	2.15%	0.82%	1.96%	2.16%	0.95%	1.99%	2.13%	1.06%	1.98%
2018	2.06%	0.80%	1.89%	2.08%	0.92%	1.92%	2.06%	1.03%	1.92%
2019	1.99%	0.78%	1.82%	1.99%	0.91%	1.84%	1.95%	1.01%	1.83%
2020	1.89%	0.75%	1.74%	1.92%	0.88%	1.77%	1.90%	0.99%	1.78%
2021	1.83%	0.74%	1.68%	1.85%	0.87%	1.72%	1.84%	0.97%	1.72%
2022	1.75%	0.72%	1.61%	1.75%	0.84%	1.63%	1.72%	0.94%	1.61%
2023	1.66%	0.70%	1.53%	1.66%	0.82%	1.55%	1.62%	0.92%	1.53%
2024	1.57%	0.68%	1.45%	1.58%	0.80%	1.48%	1.55%	0.90%	1.46%
2025	1.48%	0.65%	1.37%	1.47%	0.77%	1.38%	1.41%	0.86%	1.34%
2026	1.37%	0.63%	1.27%	1.37%	0.75%	1.29%	1.34%	0.84%	1.28%
2027	1.29%	0.61%	1.20%	1.29%	0.73%	1.22%	1.26%	0.83%	1.20%
2028	1.20%	0.58%	1.12%	1.20%	0.70%	1.14%	1.16%	0.80%	1.11%
2029	1.11%	0.57%	1.04%	1.12%	0.69%	1.07%	1.10%	0.79%	1.06%
2030	1.03%	0.00%	0.90%	1.04%	0.00%	0.90%	1.00%	0.00%	0.87%
2031	1.03%	0.55%	0.97%	1.04%	0.66%	0.99%	1.00%	0.75%	0.97%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Pendleton





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

Sunnyside

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	20,033,325	7,169,085	27,202,410	20,316,856	7,270,550	27,587,406	20,770,484	7,432,884	28,203,368	1.37%	1.37%	1.37%	2.81%	2.81%	2.81%	5.10%	5.10%	5.10%
2012	19,835,751	7,098,382	26,934,133	20,150,086	7,210,869	27,360,955	20,737,279	7,421,001	28,158,280	-0.99%	-0.99%	-0.99%	-0.82%	-0.82%	-0.82%	-0.16%	-0.16%	-0.16%
2013	19,735,156	7,062,383	26,797,540	20,036,848	7,170,346	27,207,195	20,693,303	7,405,264	28,098,566	-0.51%	-0.51%	-0.51%	-0.56%	-0.56%	-0.56%	-0.21%	-0.21%	-0.21%
2014	19,746,619	7,066,486	26,813,105	20,033,054	7,168,989	27,202,042	20,734,136	7,419,877	28,154,013	0.06%	0.06%	0.06%	-0.02%	-0.02%	-0.02%	0.20%	0.20%	0.20%
2015	19,855,514	7,105,455	26,960,969	20,158,262	7,213,795	27,372,058	20,872,803	7,469,500	28,342,303	0.55%	0.55%	0.55%	0.63%	0.63%	0.63%	0.67%	0.67%	0.67%
2016	20,011,238	7,161,182	27,172,420	20,321,837	7,272,332	27,594,169	21,043,686	7,530,651	28,574,337	0.78%	0.78%	0.78%	0.81%	0.81%	0.81%	0.82%	0.82%	0.82%
2017	20,045,505	7,173,444	27,218,950	20,363,794	7,287,347	27,651,141	21,121,477	7,558,490	28,679,967	0.17%	0.17%	0.17%	0.21%	0.21%	0.21%	0.37%	0.37%	0.37%
2018	20,089,119	7,189,052	27,278,171	20,382,450	7,294,023	27,676,472	21,178,417	7,578,866	28,757,283	0.22%	0.22%	0.22%	0.09%	0.09%	0.09%	0.27%	0.27%	0.27%
2019	20,185,123	7,223,408	27,408,530	20,493,650	7,333,817	27,827,467	21,304,482	7,623,979	28,928,461	0.48%	0.48%	0.48%	0.55%	0.55%	0.55%	0.60%	0.60%	0.60%
2020	20,312,381	7,268,948	27,581,329	20,624,052	7,380,482	28,004,534	21,447,988	7,675,334	29,123,323	0.63%	0.63%	0.63%	0.64%	0.64%	0.64%	0.67%	0.67%	0.67%
2021	20,323,483	7,272,921	27,596,404	20,626,592	7,381,391	28,007,983	21,489,505	7,690,191	29,179,697	0.05%	0.05%	0.05%	0.01%	0.01%	0.01%	0.19%	0.19%	0.19%
2022	20,322,621	7,272,613	27,595,234	20,612,715	7,376,425	27,989,140	21,517,850	7,700,335	29,218,185	0.00%	0.00%	0.00%	-0.07%	-0.07%	-0.07%	0.13%	0.13%	0.13%
2023	20,434,168	7,312,530	27,746,698	20,738,528	7,421,448	28,159,976	21,643,535	7,745,312	29,388,848	0.55%	0.55%	0.55%	0.61%	0.61%	0.61%	0.58%	0.58%	0.58%
2024	20,726,940	7,417,301	28,144,241	21,038,180	7,528,681	28,566,861	21,922,843	7,845,265	29,768,108	1.43%	1.43%	1.43%	1.44%	1.44%	1.44%	1.29%	1.29%	1.29%
2025	20,753,934	7,426,961	28,180,895	21,057,476	7,535,586	28,593,062	21,978,256	7,865,095	29,843,351	0.13%	0.13%	0.13%	0.09%	0.09%	0.09%	0.25%	0.25%	0.25%
2026	20,796,975	7,442,364	28,239,338	21,092,938	7,548,277	28,641,215	22,033,695	7,884,934	29,918,629	0.21%	0.21%	0.21%	0.17%	0.17%	0.17%	0.25%	0.25%	0.25%
2027	20,905,956	7,481,363	28,387,319	21,202,997	7,587,662	28,790,659	22,156,607	7,928,919	30,085,526	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.56%	0.56%	0.56%
2028	20,938,059	7,492,852	28,430,911	21,245,687	7,602,939	28,848,627	22,234,019	7,956,621	30,190,640	0.15%	0.15%	0.15%	0.20%	0.20%	0.20%	0.35%	0.35%	0.35%
2029	20,947,982	7,496,403	28,444,384	21,247,265	7,603,504	28,850,769	22,256,658	7,964,723	30,221,381	0.05%	0.05%	0.05%	0.01%	0.01%	0.01%	0.10%	0.10%	0.10%
2030	20,966,629	7,503,076	28,469,704	21,266,595	7,610,421	28,877,016	22,293,665	7,977,966	30,271,631	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.17%	0.17%	0.17%
2031	20,953,497	7,498,376	28,451,873	21,277,158	7,614,201	28,891,359	22,330,912	7,991,295	30,322,207	-0.06%	-0.06%	-0.06%	0.05%	0.05%	0.05%	0.17%	0.17%	0.17%

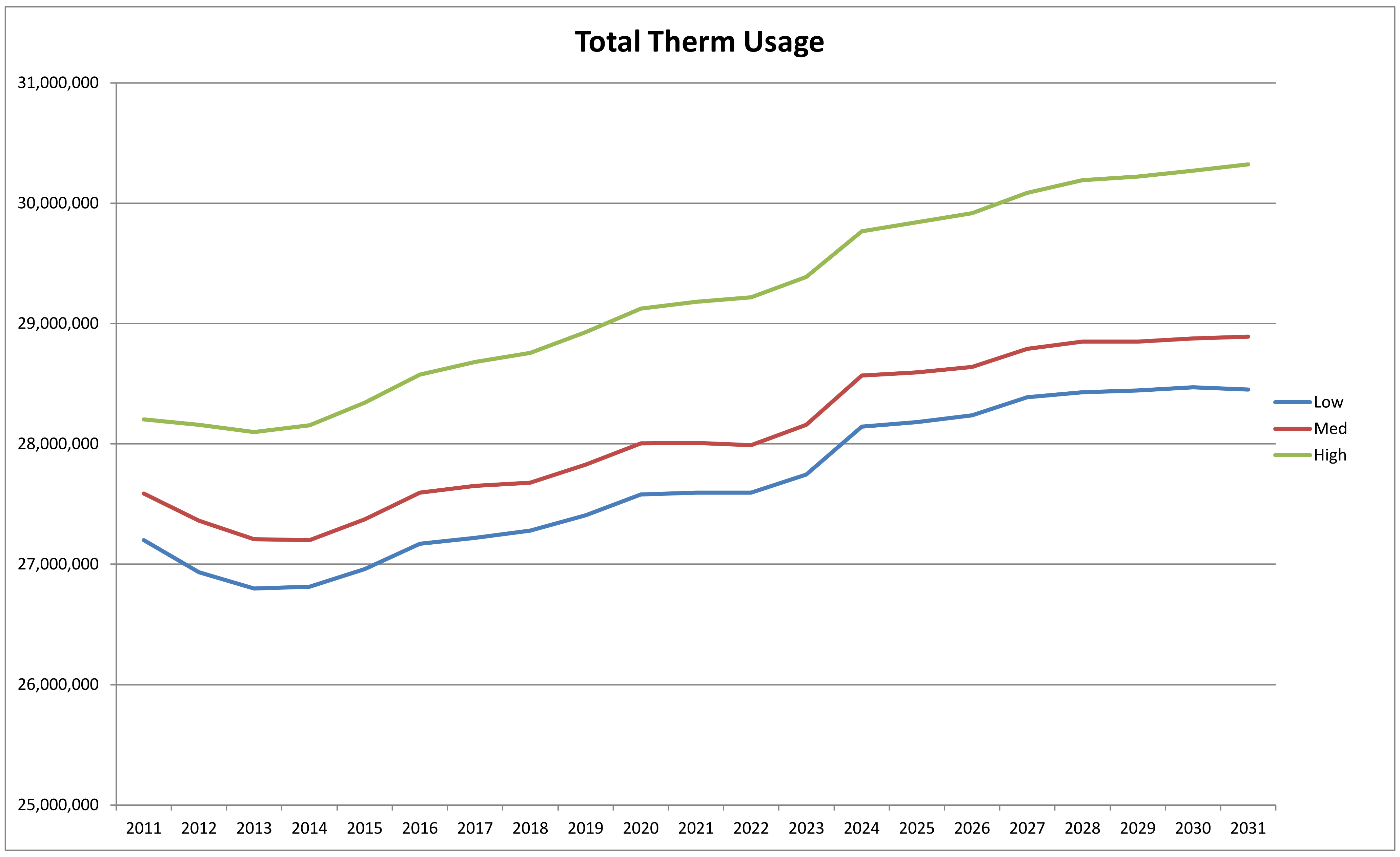
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	19,641	288,450	308,091	19,919	289,604	309,523	20,364	291,396	311,760	1.37%	0.12%	0.20%	2.81%	0.52%	0.66%	5.10%	1.14%	1.39%
2012	19,448	290,836	310,284	19,756	292,638	312,394	20,332	295,379	315,711	-0.99%	0.83%	0.71%	-0.82%	1.05%	0.93%	-0.16%	1.37%	1.27%
2013	19,349	293,768	313,117	19,645	295,590	315,234	20,288	298,213	318,501	-0.51%	1.01%	0.91%	-0.56%	1.01%	0.91%	-0.21%	0.96%	0.88%
2014	19,360	296,546	315,906	19,641	298,363	318,005	20,328	300,920	321,248	0.06%	0.95%	0.89%	-0.02%	0.94%	0.88%	0.20%	0.91%	0.86%
2015	19,467	299,171	318,638	19,764	300,953	320,717	20,464	303,444	323,909	0.55%	0.89%	0.86%	0.63%	0.87%	0.85%	0.67%	0.84%	0.83%
2016	19,620	301,692	321,311	19,924	303,446	323,370	20,632	305,865	326,497	0.78%	0.84%	0.84%	0.81%	0.83%	0.83%	0.82%	0.80%	0.80%
2017	19,653	304,273	323,926	19,965	305,987	325,952	20,708	308,320	329,028	0.17%	0.86%	0.81%	0.21%	0.84%	0.80%	0.37%	0.80%	0.78%
2018	19,696	306,773	326,469	19,984	308,491	328,475	20,764	310,721	331,485	0.22%	0.82%	0.78%	0.09%	0.82%	0.77%	0.27%	0.78%	0.75%
2019	19,790	309,163	328,953	20,093	310,847	330,940	20,888	313,012	333,899	0.48%	0.78%	0.76%	0.55%	0.76%	0.75%	0.60%	0.74%	0.73%
2020	19,915	311,464	331,379	20,220	313,127	333,347	21,028	315,255	336,284	0.63%	0.74%	0.74%	0.64%	0.73%	0.73%	0.67%	0.72%	0.71%
2021	19,926	313,836	333,762	20,223	315,502	335,725	21,069	317,571	338,640	0.05%	0.76%	0.72%	0.01%	0.76%	0.71%	0.19%	0.73%	0.70%
2022	19,925	316,190	336,115	20,209	317,850	338,060	21,097	319,841	340,938	0.00%	0.75%	0.70%	-0.07%	0.74%	0.70%	0.13%	0.71%	0.68%
2023	20,034	318,362	338,396	20,333	319,989	340,322	21,220	321,915	343,135	0.55%	0.69%	0.68%	0.61%	0.67%	0.67%	0.58%	0.65%	0.64%
2024	20,321	320,311	340,633	20,627	321,899	342,525	21,494	323,808	345,302	1.43%	0.61%	0.66%	1.44%	0.60%	0.65%	1.29%	0.59%	0.63%
2025	20,348	322,450	342,797	20,645	324,025	344,670	21,548	325,834	347,382	0.13%	0.67%	0.64%	0.09%	0.66%	0.63%	0.25%	0.63%	0.60%
2026	20,390	324,499	344,889	20,680	326,048	346,728	21,603	327,786	349,388	0.21%	0.64%	0.61%	0.17%	0.62%	0.60%	0.25%	0.60%	0.58%
2027	20,497	326,425	346,922	20,788	327,954	348,743	21,723	329,615	351,339	0.52%	0.59%	0.59%	0.52%	0.58%	0.58%	0.56%	0.56%	0.56%
2028	20,528	328,355	348,883	20,830	329,854	350,684	21,799	331,430	353,229	0.15%	0.59%	0.57%	0.20%	0.58%	0.56%	0.35%	0.55%	0.54%
2029	20,538	330,247	350,786	20,832	331,736	352,568	21,821	333,255	355,076	0.05%	0.58%	0.55%	0.01%	0.57%	0.54%	0.10%	0.55%	0.52%
2030	20,556	331,914	352,470	20,850	333,361	354,212	21,857	334,808	356,665	0.09%	0.50%	0.48%	0.09%	0.49%	0.47%	0.17%	0.47%	0.45%
2031	20,543	333,799	354,342	20,861	335,190	356,051	21,894	336,588	358,482	-0.06%	0.57%	0.53%	0.05%	0.55%	0.52%	0.17%	0.53%	0.51%

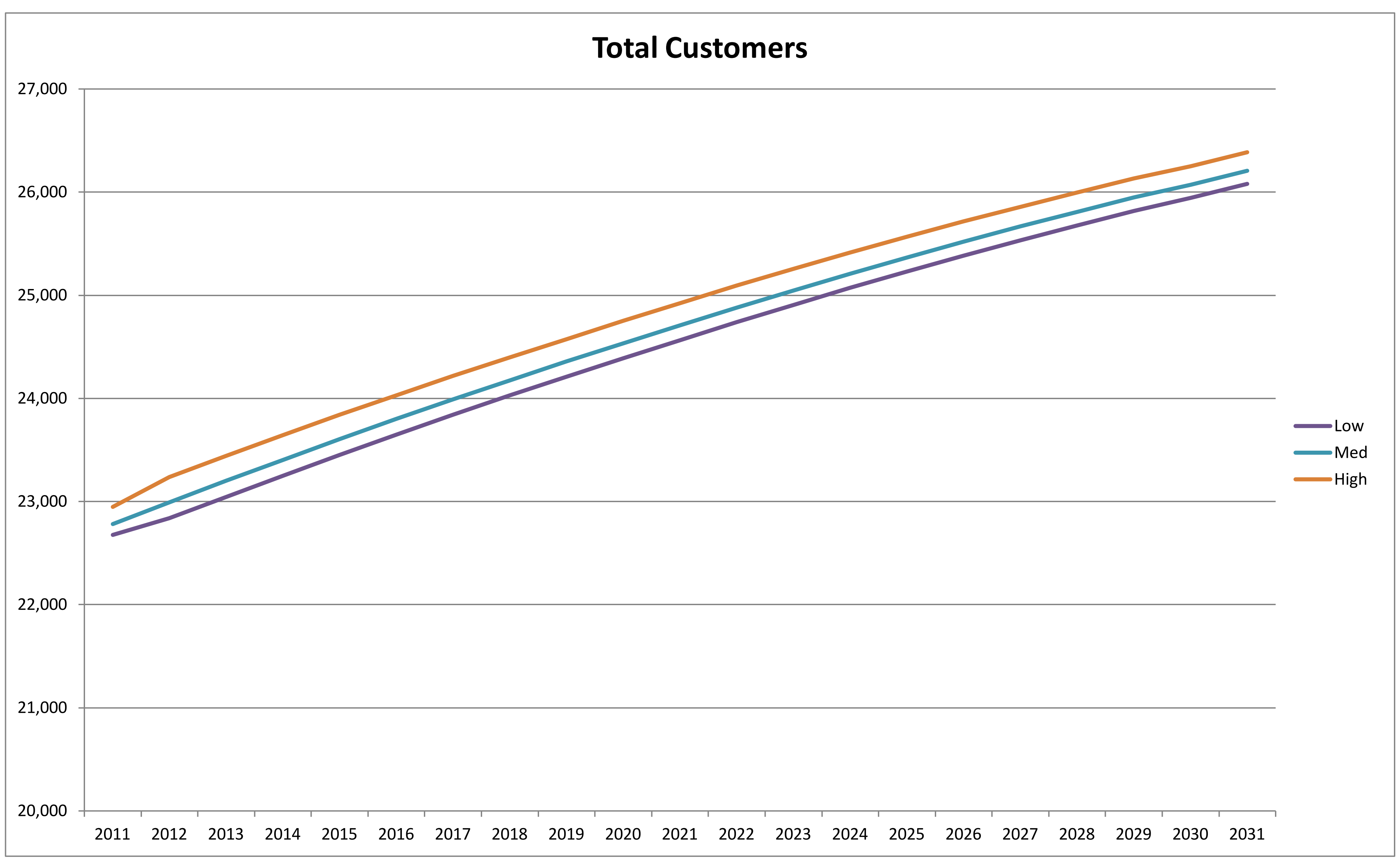
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	11,381,449	15,820,961	27,202,410	11,745,783	15,841,623	27,587,406	12,342,495	15,860,873	28,203,368	-3.99%	5.61%	1.37%	-0.92%	5.75%	2.81%	4.12%	5.88%	5.10%
2012	11,294,560	15,639,573	26,934,133	11,745,837	15,615,118	27,360,955	12,451,664	15,706,616	28,158,280	-0.76%	-1.15%	-0.99%	0.00%	-1.43%	-0.82%	0.88%	-0.97%	-0.16%
2013	11,288,918	15,508,622	26,797,540	11,762,062	15,445,133	27,207,195	12,508,923	15,589,643	28,098,566	-0.05%	-0.84%	-0.51%	0.14%	-1.09%	-0.56%	0.46%	-0.74%	-0.21%
2014	11,358,144	15,454,961	26,813,105	11,832,984	15,369,058	27,202,042	12,603,332	15,550,681	28,154,013	0.61%	-0.35%	0.06%	0.60%	-0.49%	-0.02%	0.75%	-0.25%	0.20%
2015	11,444,225	15,516,744	26,960,969	11,940,860	15,431,198	27,372,058	12,713,860	15,628,443	28,342,303	0.76%	0.40%	0.55%	0.91%	0.40%	0.63%	0.88%	0.50%	0.67%
2016	11,547,725	15,624,695	27,172,420	12,046,352	15,547,817	27,594,169	12,821,248	15,753,089	28,574,337	0.90%	0.70%	0.78%	0.88%	0.76%	0.81%	0.84%	0.80%	0.82%
2017	11,588,148	15,630,802	27,218,950	12,108,096	15,543,045	27,651,141	12,905,541	15,774,426	28,679,967	0.35%	0.04%	0.17%	0.51%	-0.03%	0.21%	0.66%	0.14%	0.37%
2018	11,665,530	15,612,641	27,278,171	12,166,784	15,509,688	27,676,472	12,986,370	15,770,913	28,757,283	0.67%	-0.12%	0.22%	0.48%	-0.21%	0.09%	0.63%	-0.02%	0.27%
2019	11,740,290	15,668,240	27,408,530	12,263,872	15,563,595	27,827,467	13,085,904	15,842,557	28,928,461	0.64%	0.36%	0.48%	0.80%	0.35%	0.55%	0.77%	0.45%	0.60%
2020	11,833,200	15,748,129	27,581,329	12,358,592	15,645,942	28,004,534	13,184,186	15,939,137	29,123,323	0.79%	0.51%	0.63%	0.77%	0.53%	0.64%	0.75%	0.61%	0.67%
2021	11,861,640	15,734,764	27,596,404	12,389,026	15,618,957	28,007,983	13,238,784	15,940,913	29,179,697	0.24%	-0.08%	0.05%	0.25%	-0.17%	0.01%	0.41%	0.01%	0.19%
2022	11,909,070	15,686,164	27,595,234	12,437,943	15,551,197	27,989,140	13,311,641	15,906,544	29,218,185	0.40%	-0.31%	0.00%	0.39%	-0.43%	-0.07%	0.55%	-0.22%	0.13%
2023	12,016,746	15,729,952	27,746,698	12,568,671	15,591,305	28,159,976	13,422,864	15,965,984	29,388,848	0.90%	0.28%	0.55%	1.05%	0.26%	0.61%	0.84%	0.37%	0.58%
2024	12,165,789	15,978,452	28,144,241	12,697,635	15,869,226	28,566,861	13,533,125	16,234,983	29,768,108	1.24%	1.58%	1.43%	1.03%	1.78%	1.44%	0.82%	1.68%	1.29%
2025	12,205,242	15,975,653	28,180,895	12,738,303	15,854,759	28,593,062	13,596,336	16,247,015	29,843,351	0.32%	-0.02%	0.13%	0.32%	-0.09%	0.09%	0.47%	0.07%	0.25%
2026	12,262,956	15,976,382	28,239,338	12,796,644	15,844,571	28,641,215	13,656,160	16,262,469	29,918,629	0.47%	0.00%	0.21%	0.46%	-0.06%	0.17%	0.44%	0.10%	0.25%
2027	12,339,932	16,047,387	28,387,319	12,874,848	15,915,811	28,790,659	13,735,281	16,350,245	30,085,526	0.63%	0.44%	0.52%	0.61%	0.45%	0.52%	0.58%	0.54%	0.56%
2028	12,370,212	16,060,699	28,430,911	12,928,088	15,920,539	28,848,627	13,811,910	16,378,730	30,190,640	0.25%	0.08%	0.15%	0.41%	0.03%	0.20%	0.56%	0.17%	0.35%
2029	12,397,720	16,046,664	28,444,384	12,956,580	15,894,189	28,850,769	13,842,090	16,379,291	30,221,381	0.22%	-0.09%	0.05%	0.22%	-0.17%	0.01%	0.22%	0.00%	0.10%
2030	12,423,040	16,046,664	28,469,704	12,982,827	15,894,189	28,877,016	13,892,340	16,379,291	30,271,631	0.20%	0.00%	0.09%	0.20%	0.00%	0.09%	0.36%	0.00%	0.17%
2031	12,426,113	16,025,760	28,451,873	13,030,980	15,860,379	28,891,359	13,949,443	16,372,764	30,322,207	0.02%	-0.13%	-0.06%	0.37%	-0.21%	0.05%	0.41%	-0.04%	0.17%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	19,193	3,483	22,676	19,287	3,494	22,781	19,437	3,509	22,946	0.16%	0.43%	0.20%	0.65%	0.76%	0.66%	1.43%	1.19%	1.39%
2012	19,340	3,497	22,837	19,479	3,514	22,993	19,702	3,535	23,237	0.77%	0.41%	0.71%	1.00%	0.55%	0.93%	1.36%	0.73%	1.27%
2013	19,531	3,515	23,046	19,669	3,533	23,202	19,887	3,555	23,442	0.99%	0.50%	0.91%	0.98%	0.54%	0.91%	0.94%	0.58%	0.88%
2014	19,719	3,532	23,251	19,854	3,552	23,406	20,069	3,575	23,644	0.96%	0.49%	0.89%	0.94%	0.53%	0.88%	0.92%	0.57%	0.86%
2015	19,903	3,549	23,452	20,035	3,570	23,605	20,245	3,595	23,840	0.93%	0.48%	0.86%	0.91%	0.52%	0.85%	0.88%	0.55%	0.83%
2016	20,083	3,566	23,649	20,212	3,589	23,801	20,416	3,615	24,031	0.90%	0.47%	0.84%	0.88%	0.51%	0.83%	0.84%	0.54%	0.80%
2017	20,259	3,583	23,842	20,384	3,607	23,991	20,583	3,634	24,217	0.88%	0.46%	0.81%	0.85%	0.50%	0.80%	0.82%	0.53%	0.78%
2018	20,430	3,599	24,029	20,552	3,624	24,176	20,745	3,653	24,398	0.84%	0.45%	0.78%	0.82%	0.49%	0.77%	0.79%	0.52%	0.75%
2019	20,597	3,615	24,212	20,716	3,642	24,358	20,904	3,672	24,576	0.82%	0.44%	0.76%	0.80%	0.48%	0.75%	0.77%	0.51%	0.73%
2020	20,760	3,630	24,390	20,876	3,659	24,535	21,061	3,690	24,751	0.79%	0.43%	0.74%	0.77%	0.47%	0.73%	0.75%	0.50%	0.71%
2021	20,920	3,645	24,565	21,034	3,676	24,710	21,216	3,709	24,925	0.77%	0.42%	0.72%	0.76%	0.47%	0.71%	0.74%	0.50%	0.70%
2022	21,078	3,661	24,739	21,189	3,693	24,882	21,367	3,727	25,094	0.76%	0.42%	0.70%	0.74%	0.46%	0.70%	0.71%	0.49%	0.68%
2023	21,231	3,676	24,907	21,339	3,709	25,048	21,511	3,744	25,255	0.73%	0.41%	0.68%	0.71%	0.45%	0.67%	0.67%	0.47%	0.64%
2024	21,381	3,690	25,071	21,485	3,725	25,210	21,653	3,762	25,415	0.71%	0.40%	0.66%	0.68%	0.44%	0.65%	0.66%	0.47%	0.63%
2025	21,526	3,705	25,231	21,627	3,741	25,368	21,789	3,779	25,568	0.68%	0.39%	0.64%	0.66%	0.43%	0.63%	0.63%	0.45%	0.60%
2026	21,666	3,718	25,384	21,763	3,757	25,520	21,920	3,796	25,716	0.65%	0.38%	0.61%	0.63%	0.41%	0.60%	0.60%	0.44%	0.58%
2027	21,802	3,732	25,534	21,896	3,772	25,668	22,047	3,812	25,859	0.63%	0.37%	0.59%	0.61%	0.41%	0.58%	0.58%	0.44%	0.56%
2028	21,933	3,745	25,678	22,024	3,787	25,811	22,170	3,828	25,998	0.60%	0.36%	0.57%	0.58%	0.39%	0.56%	0.56%	0.42%	0.54%
2029	22,060	3,758	25,818	22,148	3,802	25,950	22,290	3,844	26,134	0.58%	0.35%	0.55%	0.56%	0.39%	0.54%	0.54%	0.42%	0.52%
2030	22,184	3,758	25,942	22,269	3,802	26,071	22,407	3,844	26,251	0.56%	0.00%	0.48%	0.55%	0.00%	0.47%	0.52%	0.00%	0.45%
2031	22,309	3,771	26,080	22,390	3,816	26,206	22,525	3,860	26,385	0.56%	0.34%	0.53%	0.54%	0.38%	0.52%	0.53%	0.41%	0.51%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

Sunnyside





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

SYSTEM TOTAL

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	191,626,024	94,623,746	286,249,771	194,379,444	96,038,972	290,418,416	198,553,701	98,188,335	296,742,036	5.94%	6.35%	6.07%	7.46%	7.94%	7.62%	9.77%	10.35%	9.96%
2012	195,573,590	96,686,595	292,260,185	198,644,323	98,266,949	296,911,272	203,934,831	100,982,980	304,917,812	2.06%	2.18%	2.10%	2.19%	2.32%	2.24%	2.71%	2.85%	2.76%
2013	196,955,090	97,437,895	294,392,984	199,727,602	98,866,024	298,593,626	206,264,855	102,230,741	308,495,596	0.71%	0.78%	0.73%	0.55%	0.61%	0.57%	1.14%	1.24%	1.17%
2014	199,315,519	98,677,580	297,993,099	202,205,880	100,171,329	302,377,209	209,683,287	104,021,537	313,704,824	1.20%	1.27%	1.22%	1.24%	1.32%	1.27%	1.66%	1.75%	1.69%
2015	202,540,432	100,333,925	302,874,358	205,879,337	102,054,533	307,933,870	213,862,839	106,168,332	320,031,170	1.62%	1.68%	1.64%	1.82%	1.88%	1.84%	1.99%	2.06%	2.02%
2016	205,969,680	102,074,188	308,043,869	209,889,600	104,101,263	313,990,862	218,365,555	108,472,758	326,838,313	1.69%	1.73%	1.71%	1.95%	2.01%	1.97%	2.11%	2.17%	2.13%
2017	208,843,677	103,553,205	312,396,881	213,253,894	105,832,288	319,086,182	222,387,986	110,547,518	332,935,504	1.40%	1.45%	1.41%	1.60%	1.66%	1.62%	1.84%	1.91%	1.87%
2018	211,702,135	105,031,139	316,733,274	216,518,897	107,526,851	324,045,748	226,366,148	112,608,776	338,974,924	1.37%	1.43%	1.39%	1.53%	1.60%	1.55%	1.79%	1.86%	1.81%
2019	214,964,473	106,700,554	321,665,027	220,353,535	109,499,170	329,852,705	230,774,573	114,875,931	345,650,504	1.54%	1.59%	1.56%	1.77%	1.83%	1.79%	1.95%	2.01%	1.97%
2020	218,386,550	108,442,418	326,828,967	224,317,479	111,521,313	335,838,792	235,398,314	117,244,388	352,642,702	1.59%	1.63%	1.61%	1.80%	1.85%	1.81%	2.00%	2.06%	2.02%
2021	221,176,311	109,881,902	331,058,214	227,639,946	113,239,593	340,879,539	239,508,430	119,367,449	358,875,879	1.28%	1.33%	1.29%	1.48%	1.54%	1.50%	1.75%	1.81%	1.77%
2022	223,906,578	111,296,413	335,202,992	230,823,485	114,894,642	345,718,127	243,545,708	121,464,783	365,010,491	1.23%	1.29%	1.25%	1.40%	1.46%	1.42%	1.69%	1.76%	1.71%
2023	227,444,191	113,111,622	340,555,813	234,934,351	117,006,241	351,940,591	248,294,062	123,905,683	372,199,745	1.58%	1.63%	1.60%	1.78%	1.84%	1.80%	1.95%	2.01%	1.97%
2024	231,972,017	115,375,847	347,347,865	240,239,623	119,674,450	359,914,073	254,149,691	126,853,036	381,002,727	1.99%	2.00%	1.99%	2.26%	2.28%	2.27%	2.36%	2.38%	2.37%
2025	235,139,452	116,996,187	352,135,639	243,980,452	121,592,809	365,573,261	258,720,297	129,193,024	387,913,321	1.37%	1.40%	1.38%	1.56%	1.60%	1.57%	1.80%	1.84%	1.81%
2026	238,264,518	118,598,999	356,863,517	247,647,552	123,482,414	371,129,966	263,326,185	131,566,403	394,892,588	1.33%	1.37%	1.34%	1.50%	1.55%	1.52%	1.78%	1.84%	1.80%
2027	241,767,536	120,379,243	362,146,780	251,844,139	125,626,237	377,470,375	268,347,699	134,126,225	402,473,923	1.47%	1.50%	1.48%	1.69%	1.74%	1.71%	1.91%	1.95%	1.92%
2028	244,896,598	121,983,398	366,879,996	255,715,367	127,610,712	383,326,079	273,193,914	136,608,448	409,802,362	1.29%	1.33%	1.31%	1.54%	1.58%	1.55%	1.81%	1.85%	1.82%
2029	247,791,542	123,470,980	371,262,522	259,225,149	129,417,533	388,642,682	277,783,365	138,968,861	416,752,226	1.18%	1.22%	1.19%	1.37%	1.42%	1.39%	1.68%	1.73%	1.70%
2030	249,327,237	124,256,768	373,584,005	261,278,487	130,478,353	391,756,839	280,288,151	140,267,683	420,555,834	0.62%	0.64%	0.63%	0.79%	0.82%	0.80%	0.90%	0.93%	0.91%
2031	252,190,301	125,732,655	377,922,956	264,798,049	132,291,961	397,090,010	284,968,088	142,673,004	427,641,091	1.15%	1.19%	1.16%	1.35%	1.39%	1.36%	1.67%	1.71%	1.68%

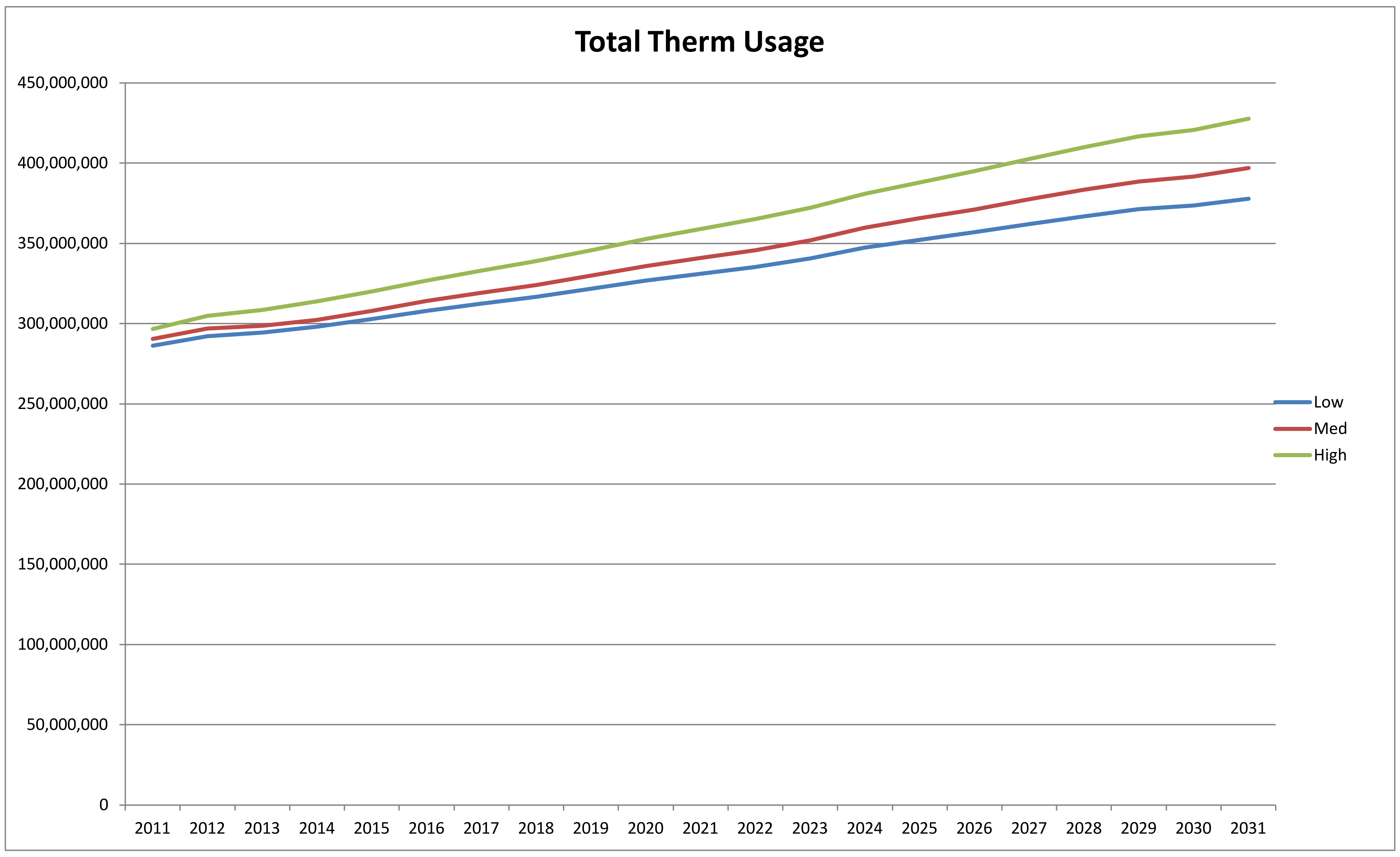
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	259,243	3,357,311	3,616,554	263,120	3,380,972	3,644,093	269,009	3,417,030	3,686,039	6.35%	0.10%	0.52%	7.94%	0.81%	1.29%	10.35%	1.88%	2.45%
2012	264,895	3,391,689	3,656,583	269,225	3,420,942	3,690,166	276,666	3,463,879	3,740,545	2.18%	1.02%	1.11%	2.32%	1.18%	1.26%	2.85%	1.37%	1.48%
2013	266,953	3,450,492	3,717,445	270,866	3,465,491	3,736,357	280,084	3,536,168	3,816,252	0.78%	1.73%	1.66%	0.61%	1.30%	1.25%	1.24%	2.09%	2.02%
2014	270,350	3,514,726	3,785,075	274,442	3,539,450	3,813,892	284,991	3,618,852	3,903,843	1.27%	1.86%	1.82%	1.32%	2.13%	2.08%	1.75%	2.34%	2.30%
2015	274,887	3,578,233	3,853,120	279,601	3,612,648	3,892,249	290,872	3,701,658	3,992,530	1.68%	1.81%	1.80%	1.88%	2.07%	2.05%	2.06%	2.29%	2.27%
2016	279,655	3,641,854	3,921,510	285,209	3,686,051	3,971,260	297,186	3,785,135	4,082,321	1.73%	1.78%	1.77%	2.01%	2.03%	2.03%	2.17%	2.26%	2.25%
2017	283,707	3,706,545	3,990,253	289,951	3,761,072	4,051,023	302,870	3,870,440	4,173,310	1.45%	1.78%	1.75%	1.66%	2.04%	2.01%	1.91%	2.25%	2.23%
2018	287,757	3,771,427	4,059,184	294,594	3,836,936	4,131,530	308,517	3,956,968	4,265,485	1.43%	1.75%	1.73%	1.60%	2.02%	1.99%	1.86%	2.24%	2.21%
2019	292,330	3,836,195	4,128,525	299,998	3,912,797	4,212,795	314,729	4,044,149	4,358,877	1.59%	1.72%	1.71%	1.83%	1.98%	1.97%	2.01%	2.20%	2.19%
2020	297,103	3,900,990	4,198,093	305,538	3,989,234	4,294,772	321,218	4,132,430	4,453,647	1.63%	1.69%	1.69%	1.85%	1.95%	1.95%	2.06%	2.18%	2.17%
2021	301,046	3,966,974	4,268,020	310,245	4,067,427	4,377,672	327,034	4,222,849	4,549,883	1.33%	1.69%	1.67%	1.54%	1.96%	1.93%	1.81%	2.19%	2.16%
2022	304,922	4,033,528	4,338,450	314,780	4,146,612	4,461,392	332,780	4,314,565	4,647,346	1.29%	1.68%	1.65%	1.46%	1.95%	1.91%	1.76%	2.17%	2.14%
2023	309,895	4,099,125	4,409,020	320,565	4,225,088	4,545,653	339,468	4,406,215	4,745,683	1.63%	1.63%	1.63%	1.84%	1.89%	1.89%	2.01%	2.12%	2.12%
2024	316,098	4,163,705	4,479,803	327,875	4,302,731	4,630,607	347,543	4,497,887	4,845,430	2.00%	1.58%	1.61%	2.28%	1.84%	1.87%	2.38%	2.08%	2.10%
2025	320,537	4,230,224	4,550,761	333,131	4,383,012	4,716,143	353,953	4,592,052	4,946,005	1.40%	1.60%	1.58%	1.60%	1.87%	1.85%	1.84%	2.09%	2.08%
2026	324,929	4,296,847	4,621,776	338,308	4,463,907	4,802,215	360,456	4,687,327	5,047,783	1.37%	1.57%	1.56%	1.55%	1.85%	1.83%	1.84%	2.07%	2.06%
2027	329,806	4,363,195	4,693,002	344,181	4,544,844	4,889,025	367,469	4,783,437	5,150,906	1.50%	1.54%	1.54%	1.74%	1.81%	1.81%	1.95%	2.05%	2.04%
2028	334,201	4,430,080	4,764,281	349,618	4,626,736	4,976,354	374,270	4,880,789	5,255,058	1.33%	1.53%	1.52%	1.58%	1.80%	1.79%	1.85%	2.04%	2.02%
2029	338,277	4,497,458	4,835,735	354,569	4,709,852	5,064,421	380,737	4,979,882	5,360,619	1.22%	1.52%	1.50%	1.42%	1.80%	1.77%	1.73%	2.03%	2.01%
2030	340,430	4,557,425	4,897,855	357,475	4,784,278	5,141,753	384,295	5,069,990	5,454,285	0.64%	1.33%	1.28%	0.82%	1.58%	1.53%	0.93%	1.81%	1.75%
2031	344,473	4,626,194	4,970,667	362,444	4,869,664	5,232,108	390,885	5,172,452	5,563,336	1.19%	1.51%	1.49%	1.39%	1.78%	1.76%	1.71%	2.02%	2.00%

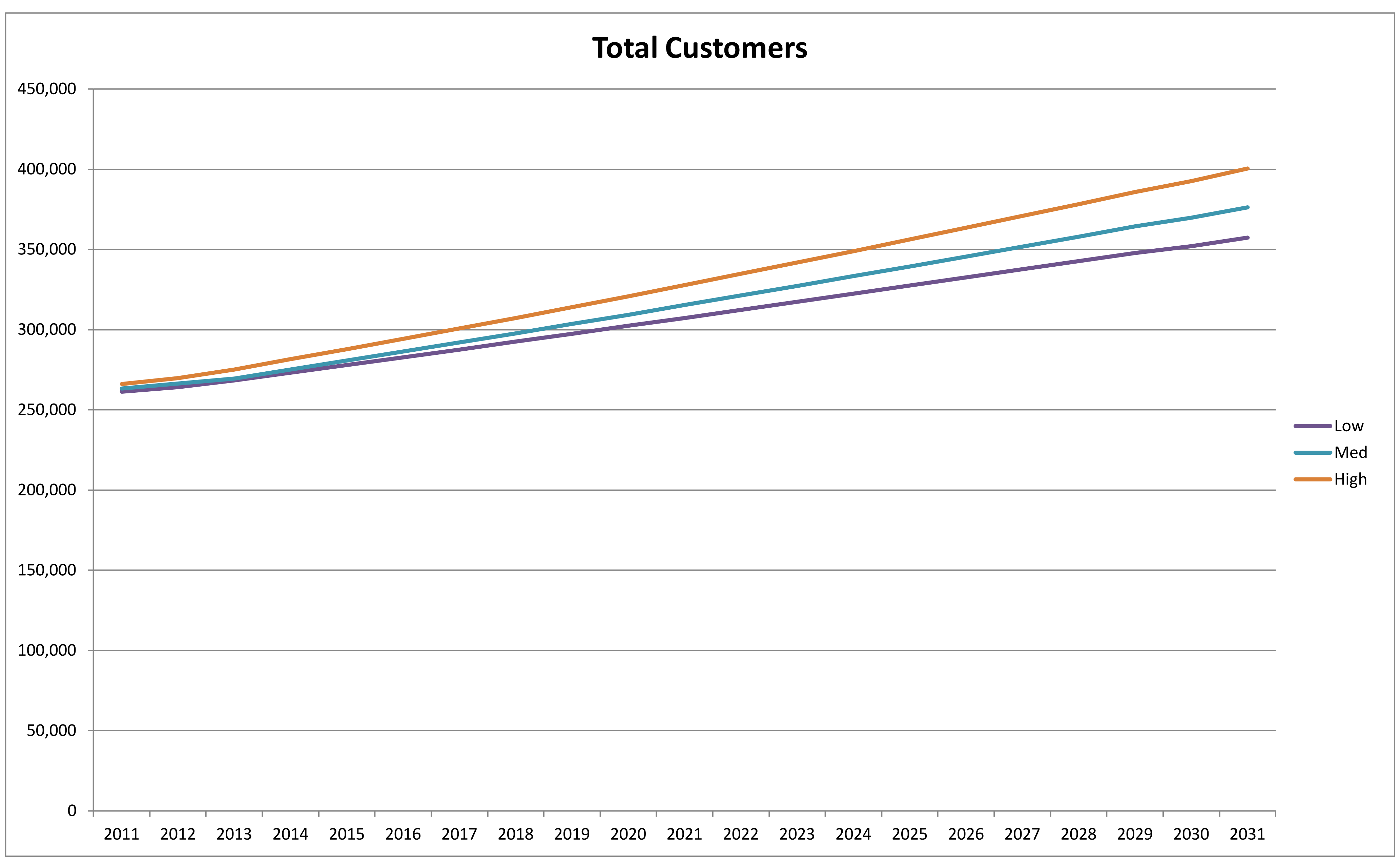
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	148,404,930	137,844,840	286,249,771	151,540,174	138,878,242	290,418,416	156,512,271	140,229,765	296,742,036	3.17%	9.39%	6.07%	5.35%	10.21%	7.62%	8.81%	11.28%	9.96%
2012	153,596,290	138,663,895	292,260,185	157,334,898	139,576,374	296,911,272	163,121,065	141,796,746	304,917,812	3.50%	0.59%	2.10%	3.82%	0.50%	2.24%	4.22%	1.12%	2.76%
2013	154,586,035	139,806,950	294,392,984	157,953,386	140,640,240	298,593,626	165,024,151	143,471,445	308,495,596	0.64%	0.82%	0.73%	0.39%	0.76%	0.57%	1.17%	1.18%	1.17%
2014	156,644,794	141,348,305	297,993,099	160,121,931	142,255,278	302,377,209	168,146,069	145,558,755	313,704,824	1.33%	1.10%	1.22%	1.37%	1.15%	1.27%	1.89%	1.45%	1.69%
2015	159,388,511	143,485,847	302,874,358	163,267,887	144,665,983	307,933,870	171,744,798	148,286,372	320,031,170	1.75%	1.51%	1.64%	1.96%	1.69%	1.84%	2.14%	1.87%	2.02%
2016	162,151,634	145,892,234	308,043,869	166,569,592	147,421,270	313,990,862	175,535,658	151,302,654	326,838,313	1.73%	1.68%	1.71%	2.02%	1.90%	1.97%	2.21%	2.03%	2.13%
2017	164,570,353	147,826,528	312,396,881	169,546,243	149,539,938	319,086,182	179,090,673	153,844,831	332,935,504	1.49%	1.33%	1.41%	1.79%	1.44%	1.62%	2.03%	1.68%	1.87%
2018	167,072,617	149,660,657	316,733,274	172,517,105	151,528,643	324,045,748	182,665,631	156,309,293	338,974,924	1.52%	1.24%	1.39%	1.75%	1.33%	1.55%	2.00%	1.60%	1.81%
2019	169,765,797	151,899,230	321,665,027	175,802,426	154,050,279	329,852,705	186,418,881	159,231,623	345,650,504	1.61%	1.50%	1.56%	1.90%	1.66%	1.79%	2.05%	1.87%	1.97%
2020	172,538,093	154,290,874	326,828,967	179,061,693	156,777,100	335,838,792	190,282,195	162,360,506	352,642,702	1.63%	1.57%	1.61%	1.85%	1.77%	1.81%	2.07%	1.96%	2.02%
2021	174,838,857	156,219,357	331,058,214	181,979,196	158,900,343	340,879,539	193,848,963	165,026,916	358,875,879	1.33%	1.25%	1.29%	1.63%	1.35%	1.50%	1.87%	1.64%	1.77%
2022	177,223,216	157,979,776	335,202,992	184,908,214	160,809,913	345,718,127	197,474,642	167,535,849	365,010,491	1.36%	1.13%	1.25%	1.61%	1.20%	1.42%	1.87%	1.52%	1.71%
2023	180,307,225	160,248,587	340,555,813	188,551,745	163,388,847	351,940,591	201,548,524	170,651,220	372,199,745	1.74%	1.44%	1.60%	1.97%	1.60%	1.80%	2.06%	1.86%	1.97%
2024	183,683,346	163,664,519	347,347,865	192,436,692	167,477,381	359,914,073	205,879,041	175,123,686	381,002,727	1.87%	2.13%	1.99%	2.06%	2.50%	2.27%	2.15%	2.62%	2.37%
2025	186,409,343	165,726,296	352,135,639	195,774,104	169,799,157	365,573,261	209,799,532	178,113,789	387,913,321	1.48%	1.26%	1.38%	1.73%	1.39%	1.57%	1.90%	1.71%	1.81%
2026	189,046,804	167,816,712	356,863,517	198,954,804	172,175,162	371,129,966	213,690,686	181,201,902	394,892,588	1.41%	1.26%	1.34%	1.62%	1.40%	1.52%	1.85%	1.73%	1.80%
2027	191,821,735	170,325,045	362,146,780	202,360,398	175,109,977	377,470,375	217,633,693	184,840,230	402,473,923	1.47%	1.49%	1.48%	1.71%	1.70%	1.71%	1.85%	2.01%	1.92%
2028	194,368,777	172,511,218	366,879,996	205,683,464	177,642,615	383,326,079	221,621,288	188,181,074	409,802,362	1.33%	1.28%	1.31%	1.64%	1.45%	1.55%	1.83%	1.81%	1.82%
2029	196,708,310	174,554,212	371,262,522	208,640,820	180,001,862	388,642,682	225,331,045	191,421,181	416,752,226	1.20%	1.18%	1.19%	1.44%	1.33%	1.39%	1.67%	1.72%	1.70%
2030	199,029,793	174,554,212	373,584,005	211,754,977	180,001,862	391,756,839	229,134,653	191,421,181	420,555,834	1.18%	0.00%	0.63%	1.49%	0.00%	0.80%	1.69%	0.00%	0.91%
2031	201,356,710	176,566,246	377,922,956	214,752,901	182,337,110	397,090,010	232,943,526	194,697,565	427,641,091	1.17%	1.15%	1.16%	1.42%	1.30%	1.36%	1.66%	1.71%	1.68%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	226,535	34,725	261,260	228,091	35,083	263,174	230,492	35,594	266,086	0.49%	0.57%	0.50%	1.18%	1.61%	1.24%	2.25%	3.09%	2.36%
2012	228,728	35,307	264,035	230,588	35,775	266,363	233,434	36,411	269,845	0.97%	1.68%	1.06%	1.09%	1.97%	1.21%	1.28%	2.29%	1.41%
2013	232,391	35,932	268,323	233,083	36,477	269,560	238,044	37,182	275,226	1.60%	1.77%	1.62%	1.08%	1.96%	1.20%	1.97%	2.12%	1.99%
2014	236,548	36,562	273,110	237,894	37,186	275,080	243,522	37,964	281,486	1.79%	1.75%	1.78%	2.06%	1.94%	2.05%	2.30%	2.10%	2.27%
2015	240,731	37,197	277,928	242,758	37,904	280,662	249,075	38,759	287,834	1.77%	1.74%	1.76%	2.04%	1.93%	2.03%	2.28%	2.09%	2.26%
2016	244,936	37,838	282,774	247,663	38,628	286,291	254,694	39,560	294,254	1.75%	1.72%	1.74%	2.02%	1.91%	2.01%	2.26%	2.07%	2.23%
2017	249,160	38,482	287,642	252,613	39,359	291,972	260,390	40,371	300,761	1.72%	1.70%	1.72%	2.00%	1.89%	1.98%	2.24%	2.05%	2.21%
2018	253,399	39,129	292,528	257,617	40,098	297,715	266,172	41,194	307,366	1.70%	1.68%	1.70%	1.98%	1.88%	1.97%	2.22%	2.04%	2.20%
2019	257,665	39,781	297,446	262,668	40,843	303,511	272,027	42,026	314,053	1.68%	1.67%	1.68%	1.96%	1.86%	1.95%	2.20%	2.02%	2.18%
2020	261,943	40,436	302,379	267,762	41,595	309,357	277,970	42,869	320,839	1.66%	1.65%	1.66%	1.94%	1.84%	1.93%	2.18%	2.01%	2.16%
2021	266,246	41,095	307,341	272,917	42,355	315,272	284,010	43,725	327,735	1.64%	1.63%	1.64%	1.93%	1.83%	1.91%	2.17%	2.00%	2.15%
2022	270,578	41,759	312,337	278,123	43,123	321,246	290,126	44,590	334,716	1.63%	1.62%	1.63%	1.91%	1.81%	1.89%	2.15%	1.98%	2.13%
2023	274,921	42,426	317,347	283,367	43,897	327,264	296,308	45,464	341,772	1.61%	1.60%	1.60%	1.89%	1.79%	1.87%	2.13%	1.96%	2.11%
2024	279,279	43,096	322,375	288,657	44,676	333,333	302,577	46,347	348,924	1.59%	1.58%	1.58%	1.87%	1.78%	1.85%	2.12%	1.94%	2.09%
2025	283,648	43,768	327,416	293,985	45,460	339,445	308,900	47,237	356,137	1.56%	1.56%	1.56%	1.85%	1.76%	1.83%	2.09%	1.92%	2.07%
2026	288,021	44,442	332,463	299,349	46,250	345,599	315,307	48,137	363,444	1.54%	1.54%	1.54%	1.82%	1.74%	1.81%	2.07%	1.91%	2.05%
2027	292,415	45,119	337,534	304,764	47,047	351,811	321,801	49,047	370,848	1.53%	1.52%	1.53%	1.81%	1.72%	1.80%	2.06%	1.89%	2.04%
2028	296,807	45,796	342,603	310,211	47,847	358,058	328,363	49,966	378,329	1.50%	1.50%	1.50%	1.79%	1.70%	1.78%	2.04%	1.87%	2.02%
2029	301,214	46,476	347,690	315,708	48,653	364,361	335,016	50,894	385,910	1.48%	1.49%	1.48%	1.77%	1.69%	1.76%	2.03%	1.86%	2.00%
2030	305,640	46,476	352,116	321,249	48,653	369,902	341,751	50,894	392,645	1.47%	0.00%	1.27%	1.76%	0.00%	1.52%	2.01%	0.00%	1.75%
2031	310,145	47,160	357,305	326,907	49,466	376,373	348,648	51,832	400,480	1.47%	1.47%	1.47%	1.76%	1.67%	1.75%	2.02%	1.84%	2.00%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

SYSTEM TOTAL





Cascade Natural Gas

2011 IRP Demand Forecast Summary Tables

WA

	Annual Requirements (Therms)									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total	Heating	Baseload	Total
2011	142,565,215	71,864,213	214,429,428	144,468,710	72,871,646	217,340,355	147,346,379	74,396,676	221,743,055	5.58%	6.14%	5.77%	6.99%	7.63%	7.21%	9.12%	9.88%	9.38%
2012	146,420,791	73,888,905	220,309,696	148,506,506	74,994,748	223,501,254	152,110,486	76,898,490	229,008,977	2.70%	2.82%	2.74%	2.79%	2.91%	2.83%	3.23%	3.36%	3.28%
2013	147,813,460	74,629,585	222,443,045	149,579,575	75,572,211	225,151,786	153,941,166	77,900,763	231,841,928	0.95%	1.00%	0.97%	0.72%	0.77%	0.74%	1.20%	1.30%	1.24%
2014	149,838,197	75,701,622	225,539,819	151,626,682	76,667,581	228,294,263	156,441,418	79,261,492	235,702,910	1.37%	1.44%	1.39%	1.37%	1.45%	1.40%	1.62%	1.75%	1.67%
2015	152,359,193	77,026,599	229,385,792	154,361,304	78,117,776	232,479,080	159,326,328	80,814,816	240,141,144	1.68%	1.75%	1.71%	1.80%	1.89%	1.83%	1.84%	1.96%	1.88%
2016	155,004,808	78,401,638	233,406,445	157,336,627	79,690,230	237,026,858	162,420,521	82,474,226	244,894,747	1.74%	1.79%	1.75%	1.93%	2.01%	1.96%	1.94%	2.05%	1.98%
2017	157,331,784	79,621,991	236,953,775	159,877,656	81,040,659	240,918,314	165,220,884	83,988,598	249,209,482	1.50%	1.56%	1.52%	1.62%	1.69%	1.64%	1.72%	1.84%	1.76%
2018	159,641,343	80,839,336	240,480,679	162,343,681	82,365,727	244,709,408	167,931,290	85,469,187	253,400,477	1.47%	1.53%	1.49%	1.54%	1.64%	1.57%	1.64%	1.76%	1.68%
2019	162,168,876	82,165,795	244,334,671	165,164,677	83,873,605	249,038,282	170,881,354	87,071,651	257,953,005	1.58%	1.64%	1.60%	1.74%	1.83%	1.77%	1.76%	1.87%	1.80%
2020	164,796,933	83,539,349	248,336,282	168,025,722	85,391,405	253,417,127	173,921,710	88,719,562	262,641,272	1.62%	1.67%	1.64%	1.73%	1.81%	1.76%	1.78%	1.89%	1.82%
2021	167,063,947	84,732,904	251,796,850	170,506,467	86,724,049	257,230,516	176,642,933	90,210,760	266,853,693	1.38%	1.43%	1.39%	1.48%	1.56%	1.50%	1.56%	1.68%	1.60%
2022	169,267,904	85,899,950	255,167,854	172,862,038	87,998,162	260,860,200	179,284,163	91,671,895	270,956,058	1.32%	1.38%	1.34%	1.38%	1.47%	1.41%	1.50%	1.62%	1.54%
2023	171,971,171	87,327,283	259,298,454	175,808,741	89,579,218	265,387,958	182,337,741	93,346,240	275,683,981	1.60%	1.66%	1.62%	1.70%	1.80%	1.74%	1.70%	1.83%	1.74%
2024	175,216,761	89,007,759	264,224,520	179,433,332	91,490,119	270,923,450	185,869,067	95,247,610	281,116,677	1.89%	1.92%	1.90%	2.06%	2.13%	2.09%	1.94%	2.04%	1.97%
2025	177,753,954	90,336,502	268,090,456	182,156,941	92,947,189	275,104,130	188,785,661	96,842,244	285,627,904	1.45%	1.49%	1.46%	1.52%	1.59%	1.54%	1.57%	1.67%	1.60%
2026	180,181,240	91,617,917	271,799,158	184,769,061	94,357,705	279,126,766	191,616,033	98,415,521	290,031,554	1.37%	1.42%	1.38%	1.43%	1.52%	1.46%	1.50%	1.62%	1.54%
2027	182,818,291	93,002,669	275,820,960	187,672,163	95,918,637	283,590,801	194,603,958	100,062,238	294,666,196	1.46%	1.51%	1.48%	1.57%	1.65%	1.60%	1.56%	1.67%	1.60%
2028	185,260,945	94,290,762	279,551,707	190,367,291	97,371,911	287,739,201	197,485,401	101,660,938	299,146,338	1.34%	1.39%	1.35%	1.44%	1.52%	1.46%	1.48%	1.60%	1.52%
2029	187,538,637	95,496,480	283,035,117	192,828,571	98,707,427	291,535,998	200,173,867	103,169,046	303,342,913	1.23%	1.28%	1.25%	1.29%	1.37%	1.32%	1.36%	1.48%	1.40%
2030	188,779,904	96,147,219	284,927,123	194,377,372	99,536,259	293,913,630	201,976,598	104,145,859	306,122,457	0.66%	0.68%	0.67%	0.80%	0.84%	0.82%	0.90%	0.95%	0.92%
2031	191,017,046	97,337,010	288,354,056	196,822,995	100,866,724	297,689,719	204,671,837	105,662,007	310,333,844	1.19%	1.24%	1.20%	1.26%	1.34%	1.28%	1.33%	1.46%	1.38%

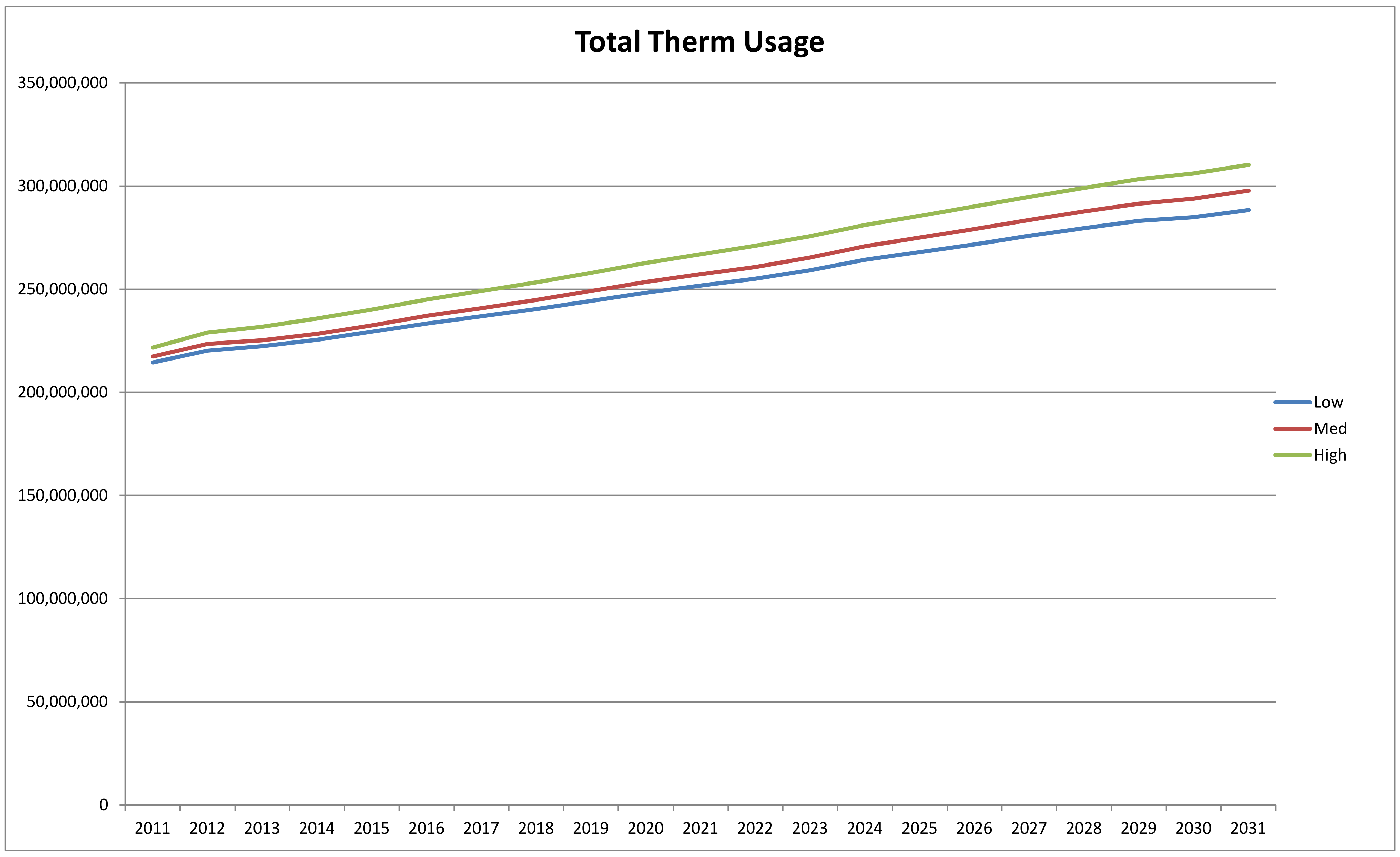
	Peak Day - Baseload									Annual Change								
	Low			Medium			High			Low			Medium			High		
	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Daily Baseload	Peak	Total Core Peak	Base	Peak	Total	Base	Peak	Total	Base	Peak	Total
2011	196,888	2,585,210	2,782,098	199,648	2,606,303	2,805,952	203,827	2,638,685	2,842,512	6.14%	-0.09%	0.32%	7.63%	0.72%	1.19%	9.88%	1.97%	2.50%
2012	202,435	2,613,796	2,816,231	205,465	2,639,333	2,844,798	210,681	2,677,339	2,888,020	2.82%	1.11%	1.23%	2.91%	1.27%	1.38%	3.36%	1.46%	1.60%
2013	204,465	2,661,382	2,865,847	207,047	2,676,681	2,883,729	213,427	2,734,890	2,948,317	1.00%	1.82%	1.76%	0.77%	1.42%	1.37%	1.30%	2.15%	2.09%
2014	207,402	2,713,007	2,920,408	210,048	2,735,315	2,945,363	217,155	2,800,122	3,017,277	1.44%	1.94%	1.90%	1.45%	2.19%	2.14%	1.75%	2.39%	2.34%
2015	211,032	2,764,258	2,975,290	214,021	2,793,628	3,007,650	221,410	2,865,666	3,087,077	1.75%	1.89%	1.88%	1.89%	2.13%	2.11%	1.96%	2.34%	2.31%
2016	214,799	2,815,663	3,030,462	218,329	2,852,162	3,070,491	225,957	2,931,884	3,157,841	1.79%	1.86%	1.85%	2.01%	2.10%	2.09%	2.05%	2.31%	2.29%
2017	218,142	2,867,810	3,085,952	222,029	2,911,919	3,133,948	230,106	2,999,460	3,229,566	1.56%	1.85%	1.83%	1.69%	2.10%	2.07%	1.84%	2.30%	2.27%
2018	221,478	2,920,129	3,141,607	225,660	2,972,323	3,197,982	234,162	3,067,943	3,302,105	1.53%	1.82%	1.80%	1.64%	2.07%	2.04%	1.76%	2.28%	2.25%
2019	225,112	2,972,446	3,197,558	229,791	3,032,863	3,262,654	238,552	3,137,212	3,375,765	1.64%	1.79%	1.78%	1.83%	2.04%	2.02%	1.87%	2.26%	2.23%
2020	228,875	3,024,906	3,253,781	233,949	3,093,988	3,327,937	243,067	3,207,451	3,450,518	1.67%	1.76%	1.76%	1.81%	2.02%	2.00%	1.89%	2.24%	2.21%
2021	232,145	3,078,181	3,310,326	237,600	3,156,414	3,394,014	247,153	3,279,319	3,526,472	1.43%	1.76%	1.74%	1.56%	2.02%	1.99%	1.68%	2.24%	2.20%
2022	235,342	3,131,969	3,367,311	241,091	3,219,680	3,460,771	251,156	3,352,329	3,603,485	1.38%	1.75%	1.72%	1.47%	2.00%	1.97%	1.62%	2.23%	2.18%
2023	239,253	3,185,240	3,424,493	245,423	3,282,617	3,528,039	255,743	3,425,419	3,681,162	1.66%	1.70%	1.70%	1.80%	1.95%	1.94%	1.83%	2.18%	2.16%
2024	243,857	3,237,999	3,481,856	250,658	3,345,197	3,595,855	260,952	3,499,079	3,760,031	1.92%	1.66%	1.68%	2.13%	1.91%	1.92%	2.04%	2.15%	2.14%
2025	247,497	3,291,982	3,539,480	254,650	3,409,647	3,664,296	265,321	3,574,433	3,839,754	1.49%	1.67%	1.65%	1.59%	1.93%	1.90%	1.67%	2.15%	2.12%
2026	251,008	3,346,221	3,597,229	258,514	3,474,659	3,733,173	269,632	3,650,684	3,920,316	1.42%	1.65%	1.63%	1.52%	1.91%	1.88%	1.62%	2.13%	2.10%
2027	254,802	3,400,315	3,655,117	262,791	3,539,867	3,802,658	274,143	3,727,883	4,002,026	1.51%	1.62%	1.61%	1.65%	1.88%	1.86%	1.67%	2.11%	2.08%
2028	258,331	3,454,878	3,713,209	266,772	3,605,915	3,872,687	278,523	3,806,139	4,084,663	1.39%	1.60%	1.59%	1.52%	1.87%	1.84%	1.60%	2.10%	2.06%
2029	261,634	3,509,846	3,771,480	270,431	3,672,888	3,943,320	282,655	3,885,746	4,168,401	1.28%	1.59%	1.57%	1.37%	1.86%	1.82%	1.48%	2.09%	2.05%
2030	263,417	3,559,278	3,822,695	272,702	3,733,360	4,006,062	285,331	3,958,259	4,243,590	0.68%	1.41%	1.36%	0.84%	1.65%	1.59%	0.95%	1.87%	1.80%
2031	266,677	3,615,491	3,882,167	276,347	3,802,317	4,078,664	289,485	4,040,811	4,330,296	1.24%	1.58%	1.56%	1.34%	1.85%	1.81%	1.46%	2.09%	2.04%

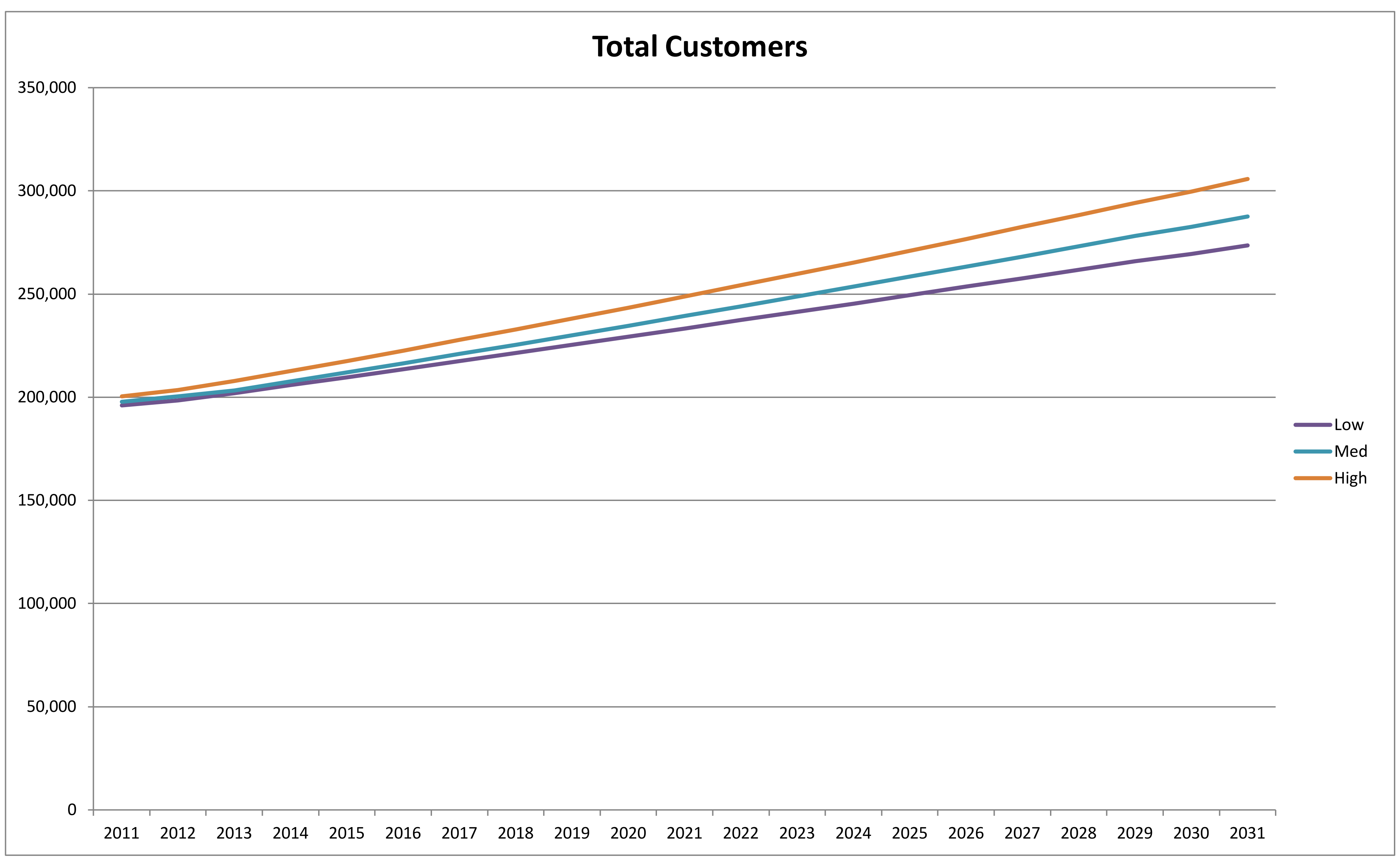
	Therm Usage by Class									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	110,110,683	104,318,745	214,429,428	112,196,225	105,144,130	217,340,355	115,468,307	106,274,747	221,743,055	3.17%	8.66%	5.77%	5.13%	9.52%	7.21%	8.19%	10.69%	9.38%
2012	115,036,211	105,273,485	220,309,696	117,567,426	105,933,828	223,501,254	121,406,986	107,601,991	229,008,977	4.47%	0.92%	2.74%	4.79%	0.75%	2.83%	5.14%	1.25%	3.28%
2013	116,003,668	106,439,376	222,443,045	118,216,303	106,935,483	225,151,786	122,962,712	108,879,216	231,841,928	0.84%	1.11%	0.97%	0.55%	0.95%	0.74%	1.28%	1.19%	1.24%
2014	117,737,121	107,802,698	225,539,819	120,043,215	108,251,048	228,294,263	125,361,919	110,340,992	235,702,910	1.49%	1.28%	1.39%	1.55%	1.23%	1.40%	1.95%	1.34%	1.67%
2015	119,922,480	109,463,312	229,385,792	122,468,636	110,010,444	232,479,080	128,057,646	112,083,498	240,141,144	1.86%	1.54%	1.71%	2.02%	1.63%	1.83%	2.15%	1.58%	1.88%
2016	122,151,098	111,255,347	233,406,445	125,072,487	111,954,371	237,026,858	130,952,942	113,941,805	244,894,747	1.86%	1.64%	1.75%	2.13%	1.77%	1.96%	2.26%	1.66%	1.98%
2017	124,144,673	112,809,102	236,953,775	127,400,101	113,518,213	240,918,314	133,668,578	115,540,904	249,209,482	1.63%	1.40%	1.52%	1.86%	1.40%	1.64%	2.07%	1.40%	1.76%
2018	126,171,493	114,309,187	240,480,679	129,719,155	114,990,253	244,709,408	136,336,934	117,063,544	253,400,477	1.63%	1.33%	1.49%	1.82%	1.30%	1.57%	2.00%	1.32%	1.68%
2019	128,326,530	116,008,141	244,334,671	132,286,666	116,751,615	249,038,282	139,173,052	118,779,954	257,953,005	1.71%	1.49%	1.60%	1.98%	1.53%	1.77%	2.08%	1.47%	1.80%
2020	130,553,553	117,782,729	248,336,282	134,804,435	118,612,692	253,417,127	142,082,486	120,558,786	262,641,272	1.74%	1.53%	1.64%	1.90%	1.59%	1.76%	2.09%	1.50%	1.82%
2021	132,471,566	119,325,284	251,796,850	137,108,380	120,122,136	257,230,516	144,757,976	122,095,717	266,853,693	1.47%	1.31%	1.39%	1.71%	1.27%	1.50%	1.88%	1.27%	1.60%
2022	134,385,335	120,782,519	255,167,854	139,359,500	121,500,700	260,860,200	147,424,529	123,531,528	270,956,058	1.44%	1.22%	1.34%	1.64%	1.15%	1.41%	1.84%	1.18%	1.54%
2023	136,806,804	122,491,650	259,298,454	142,156,435	123,231,524	265,387,958	150,484,534	125,199,447	275,683,981	1.80%	1.42%	1.62%	2.01%	1.42%	1.74%	2.08%	1.35%	1.74%
2024	139,458,684	124,765,836	264,224,520	145,155,008	125,768,442	270,923,450	153,692,210	127,424,467	281,116,677	1.94%	1.86%	1.90%	2.11%	2.06%	2.09%	2.13%	1.78%	1.97%
2025	141,725,339	126,365,117	268,090,456	147,785,968	127,318,162	275,104,130	156,671,630	128,956,275	285,627,904	1.63%	1.28%	1.46%	1.81%	1.23%	1.54%	1.94%	1.20%	1.60%
2026	143,826,975	127,972,183	271,799,158	150,251,500	128,875,266	279,126,766	159,547,526	130,484,028	290,031,554	1.48%	1.27%	1.38%	1.67%	1.22%	1.46%	1.84%	1.18%	1.54%
2027	146,043,151	129,777,809	275,820,960	152,880,449	130,710,352	283,590,801	162,465,418	132,200,778	294,666,196	1.54%	1.41%	1.48%	1.75%	1.42%	1.60%	1.83%	1.32%	1.60%
2028	148,126,702	131,425,005	279,551,707	155,425,605	132,313,596	287,739,201	165,393,386	133,752,953	299,146,338	1.43%	1.27%	1.35%	1.66%	1.23%	1.46%	1.80%	1.17%	1.52%
2029	150,041,085	132,994,032	283,035,117	157,732,504	133,803,494	291,535,998	168,120,118	135,222,795	303,342,913	1.29%	1.19%	1.25%	1.48%	1.13%	1.32%	1.65%	1.10%	1.40%
2030	151,933,091	132,994,032	284,927,123	160,110,136	133,803,494	293,913,630	170,899,662	135,222,795	306,122,457	1.26%	0.00%	0.67%	1.51%	0.00%	0.82%	1.65%	0.00%	0.92%
2031	153,812,331	134,541,726	288,354,056	162,427,789	135,261,930	297,689,719	173,666,984	136,666,860	310,333,844	1.24%	1.16%	1.20%	1.45%	1.09%	1.28%	1.62%	1.07%	1.38%

	Customer Count Forecast									Annual Change								
	Low			Medium			High			Low			Medium			High		
	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total	RES	COM/IND	Total
2011	170,986	25,131	196,117	172,372	25,401	197,773	174,519	25,795	200,314	0.26%	0.43%	0.28%	1.07%	1.51%	1.13%	2.33%	3.08%	2.43%
2012	172,927	25,563	198,490	174,570	25,909	200,479	177,096	26,396	203,492	1.14%	1.72%	1.21%	1.28%	2.00%	1.37%	1.48%	2.33%	1.59%
2013	175,955	26,030	201,985	176,765	26,425	203,190	180,801	26,956	207,757	1.75%	1.83%	1.76%	1.26%	1.99%	1.35%	2.09%	2.12%	2.10%
2014	179,337	26,501	205,838	180,611	26,946	207,557	185,130	27,524	212,654	1.92%	1.81%	1.91%	2.18%	1.97%	2.15%	2.39%	2.11%	2.36%
2015	182,737	26,976	209,713	184,495	27,473	211,968	189,509	28,098	217,607	1.90%	1.79%	1.88%	2.15%	1.96%	2.13%	2.37%	2.09%	2.33%
2016	186,153	27,455	213,608	188,414	28,005	216,419	193,950	28,679	222,629	1.87%	1.77%	1.86%	2.12%	1.94%	2.10%	2.34%	2.07%	2.31%
2017	189,585	27,936	217,521	192,368	28,542	220,910	198,450	29,267	227,717	1.84%	1.75%	1.83%	2.10%	1.92%	2.08%	2.32%	2.05%	2.29%
2018	193,028	28,420	221,448	196,360	29,082	225,442	203,002	29,860	232,862	1.82%	1.73%	1.81%	2.08%	1.89%	2.05%	2.29%	2.03%	2.26%
2019	196,486	28,906	225,392	200,390	29,628	230,018	207,625	30,462	238,087	1.79%	1.71%	1.78%	2.05%	1.88%	2.03%	2.28%	2.01%	2.24%
2020	199,960	29,396	229,356	204,457	30,179	234,636	212,317	31,071	243,388	1.77%	1.69%	1.76%	2.03%	1.86%	2.01%	2.26%	2.00%	2.23%
2021	203,454	29,888	233,342	208,574	30,736	239,310	217,085	31,689	248,774	1.75%	1.68%	1.74%	2.01%	1.84%	1.99%	2.25%	1.99%	2.21%
2022	206,972	30,384	237,356	212,732	31,298	244,030	221,918	32,313	254,231	1.73%	1.66%	1.72%	1.99%	1.83%	1.97%	2.23%	1.97%	2.19%
2023	210,502	30,882	241,384	216,922	31,863	248,785	226,796	32,942	259,738	1.71%	1.64%	1.70%	1.97%	1.81%	1.95%	2.20%	1.95%	2.17%
2024	214,042	31,382	245,424	221,147	32,433	253,580	231,748	33,578	265,326	1.68%	1.62%	1.67%	1.95%	1.79%	1.93%	2.18%	1.93%	2.15%
2025	217,597	31,883	249,480	225,411	33,006	258,417	236,755	34,219	270,974	1.66%	1.60%	1.65%	1.93%	1.77%	1.91%	2.16%	1.91%	2.13%
2026	221,159	32,386	253,545	229,702	33,582	263,284	241,817	34,864	276,681	1.64%	1.58%	1.63%	1.90%	1.74%	1.88%	2.14%	1.89%	2.11%
2027	224,729	32,889	257,618	234,030	34,162	268,192	246,951	35,517	282,468	1.61%	1.55%	1.61%	1.88%	1.73%	1.86%	2.12%	1.87%	2.09%
2028	228,310	33,394	261,704	238,394	34,745	273,139	252,146	36,175	288,321	1.59%	1.54%	1.59%	1.86%	1.71%	1.84%	2.10%	1.85%	2.07%
2029	231,902	33,900	265,802	242,794	35,332	278,126	257,409	36,840	294,249	1.57%	1.52%	1.57%	1.85%	1.69%	1.83%	2.09%	1.84%	2.06%
2030	235,506	33,900	269,406	247,231	35,332	282,563	262,742	36,840	299,582	1.55%	0.00%	1.36%	1.83%	0.00%	1.60%	2.07%	0.00%	1.81%
2031	239,179	34,407	273,586	251,766	35,922	287,688	268,209	37,511	305,720	1.56%	1.50%	1.55%	1.83%	1.67%	1.81%	2.08%	1.82%	2.05%

Cascade Natural Gas
2011 IRP Demand Forecast Summary Tables

WA





Appendix C

Distribution System Planning

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed: Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
Acme	ACME	no					
Arlington	ARLINGTON	yes	100	2	PE		2015
			720	4	PE		2018
			2070	6	PE		2022
Bellingham 1	BELLINGHAM	yes				reg	2012
			6230	6	PE		2016
			1600	4	PE		2023
			2600	4	HP	reg	2027
Burbank Heights	BURBANK	no					
Castle Rock	CASTLE ROCK	no					
Deming	DEMING	no					
Finley	FINLEY	no					
Grandview	GRANDVIEW	no					
Kalama	KALAMA	no					
Kelso / South Longview	KELSO	no					
	LONGVIEW	no					
Kennewick	KENNEWICK	yes	4000	4	PE		2010
			8400	6	HP	reg	2014
			2700	6	PE		2026
	RICHLAND	yes	5910	12	HP		2010
			5900	4	PE		2012
			1850	4	PE		2013
			1780	4	PE		2017
			800	4	PE		2017
			3730	4	PE		2018
			10400	12	HP		2023
			2400	4	PE		2026
			1980	4	PE		2029
	WEST RICHLAND	no					
Lawrence	LAWRENCE	no					
Lynden	EVERSON	no					
	NOOKSACK	no					

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed				
			Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
McCleary	ABERDEEN	no					
	ELMA	no					
	HOQUIAM	no					
	MCCLEARY	no					
	MONTESANO	no					
Moses Lake	MOSES LAKE	no					
	WHEELER	no					
Mount Vernon	MOUNT VERNON	yes	960	4	PE		2023
			2590	4	PE		2028
Moxee	MOXEE CITY	no					
Othello	OTHELLO	no					
Pasco / North Pasco / Burbank Heights	PASCO	yes	2600	6	PE		2010
			6660	6	PE		2011
			1120	6	PE		2015
			2030	6	PE		2017
Patterson / Plymouth	PATTERSON - PLYM	NA					
Prosser	PROSSER	no					
Quincy	QUINCY	no					
Sedro-Woolley	ANACORTES HP	no					
	BURLINGTON	yes	3900	6	PE		2013
			1650	4	PE		2017
			3730	6	PE		2018
			2510	6	PE		2022
			520	6	PE		2025
			560	4	PE		2028
			2100	4	PE		2029
	ANACORTES	yes	100	2	PE		2015
			720	4	PE		2018
			2070	6	PE		2022
	LA CONNER	no					
	SEDRO-WOOLLEY	yes	3740	4	PE		2010
			600	2	PE		2029
Selah	SELAH	no					

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed: Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
Shelton	BELFAIR	no					
	BREMERTON	yes	10200	6	HP	reg	2019
			1100	4	PE		2023
	CHICO	no					
	GORST	no					
	KEYPORT	no					
	KITSAP HP	yes	16900	12	HP		2011
			6200	12	HP		2015
			22300	12	HP		2024
	MANCHESTER	;ee Port Orchar					
	PORT ORCHARD	yes	890	2	PE		2010
			1150	4	PE		2012
			5960	6	HP	reg / uprate	2012
						reg	2015
						reg / uprate	2019
			3660	6	PE		2023
	POULSBO	yes	2330	6	PE		2013
			2800	4	PE		2013
	SHELTON	no					
	SILVERDALE	yes	2750	4	PE		2013
	SUNNYSLOPE	no					
Stanwood	CAMANO ISLAND	no					
	OAK HARBOR	yes	1610	4	PE		2013
			2390	4	PE		2015
			3070	4	PE	reg	2017
			3120	6	PE		2021
						reg	2023
	STANWOOD	yes	1480	6	PE		2013
Sumas	LYNDEN	yes	1030	4	PE		2012
			3890	4	HP		2015
			3650	4	PE		2017
			540	8	Steel		2026
			1930	4	PE		2029
			2780	4	PE		2030

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed				
			Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
Sumas	BLAINE	yes	4480	4	PE		2013
			8500			5 regs / upra	2030
	FERNDALE	yes	7080	4	S		2010
			5280	4	PE		2016
			1600	4	PE		2016
			1840	4	S		2019
						3 regs / upra	2022
			5280	6	PE		2024
			15840	4	HP	new reg	2027
			6500	6	PE		2027
			5500	4	PE		2029
	SUMAS	no					
	WHATCOM HP	no					
Sunnyside	SUNNYSIDE	no					
Walla Walla	COLLEGE PLACE	no	1500	4	HP		2014
	WALLA WALLA	no					
Wenatchee	EAST WENATCHEE	see Wenatchee					
	WENATCHEE	no					
Woodland	WOODLAND	no					
Yakima	UNION GAP	no					
	YAKIMA	yes	2000	6	PE		2011
			12500	8	HP	reg	2017
Zillah	GRANGER	no					
	TOPPENISH	no					
	WAPATO	no					
	ZILLAH	no					

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed: Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
Athena	ATHENA	no					
	WESTON	no					
Baker City	BAKER	no					
Bend / South Bend	BEND	yes	3680	8	S		2012
			6500	4	HP	reg / uprate	2012
			1390	6	S		2012
			17540	8	HP	reg	2014
			6780	8	HP	reg	2016
			3680	8	HP	reg / uprate	2016
			6780	8	HP	reg	2018
			2400	4	PE		2019
			4120	8	HP	reg	2019
			2300	6	PE		2022
			1340	4	PE		2024
			1200	6	PE		2027
			1990	4	PE		2029
Chemult	CHEMULT	no					
Gilchrist	CRESCENT	no					
	GILCHRIST	no					
Hermiston	HERMISTON	yes	4160	4	PE		2010
			2830	4	PE		2014
			1400	4	PE		2015
			620	2	PE		2019
Huntington	HUNTINGTON	no					
La Pine	LA PINE	no					
Madras	MADRAS	yes	12000	6	HP	reg	2015
	METOLIUS	no					
Milton-Freewater	MILTON-FREEWATE	no					
Mission	MISSION	no					
Ontario	NYSSA	no					
	ONTARIO	no					
	VALE	no					
	ONTARIO HP	no					

2011 Cascade Natural Gas IRP Forecast
Estimated Reinforcement Projects

Gate Station	Town	Reinforcement Needed?	Pipe Reinforcement Needed				
			Length (feet)	Size (inches)	Pipe Type	Additional Facilities	Year Required
Pendleton	PENDLETON	no					
	PILOT ROCK	yes	1310	4	PE		2010
Prineville	PRINEVILLE	yes	2100	6	PE		2012
			700	6	PE		2015
Redmond	REDMOND	yes	1350	6	PE		2011
			2130	4	PE		2012
			2240	4	HP	reg	2014
			1460	6	PE		2018
			2030	6	PE		2019
			640	6	PE		2028
			4000	4	HP	reg	2029
Stanfield	STANFIELD	no					
Sunriver	SUNRIVER	yes	5440	6	PE		2010
			130	2	PE		2010
			2010	4	PE		2015
Umatilla	BOARDMAN	no					
	IRRIGON	no					
	UMATILLA	yes	5000	4	HP		2016

Notes:
PE: Polyethylene (plastic) Pipe
HP: High Pressure Steel Pipe
reg: new pressure control (regulator) station
uprate: operating pressure increase

Appendix D-1

Oregon
Residential Conservation Measures

Detailed Measure Table - OR Residential Sector Technical Potential to 2030
2030 Potential Estimated with 02/26/09 Stellar Study

Measure Code	Measure Description	Program	Average Lifetime	Gas Savings to 2030	Level Cost, $/th
N-A102	MEF 2.0 Washer	New	12	5,764	($1.29)
N-A105	Hi-eff Washer	New	12	2,542	($0.82)
R-A102	MEF 2.0 Washer	Replace	12	154,270	($0.09)
R-GH115	AFUE 90 to hydrocoil combo, Z 3	Retro Gas	45	308,136	$0.10
R-GH118	AFUE 90 to hydrocoil combo, Z 4	Retro Gas	45	302,706	$0.10
N-GH130	Heating upgrade (AFUE 90) (Z 3)	New Gas	15	247,769	$0.17
R-GW128	Wx insulation (add walls), Z 4	Retro Gas	45	952,980	$0.21
R-GH125	Duct Sealing and AFUE 90+ , Z 4	Replace Gas	20	1,728,412	$0.21
R-GW123	Wx insulation (add walls), Z 3	Retro Gas	45	143,816	$0.22
N-GH135	Heating upgrade (AFUE 90) (Z 4)	New Gas	15	186,780	$0.23
N-GH132	HRV, E* (Gas Z 3)	New Gas	15	2,454,909	$0.23
N-GH133	Ducts Indoor, DHW, Lights (Gas Z 3)	New Gas	45	3,357,567	$0.28
R-GW127	Wx insulation (ceiling, floor), Z 4	Retro Gas	45	1,028,694	$0.28
R-GW122	Wx insulation (ceiling, floor), Z 3	Retro Gas	45	156,318	$0.28
R-GH114	Duct Sealing, Z 3	Retro Gas	20	80,756	$0.30
N-GH137	HRV, E* (Gas Z 4)	New Gas	15	1,850,624	$0.31
R-GH117	Duct Sealing, Z 4	Retro Gas	20	73,292	$0.33
N-GH138	Ducts Indoor, DHW, Lights (Gas Z 4)	New Gas	45	2,531,089	$0.37
N-GH129	E* Insulation, Ducts, DHW, Lights (Gas Z 3)	New Gas	45	2,663,551	$0.47
R-A103	Estar Dishwasher	Replace	12	65,292	$0.49
N-GH131	Window U=.3 (Gas Z 3)	New Gas	45	400,915	$0.55
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	715,671	$0.64
N-GH134	E* Insulation, Ducts, DHW, Lights (Gas Z 4)	New Gas	45	1,903,399	$0.66
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	913,018	$0.67
N-GH139	Tank upgrade (50 gal gas)	New Gas	15	651,638	$0.69
N-GH136	Window U=.3 (Gas Z 4)	New Gas	45	402,971	$0.72
N-A103	Estar Dishwasher	New	12	1,477	$0.73
R-GW130	Window replace (U=.35), Z 4	Replace Gas	45	44,032	$0.74
N-GD106	Tank upgrade (50 gal gas) Hi Eff Alternative	New Gas	15	371,756	$0.74
R-GW125	Window replace (U=.35), Z 3	Replace Gas	45	6,764	$0.77
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	303,548	$0.89
N-GD108	Tankless Gas heater	New Gas	20	2,097,671	$0.91
R-GD113	Solar hot water heater (50 gal) - With gas backup.	Replace Gas	20	179,409	$1.01
R-GW129	Window, retro (U=.35), Z 4	Retro Gas	45	965,743	$1.19
R-GW124	Window, retro (U=.35), Z 3	Retro Gas	45	165,563	$1.23
R-GW131	HRV, Z 4	Retro Gas	18	277,542	$2.52
R-GW126	HRV, Z 3	Retro Gas	18	42,401	$2.60
N-GD107	Solar hot water heater (50 gal) - With gas backup.	New Gas	20	1,150,458	$4.49
R-GH124	AFUE 90+ Furnace, Z 4	Replace Gas	18	115,904	$5.01
R-GD111	Tank upgrade (50 gal gas) Hi Eff Alternative	Replace Gas	15	1,163,065	$5.25
R-GH122	AFUE 90+ Furnace, Z 3	Replace Gas	18	72,360	$8.03
R-GD110	Tankless Gas heater replace	Replace Gas	20	305,719	$8.58
R-GH123	Duct Sealing and AFUE 90+ , Z 3	Replace Gas	20	45,431	$9.97
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	44,656	$10.59

Appendix D-2

Oregon
Commercial/Industrial
Conservation Measures

Detailed Measure Table-Oregon Commercial

Measure Code	Measure Name	Construction Type	Measure End Use	Average Lifetime	Levelized Cost, $/th
Co116	EStar Steam Cooker	New	Cooking	10	$0.04
Co116rep	EStar Steam Cooker	Replace	Cooking	10	$0.04
H105	HW Boiler Tune	Retrofit	Heating	5	$0.08
Co112	Infrared Fryer	New	Cooking	8	$0.08
Co107	Infrared Fryer	Replace	Cooking	8	$0.08
H104	Hot Water Temperature Reset	Retrofit	Heating	10	$0.10
E111	Roof Insulation - Attic R0-30	Retrofit	Heating	30	$0.10
R106	Heat Reclaim	New	Refrigeration	18	$0.11
R106rep	Heat Reclaim	Replace	Refrigeration	18	$0.11
H102	DCV	Retrofit	Heating	15	$0.13
H106	Steam Balance	Retrofit	Heating	15	$0.14
E103	Roof Insulation - Rigid R0-11	Replace	Heating	30	$0.15
E101	Wall Insulation - Blown R11	Retrofit	Heating	30	$0.17
W101	DHW Wrap	Retrofit	Water Heat	7	$0.21
W127r	Waste Water Heat Exchanger	Retrofit	Water Heat	15	$0.21
H119	Hi Eff Unit Heater (new)	New	Heating	18	$0.22
W102	DHW Shower Heads	Retrofit	Water Heat	8	$0.22
E104	Roof Insulation - Rigid R0-22	Replace	Heating	30	$0.23
H114	Hi Eff Unit Heater (replace)	Replace	Heating	18	$0.24
E102	Wall Insulation - Spray On for Metal Buildings	Retrofit	Heating	30	$0.24
E107	Roof Insulation - Blanket R0-19	Retrofit	Heating	30	$0.29
E108	Roof Insulation - Blanket R0-30	Retrofit	Heating	30	$0.31
H107	Vent Damper	Retrofit	Heating	12	$0.31
E105	Roof Insulation - Rigid R11-22	Replace	Heating	30	$0.34
W121	Combo Hieff Boiler (new)	New	Heating	20	$0.36
W124r	Computerized Water Heater Control	Retrofit	Water Heat	15	$0.37
W119	Combo Hieff Boiler (repl)	Replace	Heating	20	$0.40
E112	Roof Insulation - Attic 11-30	Retrofit	Heating	30	$0.40
W103	DHW Faucets	Retrofit	Water Heat	8	$0.42
E114	Windows - Add Low E to Vinyl Tint	Replace	Heating	20	$0.42
E123	Windows - Add Low E to Vinyl Tint	New	Heating	20	$0.42
H117	SPC Hieff Boiler (new)	New	Heating	20	$0.45
Co115	Power Range Burner	New	Cooking	12	$0.46
Co110	Power Range Burner	Replace	Cooking	12	$0.46
H111	SPC Hieff Boiler Replace	Replace	Heating	20	$0.49
E115	Windows - Add Low E and Argon to Vinyl Tint	Replace	Heating	20	$0.57
E124	Windows - Add Low E and Argon to Vinyl Tint	New	Heating	20	$0.58
W109	DHW Condensing Tank (new)	New	Water Heat	15	$0.62
W108	DHW Condensing Tank (repl)	Replace	Water Heat	15	$0.62
Co114	Infrared Griddle	New	Cooking	12	$0.62
Co109	Infrared Griddle	Replace	Cooking	12	$0.62
H108	Power burner	Retrofit	Heating	12	$0.63
H120a	Cond Unit Heater from Nat Draft (new)	New	Heating	18	$0.68

Detailed Measure Table-Oregon Commercial

Measure Code	Measure Name	Construction Type	Measure End Use	Average Lifetime	Levelized Cost, $/th
W127	Waste Water Heat Exchanger	New	Water Heat	15	$0.70
W122	Combo Cond Boiler (new)	New	Heating	20	$0.73
W115	DHW Hieff Boiler (new)	New	Water Heat	20	$0.74
W113	DHW Hieff Boiler (repl)	Replace	Water Heat	20	$0.74
H118	SPC Cond Boiler (new)	New	Heating	20	$0.75
H115a	Cond Unit Heater from Nat draft (replace)	Replace	Heating	18	$0.75
E129	Windows - Tinted AL Code to Class 45	New	Heating	20	$0.76
W120	Combo Cond Boiler (repl)	Replace	Heating	20	$0.80
E121	Windows - Tinted AL Code to Class 40	Replace	Heating	20	$0.80
H112	SPC Cond Boiler Replace	Replace	Heating	20	$0.81
W104	DHW Pipe Ins	Retrofit	Water Heat	15	$0.84
E130	Windows - Tinted AL Code to Class 40	New	Heating	20	$0.87
H123	HVAC controls	New	Heating	5	$0.90
H103	Ducts	Retrofit	Heating	15	$0.90
W105	DHW Recirc Controls	Retrofit	Water Heat	10	$0.95
E113	Roof Insulation - Roofcut 0-22	Replace	Heating	30	$0.96
H101	Warm Up Control	Retrofit	Heating	10	$0.98
W124	Computerized Water Heater Control	New	Water Heat	15	$1.04
W123	Hi Eff Clothes Washer	New	Water Heat	10	$1.06
W123r	Hi Eff Clothes Washer	Replace	Water Heat	10	$1.09
E106	Roof Insulation - Rigid R11-33	Replace	Heating	30	$1.15
W116	DHW Cond Boiler (new)	New	Water Heat	20	$1.16
W114	DHW Cond Boiler (repl)	Replace	Water Heat	20	$1.16
H129	Steam Trap Maintenance	Retrofit	Heating	10	$1.25
E116	Windows - Add Argon to Vinyl Lowe	Replace	Heating	20	$1.29
H120b	Cond Unit Heater From Power Draft (new)	New	Heating	18	$1.38
E125	Windows - Add Argon to Vinyl Lowe	New	Heating	20	$1.47
H115b	Cond Unit Heater from power draft (replace)	Replace	Heating	18	$1.52
H121	Cond Furnace (new)	New	Heating	18	$1.55
E122	Windows - Tinted AL Code to Class 36	Replace	Heating	20	$1.66
W125r	Solar Hot Water	Retrofit	Water Heat	15	$1.68
E131	Windows - Tinted AL Code to Class 36	New	Heating	20	$1.78
H116	Cond Furnace (repl)	Replace	Heating	18	$1.82
H122	HVAC System Commissioning	New	Heating	15	$1.85
E110	Roof Insulation - Blanket R11-41	Retrofit	Heating	30	$1.96
E118	Windows - Non-Tinted AL Code to Class 40	Replace	Heating	20	$1.97
E127	Windows - Non-Tinted AL Code to Class 40	New	Heating	20	$2.00

Detailed Measure Table-Oregon Commercial

Measure Code	Measure Name	Construction Type	Measure End Use	Average Lifetime	Levelized Cost, $/th
E109	Roof Insulation - Blanket R11-30	Retrofit	Heating	30	$2.08
E119	Windows - Non-Tinted AL Code to Class 36	Replace	Heating	20	$3.21
E128	Windows - Non-Tinted AL Code to Class 36	New	Heating	20	$3.28
E117	Windows - Non-Tinted AL Code to Class 45	Replace	Heating	20	$3.43
E126	Windows - Non-Tinted AL Code to Class 45	New	Heating	20	$3.49
H128	Rooftop Condensing Burner	Retrofit	Heating	10	$3.74
W125	Solar Hot Water	New	Water Heat	15	$4.96

Appendix D-3

Washington
Residential Conservation Measures

Detailed Measure Table - WA Residential Sector Technical Potential to 2030

Measure Code	Measure Description	Program	Average Lifetime	Implied No. of Units	Gas Savings to 2030	Total Incremental Cost	Total O&M Impact ($)	Level Cost, $/th
N-A105	Hi-eff Washer	New	12	762	3,048	24,350	(85,118)	($2.15)
N-A102	MEF 2.0 Washer	New	12	7,970	23,910	43,316	(147,895)	($1.63)
R-A102	MEF 2.0 Washer	Replace	12	120873	725,238	1,763,734	(2,127,400)	($0.19)
R-WG106	Wx insulation 1 added measure Zone 3	WxExist	45	1,391	510,983	1,234,140	0	$0.12
R-WG104	Wx insulation 1 added measure Zone 1	WxExist	45	934	301,730	832,603	0	$0.14
R-WG105	Wx insulation 1 added measure Zone 2	WxExist	45	1,879	589,428	1,679,135	0	$0.14
R-GD112	Upgrade to Navien Tankless Gas heater	Replace Gas	20	11136	155,904	232,741	0	$0.39
N-H103	E* Insulation, Ducts, Zone 3	NewPkg	45	12,556	1,582,087	10,192,822	0	$0.41
R-WG109	Window, replacement (U=.35) Zone 3	WxExist	45	2,422	1,316,936	11,363,551	0	$0.43
R-H115	Duct Sealing and AFUE 90+, Zone 3	HVACExist	20	1,464	308,084	1,833,962	0	$0.44
R-WG107	Window, replacement (U=.35) Zone 1	WxExist	45	1,630	774,175	7,663,457	0	$0.49
N-H102	E* Insulation, Ducts, Zone 2	NewPkg	45	17,078	1,736,881	13,867,698	0	$0.50
R-WG108	Window, replacement (U=.35) Zone 2	WxExist	45	3,285	1,502,388	15,463,828	0	$0.51
R-WG103	Wx insulation 2 measures Zone 3	WxExist	45	3,119	805,609	8,310,798	0	$0.51
N-H105	Heating upgrade (AFUE 90), Zone 2	NewPkg	18	8,948	724,759	3,704,483	0	$0.52
R-H103	Duct Sealing, Zone 3	HVACExist	20	2,019	228,955	1,613,145	0	$0.53
R-H113	Duct Sealing and AFUE 90+, Zone 1	HVACExist	20	987	170,490	1,237,027	0	$0.54
N-H101	E* Insulation, Ducts, Zone 1	NewPkg	45	8,471	800,512	6,874,610	0	$0.54
R-GH116	Boiler to Polaris Combo radiant, Z 3	Retro Gas	45	8,680	3,463,320	11,060,754	0	$0.55
R-GH119	Boiler to Polaris Combo radiant, Z 4	Retro Gas	45	8,698	3,313,938	11,061,382	0	$0.57
R-WG101	Wx insulation 2 measures Zone 1	WxExist	45	1,830	417,792	4,904,168	0	$0.58
R-H114	Duct Sealing and AFUE 90+, Zone 2	HVACExist	20	1,991	319,309	2,495,913	0	$0.58
R-WG102	Wx insulation 2 measures Zone 2	WxExist	45	4,327	959,919	11,627,064	0	$0.60
R-A103	Estar Dishwasher	Replace	12	154,177	308,354	707,690	-178,161	$0.63
N-H115	E* Plus (FTC) Insulation, Zone 3	NewPkg	45	5,597	1,657,242	16,749,493	0	$0.64
N-H106	Heating upgrade (AFUE 90), Zone 3	NewPkg	18	6,661	431,603	2,722,812	0	$0.64
R-H106	AFUE 90+ Furnace, Zone 3	HVACExist	18	19,042	1,877,753	15,358,651	0	$0.66
N-A103	Estar Dishwasher	New	12	1,531	4,593	11,152	-3,183	$0.67
R-H101	Duct Sealing, Zone 1	HVACExist	20	1,361	119,088	1,087,999	0	$0.68
N-H104	Heating upgrade (AFUE 90), Zone 1	NewPkg	18	4,453	272,494	1,836,417	0	$0.69

Detailed Measure Table - WA Residential Sector Technical Potential to 2030

Measure Code	Measure Description	Program	Average Lifetime	Implied No. of Units	Gas Savings to 2030	Total Incremental Cost	Total O&M Impact ($)	Level Cost, $/th
R-H112	Combo with Hot Water delivery, Zone 3	HVACExist	30	91	29,712	364,000	0	$0.72
R-H102	Duct Sealing, Zone 2	HVACExist	20	2,746	211,442	2,195,448	0	$0.78
R-H110	Combo with Hot Water delivery, Zone 1	HVACExist	30	61	18,133	244,000	0	$0.79
R-H104	AFUE 90+ Furnace, Zone 1	HVACExist	18	12,831	1,041,976	10,358,494	0	$0.80
N-H114	E* Plus (FTC) Insulation, Zone 2	NewPkg	45	7,611	1,787,826	22,788,282	0	$0.81
N-H112	HRV, E*, Zone 3	NewPkg	45	3,801	355,811	4,537,264	0	$0.81
N-GD109	Upgrade to Navien Tankless Gas heater	New Gas	20	67,453	944,342	2,970,760	0	$0.81
R-H111	Combo with Hot Water delivery, Zone 2	HVACExist	30	124	35,691	496,000	0	$0.82
N-H113	E* Plus (FTC) Insulation, Zone 1	NewPkg	45	3,773	832,004	11,296,795	0	$0.86
R-H105	AFUE 90+ Furnace, Zone 2	HVACExist	18	25,874	1,944,881	20,896,271	0	$0.86
R-WG112	Window upgrade (U=.4 to U=.35) Zone 3	WxExist	45	2,461	49,386	884,069	0	$0.89
N-H111	HRV, E*, Zone 2	NewPkg	45	5,157	417,696	6,173,109	0	$0.93
N-H110	HRV, E*, Zone 1	NewPkg	45	2,558	195,679	3,060,185	0	$0.99
N-H109	Window U=.3, Zone 3	NewPkg	45	7,199	259,177	4,100,052	0	$1.00
R-WG110	Window upgrade (U=.4 to U=.35) Zone 1	WxExist	45	1,656	28,618	596,290	0	$1.03
R-WG111	Window upgrade (U=.4 to U=.35) Zone 2	WxExist	45	3,330	56,406	1,202,679	0	$1.06
N-H108	Window U=.3, Zone 2	NewPkg	45	9,772	307,830	5,578,267	0	$1.15
N-H107	Window U=.3, Zone 1	NewPkg	45	4,854	139,786	2,765,305	0	$1.25
N-DG104	Tankless Gas heater	NewDHW	20	9,049	386,527	5,817,746	0	$1.43
R-DG104	Tankless Gas heater	DHWExist	20	8,339	356,200	6,832,212	0	$1.43
R-H109	AFUE 85 DHW combo, Zone 3	HVACExist	18	1,685	194,119	3,622,750	0	$1.49
R-H107	AFUE 85 DHW combo, Zone 1	HVACExist	18	1,137	124,127	2,444,550	0	$1.58
R-H108	AFUE 85 DHW combo, Zone 2	HVACExist	18	2,293	232,643	4,929,950	0	$1.70
R-WG115	HRV Zone 3	WxExist	18	1,468	108,423	2,840,925	0	$2.10
R-WG113	HRV Zone 1	WxExist	18	978	63,748	1,915,293	0	$2.41
N-DG101	Tank upgrade (50 gal gas)	NewDHW	15	63,684	835,897	17,490,620	0	$2.43
R-DG101	Tank upgrade (50 gal gas)	DHWExist	15	58,690	770,347	20,541,500	0	$2.43
R-WG114	HRV Zone 2	WxExist	18	1,961	123,896	3,865,663	0	$2.50
N-DG103	Solar hot water heater (50 gal) - Solar Zone 2. With gas backup.	NewDHW	20	8,845	996,646	27,993,336	0	$2.67
R-DG103	Solar hot water heater (50 gal) - Solar Zone 2. With gas backup.	DHWExist	20	8,151	918,447	32,874,630	0	$2.67
R-DG102	Tank upgrade (50 gal gas) condensing	DHWExist	15	12,307	815,203	30,767,500	0	$3.44
N-DG102	Tank upgrade (50 gal gas) condensing	NewDHW	15	13,354	884,555	26,197,402	0	$3.44

Appendix D-4

Washington
Commercial/Industrial
Conservation Measures

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Levelized Cost, $/th
C116rep	Estar Steam Cooker	Install Energy Star Steam Cooker	At Replacement	Cooking	$0.04
C116	Estar Steam Cooker	Install Energy Star Steam Cooker	New	Cooking	$0.04
H105	HW Boiler Tune	Tune up in accordance with Minneapolis Energy Office protocol. Can include derating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.	Retrofit	Heating	$0.08
C112	Infared Fryer		New	Cooking	$0.08
C107	Infared Fryer		At Replacement	Cooking	$0.08
H104	Hot Water Temperature Reset	Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.	Retrofit	Heating	$0.10
E111	Roof Insulation - Attic R0-30	Roof Insulation - Attic R0-30. Application: Buildings with uninsulated attics	Retrofit	Heating	$0.10
H102	DCV	Applicable to single zone packaged systems with large make - up air fractions either because of intermittent occupancy or because of code requirements. In most cases the outdoor air is reset to 5% or less with CO2 build-up modulating ventilation.	Retrofit	Heating	$0.13
H106	Steam Balance	Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.	Retrofit	Heating	$0.14
E103	Roof Insulation - Rigid R0-11	Roof Insulation - Rigid R0-11-not including re-roofing costs bu including deck preparation. Application: Old buildings with fla roofs and no attics	At Replacement	Heating	$0.15
E101	Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	Heating	$0.17
C111	Direct Fired Convection Oven		New	Cooking	$0.18
C106	Direct Fired Convection Oven		At Replacement	Cooking	$0.18
W101	DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	Water Heat	$0.21
W127r	Waste Water Heat Exchanger	Install HX on waste water	Retrofit	Water Heat	$0.21
H119	HiEff Unit Heater (new)	Install power draft units (80% seas. Eff) inplace of natural draft (64% seas. Eff)	New	Heating	$0.22
W102	DHW Shower Heads	Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.	Retrofit	Water Heat	$0.22
E104	Roof Insulation - Rigid R0-22	Roof Insulation - Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics	At Replacement	Heating	$0.23
H114	Hi Eff Unit Heater (replace)	Install power draft units (80% seas. Eff) inplace of natural draft (64% seas. Eff)	At Replacement	Heating	$0.24
E102	Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	Heating	$0.24
E107	Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	Heating	$0.29
E108	Roof Insulation - Blanket R0-30	Roof Insulation - Blanket R0-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	$0.31
H107	Vent Damper	Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.	Retrofit	Heating	$0.31
E105	Roof Insulation - Rigid R11-22	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	$0.34
W121	Combo Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Heating	$0.36
W124r	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	Retrofit	Water Heat	$0.37
W119	Combo Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Heating	$0.40
E112	Roof Insulation - Attic 11-30	Roof Insulation - Attic 11-30. Application: Buildings with partially insulated attics	Retrofit	Heating	$0.40

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Levelized Cost, $/th
W103	DHW Faucets	Add aerators to existing faucets to reduce flow from 3.4 gallons per minute to 2.0 GPM.	Retrofit	Water Heat	$0.42
E114	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: Old buildings	At Replacement	Heating	$0.42
E123	Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: New Construction	New	Heating	$0.42
H117	SPC Hieff Boiler (new)	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Heating	$0.45
C115	Power Range Burner		New	Cooking	$0.46
C110	Power Range Burner		At Replacement	Cooking	$0.46
H111	SPC Hieff Boiler Replace	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	At Replacement	Heating	$0.49
E115	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: Old buildings	At Replacement	Heating	$0.57
E124	Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: New Construction	New	Heating	$0.58
W109	DHW Condensing Tank (new)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	New	Water Heat	$0.62
W108	DHW Condensing Tank (repl)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	At Replacement	Water Heat	$0.62
C114	Infared Griddle		New	Cooking	$0.62
C109	Infared Griddle		At Replacement	Cooking	$0.62
H108	Power burner	Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.	Retrofit	Heating	$0.63
H120a	Cond Unit Heater from Nat Draft(new)	Install condensing power draft units (90% seas. Eff) inplace of natural draft (64% seas. Eff)	New	Heating	$0.68
W127	Waste Water Heat Exchanger	Install HX on waste water	New	Water Heat	$0.70
W122	Combo Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Heating	$0.73
W115	DHW Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	New	Water Heat	$0.74
W113	DHW Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	At Replacement	Water Heat	$0.74
H118	SPC Cond Boiler (new)	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	New	Heating	$0.75
H115a	Cond Unit Heater from Nat draft(replace)	Install condensing power draft units (90% seas. Eff) inplace of natural draft (64% seas. Eff)	At Replacement	Heating	$0.75
W120	Combo Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Heating	$0.80
R101	Heat Reclaim with Floating Head Control	Large Grocery - Heat recovery to space heating with floating head control	New	Refrigeration	$0.80
R101rep	Heat Reclaim with Floating Head Control	Large Grocery - Heat recovery to space heating with floating head control	At Replacement	Refrigeration	$0.80
E121	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	$0.80
H112	SPC Cond Boiler Replace	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	At Replacement	Heating	$0.81
W104	DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	Retrofit	Water Heat	$0.84
E130	Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: New Construction	New	Heating	$0.87
H123	HVAC controls	Control set up and algorithm. This assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, properly training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are set at optimum levels for the current occupancy.	New	Heating	$0.90
H103	Ducts	Duct retrofit of both insulation and air sealing	Retrofit	Heating	$0.90
W105	DHW Recirc Controls	Install electronic controller to hot water boiler system that turns off the boiler and circulation pump when the hot water demand is reduced (usually in residential type occupancies) or can be reset to meet the hot water load. (Steel boilers also require a mixing valve to prevent water temperatures from dropping below required levels).	Retrofit	Water Heat	$0.95
E113	Roof Insulation - Roofcut 0-22	Roof Insulation - Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time	At Replacement	Heating	$0.96

Detailed Measure Table - WA Commercial Sector Technical Potential to 2030

Measure Code	Measure Description	Measure Description	Construction Type	Measure End Use	Levelized Cost, $/th
H101	Warm Up Control	This measure is designed to implement a shut down of outside air when the building is coming off night setback. Ususally the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers	Retrofit	Heating	$0.98
W124	Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	New	Water Heat	$1.04
W123	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	New	Water Heat	$1.06
W123r	HiEff Clothes Washer	Install high performance commercial clothes washers - residential sized units	At Replacement	Water Heat	$1.09
E106	Roof Insulation - Rigid R11-33	Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	At Replacement	Heating	$1.15
W116	DHW Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	New	Water Heat	$1.16
W114	DHW Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	At Replacement	Water Heat	$1.16
H129	Steam Trap Maintanence	Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.	Retrofit	Heating	$1.25
E116	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: Old buildings	At Replacement	Heating	$1.29
H120b	Cond Unit Heater From Power Draft (new)	Install condensing power draft units (90% seas. Eff) inplace of power draft (80% seas. Eff)	New	Heating	$1.38
E125	Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: New Construction	New	Heating	$1.47
H115b	Cond Unit Heater from power draft (replace)	Install condensing power draft units (90% seas. Eff) inplace of power draft (80% seas. Eff)	At Replacement	Heating	$1.52
H121	Cond Furnace (new)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	New	Heating	$1.55
E122	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	$1.66
W125r	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	Retrofit	Water Heat	$1.68
E131	Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: New Construction	New	Heating	$1.78
H116	Cond Furnace (repl)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	At Replacement	Heating	$1.82
H122	HVAC System Commisioning	HVAC system commissioning. Includes testing and balancing, damper settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.	New	Heating	$1.85
E110	Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	Heating	$1.96
E118	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: Old buildings	At Replacement	Heating	$1.97
E127	Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: New Construction	New	Heating	$2.00
E109	Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	$2.08
E119	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: Old buildings	At Replacement	Heating	$3.21
E128	Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: New Construction	New	Heating	$3.28
E117	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: Old buildings	At Replacement	Heating	$3.43
E126	Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: New Construction	New	Heating	$3.49
W125	Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	New	Water Heat	$4.96

Appendix D-5

ETO 2011 Stellar Study Update

ENERGY EFFICIENCY AND CONSERVATION MEASURE RESOURCE ASSESSMENT FOR THE YEARS 2010-2030

Prepared for the

Energy Trust of Oregon, Inc.

Draft Report

January 25, 2011

By

Stellar Processes

And

Ecotope

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Project Overview

The goal of this project was to provide Energy Trust of Oregon, Inc. (Energy Trust) with the amount and cost of potential energy efficiency and renewable energy measures that could provide electricity and natural gas demand-side savings for Oregon consumers by 2030 within the Energy Trust service territory. This resource assessment is designed to inform strategic planning, the project development and selection process, and for use in utility resource planning. By 2030, a technical potential of approximately 766 Average Megawatts (aMW) of electric savings and 108 million annual therms of gas savings were identified in this study[1].

Table 1: Summary of Technical Potential

Electric Utilities	**Both Utilities, aMW**
Residential	181
Commercial	358
Industrial	178
Conservation Voltage Reduction	49
Total (Including voltage reduction)	766
Natural Gas Utilities	**Both Utilities, Mmtherm**
Residential	67
Commercial	21
Industrial	20
Total (Including cross-utility impact)	108

Conservation Voltage Reduction is a potential measure applicable by the utility at the substation level. Hence, it is not a measure that would be targeted by the Energy Trust but it is included in order to give a complete picture of the demand side potential. Quantification of Conservation Voltage reduction comes from the work of the Northwest Power and Conservation Council and was not explicitly developed in this project.

Stellar Processes and Ecotope, Inc., reviewed existing demographic and energy efficiency measure data sources to identify and quantify the resource potential. The contractors created updateable planning tools to develop these estimates and for Energy Trust to incorporate in their ongoing planning processes. The tools to evaluate the cost of individual measures and packages

[1] Electric measure savings are quantified in average MW as well as peak MW savings for summer and winter heavy demand periods. Gas savings are quantified in annual therms.

of measures consider the measure life, equipment and installation, annual O&M expenses, and the discount rate employed by the Energy Trust to produce levelized costs and a Benefit Cost Ratio (BCR). Levelized costs are useful to compare program options and conservation strategies that have different measure lives. The BCR provides a comparison to long-term benefits that include the lifetime and load shape value of the savings. In this sense, the BCR is a more thorough comparison and is the index used to screen for cost-effectiveness.

It is important to note that program related costs are not included because Energy Trust staff directed that they are outside the scope of this study. It is equally important to note that the levelized costs shown in this study are the entire societal cost of efficiency measures for situations where existing, working equipment is retrofit, and the incremental cost of efficiency when considering new purchases of efficiency versus standard equipment. The incentive costs to the Energy Trust are often only a portion of these "total measure costs". This study provides the basic information on the cost of measures, which the Energy Trust will combine with their knowledge of markets and programs and incentives to develop estimates of total program costs to the society and (separately) to the utility system.

While this project was not intended to provide program design, it does identify and quantify estimates of electricity and gas use and measures of activity (such as number and energy use of households or total floor space) in the target markets for the industrial / agriculture, residential, and commercial sectors. Residential savings potential is quantified by housing type for new and existing single family, multifamily, and manufactured homes. Commercial savings are quantified on a square footage basis for typical business type designations such as retail, grocery, and large and small office spaces. The industrial analysis quantifies savings and costs by process type such as wood products, food, and electronics.

Determining the applicability of potential measures to specific segments or subsectors of the commercial and industrial building stock can be difficult. For these segments, many "cross cutting" measures such as lighting improvements for commercial applications or motor efficiency improvements for industrial customers were analyzed. Cross cutting measures can be applicable across a wide variety of circumstances and building types. In the industrial sector, many measures are relevant for specific applications or processes rather than in discrete building types. The industrial technical potential section discusses the assumptions used to determine measure applicability.

Summary of Results

The resource potential can be considered "technical" or "achievable". The technical potential is an estimate of all energy savings that could be accomplished immediately without the influence of any market barriers such as cost and customer awareness. As such, it provides a snapshot of everything that could be done. Technical potential does not present what can be saved through programs; it would be impossible to get every customer to install every possible measure. Furthermore, some resources may cost more than the Energy Trust or participants wish to pay. The achievable potential represents a more realistic assessment of what could be expected – taking into account the fact that not all consumers can be persuaded to participate and other real world limitations.

The following figures and tables summarize the results of this analysis for 2030. In providing summary statistics for this section, we screened measures to a BCR of 1 or better. This provides a summary of the savings potential that has a reasonable chance of being cost effective when compared to avoided energy costs. Although the list of cost-effective measures does not include the highest cost measures, the supply curves and detailed tables of measures in the Technical Appendix lists all measures considered in this study. Both supply curves show some additional potential just beyond the current cost-effectiveness screen. Should higher avoided costs occur, there would be more additional measures available for conservation programs.

Figure 1: Electricity Supply Curve

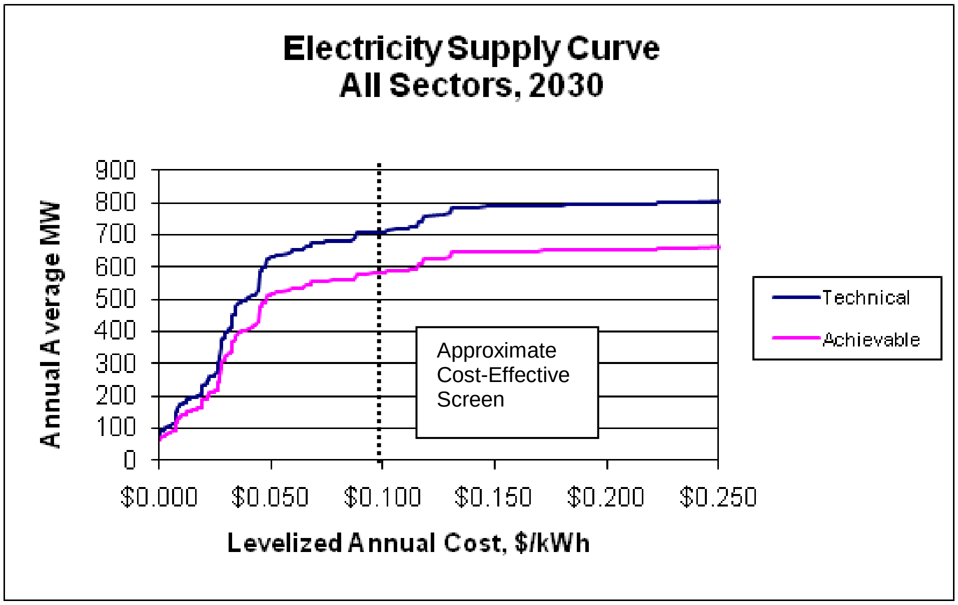


Figure 2: Electricity Technical Potential

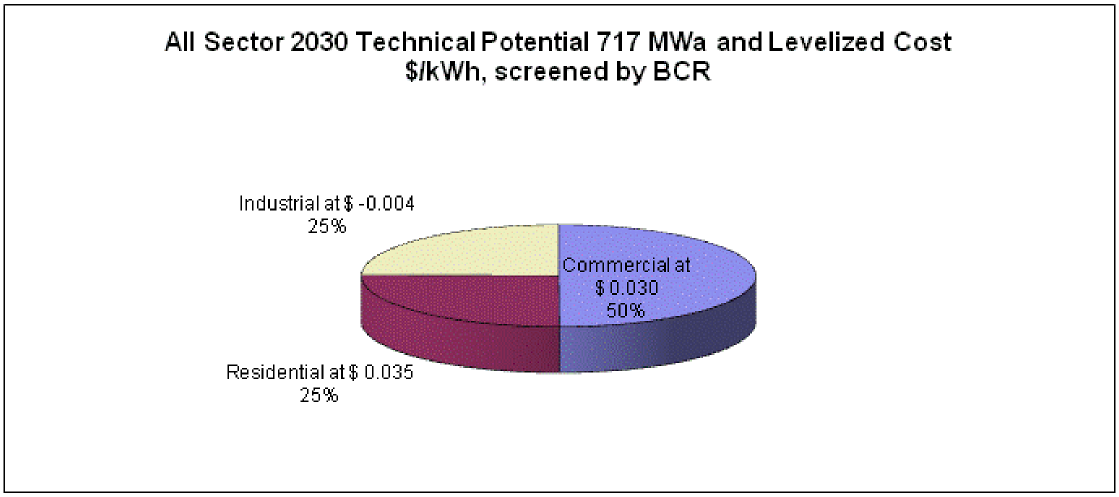


Figure 1 shows that the estimated savings from all electricity measures would reduce electricity use by 717 aMW of technical potential for cost-effective measures. Most of the proposed measures fall within the cost-effectiveness screen. One large exception is solar water heaters, which remain expensive even after tax credits. Energy Trust has found solar water heat to be cost-effective using a more complex cost-effectiveness methodology than the simple first0cut approach employed in this study. Figure 2 shows the distribution of potential electric savings across market segments.

Figure 3 shows that natural gas conservation measures could reduce consumption by an estimated 108 million therms. Figure 4 shows the distribution of potential natural gas savings across market segments.

Figure 3: Natural Gas Supply Curve

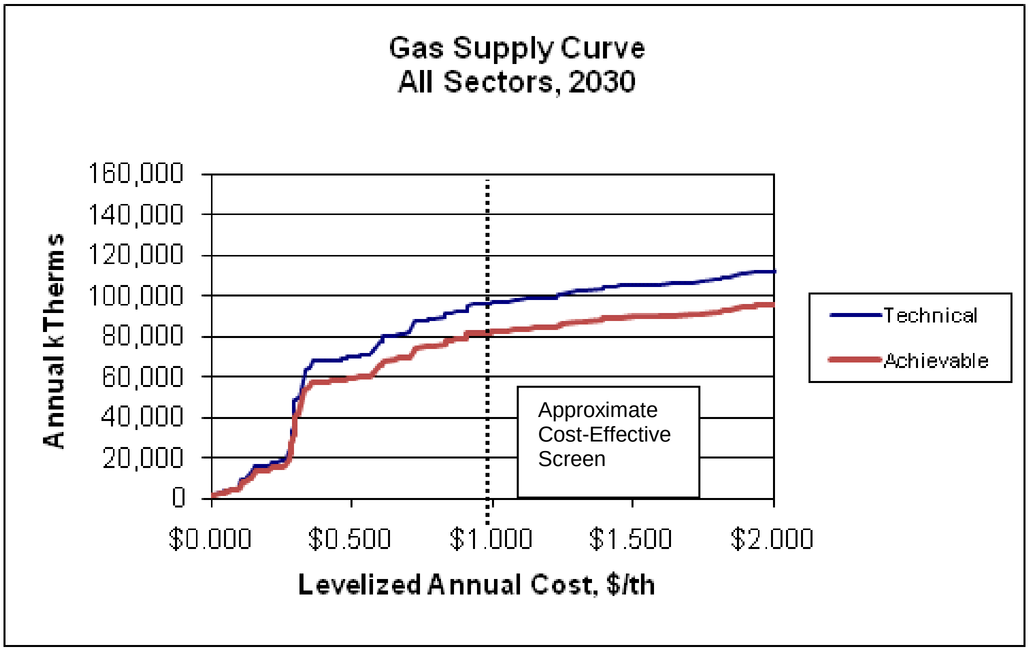
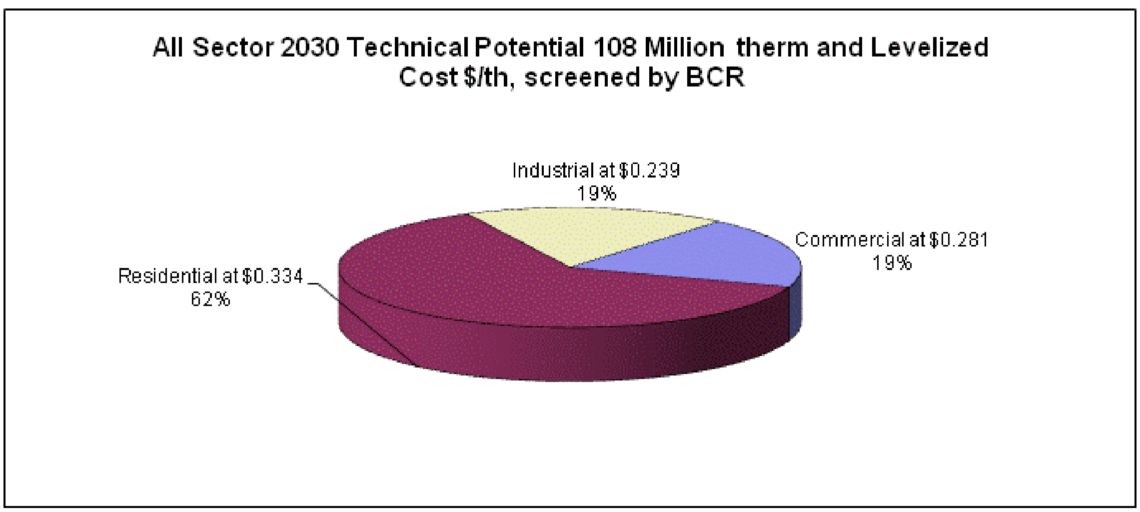


Figure 4: Natural Gas Technical Potential



Significant Efficiency Measures

Utility Sector

As mentioned previously, Conservation Voltage Reduction (CRV) is a set of measures that would be implemented at the utility level. The estimate of conservation potential was developed by the Northwest Power and Conservation Council (NPCC). The savings estimate amounts to saving 1.3% of current utility sales across all customer classes. In general, these measures could be negative in cost after credit for deferred utility investment in capacity expansion. No independent analysis was conducted for that set of measures. For further information, the reader is referred to NPCC.

Industrial Sector

Industrial customers of investor owned utilities in Oregon with over 1 aMW demand have the option of using their payment to the energy efficiency portion of the public purpose charge to self-direct implementation of efficiency projects. Under current policy, these customers are eligible for Energy Trust programs, albeit for additional conservation investments, and at reduced incentives. In addition, some industrial customers are transmission customers only for the utilities, but still pay the public purpose charges that funds the Energy Trust and are eligible for Energy Trust programs. For this study, neither of these types of industrial customers were removed – that is, these results apply to all the industries within Energy Trust territory because they are all eligible for Energy Trust programs,..

For this sector, measures can be thought of either as cutting across industries or process- specific segments. For example, motors and lighting occur in all segments; however, other measures may be specific to paper manufacturing or another process. Due to proprietary concerns, it is difficult to obtain information on specific facilities; the actual amount of process savings is likely to be much larger than estimated here. Management and engineering optimization are difficult to define and quantify but represent the most resource potential. With this sort of study, it is important that national-level process and end use data by industry type be carefully considered and adjusted for relevance to the local industry. Large potential savings are estimated for the electronics sector due to anticipated new growth as reflected in utility load forecasts.

Figure 5: Major Industrial Measures

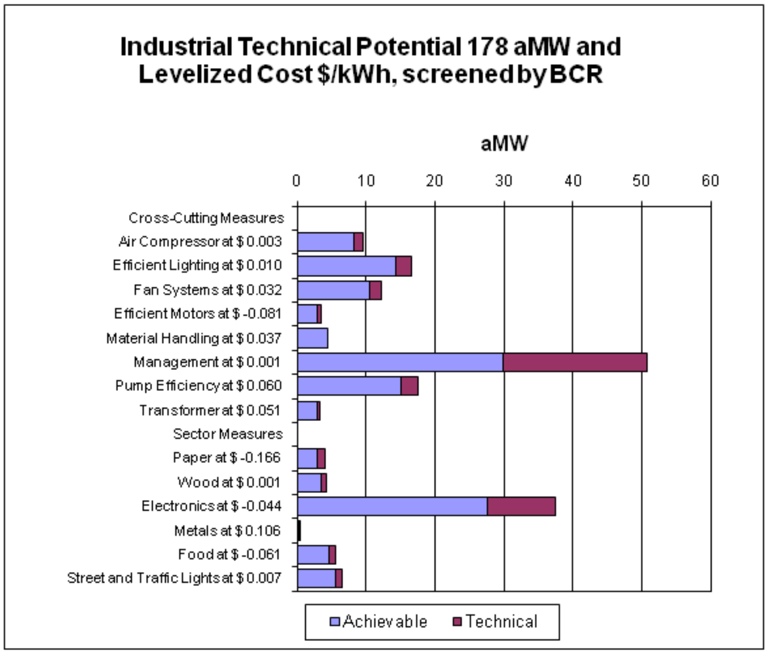


Table 2: Industrial Sector Technical Potential Saving in 2030 by Segment Screened by BCR

Segment	Consumption, aMW	Potential Savings, aMW	Savings Fraction
Hi Tech - Chip Fab	391	35	9%
Paper	42	9	23%
Kraft Pulp	111	25	22%
Foundries	96	3	3%
Metal Fab	42	2	5%
Transportation, Equip	35	3	8%
Other Food	43	9	21%
Frozen Food	23	6	24%
Wood - Lumber	64	9	14%
Wood - Panel	25	4	16%
Wood - Other	20	3	17%
Chemical	14	1	8%
Misc Manf	176	17	10%
Street Lighting	107	6	5%
Agriculture	109	0	0%
Total	**1,299**	**133**	**10%**

As Table 3 shows, industrial sector measures appear low in cost from a societal perspective because there are non-energy benefits in terms of increased production and reduced use of raw materials.

Table 3: Industrial Sector Technical Potential Saving in 2030, Screened by BCR

Measure Category	aMW Savings	Level Cost, $/kWh
Cross-Cutting Measures		
Air Compressor	9.6	$0.014
Efficient Lighting	16.6	$0.009
Fan Systems	12.2	$0.023
Efficient Motors	3.4	$0.014
Material Handling	5.2	$0.036
Management	50.7	$0.036
Pump Efficiency	17.5	$0.017
Transformer	3.4	$0.006
Segment Measures		
Paper	4.1	$0.027
Wood	4.3	-$0.056
Electronics	37.4	-$0.060
Metals	0.4	-$1.991
Food	5.5	$0.027
Street and Traffic Lights	6.7	$0.041
Ag Irrigation	0.7	$0.000
Total	**177.9**	**$0.001**

In a change from the previous study, both small and large industrial gas customers are included in the current study. Figure 6 and Table 4 show the potential for gas conservation measures. In general, much of the opportunity lies in some form of boiler improvement.

Figure 6: Industrial Natural Gas Measures

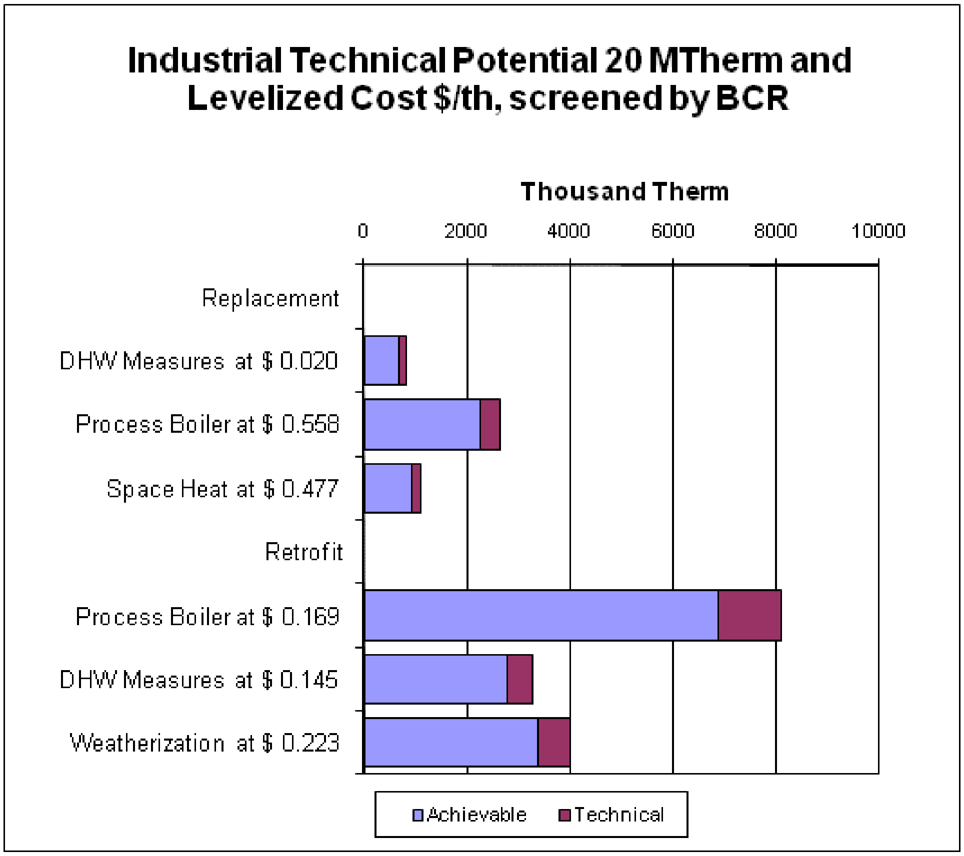


Table 4 Industrial Gas 2030 Technical Potential Savings, Screened by BCR

Measure Category	Technical Potential, ktherm	Levelized Cost, $/th
	Replacement	
Process Boiler	2,653	$0.558
DHW Measures	811	$0.020
Space Heat	1,097	$0.477
	Retrofit	
Process Boiler	3,271	$0.145
DHW Measures	8,084	$0.169
Weatherization	3,988	$0.223
Total	**19,903**	**$0.239**

Commercial Sector

Figure 7 and Table 5 show the potential for groups of measures in the commercial sector with most significant savings. These measure groups are broken out according market segments that affect program design. These groups are shown as retrofit, replacement of existing stock and new construction. Clearly, new lighting opportunities dominate, in part due to emerging technology. In most cases, achievable potential is estimated as 85% of technical potential. Details are shown in Table 5. In these tables "equipment" means mechanical equipment not included in the other specified end uses.

Figure 7: Major Commercial Segment Measures, Electricity

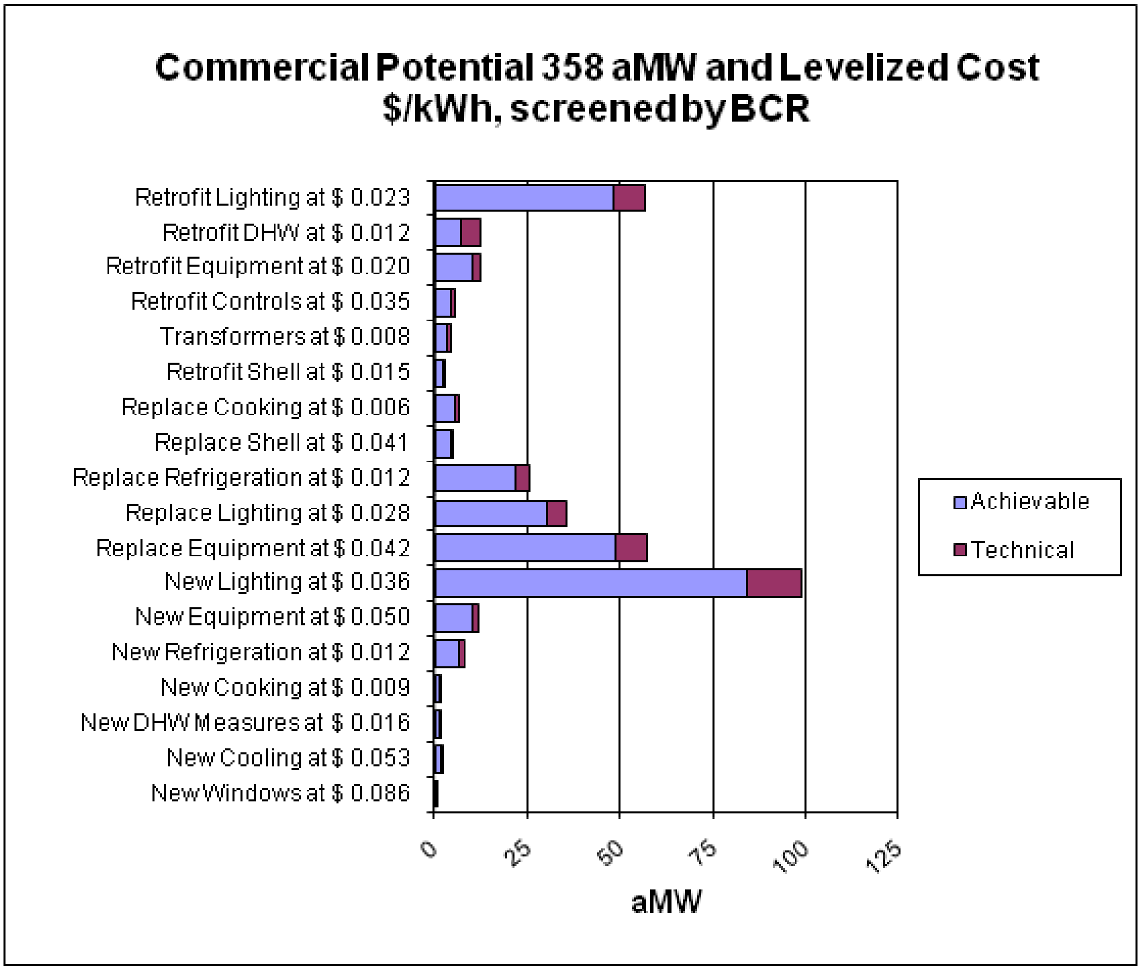


Table 5: Commercial Sector 2030 Technical Potential Savings, Screened by BCR

Measure Category	aMW Savings	Winter Peak Savings, MW	Summer Peak Savings, MW	Level Cost, $/kWh
New Windows	0	1	0	$0.086
New Cooling	2	4	4	$0.053
New Cooking	2	2	2	$0.053
New Equipment	12	21	19	$0.050
New Lighting	99	80	103	$0.036
New Refrigeration	8	10	13	$0.012
New DHW Measures	2	2	2	$0.016
Replace Cooling	9	18	16	$0.034
Replace Cooking	7	7	7	$0.006
Replace Shell	5	15	1	$0.041
Replace Lighting	36	43	56	$0.028
Replace Refrigeration	26	31	40	$0.012
Replace Equipment	57	59	59	$0.042
Retrofit Shell	3	8	1	$0.015
Retrofit Equipment	12	27	23	$0.020
Retrofit Lighting	57	68	88	$0.023
Transformers	4	4	4	$0.008
Retrofit Controls	5	6	6	$0.035
Retrofit DHW	12	13	21	$0.012
Total	**358**	**417**	**464**	**$0.030**

Major opportunities lie in upgrading the building shell and improving heating and cooling equipment. Shell measures include windows and insulation.

Figure 8 and Table 6 show the conservation potential for natural gas in the commercial sector. These measures are also grouped by retrofit, replacement and new construction. Major opportunities lie in upgrading the building shell and improving heating and cooling equipment. Shell measures include windows and insulation.

Figure 8: Major Commercial Sector Measures, Gas

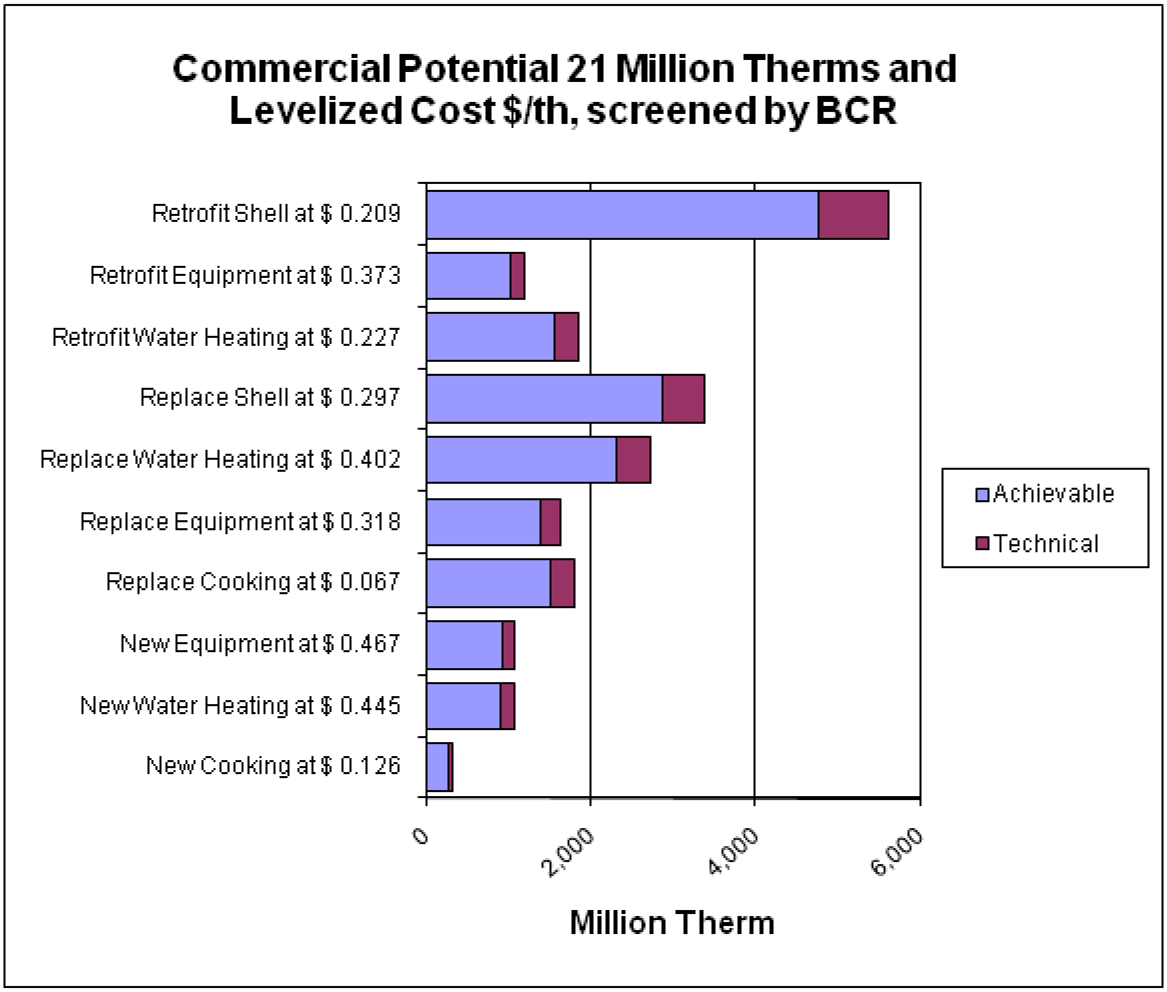


Table 6: Commercial Sector Gas Technical Potential Savings for 2030, Screened by BCR

Measure Category	Thousand therm	$/therm
New Cooking	321	$0.126
New Equipment	1,088	$0.467
New Water Heating	1,069	$0.445
Replace Cooking	1,798	$0.067
Replace Shell	3,389	$0.297
Replace Equipment	1,629	$0.318
Replace Water Heating	2,723	$0.402
Retrofit Shell	5,621	$0.209
Retrofit Equipment	1,206	$0.373
Retrofit Water Heating	1,853	$0.227
Total	**20,698**	**$0.281**

Residential Sector

Figure 9 and Table 7 show residential electricity potential in 2030 grouped by existing and new construction opportunities. The large savings in HVAC Retrofit (compared to past studies) are due to ductless heat pumps. This measure is borderline cost-effective. Lighting savings are largely from specialty CFL bulbs, as conventional CFLs or their equivalent will be required by law soon. The large savings for Appliance Replacement are due to low power consumer electronic appliances that are large in the near-term but will be replaced anyway in the long-term. There is significant potential for replacement of heating systems and appliances. Emerging heat pump water heaters are expected to be a major resource although commercially available models for Oregon's climate have just arrived and are still being tested for functionality.

Figure 9: Major Residential Segment Measures, Electricity

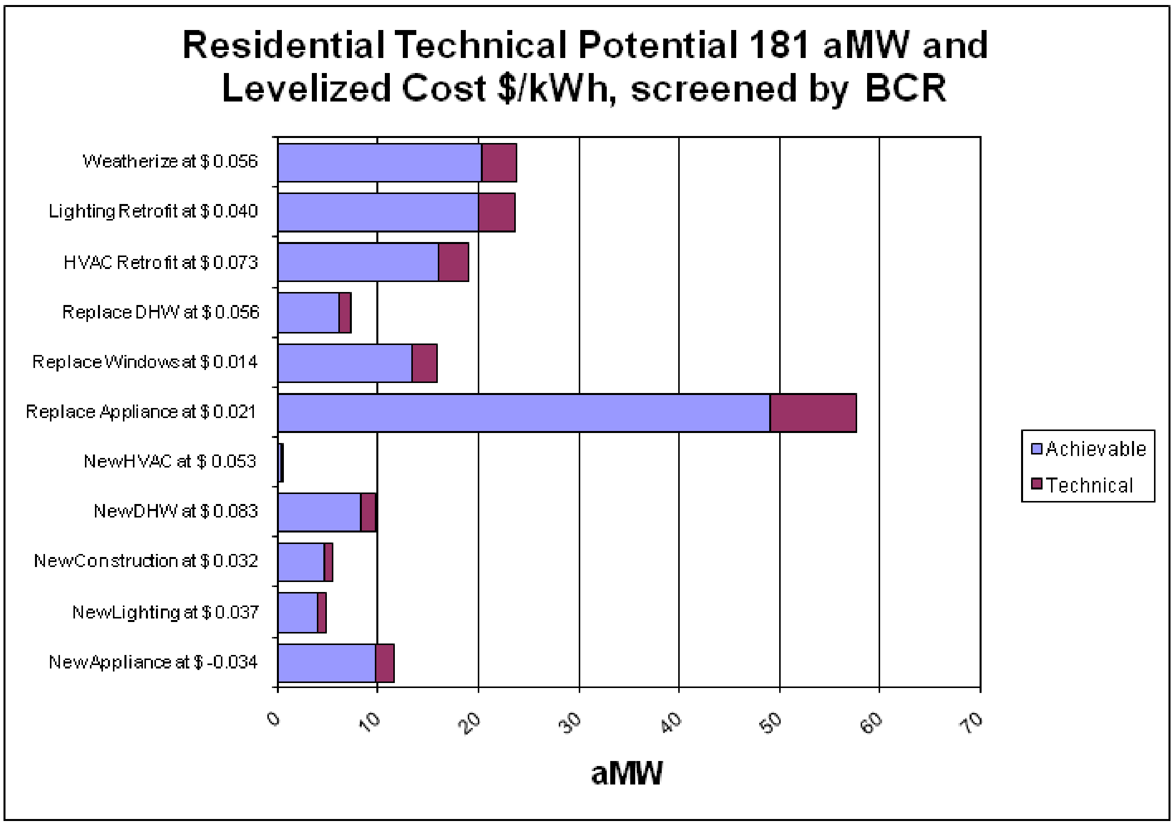


Table 7: Residential Sector Electric Technical Potential Savings for 2030, Screened by BCR

Measure	aMW Savings	Winter Peak Savings, MW	Summer Peak Savings, MW	Level Cost, $/kWh
New Appliance	12	13	12	-$0.034
New DHW	10	12	10	$0.083
New Construction	6	11	2	$0.032
New Lighting	5	5	5	$0.037
New HVAC	1	1	0	$0.053
Replace Windows	16	32	2	$0.014
Replace Appliance	58	62	60	$0.021
Replace DHW	7	9	8	$0.056
Replace Equipment	1	2	0	$0.061
HVAC Retrofit	19	28	7	$0.073
Lighting Retrofit	24	24	24	$0.040
Weatherize	24	46	5	$0.056
Total	**181**	**246**	**136**	**$0.035**

Figure 10 and Table 8 show residential potential for natural gas savings in 2030 grouped by existing and new construction. For natural gas, the greatest opportunity lies in weatherization of existing homes, retrofit of existing heating equipment, and increased efficiency for new construction. Opportunities during new construction include better insulation and windows, duct sealing, high efficiency furnaces, and heat recovery ventilation. The fact that some appliances are negative in cost reflects the fact that there are non-energy benefits, such as water savings, that offset cost for some appliances.

Figure 10: Major Residential Sector Measures, Gas

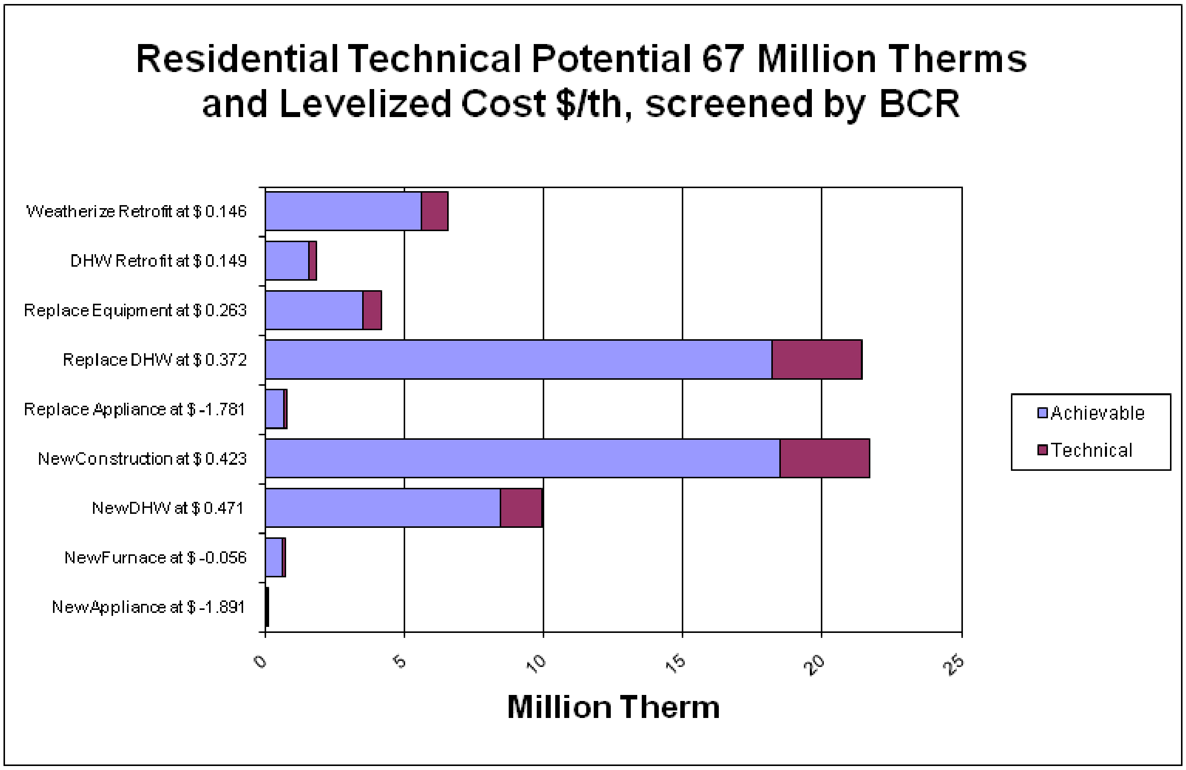


Table 8: Residential Sector Gas Technical Potential Savings for 2030, Screened by BCR

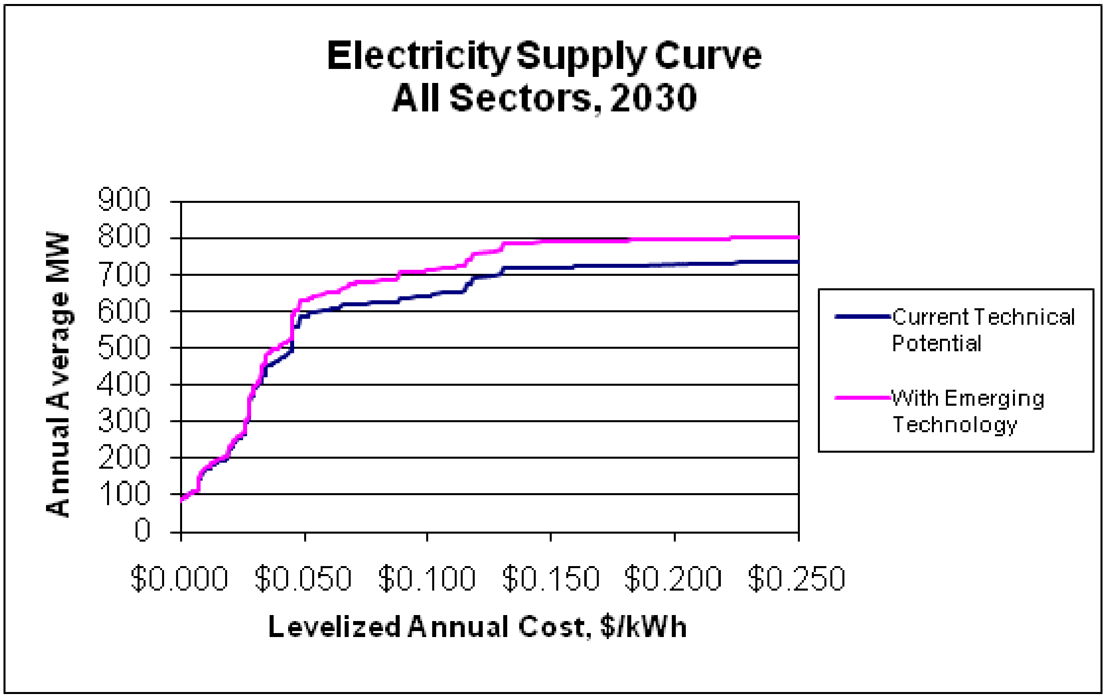
Measure Category	Thousand Therm	$/therm
New Appliance	97	-$1.891
New Furnace	737	-$0.056
New Construction	21,728	$0.423
New DHW	9,931	$0.471
Replace Equipment	4,161	$0.263
Replace DHW	21,425	$0.372
Replace Appliance	815	-$1.781
Weatherize Retrofit	6,587	$0.146
DHW Retrofit	1,871	$0.149
Total	**67,352**	**$0.334**

Emerging Technology

Distinction should be noted between those measures that are new -- that is, available but not yet in widespread practice -- and those that are emerging but not yet available in the market. These measures are expected to become widespread in the future even if they are not yet considered mainstream. Measures in this category deserve discussion and possible support for demonstration because they are quite likely to become important opportunities. Unfortunately, the methodology of resource assessment is not well suited to exploring hypothetical new options (see Fred Gordon, et al., “Beyond Supply Curves”, ACEEE Conference Proceedings, 2008).

Given that our ability to predict future inventions is limited, one can still develop some sensitivity estimates for products that are known or expected to be almost market ready. Figure 11 shows emerging technology increases the supply curve by almost 20%.

Figure 11. With Emerging Technology



The specific measures treated as emerging are discussed in more detail titled “New Measure Development” on page 21. In general, most of these measures we could identify as “emerging” are in the residential sector.

Residential consumer electronics are a rapidly changing market. One anticipates that many new products will start to use “smart” capabilities including internet controls. If done properly, this could lead to energy savings during “sleep” mode. California has identified large savings opportunities and is pursuing a program for Low Power Mode Appliances. Such savings would occur through new standards to be implemented at the manufacturing level and would not be immediate program opportunities. Within programs, we include emerging opportunities for new lighting products and heat pump water heaters.

The importance of these new technologies is illustrated in Table 9, which shows the amount of included resource potential that is anticipated as “emerging”. Assuming that the new products occur, they would then be responsible for 16% of the new and increased technical potential for the residential sector.

Table 9: Residential Emerging Technology

Measure	aMW Savings	Emerging Technology as Percent of Total
New HVAC	0	30%
New DHW	1	91%
New Lighting	5	83%
Lighting Retrofit	7	46%
Heat Pump HW	7	94%
Total	**20**	**16%**

Resource Assessment Methodology

This section describes the methodology used in this report. More detailed description is provided in the detailed appendix and many of the specifics are documented in the calculation spreadsheets.

To summarize the approach, we applied the following steps in this study:

- Establish Energy Consumption Baseline.

We quantified current energy use by segment unit (residential household, commercial square footage, and industrial by typical facility) and customer type within each segment (single family, small office, wood products, etc.). It is important to understand how much energy is currently consumed for specific end uses and market segments in order for the eventual savings estimates to be realistic. We utilized the utility estimates of sales by customer group and market segment and best estimates of Energy Use Index (EUI kWh/sq. ft.) factors to calibrate our estimates to the actual utility sales data.

- Estimate Energy Consumption by End Use for Each Customer Type.

The methods varied by customer group. For the industrial sector, we estimated the “share down” factors, that is, the fraction of consumption for specific process uses. For the commercial sector, the EUI factors provided consumption by end use. For the residential sector, we applied prototype models to estimate major end use consumption, calibrated to actual sector consumption

- Forecast future consumer population.

We applied the utility forecasted growth rate to estimate the customer base available in future years.

- Compile And Screen List Of Measures, Develop Measure Details

We reviewed information on specific measures for applicability to ETO territory customers. This information includes estimates of incremental cost and savings but also assesses the market potential for specific measures. Applicability of some measures depends on the fuel for space heating, for example. Also the amount to which the market is currently saturated affects the amount of remaining potential. We focused on measures with significant savings for a significant portion of the housing, building, or equipment stock in question. The intention was not to represent every possible measure, but represent the available cost and savings by choosing the most significant measures.

- Implement Worksheet Tool To Aggregate And Sum Conservation Potential.

We developed a series of worksheets to compute the savings potential and cost for each measure and customer type, and then results were aggregated for an estimate of the total potential.

Data Collection

To develop the inputs required by the tool, the team utilized a wide variety of resources. A literature review was conducted to collect equipment and O&M costs and energy savings. This review was augmented by internal data developed by the team members for use in prior projects. Where available, the Northwest Power & Conservation Council's (NPCC) Regional Technical Forum (RTF) data was utilized in the residential sector to collect costs and energy benefits. In addition, the NPCC libraries provided cost and benefit data for many of the commercial sector measures. In some cases, technical papers or data provided by manufacturers was used. Energy Trust historical program data and measure screening analysis also provided data input for the study. The data source(s) used for each measure are noted in the Notes and Sources section of each measure workbook.

To determine the applicability of measures to the Energy Trust service territory and to assess market conditions, economic and census data was collected from Economy.com and from the U.S. Census Bureau and the Department of Housing and Urban Development. Population estimates were also collected from the Portland State University Center for Population Studies and from the Manufactured Housing Association.

Where available, public documents prepared by the individual utilities were used to generate electricity and gas end use or device saturation and penetration rates for the Energy Trust service territory. Where not available, these rates were extrapolated from county- or state-level data.

Selection of Potential Measures

In residential sector, we utilized 121 measures. Each measure is developed separately for three building types. In the commercial sector, we utilized 106 measures. Each measure is then developed separately for 12 building types.

The measures identified in the initial list were then analyzed for cost and performance in the Energy Trust service territory. We used a wide variety of resources to develop measure-specific inputs for this study. We conducted a literature review to collect equipment and labor costs and energy benefits. Energy Trust project data and measure cost effectiveness screening models were combined with Northwest Power & Conservation Council's Regional Technical Forum (RTF) data and other regional sources for measure costs, savings, and non energy benefits assumptions. We studied the Oregon market to identify the total market size, infrastructure, climate, energy use, energy costs, and other variables that impact the usefulness of each of the measures in the particular market served by the Energy Trust.

The study is structured to present efficiency potential by measures directed to "New Construction," "Retrofit," or "Replacement." "Replacement" applies to the annual turnover of equipment in any year. We can also compute this resource as a cumulative total for a future year. Retrofit applies to upgrading existing equipment that has not yet reached its useful life.

For each measure, we attempted to identify and quantify the potential market for which that measure was applicable. While this is relatively straightforward in the residential sector and only slightly problematic in the commercial sector, it is very difficult to provide the same level of detail for a technical potential assessment in the industrial sector. Nevertheless, we have provided an approximate technical potential for each measure that can be used to estimate overall program size and savings potential.

To calculate the cost of each measure, the following assumptions were generally followed. Where appropriate, exceptions have been noted within the measure workbook. Only actual equipment and labor costs were included in the measure cost calculation used in this analysis. In addition, incremental costs (or savings) related to differences in operations and maintenance was considered in the cost analysis. We did not consider program administrative costs, marketing or other overhead expenses.

For each measure, the incremental cost of the equipment examined in the measure over that required by the relevant energy code was used where applicable in new construction, renovation, and replacement markets. The entire cost of substitute equipment was considered in retrofit situations[2]. These measures generally examine one-for-one equipment selections so all other costs, such as maintenance, are assumed to be the same. In cases where additional maintenance costs would be associated with the equipment in the measure, these incremental costs have also been included.

The impact of the measure on O&M expenses was calculated and included in the cost-effectiveness analysis. In some cases, there are negative O&M costs – that is, non-energy benefits – that are included in the analysis. In planning terms, we utilized a cost that represents the full societal cost or total resource cost (TRC). The cost-effectiveness approach employed here is a simplification of the more sophisticated approach used to qualify individual measures at the Energy Trust, intended to get about the right answer in aggregate. Individual measures that pass by this method may not pass Energy Trust's more detailed screening, and the reverse is also true.

For the technical potential savings analysis, we assumed that the measure would be applied to all applicable situations and where no related measure was applied. For retrofit measures, we assumed that the existing population would be addressed to the extent possible. For replacement measures, we first calculated a replacement rate and then assumed that the measure was applied for the cumulative number of replacements up to the target year. For "new" measures in new construction, we assumed that all of the applicable new construction was treated every year. Growth rates were developed based on utility projections. For replacement and new measures, it

[2] A retrofit situation is where working equipment might be replaced with more efficient equipment primarily for energy savings purposes.

is important to specify a target year sufficiently into the future that significant new resources will be counted. We utilized the year 2030 as the target year for assessment. Because replacement and new potential occurs as equipment is sold or buildings constructed, it is only available over the course of the period of study; that is, savings cannot be accelerated beyond the rate of sales or construction.

Retrofit and replacement can be in conflict; if one does a retrofit, the efficiency opportunity is no longer available to become a replacement candidate later. At the same time, there are measures that occur only as retrofit or only as replacement options. We worked with the measures in various ways to assure that retrofit and replacement would not be “double-counted.” Often, the retrofit is much more expensive because the replacement is only an incremental cost over replacement with a less efficient but otherwise similar piece of equipment. In cases where retrofit was clearly more expensive than grid power and pipe gas, yet replacement was feasible, we ruled out the retrofit as not feasible. Another option was to compute the cumulative replacements and remove those from eligibility as retrofits. The Resource Assessment spreadsheets allow the analyst to choose an approach.

Another potential conflict can occur when two technologies go after the same energy end use. For example, heat pump water heaters and solar water heaters are competing technologies. In these cases, we divided the market between the two options to avoid double-counting.

Since we are dealing with two fuels, we must be aware of some other factors. In general, we can develop a supply curve for only one fuel at a time. That is, the gas and electricity supply curves are independent. Of course, that does not mean that efficiency opportunities for the two fuels are always independent – many measures save both electricity and gas on the same site (e.g. building energy management system) and many markets can only be effectively approached by a dual fuel program (e.g. new homes.) This merely means that the impacts of investment in one fuel on energy use for the other are not captured in the supply curve graph. These impacts are maintained in the output tables and they do influence the levelized cost.

New Measure Development

In preparing this version of the planning tools, the primary focus was on updating costs and savings for previously developed measures. However, we considered a number of new and revised measures as the request of reviewers.

1. Gas weatherization measures, reviewed for consistency with recent evaluation results
2. Solar water heating, review ETO files for cost and savings information.
3. Cooking measures, matched to EnergyStar appliance calculation worksheets..
4. Gas Furnace. Based on 2009 Market Transformation study, the baseline is now a high-efficiency model.
5. Tankless water heaters, updated cost and savings, based on survey of vendors.
6. Gas Hearths, added efficiency measure.
7. Commercial clothes washer, updated measure based on Northwest Power Planning and Conservation Council.
8. Fleet management of HVAC, added new measure for operation of HVAC units as a group by EMCS system.

9. Corridor ventilation in MF, added new measure for reduction of excess outside air.
10. DHW, updated baseline for new standard in 2015
11. Destratification fan, added new measure in warehouse
12. Boiler measures, updated baseline to the new IECC.
13. Exterior LED, added measure based on Northwest Power Planning and Conservation Council.
14. Streetlights and traffic lights, added measures based on Northwest Power Planning and Conservation Council.
15. Ozone Treated Laundry, added new measure. Ozone treatment allows use of less hot water and chemicals.
16. Heat Recovery chillers, limited application for Hot Water Heat recovery in MF garage.
17. Industrial Electricity, added entire new set of measures based on Northwest Power Planning and Conservation Council. Significant addition is Integrated Energy Management.

Heat pump water heaters are identified as having a large technical potential in both the residential and the commercial sector. Larger products for commercial customers are available. For homes, new products are very recently available, but have not been lab tested for functionality in our climate.. We consider this measure to be an emerging technology.

The Home Energy Monitor connects a digital readout to the customer's utility meter so that the customer has direct feedback to their consumption level. We project this product as currently available but, with respect to predictable savings, as an emerging technology.

Lighting measures are an unusual case. New federal standards will require efficient lighting starting in about 2015. As a result, the lifetime for installing lighting measures in the current stock of buildings has been reduced. We expect that a new generation of LED lighting products will be available by 2015 and even more efficient lighting products will emerge around 2020. This study does not include LED down lights for homes and screw in LEDs for commercial buildings which became commercially available and cost-effective as the study approached completion, and are now included in Energy Trust programs. These would add modestly to the technical potential shown here, because the efficiencies are not yet radically better than those for compact fluorescents. They are suitable to some niches where compact fluorescent bulbs are inappropriate.

Prototype units of condensing natural gas packaged heaters have been demonstrated in Canada. However, the condensing feature of these units was not the primary source of their savings – rather it was the fact that exposed ductwork was better insulated. Furthermore, manufacturers have not indicated willingness to bring these units into production due to the higher cost of the hardware.

One area of interest was the application of residential gas water heating systems for combined space heat and water heat. We considered various combinations of available technology. Although there would be cost savings by eliminating the furnace, the added cost of a hydronic heating system would be comparable to that cost reduction. Furthermore, although a tankless water heater would be higher efficiency for hot water, for space heat it would be competing against an already-efficient gas furnace for space heating. Only one combination option appears to be currently cost-effective – that would be a combination involving a low-cost hydrocoil applied to an air distribution system. We also include a high efficiency combination system based on the Polaris water heater. However, the base case assumes that a conventional gas boiler and hydronic slab heating system would otherwise be installed, so the efficiency improvement from the combination option is small relative to the incremental cost.

A similar niche on the electricity side would be new ductless heat pump systems. These systems are designed for easier installation that may eliminate some of the installer errors that have plagued large heat pumps. Current models are small in capacity, which limits their retrofit potential. They are suggested for homes with electric baseboard heating – which makes them one of the few retrofit equipment measures possible for older homes with baseboard heating. Energy savings will depend on the extent to which customers operate these units to offset baseboard heat and the addition of summertime cooling might offset winter savings. Recent evaluations indicate that these are cost-effective for single family home applications. In multi-family housing - they would provide the equivalent of an efficient through-the-wall heat pump - These are included as an emerging technology measure. The cost estimate gives credit for the fact that a window air conditioner would otherwise have to be included to provide a similar cooling benefit.

A new set of high efficiency gas water heaters is becoming available. We include a low-cost gas water heater with 0.70 EF rating that will shortly be available as emerging technology. Tankless gas water heaters have an EF rating of 0.85. There is an incremental upgrade possible to another tankless heater at 0.89 EF rating that would be cost effective even for the high cost system.

Waste heat recovery from wastewater has been previously reviewed as a potential measure. It is not well suited for residential applications, as it is a relatively expensive retrofit limited to full basements. As a result, this measure is limited to commercial facilities.

Other commercial measures that were changed include high performance lighting systems. More efficient T8 systems can replace the previous generation of older T8s. T5 systems are somewhat more expensive but can be a worthwhile replacement for metal halide lights. One advantage of the new fluorescent system is that it can be switched off or dimmed, allowing the application of occupancy sensors that were not an option for halide lights.

Tax credits are now recognized as an offset to costs for both demand-side and supply-side measures. While there are currently available Federal tax credits, those are significantly diminished, but do not disappear at the end of 2010. Given the complexity of Federal credits, to keep things simple, we only deducted Oregon tax credits from measure costs. We assumed that all commercial and industrial measures could receive the BETC tax credit, evaluated as reducing initial cost by 31%. Credit was applied for the residential measures shown in Table 10. Note that these Oregon tax credits do not apply to Northwest Natural Gas territory in Washington.

Table 10. Oregon Residental Tax Credits

MEF 2.0 Washer	$150
MEF 2.2 Washer	$180
MEF 8.0 Dishwasher	$80
Efficient Refrigerator	$50
Heat Pump Commissioning	$250
PTCS Ducts (with bonus)	$400
Hydronic Fan	$125
Heat Recovery Ventilation	$220
Water Heat Exchanger	$100

Tool Selection and Use

One of the primary goals of this project was to continue use of, and improve upon the method of analyzing measures across segments and technology types that would provide a means of comparing anticipated costs and benefits associated with a variety of program options.

The Assessment Tool used by the team includes several favorable features:

- Standardized program assumptions. This spreadsheet tool allows the same set of program assumptions for each measure, so that differences in the results of the analysis of any two measures were impacted only by the variables of interest (cost, benefits, and technical potential).
- Updateable. The measure cost and performance, market penetration and other inputs into the tool can be easily changed to analyze a particular measure under a variety of program and cost conditions. For example, Trust personnel can easily modify the cost of the measure or number of program participants and calculate a new levelized cost.
- Consistent analysis approach. Team members individually assessed the measures with expertise in particular areas. The use of this tool ensured that measure assessments performed by different analysts were comparable.
- Record of assumptions, sources, etc. The input requirements of the tool provide a record of the data and processes used by the analysts to develop levelized costs. We believe this will be extremely informative and provide insights to the Trust that will be helpful during program design, particularly in cases where multiple measures are combined into a single conservation package targeted at a particular customer, segment or building type.

Tool Limitations

While the strict data input structure of the Assessment Tool provides a consistent way to compare measures across sectors, it does impose some limitations:

- The total measure costs and benefits calculations are based on an estimate of the number of cases for which the measure is applicable; i.e., the program participation was estimated to be the total technical potential. These figures will need to be adjusted for programs that target only a portion of the identified market.

- The tool does not allow multiple-measure "what if" analysis. While we have assessed a number of combined-measure packages, the costs and benefits must be calculated and combined outside the tool and entered as one set of assumptions.
- The tool provides limited flexibility. The tool did not provide optimum flexibility to analyze measures by segment or across segments without creating multiple worksheets. While this did impose some limits on the analysis methodology, the strict requirements of the tool ensure that comparable computations across all types of measures and sectors are made.

Benefit Cost Ratio (BCR)

In previous studies, we used the levelized cost as a screening criterion to determine cost effectiveness. One problem is that the levelized cost fails to take into account Time-Of-Use (TOU), that fact that savings during a peak period may have higher value and, hence, be more cost-effective. In order to better account for this feature, we computed the total benefit, net present value of lifetime savings and Non Energy Benefits (NEB), evaluated at each measure's load shape. This lifetime benefit can then be compared to the total resource cost. If the benefits are greater than cost, the benefit-cost ratio is greater than one. This ratio offers a simple comparison.

$$BCR = \frac{\text{Net Present Value of Benefits (including TOU, NEB, hedge and externality value)}}{\text{Total Resource Cost}}$$

In general, screening by BCR rarely results in a different cost-effectiveness determination than that afforded by the levelized cost. The exception occurs with some residential sector end uses that occur during peak periods.

In cases where the total resource cost is actually negative, due to non-energy benefits that offset cost, the calculation for BCR returns a negative value. While this is technically correct, it could be confusing. For this reason, we defined the BCR to be 100 whenever total cost is negative. This facilitates sorting the measures in order of declining BCR.

Utility Avoided Cost

One complication with computing BCR lies in obtaining realistic estimates of the utility system avoided cost at different times of the day. Utilities are in the process of updating their avoided costs estimates. However, the schedule of their Integrated Resource Plans (IRPs) did not coincide with the timing of this report. For this report, we used values previously approved by Oregon Public Utility Commission in 2007. This estimate includes a value for the future cost of CO2 mitigation.

Supply Curve of Conservation Measures

The results of the assessment are provided in the form of separate spreadsheets for the industrial, commercial, and residential sectors (see appendix for the final lists of measures). For each measure or package of measures, we developed cost and savings estimates (including peak load savings), as well as an estimate of overall achievable energy savings over the future study period. To generate both the cost and savings impacts over time, we assumed that the measure was applied to all potential candidates. These calculations could change considerably as specific programs are developed, but provide an overview of the maximum potential available from each measure. As a final step, the list of measures was ranked by overall cost-effectiveness.

Levelized Cost Calculation

To compare and prioritize measures, we calculate the levelized cost for each measure opportunity. The levelized cost calculation starts with the incremental capital cost of a given measure or package of measures as described previously. We add the present value of any net operation and maintenance (O&M) cost. The total cost is amortized over an estimated measure lifetime using a discount rate (in this case a real discount rate of 5.2 percent per year) which is the standard value used by Energy Trust. This annual net measure cost is then divided by the annual net energy savings (in kilowatt-hours or therms) from the measure application (again relative to a standard technology) to produce the levelized cost estimate in dollars per kWh saved, as illustrated in the following formula.

$$Levelized\ Cost = \frac{Net\ Annual\ Cost\ (\$)}{Net\ Annual\ Savings}$$

The levelized cost is a figure that can be compared with the full cost of delivering power from electricity generation options. The levelized cost approach was chosen as the most practical and useful method of comparing measures of various types and applications.

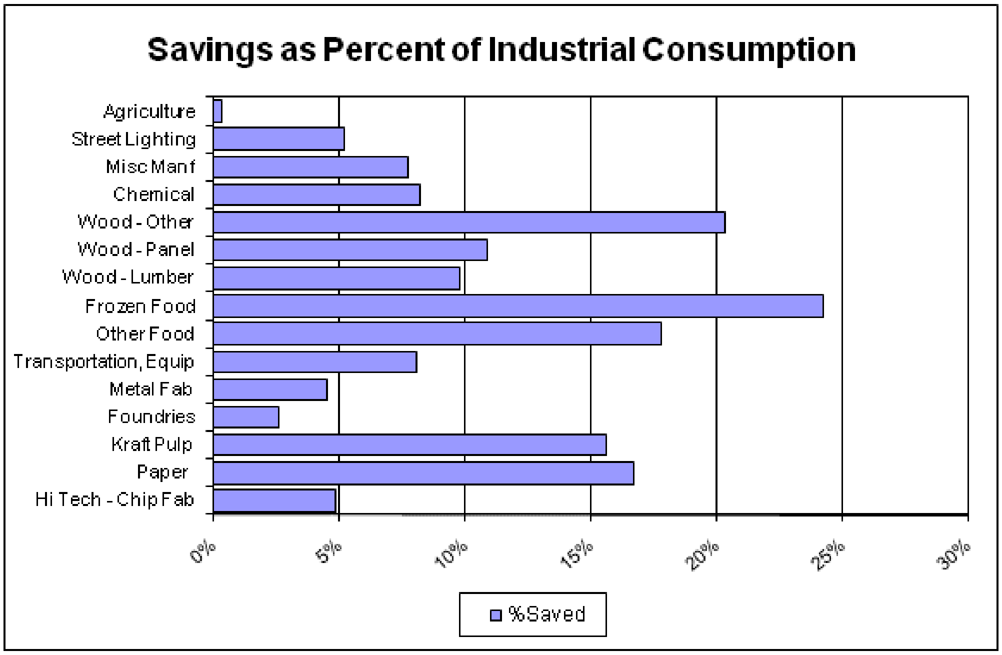
In dealing with two fuels (electricity and natural gas), we must be aware that there are cross-impacts. For example, a lighting program will save electricity but increase consumption of natural gas for space heating. In this case, we compute the Net Present Value (NPV) based on the avoided cost of natural gas and add that value to the O&M component of cost.

A more complicated case occurs when the same measure has positive savings for both fuels. In that case, we compute the NPV of avoided cost for both fuels and use the ratio of the NPVs to apportion the measure cost between the two fuels. Thus, both fuels would see a reduced levelized cost because they are only “charged” for part of the measure cost. The final result of this analysis provides the cumulative amount of potential resource available at a given levelized cost, as shown in the supply curves.

Technical Potential Savings Check

Since the potential savings estimate results in large numbers, it is useful to apply a reality check to verify that the numbers are reasonable. One procedure to check the potential is to compare estimated savings to the amount of estimated consumption. Such a comparison may be presented as the expected percent of end use savings. Note that the amount of consumption for new and existing building stock is quite different due to the inherently different deployment approach to achieve savings.

Figure 12: Savings Percentages for Industrial Segments



For existing stock, generally it is more cost-effective to replace old equipment with more efficient equipment as it wears out. We assumed that replacement of existing stock is limited to the turnover rate of the old equipment. In the case of new construction, it is technically possible to change the choice for all the new equipment at the time it is first installed. Thus, for some appliances, the potential savings percentage is higher for new installations merely because of the deployment limitations. On the other hand, because the older stock is less efficient, for some measures the existing stock offers a higher savings percentage that can be addressed. Figure 12 demonstrates that our analysis focused on the segments that account for the most energy consumption. The technical potential for the industrial sector is high and, in many cases, the cost is offset by non-energy economic benefits.

Figure 13 shows savings percentages for residential electricity consumption.

Figure 14 shows savings percentages for residential gas measures. While heating equipment is difficult to retrofit, there is good potential to replace existing gas water heaters with higher efficiency units.

Figure 13: Residential Savings Percentages by Electricity End Use

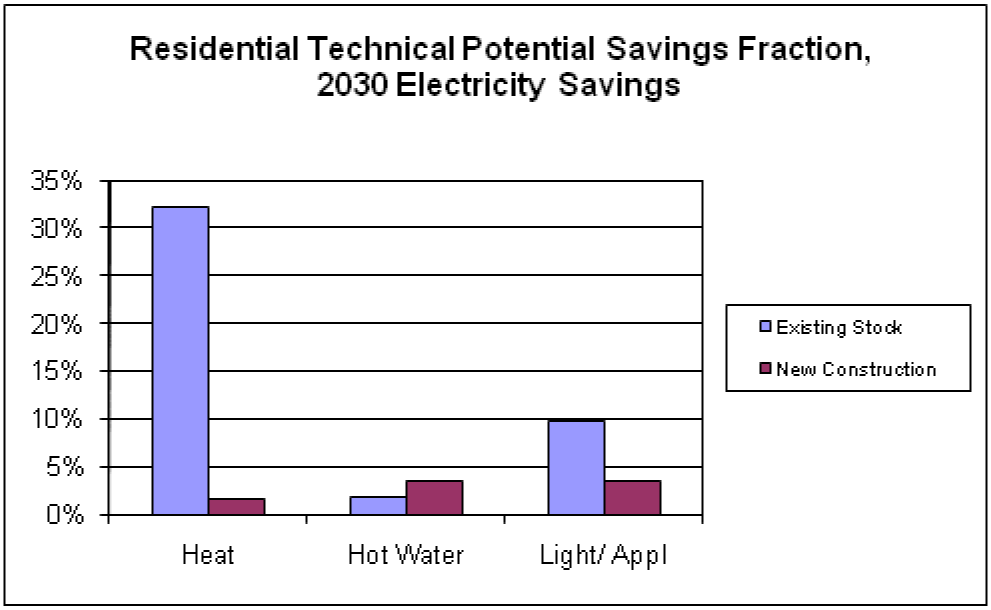


Figure 14: Residential Savings Percentages by Gas End Use

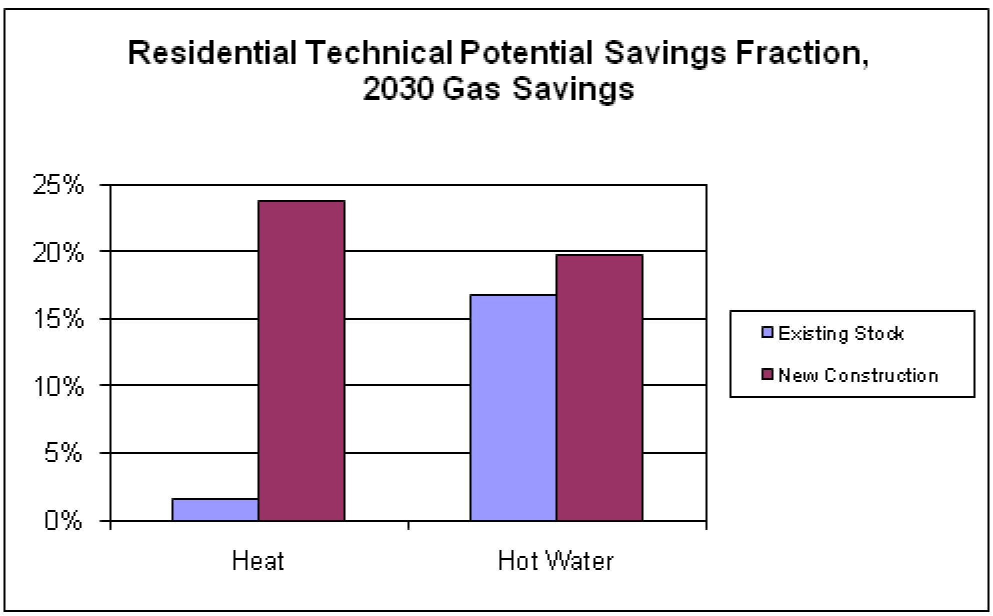


Figure 15 and

Figure **16** show savings percentages for the commercial sector. Refrigeration savings reflect recovered heat in addition to the refrigeration end use. Gas DHW savings are high, based on controls, a number of boiler improvements, and heat recovery for water heating.

Figure 15: Commercial Savings Percentages by Electricity End Use

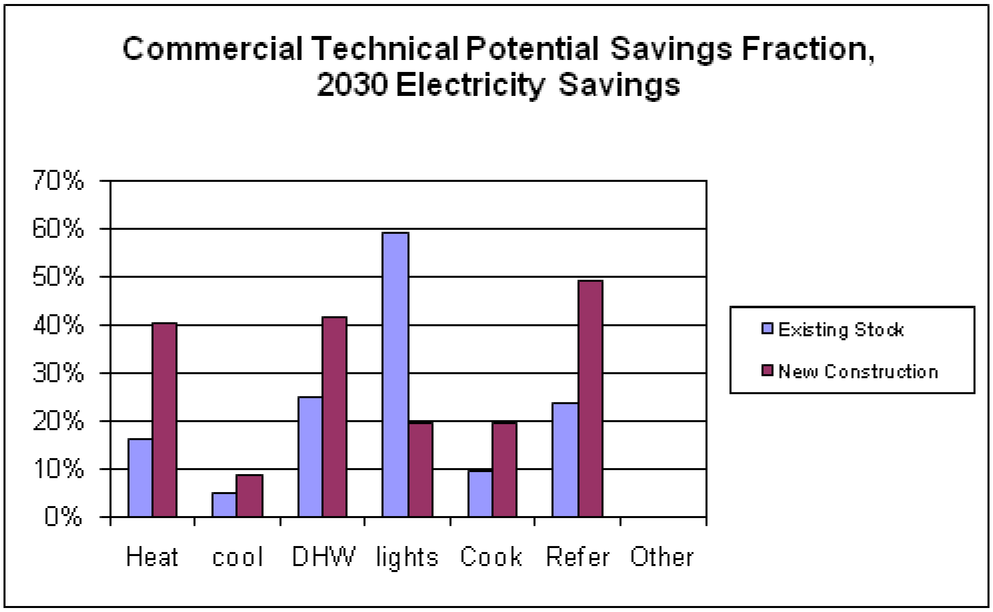
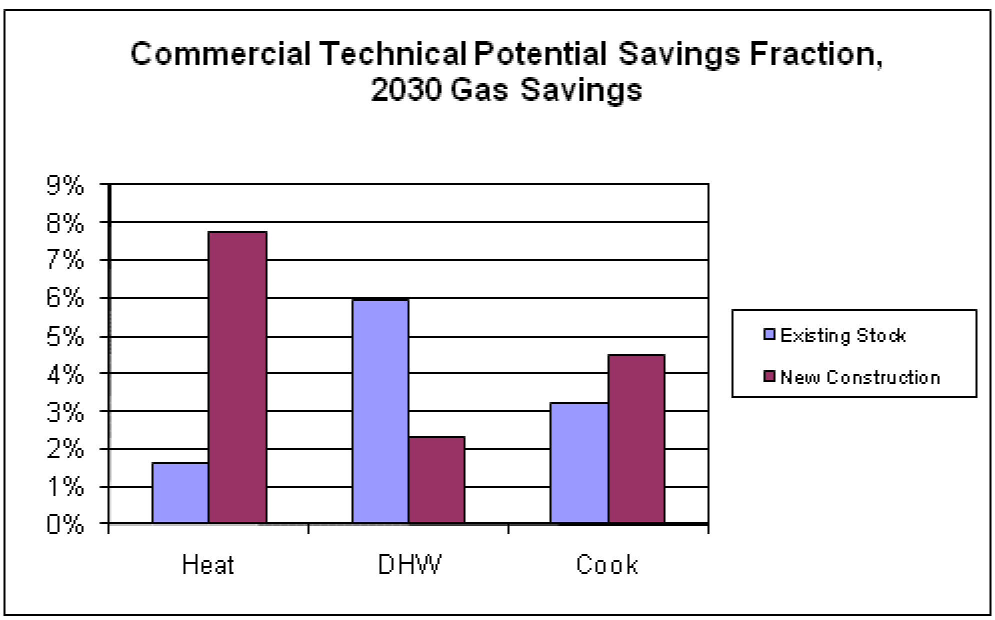


Figure 16: Commercial Savings Percentages by Gas End Use



Industrial Sector Resource Assessment

A list of the recommended industrial measures, ordered by the levelized cost, is provided in Table 12. This list presents individual measures, with incremental capital costs and net operations and maintenance costs (or benefits—shown as negative O&M costs) expressed in units of kWh of annual energy savings by the measure. In the section that follows, we provide a discussion of the potential application of these measures, as well as selected recommendations regarding potential program designs for the industrial sector.

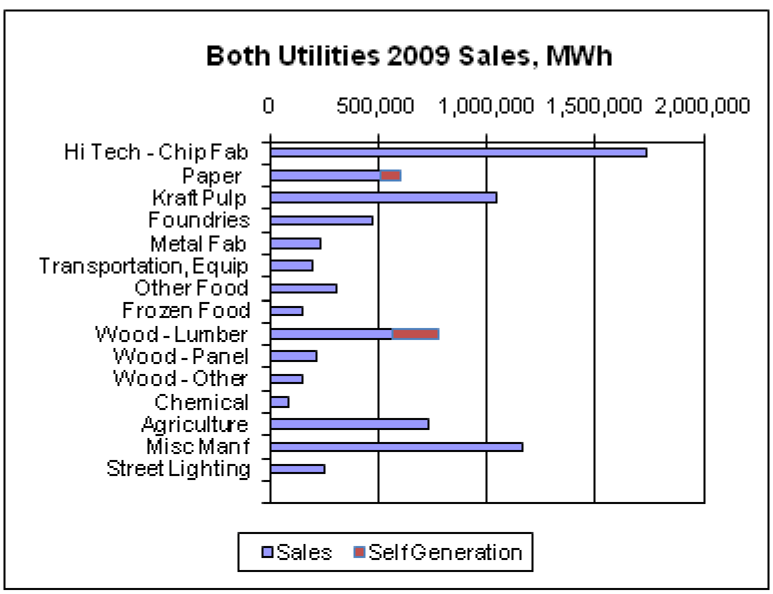
Industrial Sector Characterization

There are several important caveats to understanding the industrial approach. First, it is a top-down assessment. That is, it estimates the potential for conservation starting with MWh sales. (This approach differs from the residential and commercial sectors, which build up from an estimate of the number of customers.) In fact, economic growth has not been robust in recent years– the electronic segment in particular suffered from business reverses. We applied the same forecasted growth rates as used by the utilities in their planning to project future MWh sales.

Energy Trust serves participating industries, yet these industries have the option of self-direction. In fact, some industrial customers are transmission customers only for the utilities. For this study, we did not remove any of these loads – that is, these results apply to all the industries within Energy Trust territory regardless of whether they are currently eligible for Energy Trust programs.

The savings potential is derived from the total electrical consumption of the customer. To the extent that customers produce their own electricity, we need to include that generation as part of overall consumption. Figure 15 shows our estimate of current industrial consumption including self-generation where it is significant.

Figure 17: Industrial Electricity Consumption



We examined the potential for further generation from co-generation or Combined Heat and Power (CHP) but found it too difficult to generalize since it depends on various market factors that are not technical issues. Accordingly, CHP is an additional opportunity that is not included in this study.

Figure 18: PPL Industrial Growth Forecast

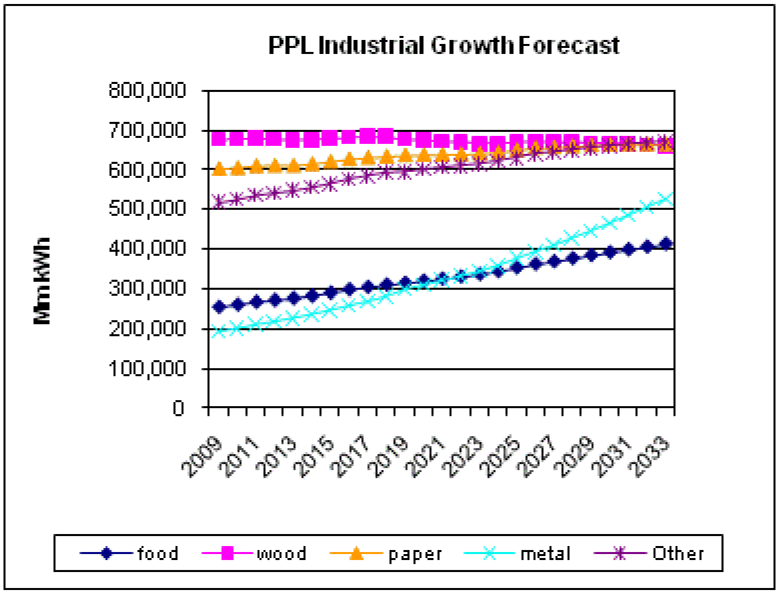
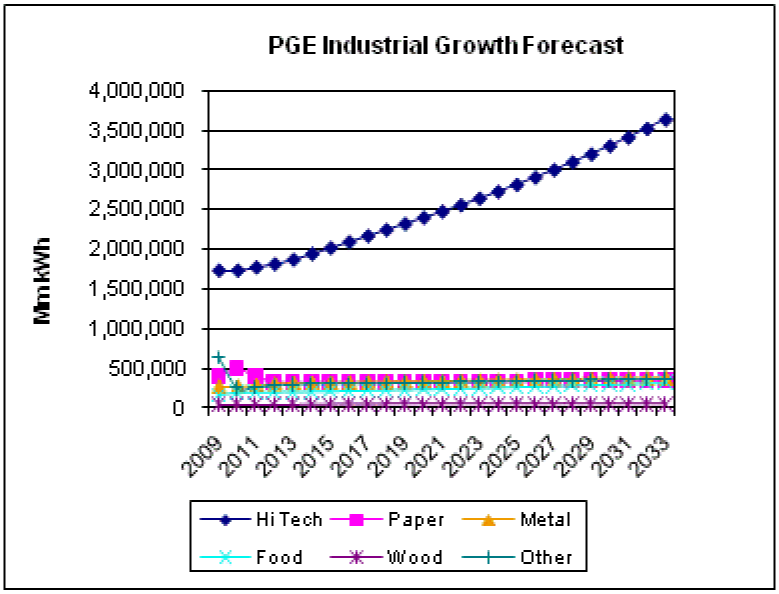


Figure 19. PGE Industrial Growth Forecast



Historically, industry has been based primarily on natural resource extraction and processing (Food and Forest Products). These industries are expected to decline or exhibit low growth rates. One notable exception is the electronics sector – this is the only industry expected to show future growth. However, past events have shown that this sector is dependent on the global business outlook and can be extremely volatile. Growth in solar photovoltaic manufacture has been proposed as a source for Oregon's future economic development. The forecast above includes solar photovoltaics as part of the electronics sector. Currently only one specific new photovoltaic plant is in operation. Other plants are projected but not yet confirmed at specific sites.

The next step is to estimate how the electricity sales are distributed to various end uses and processes within the facility. Table 11 shows the estimated shares for various processes within each type of facility.

We reviewed the current program list of committed projects in determining the extent to which further measures are applicable. For example, where one paper plant has adopted a new technology under the Trust program – that measure is no longer applicable. In general, the currently committed projects account for savings of a few percent within industrial segments – so there is still plenty of remaining opportunity.

It is difficult to estimate the extent to which technically possible industrial opportunities are achievable in the real world. We rated measures loosely as high (85% achievable), medium (50% achievable), or low (25% achievable) based on judgment.

Table 12 lists the industrial measures by increasing levelized cost. Screening by the BCR ratio is to screening by a levelized cost of about $0.09 per kWh.

Table 11: Industrial Process Share Downs

	Percent Electricity by End Use															
	Motors									Process Heating						
	Pumps	**Fans and Blowers**	**Compressed Air**	**Material Handling**	**Material Processing**	**Low Temp Refer**	**Med Temp Refer**	**Pollution Control**	**Other Motors**	**Drying and Curing**	**Heat Treating**	**Heating**	**Melting and Casting**	**HVAC**	**Lighting**	**Other**
Kraft Pulp	30%	10%	4%	12%	27%			1%	10%	3%				0%	1%	2%
Paper	26%	14%	7%	17%	17%			1%	10%	3%				1%	2%	2%
Foundries	3%	5%	5%	6%	7%			1%	6%	0%	0%	19%	9%	2%	3%	34%
Frozen Food	8%	2%	2%	6%	4%	45%	18%					6%		2%	1%	7%
Other Food	10%	18%	8%	4%	17%		26%							4%	10%	2%
Wood - Lumber		11%	13%	23%	34%			1%	4%	3%				2%	6%	2%
Wood - Panel	3%	20%	8%	20%	18%		12%	1%	4%	3%				2%	5%	3%
Wood - Other		10%	18%	29%	20%			1%	4%	3%				3%	7%	6%
Hi Tech - Chip Fab	10%	10%	5%	3%	15%			3%	17%			5%		25%	3%	4%
Metal Fab		6%	2%	16%	25%			1%	2%	3%	6%	7%	0%	9%	11%	13%
Transportation, Equip		8%	3%	13%	24%			1%	2%	1%	3%	4%	1%	15%	14%	9%
Agriculture						95%								1%	2%	2%
Lighting							83%							1%	2%	14%
Chemical	18%	5%	20%	5%	30%			1%	2%			3%		2%	10%	4%
Misc Manf	33%	5%	9%	0%	4%	0%	0%	1%	0%	0%	0%	2%	0%	1%	10%	34%
Total	**14%**	**8%**	**6%**	**8%**	**15%**	**10%**	**4%**	**1%**	**7%**	**1%**	**0%**	**3%**	**1%**	**7%**	**5%**	**10%**

Table 12: List of Industrial Measures

Conservation Measure	Potential Savings (MWh/yr)	Measure Life, yr	Initial Cost (1000$)	Annual Non-Energy Cost (1000$)	Levelized Cost ($/kWh)	Annual Non-Energy Benefit ($1000)	BCR
Air Compressor Demand Reduction	31,906	10	$1,924	$866	$0.035		2.42
Air Compressor Equipment2	13,641	10	$688	$370	$0.034		2.53
Air Compressor Optimization	38,224	10	$6,401	$1,037	($0.010)	$2,241	3.07
HighBay Lighting 1 Shift	8,494	10	$1,865		$0.029		3.79
HighBay Lighting 2 Shift	6,340	10	$751		$0.015		6.37
HighBay Lighting 3 Shift	49,757	10	$3,280		$0.009		10.94
Efficient Lighting 1 Shift	8,687	10	$545		$0.008		11.86
Efficient Lighting 2 Shift	6,209	10	$220		$0.005		19.94
Efficient Lighting 3 Shift	50,698	10	$959		$0.002		34.23
Lighting Controls	15,518	10	$3,091		$0.026		4.41
Motors: Rewind 20-50 HP	3,630	10	$995		$0.036		2.40
Motors: Rewind 51-100 HP	1,575	10	$391		$0.032		2.79
Motors: Rewind 101-200 HP	3,072	10	$544		$0.023		3.76
Motors: Rewind 201-500 HP	1,878	10	$212		$0.015		5.76
Motors: Rewind 501-5000 HP	2,316	10	$191		$0.011		7.86
Efficient Centrifugal Fan	5,357	10	$779		$0.019		4.76
Fan Energy Management	14,084	10		$459	$0.033		2.63
Fan Equipment Upgrade	35,787	10	$2,362	$1,165	$0.041		2.07
Fan System Optimization	52,078	10	$5,041	$2,035	$0.009	$2,205	2.51
Pump Energy Management	23,263	10		$758	$0.033		2.61
Pump Equipment Upgrade	64,727	10	$6,154	$2,108	$0.045		1.89
Pump System Optimization	65,638	12	$13,586	$2,993	($0.042)	$7,268	2.96
Transformers-Retrofit	22,202	10	$13,664		$0.080		1.23
Transformers-New	7,242	32	$4,990		$0.045		2.73
Synchronous Belts	17,534	10	$2,861		$0.021		4.04

Elec Chip Fab: Eliminate Exhaust	15,715	10	$3,447		$0.029		4.63
Elec Chip Fab: Exhaust Injector	59,864	10	$20,205		($0.107)	$9,034	5.34
Elec Chip Fab: Solidstate Chiller	155,168	10	$59,141		($0.088)	$21,428	4.47
Elec Chip Fab: Reduce Gas Pressure	32,351	10			($0.016)	$512	100.00
Clean Room: Change Filter Strategy	24,587	1	$168		$0.007		16.20
Clean Room: Clean Room HVAC	15,263	20	$2,825		$0.015		9.66
Clean Room: Chiller Optimize	24,791	10	$2,211		$0.012		10.61
Food: Cooling and Storage	31,418	10	$7,591		$0.032		2.91
Food: Refrig Storage Tuneup	16,892	3	$886		$0.019		4.39
Metal: New Arc Furnace	3,499	10	$246		($1.991)	$6,997	230.31
Kraft: Effluent Treatment System	4,170	10	$232		$0.007		11.65
Kraft: Efficient Agitator	17,700	10	$1,178		$0.009		10.32
Paper: Efficient Pulp Screen	1,327	10	$180		$0.018		4.78
Paper: Premium Fan	2,557	10	$348		$0.018		4.75
Paper: Material Handling	1,070	10	$980		$0.120		1.34
Paper: Large Material Handling	2,254	10	$2,513		$0.146		1.12
Paper: Premium Control Large Material	6,970	10	$2,764		$0.052		1.96
Material Handling2	8,929	10	$3,784		$0.055		1.87
Material Handling VFD2	36,821	10	$9,082		$0.032		2.91
Wood: Replace Pneumatic Conveyor	35,564	10	$376		($0.059)	$2,139	115.51
Panel: Hydraulic Press	2,266	10	$314		$0.018		4.72
Plant Energy Management	160,994	10	$2,856	$5,110	$0.034		2.55
Energy Project Management	122,837	11	$13,025	$3,867	$0.044		2.01
Integrated Plant Energy Management	160,535	11	$29,306	$6,274	($0.020)	$13,111	2.94
Irrigation: Ditch > Pipe	2,811	10	$166	-$2,840	($0.000)	-$2,818	1.09
Irrigation: Nozzles	129	3	$23		($0.000)	$8	2.34
Irrigation: Pump Systems Repair	109	7	$148	-$1	($0.000)	$25	1.36
Irrigation: Pump Systems Adjust	2,405	3	$414	-$114		$38	2.38

Irrigation: Water Management	1,093	5	$157	$73	($0.000)	$109	1.86
Rural Area Lights	317	23	$390	-$19	$0.032		1.67
Replace Traffic Light: Red Ball 8-inch	362	6	$37	-$12	($0.013)		5.76
Replace Traffic Light: Red Ball 12-inch	688	6	$52	-$13	($0.003)		6.79
Replace Traffic Light: Yellow Ball 8-inch	517	6	$2,153	-$312	$0.222		0.83
Replace Traffic Light: Yellow Ball 12-inch	529	6	$1,473	-$178	$0.216		0.76
Replace Traffic Light: Green Ball 8-inch	517	6	$92	-$22	($0.008)		3.59
Replace Traffic Light: Green Ball 12-inch	529	6	$70	-$13	$0.002		4.10
Replace Traffic Light: Red Arrow	327	6	$89	-$32	($0.044)		3.39
Replace Traffic Light: Green Arrow	322	6	$89	-$32	($0.045)		3.37
Replace Traffic Light: Yellow Bi-Modal Arrow	102	6	$50	-$10	($0.004)		1.90
Replace Traffic Light: Green Bi-Modal Arrow	105	6	$36	-$10	($0.032)		2.69
Replace Traffic Light: White Walking Person	658	6	$135	-$20	$0.011		2.80
Replace Traffic Light: Orange Hand	653	6	$135	-$20	$0.011		2.78
Replace Traffic Light: Orange Countdown	16	6	$9	-$1	$0.029		1.50
Replace Streetlight: 100WHPS>LED78W	34,318	17	$39,171	-$1,802	$0.050		1.35
Replace Streetlight: 100WHPS>LED60W	4,957	23	$5,141	-$382	$0.001		2.19
Replace Streetlight: 150HPS>LED117W	8,516	23	$10,487	-$523	$0.032		1.67
Replace Streetlight: 150HPS>LED111W	5,169	14	$5,055	-$320	$0.038		1.49
Retro Streetlight: 100WHPS>LED78W	31,906	10	$1,924	$866	$0.035		2.42
Retro Streetlight: 150HPS>LED117W	13,641	10	$688	$370	$0.034		2.53
Retro Streetlight: 150HPS>LED111W	38,224	10	$6,401	$1,037	($0.010)	$2,241	3.07

Cross Cutting Measures

Industrial measures were updated based on the latest set of measures from the Northwest Power Planning and Conservation Council. A significant change to the methodology is an inventory accounting to avoid double-counting savings when multiple measures apply to the same enduse. In that event, the mo0re cost-effective measure is assumed to occur first and savings for subsequent measures are derated.

Transformers

All electric power passes through one or more transformers on its way to service equipment, lighting, and other loads. Currently available materials and designs can considerably reduce both load and no-load losses. The new NEMA TP-1 standard is used as the reference definition for energy-efficient products. Tier-1 represents TP-1 dry-type transformers while Tier-2 reflects a switch to liquid immersed TP-1 products. More efficient transformers with attractive payback periods are estimated to save 40 to 50 percent of the energy lost by a "typical" transformer, which translates into a one to three percent reduction in electric bills for commercial and industrial customers. Typical paybacks range from 3 to 5 years (Nadel, et al. 1998). These opportunities are grouped into retrofit and new categories. Retrofit reflects the fact that existing units are being replaced with more efficient ones as a baseline.

Motor Rewinding

This measure has been the mainstay of past industrial programs. However, we recognize limited application since large motors are already rebuilt efficiently. In addition, regional efforts have partially transformed the market.

Industrial Lighting

High-bay lighting, required to provide overall ambient lighting throughout manufacturing and storage spaces, is typically provided by high-intensity discharge (HID) sources, including metal halide, high-pressure sodium and mercury vapor lamps. HID accounts for approximately 60 percent of industrial lighting energy consumption (Johnson 1997). Supplementary lighting is used to provide low-bay and task-specific lighting for inspection, equipment operation, and fine assembly activities. Fluorescent, compact fluorescent and incandescent light sources are commonly used for task lighting needs and together account for approximately 40 percent of industrial lighting energy.

One measure is the replacement of HID lighting with high-intensity fluorescent lighting in high-bay applications. New high-intensity fluorescent lighting systems incorporate high-efficiency twin-tube or linear T5 fluorescent lamps, advanced electronic ballasts, and high-efficacy fixtures that maximize light output to the work plane. Each of the system components confers advantages over traditional HID fixtures. Advantages include: lower energy consumption; lower lumen depreciation over the lifetime of the lamp; better dimming options; faster start-up and re-strike (virtually "instant-on" capability); better color rendition; higher pupil lumens ratings (translating into improved worker productivity and performance); and less glare (given fixture design and the more diffuse nature of the fluorescent light source) (Rogers and Krepchin 2000).

We broke the lighting measure into High Bay and other configurations. The cost and savings for the lighting measures are based on the same measures in commercial buildings. Since High Bay lighting and industrial HVAC are unlikely to disrupt processes, we assume a high achievable potential. However, lighting and HVAC in clean rooms and other critical environments is considered disruptive by the facility staff and we assume a low achievable potential.

Air Compressors

Achieving peak compressed air system performance requires addressing the performance of individual components, analyzing the supply and demand sides of the system, and assessing the interaction between the components and the system. This "systems approach" moves the focus away from components to total system performance. System opportunities have been shown to be the area of greatest efficiency opportunity. At the system level, savings opportunities can be grouped into three general categories: leaks, inappropriate uses of CA, and system pressure level. The goal of a management plan is to minimize all three.

The best strategy to avoid further problems is to set up a prevention program that monitors the system for new leaks and fixes them as they develop (DOE 1998). Reductions in wasted air due to inadequate maintenance, leaks, and inappropriate uses can save 20-30 percent of CA energy. A system's pressure level should be set at the lowest pressure that meets all requirements of the facility. Lowering the compressed air header pressure by 10 psi reduces the air leak losses by approximately 5 percent and improves centrifugal compressor capacity by 2-5 percent. One element of this may be the application of controls. Reducing system pressure also decreases stress on system components, lessening the likelihood of future leaks (DOE 1998). It is necessary to implement an ongoing maintenance program by plant staff, which requires both awareness and technical training (DOE 1998). Most of the barriers to improved compressors result from the lack of awareness of the opportunity. The staff reductions that have become common in United States industry and a hesitation to pay for outside consultants compound this problem. The Compressed Air Challenge (CAC) has developed a CA management training program that is available for plant staff and the Compressed Air and Gas Institute (CAGI) has developed CA training.

Overall, air compressor measures are grouped in order as follows: demand reduction (fixed leaks, etc.), two levels of equipment replacement, and system optimizing to redesign unnecessary processes.

Duct/Pipe Insulation

ACEEE identified repair and replacement of insulation as a conservation measure. Savings apply to processes that transfer heat or "cool". Because these are relatively easy to implement, we assume they are highly achievable.

Fan and Pump System Improvements

Just as motor systems benefit from optimal design and sizing, so do these systems. Overall, these measures are grouped in order as follows: demand management, equipment replacement, and system optimizing to redesign unnecessary processes.

Synchronous Belts

This is an O&M measure that applies to all motors. The measure is low-cost to implement but is short-lived. Due to ease of implementation, we assume it is highly achievable.

Plant Management

This study adds significant potential for management. The field covers a wide range of actions. For this study, they were grouped as Plant Energy Management, Energy Project Management and Integrated Plant Energy Management. The later includes hiring a dedicated staff person specifically to manage energy issues.

Specific Industrial Segments

Metal Segment

Primary metal production occurs in a few facilities within the Trust territory. There is one steel mill operating on recycled scrap and one exotic metal plant. Without specific audits of these individual facilities, we estimate the potential based on national level assumptions provided by ACEEE. The suggested potential should be considered as likely but not verified.

Metal: New Arc Furnace

While modern EAFs are generally more energy efficient many technologies exist to improve energy efficiency in existing furnaces, such as process control, efficient transformers, oxy-fuel injection, bottom stirring, post-combustion, eccentric bottom-tapping and scrap preheating (Worrell et al. 1999). Several new EAF-designs are under development, which combine energy saving features like increased fuel and oxygen injection with scrap preheating (Greissel 2000, IISI 2000b). The aim is to produce a semi-continuous process with enhanced productivity through reduced resource use (e.g. refractories, electrodes) and reduced tap-to-tap times. At the same time increased product quality also demands increased feedstock flexibility (e.g. scrap, DRI or pig iron). Different developers are involved in new EAF-process design, the most important being the Twin Electrode DC (IHI, Japan), Comelt (Voest Alpine, Austria) and Contiarc and Conarc (SMS Demag, Germany). The production costs are expected to be $9-13 lower per ton steel produced (Reichelt and Hofman 1996; Mannesmann 1998), or up to a 20 percent reduction. Given the narrow application (only one plant in the territory), we assume a low achievable potential.

Food Segment

Refrigeration in the food segment is a large energy consumer and is mainly used for freezing of vegetables. Many options exist to improve the performance of industrial refrigeration systems. System optimization and control strategies combined show a large potential for energy efficiency improvement of up to 30 percent (Brownell 1998). Opportunities include system design, component design (e.g. adjustable speed drives), as well as improved operation and maintenance practices. We focus on new system designs. Adjustable speed drives and process control systems have been discussed elsewhere. New system designs include the use of adsorption heat pumps, gas engine driven adsorption cooling, new working fluids (e.g. ammonia, CO_2) and alternative approaches (e.g. thermal storage). Due to the wide variety, we focus on selected technology developments in the areas of gas engines, thermal storage and new working fluids. Because these are new technologies, we assume a low achievable potential.

Food: Refrigerated Storage

Although the processing of frozen food tends to be seasonal, the product is stored throughout the year in refrigerated warehouses. This application is a large consumer of energy within the food segment. Simple O&M practices have been identified as providing savings. Such measures include tune-up and cleaning of compressor systems and control sensors (DEER, 2005). Due to ease of implementation, we assume a high achievable potential.

Agriculture Segment

Agriculture is important to the rural economy but a difficult segment for the utility to serve. That is because these loads tend to be highly seasonal. By far the largest agricultural use is for irrigation pumping. However, the pumping season lasts for only a few months, resulting in poor utilization of the capital investment. Nursery stock has become a major part of the local economy and consumes electricity for cooling. Animal production of poultry and containment livestock is a small segment with year-round requirement for ventilation and lighting.

Irrigation: Ditch to Pipe Conversion

PacifiCorp's IRP previously identified a narrow niche for this measure. A small amount of irrigation involves the pumping of water from unlined ditches. If the ditches are replaced with a piped system, there is sufficient gravity head that pumping is no longer needed. More importantly, the conversion saves water that would otherwise have leaked from the ditch. The saved water is a valuable commodity that can be used by the farmer or resold for wildlife or other users. While the applicability is small, the non-energy benefits can be large. We assume a high achievable where potential exists.

Irrigation: Pump Systems

The industry consists of multiple pump users including both farmers and water suppliers, such as irrigation districts. Irrigation is a difficult industry target for energy efficiency initiatives. However, there is inefficiency due to the fragmented nature. For instance, 80% of pumps in this industry are older than 15 years, resulting in poor efficiency. Pump efficiency tests performed by utilities were discontinued in the early 1990s due to budget constraints. As a result, awareness of energy efficiency and operating cost savings as well as knowledge of new technologies has decreased. Efficiency initiatives could be targeted at creating awareness of such practices as properly sizing pumps and replacing older equipment (NEEA). Pump efficiency testing and impeller improvements have long been part of program in the Northwest. Net savings from pump testing and impeller improvements are unclear, difficult to verify and not long-lived. We considered these savings to be moderately achievable.

Irrigation: Water Management

Scientific scheduling of irrigation utilizes direct measurement of soil moisture combined with local meteorological forecasts of crop transpiration. The result is a way of determining the proper amount of water to apply at just the right time. Net savings are unclear, difficult to verify and not long-lived. We considered them to be moderately achievable.

Paper Segment

Paper manufacture is one of the largest industrial consumers. Trust territory includes only a few firms but they have been actively participating in the efficiency program. For the most part, these firms produce different products and do not compete with each other. That also means that conservation measures appropriate to one plant are probably not transferable to other plants.

There is one exception in two plants that come close to similar operations. Both produce newsprint using primarily recycled paper fiber. However, the first plant produces coated paper such as is used in the advertising supplements. The second produces unfinished newsprint. The first plant has utilized Trust incentives for a major retrofit of their fiber refining process that provided large energy savings. It is possible that a similar retrofit could benefit the second plant.

Measures are broken into segments for kraft and bleached paper products. Prototype measures were applied based on a study by Marbek Associates for the British Columbia paper industry.

Wood Products Segment

Measures were broken into segment that correspond to plywood veneer, dimension lumber and other wood products. Improved material handling, in particular replacing pneumatic transfer, is an important set of measures. Conveyor systems are broadly defined as a piece of equipment moving material from one place to another. There are multiple types including blowers and pumps. Together they account for one of the largest energy uses within these facilities. The industry is fragmented with many smaller vendors. As a result, this is a difficult market to pursue energy efficiency initiatives. However, there are areas of improvement for the use of conveyor systems. These include: regular maintenance of the conveyor, installation of a VSD where loads vary significantly and replacement of inefficient pneumatic conveyors.

The Wood Products segment is large and diverse. It includes facilities that mill and cure lumber or veneer. It also includes facilities that process these products into chipboard, plywood and manufactured lumber. This segment is unique in that current Trust programs have already captured part (3%) of the opportunity for process improvements. We adjusted applicability for this fact.

Street and Traffic Lights

Since these loads are not associated with space heating, they have been included in the industrial sector. Measures are based on the latest set of measures from the Northwest Power Planning and Conservation Council.

Electronics Segment

This segment is one of the largest, accounting for 40% of PGE's industrial sales. This industry segment is comprised of a small number of companies, whose facilities are known to exhibit a wide variation in energy use, depending on their design, vintage and management philosophy. Most of these firms are self- directors.

There is an understandable reluctance to make changes in their process equipment (also known as "tools") because the processes are finely tuned to produce specific, repeatable results within extremely tight tolerances, and are sensitive to contamination. These process tool sets are persistent. For example, a manufacturer is still making 386 and 486 computer chips. Although these chips may be 20 years obsolete for desktop computers, they are still in demand for "smart appliances" or other applications. So the original process and facility is still in operation.

There may be an opening to address new measures to both tools and facility loads during the design of new facilities. However, existing facilities may operate for a long time without permitting any major overhaul. Thus, while there is large technical potential, the reluctance to participate is shown by a low achievable potential for these sorts of measures.

Table 13: Electronics Segment Process Shares

Electricity Process Shares	Total	Facility	Process
Pumps	27%	2%	25%
Fans	10%	10%	
Air Compressor	5%	5%	
Material Handling	3%	3%	
Material Processing	10%	5%	5%
Refrigeration	5%	5%	
Pollution Control	3%	3%	
Drying	0%		
Heating	5%		5%
HVAC	25%	25%	
Lighting	3%	2%	1%
Other Process	4%		4%
All Electric	100%	60%	40%
All Motors	83%		

Process Shares

The industry in Oregon differs from national averages. There is no longer any silicon melt operation in Oregon. Instead, the plants focus on wafer and chip production. Opportunities in the new solar cell manufacturing facilities are unknown but are assumed here to be represented by the measures that apply to chip production. While the MWh data include a small amount of instrument assembly and compressed gas production, chip plants dominate and require clean rooms with high HVAC consumption. Solar photovoltaic manufacturer is included with chip plants. Table 13 shows process shares for this segment. Note that the shares are split into those at the process line and those treated as part of the central facility. That is because the process lines may be more difficult for the program to access.

Specific Measures

We applied a higher achievable potential to measures that could be implemented without disruption of the process line. There are two potential openings here. To the extent that central facility operations (e.g. chiller plant) could be changed without disrupting a process line, those operations are moderately achievable. We also identified a few replacement opportunities for smaller equipment that would be achievable without disruption of processes.

Even so, it must be recognized that replacement of some parts of the process support equipment (for example, vacuum pumps) requires “re-qualifying” the process line. That is, it takes staff days to properly tune and calibrate all the mass flow, heating and cooling operations in a process tool – every time something changes they have to go through the calibration again. Of course, the same problem occurs if any equipment breaks or fails so there are continual replacement openings, albeit they cannot be scheduled.

Highly Achievable

We focused on etch tools and wet benches processes that etch and clean the wafers. This equipment runs continuously, with little electric load variation during times it is processing wafers. The equipment is so difficult to properly set up and calibrate that engineers are reluctant to let it go idle. We estimate there are about 5000 of these “benches” in Oregon. Components include 4 kW of vacuum pumps, the treatment equipment and trim chillers. The trim chiller consumes about 4.5 kW of electricity. Its role is to adjust the process cooling water temperature to that required by the process tool. The fabricating process produces dangerously reactive gases that are collected in a powered exhaust system.

Upgrade vacuum pump

The vacuum pumps are rebuilt periodically but slow to be replaced. Current units are 50% more efficient than the old units still in place. Replacement is not welcome since the process line must be “re-qualified” with every change. An efficiency incentive would encourage new replacement rather than re-build of older units. However, given that the units will eventually be replaced anyway, accelerating the upgrade is not cost effective.

Alternative Chiller

The trim chillers are large and inefficient and lack effective feedback controls. They can be replaced by a smaller, thermoelectric system that incorporates more effective feedback, does a better job of controlling temperature and increase throughput. Electricity savings are 90%. The thermoelectric system also saves about $5000 annually on decreased maintenance. There is another significant benefit in that the smaller unit has a much smaller footprint. We did not attempt to quantify the value of clean room floor space savings but it is considerable. Nor did we quantify the value of increased process throughput. The thermoelectric system permits more usable wafers per batch; better feedback controls decrease the risk of process flaws. Estimates derived from industry data sources.

Alternative Exhaust Injector

Etch tools use a point of use (POU) exhaust system to pre-treat the etch effluent before it enters the house exhaust system. The POU exhaust system consumes process gases and cleaned makeup air. It requires resistance heating and needs periodic maintenance. The alternative system uses a jet of nitrogen gas to flush (or "inject") the exhaust from the etch tool into the house exhaust header. It saves 100% of the resistance heat as well as about $6000 annually in process gases. We estimate there about 400 applications in Oregon. Estimates derived from industry data sources.

Reduce Pressure of Process Gases (Dry Air and Nitrogen)

This is a no-cost O&M measure. Sematech survey indicated that most tools could operate at 80 psi or less but that 100 psi is routinely provided. Reducing pressure by 20 psi is estimated to save 10% in compressor energy as well as reduce consumption of process gases.

Moderately Achievable

We consider the next set of measures to be moderately achievable because central facility operations (e.g. chiller plant) could be changed without disrupting a process line. The barriers here are the usual ones of reluctance to invest capital in major changes. In many cases, the cost and savings of the measures came from a Supersymmetry report on a typical facility. Many of these measures are specific opportunities that correct operations and design problems at Supersymmetry's case example. While Oregon facilities will not be identical, we assume that the measures identified by Supersymmetry are proxies for similar opportunities that exist in Oregon plants.

Electronics: Chiller optimize

Based on audit of a typical plant, Supersymmetry suggested a variety of simple changes to improve the overall system performance. These included elimination of unnecessary chillers, reset of CW temperature, combining pipe runs and controls for parallel operation of multiple chillers.

Electronics: Change filter strategy

New immerging filter technologies (HEPA/ULPA filters) offer the opportunity to significantly reduce filter energy use by reducing filter pressure drops (Tschudi 2000). Supersymmetry noted for their case example that less expensive filters could be used in part of the operations in order to offset the cost of more expensive filters in other operations.

Electronics: Clean Room HVAC

Several HVAC technologies that have emerged recently which when combined, can achieve significant energy savings. Currently a large amount of energy is expended in heating, cooling, and filtering air that is then exhausted. Air re-circulation is another large HVAC energy user. Recirculation air velocity can be turned down (from, say, 90 fpm to 80) without affecting cleanliness levels. Sensors and the use of laser-based particle counters are both technologies that can be applied to more efficiently moderate airflow. Additionally, more efficient airflow equipment that is near commercial (e.g. low face velocity fans, efficient duct systems, more efficient filter units) could be combined to further reduce recirculation fan energy requirements. Existing practices can also be applied in conjunction with these technologies to further enhance energy savings, such as “right-sizing” of exhaust air flow for each specific tool, improved design guidance for ducting and other systems, and limiting the floor area that requires clean air flow to a smaller “micro” environment. This measure has been screened to avoid double counting with other HVAC measures. Combined with the other HVAC measures, clean room technologies have the potential to reduce electricity consumption of the average clean-room facility by 25-30 percent, or an average of 145 kWh/sq. ft. Additionally, they are accompanied by several additional non-energy benefits including improved productivity and a reduction in emissions without sacrificing any product quality.

Electronics: Eliminate exhaust

Minimizing exhaust flow reduces the amount of make up air that needs to be reconditioned. Ultra low fume hoods, a technology developed at Lawrence Berkeley National Laboratory, require 25 percent of normal exhaust flow. This technology is now being piloted in field trials (Tschudi 2000). Supersymmetry’s audit noted that full exhaust is required for only 50% of operating hours. Use of controllers and VSD fans would reduce unneeded exhaust with significant savings on makeup air. Phil Naughton, SEMATECH, noted that various process tools could be reduced by about 30% of the exhaust requirement.

Electronics: Reduce pressure, reset CHW

In their audit, Supersymmetry notes that the existing tower experiences poor flow. The plant staff expected to increase pumping power to compensate. Instead, Supersymmetry suggested a number of ways to remove flow obstructions and lower pumping power. Also, they suggested reset of CW temperature to lower flow rate.

Electronics: VSD Tower Pumps

In their audit, Supersymmetry notes that tower pumps are staged off and on which results in unequal pressure drops to the different pumps. Use of VSD drives would allow for even distribution of flows and saved pump energy.

Electronics: Wastewater Preheat Of OSA

Conditioning of makeup air is a major HVAC energy requirement whether for heating in the winter or cooling in the summer. Supersymmetry noted that preconditioning with the plant wastewater would provide savings in both seasons.

Low Achievable

These measures are considered unlikely to be achievable either because they require a major re-investment in plant capital or a major re-design in handling processes. Facility operators may be reluctant for both reasons.

Electronics: CW to gas plant

In their audit, Supersymmetry noted the opportunity to provide more efficient cooling to the compressors that provide cleaned air and process gases to the process line.

Electronics: Chiller heat recovery

In their audit, Supersymmetry noted opportunities to recover waste heat from the chillers. The waste heat can be used for pre-conditioning makeup air or other low temperature applications. The savings quantified here are primarily due to improving chiller performance by better heat removal.

Electronics: New air compressor

In their audit, Supersymmetry noted that two large air compressors were scheduled for replacement with an existing used compressor. Replacement with new, efficient compressors would provide savings. Cost would be the incremental cost over the planned replacement.

Electronics: New chiller/tower, 2 loops

In their audit, Supersymmetry noted the opportunity to replace the chiller system with a better designed new one. The new system would be designed to maximize free cooling, a VSD chiller and would include splitting the CW system into two pipe loops – one cold and one moderate loop. The overall system performance would be improved by utilizing two loop temperatures. While savings are considerable, this would be a major capital investment.

Table 14: Summary of Measures -- Electronics Segment

Opportunity	Measure Name	Cost	Savings, kWh	O&M/yr	Life	LC in 2008$
Highly	Thermoelectric Chiller	$20,000	40,571	-$5000	10	($0.071)
Achievable	Exhaust Injector	$20,000	45,815	-$6170	10	($0.073)
	Reduce Gas Pressure	$0	3,260	-$46	10	($0.001)
	Vacuum pump, incremental over rebuild	$51,000	63,072		5	$0.972
Moderately	Chiller optimize	$50,000	1,736,000		10	$0.037
Achievable	Change filter strategy	$9,200	1,463,000		1	$0.054
	Clean Room HVAC	$20/sqft	144/sqft		20	$0.011
	Eliminate exhaust	$80,000	442,000		10	$0.026
	Reduce pressure, reset CHW	$40,000	81,000		10	$0.070
	VSD tower pumps	$50,000	187,000		10	$0.028
	Wastewater preheat of OSA	$325,000	776,000	-$180,000	10	($0.173)
Low	CW to gas plant	$40,000	245,000		10	$0.023
Achievable	Chiller heat recovery	$30,000	28,000		10	$0.152
	New air compressor	$50,000	273,000		10	$0.026
	New chiller/tower, 2 loops	$800,000	4,539,000		10	$0.025

Industrial Natural Gas Conservation Measures

As discussed, the gas customers included in this study are only those in the Industrial Firm tariff, corresponding to perhaps 10% of commercial and industrial customers. Those on the firm rate are generally small facilities or adjunct meters to larger facilities. As such, the end uses are more similar to other small commercial customers than to what would be expected for large industrial facilities. The primary application of gas is for boilers –either for process steam or for space heating. As a result, the opportunity is dominated by various measures to improve boiler efficiency.

The following measures are included:

- Chiller heat recovery (Electronics Segment)
- Utilize heat recovery where option exists
- Combo Cond Boiler (Replace and Retrofit)
- Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).
- Combo Hieff Boiler (Replace and Retrofit)

- Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.
- Condensing Furnace (Replace)
- Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.
- Condensing Unit Heater from Nat draft or power draft (Replace)
- Install condensing power draft units (90% seasonal efficiency) in place of natural draft (64% seasonal efficiency)
- Heat Recovery to HW
- Utilize heat recovery where option exists
- DHW Condensing Boiler (Replace and Retrofit)
- Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).
- DHW Condensing Tank (Replace and Retrofit)
- Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.
- DHW Hieff Boiler (Replace and Retrofit)
- Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.
- DHW Pipe Insulation
- Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.
- DHW Standard Boiler (Retrofit)
- Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.
- DHW Wrap
- Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.
- Ducts
- Duct retrofit of both insulation and air sealing
- Hi Eff Unit Heater (Replace and Retrofit)
- Install power draft units (80% seas. Eff) in place of natural draft (64% seasonal efficiency)
- HiEff Clothes Washer (Replace and Retrofit)

- Install high performance commercial clothes washers - residential sized units
- Hot Water Temperature Reset
- Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.
- HW Boiler Tune Tune up in accordance with Minneapolis Energy Office protocol.

  Can include derating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature.

  Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.
- Power burner

  Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack.

  Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.
- Process Boiler Controls
- Process Boiler Insulation
- Process Boiler Load Control
- Process Boiler Maintenance
- Process Boiler Steam Trap Maintenance
- Process Boiler Water Treatment
- Roof Insulation - Blanket R0-19

  Application: Buildings with open truss unfinished interior
- Roof Insulation - Blanket R0-30

  Application: Buildings with open truss unfinished interior
- Roof Insulation - Blanket R11-30

  Application: Buildings with open truss unfinished interior
- Roof Insulation - Blanket R11-41

  Application: Buildings with open truss unfinished interior
- Roof Insulation - Rigid R11-22 (Replace)

2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation

- Roof Insulation - Rigid R11-33 (Replace)
- Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation
- Solar Hot Water

  Install solar water heaters on large use facility such as multifamily or lodging
- SPC Condensing Boiler (Replace)

  Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%
- SPC Condensing Boiler (Retrofit)

  Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 69.5%
- SPC High Efficiency Boiler (Replace)

  Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%
- SPC High Efficiency Boiler (Retrofit)

  Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 69.5%
- Steam Balance (Wood Prod)

  Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.
- Steam Trap Maint (Wood Prod)

  Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.
- Upgrade Process Heat

  Replace furnace, re-heaters
- Vent Damper

  Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.
- Wall Insulation - Blown R11

Application: Old buildings

- Wall Insulation - Spray On for Metal Buildings
- Wall Insulation (Cellulose) unfinished. Application: Old buildings
- Waste Water Heat Exchanger

  Install heat exchanger where copious warm water is discarded

Commercial Sector Resource Assessment

A list of the major commercial measures, listed by the levelized cost, is provided in Table 18 and Table 19. These lists present individual measures, with costs and benefits resulting from the applicable population.

Commercial Sector Characterization

Characterizing the commercial segment reveals certain difficulties. For example, industrial customers often have a relatively large percentage of overall floor space devoted to end uses that would typically be thought of as commercial. We included a portion of “industrial” sales as really belonging to commercial uses. New construction square footage estimates were also developed using utility estimates although these appear to assume optimistic growth.

On particular problem lies with the growth of large data server “farms”. Several of these facilities have located in the Northwest and their energy consumption can be prodigious. A variety of conservation measures are available for these facilities. However, quantifying the impact is difficult. Problems occur with:

- Forecasting – specific facilities are not included in the utility forecasts.
- Baseline – computer technology changes rapidly and baseline consumption is not clear
- Current practice – the extent to which HVAC and software management measures are already adopted is not clear.

As a result, although one can anticipate significant opportunities regarding data servers, we have not attempted to quantify them.

Description of Commercial Measures

Measures were previous described in the 2007 report. For this study, the detailed measure descriptions are included in Table 18 and Table 19.

Lighting Measures

The new assessment has made several adjustments to the cost and savings assumptions and the calculation methods used in the lighting assessment.

Lighting equipment cost data were reviewed and adjusted to agree with the latest set of measures from the Northwest Power and Conservation Council.

Overall, high performance T8 technology is highly attractive and should be pursued aggressively. The high/low bay lighting is much less clear. Further evaluation of this niche is warranted. Hours of operation and available control strategies will have a large impact on savings and, as such, solutions most likely need to be evaluated on a case by case basis. Ceramic metal halide remains a highly attractive but expensive option for display light situations. It definitely delivers same to better quality light and less frequent bulb changes and, as such, is an upgrade in most situations. Even though this fixture is not cost effective in most situations, it should be evaluated on a situation-by-situation basis.

Lighting measures:

- CFL 9W to 39W hardwired
- High Efficacy LED Display
- T8 to HP T8
- T12 to HP T8
- High Bay HID Medium to T8 (Retrofit and New)
- High Bay HID Large to T5 (Retrofit and New)
- Daylight Control (overhead)
- Sweep Control
- Daylight perimeter zone
- Occupancy Sensors
- Exit signs
- Ceramic Metal Halide (Retrofit and New)
- Daylighting Overhead (New)
- Daylight control with skylight

HVAC Measures

Economizer Diagnostic, Damper Repair & Reset

Applicable to single zone packaged systems. The outdoor make-up air damper and control are often set incorrectly or not functioning. Savings derive from reduced cooling due to restored economizer function and reduced heating from reduced minimum outdoor air.

Warm Up Control

This measure is designed to implement a shut down of outside air when the building is coming off night setback. Usually the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers.

Rooftop Condensing Burner

Prototype units of condensing natural gas packaged heaters have been demonstrated in Canada. However, the condensing feature of these units was not the primary source of their savings – rather it was the fact that exposed ductwork was better insulated.

Demand Controlled Ventilation (DCV)

Applicable to single zone packaged systems with large make -up air fractions either because of intermittent occupancy or because of code requirements. In most cases the outdoor air is reset to 5% or less with CO_2 build-up modulating ventilation.

Ducts

Duct retrofit of both insulation and air sealing

Hot Water Temperature Reset

Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.

HW Boiler Tune

Tune up in accordance with Minneapolis Energy Office protocol. Can include de-rating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include up-rating the burner to reduce oxygen or de-rating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.

Steam Balance

Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.

Steam Trap Maintenance

Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.

Vent Damper

Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.

Power burner

Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.

Space Conditioning Hieff Boiler (Retro and Replace)

Boiler costs for near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 69.5%

Space Conditioning Cond Boiler (Retro and Replace)

Boiler costs for condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 69.5%

Hi Eff Unit Heater (New, Retro and Replace)

Base efficiency has gone up. Install power draft units (80% seasonal eff) in place of natural draft (64% seasonal eff)

Cond Unit Heater from Natural draft (New and Replace)

Install condensing power draft units (90% seasonal eff) in place of natural draft (64% seasonal eff)

Cond Unit Heater from Power draft (New and Replace)

Install condensing power draft units (90% seasonal eff) in place of power draft (80% seasonal eff)

Cond Furnace (New and Replace)

Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.

Space Conditioning Hieff Boiler (New)

Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%

Space Conditioning Cond Boiler (New)

Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%

Water Heating Measures

DHW Wrap

Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.

DHW Shower Heads

Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.

DHW Faucets

Add aerators to existing faucets to reduce flow from 3.4 gallons per minute to 2.0 GPM.

DHW Pipe Ins

Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.*DHW Recirc Controls*

Install electronic controller to hot water boiler system that turns off the boiler and circulation pump when the hot water demand is reduced (usually in residential type occupancies) or can be reset to meet the hot water load. (Steel boilers also require a mixing valve to prevent water temperatures from dropping below required levels).

DHW Std. Tank (Retro)

This measure would replace existing DHW tank with equipment meeting current Oregon Energy Code requirements (thermal efficiency of 78% or better).

DHW Condensing Tank (Retro)

Replace older tanks with condensing tanks with combustion efficiency of 94% and tank insulation with an R-value of 16 or greater.

DHW Condensing Tank (Replace)

Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.

DHW Condensing Tank (New)

Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.

DHW Std. Boiler (Retro)

Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.

DHW Hieff Boiler (Retro)

Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.

DHW Cond Boiler (Retro)

Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).

DHW Hieff Boiler (Replace and New)

Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.

DHW Cond Boiler (Replace and New)

Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).

Combo Hieff Boiler (Retro)

Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.

Combo Cond Boiler (Retro)

Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).

Combo Hieff Boiler (Replace and New)

Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.

Combo Cond Boiler (Replace and New)

Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).

Solar Hot Water (New and Retrofit)

Install solar water heaters on large use facility such as multifamily or lodging New

Heat Pump Water Heat (New and Retrofit)

Waste Water Heat Exchanger (New and Retrofit)

Install HX on waste water

Hi Eff Clothes Washer (Replace)

Install high performance commercial clothes washers – for residential units

Computerized Water Heater Control (New and Retrofit)

Install intelligent controls on the hot water circulation loops.

Cooking Measures

Cooking measures with primarily gas savings include Energy Star applications for Convection Oven, Fryer, Griddle, and Hot Food Holding Cabinet. These apply to both electricity and gas appliances.

Shell Measures

Insulation measures:

Wall Insulation - Blown R11

Application: Old buildings

Wall Insulation - Spray On for Metal Buildings

Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings

Roof Insulation - Rigid R0-11

Rigid R0-11-not including re-roofing costs but including deck preparation. Application: Old buildings with flat roofs and no attics

Roof Insulation - Rigid R0-22

Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics

Roof Insulation - Rigid R11-22

Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation

Roof Insulation - Rigid R11-33

Rigid R11-33: add 4' of insulation at time of reroofing. Application: Old buildings with flat roofs, no attics, and some insulation

Roof Insulation - Blanket R0-19

Blanket R0-19. Application: Buildings with open truss unfinished interior

Roof Insulation - Blanket R0-30

Blanket R0-30. Application: Buildings with open truss unfinished interior

Roof Insulation - Blanket R11-30

Blanket R11-30. Application: Buildings with open truss unfinished interior

Roof Insulation - Blanket R11-41

Blanket R11-41. Application: Buildings with open truss unfinished interior

Roof Insulation - Attic R0-30

Attic R0-30. Application: Buildings with uninsulated attics

Roof Insulation - Attic 11-30

Attic 11-30. Application: Buildings with partially insulated attics

Roof Insulation - Roofcut 0-22

Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time

Window Measures

Window energy savings were predicted with building energy simulation models for the 2004 ETO evaluation. The window market was divided into vinyl and aluminum frame, and tinted versus non-tinted. The tinted versus un-tinted is significant because without tint windows must be include a low emissivity coating to pass the SHGC code requirement. This generally brings the window SHGC and U-value below the code requirements by a significant margin, reducing savings available.

The Oregon code has low and high glazing fraction paths. The high glazing path requires maximum performance windows, which pretty much excludes them from utility programs. Therefore, we limited this evaluation to the lower glazing path and window populations (application factor) were reduced by 40% to remove the high glazing buildings (>30% in zone 1 and >25% in zone 2) from the target population.

For each of these cases, savings were predicted for various measures. For the aluminum frames, several U-value targets were established with the assumption that the target buildings would evenly divide into these groups.

Categories of retrofit windows include: Windows – Single or Double to Class 45, 40, 36 or VEA. Details of window assumptions are listed in Table 15.

Table 15: Window Measure Details

Window	SHGC	U-Value	Measure Code, At Replacement	Measure Code, New	Measure Name
Code Requirement	0.57	Z1 0.54 Z2 0.50			
Aluminum, tinted					
Model Base	0.52	0.50			
Class 45 tint	0.35	0.45	E120	E129	Windows - Tinted AL Code to Class 45
Class 40 tint	0.35	0.40	E121	E130	Windows - Tinted AL Code to Class 40
Class 36 tint	0.35	0.36	E122	E131	Windows - Tinted AL Code to Class 36
Aluminum, not tinted					

Window	SHGC	U-Value	Measure Code, At Replacement	Measure Code, New	Measure Name
Model Base	0.43	0.48			
Class 45	0.43	0.45	E117	E126	Windows - Non-Tinted AL Code to Class 45
Class 40	0.43	0.40	E118	E127	Windows - Non-Tinted AL Code to Class 40
Class 36	0.43	0.36	E119	E128	Windows - Non-Tinted AL Code to Class 36
Vinyl, tinted					
Model Base	0.54	0.50			
Add Low E	0.35	0.35	E114	E123	Windows - Add Low E to Vinyl Tint
Add Low E + Argon	0.35	0.31	E115	E125	Windows - Add Low E and Argon to Vinyl Tint
Vinyl, not tinted					
Model Base	0.43	0.35			
Add Argon	0.43	0.31	E116	E124	Windows - Add Argon to Vinyl Lowe

Cooling and HVAC Controls Measures

CEE Tier 2 3 ton (New and Replacement)

Install high efficiency cooling equipment complying with CEE Tier 2.

CEE Tier 2 7.5 ton (New and Replacement)

Install high efficiency cooling equipment complying with CEE Tier 2.

CEE Tier 2 15 ton (New and Replacement)

Install high efficiency cooling equipment complying with CEE Tier 2.

CEE Tier 2 25 ton (New and Replacement)

Install high efficiency cooling equipment complying with CEE Tier 2.

HVAC System Commissioning (New)

Commissioning includes testing and balancing, damper settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.

HVAC controls (New)

Set up control algorithms. This assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, properly training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are set at optimum levels for the current occupancy.

Lighting Scheduling/Controls (New)

This measure includes the commissioning of any occupancy and sweep controls and the review and proper setting of daylighting controls. Since these are largely a function of schedule settings (except in cases where daylighting controls are integrated into the energy management software), we have included only the impact of properly controlled lighting and occupancy.

PCs and Monitors - Energy Management Software (New and Replacement)

There is a solution to automate the enabling of Power Management in commercial computers and monitor/displays called Surveyor by EZConserve.

LCD Monitors (New and Replacement)

Replace CRT with LCD monitor at replacement time. This measure is zeroed out as being current practice.

High Efficiency Chiller (Replace)

Replace chillers or installing new chillers to purchase units with efficiencies averaging 0.51kW/ton air conditioning (AC), rather than the standard new unit, which has an efficiency of 0.65 kW/ton. In practice, some fraction of chiller replacements may involve the early retirement of units with lower efficiencies (perhaps 0.90 kW/ton), and thus achieve higher savings in the first few years of the measure installation.

Chiller System Optimization (Replace)

Includes improvements in efficiency and reduction in parasitic losses in pumps, fans, and other (non-chiller) electric motor-driven systems associated with chillers.

Chiller Tower 6F approach (Replace)

Install low approach cooling tower

Transformers (Retrofit)

Savings apply at service entry for all electric usage

EMS Retrofit for Restaurants (Retrofit)

Many commercial establishments have no means of operating facility lighting, heating, air conditioning, refrigeration, etc., except to rely upon employees to manually switch equipment on/off before, during and after a typical work day. This is especially true in restaurants. A proper EMS installation in such facilities can reduce existing gas and electric energy usage by about 10% or more.

ECM Fan Powered Boxes (New)

Install ECM motors in VAV fan powered terminals with PSC motors

Indirect/Direct Evaporative Cooling ~20 ton (New and Replacement)

Install indirect/direct evaporative cooling in commercial building HVAC system in 20 to 60 ton range

Indirect/Direct Evaporative Cooling >60 ton (New and Replacement)

Install indirect/direct evaporative cooling in commercial building HVAC system in large systems <60 ton range. Original ETO evaluation evaluated at 20, 150 and 300tons with all being essentially equivalent

Ground Source Heat Pump - Air Source HP Base (Replacement)

Install GSHP in place of air source heat pumps.

Refrigeration Measures

Four energy efficiency measures were developed from Supermarket Energy Efficiency (NEEA, 2005) for large supermarket refrigeration systems.

Floating heat pressure has very large energy savings and a relatively high current saturation. It includes floating head pressure controls with variable set-point control to maintain a 10F delta T to a minimum coil temperature of 70F.

Heat Reclaim has huge savings for the heating fuel but a significant electric interaction penalty with floating head pressure. Currently, heat reclaim is most common in the limited form of heating service hot water with refrigeration superheat. This measure is the use of condenser heat in a heat reclaim coil installed in the space heating system.

This measure assumes that floating head pressure is installed and heat reclaim holdback valves are used to maintain the refrigerant's SCT in the reclaim coil, regardless of the SCT at the condenser, thereby allowing the condenser to "float" with ambient. This greatly reduces the savings from floating head pressure and is accounted for as a negative electric savings for this measure.

Other refrigeration measures:

Refrigeration Case Package

This measure includes efficient evaporator fans, case lighting, and low energy anti-sweat heaters.

Efficient Refrigeration Systems

This measure includes efficient compressor, efficient condenser fans, mechanical sub-cooling, and controls.

Package Refrigeration - Icemakers, Vending machines (New and Replacement)

Install machines with package of measures akin to ADL low cost

Efficient Standalone Refrigeration Cases (New and Replacement)

Install efficient stand-alone cases. This measure is based upon current rebates and SAIC savings numbers

Residential Sector Resource Assessment

Sector Characterization

For this analysis, three residential segments were considered: single family, manufactured homes and multi-family units. We further divided these segments, at the request of the Energy Trust, into low income, medium low income, and all other income levels (see the ResSectorChar.xls spreadsheet). For this analysis, both electricity and fuel savings are considered. In cases where the nature of the measure limits its applicability to a portion of the homes (for example, duct measures exclude homes with basements), adjustments to the technical potential are contained in the workbook for that measure.

Description of Residential Measures

Detailed list of measures in included as Table 20 and Table 21. These tables provide results for the measures applied to the appropriate population. A short description of assumptions used to develop these measures follows. Savings estimates for heating consumption are based on simulations by Ecotope's SEEM model, which is specifically designed to include effects of duct distribution losses and other regional measures.

HVAC Measures

1. Duct Sealing (New/Replacement)

Duct sealing in accordance with PTCS standards for new construction. The distribution efficiency associated with the duct sealing measure is .85.

2. Duct Repair (Retrofit)

Duct sealing in accordance with PTCS standards for existing construction, requiring a 50% reduction in leakage, was examined for several heating system types.

3. Heat Pump Upgrade (New/Replacement/Retrofit)

Heat pump upgrade from HSPF 7.7 to 9.5, with PTCS-level commissioning and duct sealing. For the retrofit sector, the efficient heat pump was examined both as a retrofit from an older, working heat pump and from an electric furnace base case.

4. Ground Source Heat Pumps (New)

Install Ground Source heat pump (GSHP) in lieu of standard air source heat pump.

5. High Efficiency AC (New/Replacement)

We examined a measure to upgrade a central forced air AC system to SEER 15 from SEER 13. Some additional savings from proper commissioning are included in the total. We also examined a measure to upgrade a standalone window unit to Energy Star levels (base case EER 9.7 upgraded to 10.7).

6. Diagnostic Heat Pump tune-up (Retrofit)

A program based on field visits that offers minor adjustments to HVAC equipment (adjust charge, clean filters, check settings, install cutout thermostat) to optimize efficiency. The requirements for each system will vary, but cost and savings are based on overall expectations if a large population is treated.

7. Evaporative Cooling (New/Replacement/Retrofit)

Install a direct/indirect evaporative cooler for new and replacement models. Savings for the retrofit sector are from in lieu of a SEER 13 central AC.

8. High Efficiency Gas Furnace (New/Replacement)

This measure describes an upgraded gas furnace from AFUE .8 to .9. A separate measure adds duct leakage improvements of 15%.

9. Ductless Mini-split Heat Pump

Current models are small in capacity, which limits their retrofit potential. They are suggested for homes with electric baseboard heating – which makes them one of the few retrofit equipment measures possible for older homes with baseboard heating. In multi-family housing where they would provide the equivalent of an efficient through-the-wall heat pump. The cost estimate gives credit for the fact that a window air conditioner would otherwise have to be included to provide a similar cooling benefit.

Envelope Measures

1. Energy Star building package (New)

The Energy Star package is continuingly evolving. As new efficiency levels are implemented in codes and standards, Energy Star must develop new measures that provide a further level of energy savings. It becomes more difficult to find further measures that are cost-effective and provide sufficient savings. The current Energy Star package includes insulation, windows, duct sealing, efficient hot water and lights, as well as high efficiency heating/cooling equipment.

2. Window Upgrades (New/Replacement/Retrofit)

Improvement from U=.35 to U=.30. This measure is applicable to both electrically heated and gas heated homes.

2. Heat Recovery Ventilation, including infiltration reduction (New)

Addition of heat recovery to ventilation system and whole house sealing. This measure is applicable to both electrically heated and gas heated homes.

3. Standalone shell measures to Energy Star levels (New).

Window and insulation as a stand-alone measures. Basecase was R-21 in the floor and walls, and R-38 insulation in the attic. The Energy Star package requires the same wall and attic insulation performance, but also requires advanced framing for the walls and R-30 insulation in the floor. This measure is applicable to both electrically heated and gas heated homes.

4. Insulation improvements (Retrofit)

For the retrofit segment, the base cases were drawn from the existing building prototypes, weighted by vintage using data from the US Census. For these measures, the candidate home must have no existing wall insulation, ceiling insulation of R-11 or less, and floor insulation of R-19 or less. All measures utilize blown-in or batt insulation to achieve the increased R-value. The measure assumes that the home will be treated with the two most cost-effective measures (floor, wall or attic insulation), based on the specific characteristics of each home. This measure applies to both electrically heated and gas heated homes.

4. Bring Ducts Indoors. (New)

Locating ductwork within the heated space accomplished the benefits of duct sealing at low cost. Thus, it provides an alternative path to achieve similar savings to the Energy Star package. We include an alternative package with Indoor Ducts, DHW and Lights that would be the uncertified equivalent of Energy Star.

5. Weatherization Envelope Sealing (Retrofit)

Blower-door assisted sealing has been a popular measure within the program. It applies to both electric and gas heated homes.

Lighting Measures

1. Efficient fluorescent bulbs and fixtures (New/Replacement/Retrofit)

Lighting measures are difficult to categorize because new Federal standards will occur. We assume that the current Energy Star Lighting measure requires installation of 18 CFL lamps (20% reduction in LPD) or full replacement (30% reduction). However, the opportunity for this measure is short-lived. By 2015, new Federal standards will require that new lighting product meet an equivalent efficiency standard. We propose that a new set of emerging technology lighting products, based on LED lights, will become available starting in 2015 to provide efficiency beyond code minimum requirements. These proposed measures are described as:

- Add 6 LED lamps (using incandescent base) aft 2015 (65% reduction in LPD using both fixtures and lamps)
- Add 6 LED lamps (using CFL base) after 2015
- Add 16 LED lamps (using incandescent base) after 2015
- Add 16 LED lamps (using CFL base) after 2015
- All LED (from 2020 base) after 2020

Similarly for retrofit lighting measures, CFL replacements may occur up until year 2015 but then we anticipate emerging technology be based on high efficiency LED lights. These are proposed as:

- 50% LED after 2020
- 100% LED after 2020

Domestic Hot Water Measures

1. Tank wrap (Retrofit)

This measure assumes an R-6 tank wrap is installed in water heaters older than 5 years, and applies to both gas and electric units.

2. Hot water pipe wrap (Retrofit)

This measure assumes that the hot and cold water pipes are insulated with an R-2 wrap, and applies to both gas and electric water heat.

3. Water Heater Upgrade (New/Replacement)

Two water heater upgrade measures were examined for the new and replacement markets. The primary difference is in the quality of the unit. For electric water heat, the first measure upgrades the water heater from an EF of .90 to .93, with a 20 year warrantee. The second measure costs less for a unit with a 10 year warrantee. The efficiency improvement for that measure is from an EF of .90 to .94.

For the gas segment, the measures includes a water tank upgrade from EF=.59 to EF=.62. An emerging efficient option is upgrading to EF=.70. Tankless water heaters provide an EF= .85 and an incremental improvement to and efficient model with EF= .89.

4. Heat Pump Water Heater (New/Replacement)

This measure assumes that an electric water heater is replaced with a heat pump water heater (EF from .90 to 2.0).

6. Combined Space and Water Heating

We examined a variety of system that combine gas space and water heating. Although these systems have some appeal in providing radiant slab heating, there is a question about the appropriate baseline. Compared to a hydronic system that would provide similar radiant heating, there is little or no energy saving. One combination option appears to be currently cost-effective – that would be a combination involving a low-cost hydrocoil applied to an air distribution system. We also include a high efficiency combination system based on the Polaris water heater.

7. Solar Water Heater (New/Replacement)

This measure assumes that an electric or gas water heater is replaced with a solar water heater with backup, reducing the water heating load by about 60%. Cost estimates come from the current program.

Appliance Measures

1. Low Power Mode Appliances

These measures were changed to follow the latest set of measures from the Northwest Power Planning and Conservation Council. Specific measures are low-power mode PCs, televisions, monitors and setup boxes. These products have a high turnover rate and are being upgraded continually. Hence, the opportunity for long-term savings is limited.

2. EStar Refrigerator assumes a unit 15% more efficient than Federal standard.

3. Two clothes washers are considered. The MEF 2.0 Washer is only a modest improvement over the minimum standard. The high efficiency washer is MEF 2.2. It should be mentioned that units with even higher MEF ratings occur in the current program.

4. EStar Dishwasher is based on a unit rated at .68 (higher than Energy Star minimum) over a market baseline rated .52 (slightly higher than Federal minimum standard).

5. Home Energy Monitor is a device than offers direct feedback to consumers regarding their energy consumption. With the feedback, customers are expected to better control their energy usage. Estimates are based on the BC Hydro study that estimated a 6.5% reduction in electric load. To be conservative and because we are not in Canada we used 5%.

6. Solar Water Heater (New/Replacement)

This measure assumes that an electric or gas water heater is replaced with a solar water heater with backup, reducing the water heating load by about 60%.

Appendix: Detailed Measure Descriptions

Table 16: Detailed Measure Description, Industrial Electricity

Conservation Measure	First Cost ($/kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
Air Compressor Demand Reduction	$0.060	Retrofit	All Except Cold Storage	Air Comp	20%	26%	100%	10		$0.027		$0.039	2.42	SEG, Systems Optimization R4. xls
Air Compressor Equipment1	$0.124	Retrofit	Sugar, Wood, Paper, Metal, Equipment, Refinery	Air Comp	35%		100%	10		$0.027		$0.051	1.95	Ibid.
Air Compressor Equipment2	$0.048	Replace	Sugar, Wood, Paper, Metal, Equipment, Refinery	Air Comp	35%	17%	100%	10		$0.027		$0.036	2.53	Ibid.
Air Compressor Optimization	$0.150	Retrofit	Sugar, Wood, Paper, Metal, Equipment, Refinery	Air Comp	50%	36%	100%	10		$0.027	$0.059	($0.003)	3.07	Ibid.
HighBay Lighting 1 Shift	$0.181	Replace	Food, Wood, Metal Fab, Other	Lights	51%	varies by sector	100%	10				$0.034	3.79	Ecotope RA for ETO
HighBay Lighting 2 Shift	$0.106	Replace	Food, Wood, Metal Fab, Other	Lights	51%		100%	10				$0.020	6.37	Ibid.
HighBay Lighting 3 Shift	$0.059	Replace	All	Lights	51%		100%	10				$0.011	10.94	Ibid.
Efficient Lighting 1 Shift	$0.058	Replace	Food, Wood, Metal Fab, Other	Lights	70%	varies by sector	100%	10				$0.011	11.86	Ibid.
Efficient Lighting 2 Shift	$0.034	Replace	Food, Wood, Metal Fab, Other	Lights	70%		100%	10				$0.006	19.94	Ibid.
Efficient Lighting 3 Shift	$0.019	Replace	All	Lights	70%		100%	10				$0.004	34.23	Ibid.

Conservation Measure	First Cost ($/ kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/ kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
Lighting Controls	$0.147	Replace	All	Lights	28%	15%	100%	10				$0.028	4.41	Ibid.
Motors: Rewind 20-50 HP	$0.270	Replace	Food, Wood, Paper, Metal, Metal Fab, Refinery	All Motors	0.9%	varies by sector	100%	10				$0.051	2.40	Dennis Brown, "Quality Motor Rewinding", submittal to RTF, 2008.
Motors: Rewind 51-100 HP	$0.232	Replace	Food, Wood, Paper, Metal, Metal Fab, Refinery	All Motors	0.50%		100%	10				$0.044	2.79	Ibid.
Motors: Rewind 101-200 HP	$0.172	Replace	Food, Wood, Paper, Metal, Metal Fab, Refinery	All Motors	0.50%		100%	10				$0.033	3.76	Ibid.
Motors: Rewind 201-500 HP	$0.112	Replace	Food, Wood, Paper, Metal, Metal Fab, Refinery	All Motors	0.50%		100%	10				$0.021	5.76	Ibid.
Motors: Rewind 501-5000 HP	$0.082	Replace	Food, Wood, Paper, Metal, Metal Fab, Refinery	All Motors	0.50%		100%	10				$0.016	7.86	Ibid.
Efficient Centrifugal Fan	$0.136	Retrofit	Pulp, Paper, Wood	Material Handling	20%	11%	100%	10				$0.026	4.76	Marbek Resource Consultants, 2008
Fan Energy Management		Retrofit	All Except Cold Storage	Fan	10%	27%	100%	10		$0.033		$0.033	2.63	SEG, Systems Optimization R4. xls
Fan Equipment Upgrade	$0.064	Retrofit	Paper, Wood	Fan	35%	23%	100%	10		$0.033		$0.045	2.07	Ibid.
Fan System Optimization	$0.090	Retrofit	Paper, Wood	Fan	50%	30%	100%	10		$0.039	$0.042	$0.014	2.51	Ibid.
Pump Energy Management		Retrofit	All Except Cold Storage	Pump	8%	31%	100%	10		$0.033		$0.033	2.61	Ibid.

Conservation Measure	First Cost ($/ kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/ kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
Pump Equipment Upgrade	$0.094	Retrofit	Paper, Wood	Pump	20%	34%	100%	10		$0.033		$0.050	1.89	Ibid.
Pump System Optimization	$0.190	Retrofit	Paper, Wood	Pump	50%	15%	100%	12		$0.046	$0.111	($0.034)	2.96	Ibid.
Transformers-Retrofit	$0.524	Retrofit	All	All Electric	1.6%	17%	100%	10				$0.099	1.23	NWPPC, Transformers\PC-Transformer-Liquid--D1.xls
Transformers-New	$0.569	Replace	All	All Electric	0.4%	37%	100%	32				$0.053	2.73	Ibid.
Synchronous Belts	$0.160	Retrofit	All Except Cold Storage, Electronics	All Motors	2.0%	21%	100%	10				$0.030	4.04	Marbek Resource Consultants, 2008
Elec Chip Fab: Eliminate Exhaust	$0.140	Retrofit	Chip Fab portion of Electronic Fab	HVAC	5%	80%	100%	10				$0.027	4.63	Phil Naughton, 2005, NEEA Chiller
Elec Chip Fab: Exhaust Injector	$0.338	Retrofit	Chip Fab portion of Electronic Fab	Heat	100%	35%	100%	10			$0.151	($0.087)	5.34	Paragon
Elec Chip Fab: Solidstate Chiller	$0.381	Retrofit	Chip Fab portion of Electronic Fab	HVAC	90%	20%	100%	10			$0.138	($0.066)	4.47	Solid State
Elec Chip Fab: Reduce Gas Pressure		Retrofit	Chip Fab portion of Electronic Fab	Refrig, Air Comp	10%	50%	100%	10			$0.016	($0.016)	100.00	Phil Naughton, 2005
Clean Room: Change Filter Strategy	$0.005	Retrofit	Electronic Fab, Other Clean Rooms	HVAC	40%	10%	100%	1				$0.007	16.20	ACEEE,2001, NEEA Chiller
Clean Room: Clean Room HVAC	$0.121	Retrofit	Electronic Fab, Other Clean Rooms	HVAC	9%	30%	100%	20				$0.014	9.66	Ibid.
Clean Room: Chiller Optimize	$0.061	Retrofit	Electronic Fab, Other Clean Rooms	HVAC	15%	28%	100%	10				$0.012	10.61	Ibid.
Food: Cooling and Storage	$0.225	Retrofit	Food	Refer	15%	100%	100%	10				$0.043	2.91	*Cascade Engineering, NW*

Conservation Measure	First Cost ($/ kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/ kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
														Refrigeration Savings Potential.xls, 2008.
Food: Refrig Storage Tuneup	$0.052	Retrofit	Food	Refer	8%	100%	100%	3				$0.028	4.39	Ibid.
Metal: New Arc Furnace	$0.069	Retrofit	Metal	Process Heat	45%	10%	100%	10			$2.000	($1.987)	230.31	ACEEE, 2004 Resource Assessment for Energy Trust
Kraft: Effluent Treatment System	$0.056	Retrofit	Kraft Pulp	Pump	15%	10%	100%	10				$0.011	11.65	Marbek Resource Consultants, 2008
Kraft: Efficient Agitator	$0.063	Replace	Kraft Pulp	Process	50%	14%	100%	10				$0.012	10.32	Ibid.
Paper: Efficient Pulp Screen	$0.136	Retrofit	Paper	Process	15%	14%	100%	10				$0.026	4.78	Ibid.
Paper: Premium Fan	$0.136	Retrofit	Paper	Fan	20%	25%	100%	10				$0.026	4.75	Ibid.
Paper: Material Handling	$0.482	Replace	Paper	Material Handling	13%	25%	100%	10				$0.091	1.34	Ibid.
Paper: Large Material Handling	$0.576	Replace	Mech Pulp, Kraft, Paper	Material Handling	10%	25%	100%	10				$0.109	1.12	Ibid.
Paper: Premium Control Large Material	$0.330	Replace	Mech Pulp, Kraft, Paper	Material Handling	19%	25%	100%	10				$0.062	1.96	Ibid.
Material Handling1	$0.560	Retrofit	Other, Wood	Material Handling	5%		100%	10				$0.106	1.17	Ibid.
Material Handling2	$0.350	Replace	Other, Wood	Material Handling	5%	53%	100%	10				$0.066	1.87	Ibid.
Material Handling VFD1	$0.449	Retrofit	Other, Wood	Material Handling	19%		100%	10				$0.085	1.45	Ibid.
Material Handling VFD2	$0.225	Replace	Other, Wood	Material Handling	19%	53%	100%	10				$0.043	2.91	Ibid.
Wood: Replace Pneumatic Conveyor	$0.010	Replace	Wood	Material Handling	29%	50%	100%	10			$0.066	($0.064)	115.51	NEEA, Just Enough Air
Panel: Hydraulic Press	$0.138	Replace	Panel	Process	28%	28%	100%	10				$0.026	4.72	ETO Program Files
Plant Energy Management	$0.016	Retrofit	All	All Motors	12%	27%	100%	10		$0.031		$0.033	2.55	SEG, Systems Optimization R4. xls
Energy Project Management	$0.092	Retrofit	Wood, Paper, Metal	All Motors	29%	27%	100%	11		$0.031		$0.048	2.01	SEG, Systems Optimization R4. xls

Conservation Measure	First Cost ($/ kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/ kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
Integrated Plant Energy Management	$0.148	Retrofit	Wood, Paper, Metal	All Motors	50%	22%	100%	11		$0.039	$0.082	($0.017)	2.94	SEG, Systems Optimization R4. xls
Irrigation: Ditch > Pipe	$0.059	Retrofit	Agriculture	Pump	60%	1%	100%	10		($1.010)	($1.002)	($1.002)	1.09	ETO Program Files
Irrigation: Nozzles	$0.177	Retrofit	Agriculture	Pump	0%	28%	100%	3			$0.065	$0.065	2.34	Ibid.
Irrigation: Pump Systems Repair	$1.354	Retrofit	Agriculture	Pump	0%	28%	100%	7		($0.010)	$0.226	$0.226	1.36	Ibid.
Irrigation: Pump Systems Adjust	$0.172	Retrofit	Agriculture	Pump	2%	28%	100%	3		($0.048)	$0.016	$0.016	2.38	Ibid.
Irrigation: Water Management	$0.144	Retrofit	Agriculture	Pump	1%	28%	100%	5		$0.067	$0.100	$0.100	1.86	Ibid.
Rural Area Lights	$1.231	Replace	Lighting	Lighting	55%	1%	100%	23		($0.061)		$0.032	1.67	Ibid.
Replace Traffic Light: Red Ball 8-inch	$0.102	Replace	Lighting	Lighting	91%	0%	100%	6		($0.033)		($0.013)	5.76	NWPPC 6th Plan, PC-StreetRoadway-6P-D2.xls
Replace Traffic Light: Red Ball 12-inch	$0.076	Replace	Lighting	Lighting	93%	0%	100%	6		($0.018)		($0.003)	6.79	Ibid.
Replace Traffic Light: Yellow Ball 8-inch	$4.164	Replace	Lighting	Lighting	91%	0%	100%	6		($0.604)		$0.222	0.83	Ibid.
Replace Traffic Light: Yellow Ball 12-inch	$2.786	Replace	Lighting	Lighting	93%	0%	100%	6		($0.336)		$0.216	0.76	Ibid.
Replace Traffic Light: Green Ball 8-inch	$0.179	Replace	Lighting	Lighting	91%	0%	100%	6		($0.043)		($0.008)	3.59	Ibid.
Replace Traffic Light: Green Ball 12-inch	$0.133	Replace	Lighting	Lighting	93%	0%	100%	6		($0.024)		$0.002	4.10	Ibid.
Replace Traffic Light: Red Arrow	$0.271	Replace	Lighting	Lighting	95%	0%	100%	6		($0.098)		($0.044)	3.39	Ibid.
Replace Traffic Light: Green Arrow	$0.275	Replace	Lighting	Lighting	93%	0%	100%	6		($0.100)		($0.045)	3.37	Ibid.
Replace Traffic Light: Yellow Bi-Modal Arrow	$0.494	Replace	Lighting	Lighting	91%	0%	100%	6		($0.102)		($0.004)	1.90	Ibid.
Replace Traffic Light: Green Bi-Modal Arrow	$0.344	Replace	Lighting	Lighting	93%	0%	100%	6		($0.100)		($0.032)	2.69	Ibid.
Replace Traffic Light: White Walking Person	$0.205	Replace	Lighting	Lighting	94%	0%	100%	6		($0.030)		$0.011	2.80	Ibid.
Replace Traffic Light: Orange Hand	$0.207	Replace	Lighting	Lighting	93%	0%	100%	6		($0.030)		$0.011	2.78	Ibid.

Conservation Measure	First Cost ($/ kWh)	Deploy-ment	Sector	Enduse App	% Savings	Measure Applica-bility	Achiev. Potential	Lifetime	Annual Fuel Impact, therm/ kWh	Annual O&M Cost	Annual Non-Energy Benefit	Level Cost ($/kWh)	BCR	Source
Replace Traffic Light: Orange Countdown	$0.553	Replace	Lighting	Lighting	93%	0%	100%	6		($0.080)		$0.029	1.50	Ibid.
Replace Streetlight: 100WHPS>LED78W	$1.141	Replace	Lighting	Lighting	50%	22%	100%	17		($0.052)		$0.050	1.35	Ibid.
Replace Streetlight: 100WHPS>LED60W	$1.037	Replace	Lighting	Lighting	64%	2%	100%	23		($0.077)		$0.001	2.19	Ibid.
Replace Streetlight: 150HPS>LED117W	$1.231	Replace	Lighting	Lighting	55%	5%	100%	23		($0.061)		$0.032	1.67	Ibid.
Replace Streetlight: 150HPS>LED111W	$0.978	Replace	Lighting	Lighting	50%	3%	100%	14		($0.062)		$0.038	1.49	Ibid.
Retro Streetlight: 100WHPS>LED78W	$1.898	Retrofit	Lighting	Lighting	50%		100%	17		($0.052)		$0.118	0.81	Ibid.
Retro Streetlight: 100WHPS>LED60W	$2.110	Retrofit	Lighting	Lighting	64%		100%	23		($0.077)		$0.082	1.07	Ibid.
Retro Streetlight: 150HPS>LED117W	$2.115	Retrofit	Lighting	Lighting	55%		100%	23		($0.061)		$0.098	0.97	Ibid.
Retro Streetlight: 150HPS>LED111W	$1.773	Retrofit	Lighting	Lighting	50%		100%	14		($0.062)		$0.120	0.82	Ibid.

Industrial Sources and References:

ACEEE, 2001, Martin, N., Worrell, E., Ruth, M., Price, L., Elliott, R.N., Shipley, A.M., and J. Thorne. 2001. Emerging Energy Efficient Technologies. Washington, D.C.
ACEEE, 2004 Resource Assessment for Energy Trust
Cascade Engineering, NW Refrigeration Savings Potential.xls, 2008.
DEER, 2008, CPUC
Dennis Brown, "Quality Motor Rewinding", submittal to RTF, 2008. www.greenmotors.org
Distributed Generation in Oregon: Overview, Regulatory Barriers and Recommendations, Lisa Schwartz, Public Utility Commission Staff, February 2005
Ecotope, resource assessment for Energy Trust of Oregon, 2008.
ETO Program Files
Marbek Resource Consultants, BC Hydro 2007 Conservation Potential Review, 2008.
NEEA Chiller Efficiency Study, NEEA, 12/15/3
NEEA, Just Enough Air
Paragon Exhaust Injector system, 2005, vendor information for electronic clean rooms, supplied by Chris Robertson.

Phil Naughton, Project Manger, International SEMATECH Manufacturing Initiative, Austin TX, "Fab Energy Trends and Key Areas for Equipment Improvement", 2005.
SEG, Systems Optimization R4. xls
Solid State Cooling Systems, 2005, vendor information on thermoelectric chiller for electronic clean rooms.
Supersymmetry USA, Proprietary report on specific site,1998, "Report on Suggested Energy Efficiency". USDOE,
United States Industrial Electric Motor Systems Market Opportunities Assessment, Xenergy, 1998.
http://www1.eere.energy.gov/industry/bestpractices/pdfs/replace_vbelts_motor_systemts5.pdf

Table 17: Detailed Measure Description, Industrial Natural Gas

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Chiller heat recovery (Electronics)	Utilize heat recovery where option exists	Retrofit	$12.129	SHBoiler	30%	10%	25%	10		$1.581	0.69	Supersymmetry
Combo Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	Replacement	$7.525	SHBoiler, Process Boiler	16%	35%	85%	20		$0.611	1.91	WNG 1995
Combo Cond Boiler (retro)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	Retrofit	$20.234	SHBoiler, Process Boiler	22%	0%	85%	20		$1.643	0.71	WNG 1996
Combo Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	Replacement	$4.091	SHBoiler, Process Boiler	8%	35%	85%	20		$0.332	3.51	WNG 1997

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Combo Hieff Boiler (retro)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	Retrofit	$21.299	SHBoiler, Process Boiler	15%	0%	85%	20		$1.729	0.67	WNG 1998
Cond Furnace (repl)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%.	Replacement	$27.389	SHFurn	13%	40%	85%	15		$2.664	0.42	WNG 1995
Cond Unit Heater from Nat draft (replace)	Install condensing power draft units (90% seas. Eff) in place of natural draft (64% seas. Eff)	Replacement	$11.820	SHUnit		40%	85%	18		$1.022	1.13	WNG 1995
Cond Unit Heater from power draft (replace)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	Replacement	$23.914	SHUnit	11%	40%	85%	18		$2.068	0.56	WNG 1995
Heat Recovery to HW	Utilize heat recovery where option exists	Retrofit	$2.878	Specialty HW	64%	60%	85%	15	($0.130)	$0.150	11.28	Hesse Dairy, 2001
DHW Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90%	Replacement	$1.863	Process Boiler	16%	6%	85%	20		$0.151	7.70	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	efficiency for savings calculations).											
DHW Cond Boiler (retro)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 90% efficiency for savings calculations).	Retrofit	$5.841	Process Boiler	22%	0%	85%	20		$0.474	2.46	WNG 1995
DHW Condensing Tank (repl)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	Replacement	$0.255	Process Boiler	13%	6%	85%	15		$0.025	45.69	WNG 1995
DHW Condensing Tank (retro)	Replace older tanks with condensing tanks with combustion efficiency of 94% and tank insulation with an R-value of 16 or greater.	Retrofit	$1.146	Process Boiler	29%	0%	85%	15		$0.111	10.15	WNG 1995
DHW Hieff	Replace existing boiler with unit	Replacement	$0.583	Process	8%	7%	85%	20		$0.047	24.60	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Boiler (repl)	meeting OR Code requirements of 85% combustion efficiency.			Boiler								
DHW Hieff Boiler (retro)	Replace existing boiler with unit meeting OR Code requirements of 85% combustion efficiency.	Retrofit	$4.561	Process Boiler	15%	0%	85%	20		$0.370	3.14	WNG 1995
DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	Retrofit	$0.196	HW	2%	45%	85%	15		$0.019	59.46	WNG 1995
DHW Std. Boiler (retro)	Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.	Retrofit	$2.740	HW	7%	2%	85%	20		$0.222	5.23	WNG 1995
DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	$0.003	HW	2%	20%	85%	7		$0.000	100.00	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Ducts	Duct retrofit of both insulation and air sealing	Retrofit	$30.503	SHFurn	10%	80%	85%	15		$2.967	0.38	ETO 2003
Hi Eff Unit Heater (replace)	Install power draft units (80% seas. Eff) in place of natural draft (64% seas. Eff)	Replacement	$3.801	SHUnit	20%	60%	85%	18		$0.329	3.50	WNG 1995
Hi Eff Unit Heater (retro)	Install power draft units (80% seas. Eff) in place of natural draft (64% seas. Eff)	Retrofit	$23.143	SHUnit	20%	0%	85%	18		$2.002	0.58	WNG 1995
HiEff Clothes Washer (retro)	Install high performance commercial clothes washers - residential sized units	Retrofit	$7.572	Specialty HW	15%	8%	85%	15	($11.710)	($10.974)	6.29	ETO2010, DOE Clotheswasher
HiEff Clothes Washer (repl)	Install high performance commercial clothes washers - residential sized units	Replacement	$7.572	Specialty HW	15%	8%	85%	15	($11.710)	($10.974)	6.29	ETO2010, DOE Clotheswasher
Hot Water Temperature Reset	Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence	Retrofit	$1.428	SHBoiler	9%	80%	85%	10		$0.186	5.82	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	of simultaneous heating and cooling through instantaneous adjustments.											
HW Boiler Tune	Tune up in accordance with Minneapolis Energy Office protocol. Can include derating the burner, adjusting the secondary air, adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with	Retrofit	$0.742	SHBoiler, Process Boiler	5%	80%	85%	5		$0.172	5.90	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.											
Power burner	Replace standard burner with a power burner to optimize combustion and reduce standby losses in the stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.	Retrofit	$9.732	SHBoiler, Process Boiler	7%	80%	85%	12		$1.107	1.00	WNG 1995
Process Boiler Controls		Retrofit	$0.015	Process Boiler	3%	35%	85%	15	$0.000	$0.001	100.00	CADMAC 2007
Process Boiler Insulation		Retrofit	$0.074	Process Boiler	8%	60%	85%	15	$0.001	$0.008	0.81	CADMAC 2007
Process Boiler Load Control		Retrofit	$0.017	Process Boiler	4%	60%	85%	15	$0.000	$0.002	100.00	CADMAC 2007
Process Boiler Maintenance		Retrofit	$0.000	Process Boiler	10%	12%	85%	15	$0.001	$0.001	0.82	CADMAC 2007
Process Boiler Steam Trap Maintenance			Retrofit	$0.000	Process Boiler	13%	30%	85%	15	$0.035	$0.035	0.82
Process Boiler Water Treatment		Replacement	$0.008	Process Boiler	1%	60%	85%	15	$0.000	$0.001	100.00	CADMAC 2007

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	$5.067	SH	60%	3%	85%	30		$0.335	3.58	ETO 2003
Roof Insulation - Blanket R0-30	Roof Insulation - Blanket R0-30. Application: Buildings with open truss unfinished interior	Retrofit	$5.433	SH	63%	3%	85%	30		$0.359	3.34	ETO 2003
Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	$37.092	SH	8%	8%	85%	30		$2.452	0.49	ETO 2003
Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	$34.774	SH	10%	8%	85%	30		$2.298	0.52	ETO 2003
Roof Insulation - Rigid R11-22 repl	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs,	Replacement	$13.142	SH	29%	6%	85%	30		$0.869	1.38	ETO 2003

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	no attics, and some insulation											
Roof Insulation - Rigid R11-33 repl	Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	Replacement	$39.970	SH	14%	6%	85%	30		$2.642	0.45	ETO 2003
Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	Retrofit	$55.447	Specialty HW	16%	7%	85%	20		$4.502	0.26	ETO2003
SPC Cond Boiler Replace	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	Replacement	$13.113	SHBoiler, Process Boiler	15%	6%	85%	20		$1.065	1.09	WNG 1995
SPC Cond Boiler Retro	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 69.5%	Retrofit	$27.825	SHBoiler, Process Boiler	21%	0%	85%	20		$2.259	0.52	WNG 1995
SPC Hieff Boiler Replace	Install near condensing boiler. Assumed seasonal combustion efficiency of	Replacement	$8.405	SHBoiler, Process Boiler	9%	6%	85%	20		$0.682	1.71	WNG 1995

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	82% over base of 75%											
SPC Hieff Boiler Retro	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 69.5%	Retrofit	$29.399	SHBoiler, Process Boiler	15%	0%	85%	20		$2.387	0.49	WNG 1995
Steam Balance (Wood Prod)	Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.	Retrofit	$3.694	Process Boiler	10%	8%	85%	15		$0.359	3.15	WNG 1995
Steam Trap Maint (Wood Prod)	Set up a in-house steam trap	Retrofit	$4.772	Process Boiler	14%	7%	85%	10		$0.622	1.74	FEMP - Steam Trap Alert

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
	maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an outside contractor to conduct a steam survey.											
Upgrade Process Heat	Replace furnace, reheaters	Retrofit	$9.934	Melt, Heat Oven	17%	7%	85%	15		$0.966	1.17	CADMAC
Vent Damper	Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.	Retrofit	$4.069	SHBoiler, Process Boiler	5%	80%	85%	12		$0.463	2.39	WNG 1995
Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	$3.671	SH	64%	2%	85%	30		$0.243	4.95	ETO 2003

Conservation Measure	Description	Construction	First Cost ($/th)	Enduse App	% Savings	Measure Accept	Achiev. Potential	Lifetime	Annual O&M Cost	Levelized Cost ($/th)	BCR	Source
Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	$4.087	SH	35%	4%	85%	30		$0.270	4.44	ETO 2003
Waste Water Heat Exchanger	Install heat exchanger where copious warm water is discarded	Retrofit	$8.268	HW	16%	10%	85%	20		$0.671	1.73	ETO2003
Ozone Treated Laundry	Use of O3 allows less hot water	Retrofit	$2.460	Laundry HW, dryer	49%	11%	85%	15	($0.068)	$0.171	13.17	ETO2010

Note: Costs in this table do not include the cost reduction due to the BETC tax credit although those credits are included in the BCR.

Table 18: Detailed Measure Table, Commercial Sector, Electricity Savings, 2030 Technical Potential

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
Estar Commercial Clothes Washer	Install high performance commercial clothes washers - coin op	New	Water Heat	10	198,575	-1,848,900	870	0.10	0.10	-$0.248	11.96
Estar Commercial Clothes Washer	Install high performance commercial clothes washers - coin op	Replace	Water Heat	10	6,356,638	-59,104,277	27,801	3.27	3.27	-$0.248	11.94
EStar Fryer	Install EStar in place of conventional	New	Cooking	8	21,621	0	5,652	0.66	0.66	$0.001	126.07
Ozone Laundry Treatment	Ozone treatment allows use of cold water	Retrofit	Water Heat	10	316,941	-30,138	21,294	2.51	2.51	$0.002	40.67
EStar Fryer	Replace with EStar in place of conventional	Replace	Cooking	8	411,313	0	33,365	3.93	3.93	$0.002	39.12
Estar Convection Oven	Replace with EStar in place of conventional	Replace	Cooking	12	587,055	0	17,289	2.03	2.03	$0.004	21.31
Waste Water Heat Exchanger	Install HX on waste water	Retrofit	Water Heat	15	90,338	0	1,995	0.23	0.23	$0.004	19.85
Floating Head Control	Large Grocery - Add floating head control. This is considered measure for the independent grocery chains that are less likely to implement this feature.	New	Refrigeration	18	473,891	0	8,945	1.22	1.61	$0.005	20.17
Floating Head Control	Large Grocery - Add floating head control. This is considered measure for the independent grocery chains that are less likely to implement this feature.	Replace	Refrigeration	18	1,490,386	0	28,131	3.85	5.05	$0.005	20.17

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
DHW Shower Heads	Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.	Retrofit	Water Heat	8	78,408	0	2,278	0.27	0.27	$0.005	14.01
Chiller System Optimization	The "chiller system optimization" measure includes improvements in efficiency and reduction in parasitic losses in pumps, fans, and other (non-chiller) electric motor-driven systems associated with chillers.	Replace	Cooling	15	787,078	0	14,206	3.52	3.07	$0.005	16.39
Roof Insulation - Attic R0-30	Roof Insulation - Attic R0-30. Application: Buildings with uninsulated attics	Retrofit	Heating	45	190,733	0	2,032	0.70	0.06	$0.005	19.76
Heat Pump Water Heat	0	Retrofit	Water Heat	15	3,374,420	201,618	50,249	5.91	5.91	$0.007	12.63
Efficient Refrigeration systems	Large Grocery - Efficient Comp, Sub-cooling, controls	New	Refrigeration	18	4,151,281	0	48,367	6.62	8.69	$0.007	12.45
Efficient Refrigeration systems	Large Grocery - Efficient Comp, Sub-cooling, controls	Replace	Refrigeration	18	13,055,779	0	152,114	20.83	27.33	$0.007	12.45
Transformers	0	Retrofit	Total	20	3,782,545	0	37,475	4.41	4.41	$0.008	11.49
Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	Heating	45	1,750,492	0	11,569	3.97	0.36	$0.009	12.26
Roof Insulation - Rigid R0-11	Roof Insulation - Rigid R0-11-not including re-roofing costs but including deck preparation. Application: Old	Replace	Heating	45	779,541	0	4,816	1.65	0.15	$0.009	11.46

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	buildings with flat roofs and no attics										
DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	Water Heat	7	36,898	0	684	0.08	0.08	$0.009	7.85
Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	Heating	45	241,833	0	1,444	0.50	0.04	$0.010	11.07
Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	Retrofit	Water Heat	15	534,130	0	5,048	0.59	0.59	$0.010	8.50
Estar Convection Oven	Install EStar in place of conventional	New	Cooking	12	616,319	0	5,918	0.70	0.70	$0.012	6.95
Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	413,260	0	2,008	0.69	0.06	$0.012	9.01
DCV	Applicable to single zone packaged systems with large make -up air fractions either because of intermittent occupancy or because of code requirements. In most cases the outdoor air is reset to 5% or less with CO2 build-up modulating ventilation.	Retrofit	Heating	15	3,821,646	0	21,792	5.40	4.71	$0.012	5.11
Roof Insulation -	Roof Insulation - Blanket R0-30.	Retrofit	Heating	45	464,918	0	2,107	0.72	0.07	$0.013	8.40

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
Blanket R0-30	Application: Buildings with open truss unfinished interior										
High Bay HID Medium to T8	458W> 224W, 1 lamp HID to 6 Lamp HPT8	New	Lighting	21	29,439	1,383,627	25,633	3.51	4.61	$0.014	7.11
Roof Insulation - Rigid R0-22	Roof Insulation - Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics	Replace	Heating	45	1,346,480	0	5,498	1.89	0.17	$0.014	7.57
Hot Food Holding Cabinet	Install EStar in place of conventional	New	Cooking	8	41,080	0	352	0.04	0.04	$0.018	4.13
Roof Insulation - Rigid R11-22	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation	Replace	Heating	45	2,853,681	0	8,911	3.06	0.28	$0.019	5.79
T12 to HP T8	162W> 49W	Retrofit	Lighting	21	22,218,999	10,472,042	240,700	32.96	43.25	$0.019	5.25
Roof Insulation - Attic 11-30	Roof Insulation - Attic 11-30. Application: Buildings with partially insulated attics	Retrofit	Heating	45	1,190,377	0	3,457	1.19	0.11	$0.020	5.38
Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: Old buildings	Replace	Heating	20	1,119,562	0	4,446	1.53	0.14	$0.021	4.76
Hot Food Holding	Install EStar in place	Replace	Cooking	8	269,315	0	2,043	0.24	0.24	$0.021	3.66

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
Cabinet	of conventional										
Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	Replace	Refrigeration	18	4,183,121	0	10,630	1.46	1.91	$0.021	4.51
Economizer Diagnostic, Damper Repair & Reset	Applicable to single zone packaged systems. The outdoor make-up air damper and control are often set incorrectly or not functioning. This measure is the general checking . . . Savings derive from reduced cooling due to restored economizer function and reduced heating from reduced minimum outdoor air.	Retrofit	Cooling	10	18,978,703	0	82,456	20.45	17.81	$0.021	3.74
Waste Water Heat Exchanger	Install HX on waste water	New	Water Heat	15	1,151,237	0	5,139	0.60	0.60	$0.022	4.01
High Bay HID Medium to T8	458W> 224W, 1 lamp HID to 6 Lamp HPT8	Retrofit	Lighting	21	11,381,022	3,375,619	90,112	12.34	16.19	$0.023	4.47
Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	New	Refrigeration	18	920,622	0	1,888	0.26	0.34	$0.024	3.84
ECM Fan Powered Boxes	Install ECM motors in VAV fan powered terminals with PSC motors	New	Ventilation	20	2,516,868	0	11,964	2.97	2.58	$0.025	3.86
Exit signs	20W> 1 W, switch to LED sign (not	Retrofit	Lighting	21	4,275,770	0	21,255	2.50	2.50	$0.025	3.85

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	photoluminescent b/c of cost)										
Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: Old buildings	Replace	Heating	20	1,750,895	0	5,393	1.85	0.17	$0.026	3.70
T8 to HP T8	58W> 49W	Retrofit	Lighting	21	22,218,999	6,076,153	116,922	16.01	21.01	$0.027	3.69
T8 to HP T8	58W> 49W	Replace	Lighting	21	34,288,604	40,902,481	311,270	42.62	55.93	$0.028	3.65
T8 to HP T8	58W> 49W	New	Lighting	21	16,661,466	19,652,241	145,369	19.91	26.12	$0.028	3.58
High Efficiency Chiller	Replace chillers or installing new chillers to purchase units with efficiencies averaging 0.51kW/ton air conditioning (AC), rather than the standard new unit, which has an efficiency of 0.65 kW/ton. In practice, some fraction of chiller replacements may involve the early retirement of units with lower efficiencies (perhaps 0.90 kW/ton), and thus achieve higher savings in the first few years of the measure installation.	Replace	Cooling	24	6,549,282	0	17,062	2.01	2.01	$0.028	3.45
CFL 9W to 39W hardwired	75W> 18W	New	Lighting	21	967,448	35,745,456	145,178	19.88	26.09	$0.029	3.42
EStar Griddle	Install EStar in place of conventional	New	Cooking	12	341,484	0	1,312	0.15	0.15	$0.030	2.78
Solar Hot Water	Install solar water heaters on large use facility such as multifamily or	Retrofit	Water Heat	15	7,611,379	673,810	26,777	3.62	11.38	$0.030	2.98

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	lodging										
DHW Faucets	Add aerators to existing faucets to reduce flow from 2.2 gallons per minute to 1.5 GPM.	New	Water Heat	8	42,894	0	220	0.03	0.03	$0.030	2.47
DHW Faucets	Add aerators to existing faucets to reduce flow from 2.2 gallons per minute to 1.5 GPM.	Retrofit	Water Heat	8	30,345	0	152	0.02	0.02	$0.031	2.41
Exterior LED Lighting	30% savings	New	Lighting	21	154,706,094	-69,689,634	208,621	-	-	$0.032	1.98
EStar Griddle	Replace with EStar in place of conventional	Replace	Cooking	12	1,384,580	0	4,870	0.57	0.57	$0.032	2.55
Sweep Control	25% savings	New	Lighting	21	21,446,386	0	65,315	-	-	$0.033	2.74
Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	New	Water Heat	15	822,397	0	2,447	0.29	0.29	$0.033	2.68
High Bay HID Large to T5	1080W> 701W	New	Lighting	21	1,783,455	670,583	8,384	1.15	1.51	$0.033	3.05
Ducts	Duct retrofit of both insulation and air sealing	Retrofit	Heating	15	1,161,607	0	3,307	0.82	0.71	$0.034	2.58
Heat Pump Water Heat	0	New	Water Heat	15	2,305,449	137,748	6,939	0.82	0.82	$0.034	2.55
DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	New	Water Heat	15	497,104	0	1,411	0.17	0.17	$0.034	2.55
EMS Retrofit for Restaurants	Many commercial establishments have no means of operating facility lighting, heating, air	Retrofit	Total	20	20,394,536	0	47,987	5.65	5.65	$0.035	2.73

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	conditioning, refrigeration, etc., except to rely upon employees to manually switch equipment on/off before, during and after a typical work day. This is especially true in restaurants. A proper EMS installation in such facilities can reduce existing gas and electric energy usage by about 10% or more.										
Refrigeration Case Package	Efficient Evap Fans, case lighting, low energy anti-sweat heaters	New	Refrigeration	18	4,500,444	0	10,685	1.46	1.92	$0.037	2.54
Refrigeration Case Package	Efficient Evap Fans, case lighting, low energy anti-sweat heaters	Replace	Refrigeration	18	14,153,895	0	33,603	4.60	6.04	$0.037	2.54
2010 CEE Tier 1 - 3 ton (at rep)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be tracked.	Replace	Cooling	20	4,639,303	0	9,751	2.42	2.11	$0.039	2.46
Chiller Tower 6F approach	Install low approach cooling tower	Replace	Cooling	15	4,366,188	0	10,920	2.71	2.36	$0.039	2.27
High Bay HID Large to	1080W> 701W	Retrofit	Lighting	21	9,647,118	1,636,014	29,473	4.04	5.30	$0.040	2.52

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
T5											
Roof Insulation - Roofcut 0-22	Roof Insulation - Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time	Replace	Heating	45	5,701	0	8	0.00	0.00	$0.040	2.68
2010 CEE Tier 1 - 25 ton (at rep)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be tracked.	Replace	Cooling	20	7,979,145	0	15,653	3.88	3.38	$0.042	2.30
PCs and Monitors - Energy Management Software	There is a solution to automate the enabling of Power Management in commercial computers and monitor/displays called Surveyor by EZConserve.	Replace	Misc.	4	62,526,349	0	474,473	55.82	55.82	$0.045	1.47
2010 CEE Tier 1 - 3 ton (new)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be	New	Cooling	20	2,284,294	0	4,105	1.02	0.89	$0.045	2.10

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	tracked.										
2010 CEE Tier 1 - 15 ton (at rep)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be tracked.	Replace	Cooling	20	4,639,303	0	8,309	2.06	1.79	$0.046	2.10
PCs and Monitors - Energy Management Software	There is a solution to automate the enabling of Power Management in commercial computers and monitor/displays called Surveyor by EZConserve.	New	Misc.	4	5,774,710	0	43,681	5.14	5.14	$0.046	1.45
Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: Old buildings	Replace	Heating	20	775,534	0	1,343	0.46	0.04	$0.047	2.08
Daylighting Overhead	Daylight control with skylite	New	Lighting	21	84,453,932	0	217,981	29.85	39.17	$0.048	2.10
2010 CEE Tier 1 - 25 ton (new)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2	New	Cooling	20	3,928,761	0	6,589	1.63	1.42	$0.049	1.96

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	costs should be tracked.										
Windows - Tinted AL Code to Class 45	Windows - Tinted AL Code to Class 45. Application: Old buildings	Replace	Heating	20	515,730	0	813	0.28	0.03	$0.052	1.89
Lighting Scheduling/Controls	Lighting scheduling and control. This measure includes the commissioning of any occupancy and sweep controls, and the review and proper setting of daylighting controls. Since these are largely a function of schedule settings (except in cases where daylighting controls are integrated into the energy management software), we have included only the impact of properly controlled lighting and occupancy.	New	lighting	15	26,239,607	0	49,375	5.81	5.81	$0.052	1.69
2010 CEE Tier 1 - 15 ton (new)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be tracked.	New	Cooling	20	2,284,294	0	3,498	0.87	0.76	$0.053	1.79
HVAC controls	Control set up and algorithm. This	New	Heating	5	10,569,782	0	42,715	10.59	9.23	$0.057	1.23

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, properly training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are set at optimum levels for the current occupancy.										
Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: Old buildings	Replace	Heating	20	3,346,255	0	4,600	1.58	0.14	$0.059	1.65
Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: New Construction	New	Heating	20	609,289	0	790	0.27	0.02	$0.063	1.56
2010 CEE Tier 1 - 7.5 ton (at rep)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be	Replace	Cooling	20	4,639,303	0	5,935	1.47	1.28	$0.064	1.50

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	tracked.										
Roof Insulation - Rigid R11-33	Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	Replace	Heating	45	4,280,521	0	3,604	1.24	0.11	$0.069	1.56
Rooftop Condensing Burner	Install condensing burner	New	Heating	10	3,962,533	0	7,316	1.81	1.58	$0.071	1.06
2010 CEE Tier 1 - 7.5 ton (new)	Install high efficiency cooling equipment complying with 2010 CEE Tier 1 rather than 2010 code equipment. Costing in 6th plan showed 2010 Tier 2 equipment was 6 times more expensive and therefor is not included here. Tier 2 costs should be tracked.	New	Cooling	20	2,284,294	0	2,499	0.62	0.54	$0.075	1.28
Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	1,162,295	0	824	0.28	0.03	$0.082	1.31
Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: Old buildings	Replace	Heating	20	1,938,835	0	1,832	0.63	0.06	$0.086	1.13
Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	1,033,151	0	687	0.24	0.02	$0.087	1.23

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: Old buildings	Replace	Heating	20	2,541,055	0	2,258	0.78	0.07	$0.092	1.07
Install Economizer	Economizer retrofit on unit with no economizer	Retrofit	Cooling	15	8,912,797	0	9,140	2.27	1.97	$0.095	0.93
Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: New Construction	New	Heating	20	1,944,529	0	1,626	0.56	0.05	$0.098	1.00
Warm Up Control	This measure is designed to implement a shut down of outside air when the building is coming off night setback. Usually the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers	Retrofit	Heating	10	4,141,102	0	4,876	-	-	$0.111	0.67
Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: New Construction	New	Heating	20	1,523,222	0	1,097	0.38	0.03	$0.113	0.86
Daylight Control (overhead)	5% savings	New	Lighting	10	114,480,637	0	137,725	18.86	24.75	$0.118	0.71
HVAC System Commissioning	HVAC system commissioning. Includes testing and balancing, damper	New	Heating	15	31,407,353	0	24,408	6.05	5.27	$0.126	0.71

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.										
Ceramic Metal Halide	100W> 44W	New	Lighting	21	16,184,156	21,283,688	24,569	3.36	4.41	$0.127	0.80
Ceramic Metal Halide	100W> 44W	Replace	Lighting	21	30,407,448	39,309,529	44,598	6.11	8.01	$0.130	0.77
Indirect/Direct Evaporative Cooling >60 ton	Install indirect/direct evaporative cooling in commercial building HVAC system in large systems <60 ton range. Original ETO evaluation evaluated at 20, 150 and 300tons with all being essentially equivalent	Replace	Cooling	18	52,727,509	0	31,305	7.76	6.76	$0.146	0.61
Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: Old buildings	Replace	Heating	20	6,352,637	0	3,442	1.18	0.11	$0.151	0.65
Solar Hot Water	Install solar water	New	Water Heat	15	7,061,316	625,115	4,700	0.64	2.00	$0.160	0.56

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
	heaters on large use facility such as multifamily or lodging										
Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: New Construction	New	Heating	20	4,861,323	0	2,428	0.83	0.08	$0.163	0.60
Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: Old buildings	Replace	Heating	20	1,689,802	0	803	0.28	0.02	$0.172	0.57
Indirect/Direct Evaporative Cooling >60 ton	Install indirect/direct evaporative cooling in commercial building HVAC system in large systems <60 ton range. Original ETO evaluation evaluated at 20, 150 and 300tons with all being essentially equivalent	New	Cooling	18	24,872,202	0	11,860	2.94	2.56	$0.182	0.49
Ground Source Heat Pump - Air Source HP Base	Install GSHP in place of air source heat pumps.	Replace	Heating	18	9,495,024	-315,150	4,333	1.07	0.94	$0.184	0.50
Occupancy Sensors	5% savings	New	Lighting	15	16,043,629	0	8,044	-	-	$0.206	0.40
Daylight perimeter zone	10% savings	New	Lighting	10	27,390,993	0	16,267	2.23	2.92	$0.231	0.36
High Efficacy LED Display	72W> 39W	New	Lighting	21	99,006	49,766,342	14,432	1.98	2.59	$0.280	0.36
Indirect/Direct Evaporative Cooling ~20 ton	Install indirect/direct evaporative cooling in commercial building HVAC system in 20 to 60 ton range	Replace	Cooling	18	124,286,306	0	31,305	7.76	6.76	$0.345	0.26

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Winter MW	Summer mW	Levelized Cost, $/kWh	BCR
Indirect/Direct Evaporative Cooling ~20 ton	Install indirect/direct evaporative cooling in commercial building HVAC system in 20 to 60 ton range	New	Cooling	18	54,407,943	0	11,860	2.94	2.56	$0.399	0.22
Package Refrigeration - Ice makers, Vending machines	Install machines with package of measures akin to ADL low cost	new	Misc.	9	48,238,499	0	5,861	0.69	0.69	$1.168	0.07
Package Refrigeration - Ice makers, Vending machines	Install machines with package of measures akin to ADL low cost	Replace	Misc.	9	160,201,414	0	19,443	2.29	2.29	$1.170	0.07
Efficient Standalone Refrigeration Cases	Install efficient stand alone cases. This measure is based upon current rebates and SAIC savings numbers	Replace	Misc.	9	3,305,925,711	0	166,815	19.62	19.62	$2.813	0.03
Efficient Standalone Refrigeration Cases	Install efficient stand alone cases. This measure is based upon current rebates and SAIC savings numbers	new	Misc.	9	465,718,200	0	23,480	2.76	2.76	$2.815	0.03

Note: Includes emerging technology measures

Table 19: Detailed Measure Table, Commercial Sector, Gas Savings, 2030 Technical Potential

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Estar Commercial Clothes Washer	Install high performance commercial clothes washers - coin op	New	Water Heat	10	1,097	-10,214	1	0	($4.4685)	10.70
Estar Commercial Clothes Washer	Install high performance commercial clothes washers - coin op	Replace	Water Heat	10	186,282	########	288	12	($2.9839)	7.58
EStar Steam Cooker	Install EStar in place of conventional	New	Cooking	10	24,554	-66,969	0	3	($1.6283)	3.52
EStar Steam Cooker	Replace with EStar in place of conventional	Replace	Cooking	10	132,794	-361,812	0	19	($1.6104)	3.52
EStar Fryer	Install EStar in place of conventional	New	Cooking	8	13,166	0	0	172	$0.0120	60.56
EStar Fryer	Replace with EStar in place of conventional	Replace	Cooking	8	238,145	0	0	1,140	$0.0326	22.23
Estar Convection Oven	Replace with EStar in place of conventional	Replace	Cooking	12	247,058	0	0	446	$0.0631	12.04
Roof Insulation - Attic R0-30	Roof Insulation - Attic R0-30. Application: Buildings with uninsulated attics	Retrofit	Heating	45	505,401	0	891	227	$0.0871	10.09
HW Boiler Tune	Tune up in accordance with Minneapolis Energy Office protocol. Can include derating the burner, adjusting the secondary air,	Retrofit	Heating	5	9,255	0	0	23	$0.0939	7.78

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	adding flue restrictors, cleaning the fire-side of the heat exchanger, cleaning the water side, or installing turbulators. Other modifications may include uprating the burner to reduce oxygen or derating the burner to reduce stack temperature. Note: In gas systems, excess air and stack temperatures are often within reasonable ranges, so the technical potential for this measure is limited. Combining this measure with the vent damper and power burner measures increases both applicability and cost effectiveness, and was assumed for this analysis.									
DHW Shower Heads	Install low flow shower heads (2.0 gallons per minute) to replace 3.4 GPM shower heads.	Retrofit	Water Heat	8	88,072	0	0	116	$0.1181	6.13

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Hot Water Temperature Reset	Controller automatically resets the delivery temperature in a hot water radiant system based on outside air temperature. The reset reduces the on-time of the heating equipment and the occurrence of simultaneous heating and cooling through instantaneous adjustments.	Retrofit	Heating	10	747,573	0	0	750	$0.1304	5.97
Roof Insulation - Rigid R0-11	Roof Insulation - Rigid R0-11-not including re-roofing costs but including deck preparation. Application: Old buildings with flat roofs and no attics	Replace	Heating	45	2,642,731	0	3,599	627	$0.1435	6.13
Wall Insulation - Blown R11	Wall Insulation - Blown R11. Application: Old buildings	Retrofit	Heating	45	6,940,814	0	3,841	2,248	$0.1479	5.94

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	Replace	Refrigeration	18	5,031,683	0	15,292	1,054	$0.1544	5.17
Heat Reclaim	Large Grocery - Heat recovery to space heating. Assumes floating head control exists and must be changed to allow HR.	New	Refrigeration	18	1,672,412	0	5,056	349	$0.1551	5.15
Steam Balance	Single-pipe steam systems are notorious for uneven heating, which wastes energy because the thermostat must be set to heat the coldest spaces and overheating other spaces. Steam balances corrects these problems by: 1) Adding air venting on the main line or at the radiators; 2) Adding boiler cycle controls; 3) Adding or subtracting radiators. Energy savings accrue from lowering the overall building temperature.	Retrofit	Heating	15	734,199	0	0	391	$0.1834	4.43

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Waste Water Heat Exchanger	Install HX on waste water	Retrofit	Water Heat	15	118,429	0	0	59	$0.1961	3.97
DHW Wrap	Insulate the surface of the storage water heater or an unfired storage tank to R-5 to reduce standby losses.	Retrofit	Water Heat	7	16,216	0	0	14	$0.2043	3.48
Wall Insulation - Spray On for Metal Buildings	Wall Insulation - Spray On for Metal Buildings (Cellulose) Unfinished. Application: Old buildings	Retrofit	Heating	45	2,474,296	0	-58	702	$0.2131	4.13
Roof Insulation - Rigid R0-22	Roof Insulation - Rigid R0-22-- not including re-roofing costs but including deck preparation and ~4" rigid.. Application: Old buildings with flat roofs and no attics	Replace	Heating	45	4,564,717	0	4,100	713	$0.2177	4.04
Estar Convection Oven	Install EStar in place of conventional	New	Cooking	12	211,131	0	0	102	$0.2366	3.21
Roof Insulation - Blanket R0-19	Roof Insulation - Blanket R0-19. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	4,228,239	0	106	967	$0.2499	3.52

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Roof Insulation - Blanket R0-30	Roof Insulation - Blanket R0-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	4,756,769	0	116	1,015	$0.2677	3.28
DHW Condensing Tank (repl)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	Replace	Water Heat	15	5,608,629	0	0	1,870	$0.2929	2.66
DHW Condensing Tank (new)	Costs and savings are incremental over a Code-rated tank (combustion efficiency of 80%) for a condensing tank with a minimum combustion efficiency of 94% and an R-16 tank wrap.	New	Water Heat	15	1,940,952	0	0	638	$0.2968	2.62
DCV	Applicable to single zone packaged systems with large make -up air fractions either because of intermittent occupancy or because of code requirements. In most cases the	Retrofit	Heating	15	9,018,278	0	18,262	890	$0.3056	1.82

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	outdoor air is reset to 5% or less with CO2 build-up modulating ventilation.									
Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	Retrofit	Water Heat	15	803,151	0	0	252	$0.3115	2.50
Windows - Add Low E to Vinyl Tint	Windows - Add Low E to Vinyl Tint. Application: Old buildings	Replace	Heating	20	2,601,802	0	3,844	230	$0.3122	2.68
Roof Insulation - Attic 11-30	Roof Insulation - Attic 11-30. Application: Buildings with partially insulated attics	Retrofit	Heating	45	3,513,838	0	1,003	462	$0.3484	2.52
Roof Insulation - Rigid R11-22	Roof Insulation - Rigid R11-22 2" rigid added to an existing foam roof insulation at re-roof, includes some surface prep. Application: Old buildings with flat roofs, no attics, and some insulation	Replace	Heating	45	12,031,434	0	4,511	1,410	$0.3553	2.47
Hot Food Holding Cabinet	Install EStar in place of conventional	New	Cooking	8	25,015	0	0	10	$0.4011	1.80

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Hot Food Holding Cabinet	Install EStar in place of conventional	Replace	Cooking	8	166,263	0	0	65	$0.4014	1.80
Vent Damper	Install vent damper downstream of the draft relief to prevent airflow up the stack, while allowing warm air from the boiler to spill into the conditioned space as heat or into the boiler room to reduce jacket losses. This measure is most cost-effective when combined with the boiler tune up and power burner measures.	Retrofit	Heating	12	360,127	0	0	99	$0.4158	1.91
Windows - Add Low E and Argon to Vinyl Tint	Windows - Add Low E and Argon to Vinyl Tint. Application: Old buildings	Replace	Heating	20	4,068,983	0	3,894	323	$0.4267	1.96
EStar Griddle	Install EStar in place of conventional	New	Cooking	12	140,420	0	0	35	$0.4615	1.65
EStar Griddle	Replace with EStar in place of conventional	Replace	Cooking	12	519,617	0	0	128	$0.4635	1.64

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Waste Water Heat Exchanger	Install HX on waste water	New	Water Heat	15	404,081	0	0	82	$0.4806	1.62
SPC Hieff Boiler Replace	Install near condensing boiler. Assumed seasonal combustion efficiency of 85% over base of 80%	Replace	Heating	20	567,786	0	0	92	$0.5046	1.66
DHW Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.	Replace	Water Heat	20	1,690,979	0	0	261	$0.5280	1.59
Combo Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.	New	Heating	20	468,922	0	0	72	$0.5284	1.52
Windows - Tinted AL Code to Class 45	Windows - Tinted AL Code to Class 45. Application: Old buildings	Replace	Heating	20	1,330,196	0	1,631	14	$0.5297	1.58
DHW Hieff Boiler (new)	Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.	New	Water Heat	20	626,309	0	0	96	$0.5337	1.50
Ducts	Duct retrofit of both insulation and air sealing	Retrofit	Heating	15	3,677,163	0	2,944	317	$0.5628	1.44

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Combo Hieff Boiler (repl)	Replace existing boiler with unit meeting OR Code requirements of 80% combustion efficiency.	Replace	Heating	20	1,497,659	0	0	217	$0.5634	1.49
Cond Furnace (new)	Condensing / pulse package or residential-type furnace with a minimum AFUE of 92%. Base case: AFUE 80	New	Heating	18	2,739,672	0	0	417	$0.5707	1.40
Roof Insulation - Roofcut 0-22	Roof Insulation - Roofcut 0-22. Application: Buildings with uninsulated flat roofs at reroofing time	Replace	Heating	45	10,067	0	2	1	$0.5987	1.47
Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: Old buildings	Replace	Heating	20	2,000,295	0	1,693	71	$0.6070	1.38
SPC Hieff Boiler (new)	Install near condensing boiler. Assumed seasonal combustion efficiency of 82% over base of 75%	New	Heating	20	988,174	0	0	123	$0.6533	1.24
DHW Recirc Controls	Install electronic controller to hot water boiler system that turns	Retrofit	Water Heat	10	730,193	0	0	142	$0.6711	1.11

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	off the boiler and circulation pump when the hot water demand is reduced (usually in residential type occupancies) or can be reset to meet the hot water load. (Steel boilers also require a mixing valve to prevent water temperatures from dropping below required levels).									
DHW Faucets	Add aerators to existing faucets to reduce flow from 2.2 gallons per minute to 1.5 GPM.	New	Water Heat	8	14,670	0	0	3	$0.6842	1.06
DHW Faucets	Add aerators to existing faucets to reduce flow from 2.2 gallons per minute to 1.5 GPM.	Retrofit	Water Heat	8	34,128	0	0	8	$0.6863	1.05
SPC Cond Boiler Replace	Install condensing boiler. Assumed seasonal combustion efficiency of 92% over base of 80%	Replace	Heating	20	2,297,078	0	0	266	$0.7041	1.19

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Hi Eff Unit Heater (new)	Install power draft units (83% seas. Eff) in place of natural draft (80% seas. Eff) per ASHRAE 90.1-2007	New	Heating	18	1,114,946	0	0	126	$0.7678	1.04
DHW Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 92% efficiency for savings calculations).	Replace	Water Heat	20	5,473,743	0	0	580	$0.7708	1.09
Computerized Water Heater Control	Install intelligent controls on the hot water circulation loops.	New	Water Heat	15	292,751	0	0	37	$0.7732	1.01
DHW Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 92% efficiency for savings calculations).	New	Water Heat	20	2,027,806	0	0	212	$0.7792	1.03
Power burner	Replace standard burner with a power burner to optimize combustion and reduce standby losses in the	Retrofit	Heating	12	7,437,584	0	0	1,020	$0.8323	0.95

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	stack. Note: Costs and savings assume that this measure will be performed in conjunction with a boiler tune up when appropriate.									
SPC Cond Boiler (new)	Install condensing boiler. Assumed seasonal combustion efficiency of 88% over base of 75%	New	Heating	20	3,084,463	0	0	296	$0.8515	0.95
Cond Unit Heater From Power Draft (new)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	New	Heating	18	3,114,289	0	0	310	$0.8720	0.92
Windows - Tinted AL Code to Class 40	Windows - Tinted AL Code to Class 40. Application: New Construction	New	Heating	20	938,064	0	465	29	$0.8932	0.90

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
DHW Pipe Ins	Add 1" insulation to pipes used for steam or hydronic distribution; particularly effective when pipes run through unheated spaces.	New	Water Heat	15	91,936	0	0	10	$0.9104	0.85
HVAC controls	Control set up and algorithm. This assumes the development of an open source control package aimed at describing scheduling and control points throughout the HVAC system, properly training operators so that scheduling can be maintained and adjusted as needed, and providing operator back up so that temperature reset, pressure reset, and minimum damper settings are set at optimum levels for the current occupancy.	New	Heating	5	21,153,361	0	24,673	2,902	$0.9109	0.77
Combo Cond Boiler (new)	Replace with boiler using condensing or pulse technology to achieve steady-state	New	Heating	20	1,865,757	0	0	161	$0.9482	0.85

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	combustion efficiencies of 89% to 94% (this analysis used 92% efficiency for savings calculations).									
Combo Cond Boiler (repl)	Replace with boiler using condensing or pulse technology to achieve steady-state combustion efficiencies of 89% to 94% (this analysis used 92% efficiency for savings calculations).	Replace	Heating	20	5,850,328	0	0	481	$0.9925	0.84
Rooftop Condensing Burner	Install condensing burner	New	Heating	10	7,635,910	0	5,906	397	$0.9963	0.75
Roof Insulation - Rigid R11-33	Roof Insulation - Rigid R11-33: add 4' of insulation at reroof. Application: Old buildings with flat roofs, no attics, and some insulation	Replace	Heating	45	18,047,150	0	3,456	549	$1.0765	0.82
Cond Unit Heater from Nat Draft (new)	Install condensing power draft units (90% seas. Eff) in place of natural draft (80% seas. Eff)	New	Heating	18	6,009,369	0	0	465	$1.1218	0.71
Hi Eff Unit Heater (replace)	Install power draft units (83% seas. Eff) in place of natural	Replace	Heating	18	5,606,481	0	0	397	$1.2256	0.68

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	draft (80% seas. Eff)									
Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: Old buildings	Replace	Heating	20	5,000,737	0	1,739	125	$1.2406	0.67
Windows - Add Argon to Vinyl Lowe	Windows - Add Argon to Vinyl Lowe. Application: Old buildings	Replace	Heating	20	10,132,890	0	-728	723	$1.2432	0.67
Cond Unit Heater from power draft (replace)	Install condensing power draft units (90% seas. Eff) in place of power draft (80% seas. Eff)	Replace	Heating	18	15,660,136	0	0	976	$1.3934	0.59
Ozone Laundry Treatment	Ozone treatment allows use of cold water	Retrofit	Water Heat	10	149,203	-9,844	8	12	$1.4330	0.55
Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	Retrofit	Water Heat	15	6,551,842	580,013	0	463	$1.5044	0.52
Steam Trap Maintenance	Set up a in-house steam trap maintenance program with equipment, training, and trap replacement. An alternative procedure is to just pay for an	Retrofit	Heating	10	1,071,732	4,459,777	0	442	$1.6373	0.48

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	outside contractor to conduct a steam survey.									
Roof Insulation - Blanket R11-41	Roof Insulation - Blanket R11-41. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	11,891,923	0	53	396	$1.7097	0.51
Cond Unit Heater from Nat draft (replace)	Install condensing power draft units (90% seas. Eff) in place of natural draft (80% seas. Eff)	Replace	Heating	18	30,217,981	0	0	1,466	$1.7907	0.46
Windows - Tinted AL Code to Class 36	Windows - Tinted AL Code to Class 36. Application: New Construction	New	Heating	20	2,345,160	0	475	48	$1.8073	0.45

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
Roof Insulation - Blanket R11-30	Roof Insulation - Blanket R11-30. Application: Buildings with open truss unfinished interior	Retrofit	Heating	45	10,570,599	0	53	330	$1.8178	0.48
Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: Old buildings	Replace	Heating	20	7,664,277	0	-336	358	$1.8375	0.46
HVAC System Commissioning	HVAC system commissioning. Includes testing and balancing, damper settings, economizer settings, and proper HVAC heating and compressor control installation. This measure includes the proper set-up of single zone package equipment in simple HVAC systems. The majority of the Commercial area is served by this	New	Heating	15	62,855,700	0	14,099	1,658	$1.8869	0.42

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	technology. Work done in Eugene (Davis, et al, 2002) suggests higher savings than the other documented commissioning on more complex systems.									
Warm Up Control	This measure is designed to implement a shut down of outside air when the building is coming off night setback. Usually the capability for this is available in a commercial t-stat but either the extra control wire is not attached or the unit itself has not been set up to receive the signal. Cost is based on labor cost to enable this ability in existing controllers	Retrofit	Heating	10	9,809,728	0	0	679	$1.8882	0.41
Windows - Non-Tinted AL Code to Class 40	Windows - Non-Tinted AL Code to Class 40. Application: New Construction	New	Heating	20	4,087,993	0	-169	177	$1.9730	0.41
Cond Furnace (repl)	Condensing / pulse package or residential-type furnace with a minimum AFUE	Replace	Heating	18	34,609,180	0	0	1,280	$2.3500	0.35

Measure Name	Measure Description	Construction Type	Measure End Use	Average Lifetime	Total Incremental Cost	Total O&M	Total MWh Savings	Gas Impacts kTherms	Levelized Cost, $/th	BCR
	of 92%.									
Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: Old buildings	Replace	Heating	20	19,160,692	0	-565	545	$2.9716	0.28
Windows - Non-Tinted AL Code to Class 45	Windows - Non-Tinted AL Code to Class 45. Application: Old buildings	Replace	Heating	20	5,096,744	0	-164	134	$3.2280	0.26
Windows - Non-Tinted AL Code to Class 36	Windows - Non-Tinted AL Code to Class 36. Application: New Construction	New	Heating	20	10,219,984	0	-331	268	$3.2280	0.25
Solar Hot Water	Install solar water heaters on large use facility such as multifamily or lodging	New	Water Heat	15	2,210,537	195,691	0	67	$3.5084	0.22

Table 20: Detailed Measure Table, Residential Sector, Electricity Savings, 2030 Technical Potential

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Elec Hi-eff Washer	New Appl	12	9,364,706	-32,604,571	26,558,305	3,843	3,219	199,145	-$0.094	100.00	187,294
Elec MEF 2.0 Washer	New Appl	12	6,180,706	-21,230,884	17,774,211	2,572	2,154	152,975	-$0.090	100.00	187,294
Elec Hi-eff Washer	ReplaceAppl	12	46,013,321	-73,365,686	47,606,493	6,889	5,770	97,928	-$0.064	100.00	298,788
Elec ETO Dishwasher	ReplaceAppl	12	2,074,441	-3,640,238	2,939,959	425	356	13,228	-$0.058	100.00	38,416
Elec ETO Dishwasher	New Appl	12	1,300,356	-2,281,871	3,189,118	462	387	-4,549	-$0.034	3.66	24,081
Elec MEF 2.0 Washer	ReplaceAppl	12	33,763,021	-38,406,198	34,911,428	5,052	4,231	82,862	-$0.015	100.00	298,788
Common Area Lighting (MF Only)	Retro	7	0	0	54,725,937	6,438	6,438	1,095,061	$0.000	100.00	135,953
Heat Pump, (ER Base), Z B	Retro	18	0	107,562	4,054,956	678	170	0	$0.002	44.64	283
Hot water pipe wrap	Retro	10	215,203	0	6,756,705	795	795	128,175	$0.004	22.37	9,782
Tank wrap (in accordance with EWEB guidelines or equivalent)	Replace	10	82,168	0	1,430,785	168	168	27,172	$0.006	12.41	29,346
Window U=.3 (ER, Z B)	New	45	67,766	0	598,816	151	4	0	$0.007	17.63	479
Window U=.3 (HP, Z B)	New	45	39,975	0	336,760	56	14	0	$0.007	17.49	226
Window replace (U=.35), ER Z B	Replace	45	5,291,349	0	42,959,717	10,810	300	0	$0.007	16.20	15,118
Energy Star Television	New	10	1,072,452	0	18,838,358	2,216	2,216	0	$0.007	10.61	110,201
Window replace	Replace	45	1,637,447	0	11,559,807	1,932	484	0	$0.008	14.66	4,678

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
(U=.35), HP Z B											
Ducts Indoor, DHW, Lights (HP, Z2)	New	45	638,257	0	3,942,925	659	165	0	$0.009	12.82	824
Energy Star Computer Monitor	New	8	259,343	0	3,334,238	392	392	0	$0.012	6.20	110,614
Window replace (U=.35), ER Z A	Replace	45	12,972,503	0	61,383,286	15,446	429	0	$0.012	9.44	42,302
Energy Star Set Top Box	New	5	866,077	0	16,224,462	1,909	1,909	0	$0.012	5.66	119,715
Window U=.3 (ER, Z A)	New	45	228,780	0	976,822	246	7	0	$0.014	8.52	1,922
Ducts Indoor, DHW, Lights (HP, Z C)	New	45	223,390	0	943,593	158	40	0	$0.014	8.77	288
Window U=.3 (HP, Z A)	New	45	59,316	0	202,053	34	8	0	$0.017	7.07	374
Energy Star Computer Monitor	ReplaceAppl	8	2,557,252	0	43,190,135	5,081	5,081	-437,645	$0.017	7.29	888,671
Wx (ceiling,floor) ER, Z B	Retro	45	459,180	0	1,405,733	354	10	0	$0.019	6.11	242
Duct Sealing, Elect Resis, Z B	Retro	20	1,142,127	0	4,777,513	1,202	33	0	$0.020	5.43	1,845
Energy Star Insulation, Ducts, DHW, Lights (ER, Z B)	New	45	1,480,425	0	4,205,462	1,058	29	0	$0.020	5.67	1,306
Energy Star Insulation, Ducts, DHW, Lights (HP, Z B)	New	45	3,363,201	0	8,764,695	1,465	367	0	$0.022	5.41	2,120
Near Net Zero Zonal (Z B)	New	45	781,791	0	1,854,238	467	13	0	$0.024	4.73	176

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Energy Star HP HSPF 7.7>9.5 (Z B) w. cx	New	15	317,609	0	1,193,582	200	50	0	$0.026	3.98	426
Energy Star Desktop Computer	New	5	1,781,901	0	15,839,988	1,863	1,863	0	$0.026	2.69	113,414
Energy Star Television	ReplaceAppl	10	12,963,912	0	145,097,771	17,069	17,069	-2,695,422	$0.026	5.52	972,223
Energy Star Set Top Box	ReplaceAppl	5	7,640,791	0	136,036,684	16,003	16,003	-2,321,422	$0.026	4.36	1,056,160
Wx Air Sealing, Z A	Retro	10	1,335,751	0	6,558,989	1,650	46	0	$0.027	3.38	9,869
Retail Lights (2 lamps)	Retro	7	3,621,803	0	19,422,331	2,285	2,285	400,401	$0.027	2.74	603,634
Wx (ceiling,floor) HP, Z B	Retro	45	157,083	0	337,029	56	14	0	$0.027	4.45	75
Wx (ceiling,floor) ER, Z A	Retro	45	13,283,855	0	27,378,686	6,889	191	0	$0.028	4.11	8,926
Duct Sealing, Heat Pump, Z B	Retro	20	1,164,797	0	3,356,992	561	141	0	$0.028	3.90	1,939
Ducts Indoor, DHW, Lights (HP, Z A)	New	15	765,067	0	2,552,436	427	107	0	$0.029	3.53	987
Duct Sealing, Elect Resis, Z A	Retro	20	17,536,821	0	46,357,344	11,665	324	0	$0.031	3.43	32,334
Energy Star Insulation, Ducts, DHW, Lights (HP, Z C)	New	45	1,224,630	0	2,292,092	383	96	0	$0.031	3.89	782
Tank upgrade (50 gal)-20 yr warranty	New	20	325,393	0	753,373	109	91	13,451	$0.031	3.29	3,264
Near Net Zero Zonal (Z C)	New	45	273,627	0	491,972	124	3	0	$0.032	3.59	62

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Window replace (U=.35), HP Z A	Replace	45	13,115,723	0	23,151,080	3,870	970	0	$0.033	3.66	37,473
Add 16 LED lamps (using incand base) after 2015	New	10	3,111,782	0	20,578,246	2,421	2,421	-367,403	$0.034	3.29	24,311
Add 6 LED lamps (using incandesent base) aft 2015	New	10	2,031,003	0	12,523,439	1,473	1,473	-204,951	$0.034	3.12	42,313
Commissioning (HP), Z B	Retro	5	375,442	0	2,537,642	424	106	0	$0.034	2.44	1,707
Refrigerator Recycle	Retro	6	3,252,112	0	18,092,069	2,128	2,128	0	$0.036	2.03	32,521
Heat Pump, (HP Upgrade), Z B	Replace	18	1,881,739	0	4,498,615	752	189	0	$0.036	2.83	1,077
Energy Star Insulation, Ducts, DHW, Lights (ER, Z C)	New	45	735,959	0	1,167,319	294	8	0	$0.037	3.17	733
Near Net Zero Zonal (Z A)	New	45	901,835	0	1,380,234	347	10	0	$0.038	3.05	204
Energy Star Insulation, Ducts, DHW, Lights (HP, Z A)	New	45	4,859,320	0	7,392,191	1,236	310	0	$0.038	3.16	3,217
Commissioning (HP), Z A	Retro	5	6,448,074	0	37,519,201	6,272	1,572	0	$0.040	2.10	29,309
Window U=.3 (ER, Z C)	New	45	165,536	0	223,305	56	2	0	$0.043	2.69	346
Wx (ceiling, floor, wall) HP, Z B	Retro	45	365,735	0	475,707	80	20	0	$0.045	2.70	108
Energy Star HP HSPF 7.7>9.5 (Z C) w. cx	New	15	116,867	0	255,718	43	11	0	$0.045	2.32	158

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Window U=.3 (HP, Z C)	New	45	59,230	0	75,203	13	3	0	$0.046	2.64	92
50% LED after 2020	Retro	10	23,707,897	0	56,529,352	6,650	6,650	1,180,011	$0.046	1.73	98,925
Heat pump water heater (80 gal)	New	15	2,582,703	1,085,058	7,508,675	1,087	910	0	$0.048	1.99	3,532
Heat pump water heater (80 gal)	ReplaceAppl	15	2,378,154	999,122	6,913,990	1,001	838	0	$0.048	1.99	3,252
Tank upgrade (50 gal)-10 yr warranty	ReplaceAppl	10	705,502	0	1,862,339	270	226	0	$0.050	1.73	20,157
Full lighting (all high efficacy)	New	7	2,189,898	0	9,101,654	1,071	1,071	-90,151	$0.050	1.58	19,553
Energy Star Insulation, Ducts, DHW, Lights (ER, Z A)	New	45	10,431,463	0	11,537,426	3,961	359	0	$0.052	1.96	10,989
ER> Mini-split ductless heat pump Z B	New	15	724,730	0	1,310,314	219	55	0	$0.054	1.91	259
Heat pump water heater (50 gal)	ReplaceAppl	15	24,213,044	8,369,072	53,957,456	7,809	6,540	0	$0.059	1.61	27,241
Wx (ceiling,floor) HP, Z A	Retro	45	2,124,396	0	2,086,601	349	87	0	$0.059	2.04	1,026
Energy Star HP HSPF 7.7>9.5 (Z A) w. cx	New	15	416,187	0	667,200	112	28	0	$0.061	1.70	569
Duct Sealing, Heat Pump, Z A	Retro	20	19,922,289	0	26,671,982	4,459	1,118	0	$0.061	1.81	33,306
Tank upgrade (50 gal)-20 yr warranty	ReplaceAppl	20	289,331	0	371,437	54	45	0	$0.064	1.61	2,903

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Energy Star Desktop Computer	ReplaceAppl	5	19,294,417	0	95,770,205	11,266	11,266	-2,266,411	$0.065	1.11	1,000,573
ER> Mini-split ductless heat pump Z B-C	Retro	15	6,155,885	0	8,845,035	1,479	371	0	$0.068	1.52	1,620
100% LED after 2020	Retro	10	47,415,794	0	76,232,855	8,968	8,968	1,576,398	$0.068	1.16	88,261
Home Energy Monitor	New	3	1,045,287	0	5,532,756	651	651	0	$0.070	0.84	11,364
ER> Mini-split ductless heat pump Z C	New	15	253,656	0	350,775	59	15	0	$0.071	1.46	91
ER> Mini-split ductless heat pump Z A	New	15	841,929	0	1,125,042	283	8	0	$0.073	1.36	301
Wx (ceiling, floor, wall) ER, Z B	Retro	45	6,783,291	0	5,323,015	1,339	37	0	$0.074	1.57	3,145
All LED (from 2020 base) after 2020	New	10	6,320,807	0	12,248,956	1,441	1,441	-218,692	$0.081	0.96	24,311
Heat Pump, (HP Upgrade), Z A	Replace	18	4,769,293	0	5,049,640	844	212	0	$0.082	1.25	2,741
Windows U-.30, HP, Z A	Retro	45	482,920	0	330,701	55	14	0	$0.085	1.42	126
Heat pump water heater (50 gal)	New	15	51,670,935	17,579,404	77,327,128	11,191	9,372	0	$0.087	1.09	57,220
ER> Mini-split ductless heat pump Z A	Retro	15	102,594,743	0	113,394,190	18,956	4,752	0	$0.088	1.17	26,999
Common Area Lighting (MF Only)	New	7	1,582,628	0	2,719,162	320	320	9,298	$0.098	0.75	98,914
Wx (ceiling,	Retro	45	4,457,324	0	2,631,878	440	110	0	$0.098	1.23	1,332

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
floor, wall) HP, Z A											
Room AC (Z B)	Retro	18	399,552	0	351,758	0	160	0	$0.099	0.99	10,413
Windows U=.30, ER, Z A	Retro	45	43,573,221	0	25,498,403	6,416	178	0	$0.099	1.17	16,138
Room AC (Z A)	New	18	126,898	0	109,230	0	50	0	$0.101	0.97	3,172
HRV ER, Z B	Retro	18	49,462,424	0	42,301,109	10,644	296	0	$0.102	0.97	25,815
Energy Star lighting (18 lamps)	New	7	3,750,604	7,051,407	19,366,972	2,278	2,278	-220,943	$0.106	0.67	68,193
Tank upgrade (50 gal)-10 yr warranty	New	10	1,850,994	0	1,939,927	281	235	33,203	$0.109	0.79	52,886
Wx (ceiling, floor, wall) ER, Z A	Retro	45	60,163,084	0	31,141,246	7,836	218	0	$0.112	1.03	27,398
Estar Refrigerator	ReplaceAppl	12	25,968,609	0	22,282,698	2,621	2,621	364,509	$0.115	0.72	350,927
Heat Pump, (ER Base), Z A	Retro	18	198,216,860	13,125,841	158,700,068	39,933	1,109	0	$0.116	0.85	34,560
Solar hot water heater (50 gal) With electric backup.	ReplaceAppl	20	211,408,965	0	132,113,559	17,882	56,127	0	$0.131	0.75	51,221
HRV, Energy Star (ER Z C)	New	15	180,153	0	127,242	21	5	0	$0.138	0.75	209
Add 6 LED lamps (using CFL base) after 2015	New	10	1,166,918	0	1,224,896	144	144	-21,869	$0.138	0.52	24,311
Add 16 LED lamps (using CFL base) after 2015	New	10	3,111,782	0	3,184,729	375	375	-56,860	$0.142	0.51	24,311
HRV, Energy	New	15	721,500	0	466,187	78	20	0	$0.151	0.68	343

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Star (ER Z B)											
Room AC (Z A)	Retro	18	1,043,487	0	571,919	0	261	0	$0.159	0.62	26,087
HRV, Energy Star (HP Z B)	New	15	533,340	0	309,340	52	13	0	$0.168	0.61	217
HRV HP Z B	Retro	18	41,986,466	0	20,302,954	3,394	851	0	$0.180	0.57	20,993
Evaporative Cooling (Direct/indirect) (Z A)	New	18	6,568,122	0	2,709,369	0	1,236	0	$0.211	0.47	8,210
HRV ER, Z A	Retro	18	102,228,241	0	39,908,681	10,042	279	0	$0.223	0.44	61,754
Evaporative Cooling (Direct/indirect) (Z A)	Retro	18	13,234,158	0	5,089,175	0	2,321	0	$0.226	0.43	16,543
HRV, Energy Star (HP Z C)	New	15	180,153	0	74,799	13	3	0	$0.235	0.44	83
Estar Refrigerator	New	12	23,020,024	0	10,480,014	1,233	1,233	-91,078	$0.257	0.30	163,263
AC Tune - up (Z B)	Retro	18	1,773,043	0	587,360	0	268	0	$0.262	0.37	11,820
Energy Star GSHP HSPF 12 (Z B)	New	15	2,985,394	0	1,099,714	184	46	0	$0.265	0.39	206
Wx Air Sealing, Z B	Retro	10	176,150	0	84,850	21	1	0	$0.271	0.33	406
Evaporative Cooling (Direct/indirect) (Z B)	Retro	18	7,991,038	7,790,119	4,592,401	0	2,094	0	$0.299	0.33	10,413
Solar hot water heater (50 gal) - With electric backup.	New	20	441,532,385	0	119,775,822	16,212	50,886	0	$0.301	0.33	68,665
ER> Mini-split ductless heat	New	15	7,435,423	0	2,336,847	588	16	0	$0.311	0.32	4,426

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
pump Z B in MF											
HRV HP Z A	Retro	18	17,258,740	0	4,121,654	689	173	0	$0.364	0.28	8,957
HRV, Energy Star (HP Z A)	New	15	800,932	0	211,949	35	9	0	$0.369	0.28	367
AC Tune - up (Z A)	Retro	18	5,815,065	0	1,267,361	0	578	0	$0.399	0.25	38,767
ER> Mini-split ductless heat pump Z A in MF	New	15	4,289,667	0	1,036,670	261	7	0	$0.404	0.25	2,553
Energy Star GSHP HSPF 12 (Z C)	New	15	1,044,888	0	238,774	40	10	0	$0.427	0.24	72
HRV, Energy Star (ER Z A)	New	15	1,867,679	0	405,945	102	3	0	$0.449	0.22	1,084
Energy Star GSHP HSPF 12 (Z A)	New	15	3,469,537	0	631,158	106	26	0	$0.537	0.19	239
Evaporative Cooling (Direct/indirect) (Z B)	New	18	3,573,289	0	549,870	0	251	0	$0.565	0.17	4,467
High SEER CAC, (SEER 15) (Z B)	Retro	18	11,613,021	0	1,664,658	0	759	0	$0.606	0.16	13,298
High SEER CAC, (SEER 15) (Z A)	New	18	69,356,751	0	9,456,652	0	4,313	0	$0.637	0.15	99,081
Room AC (Z B)	New	18	2,315,593	0	280,161	0	128	0	$0.718	0.14	57,890
High SEER CAC, (SEER 15) (Z A)	Retro	18	30,452,055	0	3,535,530	0	1,612	0	$0.748	0.13	33,836
ER> Mini-split ductless heat pump Z C in MF	New	15	4,289,667	0	554,593	140	4	0	$0.755	0.13	1,532
Home Energy	Replace	3	83,195,412	0	40,802,080	4,800	4,800	-897,046	$0.769	0.05	792,337

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Total KWh Savings	Winter Peak Savings, kW	Summer Peak Savings, kW	Gas Savings Therms	Level Cost, $/kWh	BCR	No. Units
Monitor											
High SEER CAC, (SEER 15) (Z B)	New	18	31,389,131	0	2,112,386	0	963	0	$1.291	0.08	44,842

Table 21: Detailed Measure Table, Residential Sector, Gas Savings, and 2030 Technical Potential

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Gas Savings Therms	Level Cost, $/th	BCR	No. Units
Low Flow Shower	Retro Gas	10	1,222,788	-3,181,526	12,113	-$21.145	100.00	38,069
Gas Hi-eff Washer	New Appl	12	-2,496,201	-4,369,577	88,046	-$1.911	100.00	25,101
Gas Hi-eff Washer	ReplaceAppl	12	-31,564,550	-59,619,232	661,514	-$1.872	100.00	242,804
Gas MEF 2.0 Washer	New Appl	12	-199,642	-252,916	6,622	-$1.833	100.00	2,231
Gas ETO Dishwasher	ReplaceAppl	12	-4,298,928	-16,558,780	114,745	-$1.436	100.00	174,745
Gas ETO Dishwasher	New Appl	12	-66,547	-317,136	2,829	-$1.416	100.00	3,347
Gas MEF 2.0 Washer	ReplaceAppl	12	-2,002,739	-2,200,275	38,831	-$1.235	100.00	17,117
Heating upgrade (AFUE 95) (Z A)	New Gas	15	-380,048	0	45,712	-$0.793	100.00	2,771
Heating upgrade (AFUE 95) (Z C)	New Gas	15	-71,202	0	9,721	-$0.715	100.00	479
Heating upgrade (AFUE 95) (Z B)	New Gas	15	-71,202	0	13,874	-$0.501	100.00	479
MF Corridor Ventilation	New Gas	15	0	0	483,536	$0.000	100.00	15,350
AFUE 92 to condensing combo hydrocoil, Z C	New Gas	45	17,953	0	24,026	$0.043	20.32	264
AFUE 92 to condensing combo hydrocoil, Z B	New Gas	45	17,953	0	21,650	$0.048	18.31	264
Window, retro (U=.35), Z B	Retro Gas	45	599,471	0	694,784	$0.050	17.59	4,867
AFUE 92 to condensing combo hydrocoil, Z A	New Gas	45	121,107	0	138,917	$0.050	17.41	1,781
Window, retro (U=.35), Z C	Retro Gas	45	615,179	0	499,806	$0.071	12.33	4,867
AFUE 95 Furnace, Z B	Replace Gas	18	789,914	317,173	984,463	$0.098	8.47	7,899
Window, retro (U=.20), Z B	Retro Gas	45	693,318	0	387,586	$0.104	8.49	1,521
Window, retro (U=.35), Z A	Retro Gas	45	6,224,460	0	3,281,961	$0.110	8.00	51,346
AFUE 95 Furnace, Z C	Replace Gas	18	776,894	317,173	704,387	$0.135	6.13	7,899
Window, retro (U=.20), Z C	Retro Gas	45	768,974	0	233,490	$0.191	4.61	1,521
Duct Sealing, Z B	Retro Gas	20	186,492	0	57,164	$0.266	3.14	594
E* Insulation, Ducts, DHW, Lights (Gas Z B)	New Gas	45	11,720,299	0	2,384,201	$0.278	3.17	16,448
Tankless Gas heater replace after 2015	Replace Gas	20	15,826,148	0	4,524,336	$0.285	2.81	16,448
Tankless Gas heater after 2015	New Gas	20	9,832,600	0	2,807,533	$0.286	2.80	79,131
Solar hot water heater (50 gal) - With gas backup.	New Gas	20	22,401,329	-19,953,670	697,771	$0.286	1.18	49,163

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Gas Savings Therms	Level Cost, $/th	BCR	No. Units
Solar hot water heater (50 gal) - With gas backup.	Retro Gas	20	60,015,479	-53,452,671	1,858,558	$0.288	1.18	5,428
E* Insulation, Ducts, DHW, Lights (Gas Z C)	New Gas	45	11,720,299	0	1,747,428	$0.290	3.04	14,541
E* Insulation, Ducts, DHW, Lights (Gas Z A)	New Gas	45	77,210,291	0	10,261,732	$0.297	2.97	111,960
Window, retro (U=.20), Z A	Retro Gas	45	7,652,950	0	1,489,220	$0.298	2.95	16,046
Duct Sealing, Z C	Retro Gas	20	193,859	0	52,961	$0.299	2.80	594
Tankless Gas heater replace	Replace Gas	20	54,891,879	0	13,413,665	$0.334	2.40	182,973
Tankless Gas heater	New Gas	20	2,674,065	0	652,585	$0.334	2.40	8,914
AFUE 95 Furnace, Z A	Replace Gas	18	6,907,414	2,773,525	2,340,995	$0.359	2.30	69,074
Upgrade Gas Hearth	Replace Gas	10	462,196	0	131,437	$0.460	1.69	28,887
Near Net Zero (Gas Z B)	New Gas	45	11,080,486	0	1,310,649	$0.485	1.82	2,501
HRV, Z B	Retro Gas	18	934,154	267,629	196,522	$0.531	1.56	1,868
Solar hot water heater (50 gal) - With gas aft 2015	New Gas	20	185,945,835	-148,133,828	5,160,721	$0.598	1.05	46,175
Tank upgrade (50 gal gas)	New Gas	15	2,784,067	0	450,096	$0.604	1.29	27,841
Near Net Zero (Gas Z C)	New Gas	45	3,077,913	0	281,389	$0.610	1.45	695
Condensing Tankless Gas heater	Replace Gas	20	16,852,696	0	2,254,012	$0.610	1.31	27,627
Condensing Tankless Gas heater	New Gas	20	1,212,543	0	161,958	$0.611	1.31	1,988
Solar hot water heater (50 gal) - With gas backup aft 2015	Replace Gas	20	45,372,149	-35,266,425	1,232,808	$0.669	1.03	10,993
Near Net Zero (Gas Z A)	New Gas	45	71,007,947	0	5,674,224	$0.725	1.22	16,029
HRV, Z C	Retro Gas	18	680,076	194,837	99,779	$0.762	1.09	1,360
Window U=.2 (Gas Z B)	New Gas	45	923,089	0	68,085	$0.785	1.12	1,267
Condensing Tankless Gas heater after 2015	New Gas	20	16,906,917	0	1,654,263	$0.834	0.96	33,151
HRV, E* (Gas Z B)	New Gas	15	3,518,829	0	394,464	$0.871	0.94	6,289
MF Corridor Ventilation	Retro Gas	15	2,773,077	0	291,173	$0.930	0.87	9,244
Window U=.2 (Gas Z C)	New Gas	45	922,490	0	56,676	$0.943	0.93	1,267
Wx insulation (ceiling, floor, walls), Z B	Retro Gas	45	8,188,487	0	451,759	$1.050	0.84	1,546
Window U=.2 (Gas Z A)	New Gas	45	6,026,665	0	320,825	$1.088	0.81	8,500
HRV, E* (Gas Z C)	New Gas	15	3,501,734	0	297,421	$1.150	0.71	6,289

Measure Description	Program	Average Lifetime	Total Incremental Cost	Total O&M Impact ($)	Gas Savings Therms	Level Cost, $/th	BCR	No. Units
Move Ducts Inside, E* lights , Z A	New Gas	18	15,387,727	0	1,082,428	$1.235	0.67	9,617
HRV, E* (Gas Z A)	New Gas	15	22,440,837	0	1,683,065	$1.302	0.63	40,073
Move Ducts Inside, E* lights , Z B	New Gas	20	2,401,189	0	148,137	$1.323	0.63	1,501
HRV, Z A	Retro Gas	36	15,137,430	6,078,114	943,858	$1.393	0.63	30,275
Wx insulation (ceiling, floor, walls), Z C	Retro Gas	45	5,954,640	0	237,077	$1.455	0.60	1,124
Tank upgrade (50 gal gas) after 2015	New Gas	15	3,146,713	0	193,202	$1.590	0.49	17,879
Upgrade to forced draft tank	New Gas	20	3,595,132	0	168,464	$1.742	0.46	2,971
Duct Sealing, Z A	Retro Gas	20	896,539	0	39,971	$1.830	0.46	2,708
Move Ducts Inside, E* lights , Z C	New Gas	20	2,401,189	0	101,376	$1.933	0.43	1,501
Wx insulation (ceiling, floor), Z B	Retro Gas	45	10,196,220	0	305,476	$1.933	0.45	3,337
Upgrade to forced draft tank	Replace Gas	15	34,836,660	0	1,635,294	$2.204	0.35	28,791
Wx insulation (ceiling, floor), Z C	Retro Gas	45	7,593,608	0	174,141	$2.526	0.35	2,461
Wx Air Sealing, Z B	Retro Gas	10	209,107	0	9,850	$2.776	0.28	482
Wx Air Sealing, Z C	Retro Gas	10	335,530	0	15,786	$2.779	0.28	773
Wx insulation (ceiling, floor, walls), Z A	Retro Gas	45	123,705,281	0	2,572,669	$2.785	0.32	23,359
Upgrade to forced draft tank after 2015	New Gas	15	65,527,784	0	2,391,017	$2.849	0.27	59,034
Wx insulation (ceiling, floor), Z A	Retro Gas	45	145,192,683	0	1,880,950	$4.471	0.20	48,664
Wx Air Sealing, Z A	Retro Gas	10	10,558,357	0	197,803	$6.980	0.11	24,332

Appendix E

Supply Resource Alternatives

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
IMP-LNG 1	Imported LNG		Palomar	PALOMAR IN 2016, BACKHAUL W/GTN	NYMEX	Yes	No		Swing	Incremental			UP TO 10,000	0	0
IMP-LNG 2	Imported LNG		Pacific Connector	PACIFIC CONNECTOR IN 2016, BACKHAUL W/NWP, BACKHAUL W/GTN	NYMEX	Yes	No		Swing	Incremental			UP TO 10,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE , RUBY W/BACKHAUL IN 2012	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required (NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012)	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES
STORAGE 4	AECO STORAGE	Undergound	AECO	Yes	NA	2013	2030	NA	350,000	10,000	YES	AECO C STRG	YES
STORAGE 5	MIST STORAGE	Undergound	Mist	Yes	NA	2013	2030	NA	350,000	10,000	YES	MIST	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIIABLE < $.10	FUEL < 3%
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
Ruby with backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES
PALOMAR XPORT	Nov-15	Dec-30	300	Madras OR to Molalla OR (bi-directional)	NWP Rate up to 4x	> 6 years	PALOMAR			YES	YES
PAC CONNECT	Nov-15	Dec-30	300	Jordona Cove OR to Malin	NWP Rate up to 4x	> 5 years	PAC CONNECT			YES	YES

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES															
STORAGE	**Model Name**	**Type**	**Location**	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**		
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES		
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-	2050	NA	500,000	30,000	YES	SGS	YES		
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	2009 (full access mid-2012)	2014	NA	562,207	60,000	YES	SGS	YES		

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES															
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX**	**RMIX**	**VARIIABLE <**	**FUEL <**				
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES				
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO	0	YES	YES				
Ruby with Backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES				
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES				

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost	INCLUDE?
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			UP TO 20,000	0.3154	0.035	
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			UP TO 2,500	0	0	
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1	
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03	**NO**
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03	
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			**UP TO 50,000**	0	0.05	
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0	
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05	
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0	
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1	
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02	
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025	
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015	
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025	
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0	
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01	
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2	
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025	
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025	
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05	
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08	
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04	
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0	
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025	
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05	
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879	
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1	
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08	
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03	
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07	
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01	
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15	**NO**
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0	
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01	
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03	

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES													
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE	**Model Name**	**Type**	**Location**	**Pipeline Transport Required**	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES											
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX MAX**	**RMIX MIN**	**VARIIABLE < $.10**	**FUEL < 3%**
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
Ruby with Backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	**NWP, GTN**	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	**NWP, GTN, CROSS CASCADE**	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012												
STORAGE	**Model Name**	**Type**	**Location**	**Pipeline Transport Required**	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**			**INCLUDE?**
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2014	NA	604,351	16,789	YES	SGS	YES			
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES			
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES			

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES																
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX MAX**	**RMIX MIN**	**VARIIABLE < $.10**	**FUEL < 3%**					**INCLUDE?**
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES					
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES					
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES					
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES					
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES					

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SUPPLY SIDE RESOURCE ALTERNATIVES

Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost	INCLUDE?
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20	0.3154	0.035	
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2.5	0	0	
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1 AND 10	0	0.1	
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	**NYMEX FLAT**	Yes	No		Swing	Incremental			100	0	**0**	
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	**NYMEX FLAT**	Yes	No		Swing	Incremental			100	0	**0**	
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	**NYMEX FLAT**	2009 (full access mid-2012)	No		Swing	Incremental			100	0	**0**	
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0	
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05	
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0	
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1	
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02	
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025	
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015	
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025	
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0	
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01	
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2	
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025	
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025	
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05	
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08	
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04	
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0	
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025	
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05	
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879	
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1	
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	**NYMEX FLAT**	Yes	No		Swing	Incremental			UP TO 10,000	0	**0**	
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03	
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	**NYMEX FLAT**	Yes	No		Swing	Incremental			UP TO 1,000,000	0	**0**	
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01	
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	**NYMEX FLAT**	Yes	No		Swing	Incremental			UP TO 1,000,000	0	**0**	
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0	**NO**
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01	
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03	

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIIABLE < $.10	FUEL < 3%
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
Ruby with Backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	**GTN, NWP, CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES													
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE	**Model Name**	**Type**	**Location**	**Pipeline Transport Required**	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES											
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX MAX**	**RMIX MIN**	**VARIIABLE < $.10**	**FUEL < 3%**
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES
25	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES
20	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	NO
15	Nov-11	Sep-27	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES
10	Nov-11	Sep-22	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
Ruby with Backhaul	**Nov-12**	**Dec-30**	**300**	**Opal Hub to Turquoise Flats**	**0.95**	**> 2 years**	**RUBY**			**YES**	**YES**

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
IMP-LNG 2	**Imported LNG**		**Pacific Connector**	**PACIFIC CONNECTOR IN 2016, BACKHAUL W/NWP, BACKHAUL W/GTN**	**NYMEX**	**Yes**	**No**		**Swing**	**Incremental**			**UP TO 10,000**	**0**	**0**
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIIABLE < $.10	FUEL < 3%
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PAC CONNECT	**Nov-15**	**Dec-30**	**300**	**Jordona Cove OR to Malin**	**NWP Rate up to 4x**	**> 5 years**	**PAC CONNECT**			**YES**	**YES**

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
IMP-LNG 1	**Imported LNG**		**Palomar**	**PALOMAR IN 2016, BACKHAUL W/GTN**	**NYMEX**	**Yes**	**No**		**Swing**	**Incremental**			**UP TO 10,000**	**0**	**0**
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES													
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE	**Model Name**	**Type**	**Location**	**Pipeline Transport Required**	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES											
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX MAX**	**RMIX MIN**	**VARIIABLE < $.10**	**FUEL < 3%**
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PALOMAR XPORT	**Nov-15**	**Dec-30**	**300**	**Madras OR to Molalla OR (bi-directional)**	**NWP Rate up to 4x**	**> 6 years**	**PALOMAR**			**YES**	**YES**

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES

STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES
STORAGE 4	**AECO STORAGE**	**Undergound**	**AECO**	**Yes**	**NA**	**2013**	**2030**	**NA**	**350,000**	**10,000**	**YES**	**AECO C STRG**	**YES**

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES

Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIIABLE < $.10	FUEL < 3%
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
Ruby with Backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	NWP, GTN, , CROSS CASCADE	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

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SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES													
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE	Model Name	Type	Location	Pipeline Transport Required	Evergreen	Start	Contract Expiration	Lead Time	Max Cap	WD MDQ	Fuel Inj < 3%	SVDD	D2 RATE > $0.05 < $0.15
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES
STORAGE 5	**MIST STORAGE**	**Undergound**	**Mist**	**Yes**	**NA**	**2013**	**2030**	**NA**	**350,000**	**10,000**	**YES**	**MIST**	**YES**

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES											
Model Name	Start Date	End Date	Daily MDQ	Description	Cost Dths	Lead Time	Pipeline	RMIX MAX	RMIX MIN	VARIIABLE < $.10	FUEL < 3%
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES
	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES
Ruby with Backhaul	Nov-12	Dec-30	300	Opal Hub to Turquoise Flats	0.95	> 2 years	RUBY			YES	YES
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES
PaloBlueCross25	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES
PaloBlueCross15	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

Model Name	Category	Other Category Info	Receipt Pt	Delivery Pt(s)	Index	Comm Adder	Demand Chg	Daily Min	Base/ Swing	Contract Expiration	Total Cost	NPV	MDQ in dkths	Demand Chg	Cost
FIRM 1	Annual	Annual	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Base	2012			20,000	0.3154	0.035
FIRM 2	Annual	Annual	Rockies	NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012	IFERC Rockies	No	No	100%	Swing	2011			2,500	0	0
FIRM 3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			VARIES BETWEEN 1,000 AND 10,000	0	0.1
INCR-FIRM 1	Annual	Annual	AECO	NWP, GTN	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM 2	Annual	Annual	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 100,000	0	0.03
INCR-FIRM3	Annual	Annual	Sumas	NWP, GTN	IFERC Sumas	2009 (full access mid-2012)	No		Swing	Incremental			UP TO 100,000	0	0.05
FIRM 4	Citygate	Nov-Mar	Citygate	Zone GTN	CGPR (AECO)	Yes	No		Base	2012			5,000	0	0
INCR PEAK 1	Peaking		AECO	GTN	CGPR (AECO)	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.05
INCR PEAK 2	Peaking		Rockies	NWP	IFERC Rockies	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0
INCR PEAK 3	Peaking		Sumas	NWP	IFERC Sumas	Yes	Yes		Swing	Incremental			UP TO 10,000	0.05	0.1
PEAK 1	Peaking		Rockies	NWP	GD Rockies	Yes	Yes		Swing	2011			10,000	0.06	0.02
PEAK 2	Peaking		Sumas	NWP	GD Sumas	Yes	Yes		Swing	2012			10,000	0.08	0.025
PEAK 3	Peaking		Rockies	NWP	IFERC Rockies	Yes	No		Swing	2011			5,000	0	-0.015
PEAK 4	Peaking		Citygate	NWP	IFERC Rockies	Yes	No		Swing	2013			5,000	0	-0.025
SAT LNG	Satilite LNG		Zone 11	Zone 11	NYMEX	No	No		Base	Incremental			UP TO 500	0	0
FIRM 5	Seansonal/Winter	Dec-Jan	AECO	**GTN, NWP, CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	CGPR (AECO)	Yes	No	100%	Swing	2011			VARIES BETWEEN 2,500 AND 7,500	0	0.01
FIRM 6	Seansonal/Winter	Nov-Feb	Station 2	NWP, GTN	CGPR (AECO)	Yes	No	100%	Swing	2012			VAIRIES BETWEEN 4,000 AND 7,000	0	0.2
FIRM 7	Seansonal/Winter	Nov-Jan	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			VARIES BETWEEN 1,000 AND 3,500	0	0.025
FIRM 8	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No	100%	Swing	2012			8,000	0	0.025
FIRM 9	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	CGPR (AECO)	Yes	No		Base	2011			10,000	0	0.05
FIRM 10	Seansonal/Winter	Nov	Rockies	NWP, GTN	IFERC Rockies	Yes	No	100%	Swing	2011			VARIES BETWEEN 3,800 AND 12,500	0	-0.08
FIRM 11	Seansonal/Winter	Nov-Feb	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No	100%	Swing	2011			5,000	0	-0.04
FIRM 12	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	Yes		Base	2012			8,000	0.048	0
FIRM 13	Seansonal/Winter	Nov-Oct	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No	100%	Swing	2012			7,000	0	-0.025
FIRM 14	Seansonal/Winter	Apr-Oct	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2011			10,000	0	0.05
FIRM 15	Seansonal/Winter	Dec-Jan	Citygate	Zone 30W	IFERC Sumas	Yes	No	100%	Swing	2011			8,000	0	0.3879
FIRM 16	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No	100%	Swing	2012			VARIES BETWEEN 2,500 AND 7,000	0	0.1
INCR WTR 1	Seansonal/Winter	Nov-Mar	AECO	GTN, NWP, CROSS CASCADE	CGPR (AECO)	Yes	No		Swing	Incremental			UP TO 10,000	0	0.08
INCR WTR 2	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	GD STA2	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03
INCR WTR 3	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.07
INCR WTR 4	Seansonal/Winter	Nov-Mar	Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Base	Incremental			UP TO 10,000	0	-0.01
INCR WTR 5	Seansonal/Winter	Nov-Mar	Sumas	NWP, GTN	IFERC Sumas	Yes	No		Swing	Incremental			UP TO 1,000,000	0	0.15
SPOT CDN	Spot		Station 2	NWP, GTN	CGPR (AECO)	No	No		Swing	Incremental			UP TO 5,000	0	0
SPOT RM	Spot		Rockies	**NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012**	IFERC Rockies	Yes	No		Base	2012			10,000	0	-0.01
SPOT SUMAS	Spot		Sumas	NWP, GTN	IFERC Sumas	Yes	Yes		Base	Incremental			UP TO 5,000	0	0.03

NOTE: All yellow-highlighted lines denotes a change from the base scenario.

SUPPLY SIDE RESOURCE ALTERNATIVES
Integrated Resource Plan

EXISTING AND POTENTIAL ADDITIONAL STORAGE RESOURCES													
				NWP, GTN, , CROSS CASCADE , RUBY W/BACKHAUL IN 2012									
STORAGE	**Model Name**	**Type**	**Location**	**Pipeline Transport Required**	**Evergreen**	**Start**	**Contract Expiration**	**Lead Time**	**Max Cap**	**WD MDQ**	**Fuel Inj < 3%**	**SVDD**	**D2 RATE > $0.05 < $0.15**
STORAGE 1	JP-1	Undergound	Jackson Prairie	Yes	Yes	1994	2014	NA	604,351	16,789	YES	SGS	YES
STORAGE 2	JP-EXP	Undergound	Jackson Prairie	Yes	Yes	2009 (full access mid-2012)	2050	NA	500,000	30,000	YES	SGS	YES
STORAGE 3	LNG	LNG	Plymouth	Yes	Yes	1994	2014	NA	562,207	60,000	YES	SGS	YES

POTENTIAL ADDITIONAL PIPELINE TRANSPORT RESOURCES												
Model Name	**Start Date**	**End Date**	**Daily MDQ**	**Description**	**Cost Dths**	**Lead Time**	**Pipeline**	**RMIX MAX**	**RMIX MIN**	**VARIIABLE < $.10**	**FUEL < 3%**	
INCR-PGT	Nov-10	Oct-24	20	AECO NIT, Foothills to Kingsgate	NOVA, Foothills, GTN		NOVA, Foothills, GTN	UP TO 50,000	0	YES	YES	
INCR-WGPW	Nov-10	Oct-24	20	Sumas to WA and OR citygates	NWP Rate up to 4x		NWP	UP TO 200,000	0	YES	YES	
	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES	
25	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES	
20	Nov-11	Dec-30	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	NO	
15	Nov-11	Sep-27	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES	
10	Nov-11	Sep-22	300	Rockies to Stanfield Interconnect	Precedent Agmt	> 2 years				YES	YES	
INCR-STAINF	Oct-11	Dec-30	300	Stanfield Interconnect to Central OR	GTN Rate	> 2 years	GTN			YES	YES	
PaloBlueCross2 5	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES	
PaloBlueCross1 5	Nov-11	Dec-30	300	Stanfield Interconnect to I-5 Corridor	Precedent Agmt	> 2 years	NWP			YES	YES	
RUBY XPORT	**Nov-12**	**Dec-30**	**300**	**Opal Hub to Turquoise Flats**	**$.010 and $0.94**	**> 2 years**	**RUBY**			**YES**	**YES**	

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TRANSPORTATION AGREEMENTS

CONTRACT DESCRIPTION	TERMINATION DATE	Dths/d
TF-1 Contract #100002 April 31, 1991	4/30/2015	206123
Contract #135384 (JP/Bremerton), March 26, 2007	10/31/2029	30000
Contract #135558 (Sumas/Prtld), 4/1/2007)	4/30/2020	25400
Contract #100134 January 15,1993	11/30/2015	330
Contract #100149 February 15,1996	11/30/2015	75
Contract #100150 May 15, 1996	11/30/2015	160
Contract #100064 May 8, 1995	3/31/2013	1078
Weyer Release Contract #132329 July 1, 2004	1/31/2016	5000
Contract #139090 June 2, 2011	3/31/2052	27063
PARK AND BALANCE		
Clay Basin Park & Loan #135675	12/31/2098	
Jackson Prairie Park & Loan #131179	12/31/2098	
TI Contract #100851 (May 1, 1994)	12/31/2098	
TF-2		
Contract #100302 SGS-1 January 12, 1994	10/31/2014	2000
Contract #100304 LS-1 (January 12, 1994)	10/31/2014	15000
Jackson Prairie Expansion Precident Agreement	10/31/2060	30000
GTN		
2003 Expansion, #08844	10/31/2028	20380
Firm Transportation #02812 (November 4, 1994)	11/1/2015	3600
Firm Transportation #00179 (October 7, 1993)	10/31/2023	31335
Firm Transportation #00152 (December 1, 1997)	10/31/2023	7446
NOVA AND FOOTHILLS		
2002 Service Agreement (CNG FS-2)	11/1/2017	3126
Service Agreement (ANG) September 11, 2001 (#CNG FS-3)	10/31/2028	21500
Service Agreement (NOVA) September 4, 2001 (#2003039348-1)	10/31/2028	21800
FS-1 Transportation (ANG) June 12, 1991 (CNG FS-1)	10/31/2023	7600
SPECTRA		
Westcoast Service Agreemenet January 3, 2002 (#FI-2583-B-00)	10/31/2014	20000

	Cascade Henry Hub Medium Price Projection	Cascade Sumas Medium Price Forecast	Cascade Rockies Medium Price Forecast	Cascade AECO Medium Price Forecast	Cascade Malin Price Medium Forecast
Jan-12	$ 4.20	$ 3.85	$ 3.75	$ 3.78	$ 4.09
Feb-12	$ 4.21	$ 3.86	$ 3.75	$ 3.77	$ 4.09
Mar-12	$ 4.17	$ 3.82	$ 3.69	$ 3.74	$ 4.03
Apr-12	$ 4.18	$ 3.79	$ 3.62	$ 3.71	$ 3.97
May-12	$ 4.28	$ 3.89	$ 3.72	$ 3.79	$ 4.05
Jun-12	$ 4.22	$ 3.84	$ 3.67	$ 3.71	$ 3.99
Jul-12	$ 4.25	$ 3.86	$ 3.69	$ 3.69	$ 4.05
Aug-12	$ 4.21	$ 3.82	$ 3.65	$ 3.66	$ 4.02
Sep-12	$ 4.15	$ 3.76	$ 3.59	$ 3.61	$ 3.94
Oct-12	$ 4.21	$ 3.82	$ 3.65	$ 3.70	$ 4.00
Nov-12	$ 4.30	$ 3.84	$ 3.80	$ 3.87	$ 4.30
Dec-12	$ 4.21	$ 3.74	$ 3.71	$ 3.75	$ 4.20
Jan-13	$ 5.00	$ 4.53	$ 4.50	$ 4.48	$ 4.99
Feb-13	$ 4.61	$ 4.14	$ 4.11	$ 4.09	$ 4.60
Mar-13	$ 4.51	$ 4.05	$ 4.01	$ 4.00	$ 4.51
Apr-13	$ 4.68	$ 4.25	$ 4.11	$ 4.18	$ 4.65
May-13	$ 4.75	$ 4.32	$ 4.17	$ 4.23	$ 4.72
Jun-13	$ 4.74	$ 4.31	$ 4.16	$ 4.18	$ 4.71
Jul-13	$ 4.76	$ 4.33	$ 4.19	$ 4.20	$ 4.73
Aug-13	$ 4.73	$ 4.30	$ 4.15	$ 4.13	$ 4.70
Sep-13	$ 4.69	$ 4.26	$ 4.12	$ 4.16	$ 4.66
Oct-13	$ 4.72	$ 4.29	$ 4.14	$ 4.16	$ 4.69
Nov-13	$ 4.75	$ 4.79	$ 4.25	$ 4.32	$ 4.69
Dec-13	$ 4.74	$ 4.78	$ 4.24	$ 4.26	$ 4.69
Jan-14	$ 5.01	$ 5.04	$ 4.50	$ 4.49	$ 4.95
Feb-14	$ 5.01	$ 5.04	$ 4.50	$ 4.49	$ 4.94
Mar-14	$ 4.62	$ 4.65	$ 4.11	$ 4.13	$ 4.48
Apr-14	$ 4.96	$ 4.48	$ 4.33	$ 4.48	$ 4.80
May-14	$ 5.01	$ 4.53	$ 4.38	$ 4.47	$ 4.78
Jun-14	$ 5.02	$ 4.38	$ 4.39	$ 4.44	$ 4.72
Jul-14	$ 5.04	$ 4.42	$ 4.41	$ 4.44	$ 4.71
Aug-14	$ 5.00	$ 4.39	$ 4.38	$ 4.40	$ 4.68
Sep-14	$ 4.94	$ 4.42	$ 4.31	$ 4.37	$ 4.74
Oct-14	$ 5.03	$ 4.51	$ 4.40	$ 4.47	$ 4.85
Nov-14	$ 5.04	$ 4.71	$ 4.47	$ 4.64	$ 4.93
Dec-14	$ 5.02	$ 4.95	$ 4.46	$ 4.61	$ 4.95
Jan-15	$ 5.09	$ 5.01	$ 4.82	$ 4.68	$ 5.01
Feb-15	$ 5.09	$ 5.00	$ 4.82	$ 4.68	$ 4.98
Mar-15	$ 4.98	$ 4.67	$ 4.71	$ 4.61	$ 4.80
Apr-15	$ 5.02	$ 4.55	$ 4.60	$ 4.49	$ 4.80
May-15	$ 5.10	$ 4.52	$ 4.68	$ 4.49	$ 4.80
Jun-15	$ 5.10	$ 4.39	$ 4.68	$ 4.42	$ 4.72
Jul-15	$ 5.12	$ 4.38	$ 4.70	$ 4.41	$ 4.71
Aug-15	$ 5.09	$ 4.39	$ 4.68	$ 4.36	$ 4.68
Sep-15	$ 5.01	$ 4.42	$ 4.60	$ 4.38	$ 4.72
Oct-15	$ 5.10	$ 4.52	$ 4.68	$ 4.47	$ 4.86
Nov-15	$ 5.07	$ 4.71	$ 4.74	$ 4.62	$ 4.96
Dec-15	$ 5.16	$ 4.99	$ 4.83	$ 4.63	$ 4.99
Jan-16	$ 5.25	$ 5.08	$ 5.02	$ 4.73	$ 5.07
Feb-16	$ 5.25	$ 5.07	$ 5.02	$ 4.72	$ 5.07
Mar-16	$ 5.07	$ 4.64	$ 4.78	$ 4.58	$ 4.82

	Cascade Henry Hub Medium Price Projection	Cascade Sumas Medium Price Forecast	Cascade Rockies Medium Price Forecast	Cascade AECO Medium Price Forecast	Cascade Malin Price Medium Forecast
Apr-16	$ 5.19	$ 4.71	$ 4.90	$ 4.64	$ 4.94
May-16	$ 5.26	$ 4.70	$ 4.87	$ 4.66	$ 4.91
Jun-16	$ 5.29	$ 4.61	$ 4.79	$ 4.64	$ 4.86
Jul-16	$ 5.31	$ 4.57	$ 4.73	$ 4.59	$ 4.81
Aug-16	$ 5.25	$ 4.53	$ 4.67	$ 4.50	$ 4.75
Sep-16	$ 5.15	$ 4.54	$ 4.73	$ 4.49	$ 4.79
Oct-16	$ 5.22	$ 4.70	$ 4.89	$ 4.62	$ 4.94
Nov-16	$ 5.27	$ 4.83	$ 5.04	$ 4.73	$ 5.09
Dec-16	$ 5.28	$ 5.08	$ 5.03	$ 4.68	$ 5.08
Jan-17	$ 5.38	$ 5.18	$ 5.13	$ 4.78	$ 5.18
Feb-17	$ 5.39	$ 5.14	$ 5.08	$ 4.76	$ 5.13
Mar-17	$ 5.01	$ 4.54	$ 4.68	$ 4.48	$ 4.72
Apr-17	$ 5.35	$ 4.77	$ 4.95	$ 4.68	$ 5.00
May-17	$ 5.40	$ 4.70	$ 4.90	$ 4.67	$ 5.00
Jun-17	$ 5.40	$ 4.60	$ 4.83	$ 4.63	$ 4.94
Jul-17	$ 5.51	$ 4.62	$ 4.80	$ 4.60	$ 4.91
Aug-17	$ 5.39	$ 4.48	$ 4.67	$ 4.46	$ 4.78
Sep-17	$ 5.20	$ 4.50	$ 4.73	$ 4.46	$ 4.85
Oct-17	$ 5.36	$ 4.74	$ 4.96	$ 4.66	$ 5.08
Nov-17	$ 5.41	$ 4.87	$ 5.12	$ 4.76	$ 5.17
Dec-17	$ 5.42	$ 5.13	$ 5.10	$ 4.72	$ 5.15
Jan-18	$ 5.53	$ 5.23	$ 5.20	$ 4.83	$ 5.25
Feb-18	$ 5.53	$ 5.22	$ 5.19	$ 4.82	$ 5.24
Mar-18	$ 5.12	$ 4.59	$ 4.80	$ 4.52	$ 4.84
Apr-18	$ 5.47	$ 4.81	$ 5.08	$ 4.73	$ 5.12
May-18	$ 5.56	$ 4.76	$ 5.09	$ 4.73	$ 5.14
Jun-18	$ 5.58	$ 4.64	$ 5.00	$ 4.68	$ 5.05
Jul-18	$ 5.61	$ 4.63	$ 4.95	$ 4.62	$ 5.00
Aug-18	$ 5.53	$ 4.57	$ 4.85	$ 4.53	$ 4.93
Sep-18	$ 5.42	$ 4.60	$ 4.91	$ 4.54	$ 4.96
Oct-18	$ 5.44	$ 4.73	$ 5.07	$ 4.66	$ 5.11
Nov-18	$ 5.51	$ 4.92	$ 5.20	$ 4.81	$ 5.25
Dec-18	$ 5.57	$ 5.27	$ 5.23	$ 4.82	$ 5.28
Jan-19	$ 5.69	$ 5.37	$ 5.33	$ 4.93	$ 5.38
Feb-19	$ 5.69	$ 5.37	$ 5.33	$ 4.92	$ 5.38
Mar-19	$ 5.50	$ 5.23	$ 5.17	$ 4.86	$ 5.22
Apr-19	$ 5.65	$ 5.26	$ 5.22	$ 4.85	$ 5.26
May-19	$ 5.72	$ 5.23	$ 5.17	$ 4.87	$ 5.26
Jun-19	$ 5.74	$ 4.94	$ 5.08	$ 4.81	$ 5.17
Jul-19	$ 5.79	$ 4.88	$ 5.03	$ 4.75	$ 5.13
Aug-19	$ 5.69	$ 4.77	$ 4.92	$ 4.64	$ 5.03
Sep-19	$ 5.55	$ 4.80	$ 4.98	$ 4.65	$ 5.08
Oct-19	$ 5.57	$ 4.97	$ 5.18	$ 4.81	$ 5.27
Nov-19	$ 5.69	$ 5.40	$ 5.37	$ 4.98	$ 5.42
Dec-19	$ 5.76	$ 5.43	$ 5.39	$ 4.97	$ 5.44
Jan-20	$ 5.93	$ 5.54	$ 5.49	$ 5.08	$ 5.54
Feb-20	$ 5.84	$ 5.49	$ 5.42	$ 5.03	$ 5.48
Mar-20	$ 5.71	$ 5.35	$ 5.30	$ 5.02	$ 5.35
Apr-20	$ 5.82	$ 5.38	$ 5.32	$ 5.01	$ 5.42
May-20	$ 5.94	$ 5.17	$ 5.31	$ 5.04	$ 5.44
Jun-20	$ 5.93	$ 5.04	$ 5.20	$ 4.96	$ 5.33

	Cascade Henry Hub Medium Price Projection	Cascade Sumas Medium Price Forecast	Cascade Rockies Medium Price Forecast	Cascade AECO Medium Price Forecast	Cascade Malin Price Medium Forecast
Jul-20	$ 5.98	$ 4.99	$ 5.14	$ 4.90	$ 5.27
Aug-20	$ 5.88	$ 4.91	$ 5.02	$ 4.77	$ 5.16
Sep-20	$ 5.72	$ 4.95	$ 5.08	$ 4.80	$ 5.22
Oct-20	$ 5.80	$ 5.13	$ 5.31	$ 4.98	$ 5.43
Nov-20	$ 5.93	$ 5.58	$ 5.52	$ 5.17	$ 5.58
Dec-20	$ 5.98	$ 5.53	$ 5.48	$ 5.11	$ 5.53
Jan-21	$ 6.15	$ 5.66	$ 5.60	$ 5.24	$ 5.65
Feb-21	$ 6.08	$ 5.60	$ 5.54	$ 5.19	$ 5.60
Mar-21	$ 5.97	$ 5.56	$ 5.47	$ 5.21	$ 5.56
Apr-21	$ 6.04	$ 5.46	$ 5.36	$ 5.09	$ 5.51
May-21	$ 6.15	$ 5.25	$ 5.32	$ 5.11	$ 5.48
Jun-21	$ 6.20	$ 5.19	$ 5.21	$ 5.09	$ 5.40
Jul-21	$ 6.18	$ 5.08	$ 5.10	$ 4.98	$ 5.31
Aug-21	$ 6.10	$ 5.00	$ 5.01	$ 4.88	$ 5.22
Sep-21	$ 5.94	$ 4.96	$ 5.06	$ 4.81	$ 5.23
Oct-21	$ 5.98	$ 5.17	$ 5.31	$ 5.02	$ 5.45
Nov-21	$ 6.15	$ 5.68	$ 5.59	$ 5.27	$ 5.68
Dec-21	$ 6.13	$ 5.63	$ 5.55	$ 5.21	$ 5.63
Jan-22	$ 6.13	$ 5.62	$ 5.52	$ 5.20	$ 5.59
Feb-22	$ 6.13	$ 5.61	$ 5.51	$ 5.19	$ 5.59
Mar-22	$ 5.77	$ 5.30	$ 5.17	$ 4.96	$ 5.27
Apr-22	$ 6.08	$ 5.39	$ 5.27	$ 5.05	$ 5.44
May-22	$ 6.19	$ 5.18	$ 5.27	$ 5.05	$ 5.41
Jun-22	$ 6.21	$ 5.14	$ 5.15	$ 5.05	$ 5.34
Jul-22	$ 6.23	$ 5.06	$ 5.06	$ 4.95	$ 5.25
Aug-22	$ 6.13	$ 4.96	$ 4.95	$ 4.84	$ 5.17
Sep-22	$ 5.87	$ 4.89	$ 4.94	$ 4.76	$ 5.16
Oct-22	$ 5.98	$ 5.20	$ 5.32	$ 5.04	$ 5.47
Nov-22	$ 6.19	$ 5.73	$ 5.59	$ 5.32	$ 5.74
Dec-22	$ 6.18	$ 5.67	$ 5.55	$ 5.25	$ 5.68
Jan-23	$ 6.32	$ 5.76	$ 5.61	$ 5.34	$ 5.72
Feb-23	$ 6.23	$ 5.71	$ 5.56	$ 5.29	$ 5.68
Mar-23	$ 6.02	$ 5.50	$ 5.35	$ 5.19	$ 5.49
Apr-23	$ 6.24	$ 5.50	$ 5.38	$ 5.18	$ 5.56
May-23	$ 6.36	$ 5.30	$ 5.37	$ 5.18	$ 5.53
Jun-23	$ 6.34	$ 5.27	$ 5.24	$ 5.17	$ 5.45
Jul-23	$ 6.40	$ 5.20	$ 5.16	$ 5.09	$ 5.38
Aug-23	$ 6.28	$ 5.09	$ 5.03	$ 4.96	$ 5.27
Sep-23	$ 5.96	$ 4.99	$ 4.99	$ 4.85	$ 5.26
Oct-23	$ 6.14	$ 5.35	$ 5.38	$ 5.19	$ 5.62
Nov-23	$ 6.34	$ 5.88	$ 5.66	$ 5.46	$ 5.89
Dec-23	$ 6.30	$ 5.81	$ 5.64	$ 5.39	$ 5.82
Jan-24	$ 6.42	$ 5.86	$ 5.66	$ 5.44	$ 5.82
Feb-24	$ 6.33	$ 5.81	$ 5.59	$ 5.39	$ 5.78
Mar-24	$ 5.94	$ 5.44	$ 5.21	$ 5.13	$ 5.42
Apr-24	$ 6.34	$ 5.70	$ 5.48	$ 5.37	$ 5.75
May-24	$ 6.43	$ 5.51	$ 5.47	$ 5.39	$ 5.74
Jun-24	$ 6.45	$ 5.39	$ 5.35	$ 5.29	$ 5.62
Jul-24	$ 6.51	$ 5.31	$ 5.27	$ 5.21	$ 5.55
Aug-24	$ 6.37	$ 5.18	$ 5.12	$ 5.06	$ 5.40
Sep-24	$ 6.22	$ 5.22	$ 5.16	$ 5.10	$ 5.45

	Cascade Henry Hub Medium Price Projection	Cascade Sumas Medium Price Forecast	Cascade Rockies Medium Price Forecast	Cascade AECO Medium Price Forecast	Cascade Malin Price Medium Forecast
Oct-24	$ 6.18	$ 5.37	$ 5.36	$ 5.24	$ 5.64
Nov-24	$ 6.42	$ 5.93	$ 5.63	$ 5.51	$ 5.93
Dec-24	$ 6.42	$ 5.87	$ 5.67	$ 5.46	$ 5.88
Jan-25	$ 6.48	$ 5.89	$ 5.61	$ 5.47	$ 5.85
Feb-25	$ 6.41	$ 5.85	$ 5.56	$ 5.43	$ 5.82
Mar-25	$ 6.04	$ 5.51	$ 5.22	$ 5.21	$ 5.50
Apr-25	$ 6.39	$ 5.73	$ 5.48	$ 5.41	$ 5.79
May-25	$ 6.48	$ 5.55	$ 5.48	$ 5.42	$ 5.77
Jun-25	$ 6.54	$ 5.47	$ 5.39	$ 5.38	$ 5.69
Jul-25	$ 6.60	$ 5.37	$ 5.30	$ 5.27	$ 5.62
Aug-25	$ 6.44	$ 5.22	$ 5.13	$ 5.10	$ 5.45
Sep-25	$ 6.27	$ 5.24	$ 5.18	$ 5.12	$ 5.47
Oct-25	$ 6.24	$ 5.67	$ 5.40	$ 5.33	$ 5.72
Nov-25	$ 6.44	$ 6.01	$ 5.79	$ 5.61	$ 6.00
Dec-25	$ 6.55	$ 6.03	$ 5.92	$ 5.61	$ 6.01
Jan-26	$ 6.58	$ 6.05	$ 5.95	$ 5.63	$ 6.01
Feb-26	$ 6.58	$ 6.05	$ 5.95	$ 5.63	$ 6.01
Mar-26	$ 6.31	$ 5.84	$ 5.70	$ 5.55	$ 5.81
Apr-26	$ 6.51	$ 5.94	$ 5.86	$ 5.63	$ 5.97
May-26	$ 6.61	$ 5.81	$ 5.84	$ 5.69	$ 6.00
Jun-26	$ 6.69	$ 5.73	$ 5.75	$ 5.63	$ 5.92
Jul-26	$ 6.75	$ 5.63	$ 5.66	$ 5.52	$ 5.81
Aug-26	$ 6.58	$ 5.44	$ 5.48	$ 5.33	$ 5.63
Sep-26	$ 6.35	$ 5.48	$ 5.53	$ 5.35	$ 5.68
Oct-26	$ 6.46	$ 5.84	$ 5.84	$ 5.60	$ 5.95
Nov-26	$ 6.57	$ 6.16	$ 6.02	$ 5.79	$ 6.15
Dec-26	$ 6.71	$ 6.21	$ 6.08	$ 5.79	$ 6.17
Jan-27	$ 6.80	$ 6.29	$ 6.16	$ 5.87	$ 6.24
Feb-27	$ 6.80	$ 6.29	$ 6.16	$ 5.86	$ 6.23
Mar-27	$ 6.58	$ 6.14	$ 5.96	$ 5.85	$ 6.11
Apr-27	$ 6.75	$ 6.19	$ 6.07	$ 5.90	$ 6.23
May-27	$ 6.82	$ 6.05	$ 6.02	$ 5.92	$ 6.23
Jun-27	$ 6.91	$ 5.99	$ 5.95	$ 5.88	$ 6.16
Jul-27	$ 6.96	$ 5.87	$ 5.87	$ 5.75	$ 6.04
Aug-27	$ 6.80	$ 5.70	$ 5.70	$ 5.58	$ 5.87
Sep-27	$ 6.58	$ 5.88	$ 5.75	$ 5.60	$ 5.93
Oct-27	$ 6.67	$ 6.15	$ 6.01	$ 5.84	$ 6.19
Nov-27	$ 6.81	$ 6.42	$ 6.21	$ 6.01	$ 6.40
Dec-27	$ 6.88	$ 6.43	$ 6.22	$ 6.00	$ 6.39
Jan-28	$ 6.94	$ 6.48	$ 6.27	$ 6.04	$ 6.44
Feb-28	$ 6.94	$ 6.47	$ 6.26	$ 6.04	$ 6.43
Mar-28	$ 6.66	$ 6.19	$ 5.99	$ 5.89	$ 6.14
Apr-28	$ 6.85	$ 6.27	$ 6.12	$ 6.00	$ 6.31
May-28	$ 6.98	$ 6.18	$ 6.12	$ 6.06	$ 6.35
Jun-28	$ 7.07	$ 6.09	$ 6.04	$ 5.97	$ 6.26
Jul-28	$ 7.10	$ 5.97	$ 5.94	$ 5.84	$ 6.16
Aug-28	$ 6.94	$ 5.80	$ 5.76	$ 5.66	$ 5.99
Sep-28	$ 6.59	$ 5.81	$ 5.72	$ 5.66	$ 6.01
Oct-28	$ 6.82	$ 6.37	$ 6.10	$ 6.04	$ 6.40
Nov-28	$ 6.96	$ 6.60	$ 6.29	$ 6.21	$ 6.59
Dec-28	$ 7.01	$ 6.62	$ 6.27	$ 6.19	$ 6.60

	Cascade Henry Hub Medium Price Projection	Cascade Sumas Medium Price Forecast	Cascade Rockies Medium Price Forecast	Cascade AECO Medium Price Forecast	Cascade Malin Price Medium Forecast
Jan-29	$ 6.98	$ 6.58	$ 6.21	$ 6.15	$ 6.51
Feb-29	$ 6.98	$ 6.57	$ 6.21	$ 6.14	$ 6.51
Mar-29	$ 6.62	$ 6.13	$ 5.84	$ 5.84	$ 6.07
Apr-29	$ 6.87	$ 6.30	$ 6.07	$ 6.03	$ 6.34
May-29	$ 7.01	$ 6.25	$ 6.11	$ 6.13	$ 6.42
Jun-29	$ 7.14	$ 6.22	$ 6.03	$ 6.11	$ 6.35
Jul-29	$ 7.17	$ 6.07	$ 5.92	$ 5.94	$ 6.21
Aug-29	$ 6.98	$ 5.87	$ 5.72	$ 5.74	$ 6.04
Sep-29	$ 6.74	$ 6.00	$ 5.72	$ 5.75	$ 6.05
Oct-29	$ 6.75	$ 6.30	$ 6.01	$ 6.00	$ 6.34
Nov-29	$ 6.96	$ 6.64	$ 6.25	$ 6.28	$ 6.64
Dec-29	$ 7.09	$ 6.73	$ 6.29	$ 6.30	$ 6.70
Jan-30	$ 7.06	$ 6.70	$ 6.26	$ 6.27	$ 6.63
Feb-30	$ 7.06	$ 6.69	$ 6.25	$ 6.26	$ 6.63
Mar-30	$ 6.69	$ 6.23	$ 5.85	$ 5.94	$ 6.17
Apr-30	$ 6.98	$ 6.41	$ 6.06	$ 6.20	$ 6.45
May-30	$ 7.10	$ 6.40	$ 6.08	$ 6.29	$ 6.50
Jun-30	$ 7.18	$ 6.33	$ 5.99	$ 6.21	$ 6.41
Jul-30	$ 7.24	$ 6.21	$ 5.94	$ 6.09	$ 6.31
Aug-30	$ 7.06	$ 6.02	$ 5.75	$ 5.89	$ 6.14
Sep-30	$ 6.85	$ 6.11	$ 5.74	$ 5.93	$ 6.17
Oct-30	$ 6.93	$ 6.42	$ 6.04	$ 6.16	$ 6.45
Nov-30	$ 7.06	$ 6.69	$ 6.23	$ 6.36	$ 6.67
Dec-30	$ 7.22	$ 6.80	$ 6.37	$ 6.39	$ 6.74
Jan-31	$ 7.23	$ 6.86	$ 6.42	$ 6.43	$ 6.80
Feb-31	$ 7.06	$ 6.69	$ 6.25	$ 6.26	$ 6.63
Mar-31	$ 6.69	$ 6.23	$ 5.85	$ 5.94	$ 6.17
Apr-31	$ 6.98	$ 6.41	$ 6.06	$ 6.20	$ 6.45
May-31	$ 7.10	$ 6.40	$ 6.08	$ 6.29	$ 6.50
Jun-31	$ 7.18	$ 6.33	$ 5.99	$ 6.21	$ 6.41
Jul-31	$ 7.24	$ 6.21	$ 5.94	$ 6.09	$ 6.31
Aug-31	$ 7.06	$ 6.02	$ 5.75	$ 5.89	$ 6.14
Sep-31	$ 6.85	$ 6.11	$ 5.74	$ 5.93	$ 6.17
Oct-31	$ 6.93	$ 6.42	$ 6.04	$ 6.16	$ 6.45
Nov-31	$ 7.06	$ 6.69	$ 6.23	$ 6.36	$ 6.67
Dec-31	$ 7.22	$ 6.80	$ 6.37	$ 6.39	$ 6.74

	Cascade Henry Hub Low Price Projection	Cascade Sumas Low Price Forecast	Cascade Rockies Low Price Forecast	Cascade AECO Low Price Forecast	Cascade Malin Price Low Forecast
Jan-12	$ 3.95	$ 3.62	$ 3.53	$ 3.55	$ 3.84
Feb-12	$ 3.96	$ 3.63	$ 3.52	$ 3.55	$ 3.84
Mar-12	$ 3.92	$ 3.59	$ 3.47	$ 3.52	$ 3.79
Apr-12	$ 3.93	$ 3.56	$ 3.40	$ 3.49	$ 3.73
May-12	$ 4.02	$ 3.66	$ 3.50	$ 3.56	$ 3.80
Jun-12	$ 3.97	$ 3.61	$ 3.45	$ 3.49	$ 3.75
Jul-12	$ 3.99	$ 3.63	$ 3.47	$ 3.47	$ 3.81
Aug-12	$ 3.96	$ 3.59	$ 3.44	$ 3.44	$ 3.78
Sep-12	$ 3.90	$ 3.54	$ 3.38	$ 3.40	$ 3.70
Oct-12	$ 3.95	$ 3.59	$ 3.43	$ 3.48	$ 3.76
Nov-12	$ 4.04	$ 3.61	$ 3.57	$ 3.64	$ 4.04
Dec-12	$ 3.96	$ 3.52	$ 3.49	$ 3.52	$ 3.95
Jan-13	$ 4.70	$ 4.26	$ 4.23	$ 4.21	$ 4.70
Feb-13	$ 4.33	$ 3.89	$ 3.86	$ 3.85	$ 4.33
Mar-13	$ 4.24	$ 3.80	$ 3.77	$ 3.76	$ 4.24
Apr-13	$ 4.40	$ 4.00	$ 3.86	$ 3.93	$ 4.37
May-13	$ 4.46	$ 4.06	$ 3.92	$ 3.97	$ 4.43
Jun-13	$ 4.46	$ 4.05	$ 3.91	$ 3.93	$ 4.43
Jul-13	$ 4.48	$ 4.07	$ 3.93	$ 3.95	$ 4.45
Aug-13	$ 4.45	$ 4.04	$ 3.90	$ 3.89	$ 4.42
Sep-13	$ 4.41	$ 4.01	$ 3.87	$ 3.91	$ 4.38
Oct-13	$ 4.44	$ 4.03	$ 3.90	$ 3.91	$ 4.41
Nov-13	$ 4.47	$ 4.50	$ 3.99	$ 4.06	$ 4.41
Dec-13	$ 4.46	$ 4.49	$ 3.98	$ 4.00	$ 4.40
Jan-14	$ 4.71	$ 4.74	$ 4.23	$ 4.22	$ 4.65
Feb-14	$ 4.71	$ 4.73	$ 4.23	$ 4.22	$ 4.65
Mar-14	$ 4.34	$ 4.37	$ 3.86	$ 3.88	$ 4.21
Apr-14	$ 4.66	$ 4.21	$ 4.07	$ 4.21	$ 4.51
May-14	$ 4.71	$ 4.25	$ 4.12	$ 4.20	$ 4.49
Jun-14	$ 4.72	$ 4.12	$ 4.13	$ 4.18	$ 4.44
Jul-14	$ 4.73	$ 4.15	$ 4.14	$ 4.18	$ 4.43
Aug-14	$ 4.70	$ 4.12	$ 4.11	$ 4.14	$ 4.40
Sep-14	$ 4.64	$ 4.15	$ 4.05	$ 4.11	$ 4.45
Oct-14	$ 4.73	$ 4.24	$ 4.14	$ 4.20	$ 4.56
Nov-14	$ 4.74	$ 4.43	$ 4.20	$ 4.37	$ 4.63
Dec-14	$ 4.72	$ 4.65	$ 4.19	$ 4.34	$ 4.65
Jan-15	$ 4.79	$ 4.71	$ 4.53	$ 4.40	$ 4.71
Feb-15	$ 4.79	$ 4.70	$ 4.53	$ 4.40	$ 4.69
Mar-15	$ 4.68	$ 4.39	$ 4.43	$ 4.34	$ 4.52
Apr-15	$ 4.72	$ 4.28	$ 4.33	$ 4.22	$ 4.51
May-15	$ 4.80	$ 4.25	$ 4.40	$ 4.22	$ 4.51
Jun-15	$ 4.79	$ 4.13	$ 4.40	$ 4.16	$ 4.43
Jul-15	$ 4.81	$ 4.12	$ 4.42	$ 4.14	$ 4.42
Aug-15	$ 4.79	$ 4.12	$ 4.40	$ 4.10	$ 4.40
Sep-15	$ 4.71	$ 4.15	$ 4.32	$ 4.11	$ 4.44
Oct-15	$ 4.79	$ 4.25	$ 4.40	$ 4.20	$ 4.56
Nov-15	$ 4.77	$ 4.42	$ 4.46	$ 4.34	$ 4.67
Dec-15	$ 4.85	$ 4.69	$ 4.54	$ 4.36	$ 4.69
Jan-16	$ 4.94	$ 4.78	$ 4.72	$ 4.45	$ 4.77
Feb-16	$ 4.94	$ 4.77	$ 4.72	$ 4.44	$ 4.77
Mar-16	$ 4.76	$ 4.36	$ 4.49	$ 4.30	$ 4.54

	Cascade Henry Hub Low Price Projection	Cascade Sumas Low Price Forecast	Cascade Rockies Low Price Forecast	Cascade AECO Low Price Forecast	Cascade Malin Price Low Forecast
Apr-16	$ 4.88	$ 4.43	$ 4.61	$ 4.36	$ 4.64
May-16	$ 4.95	$ 4.41	$ 4.58	$ 4.38	$ 4.62
Jun-16	$ 4.97	$ 4.34	$ 4.50	$ 4.36	$ 4.57
Jul-16	$ 4.99	$ 4.29	$ 4.45	$ 4.31	$ 4.52
Aug-16	$ 4.93	$ 4.26	$ 4.39	$ 4.23	$ 4.47
Sep-16	$ 4.84	$ 4.27	$ 4.44	$ 4.22	$ 4.50
Oct-16	$ 4.91	$ 4.42	$ 4.60	$ 4.34	$ 4.65
Nov-16	$ 4.95	$ 4.54	$ 4.74	$ 4.45	$ 4.79
Dec-16	$ 4.96	$ 4.77	$ 4.73	$ 4.40	$ 4.78
Jan-17	$ 5.06	$ 4.87	$ 4.82	$ 4.49	$ 4.87
Feb-17	$ 5.07	$ 4.84	$ 4.78	$ 4.47	$ 4.82
Mar-17	$ 4.71	$ 4.27	$ 4.40	$ 4.21	$ 4.44
Apr-17	$ 5.02	$ 4.48	$ 4.66	$ 4.40	$ 4.70
May-17	$ 5.08	$ 4.42	$ 4.61	$ 4.39	$ 4.70
Jun-17	$ 5.08	$ 4.32	$ 4.54	$ 4.35	$ 4.64
Jul-17	$ 5.18	$ 4.34	$ 4.51	$ 4.33	$ 4.61
Aug-17	$ 5.06	$ 4.21	$ 4.39	$ 4.19	$ 4.49
Sep-17	$ 4.89	$ 4.23	$ 4.44	$ 4.19	$ 4.55
Oct-17	$ 5.04	$ 4.45	$ 4.67	$ 4.38	$ 4.77
Nov-17	$ 5.09	$ 4.58	$ 4.81	$ 4.47	$ 4.86
Dec-17	$ 5.09	$ 4.82	$ 4.79	$ 4.44	$ 4.84
Jan-18	$ 5.19	$ 4.92	$ 4.89	$ 4.54	$ 4.94
Feb-18	$ 5.19	$ 4.91	$ 4.88	$ 4.53	$ 4.93
Mar-18	$ 4.81	$ 4.32	$ 4.51	$ 4.25	$ 4.55
Apr-18	$ 5.14	$ 4.52	$ 4.78	$ 4.44	$ 4.81
May-18	$ 5.23	$ 4.47	$ 4.79	$ 4.45	$ 4.83
Jun-18	$ 5.25	$ 4.37	$ 4.70	$ 4.40	$ 4.75
Jul-18	$ 5.27	$ 4.35	$ 4.65	$ 4.34	$ 4.70
Aug-18	$ 5.19	$ 4.29	$ 4.56	$ 4.25	$ 4.64
Sep-18	$ 5.10	$ 4.32	$ 4.61	$ 4.26	$ 4.66
Oct-18	$ 5.12	$ 4.44	$ 4.76	$ 4.38	$ 4.80
Nov-18	$ 5.18	$ 4.63	$ 4.89	$ 4.52	$ 4.93
Dec-18	$ 5.24	$ 4.95	$ 4.92	$ 4.53	$ 4.96
Jan-19	$ 5.35	$ 5.05	$ 5.01	$ 4.63	$ 5.06
Feb-19	$ 5.35	$ 5.04	$ 5.01	$ 4.62	$ 5.05
Mar-19	$ 5.17	$ 4.91	$ 4.86	$ 4.57	$ 4.90
Apr-19	$ 5.31	$ 4.95	$ 4.90	$ 4.56	$ 4.95
May-19	$ 5.38	$ 4.91	$ 4.86	$ 4.58	$ 4.94
Jun-19	$ 5.39	$ 4.64	$ 4.77	$ 4.52	$ 4.86
Jul-19	$ 5.44	$ 4.59	$ 4.73	$ 4.47	$ 4.82
Aug-19	$ 5.35	$ 4.48	$ 4.63	$ 4.36	$ 4.73
Sep-19	$ 5.22	$ 4.51	$ 4.68	$ 4.37	$ 4.78
Oct-19	$ 5.24	$ 4.67	$ 4.87	$ 4.53	$ 4.95
Nov-19	$ 5.35	$ 5.07	$ 5.04	$ 4.68	$ 5.09
Dec-19	$ 5.42	$ 5.10	$ 5.06	$ 4.67	$ 5.11
Jan-20	$ 5.57	$ 5.21	$ 5.16	$ 4.77	$ 5.21
Feb-20	$ 5.49	$ 5.16	$ 5.10	$ 4.72	$ 5.15
Mar-20	$ 5.36	$ 5.03	$ 4.98	$ 4.72	$ 5.03
Apr-20	$ 5.47	$ 5.06	$ 5.00	$ 4.71	$ 5.10
May-20	$ 5.58	$ 4.86	$ 4.99	$ 4.74	$ 5.11
Jun-20	$ 5.58	$ 4.74	$ 4.89	$ 4.66	$ 5.01

	Cascade Henry Hub Low Price Projection	Cascade Sumas Low Price Forecast	Cascade Rockies Low Price Forecast	Cascade AECO Low Price Forecast	Cascade Malin Price Low Forecast
Jul-20	$ 5.62	$ 4.69	$ 4.83	$ 4.60	$ 4.95
Aug-20	$ 5.53	$ 4.61	$ 4.72	$ 4.49	$ 4.85
Sep-20	$ 5.38	$ 4.66	$ 4.78	$ 4.52	$ 4.91
Oct-20	$ 5.45	$ 4.83	$ 4.99	$ 4.68	$ 5.10
Nov-20	$ 5.57	$ 5.24	$ 5.19	$ 4.86	$ 5.24
Dec-20	$ 5.62	$ 5.20	$ 5.15	$ 4.80	$ 5.20
Jan-21	$ 5.78	$ 5.32	$ 5.26	$ 4.93	$ 5.31
Feb-21	$ 5.71	$ 5.27	$ 5.21	$ 4.88	$ 5.26
Mar-21	$ 5.61	$ 5.23	$ 5.14	$ 4.90	$ 5.23
Apr-21	$ 5.68	$ 5.13	$ 5.04	$ 4.79	$ 5.18
May-21	$ 5.78	$ 4.93	$ 5.01	$ 4.81	$ 5.15
Jun-21	$ 5.83	$ 4.88	$ 4.90	$ 4.78	$ 5.08
Jul-21	$ 5.81	$ 4.77	$ 4.80	$ 4.68	$ 4.99
Aug-21	$ 5.73	$ 4.70	$ 4.71	$ 4.59	$ 4.91
Sep-21	$ 5.58	$ 4.66	$ 4.76	$ 4.52	$ 4.91
Oct-21	$ 5.62	$ 4.86	$ 4.99	$ 4.72	$ 5.13
Nov-21	$ 5.78	$ 5.34	$ 5.25	$ 4.95	$ 5.34
Dec-21	$ 5.76	$ 5.29	$ 5.21	$ 4.89	$ 5.29
Jan-22	$ 5.76	$ 5.28	$ 5.19	$ 4.89	$ 5.25
Feb-22	$ 5.76	$ 5.27	$ 5.18	$ 4.88	$ 5.25
Mar-22	$ 5.42	$ 4.99	$ 4.86	$ 4.66	$ 4.96
Apr-22	$ 5.72	$ 5.06	$ 4.96	$ 4.75	$ 5.11
May-22	$ 5.82	$ 4.87	$ 4.95	$ 4.74	$ 5.08
Jun-22	$ 5.84	$ 4.83	$ 4.84	$ 4.74	$ 5.02
Jul-22	$ 5.85	$ 4.75	$ 4.76	$ 4.66	$ 4.94
Aug-22	$ 5.76	$ 4.66	$ 4.65	$ 4.55	$ 4.86
Sep-22	$ 5.52	$ 4.60	$ 4.65	$ 4.47	$ 4.85
Oct-22	$ 5.63	$ 4.88	$ 5.00	$ 4.74	$ 5.14
Nov-22	$ 5.82	$ 5.39	$ 5.25	$ 5.00	$ 5.39
Dec-22	$ 5.81	$ 5.33	$ 5.22	$ 4.94	$ 5.34
Jan-23	$ 5.94	$ 5.41	$ 5.27	$ 5.02	$ 5.38
Feb-23	$ 5.86	$ 5.37	$ 5.23	$ 4.98	$ 5.34
Mar-23	$ 5.66	$ 5.17	$ 5.03	$ 4.88	$ 5.16
Apr-23	$ 5.87	$ 5.17	$ 5.06	$ 4.87	$ 5.22
May-23	$ 5.97	$ 4.99	$ 5.05	$ 4.87	$ 5.19
Jun-23	$ 5.96	$ 4.95	$ 4.93	$ 4.86	$ 5.13
Jul-23	$ 6.01	$ 4.88	$ 4.85	$ 4.79	$ 5.05
Aug-23	$ 5.90	$ 4.78	$ 4.73	$ 4.66	$ 4.96
Sep-23	$ 5.60	$ 4.69	$ 4.69	$ 4.56	$ 4.94
Oct-23	$ 5.77	$ 5.03	$ 5.06	$ 4.88	$ 5.28
Nov-23	$ 5.96	$ 5.52	$ 5.32	$ 5.13	$ 5.54
Dec-23	$ 5.92	$ 5.46	$ 5.30	$ 5.07	$ 5.47
Jan-24	$ 6.03	$ 5.51	$ 5.32	$ 5.11	$ 5.47
Feb-24	$ 5.95	$ 5.46	$ 5.26	$ 5.07	$ 5.43
Mar-24	$ 5.58	$ 5.11	$ 4.90	$ 4.82	$ 5.10
Apr-24	$ 5.96	$ 5.35	$ 5.15	$ 5.05	$ 5.40
May-24	$ 6.05	$ 5.18	$ 5.14	$ 5.07	$ 5.39
Jun-24	$ 6.06	$ 5.06	$ 5.03	$ 4.97	$ 5.28
Jul-24	$ 6.11	$ 4.99	$ 4.96	$ 4.89	$ 5.22
Aug-24	$ 5.99	$ 4.87	$ 4.82	$ 4.76	$ 5.08
Sep-24	$ 5.85	$ 4.91	$ 4.85	$ 4.79	$ 5.12

	Cascade Henry Hub Low Price Projection	Cascade Sumas Low Price Forecast	Cascade Rockies Low Price Forecast	Cascade AECO Low Price Forecast	Cascade Malin Price Low Forecast
Oct-24	$ 5.81	$ 5.05	$ 5.03	$ 4.92	$ 5.31
Nov-24	$ 6.03	$ 5.57	$ 5.29	$ 5.18	$ 5.57
Dec-24	$ 6.03	$ 5.52	$ 5.33	$ 5.13	$ 5.52
Jan-25	$ 6.09	$ 5.54	$ 5.27	$ 5.15	$ 5.50
Feb-25	$ 6.03	$ 5.50	$ 5.22	$ 5.11	$ 5.47
Mar-25	$ 5.67	$ 5.18	$ 4.91	$ 4.89	$ 5.17
Apr-25	$ 6.01	$ 5.39	$ 5.15	$ 5.09	$ 5.44
May-25	$ 6.09	$ 5.22	$ 5.15	$ 5.09	$ 5.42
Jun-25	$ 6.15	$ 5.14	$ 5.06	$ 5.06	$ 5.35
Jul-25	$ 6.20	$ 5.05	$ 4.98	$ 4.96	$ 5.28
Aug-25	$ 6.06	$ 4.91	$ 4.82	$ 4.80	$ 5.12
Sep-25	$ 5.89	$ 4.92	$ 4.87	$ 4.81	$ 5.14
Oct-25	$ 5.86	$ 5.33	$ 5.08	$ 5.01	$ 5.38
Nov-25	$ 6.05	$ 5.64	$ 5.44	$ 5.27	$ 5.64
Dec-25	$ 6.16	$ 5.67	$ 5.57	$ 5.28	$ 5.65
Jan-26	$ 6.19	$ 5.69	$ 5.59	$ 5.30	$ 5.65
Feb-26	$ 6.19	$ 5.68	$ 5.59	$ 5.29	$ 5.65
Mar-26	$ 5.93	$ 5.49	$ 5.36	$ 5.21	$ 5.46
Apr-26	$ 6.12	$ 5.58	$ 5.51	$ 5.29	$ 5.61
May-26	$ 6.22	$ 5.46	$ 5.49	$ 5.35	$ 5.64
Jun-26	$ 6.29	$ 5.39	$ 5.40	$ 5.29	$ 5.56
Jul-26	$ 6.35	$ 5.29	$ 5.32	$ 5.19	$ 5.46
Aug-26	$ 6.19	$ 5.12	$ 5.15	$ 5.01	$ 5.29
Sep-26	$ 5.97	$ 5.15	$ 5.20	$ 5.03	$ 5.34
Oct-26	$ 6.07	$ 5.49	$ 5.49	$ 5.26	$ 5.59
Nov-26	$ 6.18	$ 5.79	$ 5.66	$ 5.44	$ 5.78
Dec-26	$ 6.31	$ 5.84	$ 5.72	$ 5.44	$ 5.80
Jan-27	$ 6.39	$ 5.91	$ 5.79	$ 5.51	$ 5.86
Feb-27	$ 6.39	$ 5.91	$ 5.79	$ 5.51	$ 5.86
Mar-27	$ 6.18	$ 5.77	$ 5.60	$ 5.50	$ 5.74
Apr-27	$ 6.35	$ 5.82	$ 5.70	$ 5.55	$ 5.85
May-27	$ 6.41	$ 5.69	$ 5.66	$ 5.57	$ 5.86
Jun-27	$ 6.50	$ 5.63	$ 5.59	$ 5.53	$ 5.79
Jul-27	$ 6.54	$ 5.52	$ 5.52	$ 5.41	$ 5.68
Aug-27	$ 6.39	$ 5.36	$ 5.35	$ 5.24	$ 5.52
Sep-27	$ 6.18	$ 5.53	$ 5.41	$ 5.27	$ 5.57
Oct-27	$ 6.27	$ 5.79	$ 5.65	$ 5.49	$ 5.82
Nov-27	$ 6.40	$ 6.03	$ 5.84	$ 5.65	$ 6.01
Dec-27	$ 6.47	$ 6.04	$ 5.85	$ 5.64	$ 6.00
Jan-28	$ 6.52	$ 6.09	$ 5.89	$ 5.68	$ 6.06
Feb-28	$ 6.52	$ 6.08	$ 5.88	$ 5.67	$ 6.04
Mar-28	$ 6.26	$ 5.82	$ 5.63	$ 5.53	$ 5.77
Apr-28	$ 6.44	$ 5.90	$ 5.76	$ 5.64	$ 5.93
May-28	$ 6.56	$ 5.81	$ 5.76	$ 5.69	$ 5.97
Jun-28	$ 6.64	$ 5.72	$ 5.68	$ 5.61	$ 5.88
Jul-28	$ 6.67	$ 5.61	$ 5.58	$ 5.49	$ 5.79
Aug-28	$ 6.52	$ 5.45	$ 5.41	$ 5.32	$ 5.63
Sep-28	$ 6.20	$ 5.46	$ 5.38	$ 5.32	$ 5.65
Oct-28	$ 6.41	$ 5.98	$ 5.73	$ 5.68	$ 6.02
Nov-28	$ 6.54	$ 6.20	$ 5.92	$ 5.84	$ 6.20
Dec-28	$ 6.59	$ 6.22	$ 5.90	$ 5.81	$ 6.20

	Cascade Henry Hub Low Price Projection	Cascade Sumas Low Price Forecast	Cascade Rockies Low Price Forecast	Cascade AECO Low Price Forecast	Cascade Malin Price Low Forecast
Jan-29	$ 6.56	$ 6.18	$ 5.84	$ 5.78	$ 6.12
Feb-29	$ 6.56	$ 6.18	$ 5.84	$ 5.77	$ 6.12
Mar-29	$ 6.22	$ 5.76	$ 5.49	$ 5.49	$ 5.70
Apr-29	$ 6.45	$ 5.93	$ 5.71	$ 5.67	$ 5.96
May-29	$ 6.59	$ 5.87	$ 5.74	$ 5.77	$ 6.03
Jun-29	$ 6.71	$ 5.85	$ 5.67	$ 5.74	$ 5.97
Jul-29	$ 6.74	$ 5.70	$ 5.56	$ 5.58	$ 5.84
Aug-29	$ 6.56	$ 5.52	$ 5.38	$ 5.40	$ 5.68
Sep-29	$ 6.33	$ 5.64	$ 5.38	$ 5.40	$ 5.69
Oct-29	$ 6.35	$ 5.92	$ 5.65	$ 5.64	$ 5.96
Nov-29	$ 6.54	$ 6.24	$ 5.87	$ 5.90	$ 6.24
Dec-29	$ 6.66	$ 6.33	$ 5.91	$ 5.92	$ 6.30
Jan-30	$ 6.64	$ 6.29	$ 5.88	$ 5.89	$ 6.23
Feb-30	$ 6.64	$ 6.29	$ 5.88	$ 5.89	$ 6.23
Mar-30	$ 6.29	$ 5.86	$ 5.50	$ 5.59	$ 5.80
Apr-30	$ 6.56	$ 6.03	$ 5.69	$ 5.82	$ 6.06
May-30	$ 6.68	$ 6.02	$ 5.72	$ 5.91	$ 6.11
Jun-30	$ 6.75	$ 5.95	$ 5.63	$ 5.84	$ 6.03
Jul-30	$ 6.81	$ 5.84	$ 5.58	$ 5.72	$ 5.93
Aug-30	$ 6.64	$ 5.66	$ 5.40	$ 5.53	$ 5.77
Sep-30	$ 6.44	$ 5.75	$ 5.40	$ 5.58	$ 5.80
Oct-30	$ 6.51	$ 6.04	$ 5.67	$ 5.79	$ 6.06
Nov-30	$ 6.64	$ 6.29	$ 5.86	$ 5.98	$ 6.27
Dec-30	$ 6.78	$ 6.39	$ 5.99	$ 6.01	$ 6.33
Jan-31	$ 6.80	$ 6.45	$ 6.04	$ 6.05	$ 6.39
Feb-31	$ 6.64	$ 6.29	$ 5.88	$ 5.89	$ 6.23
Mar-31	$ 6.29	$ 5.86	$ 5.50	$ 5.59	$ 5.80
Apr-31	$ 6.56	$ 6.03	$ 5.69	$ 5.82	$ 6.06
May-31	$ 6.68	$ 6.02	$ 5.72	$ 5.91	$ 6.11
Jun-31	$ 6.75	$ 5.95	$ 5.63	$ 5.84	$ 6.03
Jul-31	$ 6.81	$ 5.84	$ 5.58	$ 5.72	$ 5.93
Aug-31	$ 6.64	$ 5.66	$ 5.40	$ 5.53	$ 5.77
Sep-31	$ 6.44	$ 5.75	$ 5.40	$ 5.58	$ 5.80
Oct-31	$ 6.51	$ 6.04	$ 5.67	$ 5.79	$ 6.06
Nov-31	$ 6.64	$ 6.29	$ 5.86	$ 5.98	$ 6.27
Dec-31	$ 6.78	$ 6.39	$ 5.99	$ 6.01	$ 6.33

	Cascade Henry Hub High Price Projection	Cascade Sumas High Price Forecast	Cascade Rockies High Price Forecast	Cascade AECO High Price Forecast	Cascade Malin Price High Forecast
Jan-12	$ 4.41	$ 4.05	$ 3.94	$ 3.96	$ 4.29
Feb-12	$ 4.42	$ 4.06	$ 3.94	$ 3.96	$ 4.29
Mar-12	$ 4.38	$ 4.01	$ 3.87	$ 3.93	$ 4.23
Apr-12	$ 4.39	$ 3.98	$ 3.80	$ 3.90	$ 4.16
May-12	$ 4.49	$ 4.08	$ 3.91	$ 3.98	$ 4.25
Jun-12	$ 4.43	$ 4.03	$ 3.85	$ 3.89	$ 4.18
Jul-12	$ 4.46	$ 4.05	$ 3.87	$ 3.88	$ 4.25
Aug-12	$ 4.42	$ 4.02	$ 3.84	$ 3.84	$ 4.23
Sep-12	$ 4.36	$ 3.95	$ 3.77	$ 3.80	$ 4.14
Oct-12	$ 4.42	$ 4.01	$ 3.83	$ 3.89	$ 4.20
Nov-12	$ 4.52	$ 4.03	$ 3.99	$ 4.06	$ 4.51
Dec-12	$ 4.42	$ 3.93	$ 3.89	$ 3.94	$ 4.41
Jan-13	$ 5.25	$ 4.76	$ 4.72	$ 4.70	$ 5.24
Feb-13	$ 4.84	$ 4.35	$ 4.31	$ 4.30	$ 4.83
Mar-13	$ 4.74	$ 4.25	$ 4.21	$ 4.20	$ 4.73
Apr-13	$ 4.92	$ 4.47	$ 4.31	$ 4.38	$ 4.89
May-13	$ 4.98	$ 4.53	$ 4.38	$ 4.44	$ 4.95
Jun-13	$ 4.98	$ 4.53	$ 4.37	$ 4.39	$ 4.95
Jul-13	$ 5.00	$ 4.55	$ 4.40	$ 4.41	$ 4.97
Aug-13	$ 4.97	$ 4.51	$ 4.36	$ 4.34	$ 4.93
Sep-13	$ 4.93	$ 4.48	$ 4.32	$ 4.36	$ 4.90
Oct-13	$ 4.96	$ 4.51	$ 4.35	$ 4.37	$ 4.93
Nov-13	$ 4.99	$ 5.03	$ 4.46	$ 4.53	$ 4.92
Dec-13	$ 4.98	$ 5.02	$ 4.45	$ 4.47	$ 4.92
Jan-14	$ 5.26	$ 5.29	$ 4.73	$ 4.71	$ 5.19
Feb-14	$ 5.26	$ 5.29	$ 4.73	$ 4.72	$ 5.19
Mar-14	$ 4.85	$ 4.88	$ 4.32	$ 4.34	$ 4.71
Apr-14	$ 5.21	$ 4.70	$ 4.55	$ 4.70	$ 5.04
May-14	$ 5.26	$ 4.75	$ 4.60	$ 4.70	$ 5.02
Jun-14	$ 5.27	$ 4.60	$ 4.61	$ 4.67	$ 4.96
Jul-14	$ 5.29	$ 4.64	$ 4.63	$ 4.67	$ 4.94
Aug-14	$ 5.25	$ 4.60	$ 4.60	$ 4.62	$ 4.92
Sep-14	$ 5.18	$ 4.64	$ 4.52	$ 4.59	$ 4.97
Oct-14	$ 5.28	$ 4.73	$ 4.62	$ 4.69	$ 5.10
Nov-14	$ 5.29	$ 4.95	$ 4.69	$ 4.88	$ 5.17
Dec-14	$ 5.28	$ 5.19	$ 4.68	$ 4.84	$ 5.19
Jan-15	$ 5.35	$ 5.26	$ 5.06	$ 4.92	$ 5.26
Feb-15	$ 5.34	$ 5.25	$ 5.06	$ 4.91	$ 5.23
Mar-15	$ 5.23	$ 4.91	$ 4.95	$ 4.84	$ 5.04
Apr-15	$ 5.27	$ 4.78	$ 4.83	$ 4.71	$ 5.04
May-15	$ 5.36	$ 4.74	$ 4.92	$ 4.71	$ 5.04
Jun-15	$ 5.35	$ 4.61	$ 4.91	$ 4.65	$ 4.95
Jul-15	$ 5.37	$ 4.60	$ 4.93	$ 4.63	$ 4.94
Aug-15	$ 5.35	$ 4.61	$ 4.91	$ 4.58	$ 4.91
Sep-15	$ 5.26	$ 4.64	$ 4.83	$ 4.59	$ 4.96
Oct-15	$ 5.35	$ 4.75	$ 4.92	$ 4.70	$ 5.10
Nov-15	$ 5.32	$ 4.94	$ 4.98	$ 4.85	$ 5.21
Dec-15	$ 5.42	$ 5.24	$ 5.07	$ 4.87	$ 5.24
Jan-16	$ 5.51	$ 5.34	$ 5.27	$ 4.97	$ 5.32
Feb-16	$ 5.51	$ 5.33	$ 5.27	$ 4.96	$ 5.32
Mar-16	$ 5.32	$ 4.87	$ 5.02	$ 4.81	$ 5.07

	Cascade Henry Hub High Price Projection	Cascade Sumas High Price Forecast	Cascade Rockies High Price Forecast	Cascade AECO High Price Forecast	Cascade Malin Price High Forecast
Apr-16	$ 5.45	$ 4.95	$ 5.15	$ 4.88	$ 5.19
May-16	$ 5.52	$ 4.93	$ 5.12	$ 4.89	$ 5.16
Jun-16	$ 5.56	$ 4.84	$ 5.03	$ 4.87	$ 5.11
Jul-16	$ 5.57	$ 4.80	$ 4.97	$ 4.82	$ 5.05
Aug-16	$ 5.51	$ 4.76	$ 4.90	$ 4.73	$ 4.99
Sep-16	$ 5.40	$ 4.77	$ 4.96	$ 4.71	$ 5.03
Oct-16	$ 5.49	$ 4.93	$ 5.14	$ 4.85	$ 5.19
Nov-16	$ 5.53	$ 5.07	$ 5.29	$ 4.97	$ 5.35
Dec-16	$ 5.55	$ 5.33	$ 5.28	$ 4.92	$ 5.34
Jan-17	$ 5.65	$ 5.44	$ 5.38	$ 5.01	$ 5.44
Feb-17	$ 5.66	$ 5.40	$ 5.33	$ 5.00	$ 5.39
Mar-17	$ 5.27	$ 4.77	$ 4.91	$ 4.71	$ 4.96
Apr-17	$ 5.61	$ 5.00	$ 5.20	$ 4.91	$ 5.25
May-17	$ 5.68	$ 4.94	$ 5.15	$ 4.90	$ 5.25
Jun-17	$ 5.67	$ 4.83	$ 5.07	$ 4.86	$ 5.18
Jul-17	$ 5.79	$ 4.85	$ 5.04	$ 4.83	$ 5.15
Aug-17	$ 5.66	$ 4.71	$ 4.90	$ 4.68	$ 5.02
Sep-17	$ 5.46	$ 4.72	$ 4.96	$ 4.68	$ 5.09
Oct-17	$ 5.63	$ 4.97	$ 5.21	$ 4.90	$ 5.33
Nov-17	$ 5.68	$ 5.12	$ 5.38	$ 5.00	$ 5.43
Dec-17	$ 5.69	$ 5.38	$ 5.35	$ 4.96	$ 5.40
Jan-18	$ 5.80	$ 5.49	$ 5.46	$ 5.07	$ 5.51
Feb-18	$ 5.80	$ 5.49	$ 5.45	$ 5.06	$ 5.50
Mar-18	$ 5.37	$ 4.82	$ 5.04	$ 4.74	$ 5.09
Apr-18	$ 5.74	$ 5.05	$ 5.34	$ 4.97	$ 5.38
May-18	$ 5.84	$ 5.00	$ 5.35	$ 4.97	$ 5.39
Jun-18	$ 5.86	$ 4.88	$ 5.25	$ 4.92	$ 5.30
Jul-18	$ 5.89	$ 4.86	$ 5.19	$ 4.85	$ 5.25
Aug-18	$ 5.80	$ 4.80	$ 5.10	$ 4.75	$ 5.18
Sep-18	$ 5.69	$ 4.83	$ 5.15	$ 4.76	$ 5.21
Oct-18	$ 5.72	$ 4.97	$ 5.32	$ 4.89	$ 5.36
Nov-18	$ 5.79	$ 5.17	$ 5.46	$ 5.05	$ 5.51
Dec-18	$ 5.85	$ 5.53	$ 5.49	$ 5.06	$ 5.54
Jan-19	$ 5.98	$ 5.64	$ 5.60	$ 5.17	$ 5.65
Feb-19	$ 5.97	$ 5.63	$ 5.59	$ 5.16	$ 5.64
Mar-19	$ 5.78	$ 5.49	$ 5.43	$ 5.10	$ 5.48
Apr-19	$ 5.94	$ 5.52	$ 5.48	$ 5.09	$ 5.52
May-19	$ 6.01	$ 5.49	$ 5.42	$ 5.12	$ 5.52
Jun-19	$ 6.03	$ 5.19	$ 5.33	$ 5.05	$ 5.43
Jul-19	$ 6.08	$ 5.13	$ 5.28	$ 4.99	$ 5.38
Aug-19	$ 5.97	$ 5.01	$ 5.17	$ 4.87	$ 5.29
Sep-19	$ 5.83	$ 5.03	$ 5.23	$ 4.88	$ 5.34
Oct-19	$ 5.85	$ 5.22	$ 5.44	$ 5.06	$ 5.53
Nov-19	$ 5.98	$ 5.67	$ 5.63	$ 5.23	$ 5.69
Dec-19	$ 6.05	$ 5.70	$ 5.65	$ 5.22	$ 5.71
Jan-20	$ 6.22	$ 5.82	$ 5.77	$ 5.33	$ 5.82
Feb-20	$ 6.13	$ 5.77	$ 5.70	$ 5.28	$ 5.75
Mar-20	$ 5.99	$ 5.62	$ 5.57	$ 5.27	$ 5.62
Apr-20	$ 6.11	$ 5.65	$ 5.58	$ 5.26	$ 5.69
May-20	$ 6.23	$ 5.43	$ 5.58	$ 5.29	$ 5.71
Jun-20	$ 6.23	$ 5.30	$ 5.46	$ 5.20	$ 5.60

	Cascade Henry Hub High Price Projection	Cascade Sumas High Price Forecast	Cascade Rockies High Price Forecast	Cascade AECO High Price Forecast	Cascade Malin Price High Forecast
Jul-20	$ 6.28	$ 5.24	$ 5.39	$ 5.14	$ 5.53
Aug-20	$ 6.17	$ 5.15	$ 5.27	$ 5.01	$ 5.42
Sep-20	$ 6.01	$ 5.20	$ 5.34	$ 5.04	$ 5.48
Oct-20	$ 6.09	$ 5.39	$ 5.58	$ 5.23	$ 5.70
Nov-20	$ 6.23	$ 5.85	$ 5.80	$ 5.43	$ 5.85
Dec-20	$ 6.28	$ 5.81	$ 5.75	$ 5.37	$ 5.81
Jan-21	$ 6.46	$ 5.94	$ 5.88	$ 5.51	$ 5.93
Feb-21	$ 6.38	$ 5.88	$ 5.82	$ 5.45	$ 5.88
Mar-21	$ 6.27	$ 5.84	$ 5.74	$ 5.47	$ 5.84
Apr-21	$ 6.34	$ 5.73	$ 5.63	$ 5.35	$ 5.78
May-21	$ 6.46	$ 5.51	$ 5.59	$ 5.37	$ 5.75
Jun-21	$ 6.51	$ 5.45	$ 5.47	$ 5.34	$ 5.67
Jul-21	$ 6.49	$ 5.33	$ 5.36	$ 5.22	$ 5.57
Aug-21	$ 6.41	$ 5.25	$ 5.26	$ 5.12	$ 5.48
Sep-21	$ 6.24	$ 5.21	$ 5.32	$ 5.05	$ 5.49
Oct-21	$ 6.27	$ 5.43	$ 5.58	$ 5.27	$ 5.73
Nov-21	$ 6.46	$ 5.97	$ 5.86	$ 5.53	$ 5.97
Dec-21	$ 6.44	$ 5.91	$ 5.82	$ 5.47	$ 5.91
Jan-22	$ 6.44	$ 5.90	$ 5.80	$ 5.46	$ 5.87
Feb-22	$ 6.44	$ 5.89	$ 5.79	$ 5.45	$ 5.87
Mar-22	$ 6.05	$ 5.57	$ 5.43	$ 5.21	$ 5.54
Apr-22	$ 6.39	$ 5.66	$ 5.54	$ 5.31	$ 5.71
May-22	$ 6.50	$ 5.44	$ 5.53	$ 5.30	$ 5.68
Jun-22	$ 6.52	$ 5.40	$ 5.41	$ 5.30	$ 5.61
Jul-22	$ 6.54	$ 5.31	$ 5.32	$ 5.20	$ 5.51
Aug-22	$ 6.44	$ 5.21	$ 5.20	$ 5.08	$ 5.43
Sep-22	$ 6.16	$ 5.14	$ 5.19	$ 4.99	$ 5.42
Oct-22	$ 6.28	$ 5.46	$ 5.59	$ 5.30	$ 5.74
Nov-22	$ 6.50	$ 6.02	$ 5.87	$ 5.58	$ 6.02
Dec-22	$ 6.49	$ 5.96	$ 5.83	$ 5.51	$ 5.96
Jan-23	$ 6.64	$ 6.05	$ 5.89	$ 5.61	$ 6.01
Feb-23	$ 6.55	$ 6.00	$ 5.84	$ 5.56	$ 5.96
Mar-23	$ 6.32	$ 5.78	$ 5.62	$ 5.45	$ 5.76
Apr-23	$ 6.55	$ 5.78	$ 5.65	$ 5.44	$ 5.83
May-23	$ 6.67	$ 5.57	$ 5.64	$ 5.44	$ 5.80
Jun-23	$ 6.66	$ 5.53	$ 5.50	$ 5.43	$ 5.73
Jul-23	$ 6.72	$ 5.46	$ 5.42	$ 5.35	$ 5.65
Aug-23	$ 6.59	$ 5.34	$ 5.28	$ 5.21	$ 5.54
Sep-23	$ 6.26	$ 5.24	$ 5.24	$ 5.09	$ 5.52
Oct-23	$ 6.45	$ 5.62	$ 5.65	$ 5.45	$ 5.90
Nov-23	$ 6.66	$ 6.17	$ 5.95	$ 5.73	$ 6.18
Dec-23	$ 6.62	$ 6.10	$ 5.92	$ 5.66	$ 6.12
Jan-24	$ 6.74	$ 6.15	$ 5.94	$ 5.71	$ 6.11
Feb-24	$ 6.65	$ 6.10	$ 5.87	$ 5.66	$ 6.07
Mar-24	$ 6.23	$ 5.71	$ 5.47	$ 5.39	$ 5.69
Apr-24	$ 6.65	$ 5.98	$ 5.75	$ 5.64	$ 6.04
May-24	$ 6.76	$ 5.79	$ 5.74	$ 5.66	$ 6.02
Jun-24	$ 6.77	$ 5.65	$ 5.62	$ 5.56	$ 5.90
Jul-24	$ 6.83	$ 5.57	$ 5.54	$ 5.47	$ 5.83
Aug-24	$ 6.69	$ 5.44	$ 5.38	$ 5.31	$ 5.67
Sep-24	$ 6.53	$ 5.48	$ 5.42	$ 5.35	$ 5.72

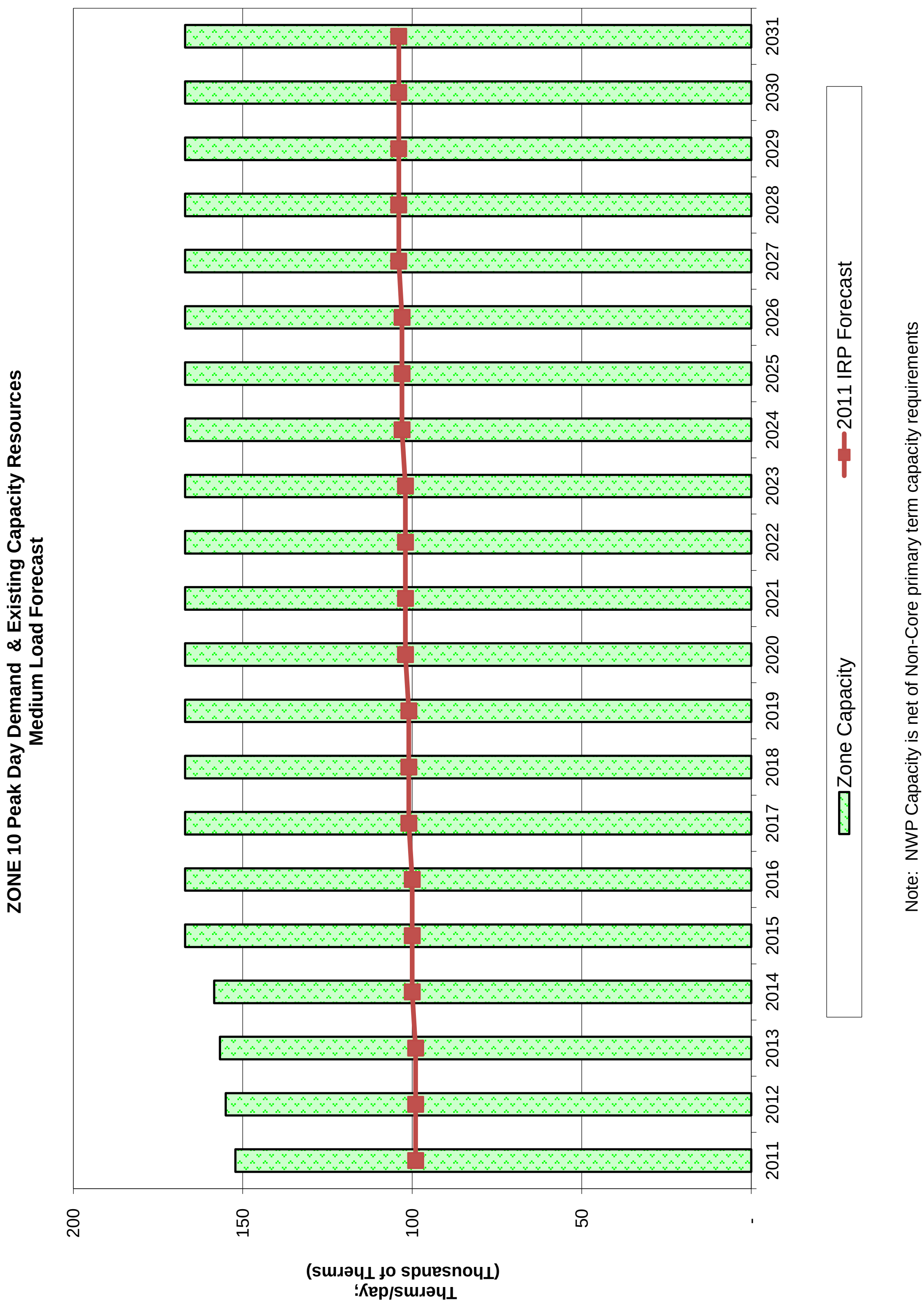
	Cascade Henry Hub High Price Projection	Cascade Sumas High Price Forecast	Cascade Rockies High Price Forecast	Cascade AECO High Price Forecast	Cascade Malin Price High Forecast
Oct-24	$ 6.48	$ 5.64	$ 5.62	$ 5.50	$ 5.93
Nov-24	$ 6.74	$ 6.22	$ 5.91	$ 5.79	$ 6.22
Dec-24	$ 6.74	$ 6.17	$ 5.95	$ 5.73	$ 6.17
Jan-25	$ 6.80	$ 6.18	$ 5.89	$ 5.75	$ 6.15
Feb-25	$ 6.73	$ 6.14	$ 5.84	$ 5.70	$ 6.11
Mar-25	$ 6.34	$ 5.79	$ 5.48	$ 5.47	$ 5.77
Apr-25	$ 6.71	$ 6.02	$ 5.75	$ 5.68	$ 6.08
May-25	$ 6.80	$ 5.83	$ 5.75	$ 5.69	$ 6.06
Jun-25	$ 6.87	$ 5.75	$ 5.66	$ 5.65	$ 5.98
Jul-25	$ 6.93	$ 5.64	$ 5.57	$ 5.54	$ 5.90
Aug-25	$ 6.76	$ 5.49	$ 5.39	$ 5.36	$ 5.72
Sep-25	$ 6.58	$ 5.50	$ 5.44	$ 5.37	$ 5.74
Oct-25	$ 6.55	$ 5.95	$ 5.67	$ 5.60	$ 6.01
Nov-25	$ 6.76	$ 6.31	$ 6.08	$ 5.89	$ 6.30
Dec-25	$ 6.88	$ 6.33	$ 6.22	$ 5.89	$ 6.31
Jan-26	$ 6.91	$ 6.35	$ 6.25	$ 5.92	$ 6.31
Feb-26	$ 6.91	$ 6.35	$ 6.25	$ 5.91	$ 6.31
Mar-26	$ 6.63	$ 6.13	$ 5.99	$ 5.82	$ 6.10
Apr-26	$ 6.83	$ 6.23	$ 6.15	$ 5.91	$ 6.27
May-26	$ 6.95	$ 6.10	$ 6.13	$ 5.97	$ 6.30
Jun-26	$ 7.02	$ 6.02	$ 6.04	$ 5.91	$ 6.21
Jul-26	$ 7.09	$ 5.91	$ 5.95	$ 5.79	$ 6.10
Aug-26	$ 6.91	$ 5.71	$ 5.75	$ 5.59	$ 5.91
Sep-26	$ 6.67	$ 5.75	$ 5.81	$ 5.62	$ 5.97
Oct-26	$ 6.78	$ 6.13	$ 6.13	$ 5.88	$ 6.25
Nov-26	$ 6.90	$ 6.47	$ 6.32	$ 6.08	$ 6.45
Dec-26	$ 7.05	$ 6.52	$ 6.39	$ 6.08	$ 6.48
Jan-27	$ 7.14	$ 6.60	$ 6.47	$ 6.16	$ 6.55
Feb-27	$ 7.14	$ 6.60	$ 6.47	$ 6.16	$ 6.55
Mar-27	$ 6.91	$ 6.45	$ 6.26	$ 6.14	$ 6.41
Apr-27	$ 7.09	$ 6.50	$ 6.37	$ 6.20	$ 6.54
May-27	$ 7.16	$ 6.36	$ 6.33	$ 6.22	$ 6.55
Jun-27	$ 7.26	$ 6.29	$ 6.25	$ 6.17	$ 6.47
Jul-27	$ 7.31	$ 6.17	$ 6.17	$ 6.04	$ 6.34
Aug-27	$ 7.14	$ 5.99	$ 5.98	$ 5.85	$ 6.16
Sep-27	$ 6.91	$ 6.18	$ 6.04	$ 5.88	$ 6.22
Oct-27	$ 7.01	$ 6.46	$ 6.31	$ 6.13	$ 6.50
Nov-27	$ 7.15	$ 6.74	$ 6.52	$ 6.31	$ 6.72
Dec-27	$ 7.23	$ 6.75	$ 6.53	$ 6.30	$ 6.71
Jan-28	$ 7.28	$ 6.80	$ 6.58	$ 6.35	$ 6.76
Feb-28	$ 7.28	$ 6.79	$ 6.57	$ 6.34	$ 6.75
Mar-28	$ 7.00	$ 6.50	$ 6.28	$ 6.18	$ 6.44
Apr-28	$ 7.19	$ 6.59	$ 6.43	$ 6.30	$ 6.62
May-28	$ 7.33	$ 6.49	$ 6.43	$ 6.36	$ 6.67
Jun-28	$ 7.42	$ 6.39	$ 6.34	$ 6.27	$ 6.57
Jul-28	$ 7.45	$ 6.27	$ 6.24	$ 6.13	$ 6.47
Aug-28	$ 7.28	$ 6.09	$ 6.05	$ 5.95	$ 6.29
Sep-28	$ 6.92	$ 6.10	$ 6.01	$ 5.95	$ 6.32
Oct-28	$ 7.16	$ 6.68	$ 6.41	$ 6.35	$ 6.72
Nov-28	$ 7.31	$ 6.93	$ 6.61	$ 6.52	$ 6.92
Dec-28	$ 7.36	$ 6.95	$ 6.59	$ 6.50	$ 6.93

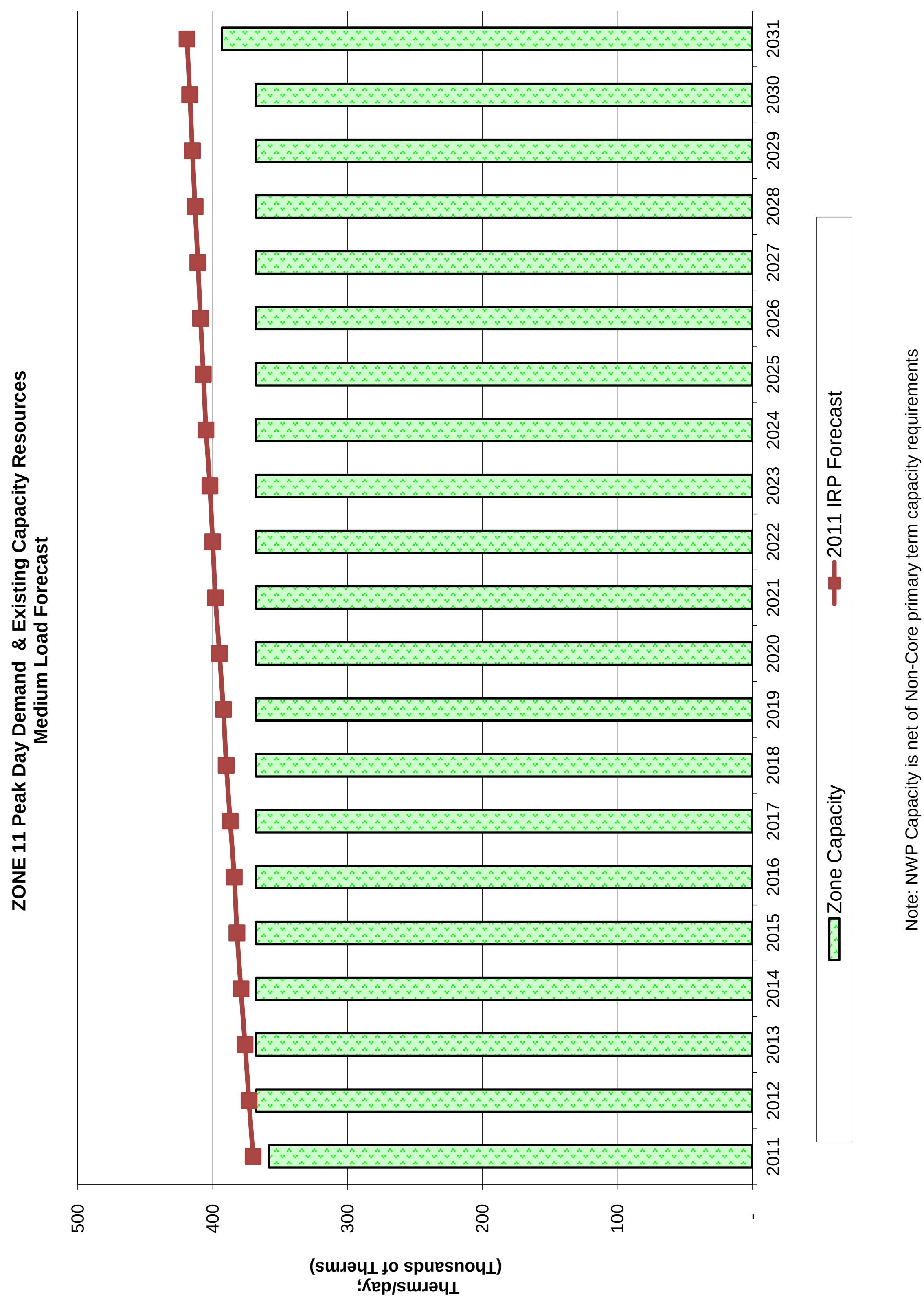
	Cascade Henry Hub High Price Projection	Cascade Sumas High Price Forecast	Cascade Rockies High Price Forecast	Cascade AECO High Price Forecast	Cascade Malin Price High Forecast
Jan-29	$ 7.33	$ 6.91	$ 6.52	$ 6.46	$ 6.84
Feb-29	$ 7.33	$ 6.90	$ 6.52	$ 6.45	$ 6.84
Mar-29	$ 6.95	$ 6.43	$ 6.13	$ 6.13	$ 6.37
Apr-29	$ 7.21	$ 6.62	$ 6.38	$ 6.33	$ 6.65
May-29	$ 7.36	$ 6.56	$ 6.41	$ 6.44	$ 6.74
Jun-29	$ 7.50	$ 6.53	$ 6.33	$ 6.41	$ 6.66
Jul-29	$ 7.52	$ 6.37	$ 6.21	$ 6.24	$ 6.52
Aug-29	$ 7.33	$ 6.16	$ 6.00	$ 6.03	$ 6.35
Sep-29	$ 7.07	$ 6.30	$ 6.01	$ 6.03	$ 6.35
Oct-29	$ 7.09	$ 6.61	$ 6.31	$ 6.30	$ 6.66
Nov-29	$ 7.31	$ 6.98	$ 6.56	$ 6.59	$ 6.97
Dec-29	$ 7.44	$ 7.07	$ 6.61	$ 6.61	$ 7.03
Jan-30	$ 7.42	$ 7.03	$ 6.57	$ 6.58	$ 6.96
Feb-30	$ 7.41	$ 7.03	$ 6.56	$ 6.57	$ 6.96
Mar-30	$ 7.03	$ 6.54	$ 6.14	$ 6.24	$ 6.48
Apr-30	$ 7.33	$ 6.73	$ 6.36	$ 6.51	$ 6.77
May-30	$ 7.46	$ 6.72	$ 6.39	$ 6.60	$ 6.82
Jun-30	$ 7.54	$ 6.65	$ 6.29	$ 6.52	$ 6.73
Jul-30	$ 7.60	$ 6.52	$ 6.23	$ 6.39	$ 6.63
Aug-30	$ 7.42	$ 6.32	$ 6.03	$ 6.18	$ 6.45
Sep-30	$ 7.19	$ 6.42	$ 6.03	$ 6.23	$ 6.48
Oct-30	$ 7.28	$ 6.74	$ 6.34	$ 6.47	$ 6.77
Nov-30	$ 7.42	$ 7.02	$ 6.54	$ 6.68	$ 7.00
Dec-30	$ 7.58	$ 7.14	$ 6.69	$ 6.71	$ 7.07
Jan-31	$ 7.59	$ 7.21	$ 6.75	$ 6.76	$ 7.14
Feb-31	$ 7.41	$ 7.03	$ 6.56	$ 6.57	$ 6.96
Mar-31	$ 7.03	$ 6.54	$ 6.14	$ 6.24	$ 6.48
Apr-31	$ 7.33	$ 6.73	$ 6.36	$ 6.51	$ 6.77
May-31	$ 7.46	$ 6.72	$ 6.39	$ 6.60	$ 6.82
Jun-31	$ 7.54	$ 6.65	$ 6.29	$ 6.52	$ 6.73
Jul-31	$ 7.60	$ 6.52	$ 6.23	$ 6.39	$ 6.63
Aug-31	$ 7.42	$ 6.32	$ 6.03	$ 6.18	$ 6.45
Sep-31	$ 7.19	$ 6.42	$ 6.03	$ 6.23	$ 6.48
Oct-31	$ 7.28	$ 6.74	$ 6.34	$ 6.47	$ 6.77
Nov-31	$ 7.42	$ 7.02	$ 6.54	$ 6.68	$ 7.00
Dec-31	$ 7.58	$ 7.14	$ 6.69	$ 6.71	$ 7.07

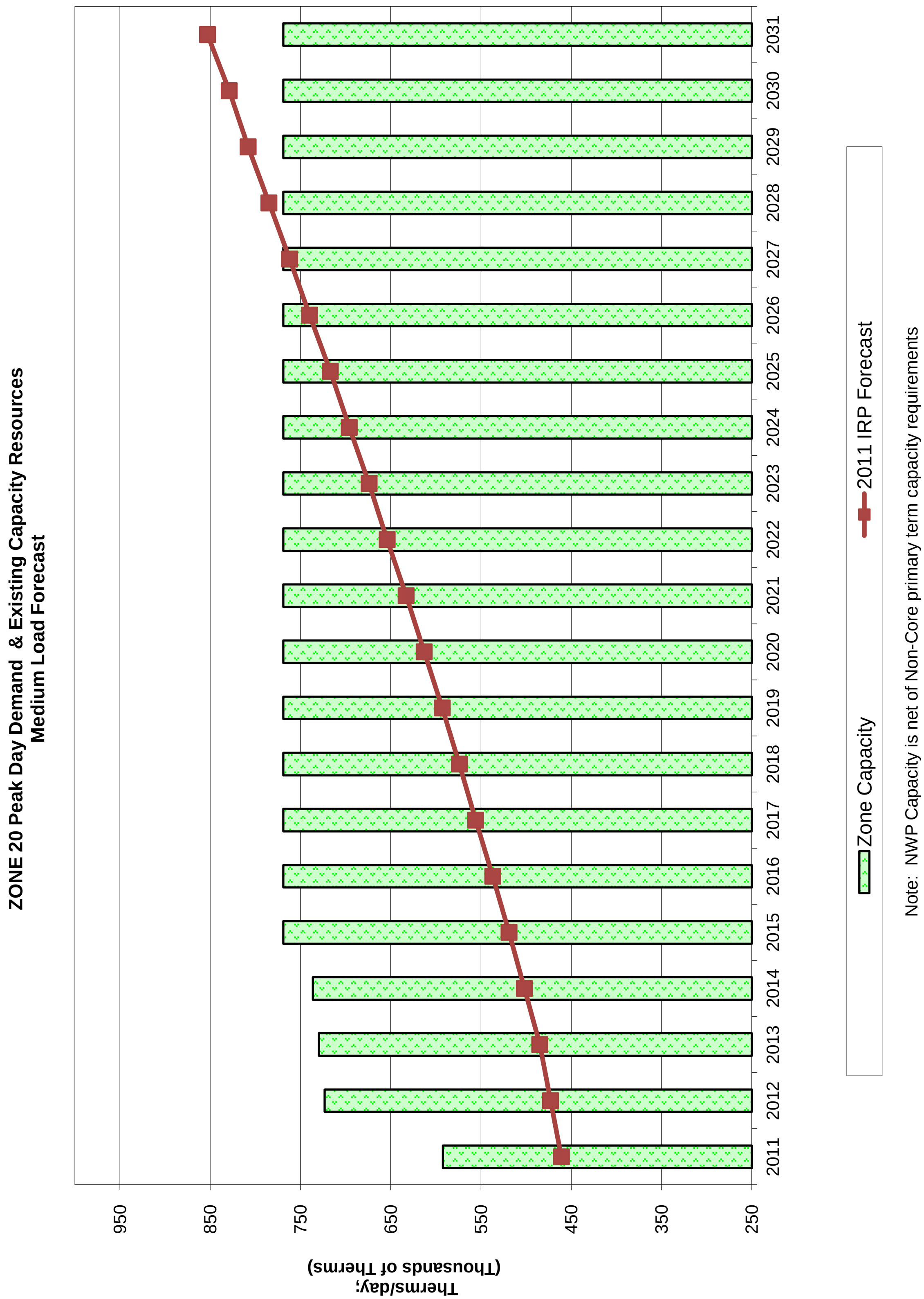
Appendix F

Capacity Requirements & Peak Day Planning

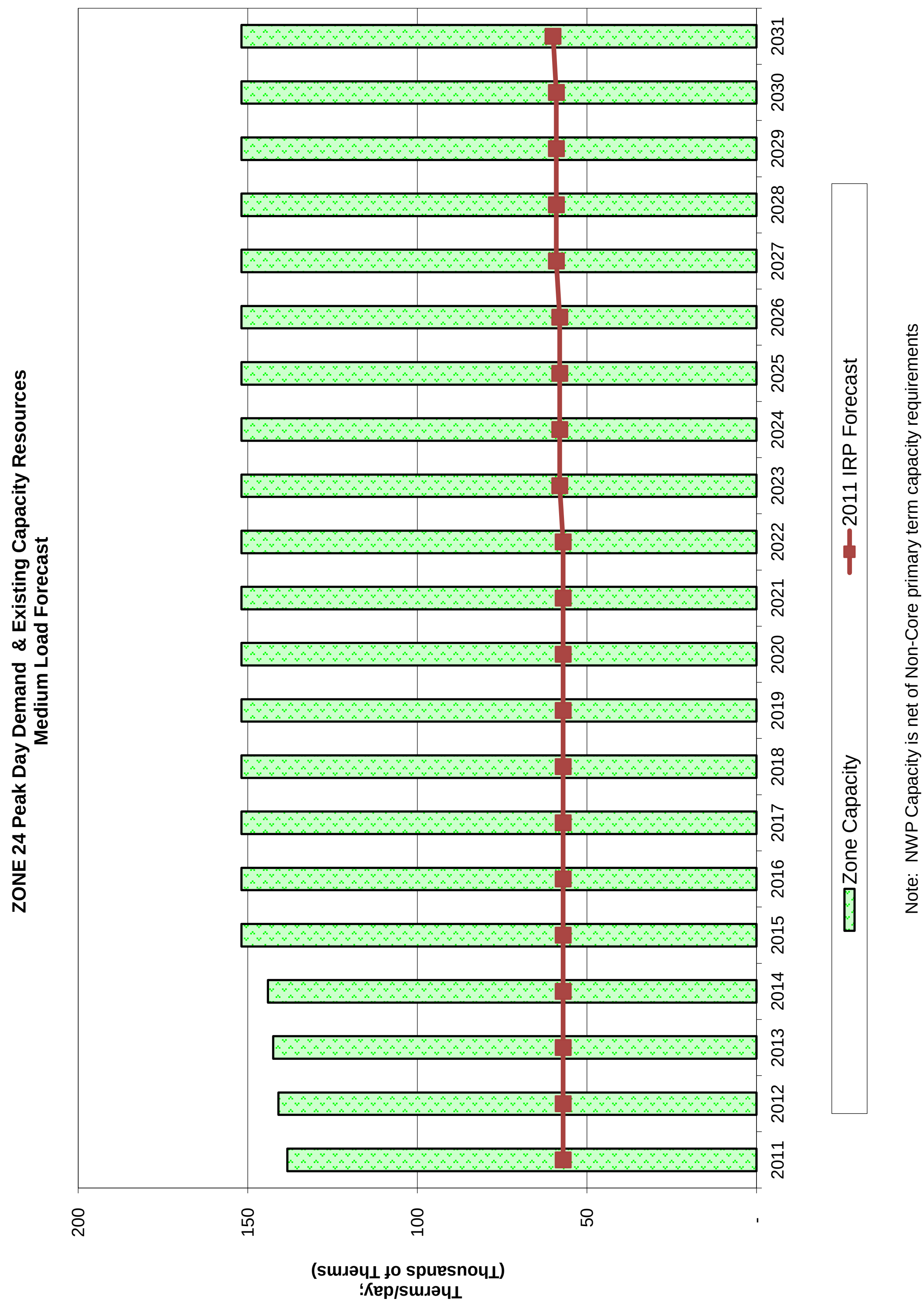
	YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Zone 10	Zone Capacity	152	155	157	158	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167	167
	2011 IRP Forecast	99	99	99	100	100	100	101	101	101	102	102	102	102	103	103	103	104	104	104	104	104
	Excess/(Shortfall)	53	56	58	58	67	67	66	66	66	65	65	65	65	64	64	64	63	63	63	63	63
Zone 11	Zone Capacity	358	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	393
	2011 IRP Forecast	370	373	376	379	382	384	387	390	392	395	398	400	402	405	407	409	411	413	415	417	419
	Excess/(Shortfall)	(12)	(5)	(8)	(11)	(14)	(16)	(19)	(22)	(24)	(27)	(30)	(32)	(34)	(37)	(39)	(41)	(43)	(45)	(47)	(49)	(26)
Zone 20	Zone Capacity	592	723	730	736	769	769	769	769	769	769	769	769	769	769	769	769	769	769	769	769	769
	2011 IRP Forecast	461	473	485	502	519	537	556	574	593	613	633	654	674	696	717	740	762	785	808	829	853
	Excess/(Shortfall)	131	250	245	234	250	232	213	195	176	156	136	115	95	73	52	29	7	(16)	(39)	(60)	(84)
Zone 24	Zone Capacity	138	141	142	144	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152
	2011 IRP Forecast	57	57	57	57	57	57	57	57	57	57	57	57	58	58	58	58	59	59	59	59	60
	Excess/(Shortfall)	81	84	85	87	95	95	95	95	95	95	95	95	94	94	94	94	93	93	93	93	92
Zone 26	Zone Capacity	476	484	489	494	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518	518
	2011 IRP Forecast	81	80	80	80	81	82	82	83	84	85	85	86	87	88	89	90	91	92	92	93	94
	Excess/(Shortfall)	395	404	409	414	437	436	436	435	434	433	433	432	431	430	429	428	427	426	426	425	424
Zone 30-S	Zone Capacity	554	561	564	568	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588	588
	2011 IRP Forecast	427	430	433	441	449	457	465	473	481	489	497	506	514	523	531	540	549	557	566	574	583
	Excess/(Shortfall)	127	131	131	127	139	131	123	115	107	99	91	82	74	65	57	48	39	31	22	14	5
Zone 30-W	Zone Capacity	1,005	1,104	1,115	1,127	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184	1,184
	2011 IRP Forecast	1,205	1,225	1,244	1,275	1,306	1,337	1,369	1,400	1,432	1,464	1,497	1,529	1,562	1,595	1,628	1,662	1,695	1,729	1,763	1,794	1,828
	Excess/(Shortfall)	(200)	(121)	(129)	(148)	(122)	(153)	(185)	(216)	(248)	(280)	(313)	(345)	(378)	(411)	(444)	(478)	(511)	(545)	(579)	(610)	(644)
Zone GTN	Zone Capacity	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512	512
	2011 IRP Forecast	581	584	588	599	610	622	634	646	658	670	683	696	709	722	735	749	763	777	791	803	818
	Excess/(Shortfall)	(69)	(72)	(76)	(87)	(98)	(110)	(122)	(134)	(146)	(158)	(171)	(184)	(197)	(210)	(223)	(237)	(251)	(265)	(279)	(291)	(306)
Zone ME-OR	Zone Capacity	244	309	312	315	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329	329
	2011 IRP Forecast	200	204	208	213	218	222	227	231	235	239	243	247	251	255	258	262	265	268	271	273	276
	Excess/(Shortfall)	44	105	104	102	111	107	102	98	94	90	86	82	78	74	71	67	64	61	58	56	53
Zone ME-WA	Zone Capacity	128	130	131	133	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	2011 IRP Forecast	163	165	167	169	171	173	175	177	178	180	182	184	185	187	189	190	191	193	194	195	196
	Excess/(Shortfall)	(35)	(35)	(36)	(36)	(31)	(33)	(35)	(37)	(38)	(40)	(42)	(44)	(45)	(47)	(49)	(50)	(51)	(53)	(54)	(55)	(56)

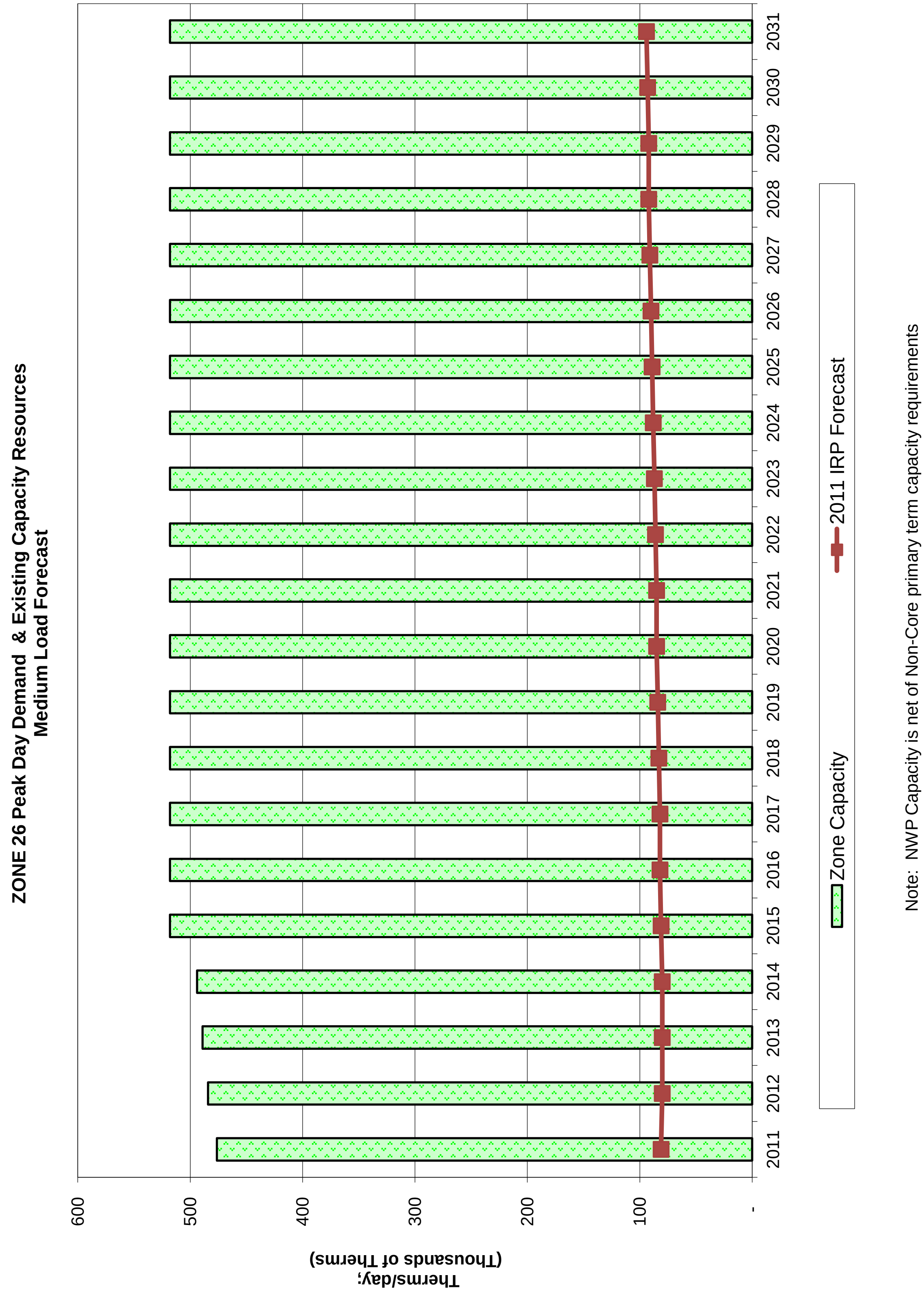

ZONE 10 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day; (Thousands of Therms)
200
150
100
50
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

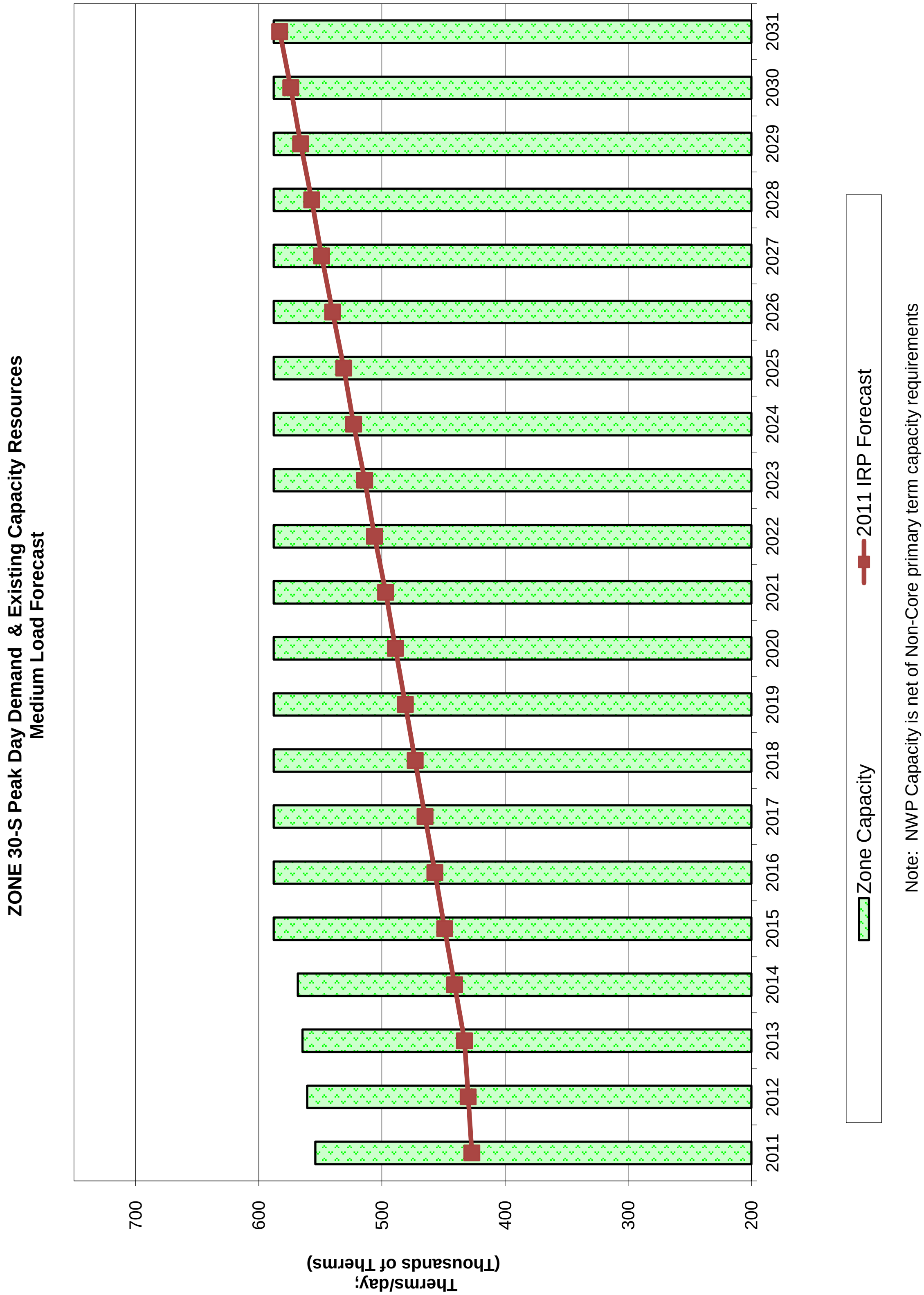

ZONE 11 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
500
400
300
200
100
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

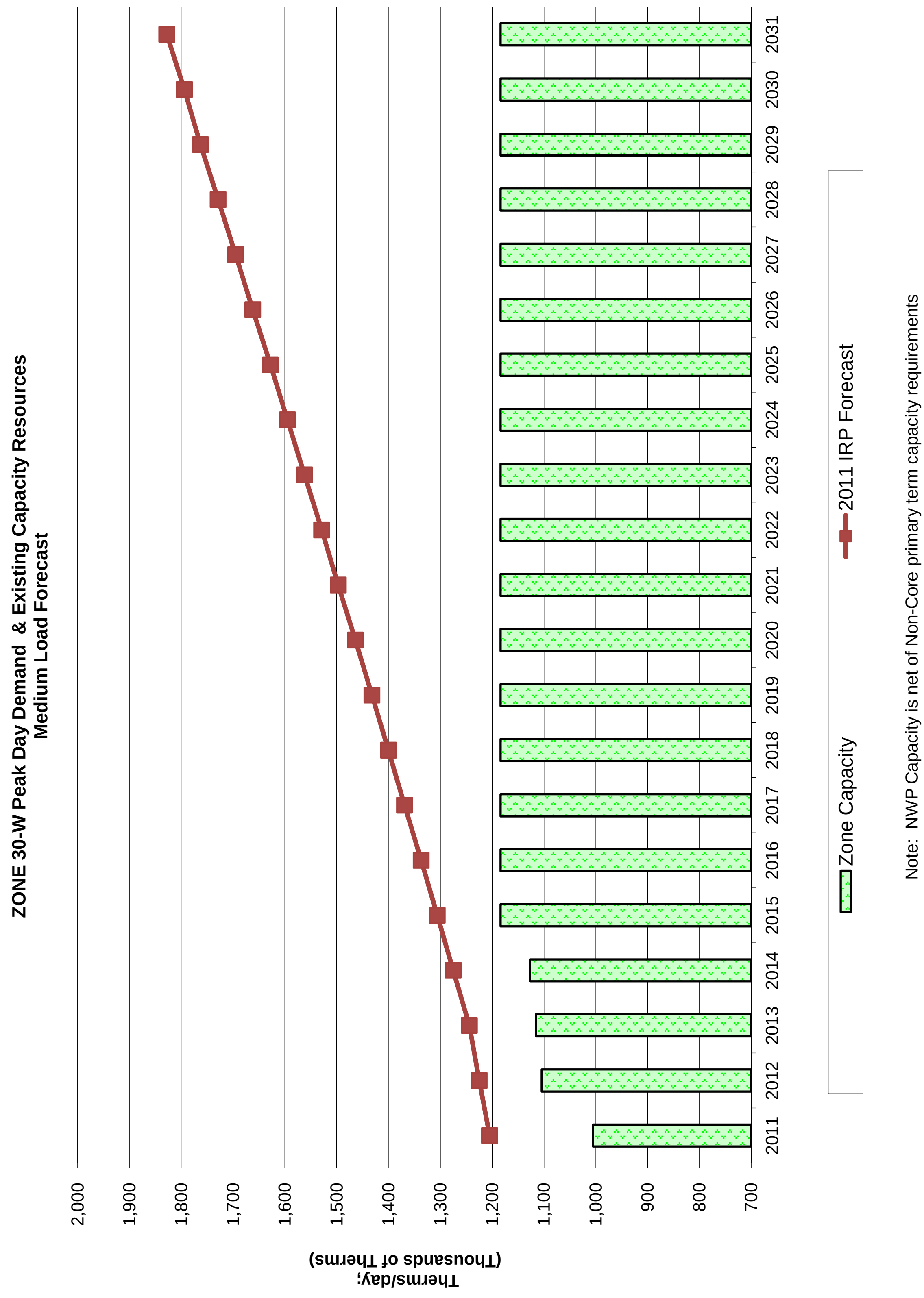


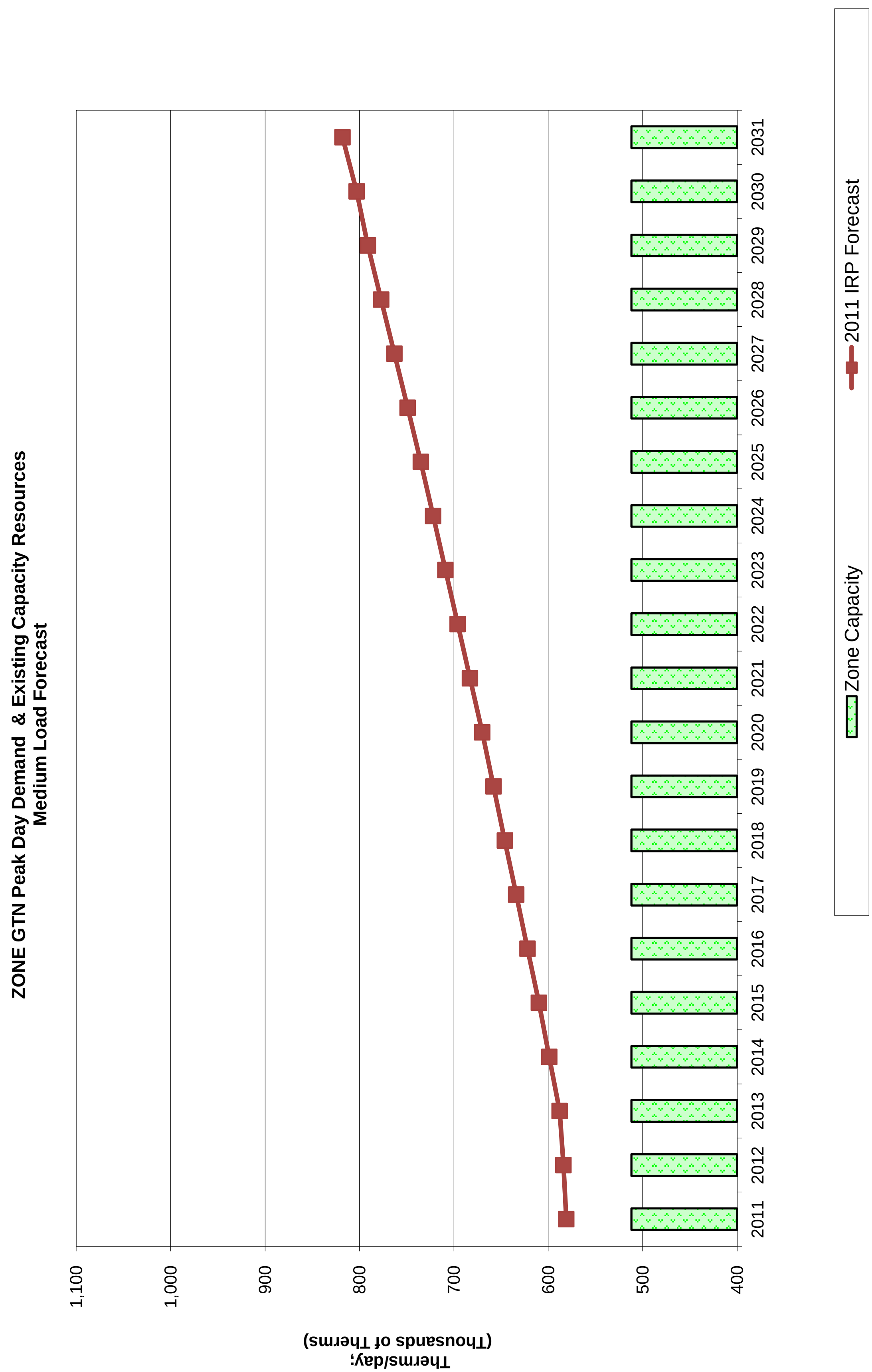
ZONE 20 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
950
850
750
650
550
450
350
250
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

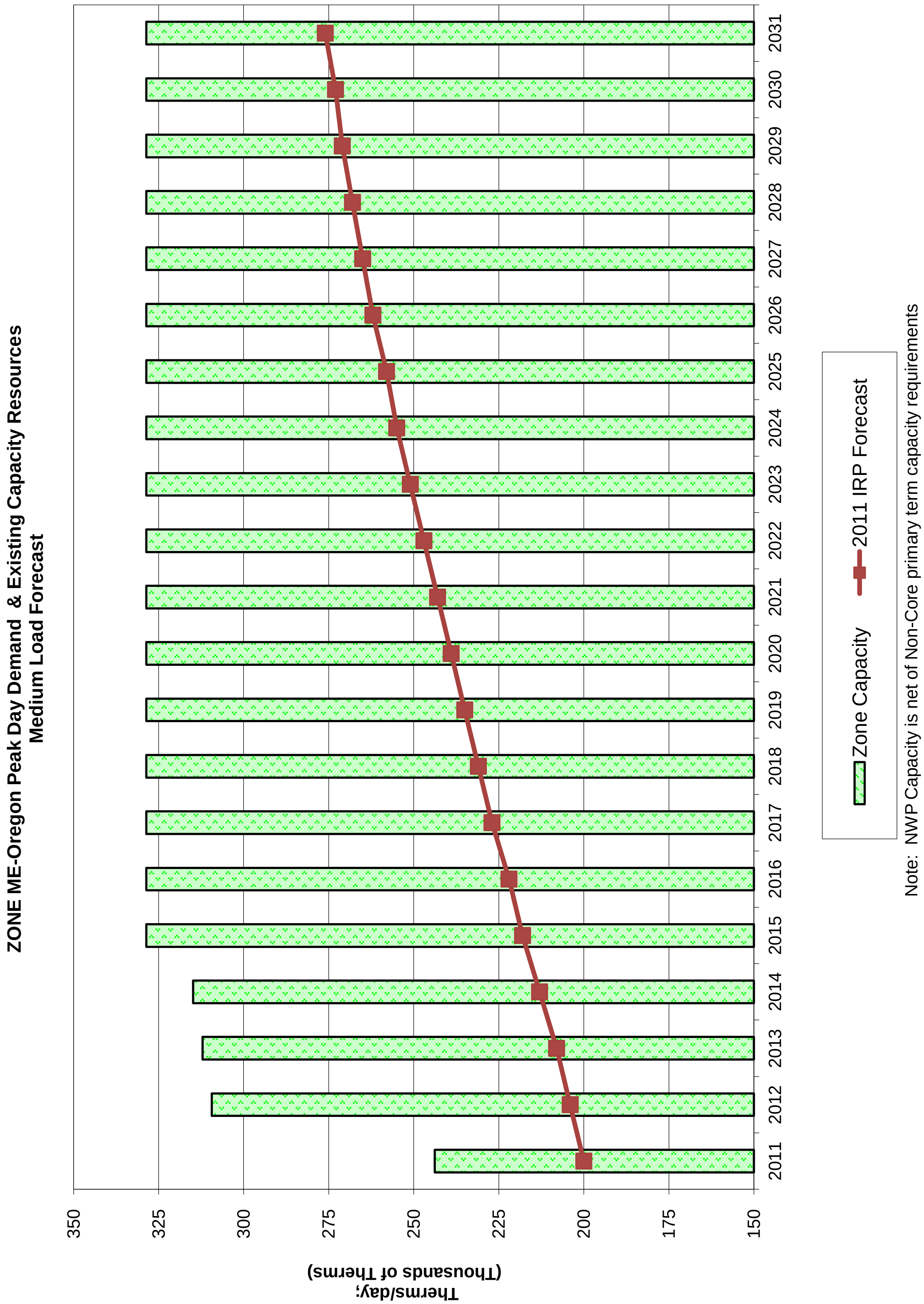

ZONE 24 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
200
150
100
50
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

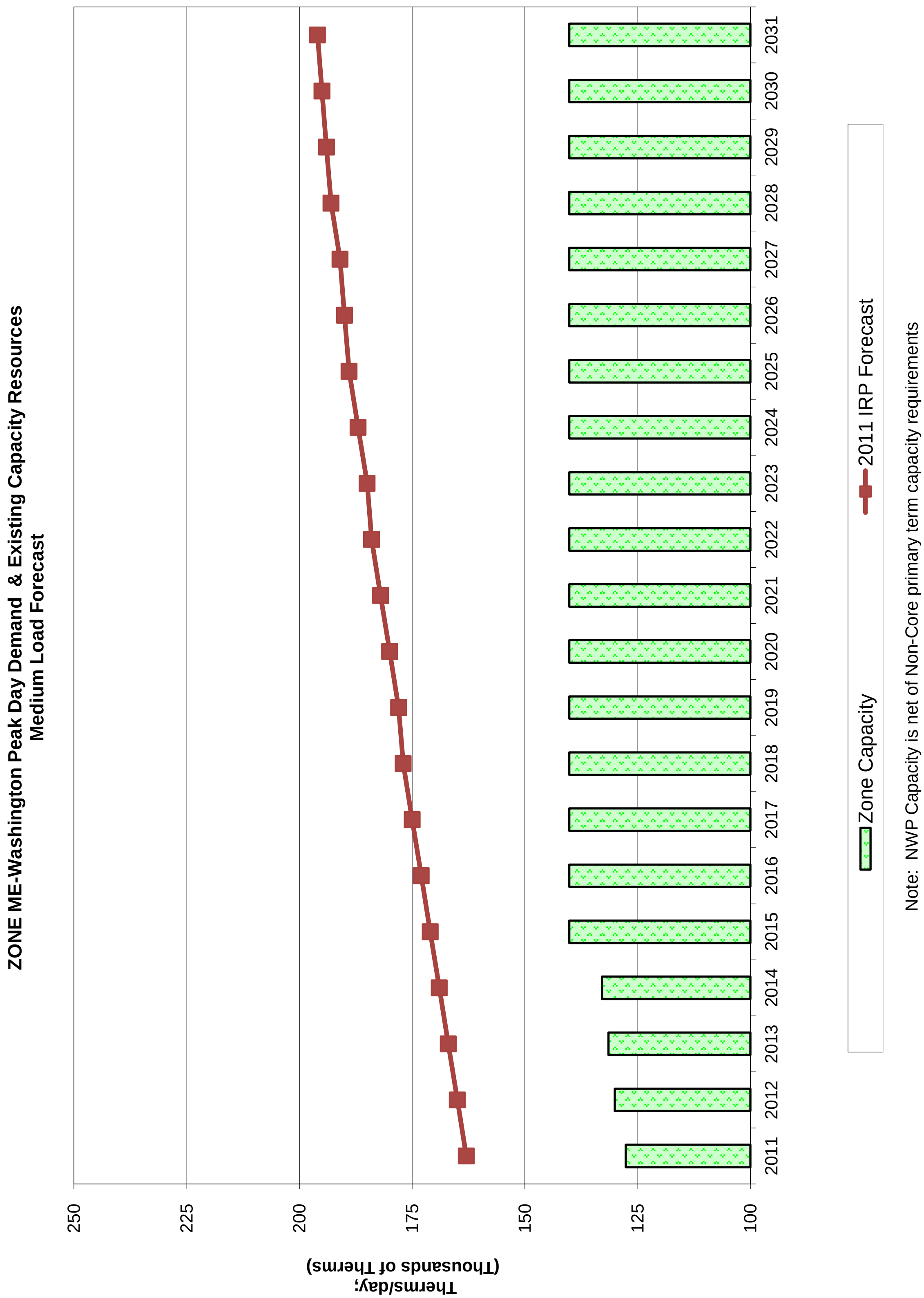

ZONE 26 Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
600
500
400
300
200
100
-
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE 30-S Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
700
600
500
400
300
200
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE 30-W Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

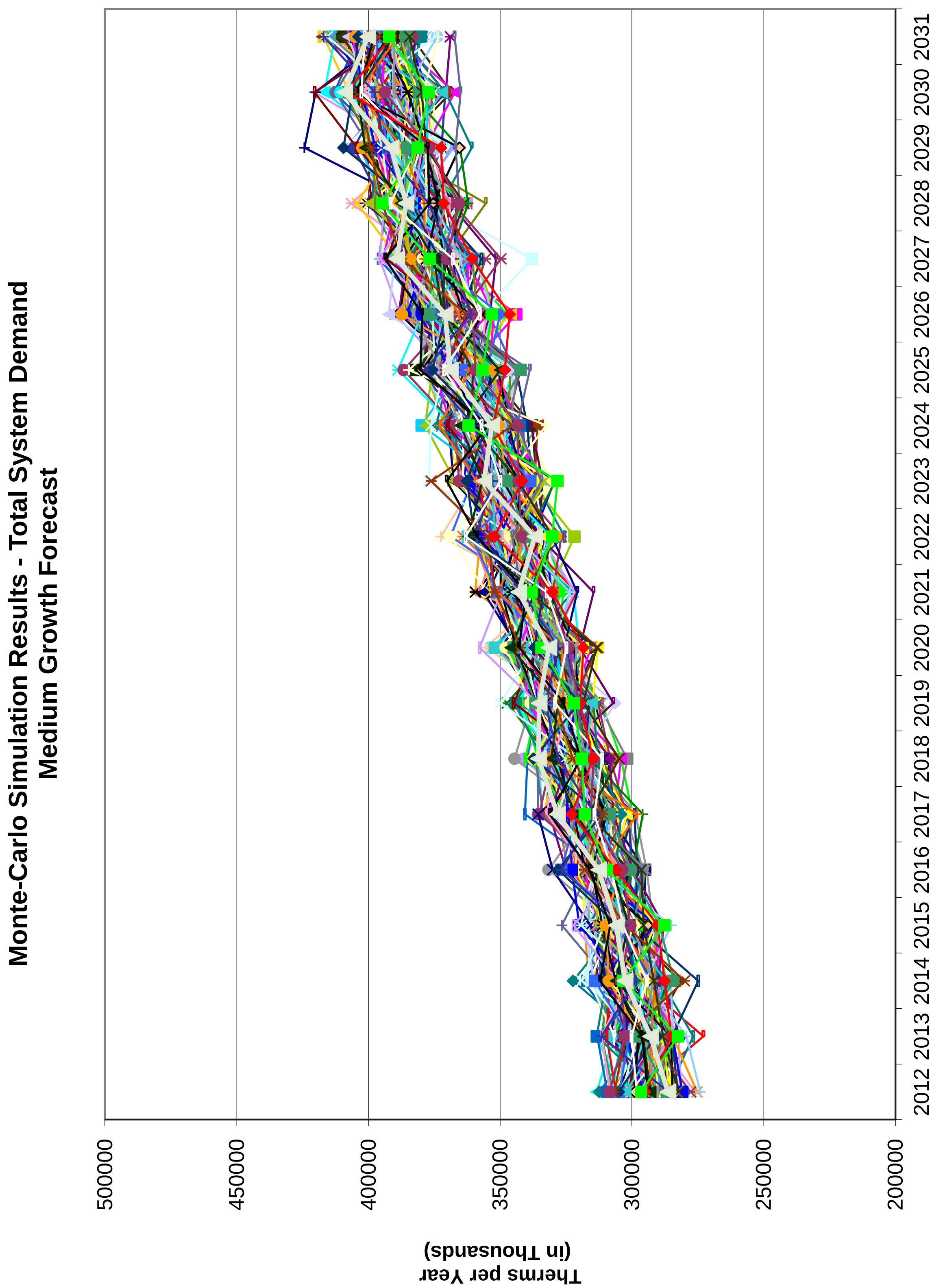

ZONE GTN Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
1,100
1,000
900
800
700
600
500
400
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast


ZONE ME-Oregon Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
350
325
300
275
250
225
200
175
150
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements


ZONE ME-Washington Peak Day Demand & Existing Capacity Resources
Medium Load Forecast
Therms/day;
(Thousands of Therms)
250
225
200
175
150
125
100
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Zone Capacity
2011 IRP Forecast
Note: NWP Capacity is net of Non-Core primary term capacity requirements

Appendix G-1

Weather Uncertainty Analysis & Impact on Annual Loads


Monte-Carlo Simulation Results - Total System Demand
Medium Growth Forecast
Therms per Year
(in Thousands)
500000
450000
400000
350000
300000
250000
200000
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
High Growth-Cold Weather	311,605	313,519	319,994	324,372	332,658	341,318	348,119	353,238	362,048	369,064
HighGrowth-Avg weather	300,762	304,145	309,251	315,437	322,849	330,266	336,808	343,372	350,965	358,509
Medium 95%-Max	309,663	311,037	316,175	319,348	326,354	333,956	339,326	343,420	350,880	356,573
Medium-Avg Weather	298,887	301,736	305,560	310,551	316,731	323,142	328,301	333,829	340,139	346,374
Medium expected high	301,659	303,180	307,978	311,877	318,494	325,237	330,932	335,490	341,961	348,258
Medium Load-Expected	293,656	295,323	299,780	304,406	310,633	316,518	322,539	327,560	333,041	339,944
Medium Expected Low	285,652	287,467	291,583	296,934	302,773	307,798	314,145	319,630	324,122	331,629
Medium 95%-Min	277,649	279,610	283,386	289,463	294,912	299,079	305,752	311,699	315,203	323,314
Low Growth-Average Weather	295,999	297,532	300,764	305,019	310,410	315,745	320,195	324,613	329,935	335,139

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
High Growth-Cold Weather	377,303	384,719	393,065	401,537	407,936	417,040	425,725	431,446	442,527	446,957
HighGrowth-Avg weather	365,246	371,740	379,756	389,006	396,263	403,745	412,136	419,888	427,466	435,251
Medium 95%-Max	362,956	368,806	375,609	382,940	387,175	394,281	400,909	405,141	413,874	416,430
Medium-Avg Weather	351,358	356,364	362,891	370,990	376,096	381,712	388,112	394,288	399,789	405,524
Medium expected high	354,055	359,424	366,374	373,427	378,368	384,486	391,377	395,686	403,032	406,744
Medium Load-Expected	345,153	350,043	357,138	363,914	369,561	374,691	381,845	386,230	392,190	397,057
Medium Expected Low	336,251	340,661	347,903	354,400	360,754	364,896	372,313	376,775	381,348	387,370
Medium 95%-Min	327,349	331,279	338,668	344,887	351,947	355,101	362,780	367,320	370,507	377,683
Low Growth-Average Weather	339,527	343,636	349,069	355,531	360,120	364,845	370,297	375,105	379,687	384,367

Draw	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	286,560	285,833	296,696	306,322	300,326	306,097	320,239	336,173	331,257	350,913	342,228	347,660	361,889
2	299,482	295,907	305,852	305,134	306,412	323,306	335,207	335,246	322,712	353,309	345,292	361,683	365,105
3	303,990	313,496	293,554	311,093	310,480	333,872	335,623	324,234	353,102	331,176	344,121	362,570	343,498
4	288,121	284,952	291,673	303,599	307,063	305,420	319,492	333,117	345,283	351,394	336,710	356,983	365,098
5	289,702	297,717	289,032	299,377	320,613	315,085	314,440	329,419	338,111	340,915	342,962	358,324	353,237
6	303,164	297,424	312,410	311,242	309,587	324,350	319,541	330,649	342,670	328,554	347,468	361,215	352,427
7	293,451	293,685	291,625	306,432	303,592	324,763	310,587	322,151	332,299	338,603	351,983	356,582	341,751
8	289,880	290,079	306,788	297,836	308,495	321,500	321,851	327,194	340,917	347,744	331,296	358,413	342,868
9	284,162	288,127	288,333	299,359	297,226	310,590	321,651	329,190	322,084	327,397	336,918	357,327	353,819
10	284,670	291,819	295,837	305,367	324,627	315,228	322,004	317,259	348,085	327,939	337,624	343,245	361,783
11	293,846	285,169	299,089	294,455	303,988	313,656	305,154	331,600	319,590	332,797	338,132	331,355	340,338
12	295,422	293,006	293,962	293,522	304,488	310,050	318,423	311,283	338,575	330,849	346,265	341,601	353,256
13	309,911	301,652	312,203	319,060	309,082	330,314	321,978	333,341	334,839	348,356	345,819	353,533	363,185
14	295,951	302,209	291,640	315,424	310,998	317,398	341,167	328,533	337,323	350,962	332,326	364,503	365,663
15	303,002	299,976	304,694	307,804	308,593	318,949	321,608	322,857	355,512	332,398	372,488	359,320	350,512
16	294,926	298,968	297,096	297,542	319,236	313,403	330,961	323,715	324,281	337,304	368,783	360,662	356,590
17	295,231	292,591	304,065	291,772	300,021	316,272	311,384	328,422	330,410	321,187	337,098	338,918	348,752
18	304,054	305,708	298,862	311,721	307,082	315,111	311,496	321,615	328,100	346,902	341,368	364,944	371,099
19	295,057	308,985	314,639	309,687	318,682	317,783	316,742	335,905	329,462	343,833	348,553	345,457	353,348
20	290,193	301,733	316,584	317,851	310,830	304,867	327,085	333,257	328,632	359,437	357,515	336,995	358,801
21	306,248	299,536	304,458	302,513	324,248	328,257	328,009	312,033	341,298	331,884	341,527	367,984	354,881
22	286,544	293,019	299,871	309,030	301,380	306,590	324,564	323,696	320,455	330,129	337,135	341,421	364,960
23	294,945	302,751	305,052	306,693	331,669	316,627	344,565	338,162	346,087	344,094	351,904	340,336	362,131
24	302,848	297,538	301,882	310,408	312,107	319,235	330,419	327,432	329,992	344,640	350,114	358,619	350,894
25	293,753	309,615	297,821	298,900	315,606	330,885	319,394	335,935	336,868	349,079	338,509	353,896	351,357
26	279,553	300,912	290,272	308,754	311,729	325,337	322,155	324,293	319,942	337,773	343,400	362,694	370,361
27	288,121	292,960	281,602	303,491	317,998	311,300	322,697	315,786	323,721	333,401	335,104	340,646	343,605
28	284,945	293,289	310,771	305,812	316,102	326,836	329,611	327,001	331,491	349,362	338,465	341,866	363,701
29	296,924	297,903	302,477	308,583	319,161	324,696	334,583	333,297	344,774	338,289	352,347	363,996	365,081
30	282,902	304,306	304,589	294,252	315,556	305,858	319,512	328,806	329,931	334,054	347,040	356,530	363,041
31	296,284	294,126	302,419	311,561	312,905	326,581	333,389	336,379	319,991	359,417	340,967	348,961	371,260
32	293,200	293,783	286,401	306,391	304,982	307,923	317,743	331,922	330,664	325,241	334,894	366,304	368,457
33	290,740	311,051	292,382	294,182	317,277	325,294	332,491	342,061	316,823	345,326	352,398	349,993	367,467
34	290,340	286,826	305,075	304,874	307,405	299,715	304,131	311,515	328,305	325,992	332,528	345,943	343,002
35	289,021	305,432	295,082	313,572	319,830	323,146	318,118	327,254	332,065	341,006	337,153	356,120	352,860
36	306,753	295,899	296,324	317,776	318,921	329,041	328,011	331,839	345,582	348,841	343,182	368,833	363,491
37	297,038	294,141	295,091	306,178	314,892	332,206	323,686	316,428	323,238	341,961	334,989	356,257	365,494
38	313,446	306,642	300,065	302,563	297,278	312,212	333,631	338,322	333,452	344,371	338,163	357,500	370,427
39	296,333	290,268	287,705	300,942	316,164	327,485	311,603	323,692	328,311	341,129	338,031	345,282	344,620
40	303,312	296,937	302,041	308,609	303,484	324,160	330,855	347,317	328,850	339,141	341,747	360,735	351,880
41	286,930	285,849	312,216	305,828	322,816	313,761	315,730	331,456	344,211	353,744	346,524	336,097	356,882
42	286,087	296,917	291,660	296,631	307,244	309,109	309,316	331,811	335,255	335,667	350,645	350,790	358,764
43	294,175	308,310	295,249	299,628	323,115	318,768	335,766	323,110	341,309	351,533	355,787	358,620	368,712
44	291,406	286,646	297,875	301,506	302,908	326,043	318,255	331,625	331,183	349,104	325,633	336,817	368,058
45	278,645	300,874	303,389	303,062	294,858	315,862	319,854	329,761	331,315	343,829	360,071	350,967	368,543
46	286,288	283,606	305,342	307,106	311,467	305,364	301,805	312,969	321,223	331,302	339,081	353,363	350,956
47	281,591	291,250	308,189	314,777	300,763	324,899	318,014	319,450	329,668	339,799	351,859	333,531	372,737

Draw	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
48	300,223	298,373	299,233	302,112	316,473	320,179	326,685	328,654	346,034	342,729	362,481	353,127	358,154
49	290,446	296,708	292,938	313,239	316,157	313,965	331,282	315,195	327,253	335,019	347,406	347,534	369,113
50	310,482	290,747	298,709	312,150	323,741	311,048	329,555	321,281	328,958	347,329	338,706	352,380	375,646
51	290,931	304,217	299,228	312,915	309,098	316,880	311,625	329,648	340,433	340,142	351,050	351,524	371,100
52	294,771	286,083	305,469	301,543	296,072	307,383	328,238	331,871	318,051	357,685	351,104	353,383	356,031
53	295,253	302,713	318,544	301,662	311,013	340,630	339,587	336,667	332,844	329,519	355,047	360,165	372,053
54	295,897	292,231	301,700	299,324	300,789	319,050	319,307	306,337	331,427	327,126	341,521	339,237	351,410
55	294,227	289,905	301,042	295,278	294,977	308,946	308,882	314,074	338,454	336,355	331,767	349,801	351,702
56	287,951	290,713	300,142	291,991	306,249	306,775	322,165	320,034	326,564	334,776	339,240	347,174	346,141
57	286,839	287,333	304,979	295,872	303,908	321,411	315,620	319,653	332,587	344,921	345,621	356,537	351,008
58	285,562	284,355	302,218	299,482	311,122	318,589	314,814	323,690	319,887	322,231	344,146	343,089	352,363
59	304,754	281,960	288,105	298,769	322,232	311,526	315,465	334,205	330,995	335,019	344,201	354,104	361,386
60	306,510	284,226	313,602	312,252	313,368	321,791	313,342	326,080	328,550	341,439	353,118	364,425	359,261
61	289,505	306,509	295,338	300,813	307,316	315,433	327,542	313,144	340,696	322,466	346,594	343,126	370,560
62	282,948	302,277	304,273	314,299	310,730	313,131	318,520	335,847	338,237	330,451	333,050	355,679	361,228
63	297,168	298,269	299,218	308,036	304,409	314,835	332,203	326,448	326,150	337,250	357,735	347,662	356,566
64	277,543	298,691	296,571	298,055	299,328	315,089	316,758	324,570	341,253	329,261	341,165	346,837	367,310
65	299,070	294,976	292,878	299,734	318,970	309,542	329,075	338,264	334,726	338,836	347,810	347,935	353,787
66	288,954	296,152	297,800	299,867	301,399	312,185	331,288	324,438	333,276	333,284	345,986	349,545	361,874
67	296,378	290,273	295,308	306,497	324,638	320,800	319,144	331,531	336,143	347,916	346,797	364,338	362,569
68	280,431	290,836	296,646	301,808	307,683	317,366	321,561	323,629	334,058	341,312	342,709	341,526	358,279
69	300,119	304,423	299,334	300,039	318,730	318,981	321,466	335,325	327,546	343,983	355,328	349,931	361,182
70	280,126	292,340	292,006	302,654	323,294	316,358	309,770	332,802	322,271	333,098	342,045	338,623	341,484
71	289,043	300,060	295,884	298,911	309,133	307,773	319,647	330,224	336,477	349,598	338,904	358,445	371,309
72	285,522	285,275	298,574	301,596	319,572	314,977	310,949	330,411	331,175	340,437	344,861	353,048	359,722
73	298,127	304,122	295,024	297,992	317,340	303,964	329,872	318,444	330,174	331,287	321,810	338,424	358,587
74	292,993	290,508	297,426	294,345	310,416	323,426	311,711	327,246	345,426	333,067	344,061	360,849	351,884
75	280,761	300,401	294,538	313,236	315,155	306,544	321,247	330,190	325,483	345,375	339,799	362,028	357,571
76	295,952	287,830	297,732	308,598	316,865	313,493	316,675	330,141	345,114	342,763	364,093	348,235	359,245
77	300,793	299,604	299,012	307,328	299,881	335,654	335,728	330,887	338,125	352,962	357,559	359,576	371,008
78	290,915	293,450	289,704	302,945	295,607	302,683	325,663	320,960	332,008	327,316	335,327	352,896	334,750
79	285,809	295,994	305,402	307,420	305,912	299,640	320,827	323,640	313,483	344,580	339,979	334,742	356,277
80	305,912	293,991	302,134	300,802	297,641	331,114	324,968	323,628	324,958	333,709	352,629	356,641	354,264
81	288,198	296,680	310,719	309,135	311,384	318,640	319,650	333,699	331,988	342,377	346,272	349,710	362,807
82	294,161	292,725	298,429	311,155	308,066	301,609	320,499	332,227	316,408	338,957	332,883	336,045	337,913
83	292,864	286,737	302,769	308,161	316,899	304,207	319,594	337,095	323,977	340,273	344,002	336,984	335,772
84	295,050	302,932	299,780	313,378	299,628	326,476	335,788	333,475	336,448	345,632	333,215	344,361	361,206
85	287,382	286,801	291,922	303,101	300,127	301,237	324,298	325,925	340,117	339,122	341,133	362,554	349,811
86	290,515	305,532	294,264	306,221	310,927	310,872	331,972	322,587	345,450	344,566	360,195	352,540	358,856
87	287,388	283,789	307,075	298,320	307,600	318,226	321,388	335,155	331,003	335,538	339,149	348,877	373,024
88	297,901	272,883	297,599	304,221	323,066	305,348	327,193	321,104	332,073	321,060	341,547	341,694	349,903
89	301,237	307,376	297,576	302,596	305,753	316,304	340,454	335,900	347,290	334,861	363,596	340,511	361,179
90	284,157	295,675	297,562	291,452	304,207	317,850	318,337	328,381	322,667	333,787	337,500	329,473	361,027
91	301,677	283,623	297,742	310,087	299,109	315,870	308,555	314,944	312,914	336,665	335,098	356,215	347,541
92	293,433	291,010	289,662	290,966	315,906	306,494	304,212	323,628	333,368	337,919	357,927	336,981	342,611
93	294,106	300,039	303,531	300,505	303,441	322,310	316,804	326,460	323,613	350,278	346,239	352,523	355,888
94	295,652	302,566	303,544	302,228	316,950	309,291	310,748	322,275	331,015	332,807	351,793	353,291	351,479

Draw	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
95	301,577	296,452	309,203	313,527	314,707	332,494	330,927	322,084	332,643	349,494	341,478	351,043	355,605
96	304,623	296,384	290,983	311,707	306,463	317,785	325,946	336,120	349,901	333,766	350,372	353,608	358,023
97	289,682	292,693	295,174	304,109	315,193	301,540	311,402	322,037	329,292	333,269	349,876	339,860	346,742
98	287,411	292,903	305,196	298,217	316,151	309,467	317,887	340,997	330,527	347,052	343,069	352,752	355,689
99	312,399	297,515	322,371	305,279	310,935	317,957	324,487	331,115	340,709	349,311	343,846	355,242	374,264
100	292,631	306,844	303,960	312,718	306,035	311,366	334,994	330,968	339,201	342,375	335,413	337,732	363,867
101	284,163	290,407	301,024	313,586	312,075	315,493	333,974	344,777	334,951	338,099	360,876	353,241	358,492
102	303,213	304,676	300,145	302,836	310,829	301,729	325,013	324,360	328,287	349,792	336,782	356,527	364,342
103	294,943	296,292	304,217	302,258	300,632	313,165	315,874	329,656	350,995	339,072	344,801	332,902	351,569
104	289,259	292,985	289,654	303,319	305,313	327,201	329,941	325,979	344,606	355,274	368,988	350,030	368,377
105	305,321	299,836	306,024	306,537	313,052	329,820	323,158	335,871	333,402	354,110	342,593	354,334	366,032
106	286,760	299,986	299,005	295,472	306,694	317,985	329,781	307,044	319,781	314,567	335,153	333,910	338,265
107	291,508	302,159	301,623	309,607	305,310	325,401	324,243	333,922	333,504	352,662	360,622	344,183	361,101
108	292,988	295,868	302,496	312,243	308,855	316,032	330,764	318,076	333,204	338,870	354,131	352,666	369,760
109	295,293	296,896	284,292	317,494	302,981	318,568	309,998	325,931	327,116	335,586	357,035	349,323	345,763
110	290,854	308,090	304,640	304,999	301,188	321,294	323,132	336,724	343,172	356,285	347,795	367,686	369,538
111	290,390	285,182	291,263	300,456	310,396	311,037	317,966	322,455	315,667	348,035	342,353	338,798	341,682
112	286,937	296,624	294,648	299,410	309,711	304,669	318,159	313,635	330,427	341,213	343,803	352,352	359,158
113	307,432	304,077	302,485	290,795	318,123	318,361	326,504	326,207	345,042	344,716	346,105	349,426	362,034
114	293,001	308,810	308,903	306,492	325,003	331,280	320,409	338,955	344,836	345,594	353,064	351,763	361,549
115	298,185	292,904	296,311	302,259	318,413	313,186	311,050	325,540	343,955	345,098	342,271	340,128	348,422
116	286,497	276,744	288,971	298,819	294,645	315,587	324,964	333,116	334,107	343,741	344,586	341,369	341,067
117	284,385	297,942	289,520	316,053	303,709	312,829	329,989	323,115	332,622	342,263	344,536	364,222	358,692
118	296,257	286,079	299,817	311,683	305,377	325,982	319,572	342,115	342,247	347,497	350,319	351,190	379,797
119	296,187	294,659	297,942	306,340	314,515	314,792	328,194	324,456	320,530	343,688	344,424	354,856	352,827
120	292,131	295,982	283,174	306,660	302,302	310,924	310,507	332,484	338,036	336,731	334,060	344,148	355,659
121	282,260	304,330	295,187	310,523	307,264	308,149	320,637	330,584	319,186	345,121	339,912	351,630	354,679
122	288,241	284,296	285,273	308,158	310,730	312,010	326,473	322,697	326,577	332,552	343,853	351,997	367,886
123	276,067	291,637	297,021	306,073	309,679	313,176	312,743	316,551	319,575	338,635	347,682	339,485	358,263
124	281,599	282,288	294,434	290,568	306,164	303,609	320,030	323,519	332,240	321,743	334,508	339,258	345,811
125	294,277	295,672	295,972	312,323	310,517	314,995	334,708	322,463	338,073	349,770	349,836	355,226	360,056
126	289,504	299,046	308,865	300,745	296,190	320,767	331,564	314,391	324,633	336,034	353,358	343,539	358,476
127	293,333	306,836	314,915	315,763	319,075	318,692	335,271	329,723	352,034	330,465	362,286	346,283	359,303
128	303,633	298,242	309,422	310,910	314,262	315,591	323,497	343,526	339,976	347,549	345,576	367,174	378,469
129	292,116	295,345	303,149	299,142	315,491	333,641	327,865	321,973	339,104	353,511	357,703	352,051	361,795
130	275,245	284,556	295,518	294,371	324,619	316,253	324,277	337,461	338,741	330,678	338,441	357,005	361,428
131	285,899	290,484	291,394	290,893	310,647	312,353	306,722	331,669	330,975	329,542	347,236	346,349	352,485
132	295,848	298,938	308,812	326,573	315,894	333,695	336,567	323,762	341,222	339,709	339,682	360,939	365,666
133	292,414	303,645	286,909	291,804	294,375	298,650	314,972	324,541	327,649	331,998	356,684	349,979	353,163
134	282,630	284,691	274,833	298,959	297,984	299,009	320,546	326,829	334,428	340,979	333,910	337,988	339,726
135	307,143	311,461	308,763	300,166	306,400	326,377	324,426	325,671	317,451	337,971	352,453	354,710	355,051
136	298,445	284,196	313,578	299,673	315,678	310,606	311,245	321,805	343,711	338,411	342,423	347,506	354,628
137	295,114	284,626	306,758	311,975	300,968	320,920	321,169	331,232	334,210	335,694	330,224	350,384	352,850
138	298,857	303,974	293,811	306,922	315,504	317,279	327,947	322,658	312,849	336,926	339,364	354,993	352,165
139	277,681	293,304	287,674	296,776	313,819	302,051	308,212	312,861	330,289	329,938	326,760	344,795	347,561
140	290,215	293,376	298,730	305,766	314,026	318,063	312,971	327,987	331,973	331,174	342,769	347,487	369,223
141	289,059	286,060	301,141	294,122	315,755	309,482	324,858	320,024	321,886	331,301	337,329	347,209	346,453

Draw	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
142	307,569	306,687	316,125	306,987	318,564	319,112	335,075	321,777	338,148	340,997	356,507	364,158	363,957
143	306,032	309,621	308,423	304,405	314,152	324,503	324,456	336,210	326,121	352,294	354,508	357,958	356,689
144	286,192	288,084	309,016	296,381	314,852	325,525	335,632	341,492	340,962	326,186	337,768	355,265	355,833
145	280,894	284,478	313,707	290,622	316,613	318,713	326,058	328,526	344,841	337,955	357,044	360,647	353,862
146	285,727	284,649	300,644	291,102	306,950	302,033	312,871	320,524	318,637	341,159	333,554	341,912	345,577
147	295,643	298,121	294,848	307,532	322,394	318,223	333,459	336,934	336,094	348,868	345,881	347,627	368,644
148	302,326	301,540	311,454	309,015	315,097	315,699	330,509	343,902	327,640	346,492	343,000	344,609	367,582
149	295,371	297,178	312,204	301,586	320,469	308,777	320,791	321,930	328,504	346,992	343,918	348,676	353,530
150	292,419	296,215	285,497	307,964	299,594	295,926	315,709	321,605	327,815	331,090	340,047	328,990	358,306
151	288,219	284,772	300,248	306,940	305,992	312,735	324,829	318,879	325,661	320,721	330,354	349,674	358,840
152	291,915	288,832	309,054	312,895	307,061	303,416	321,499	319,410	341,779	339,504	342,195	334,715	360,825
153	300,839	300,781	289,997	287,980	299,616	307,014	308,386	322,364	324,147	330,452	343,177	338,094	362,224
154	290,753	313,322	309,688	316,309	304,693	320,258	334,134	344,141	332,570	346,001	350,059	355,765	349,136
155	301,180	300,910	299,081	307,239	311,006	320,413	333,147	329,562	341,083	338,661	347,893	358,259	344,506
156	282,815	288,809	294,551	299,672	294,796	317,581	320,675	321,846	326,959	332,470	343,579	343,863	346,033
157	295,460	286,599	291,989	299,545	315,052	312,567	315,075	326,822	342,367	338,594	353,731	343,632	354,736
158	299,275	292,999	303,093	320,086	310,952	335,192	330,369	335,564	345,353	344,478	344,413	365,608	367,070
159	286,705	292,780	296,939	297,890	308,447	302,655	319,612	323,637	335,059	330,169	343,499	348,188	332,516
160	304,895	299,014	316,946	315,059	305,821	315,996	320,031	328,565	332,755	344,776	345,901	357,359	362,898
161	298,147	304,723	295,443	299,903	304,730	315,258	318,179	315,965	332,028	349,408	345,734	336,681	350,193
162	299,539	289,799	307,449	308,628	304,350	326,544	327,226	335,934	333,490	348,005	339,988	350,076	350,639
163	309,305	313,141	292,491	304,234	304,413	321,283	334,002	321,362	325,161	348,206	346,061	350,035	342,456
164	306,917	288,807	314,318	318,037	314,036	312,543	324,841	329,175	339,990	343,157	348,922	341,767	352,675
165	305,745	295,282	309,675	315,746	330,073	335,565	310,920	337,961	337,337	343,385	350,223	340,966	346,922
166	293,593	292,480	296,874	312,488	318,061	315,828	327,640	339,044	342,513	335,534	336,349	353,601	358,063
167	285,708	288,416	293,470	310,480	321,451	320,308	337,445	325,220	326,811	345,290	349,250	335,156	356,112
168	301,836	295,322	296,981	302,729	312,736	322,576	324,460	325,038	328,968	339,285	330,699	351,540	352,471
169	296,576	302,198	308,227	305,683	311,725	331,251	323,970	321,689	337,223	332,570	344,227	358,422	351,895
170	301,426	296,355	300,524	299,788	314,896	326,250	316,858	344,906	335,871	345,043	334,492	354,105	369,898
171	294,893	303,460	298,054	302,313	306,084	304,056	313,027	314,523	331,432	338,608	344,414	344,664	374,094
172	295,556	302,004	301,835	320,005	322,744	324,035	326,811	320,616	335,044	343,743	348,321	352,231	357,021
173	288,197	295,270	287,064	303,490	309,431	309,388	318,408	326,526	328,798	334,618	343,696	342,951	348,619
174	300,579	284,152	319,048	310,529	316,002	328,266	320,844	349,809	337,127	342,637	345,004	377,094	376,320
175	303,682	298,006	295,725	319,315	314,522	317,986	325,615	336,291	340,854	350,411	337,895	350,090	349,904
176	290,279	291,336	308,184	299,053	310,154	321,475	320,770	338,467	347,926	337,318	347,878	330,202	364,841
177	274,007	279,298	294,931	285,077	312,789	307,091	318,001	330,593	330,025	323,439	343,821	348,539	348,200
178	308,367	311,460	301,517	304,145	317,619	332,141	330,062	323,144	346,027	336,606	349,365	354,396	353,861
179	296,874	285,669	305,531	322,164	304,265	318,715	314,279	335,894	357,781	349,558	345,314	346,621	361,576
180	298,907	297,569	305,980	293,981	317,778	321,933	328,396	336,281	344,003	349,399	343,647	342,570	356,143
181	304,770	301,095	314,005	300,866	326,817	320,956	331,861	330,464	330,547	351,170	360,860	338,556	356,671
182	302,534	288,220	303,024	304,676	303,556	314,589	317,277	315,342	341,558	346,342	351,792	353,353	352,479
183	290,273	284,030	295,690	313,347	312,529	321,372	323,722	328,490	324,898	338,905	344,324	333,145	345,420
184	284,575	285,085	306,114	311,160	315,207	309,612	319,764	332,811	327,727	345,532	336,731	348,927	359,039
185	284,540	296,678	308,696	309,864	304,881	320,551	331,087	325,724	335,996	341,970	328,814	347,487	350,619
186	293,579	292,654	291,198	304,399	312,471	297,923	331,556	326,028	326,609	350,970	340,509	358,999	372,966
187	289,728	286,390	291,688	300,083	310,769	321,248	317,850	320,895	325,910	342,138	345,346	334,352	343,618
188	290,539	295,248	292,053	299,694	318,902	313,314	317,175	323,016	320,841	342,664	361,629	350,664	365,654

Draw	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
189	304,990	291,048	304,458	305,449	327,998	311,417	337,360	319,901	336,929	333,707	359,763	362,562	355,197
190	286,679	297,117	284,033	289,550	300,454	308,413	315,144	336,593	344,873	339,186	340,609	346,781	353,411
191	293,033	295,791	306,065	301,272	307,273	321,355	330,571	328,095	346,013	336,707	362,042	356,728	365,021
192	282,313	288,199	291,634	295,626	296,413	316,314	304,824	318,423	313,425	338,693	330,106	343,026	360,900
193	306,615	302,492	280,086	302,397	317,764	311,124	322,431	328,911	342,217	351,836	354,729	376,187	345,261
194	308,480	302,674	304,104	300,596	303,663	315,672	314,576	320,198	324,122	332,498	341,918	342,968	343,386
195	286,196	311,586	298,459	303,142	326,706	313,943	327,969	332,776	327,885	341,577	359,218	352,866	359,910
196	293,670	296,268	312,067	308,232	316,034	331,231	319,363	325,932	342,794	340,121	358,823	370,284	354,637
197	298,101	300,141	294,337	303,423	307,772	314,225	311,251	329,164	324,841	332,333	363,094	349,919	357,048
198	295,006	285,040	287,577	290,278	306,094	322,926	314,698	319,668	318,431	330,226	352,082	341,648	352,673
199	296,508	282,524	303,336	287,698	309,504	317,883	319,023	322,035	334,327	338,071	330,283	328,240	361,979
200	286,317	292,949	302,620	305,970	312,620	328,229	335,446	335,192	331,514	342,963	336,830	356,155	353,203
Max	313,446	313,496	322,371	326,573	331,669	340,630	344,565	349,809	357,781	359,437	372,488	377,094	379,797
Min	274,007	272,883	274,833	285,077	294,375	295,926	301,805	306,337	312,849	314,567	321,810	328,240	332,516
Average	293,656	295,323	299,780	304,406	310,633	316,518	322,539	327,560	333,041	339,944	345,153	350,043	357,138

Draw	2025	2026	2027	2028	2029	2030	2031	20 Yr Total
1	370,414	370,483	373,536	370,047	372,861	388,555	401,280	6,819,369
2	356,802	373,527	378,277	364,822	396,898	389,491	391,256	6,905,720
3	370,219	377,069	384,842	372,310	388,432	387,139	413,139	6,953,959
4	373,530	365,488	366,260	372,706	389,625	370,638	368,902	6,796,054
5	366,787	358,244	369,422	373,155	378,084	383,226	397,189	6,815,041
6	373,959	361,523	376,903	377,996	404,353	383,090	416,467	6,934,991
7	366,764	365,603	366,862	377,781	389,873	395,675	409,879	6,839,941
8	370,020	368,490	381,635	379,288	395,369	408,351	395,406	6,883,418
9	362,488	363,432	374,452	372,684	366,613	383,863	390,077	6,729,793
10	366,435	375,653	394,900	383,504	371,366	387,280	394,235	6,848,862
11	365,547	365,216	361,921	393,366	378,571	394,459	398,249	6,746,498
12	375,412	381,728	359,293	384,025	367,483	393,258	378,111	6,770,012
13	375,050	362,359	376,583	406,493	382,679	405,185	400,260	6,991,882
14	373,120	375,650	369,926	396,570	382,437	385,255	403,588	6,940,646
15	373,232	369,102	384,209	395,169	397,278	398,169	394,970	6,969,843
16	368,866	378,314	372,254	385,171	386,781	393,352	394,606	6,902,811
17	350,886	375,882	360,558	381,852	378,035	380,275	399,565	6,743,176
18	378,321	375,359	382,272	370,268	391,244	388,406	388,645	6,902,577
19	357,101	362,619	386,163	394,289	389,233	407,303	416,974	6,951,815
20	369,237	370,384	381,216	377,890	393,918	408,245	403,163	6,947,832
21	360,871	384,929	385,355	387,455	384,291	379,477	394,690	6,919,941
22	351,414	373,364	362,824	384,390	383,145	394,370	386,879	6,775,182
23	365,293	358,707	385,013	391,139	390,310	384,685	413,759	6,973,922
24	376,622	382,776	367,743	385,441	373,647	401,441	399,186	6,922,981
25	357,514	385,580	388,161	399,229	383,708	396,243	380,270	6,922,323
26	358,515	371,295	380,865	369,947	385,876	390,030	392,942	6,846,644
27	354,849	358,067	372,915	387,087	388,802	368,580	383,593	6,724,326
28	366,045	375,350	382,387	388,189	383,047	402,631	406,956	6,923,856
29	372,471	376,174	369,941	384,380	408,649	389,952	417,562	7,001,240
30	380,574	374,621	392,976	381,216	372,222	370,830	388,075	6,846,891
31	357,010	369,562	377,577	400,605	388,758	398,491	391,470	6,937,714
32	353,759	374,683	375,404	381,292	391,542	390,173	380,779	6,815,537
33	350,325	382,752	375,116	386,279	396,160	385,839	399,150	6,913,104
34	359,202	347,386	365,924	382,339	391,564	380,498	396,174	6,708,740
35	373,520	373,358	366,984	385,327	384,493	393,686	407,714	6,895,741
36	367,030	369,371	359,910	391,664	398,630	401,205	390,326	6,972,630
37	362,555	343,903	371,247	372,801	380,166	382,622	389,671	6,804,564
38	361,034	368,316	379,027	389,096	389,443	416,707	412,697	6,964,395
39	379,276	361,481	367,232	381,638	380,290	400,936	401,846	6,824,264
40	375,366	372,224	378,248	386,819	381,189	404,195	399,889	6,936,998
41	372,877	364,501	386,018	381,724	383,114	391,281	415,855	6,907,414
42	351,696	363,281	363,483	378,452	378,988	375,557	391,144	6,762,498
43	355,716	388,565	385,561	386,518	387,823	402,904	391,180	6,972,349
44	365,605	365,568	361,892	383,480	383,645	390,677	401,798	6,819,722
45	379,240	379,106	390,023	388,203	382,907	396,983	410,942	6,928,433
46	358,642	377,643	376,343	372,464	378,548	392,185	413,155	6,778,854
47	363,316	373,089	366,954	378,773	380,456	394,843	409,406	6,853,360

Draw	2025	2026	2027	2028	2029	2030	2031	20 Yr Total
48	359,473	373,438	390,461	392,480	400,539	398,138	397,504	6,966,491
49	357,079	357,463	378,439	391,868	378,291	379,690	393,089	6,832,174
50	359,600	367,032	375,832	384,581	378,753	400,845	395,619	6,902,993
51	346,054	367,794	374,119	401,314	386,533	392,540	391,909	6,889,055
52	371,231	385,465	370,638	393,123	376,497	402,222	407,567	6,894,428
53	357,635	377,246	396,064	393,115	392,118	412,935	403,767	7,028,578
54	367,362	362,469	375,507	376,271	380,050	381,271	412,980	6,781,268
55	354,443	360,702	361,049	394,052	373,936	408,942	392,982	6,761,517
56	351,035	367,899	368,580	374,871	378,504	367,188	391,154	6,719,147
57	365,255	368,900	365,851	386,225	375,528	400,344	393,291	6,821,679
58	344,833	376,670	363,598	389,004	379,975	390,581	387,251	6,753,460
59	354,999	364,097	384,598	379,991	382,151	375,237	394,568	6,818,361
60	379,759	363,256	382,540	398,892	400,555	404,435	402,170	6,969,572
61	359,651	370,474	384,804	372,456	360,789	370,740	397,545	6,795,501
62	359,476	365,064	363,890	374,944	379,535	397,754	413,820	6,855,154
63	347,940	374,523	391,625	378,371	383,228	390,873	398,747	6,871,256
64	357,265	357,554	337,957	375,699	379,103	383,341	402,494	6,745,846
65	359,951	361,972	395,541	388,925	395,825	396,962	401,309	6,906,086
66	364,458	367,717	372,764	374,616	396,085	390,315	391,049	6,833,051
67	368,377	374,986	383,618	386,504	375,467	388,702	395,283	6,915,269
68	367,842	375,963	379,160	384,392	392,756	399,459	395,840	6,853,254
69	362,303	388,152	395,776	393,878	384,384	420,649	391,725	6,973,253
70	351,390	370,185	365,677	389,021	383,350	385,642	383,071	6,755,209
71	344,675	354,269	372,196	376,697	385,906	392,493	385,208	6,816,853
72	359,818	361,006	391,754	380,199	382,306	393,586	393,215	6,838,002
73	356,856	352,679	358,234	384,352	379,672	399,417	389,554	6,765,933
74	367,550	345,924	361,393	381,971	402,509	378,786	396,762	6,818,252
75	365,659	368,138	385,369	379,871	382,354	394,863	410,461	6,879,043
76	369,646	380,246	376,075	391,973	396,734	389,013	399,065	6,929,489
77	356,617	364,186	368,510	372,036	399,295	412,480	399,640	6,960,880
78	369,505	370,648	373,373	376,890	380,821	378,293	411,074	6,764,827
79	363,510	357,079	381,212	363,635	387,173	376,134	404,958	6,767,405
80	360,042	369,631	384,535	388,320	400,920	402,141	396,133	6,904,113
81	353,252	365,139	386,283	393,151	397,827	389,990	392,656	6,899,557
82	354,633	372,190	376,457	381,841	385,677	386,911	399,264	6,778,049
83	368,725	372,123	374,851	377,849	395,724	371,092	396,590	6,806,289
84	364,857	376,425	369,596	388,807	383,756	391,864	402,421	6,905,096
85	364,715	375,627	383,352	376,584	381,164	398,360	379,545	6,812,879
86	365,959	387,997	384,616	387,791	378,205	390,134	390,449	6,919,649
87	358,813	371,427	367,435	387,606	385,600	404,712	390,226	6,852,350
88	367,232	369,707	376,288	369,419	376,952	396,979	397,601	6,789,771
89	371,005	377,451	383,868	391,470	389,363	404,559	403,763	6,976,111
90	360,491	358,383	373,351	368,299	382,820	377,448	384,859	6,727,725
91	360,577	375,674	379,067	383,403	374,349	379,607	392,173	6,764,888
92	352,321	371,010	374,214	362,880	390,183	399,399	388,854	6,762,979
93	366,275	373,827	387,381	363,330	397,103	406,014	394,659	6,884,324
94	373,610	375,167	377,331	382,498	378,513	381,216	407,266	6,859,242

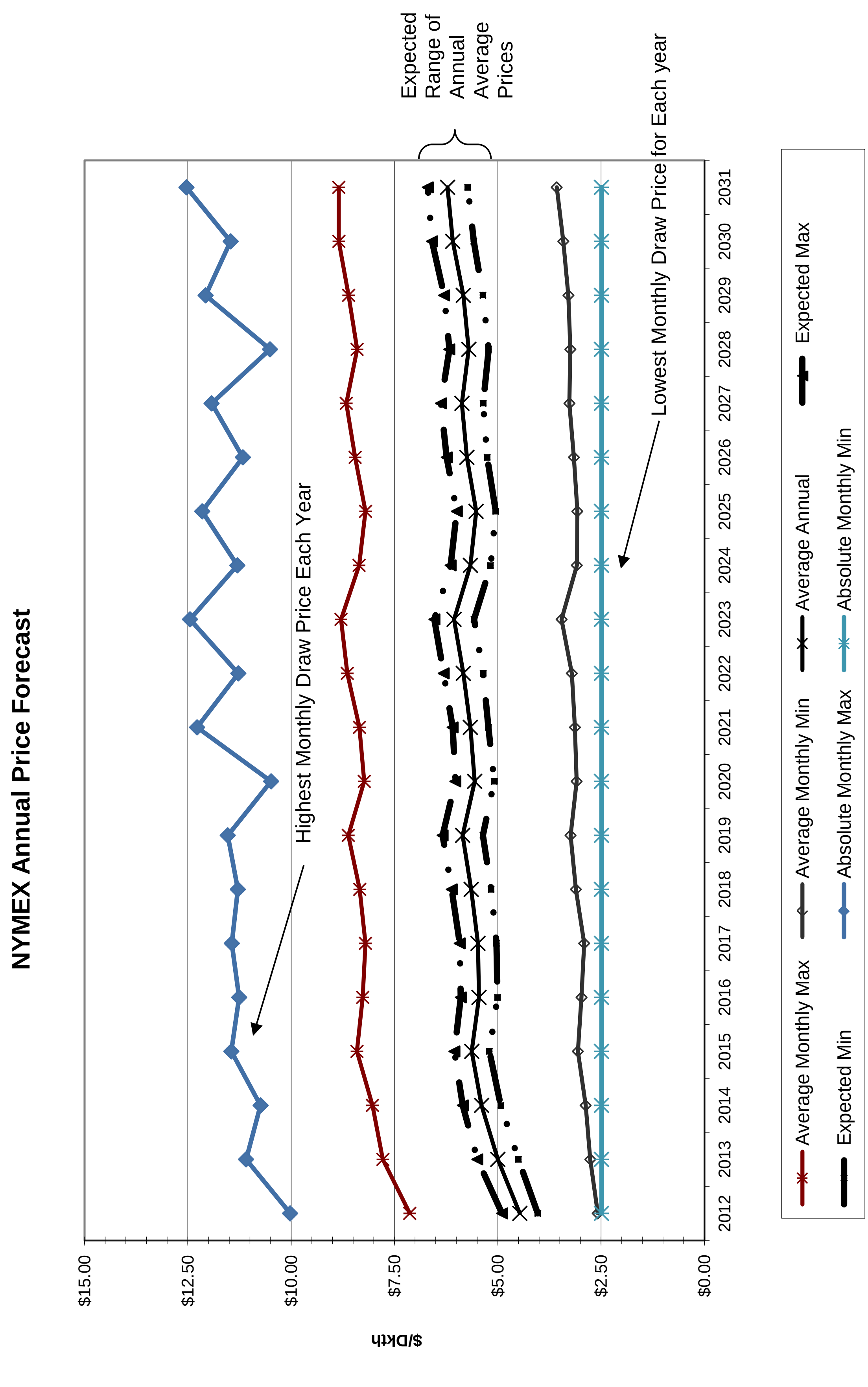
Draw	2025	2026	2027	2028	2029	2030	2031	20 Yr Total
95	351,601	378,373	384,856	378,881	383,478	402,284	395,411	6,926,121
96	372,925	376,220	379,509	382,879	424,321	420,041	393,738	6,985,313
97	346,252	365,100	370,556	355,478	391,436	382,588	397,612	6,739,891
98	369,659	368,117	380,587	381,579	386,133	406,296	407,581	6,897,270
99	368,923	384,988	374,930	398,480	397,375	392,770	399,958	7,002,854
100	364,661	372,934	381,719	386,665	390,973	393,235	409,752	6,918,042
101	373,842	369,476	374,288	395,404	382,808	382,539	386,312	6,905,827
102	369,709	389,888	371,812	391,619	384,499	380,996	401,932	6,898,986
103	367,750	362,614	355,569	387,742	393,059	391,209	392,614	6,826,930
104	348,220	369,604	374,511	374,551	383,232	396,429	412,312	6,909,787
105	362,601	372,970	377,979	386,118	408,928	387,869	409,129	6,975,685
106	360,043	353,868	351,556	369,111	386,688	383,131	382,400	6,671,200
107	364,970	375,942	370,235	388,702	377,348	376,409	414,371	6,913,822
108	366,170	366,620	367,789	387,646	387,263	384,493	384,226	6,870,158
109	345,149	371,837	370,707	384,054	377,360	392,386	414,311	6,822,084
110	370,268	380,581	379,313	388,629	392,831	384,052	407,707	6,978,777
111	354,293	352,339	363,038	370,558	375,489	390,316	393,919	6,715,632
112	356,436	373,526	375,466	363,190	379,377	390,407	396,283	6,785,432
113	375,949	376,618	373,676	390,858	389,782	410,587	395,169	6,953,947
114	378,857	375,756	387,862	386,136	387,488	401,372	406,780	7,013,911
115	370,781	374,993	379,311	366,944	376,817	402,608	395,405	6,844,581
116	358,032	371,144	378,152	370,259	391,681	371,297	386,788	6,751,565
117	358,807	385,381	378,403	373,543	397,764	381,266	403,226	6,878,268
118	365,265	366,358	367,052	393,922	403,010	393,803	414,012	6,961,353
119	363,288	363,961	359,047	385,367	396,452	398,120	381,907	6,841,552
120	368,414	361,666	377,675	365,584	404,261	379,590	390,635	6,790,623
121	357,722	370,963	362,448	399,815	375,685	374,942	396,560	6,807,598
122	359,300	353,044	359,069	387,416	373,577	386,232	373,943	6,753,323
123	357,756	355,436	382,437	371,913	382,178	386,783	397,403	6,760,492
124	357,739	376,077	372,868	361,446	388,958	383,752	400,324	6,716,935
125	371,748	364,068	374,773	378,713	382,899	405,487	404,551	6,916,128
126	354,901	350,006	376,375	377,735	378,369	384,043	385,125	6,783,666
127	379,604	379,433	368,533	383,539	390,388	401,020	397,774	6,984,270
128	375,761	376,628	378,673	399,478	383,134	402,287	408,058	7,021,844
129	362,392	377,276	388,732	404,202	391,315	377,666	417,107	6,971,578
130	355,753	368,821	367,162	381,432	389,946	386,468	399,358	6,827,532
131	366,317	357,402	370,449	373,859	386,946	387,534	398,065	6,767,218
132	357,504	371,351	389,433	379,284	382,392	395,870	394,136	6,957,276
133	362,091	375,608	363,429	373,473	387,702	392,815	383,046	6,764,948
134	343,892	365,173	357,094	375,888	381,186	385,596	398,148	6,679,489
135	367,925	366,463	379,807	374,227	377,223	395,142	392,618	6,881,449
136	381,875	361,234	376,473	384,346	393,966	377,936	410,025	6,867,761
137	379,656	375,613	364,927	392,884	391,410	394,551	410,105	6,885,270
138	362,680	366,779	366,861	386,605	379,246	396,905	395,708	6,838,034
139	342,307	364,959	349,680	367,892	380,411	376,921	398,548	6,652,439
140	366,297	379,578	368,029	394,688	405,483	393,981	403,039	6,894,853
141	350,769	365,870	386,617	372,185	378,925	395,943	405,263	6,780,250

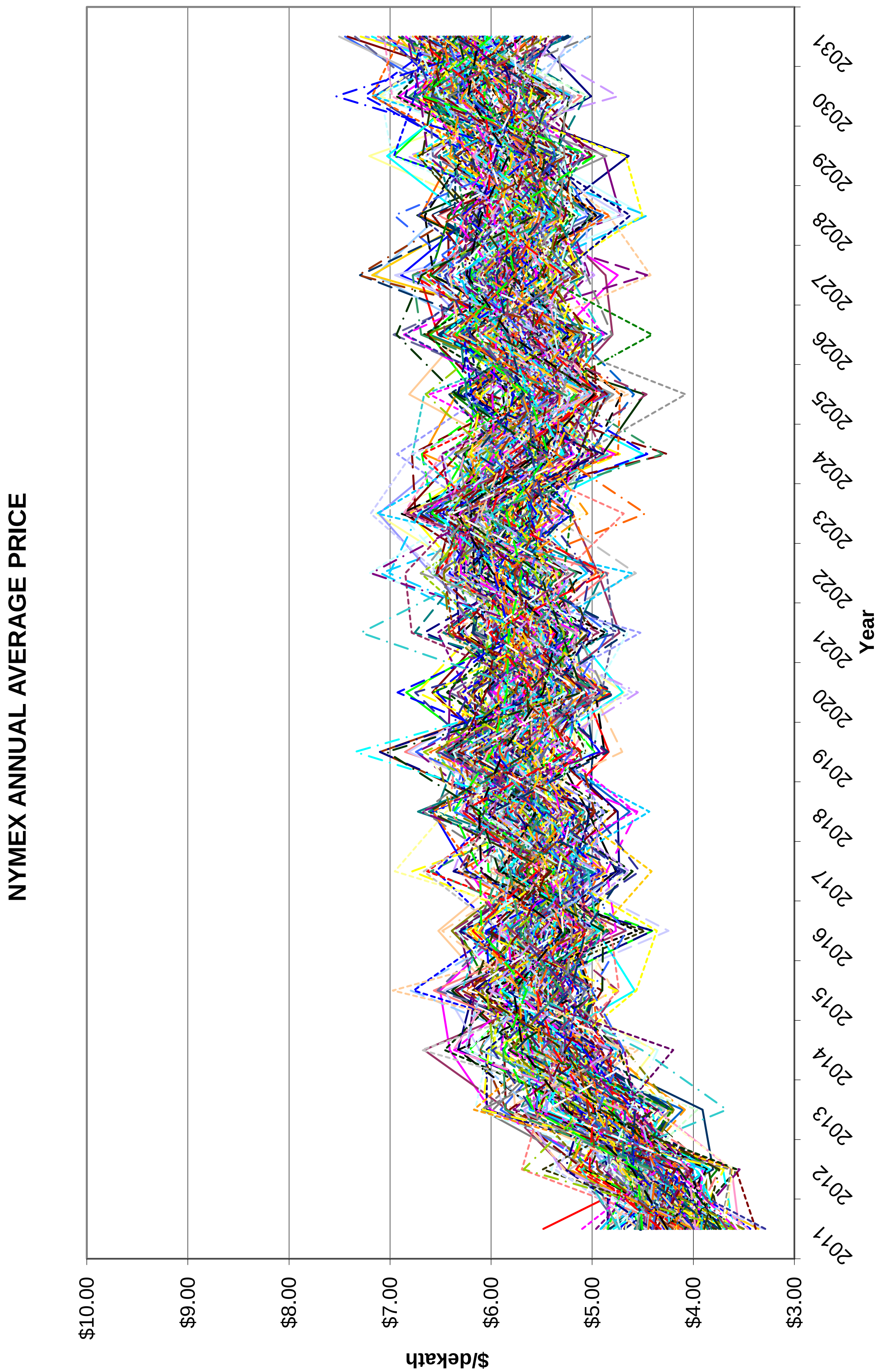
Draw	2025	2026	2027	2028	2029	2030	2031	20 Yr Total
142	369,096	371,687	366,033	382,218	384,376	383,493	399,802	6,952,371
143	370,464	375,139	384,055	371,764	396,300	395,576	385,293	6,953,962
144	373,336	370,483	377,805	363,151	390,173	386,044	393,089	6,867,270
145	371,157	374,271	368,992	375,688	395,434	390,126	395,796	6,885,426
146	359,207	366,410	372,738	384,430	384,646	381,663	406,908	6,741,341
147	375,202	354,375	394,450	389,588	397,554	402,054	406,007	6,973,499
148	388,821	379,608	368,449	381,979	393,379	389,648	396,667	6,957,415
149	365,829	378,313	362,684	373,923	394,439	390,395	392,618	6,858,125
150	356,292	367,295	369,375	362,186	365,210	384,601	387,864	6,694,000
151	352,714	365,326	367,760	366,475	387,132	383,362	402,422	6,753,053
152	372,294	358,911	360,462	397,106	398,389	409,008	391,275	6,860,543
153	359,763	374,613	368,543	370,495	398,193	385,895	394,389	6,766,962
154	370,650	359,729	384,805	371,682	389,130	385,456	380,085	6,908,365
155	379,513	369,052	364,963	381,990	387,603	402,420	404,314	6,922,796
156	343,545	367,917	363,270	383,984	390,694	391,955	413,842	6,768,856
157	351,895	365,225	372,932	381,487	368,418	393,816	396,990	6,806,931
158	386,651	367,370	382,181	369,052	386,402	404,292	383,367	6,973,768
159	384,745	360,256	367,065	371,493	376,267	379,207	373,408	6,730,536
160	363,028	376,490	376,267	396,065	369,883	402,395	374,530	6,908,674
161	369,433	370,088	371,157	381,969	379,198	405,654	387,025	6,830,916
162	372,105	362,754	376,344	383,947	396,051	400,851	393,623	6,907,343
163	361,980	376,397	360,860	377,059	386,762	394,337	397,454	6,867,001
164	359,999	392,295	390,034	388,637	389,084	400,289	407,543	6,963,068
165	366,486	358,980	375,512	386,422	387,870	401,834	393,797	6,930,703
166	369,229	362,072	362,361	391,918	393,541	394,574	394,064	6,889,826
167	366,155	359,760	367,661	390,250	387,477	384,345	392,474	6,843,239
168	365,612	377,941	367,569	381,885	390,171	398,016	394,973	6,860,809
169	362,393	376,969	378,866	383,112	381,624	395,664	401,742	6,906,026
170	363,758	368,141	392,949	385,229	404,325	420,420	388,898	6,964,130
171	351,357	371,922	368,843	375,843	385,273	405,521	402,445	6,830,827
172	368,973	380,625	385,465	382,040	397,280	402,571	404,745	6,971,665
173	359,863	372,511	376,108	383,540	377,658	377,625	404,502	6,788,263
174	371,446	364,679	376,356	386,322	380,402	390,998	415,628	6,993,241
175	374,861	375,628	368,571	392,178	394,632	401,793	396,324	6,944,283
176	375,490	371,266	379,378	377,865	378,333	380,635	391,239	6,862,089
177	363,954	359,581	365,238	374,859	386,714	390,471	391,036	6,727,664
178	361,874	364,610	367,048	369,338	376,425	401,413	395,604	6,905,022
179	373,577	372,697	395,500	382,833	379,679	386,823	391,555	6,926,905
180	379,841	363,697	371,116	375,209	365,431	405,323	392,666	6,889,869
181	364,567	374,260	372,568	386,007	392,554	396,643	396,795	6,952,033
182	351,790	377,432	361,948	389,340	386,490	372,059	395,880	6,829,682
183	354,135	369,516	383,947	386,882	381,613	382,189	387,704	6,802,129
184	367,489	356,964	378,005	373,432	378,011	385,093	395,451	6,816,729
185	352,070	387,263	384,178	388,746	402,286	395,412	405,089	6,901,950
186	361,601	365,575	378,626	378,721	387,125	403,974	388,814	6,864,297
187	338,722	370,404	372,585	365,435	366,903	365,061	367,290	6,676,416
188	372,195	382,884	377,123	370,345	378,440	390,092	390,475	6,852,949

Draw	2025	2026	2027	2028	2029	2030	2031	20 Yr Total
189	375,689	370,663	373,182	383,518	409,472	405,957	403,780	6,973,041
190	342,212	376,960	375,542	386,385	385,253	380,840	385,641	6,775,676
191	350,043	371,855	375,074	387,652	401,218	404,251	390,629	6,930,688
192	360,384	371,744	371,153	363,733	378,175	379,702	384,365	6,689,151
193	370,903	362,869	387,382	394,736	399,064	403,575	396,473	6,957,054
194	359,295	360,468	370,112	365,583	376,922	393,782	400,483	6,781,498
195	378,455	361,156	367,822	377,182	393,964	397,607	417,010	6,935,430
196	380,289	379,573	393,628	376,845	377,483	403,694	397,826	6,978,798
197	371,279	357,691	367,958	391,576	381,874	402,653	401,385	6,860,065
198	348,211	346,435	360,599	371,475	372,431	408,201	391,345	6,715,045
199	356,749	353,183	376,767	394,746	381,276	377,155	392,106	6,763,396
200	368,922	370,840	389,246	385,701	391,364	409,028	400,218	6,935,328
Max	388,821	392,295	396,064	406,493	424,321	420,649	417,562	7,028,578
Min	338,722	343,903	337,957	355,478	360,789	365,061	367,290	6,652,439
Average	363,914	369,561	374,691	381,845	386,230	392,190	397,057	6,861,221

Appendix G-2

Price Uncertainty Analysis


NYMEX Annual Price Forecast
$/Dkth
$15.00
$12.50
$10.00
$7.50
$5.00
$2.50
$0.00
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Highest Monthly Draw Price Each Year
Expected Range of Annual Average Prices
Lowest Monthly Draw Price for Each year
Average Monthly Max
Average Monthly Min
Average Annual
Expected Max
Expected Min
Absolute Monthly Max
Absolute Monthly Min


NYMEX ANNUAL AVERAGE PRICE
$/dekath
Year
$10.00
$9.00
$8.00
$7.00
$6.00
$5.00
$4.00
$3.00
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031

	2012			2013			2014		
Draw	max	min	avg	max	min	avg	max	min	avg
1	$6.21	$2.57	$4.12	$8.08	$2.57	$5.01	$8.34	$3.29	$5.64
2	$8.36	$2.57	$4.88	$8.23	$2.57	$6.09	$8.13	$2.57	$6.50
3	$6.57	$2.49	$4.42	$6.36	$2.49	$4.65	$8.54	$3.47	$5.20
4	$6.87	$2.54	$4.13	$8.15	$2.54	$5.13	$8.15	$2.54	$5.13
5	$5.89	$2.52	$4.66	$9.91	$3.38	$4.94	$10.74	$2.53	$5.15
6	$6.49	$2.49	$4.45	$8.77	$2.49	$5.06	$8.26	$2.49	$5.71
7	$6.11	$2.54	$4.23	$7.45	$2.54	$5.36	$9.05	$2.54	$5.91
8	$7.75	$2.57	$4.67	$7.84	$2.57	$4.26	$8.93	$3.25	$5.69
9	$7.05	$2.76	$4.69	$8.31	$2.54	$5.15	$5.86	$3.14	$5.06
10	$7.11	$2.75	$4.97	$8.53	$2.49	$5.23	$9.15	$2.49	$5.22
11	$9.92	$2.52	$4.53	$7.62	$2.98	$4.72	$7.04	$4.68	$6.09
12	$7.15	$2.52	$3.97	$6.69	$2.52	$4.96	$7.28	$2.56	$4.50
13	$8.21	$2.57	$4.59	$9.37	$2.57	$5.53	$7.76	$2.57	$4.60
14	$6.03	$2.49	$3.64	$7.04	$3.03	$4.38	$7.73	$2.71	$4.95
15	$6.74	$2.98	$4.39	$8.35	$2.57	$4.87	$8.88	$2.57	$5.40
16	$6.42	$2.49	$4.24	$8.12	$2.83	$5.10	$7.35	$2.49	$4.62
17	$6.92	$2.54	$4.92	$8.20	$3.82	$5.87	$7.54	$3.00	$5.34
18	$6.02	$3.12	$4.61	$7.74	$2.90	$5.25	$8.70	$2.69	$5.35
19	$7.76	$2.49	$5.21	$7.47	$2.49	$4.97	$7.91	$2.49	$5.30
20	$7.59	$2.49	$4.58	$10.58	$2.49	$5.67	$8.48	$3.44	$5.83
21	$8.79	$2.54	$4.70	$6.32	$2.54	$4.43	$7.89	$2.54	$5.50
22	$7.64	$2.54	$4.80	$6.97	$2.54	$4.60	$8.21	$2.54	$5.03
23	$7.60	$2.57	$4.43	$7.13	$2.57	$5.11	$8.71	$3.52	$5.69
24	$7.56	$2.76	$5.01	$8.22	$2.57	$4.28	$8.20	$3.81	$5.88
25	$6.21	$2.49	$3.74	$5.84	$2.49	$3.85	$7.65	$2.49	$5.04
26	$8.38	$2.49	$4.59	$7.38	$2.73	$4.59	$7.90	$2.49	$5.26
27	$7.97	$2.52	$4.50	$9.34	$2.52	$5.36	$8.65	$2.52	$5.57
28	$8.19	$2.71	$5.00	$7.34	$2.54	$4.74	$6.83	$2.54	$5.07
29	$6.46	$2.63	$4.43	$5.79	$3.15	$4.51	$6.52	$3.41	$5.25
30	$7.40	$2.95	$5.23	$9.21	$3.62	$5.80	$10.16	$3.32	$6.62
31	$6.88	$2.57	$4.03	$6.75	$2.57	$4.90	$8.03	$4.22	$5.74
32	$7.51	$2.52	$4.15	$10.02	$2.52	$5.22	$8.58	$3.57	$5.70
33	$6.66	$2.49	$4.95	$8.04	$3.09	$4.52	$7.67	$2.49	$4.68
34	$6.64	$2.54	$4.31	$5.95	$2.54	$4.47	$6.98	$2.64	$5.64
35	$6.90	$2.52	$4.71	$7.58	$3.59	$5.56	$8.41	$2.52	$5.73
36	$7.09	$2.54	$4.06	$7.67	$2.77	$5.01	$7.36	$3.29	$5.13
37	$6.42	$2.54	$4.21	$8.58	$3.25	$5.53	$7.52	$2.59	$4.94
38	$5.74	$2.52	$4.32	$6.12	$2.52	$4.50	$9.58	$2.52	$4.99
39	$6.73	$2.52	$4.52	$8.31	$2.52	$5.02	$8.76	$2.88	$5.62
40	$7.22	$2.57	$4.47	$7.43	$2.57	$4.73	$8.57	$2.57	$4.94
41	$7.17	$2.57	$4.11	$7.59	$2.66	$4.76	$7.57	$2.69	$5.25
42	$6.60	$3.28	$4.87	$7.51	$2.49	$5.00	$9.04	$2.49	$6.35
43	$6.06	$2.49	$3.85	$9.75	$2.49	$5.06	$8.14	$2.70	$5.53
44	$8.00	$2.54	$4.85	$6.86	$2.54	$4.31	$7.83	$3.39	$5.29
45	$7.68	$2.57	$4.51	$8.26	$2.57	$4.93	$9.16	$2.57	$5.31
46	$7.86	$2.54	$4.55	$7.05	$2.66	$4.87	$9.70	$3.88	$5.98
47	$7.36	$3.25	$5.03	$9.64	$3.94	$6.12	$6.86	$2.93	$4.94
48	$6.43	$2.49	$4.82	$8.34	$2.49	$5.28	$8.84	$2.91	$5.61
49	$6.78	$2.82	$4.38	$9.85	$2.57	$5.72	$8.06	$2.57	$5.47
50	$5.91	$2.57	$4.43	$8.81	$2.57	$4.65	$7.66	$3.00	$5.04
51	$8.34	$2.57	$4.61	$7.65	$2.57	$5.14	$6.94	$3.97	$5.40
52	$7.93	$2.52	$4.63	$7.38	$2.82	$4.98	$9.57	$2.52	$6.12

	2012			2013			2014		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$6.66	$2.54	$3.97	$10.36	$2.93	$5.31	$6.83	$2.54	$5.08
54	$6.88	$2.49	$4.76	$8.24	$2.49	$4.16	$8.79	$2.86	$5.53
55	$5.91	$2.49	$4.30	$8.22	$3.07	$5.76	$8.24	$2.84	$6.01
56	$6.77	$2.57	$3.87	$7.20	$2.57	$4.63	$7.59	$3.25	$5.36
57	$8.43	$2.57	$4.80	$6.02	$3.16	$4.45	$8.90	$2.57	$5.93
58	$7.87	$2.57	$4.68	$8.64	$2.57	$5.32	$7.23	$2.57	$5.15
59	$6.62	$2.54	$3.72	$7.55	$3.06	$5.54	$9.67	$3.18	$5.57
60	$5.45	$2.54	$3.56	$8.91	$4.24	$5.80	$7.54	$2.54	$5.12
61	$7.61	$2.49	$5.15	$10.19	$3.17	$5.94	$10.64	$2.49	$5.95
62	$5.73	$2.54	$4.37	$6.70	$2.54	$4.69	$7.22	$2.87	$5.62
63	$7.39	$2.54	$4.15	$8.38	$3.16	$5.27	$8.08	$2.54	$5.85
64	$7.44	$2.59	$4.36	$7.89	$2.49	$4.67	$8.72	$2.49	$5.35
65	$6.64	$2.49	$4.20	$6.73	$2.49	$4.39	$8.50	$2.49	$5.50
66	$6.45	$2.93	$4.77	$8.31	$2.52	$4.67	$9.10	$2.96	$5.57
67	$7.65	$2.52	$4.63	$7.79	$2.52	$5.18	$8.15	$2.73	$5.01
68	$7.64	$2.54	$4.45	$7.70	$2.54	$4.94	$8.81	$2.54	$5.28
69	$8.16	$2.52	$5.05	$6.94	$3.65	$4.89	$7.55	$2.52	$5.20
70	$7.37	$2.49	$4.34	$8.18	$2.49	$5.35	$6.75	$2.49	$5.00
71	$7.91	$2.57	$5.40	$8.30	$3.22	$5.90	$8.65	$2.57	$5.95
72	$6.10	$2.49	$4.05	$8.13	$3.73	$5.52	$8.24	$2.91	$5.48
73	$6.47	$2.52	$4.25	$6.51	$2.65	$4.72	$7.10	$2.52	$5.26
74	$7.41	$3.22	$4.66	$5.60	$2.52	$4.22	$8.98	$3.60	$5.70
75	$7.83	$2.61	$4.77	$7.02	$2.73	$4.26	$7.46	$2.49	$4.81
76	$7.29	$2.49	$4.70	$6.20	$2.49	$4.18	$6.01	$2.49	$5.00
77	$7.03	$2.49	$4.04	$7.10	$2.49	$5.23	$8.63	$2.98	$5.12
78	$8.04	$2.54	$5.07	$7.31	$2.54	$4.96	$6.38	$2.54	$4.74
79	$6.59	$2.49	$4.53	$7.22	$2.49	$4.19	$7.24	$2.49	$5.11
80	$7.36	$2.49	$4.44	$8.37	$2.97	$5.04	$8.04	$2.56	$5.01
81	$7.64	$2.54	$4.87	$7.45	$2.54	$5.42	$8.12	$2.54	$5.49
82	$7.35	$2.52	$4.68	$9.41	$2.52	$4.61	$7.25	$2.52	$4.80
83	$8.21	$2.54	$3.94	$6.73	$2.54	$4.62	$8.59	$2.82	$5.18
84	$7.65	$2.54	$4.42	$8.48	$2.71	$5.93	$9.48	$2.54	$6.19
85	$7.87	$2.54	$4.64	$6.99	$3.52	$5.26	$9.30	$2.54	$5.20
86	$6.35	$2.52	$4.28	$9.05	$2.52	$5.33	$7.27	$3.91	$5.23
87	$6.02	$2.57	$4.26	$8.21	$2.96	$5.63	$8.03	$2.57	$6.42
88	$6.24	$2.57	$3.93	$6.64	$2.85	$4.66	$6.25	$3.78	$4.91
89	$8.19	$2.57	$5.23	$6.20	$3.26	$4.74	$7.00	$3.19	$5.40
90	$8.74	$2.49	$5.06	$11.09	$2.49	$5.20	$8.39	$4.26	$6.18
91	$7.37	$2.52	$4.53	$7.75	$2.52	$4.40	$7.18	$2.52	$4.94
92	$7.81	$2.52	$4.53	$7.69	$2.52	$4.89	$6.75	$4.01	$5.45
93	$6.24	$2.54	$4.26	$7.31	$2.54	$4.92	$9.09	$4.14	$6.52
94	$6.26	$2.49	$3.85	$7.44	$2.49	$4.88	$7.33	$2.49	$5.30
95	$7.55	$2.57	$4.37	$6.67	$2.57	$5.19	$7.26	$2.77	$5.33
96	$5.84	$2.57	$3.74	$6.48	$3.15	$4.94	$7.16	$2.57	$5.14
97	$6.68	$2.49	$4.50	$8.13	$2.49	$4.79	$8.68	$2.49	$4.99
98	$6.84	$2.57	$4.39	$6.04	$2.57	$4.09	$7.15	$2.59	$4.55
99	$8.26	$2.52	$4.38	$7.35	$3.82	$5.21	$7.87	$3.07	$5.31
100	$7.69	$2.54	$4.18	$8.24	$2.54	$4.70	$8.66	$3.12	$5.69
101	$6.81	$2.54	$5.25	$7.80	$2.54	$4.30	$9.16	$2.91	$5.66
102	$8.04	$2.57	$4.82	$8.25	$4.49	$6.00	$6.84	$3.20	$5.40
103	$6.25	$2.52	$4.44	$8.04	$2.52	$5.47	$7.97	$3.81	$5.55
104	$6.03	$2.52	$4.45	$6.63	$2.52	$4.78	$10.32	$2.52	$5.32

	2012			2013			2014		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$7.21	$2.57	$4.84	$6.85	$2.57	$4.30	$7.70	$2.57	$5.14
106	$6.41	$2.52	$4.52	$6.24	$3.08	$4.88	$8.64	$3.07	$5.50
107	$6.30	$2.49	$3.90	$7.96	$2.49	$4.61	$8.85	$3.13	$5.47
108	$7.96	$2.54	$3.79	$6.83	$2.54	$4.76	$8.61	$3.95	$5.51
109	$6.50	$2.57	$4.29	$7.58	$2.89	$5.14	$8.40	$3.05	$5.96
110	$8.81	$2.57	$4.59	$6.63	$2.72	$4.77	$8.60	$2.57	$5.46
111	$8.31	$2.53	$4.71	$7.32	$2.52	$5.36	$7.00	$2.52	$4.92
112	$7.23	$2.54	$4.45	$8.35	$2.54	$4.69	$8.04	$3.30	$5.95
113	$7.89	$3.32	$5.10	$8.04	$2.54	$4.79	$8.33	$2.73	$5.25
114	$6.51	$2.49	$3.97	$7.28	$2.68	$5.40	$7.28	$2.83	$5.46
115	$6.78	$2.49	$4.28	$6.74	$2.49	$4.90	$7.01	$2.49	$4.78
116	$5.70	$2.49	$3.56	$8.56	$2.49	$5.23	$7.88	$2.49	$5.57
117	$6.76	$2.57	$4.21	$10.28	$2.57	$5.24	$6.80	$3.23	$5.13
118	$6.76	$2.54	$4.19	$7.59	$2.54	$4.81	$6.86	$2.54	$4.77
119	$6.17	$2.52	$4.00	$7.23	$2.52	$5.07	$7.03	$2.52	$4.87
120	$6.70	$2.54	$4.57	$9.48	$3.58	$6.31	$8.13	$2.82	$6.18
121	$6.39	$2.57	$4.65	$5.05	$2.57	$4.01	$7.89	$2.57	$5.80
122	$7.67	$2.52	$4.74	$8.35	$2.90	$4.71	$8.52	$2.52	$5.22
123	$5.51	$2.57	$3.80	$7.69	$2.57	$5.43	$8.31	$2.57	$6.10
124	$6.58	$2.49	$4.21	$6.66	$3.32	$4.60	$8.18	$2.49	$5.42
125	$7.36	$2.52	$4.70	$7.27	$2.52	$4.97	$7.45	$2.82	$5.39
126	$6.64	$2.54	$4.23	$11.09	$2.54	$5.37	$8.13	$2.54	$4.52
127	$7.92	$2.52	$4.44	$7.58	$2.71	$5.04	$8.16	$2.52	$5.35
128	$6.54	$2.80	$4.54	$6.01	$2.49	$4.33	$6.64	$2.49	$5.20
129	$6.16	$2.53	$4.01	$7.25	$2.52	$4.65	$8.44	$3.40	$5.95
130	$5.10	$2.57	$3.67	$8.10	$2.92	$5.29	$7.36	$2.57	$5.42
131	$5.80	$2.55	$4.08	$9.38	$3.72	$6.20	$9.12	$2.81	$5.51
132	$6.79	$2.72	$4.24	$6.87	$2.52	$4.59	$7.38	$2.52	$4.84
133	$7.03	$2.57	$4.58	$8.53	$2.57	$5.01	$8.88	$2.57	$5.35
134	$8.22	$2.52	$4.92	$7.40	$2.52	$4.68	$7.75	$2.52	$5.08
135	$6.94	$2.67	$4.93	$7.34	$2.52	$4.37	$7.47	$2.97	$5.07
136	$7.38	$2.54	$4.44	$8.00	$2.54	$4.64	$9.75	$3.21	$5.95
137	$5.47	$2.54	$3.55	$7.41	$2.54	$5.05	$8.84	$3.35	$6.42
138	$7.84	$2.53	$5.62	$7.80	$2.49	$4.47	$7.26	$3.44	$5.71
139	$7.94	$2.52	$4.54	$8.04	$2.52	$4.56	$8.98	$2.52	$5.34
140	$6.53	$2.57	$4.40	$8.30	$2.57	$5.13	$7.59	$3.02	$4.67
141	$6.23	$2.52	$4.33	$7.46	$2.52	$4.71	$6.30	$4.36	$5.07
142	$6.08	$2.49	$3.76	$8.05	$2.49	$4.84	$7.92	$3.61	$5.15
143	$8.38	$2.57	$4.29	$7.24	$2.57	$4.08	$6.84	$2.57	$5.25
144	$9.20	$2.57	$5.13	$10.08	$3.26	$4.81	$6.43	$2.57	$4.84
145	$7.34	$2.86	$4.70	$6.81	$2.57	$4.86	$9.09	$2.57	$5.83
146	$6.52	$2.52	$4.61	$8.22	$3.04	$5.16	$8.10	$2.52	$5.26
147	$7.22	$2.52	$4.61	$8.36	$2.52	$4.73	$8.69	$3.28	$5.82
148	$6.21	$2.54	$3.92	$8.27	$2.54	$5.60	$8.20	$2.54	$5.62
149	$6.67	$2.49	$4.40	$7.38	$2.49	$4.52	$8.14	$2.92	$5.49
150	$6.40	$2.52	$4.32	$7.36	$2.52	$4.64	$7.37	$2.52	$4.98
151	$9.62	$2.52	$4.62	$8.31	$2.52	$4.18	$8.31	$2.52	$5.55
152	$7.75	$2.54	$4.13	$8.60	$3.13	$6.01	$8.83	$4.70	$6.01
153	$6.48	$2.57	$5.01	$7.61	$2.92	$5.55	$9.35	$4.11	$5.72
154	$7.19	$2.52	$4.28	$7.28	$2.52	$4.45	$6.63	$3.23	$4.56
155	$7.80	$2.54	$4.39	$8.02	$2.54	$5.73	$7.69	$2.54	$5.43
156	$7.93	$2.52	$4.65	$6.70	$2.52	$4.56	$8.34	$3.94	$6.58

	2012			2013			2014		
Draw	max	min	avg	max	min	avg	max	min	avg
157	$7.04	$2.54	$3.68	$7.92	$3.82	$6.18	$9.16	$2.54	$5.45
158	$8.19	$2.49	$4.72	$7.60	$2.75	$5.42	$8.76	$2.49	$5.26
159	$5.94	$2.57	$4.16	$7.37	$2.57	$5.26	$8.23	$2.57	$4.89
160	$5.59	$2.54	$3.57	$7.83	$2.54	$4.39	$8.23	$3.21	$5.90
161	$9.02	$2.54	$5.43	$7.61	$2.54	$5.03	$8.45	$3.00	$6.25
162	$5.33	$2.49	$4.03	$9.77	$2.49	$4.67	$5.96	$2.49	$4.17
163	$8.53	$4.58	$5.66	$8.48	$2.54	$5.49	$8.10	$2.75	$5.29
164	$6.54	$2.52	$4.20	$9.95	$2.52	$5.01	$8.63	$2.73	$5.10
165	$7.91	$2.56	$5.44	$7.88	$2.52	$4.96	$7.76	$3.79	$5.54
166	$7.36	$3.06	$5.18	$6.45	$2.57	$5.01	$8.47	$2.57	$4.82
167	$8.22	$2.54	$4.16	$6.95	$2.54	$4.70	$8.55	$2.54	$5.05
168	$5.41	$2.52	$3.75	$8.22	$4.51	$6.17	$9.16	$2.52	$6.11
169	$6.04	$2.54	$3.87	$8.99	$2.54	$5.34	$7.57	$2.54	$4.96
170	$7.97	$2.57	$3.96	$6.65	$3.14	$4.50	$6.50	$3.41	$5.18
171	$5.80	$2.57	$4.11	$7.17	$4.28	$5.72	$6.55	$2.98	$4.91
172	$7.34	$2.57	$4.58	$6.50	$2.57	$4.55	$7.74	$2.57	$5.12
173	$6.84	$2.52	$4.52	$7.88	$2.52	$4.52	$6.84	$2.56	$5.00
174	$6.45	$2.54	$3.90	$8.32	$4.67	$5.64	$9.84	$2.54	$5.65
175	$8.41	$2.57	$4.93	$6.56	$2.64	$4.69	$5.28	$2.57	$4.41
176	$6.50	$2.49	$4.71	$8.19	$2.49	$5.19	$7.61	$3.15	$5.83
177	$6.74	$2.52	$3.94	$8.89	$2.52	$5.44	$8.95	$2.52	$5.19
178	$6.29	$2.52	$4.50	$6.20	$2.52	$4.65	$8.07	$2.55	$6.27
179	$7.53	$2.57	$4.10	$7.16	$2.63	$4.77	$8.28	$4.92	$6.46
180	$8.34	$2.54	$5.38	$9.00	$2.54	$5.75	$7.22	$2.62	$4.87
181	$7.27	$2.52	$4.50	$9.10	$3.02	$5.83	$7.65	$2.52	$4.68
182	$6.50	$2.54	$4.31	$7.57	$2.54	$4.96	$6.43	$2.64	$4.71
183	$10.02	$3.20	$5.18	$5.46	$2.54	$3.72	$6.25	$2.54	$4.57
184	$10.03	$2.54	$5.59	$8.04	$2.90	$5.00	$9.73	$2.54	$5.88
185	$6.60	$2.49	$4.76	$7.42	$2.49	$5.03	$7.14	$3.44	$5.34
186	$7.94	$2.54	$5.20	$8.05	$2.54	$4.92	$8.58	$2.54	$5.65
187	$7.07	$2.49	$4.38	$6.03	$2.49	$4.68	$7.48	$2.49	$5.55
188	$7.47	$2.49	$4.85	$7.68	$2.49	$4.89	$8.81	$2.49	$5.34
189	$7.09	$2.61	$4.43	$8.29	$3.86	$5.71	$7.03	$2.77	$4.69
190	$7.08	$2.52	$4.63	$6.99	$2.52	$4.59	$8.94	$2.52	$5.78
191	$6.80	$2.52	$4.43	$10.93	$2.52	$5.88	$10.03	$3.61	$5.90
192	$6.73	$2.49	$4.16	$6.55	$2.49	$4.86	$9.14	$3.28	$5.85
193	$7.46	$2.57	$3.68	$7.61	$2.57	$4.84	$7.61	$2.57	$5.19
194	$7.65	$2.54	$4.96	$7.11	$2.54	$5.06	$7.50	$2.54	$5.18
195	$6.04	$2.54	$4.17	$7.02	$3.54	$5.43	$8.52	$2.54	$5.63
196	$7.33	$2.54	$4.40	$8.60	$2.67	$5.67	$8.98	$3.93	$6.07
197	$6.24	$2.54	$4.53	$7.97	$2.88	$5.17	$9.01	$2.54	$5.60
198	$6.64	$2.52	$4.00	$7.19	$2.85	$5.52	$6.90	$2.52	$4.45
199	$9.93	$2.57	$5.10	$9.42	$2.57	$5.06	$7.80	$2.57	$5.45
200	$8.38	$2.49	$4.57	$7.39	$3.70	$5.60	$7.99	$2.49	$5.89
average	$7.13	$2.58	$4.47	$7.78	$2.76	$5.00	$8.03	$2.87	$5.39
Max	$10.03			$11.09			$10.74		
Avg			$4.47			$5.00			$5.39
Min	$2.49			$2.49			$2.49		
Range	7.54			8.60			8.25		

	2015			2016			2017		
Draw	max	min	avg	max	min	avg	max	min	avg
1	$7.99	$3.18	$5.33	$8.30	$4.23	$5.51	$7.45	$3.49	$5.02
2	$8.30	$5.13	$6.60	$9.86	$2.57	$5.95	$8.19	$2.57	$4.97
3	$9.37	$3.00	$5.77	$10.29	$3.73	$6.22	$8.43	$2.49	$5.35
4	$7.69	$3.13	$5.03	$9.08	$3.17	$5.94	$8.51	$2.54	$4.95
5	$7.56	$2.52	$5.38	$8.04	$2.54	$5.36	$10.35	$3.84	$6.04
6	$9.60	$3.70	$6.38	$8.20	$2.49	$5.30	$7.59	$2.73	$5.18
7	$9.09	$2.99	$5.95	$8.69	$2.72	$5.97	$8.21	$2.54	$4.96
8	$7.89	$2.57	$5.17	$8.34	$3.37	$5.51	$8.78	$2.57	$5.61
9	$8.55	$3.13	$5.54	$8.75	$3.95	$6.17	$7.29	$3.61	$5.04
10	$7.33	$2.49	$5.21	$7.12	$2.49	$5.06	$8.40	$3.69	$6.17
11	$7.30	$2.65	$5.58	$8.79	$2.52	$5.82	$7.59	$3.32	$5.13
12	$8.11	$4.33	$5.60	$9.68	$2.52	$5.56	$8.27	$3.33	$5.74
13	$9.08	$2.57	$5.64	$7.33	$3.00	$4.83	$7.31	$3.16	$5.13
14	$7.99	$3.04	$5.47	$6.89	$3.78	$5.60	$7.44	$2.49	$5.22
15	$9.13	$2.57	$5.92	$7.83	$3.69	$5.52	$9.52	$2.57	$5.24
16	$8.06	$2.49	$5.96	$8.83	$2.72	$6.48	$8.07	$2.49	$5.78
17	$8.44	$2.85	$4.99	$9.10	$2.54	$5.26	$8.12	$2.54	$5.04
18	$7.44	$3.82	$5.73	$9.81	$2.49	$6.13	$7.95	$2.49	$5.67
19	$7.15	$2.49	$5.31	$8.35	$3.62	$5.52	$8.60	$2.49	$5.59
20	$7.55	$2.56	$5.33	$9.74	$3.26	$5.97	$9.05	$2.49	$4.91
21	$7.07	$4.27	$5.93	$6.69	$2.83	$4.89	$7.80	$2.54	$5.54
22	$9.30	$3.46	$6.32	$7.84	$3.56	$5.74	$8.49	$3.92	$5.93
23	$9.09	$2.99	$5.36	$8.94	$2.57	$5.65	$7.80	$2.57	$5.29
24	$10.59	$3.24	$6.17	$6.77	$3.82	$5.68	$7.21	$2.57	$5.00
25	$10.23	$4.15	$6.35	$6.18	$2.49	$4.99	$6.78	$2.49	$5.03
26	$7.52	$3.13	$5.51	$8.49	$3.33	$6.17	$8.25	$2.72	$5.94
27	$11.45	$3.74	$6.22	$7.22	$3.07	$5.49	$7.95	$3.85	$5.62
28	$7.85	$2.54	$5.44	$6.35	$2.73	$5.04	$8.59	$2.54	$5.69
29	$8.54	$2.49	$5.96	$8.93	$2.49	$5.74	$8.30	$2.50	$5.85
30	$8.91	$2.57	$5.26	$9.36	$3.36	$6.27	$8.54	$2.57	$5.45
31	$6.43	$3.05	$5.25	$7.46	$3.05	$5.09	$8.78	$2.75	$5.53
32	$8.54	$4.23	$6.30	$8.18	$3.95	$5.65	$7.58	$2.52	$4.88
33	$8.51	$3.64	$5.71	$7.99	$3.06	$5.18	$8.11	$2.79	$5.66
34	$7.22	$3.35	$5.21	$7.50	$2.54	$5.23	$9.97	$3.16	$5.37
35	$8.27	$3.35	$6.10	$7.39	$2.68	$5.35	$9.37	$2.52	$5.31
36	$8.96	$2.78	$5.97	$8.32	$2.54	$5.04	$9.85	$3.38	$6.07
37	$8.47	$2.54	$5.61	$8.43	$2.54	$5.23	$9.49	$3.04	$5.47
38	$8.12	$3.44	$5.67	$8.33	$3.02	$5.45	$6.84	$3.82	$5.34
39	$8.57	$2.52	$4.60	$7.62	$2.52	$4.97	$8.34	$3.57	$5.79
40	$7.43	$3.84	$5.75	$7.90	$3.62	$5.52	$8.14	$3.35	$5.20
41	$8.06	$4.04	$5.85	$9.49	$4.01	$6.15	$7.80	$2.74	$5.37
42	$8.24	$4.02	$6.20	$7.87	$2.49	$5.40	$6.44	$2.49	$4.75
43	$7.91	$2.58	$5.77	$8.38	$3.40	$6.35	$7.91	$2.49	$5.60
44	$8.39	$3.85	$6.09	$7.38	$3.16	$5.04	$7.83	$3.23	$5.50
45	$8.17	$3.41	$5.70	$7.14	$3.74	$5.36	$6.78	$3.48	$4.91
46	$9.34	$2.83	$5.30	$8.00	$3.82	$5.96	$8.13	$2.54	$5.26
47	$8.08	$3.53	$5.75	$7.90	$2.96	$5.21	$7.08	$2.52	$5.39
48	$10.17	$2.49	$5.70	$7.68	$2.85	$5.27	$8.43	$3.08	$5.39
49	$8.10	$3.53	$6.19	$7.04	$2.57	$4.78	$8.71	$2.75	$6.06
50	$7.42	$2.57	$4.87	$8.34	$2.57	$5.45	$7.92	$3.54	$5.43
51	$8.54	$2.57	$5.73	$8.10	$3.05	$5.34	$7.62	$2.57	$5.08
52	$9.67	$2.52	$6.07	$9.27	$2.78	$6.21	$8.48	$3.54	$5.41

	2015			2016			2017		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$10.42	$3.78	$6.46	$9.29	$2.64	$5.11	$7.82	$2.54	$5.65
54	$8.52	$2.83	$5.68	$8.43	$3.53	$5.53	$8.67	$2.57	$5.47
55	$8.43	$4.74	$6.36	$8.64	$2.49	$5.02	$9.07	$2.49	$5.27
56	$8.01	$2.67	$5.46	$8.62	$2.91	$4.98	$9.09	$2.57	$5.79
57	$9.21	$2.57	$5.84	$7.49	$2.57	$4.78	$7.39	$2.57	$4.88
58	$9.31	$3.01	$5.39	$9.95	$2.57	$6.03	$7.69	$2.83	$5.38
59	$8.76	$3.00	$5.40	$7.80	$2.54	$5.60	$8.46	$2.54	$5.22
60	$8.49	$2.64	$5.76	$7.69	$2.54	$4.82	$9.69	$2.69	$5.56
61	$8.98	$2.49	$5.72	$6.95	$3.02	$5.30	$8.01	$2.49	$5.22
62	$8.81	$2.54	$6.04	$8.34	$2.54	$5.38	$6.79	$3.42	$5.32
63	$8.65	$2.54	$5.48	$7.87	$2.54	$5.27	$8.63	$2.72	$5.71
64	$7.16	$3.58	$5.69	$8.71	$2.49	$5.25	$8.00	$3.11	$5.16
65	$8.59	$2.79	$4.83	$11.26	$2.49	$5.91	$7.38	$2.49	$4.84
66	$8.67	$2.65	$5.67	$8.51	$3.11	$5.61	$7.97	$2.52	$5.30
67	$8.08	$2.62	$5.55	$8.00	$2.77	$5.06	$6.59	$2.52	$4.61
68	$8.69	$5.12	$6.69	$9.67	$3.62	$5.67	$8.81	$3.16	$5.77
69	$9.06	$3.42	$5.52	$9.02	$2.93	$5.45	$9.30	$3.46	$5.65
70	$9.89	$2.49	$5.30	$6.72	$2.63	$4.71	$8.33	$2.82	$6.21
71	$8.31	$2.57	$4.91	$8.76	$2.57	$5.25	$8.84	$2.57	$5.94
72	$7.67	$2.49	$5.08	$9.23	$2.49	$5.24	$7.61	$2.70	$5.12
73	$10.07	$2.52	$5.18	$8.66	$2.57	$4.88	$8.96	$2.52	$5.02
74	$9.45	$2.52	$6.00	$9.11	$3.07	$5.37	$7.97	$2.52	$5.54
75	$7.08	$2.49	$5.54	$7.45	$3.37	$5.79	$7.42	$2.49	$5.18
76	$9.03	$2.49	$6.15	$9.54	$2.53	$5.10	$8.32	$2.49	$5.00
77	$7.72	$3.39	$5.72	$6.85	$3.10	$5.19	$8.48	$2.49	$6.28
78	$9.13	$4.44	$6.43	$9.86	$2.54	$5.83	$9.78	$2.54	$5.03
79	$6.81	$2.49	$4.95	$8.59	$2.71	$6.01	$8.27	$3.48	$5.76
80	$8.59	$3.01	$5.47	$7.25	$3.11	$5.39	$8.19	$3.47	$5.72
81	$8.55	$2.54	$5.74	$9.41	$2.54	$5.36	$10.17	$4.80	$6.76
82	$7.49	$2.55	$5.45	$9.09	$2.92	$5.32	$6.23	$2.52	$4.66
83	$10.86	$3.02	$6.14	$7.59	$3.47	$5.38	$10.11	$2.55	$6.05
84	$8.51	$3.24	$5.91	$7.33	$2.54	$5.57	$8.02	$2.54	$5.53
85	$7.86	$2.56	$4.77	$8.90	$3.45	$5.46	$7.98	$3.74	$5.73
86	$9.29	$3.97	$5.94	$7.53	$3.76	$5.53	$6.61	$2.52	$4.64
87	$8.25	$2.57	$5.09	$8.41	$2.57	$5.30	$9.35	$3.30	$5.33
88	$9.38	$2.57	$5.68	$7.51	$4.38	$5.75	$8.09	$2.67	$5.61
89	$8.52	$2.57	$5.65	$8.64	$2.57	$5.64	$7.08	$3.55	$5.31
90	$8.45	$2.49	$5.59	$7.04	$3.02	$4.38	$9.08	$2.49	$5.99
91	$7.89	$2.52	$5.58	$8.13	$2.52	$5.24	$7.74	$2.52	$5.30
92	$7.94	$2.86	$5.12	$9.24	$2.76	$5.37	$9.48	$3.65	$6.88
93	$7.92	$3.89	$5.79	$9.07	$3.52	$6.00	$8.51	$2.54	$6.36
94	$8.84	$3.32	$5.80	$8.87	$2.49	$5.84	$9.09	$2.49	$5.92
95	$8.97	$3.88	$5.69	$9.11	$2.57	$5.78	$7.53	$2.57	$5.45
96	$8.15	$3.40	$5.42	$8.09	$2.57	$5.23	$7.06	$2.90	$5.36
97	$8.10	$3.10	$5.57	$9.23	$2.49	$4.33	$9.84	$2.55	$6.27
98	$8.21	$3.15	$5.19	$8.38	$3.48	$5.48	$6.83	$2.57	$5.07
99	$9.33	$2.52	$6.36	$8.20	$2.52	$5.14	$9.98	$3.17	$5.53
100	$7.65	$4.01	$5.85	$8.10	$3.68	$5.85	$7.89	$3.03	$5.53
101	$8.55	$3.42	$6.03	$7.31	$3.02	$5.11	$9.56	$3.11	$5.48
102	$7.46	$2.93	$5.59	$7.71	$3.54	$5.30	$7.14	$4.36	$5.79
103	$7.52	$3.53	$5.51	$7.34	$2.52	$5.04	$7.49	$3.24	$5.50
104	$9.08	$2.80	$5.42	$9.02	$2.52	$6.47	$8.41	$2.71	$5.55

	2015			2016			2017		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$9.22	$3.49	$5.73	$8.58	$2.70	$5.54	$9.97	$2.57	$5.64
106	$8.78	$3.68	$6.03	$9.17	$2.89	$5.33	$7.06	$2.52	$4.95
107	$8.86	$3.06	$5.92	$7.77	$4.09	$5.48	$8.72	$3.94	$6.06
108	$7.88	$3.36	$5.33	$6.96	$3.51	$5.09	$11.20	$2.74	$6.04
109	$9.29	$2.57	$5.73	$7.17	$3.91	$5.23	$7.84	$2.57	$5.76
110	$8.76	$2.74	$5.60	$6.51	$2.57	$4.22	$9.46	$2.57	$5.35
111	$7.32	$2.52	$5.45	$9.27	$2.52	$6.47	$7.25	$2.52	$4.86
112	$7.50	$2.89	$5.43	$7.78	$2.95	$5.38	$8.19	$3.24	$5.58
113	$6.64	$2.54	$4.53	$9.29	$2.54	$4.33	$9.37	$2.54	$5.34
114	$8.20	$2.73	$5.95	$7.15	$2.84	$5.74	$7.61	$4.19	$5.79
115	$7.38	$2.49	$5.28	$7.68	$3.86	$5.60	$7.89	$2.49	$5.42
116	$8.53	$2.49	$5.74	$8.79	$2.49	$5.48	$9.38	$2.49	$5.71
117	$8.30	$2.57	$5.15	$8.87	$2.60	$5.59	$7.55	$3.61	$5.80
118	$9.32	$4.29	$6.59	$8.00	$3.53	$5.78	$8.50	$4.83	$6.38
119	$8.66	$3.49	$6.01	$8.19	$4.26	$5.98	$7.57	$2.52	$5.55
120	$7.82	$3.41	$5.82	$8.62	$2.94	$5.32	$8.05	$3.64	$5.97
121	$8.35	$2.70	$5.63	$7.85	$3.90	$5.66	$8.44	$2.57	$5.51
122	$7.30	$3.02	$5.40	$7.38	$2.87	$5.05	$10.73	$2.71	$6.98
123	$8.90	$2.97	$5.94	$7.76	$2.94	$4.92	$7.05	$2.94	$5.26
124	$8.52	$2.49	$5.55	$8.63	$2.49	$5.52	$7.81	$2.49	$4.94
125	$8.23	$2.53	$5.52	$6.97	$2.52	$5.37	$8.22	$2.52	$4.65
126	$10.40	$3.88	$6.93	$8.19	$2.54	$4.82	$8.60	$3.44	$5.98
127	$7.75	$3.18	$5.02	$8.94	$3.70	$5.38	$8.40	$2.54	$4.87
128	$9.77	$3.20	$6.31	$8.40	$3.71	$6.11	$7.67	$3.20	$5.88
129	$7.92	$3.52	$5.85	$7.88	$2.87	$5.51	$7.44	$2.52	$5.44
130	$8.31	$2.94	$5.61	$7.39	$2.57	$5.00	$6.60	$2.57	$4.48
131	$9.70	$3.41	$5.59	$10.39	$3.54	$6.27	$8.62	$2.52	$5.31
132	$6.90	$3.40	$4.92	$8.37	$3.14	$5.13	$7.48	$3.70	$4.85
133	$7.41	$2.58	$5.32	$8.06	$3.67	$5.79	$6.96	$3.10	$5.08
134	$8.61	$3.34	$5.84	$9.76	$2.52	$5.06	$10.45	$3.25	$6.38
135	$7.55	$2.52	$5.11	$8.23	$2.52	$5.37	$7.42	$3.45	$5.68
136	$8.56	$2.54	$5.55	$9.13	$2.83	$5.44	$7.64	$2.54	$5.22
137	$9.69	$3.47	$5.83	$7.41	$2.54	$5.21	$7.38	$3.62	$5.63
138	$9.74	$3.31	$6.01	$5.74	$3.00	$4.59	$10.05	$2.49	$6.41
139	$9.28	$2.92	$5.64	$8.97	$3.65	$5.60	$8.66	$2.52	$5.72
140	$9.15	$2.57	$5.03	$8.54	$2.92	$6.06	$7.12	$3.11	$5.68
141	$8.71	$2.52	$5.44	$9.01	$2.52	$5.04	$7.01	$3.18	$5.20
142	$8.15	$3.00	$5.90	$7.21	$2.49	$4.44	$7.60	$2.87	$5.76
143	$8.42	$3.91	$5.93	$7.92	$2.57	$4.99	$7.70	$3.61	$5.56
144	$8.90	$3.69	$5.48	$6.64	$2.57	$5.07	$10.38	$3.92	$6.66
145	$8.37	$2.88	$5.76	$7.86	$2.57	$5.76	$8.07	$3.33	$5.45
146	$8.07	$2.52	$5.16	$9.72	$3.32	$5.64	$8.48	$3.06	$5.57
147	$8.00	$2.52	$5.75	$8.26	$3.34	$5.16	$8.41	$2.52	$5.12
148	$9.19	$3.73	$5.96	$7.63	$2.54	$5.11	$8.66	$3.96	$5.72
149	$6.70	$3.56	$5.57	$8.75	$2.49	$5.53	$8.36	$2.49	$5.32
150	$6.77	$3.81	$5.60	$8.81	$2.52	$6.08	$8.14	$2.52	$5.41
151	$8.91	$3.02	$5.83	$6.16	$2.71	$4.81	$7.91	$2.52	$5.61
152	$8.36	$2.55	$5.32	$7.80	$2.54	$5.15	$7.10	$2.54	$5.17
153	$9.24	$3.28	$6.05	$7.71	$4.21	$5.76	$7.95	$3.35	$5.60
154	$7.82	$2.52	$5.20	$6.70	$3.14	$4.81	$7.32	$2.78	$5.10
155	$9.53	$4.19	$5.41	$8.62	$2.54	$4.88	$7.10	$2.54	$5.75
156	$8.56	$2.52	$4.93	$8.24	$3.13	$5.80	$11.23	$3.88	$6.56

	2015			2016			2017		
Draw	max	min	avg	max	min	avg	max	min	avg
157	$8.81	$2.54	$5.76	$9.12	$3.33	$5.70	$9.38	$3.91	$5.89
158	$9.68	$2.49	$5.52	$6.78	$4.10	$5.58	$6.76	$2.49	$5.00
159	$7.24	$2.57	$5.21	$8.45	$2.57	$5.75	$7.37	$2.57	$4.86
160	$6.96	$2.54	$4.96	$7.96	$3.16	$4.87	$8.46	$2.54	$5.47
161	$8.69	$2.54	$5.62	$9.68	$2.54	$5.46	$8.54	$2.54	$6.20
162	$8.97	$3.40	$5.83	$7.01	$2.49	$5.04	$7.21	$2.49	$5.07
163	$6.85	$2.54	$4.71	$7.07	$2.54	$4.79	$8.85	$2.94	$5.41
164	$8.97	$2.59	$5.72	$7.81	$2.52	$5.42	$9.11	$2.52	$6.24
165	$7.72	$2.52	$5.51	$8.15	$3.22	$6.00	$7.21	$3.46	$5.89
166	$7.99	$3.38	$5.75	$8.35	$2.57	$5.23	$8.57	$2.57	$5.24
167	$7.81	$2.54	$5.75	$9.27	$2.54	$5.79	$7.10	$2.54	$5.18
168	$6.13	$2.59	$4.82	$9.03	$4.37	$6.26	$8.29	$2.75	$5.47
169	$9.39	$2.54	$5.74	$7.09	$3.00	$4.80	$9.59	$2.93	$5.68
170	$8.09	$2.57	$5.19	$8.92	$2.57	$5.40	$7.17	$3.53	$5.10
171	$8.03	$4.79	$6.10	$8.59	$2.86	$5.61	$7.31	$3.57	$5.36
172	$7.47	$3.51	$5.16	$9.17	$2.57	$5.69	$6.87	$2.57	$4.88
173	$8.17	$3.55	$5.92	$8.56	$3.91	$5.95	$6.87	$2.52	$4.85
174	$9.53	$2.54	$5.70	$8.77	$2.54	$5.59	$6.99	$2.54	$5.23
175	$9.08	$4.37	$5.94	$9.02	$3.77	$6.43	$6.54	$3.36	$5.32
176	$8.35	$2.49	$5.36	$7.02	$3.50	$5.15	$7.88	$2.49	$5.25
177	$7.53	$2.52	$4.82	$9.33	$2.88	$5.93	$8.32	$2.52	$5.33
178	$8.11	$2.52	$5.75	$7.31	$4.49	$5.81	$7.08	$2.52	$4.79
179	$7.79	$2.57	$6.06	$8.17	$4.16	$6.00	$9.27	$2.60	$5.57
180	$8.39	$2.54	$6.10	$8.42	$2.54	$5.57	$8.43	$2.54	$5.02
181	$8.28	$3.03	$5.65	$10.30	$2.52	$6.44	$7.59	$3.85	$5.50
182	$8.39	$2.54	$5.02	$8.66	$2.54	$4.68	$8.07	$2.54	$5.26
183	$9.46	$3.63	$5.74	$8.56	$2.54	$5.02	$8.15	$2.54	$5.11
184	$7.27	$4.23	$5.95	$10.16	$2.54	$5.67	$8.73	$2.54	$5.07
185	$9.10	$3.93	$6.24	$7.73	$2.49	$5.16	$7.98	$2.67	$5.50
186	$10.43	$2.54	$5.69	$10.31	$2.54	$6.08	$8.58	$4.08	$5.66
187	$8.95	$2.71	$5.56	$8.03	$2.49	$5.32	$7.88	$2.49	$5.55
188	$7.29	$2.49	$5.10	$8.40	$3.67	$5.69	$8.66	$2.96	$5.09
189	$6.84	$4.22	$5.23	$8.12	$2.57	$5.17	$7.23	$2.57	$5.32
190	$7.36	$2.52	$5.23	$7.55	$2.72	$5.08	$7.54	$2.52	$4.69
191	$9.76	$3.69	$5.33	$8.17	$3.03	$5.74	$8.33	$2.52	$5.84
192	$7.69	$2.49	$4.92	$6.68	$3.60	$4.91	$8.24	$2.57	$5.95
193	$9.34	$3.88	$6.08	$8.83	$3.06	$5.88	$8.19	$2.57	$5.32
194	$8.59	$4.22	$6.31	$7.50	$2.54	$5.08	$7.79	$2.54	$5.73
195	$7.97	$2.54	$5.09	$8.08	$2.54	$5.94	$9.94	$5.08	$6.48
196	$7.99	$2.54	$5.31	$7.65	$2.54	$5.83	$6.45	$2.54	$4.76
197	$7.10	$3.61	$5.68	$7.74	$3.93	$5.21	$11.44	$2.54	$6.00
198	$8.54	$2.54	$6.31	$10.26	$2.52	$5.36	$8.51	$3.32	$5.41
199	$7.39	$2.57	$5.63	$9.30	$2.57	$6.27	$7.57	$3.07	$5.62
200	$8.76	$3.09	$5.67	$8.87	$3.20	$6.12	$9.55	$3.17	$6.13
average	$8.41	$3.06	$5.63	$8.27	$2.97	$5.45	$8.20	$2.91	$5.48
Max	$11.45			$11.26			$11.44		
Avg			$5.63			$5.45			$5.48
Min	$2.49			$2.49			$2.49		
Range	8.96			8.77			8.95		

	2018			2019			2020		
Draw	max	min	avg	max	min	avg	max	min	avg
1	$9.20	$2.57	$5.19	$8.22	$5.16	$6.27	$7.66	$2.96	$5.27
2	$8.49	$2.57	$5.59	$8.57	$2.57	$5.93	$7.70	$3.79	$5.75
3	$7.97	$4.73	$6.11	$9.26	$3.46	$5.75	$9.59	$3.01	$5.26
4	$6.69	$2.54	$5.14	$8.30	$3.36	$5.64	$8.37	$3.72	$5.83
5	$7.75	$2.81	$5.47	$7.91	$2.52	$5.68	$8.02	$3.93	$6.11
6	$8.36	$3.88	$5.98	$7.57	$2.49	$5.99	$9.53	$3.53	$6.61
7	$8.93	$4.09	$6.57	$9.03	$2.54	$6.35	$8.90	$3.41	$6.21
8	$8.66	$3.35	$6.20	$11.40	$3.30	$6.28	$9.55	$2.71	$5.76
9	$8.81	$3.83	$6.26	$10.25	$4.19	$5.75	$7.29	$2.54	$4.81
10	$7.94	$2.83	$5.95	$8.10	$3.86	$6.18	$8.28	$3.09	$5.68
11	$7.96	$2.87	$5.72	$7.34	$2.52	$5.90	$7.38	$3.61	$5.57
12	$9.76	$3.30	$6.28	$7.77	$2.61	$5.53	$7.96	$2.52	$4.80
13	$9.26	$2.92	$5.93	$8.53	$3.15	$6.15	$7.95	$2.57	$4.84
14	$8.16	$2.76	$5.75	$7.08	$2.49	$5.22	$8.03	$2.49	$4.89
15	$7.32	$2.89	$5.52	$11.23	$2.57	$6.04	$7.13	$2.80	$5.54
16	$7.56	$4.37	$5.93	$7.59	$2.49	$5.58	$10.19	$2.49	$5.54
17	$9.04	$2.54	$6.04	$8.61	$4.77	$5.91	$7.58	$2.54	$4.99
18	$9.66	$2.49	$5.57	$10.20	$4.02	$6.07	$9.73	$3.62	$6.01
19	$8.73	$2.49	$5.83	$9.23	$2.96	$6.24	$6.32	$2.56	$5.06
20	$6.86	$3.75	$5.65	$9.13	$3.84	$5.79	$7.15	$3.25	$5.56
21	$7.24	$3.49	$5.35	$8.77	$2.71	$6.47	$8.41	$2.54	$5.60
22	$10.24	$4.48	$5.99	$9.51	$3.55	$5.93	$8.77	$3.14	$5.41
23	$8.96	$3.34	$5.86	$7.87	$2.66	$5.88	$8.88	$2.96	$5.79
24	$7.29	$3.07	$5.97	$9.93	$2.74	$6.42	$8.21	$4.01	$5.90
25	$7.30	$2.74	$4.95	$6.13	$3.11	$4.91	$7.53	$2.49	$4.99
26	$9.20	$3.99	$5.82	$8.25	$3.17	$5.53	$7.87	$2.49	$4.90
27	$9.60	$2.52	$5.46	$8.90	$3.11	$6.27	$7.63	$3.76	$5.49
28	$7.88	$2.54	$5.24	$8.86	$3.39	$5.93	$8.11	$3.02	$5.60
29	$7.66	$3.77	$5.84	$9.76	$5.16	$7.13	$8.40	$3.22	$5.47
30	$9.40	$2.57	$5.74	$9.61	$3.86	$6.42	$7.35	$3.49	$5.54
31	$8.02	$4.61	$6.05	$7.91	$3.59	$6.07	$9.12	$2.57	$5.17
32	$7.40	$2.52	$5.16	$7.22	$3.54	$5.50	$8.55	$2.52	$5.42
33	$7.12	$2.49	$4.36	$9.34	$2.49	$6.17	$7.59	$3.04	$5.06
34	$8.72	$4.08	$5.41	$6.87	$2.54	$4.86	$9.00	$2.54	$5.08
35	$8.52	$4.30	$6.05	$6.94	$2.52	$5.05	$7.63	$2.52	$5.55
36	$9.60	$2.77	$6.41	$7.45	$3.14	$4.80	$8.45	$2.54	$5.23
37	$10.31	$2.88	$5.31	$9.04	$3.58	$5.33	$9.04	$3.93	$5.41
38	$6.67	$2.71	$5.24	$8.69	$2.95	$5.89	$7.33	$2.56	$6.03
39	$7.78	$4.16	$5.82	$7.94	$2.52	$5.61	$5.97	$2.52	$4.72
40	$7.19	$3.29	$5.02	$8.54	$3.84	$5.66	$7.79	$2.57	$5.15
41	$7.47	$2.64	$5.71	$7.47	$2.98	$5.47	$9.69	$2.57	$5.26
42	$6.35	$2.49	$4.77	$8.68	$2.49	$5.40	$7.17	$2.82	$5.10
43	$7.99	$2.49	$5.15	$7.51	$2.49	$5.52	$7.91	$3.22	$5.71
44	$7.55	$2.54	$5.65	$8.78	$4.28	$6.38	$8.54	$3.65	$6.37
45	$10.20	$4.83	$6.61	$7.97	$2.65	$5.18	$7.13	$3.76	$5.00
46	$8.43	$2.75	$5.98	$8.66	$3.33	$5.53	$7.90	$3.08	$5.99
47	$8.44	$2.52	$5.09	$9.46	$3.22	$6.25	$7.60	$3.12	$5.74
48	$8.33	$2.49	$5.47	$6.63	$3.42	$5.61	$7.03	$3.29	$5.34
49	$7.33	$2.67	$5.51	$9.36	$3.69	$5.92	$8.69	$2.57	$5.64
50	$7.11	$3.04	$5.55	$10.12	$3.90	$5.91	$8.58	$3.39	$6.66
51	$8.28	$3.20	$6.12	$9.23	$3.85	$5.84	$8.89	$3.22	$5.50
52	$7.31	$2.87	$5.60	$8.07	$2.52	$6.00	$7.63	$2.52	$4.81

	2018			2019			2020		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$7.11	$2.54	$5.02	$9.94	$4.85	$6.74	$7.65	$3.17	$5.71
54	$6.48	$2.49	$4.70	$8.80	$4.08	$5.48	$9.31	$3.63	$6.06
55	$8.30	$2.49	$5.34	$10.24	$4.84	$6.71	$8.82	$4.12	$5.76
56	$8.52	$3.33	$5.85	$9.78	$3.81	$6.08	$9.15	$4.23	$6.15
57	$7.31	$2.57	$4.57	$8.95	$2.57	$6.02	$7.34	$3.72	$5.70
58	$9.38	$2.57	$5.60	$7.68	$2.74	$5.61	$9.77	$4.73	$6.89
59	$8.23	$4.17	$6.01	$7.20	$3.10	$5.25	$7.84	$3.14	$5.21
60	$8.63	$4.19	$6.02	$9.97	$3.92	$6.77	$7.41	$2.96	$5.52
61	$7.36	$3.40	$5.57	$8.04	$2.71	$6.14	$7.78	$2.49	$5.89
62	$8.27	$2.54	$5.19	$8.92	$2.92	$6.41	$9.72	$2.97	$6.18
63	$7.41	$2.97	$5.35	$8.54	$2.54	$5.64	$8.53	$2.54	$4.89
64	$8.60	$2.49	$5.57	$10.48	$3.15	$5.95	$7.64	$2.49	$5.20
65	$10.01	$2.71	$6.06	$7.14	$2.49	$4.87	$7.24	$2.49	$4.74
66	$8.52	$2.52	$5.63	$7.97	$3.66	$6.64	$9.08	$3.49	$5.50
67	$7.11	$2.52	$5.34	$6.79	$2.64	$5.10	$8.84	$2.87	$5.09
68	$8.16	$3.65	$6.12	$8.87	$2.54	$5.88	$8.29	$3.14	$5.33
69	$7.87	$2.91	$5.10	$10.01	$2.58	$6.08	$8.55	$2.76	$6.04
70	$8.98	$2.79	$5.99	$9.03	$3.39	$6.31	$10.17	$3.85	$5.73
71	$8.56	$3.77	$6.09	$7.90	$3.35	$4.82	$7.56	$2.57	$5.11
72	$7.56	$3.44	$5.40	$10.14	$3.43	$6.70	$8.70	$3.77	$5.68
73	$6.72	$3.32	$5.26	$8.54	$2.52	$5.89	$9.52	$3.75	$5.66
74	$8.38	$3.92	$5.35	$10.10	$2.79	$5.83	$9.70	$3.33	$5.65
75	$7.83	$2.89	$4.84	$8.62	$3.96	$6.06	$7.18	$2.49	$5.35
76	$7.79	$4.05	$5.97	$6.94	$3.87	$5.62	$7.70	$3.67	$6.12
77	$7.41	$2.49	$5.22	$8.94	$3.48	$6.57	$8.13	$3.11	$5.27
78	$9.03	$3.24	$5.99	$7.45	$2.75	$5.07	$9.79	$4.05	$6.31
79	$9.05	$3.90	$5.52	$7.77	$4.49	$6.05	$7.14	$2.49	$4.74
80	$7.17	$2.49	$5.31	$9.14	$3.08	$6.22	$8.58	$3.60	$5.91
81	$8.46	$2.54	$5.59	$7.87	$3.60	$5.98	$7.11	$2.54	$5.20
82	$9.62	$2.52	$5.67	$8.15	$2.52	$6.14	$7.21	$2.80	$5.29
83	$7.23	$2.54	$5.63	$8.43	$3.51	$5.99	$9.79	$3.78	$6.07
84	$9.54	$3.64	$6.25	$10.38	$3.62	$6.36	$10.07	$2.54	$5.36
85	$8.10	$2.54	$5.49	$8.68	$3.19	$6.09	$8.92	$3.22	$6.36
86	$8.13	$2.52	$5.11	$9.44	$3.54	$6.30	$8.81	$4.18	$6.92
87	$8.55	$3.41	$6.14	$8.19	$2.57	$4.95	$7.61	$2.57	$5.04
88	$8.86	$2.92	$6.05	$10.62	$3.36	$6.35	$8.04	$2.57	$5.31
89	$7.44	$3.19	$5.49	$7.89	$3.72	$6.13	$6.41	$2.57	$4.87
90	$7.54	$2.49	$6.01	$9.37	$3.25	$6.00	$7.69	$2.62	$5.19
91	$7.39	$2.52	$5.22	$7.51	$3.59	$5.43	$8.82	$5.53	$6.81
92	$8.96	$2.52	$5.23	$9.68	$2.52	$6.46	$7.97	$3.68	$5.92
93	$8.11	$2.54	$5.70	$8.06	$2.54	$5.29	$9.49	$3.71	$6.46
94	$8.60	$2.56	$5.11	$8.97	$2.61	$5.89	$8.09	$2.49	$5.56
95	$8.88	$3.65	$5.65	$8.67	$2.57	$5.46	$6.78	$2.57	$5.32
96	$8.70	$2.57	$5.53	$8.66	$2.57	$5.07	$9.20	$4.55	$6.54
97	$8.88	$2.49	$5.33	$8.73	$2.49	$6.08	$9.90	$2.77	$5.21
98	$7.04	$2.57	$4.97	$9.80	$3.34	$5.48	$9.15	$2.61	$5.71
99	$7.57	$4.38	$6.31	$8.84	$3.61	$5.61	$7.65	$2.52	$5.26
100	$8.85	$3.72	$5.56	$9.52	$3.73	$6.52	$7.35	$2.54	$4.93
101	$10.91	$2.54	$5.95	$8.73	$2.54	$5.70	$9.20	$4.53	$5.96
102	$9.90	$4.26	$6.70	$7.64	$4.12	$5.91	$8.97	$3.67	$6.33
103	$7.31	$2.73	$4.89	$8.88	$3.48	$5.86	$6.73	$3.47	$4.91
104	$8.77	$4.95	$6.39	$7.60	$3.62	$5.79	$7.62	$2.52	$4.97

	2018			2019			2020		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$8.98	$2.57	$6.22	$8.85	$4.14	$6.60	$6.69	$3.03	$5.30
106	$8.07	$2.92	$5.81	$8.49	$2.52	$5.38	$7.29	$3.05	$5.44
107	$8.62	$2.49	$5.81	$7.73	$3.29	$5.76	$9.40	$3.90	$6.29
108	$9.17	$3.79	$6.50	$8.92	$3.51	$6.44	$7.39	$2.72	$5.01
109	$7.69	$2.57	$6.07	$7.99	$2.57	$5.43	$9.81	$2.57	$5.70
110	$8.73	$3.98	$5.94	$7.64	$3.61	$5.65	$7.54	$3.29	$5.22
111	$7.87	$2.52	$5.34	$8.72	$4.27	$5.77	$8.69	$2.61	$6.34
112	$8.49	$3.71	$5.65	$7.88	$3.84	$6.68	$8.44	$3.12	$5.77
113	$8.74	$2.54	$5.49	$8.34	$3.17	$5.65	$9.50	$2.88	$6.09
114	$8.73	$3.57	$5.83	$9.97	$4.65	$6.24	$9.02	$2.49	$5.93
115	$7.13	$3.19	$5.12	$8.29	$2.73	$5.55	$8.68	$3.90	$6.20
116	$7.28	$3.52	$5.40	$8.68	$3.08	$5.58	$10.01	$2.49	$5.98
117	$10.48	$2.57	$5.51	$7.40	$4.23	$5.93	$7.84	$2.85	$5.89
118	$8.88	$4.41	$5.80	$8.27	$4.39	$5.81	$9.10	$3.93	$6.12
119	$7.19	$2.91	$4.54	$7.94	$2.52	$5.70	$9.10	$3.04	$5.70
120	$8.51	$4.62	$6.09	$8.90	$2.54	$5.65	$7.61	$3.15	$5.71
121	$8.00	$2.57	$5.35	$8.98	$2.64	$5.86	$7.44	$3.78	$5.91
122	$8.83	$3.29	$6.47	$8.81	$2.52	$5.22	$10.49	$4.58	$6.34
123	$10.85	$2.57	$5.75	$8.44	$3.15	$5.12	$7.16	$3.49	$5.30
124	$7.95	$3.02	$5.00	$8.46	$3.96	$6.37	$8.60	$3.84	$5.72
125	$9.56	$3.51	$5.41	$7.03	$4.04	$5.90	$8.73	$3.14	$5.37
126	$7.68	$2.54	$5.29	$7.36	$3.78	$5.85	$8.57	$2.54	$5.37
127	$8.47	$4.55	$6.34	$8.80	$2.80	$6.22	$8.81	$2.52	$5.64
128	$9.62	$3.70	$6.14	$9.02	$2.49	$6.56	$7.91	$3.18	$5.40
129	$8.00	$3.27	$5.63	$8.06	$3.18	$6.04	$8.74	$3.53	$6.05
130	$8.63	$2.57	$5.28	$8.42	$3.08	$5.59	$7.77	$2.57	$4.94
131	$10.46	$2.92	$6.03	$9.24	$2.52	$6.49	$8.79	$2.52	$6.19
132	$7.94	$3.37	$5.65	$8.94	$3.66	$6.10	$8.51	$2.52	$5.09
133	$9.87	$3.75	$5.81	$7.46	$2.57	$5.45	$7.00	$2.82	$4.88
134	$8.90	$2.52	$5.93	$9.82	$4.03	$6.43	$7.61	$3.31	$6.01
135	$7.32	$2.52	$4.90	$8.57	$3.48	$6.34	$7.72	$2.96	$5.59
136	$7.06	$2.54	$4.98	$8.89	$2.54	$5.62	$7.48	$4.11	$5.66
137	$7.22	$2.54	$4.82	$8.04	$3.64	$5.65	$9.21	$2.54	$6.40
138	$9.17	$3.72	$6.22	$8.71	$2.81	$5.18	$9.97	$2.49	$5.49
139	$9.39	$3.43	$5.31	$8.25	$2.52	$6.11	$7.66	$2.52	$5.09
140	$7.38	$3.36	$5.28	$8.19	$5.15	$6.37	$7.18	$2.57	$5.44
141	$7.58	$3.48	$5.58	$9.08	$2.71	$5.47	$8.47	$3.21	$5.92
142	$6.74	$2.49	$5.41	$9.40	$4.05	$6.25	$8.34	$2.49	$5.64
143	$8.22	$2.57	$4.89	$8.21	$2.72	$5.92	$8.98	$2.57	$5.56
144	$8.18	$2.57	$5.82	$8.24	$2.57	$5.13	$8.49	$3.35	$5.70
145	$9.39	$4.56	$6.23	$8.16	$2.57	$5.36	$7.84	$3.90	$5.59
146	$7.35	$2.52	$5.18	$7.05	$2.52	$5.71	$7.44	$2.53	$5.41
147	$8.61	$2.52	$5.41	$8.27	$2.52	$5.42	$7.45	$2.88	$5.34
148	$7.11	$2.62	$4.59	$9.67	$2.54	$5.34	$8.11	$4.17	$6.00
149	$7.10	$2.49	$5.36	$7.87	$4.20	$6.04	$9.14	$3.36	$6.00
150	$8.34	$2.52	$6.33	$7.19	$4.06	$6.23	$7.51	$4.62	$6.25
151	$8.37	$2.59	$5.57	$7.71	$2.96	$5.56	$7.84	$3.16	$5.60
152	$8.54	$2.54	$4.98	$7.99	$2.62	$5.75	$7.88	$3.51	$5.74
153	$8.35	$2.57	$5.21	$9.40	$2.99	$5.67	$8.48	$3.25	$6.19
154	$8.81	$2.52	$5.70	$9.24	$3.15	$5.80	$7.57	$3.17	$5.44
155	$7.75	$2.76	$5.50	$8.87	$3.21	$6.49	$9.55	$2.82	$5.29
156	$8.70	$2.52	$5.56	$7.71	$3.92	$6.21	$7.00	$2.52	$5.08

	2018			2019			2020		
Draw	max	min	avg	max	min	avg	max	min	avg
157	$9.35	$2.54	$5.33	$7.68	$4.32	$5.81	$8.89	$2.55	$5.19
158	$8.70	$2.49	$4.87	$7.41	$2.49	$5.25	$8.89	$3.00	$5.56
159	$7.50	$2.82	$5.15	$8.70	$3.57	$6.50	$8.14	$2.57	$5.35
160	$9.33	$3.36	$6.50	$7.13	$2.64	$5.02	$7.40	$2.54	$5.16
161	$7.38	$3.09	$5.62	$7.95	$2.64	$5.10	$7.72	$2.54	$5.00
162	$9.43	$3.47	$6.22	$8.60	$3.18	$5.18	$7.70	$3.02	$5.42
163	$9.99	$3.31	$5.79	$7.56	$2.56	$5.14	$6.89	$3.46	$5.51
164	$11.29	$2.52	$6.67	$8.05	$3.45	$5.62	$7.41	$2.66	$5.52
165	$7.30	$3.34	$5.40	$8.24	$3.01	$5.95	$7.43	$2.52	$4.67
166	$7.82	$3.72	$5.67	$9.55	$4.79	$6.99	$8.61	$3.74	$5.30
167	$7.44	$3.40	$5.29	$8.32	$2.76	$5.42	$7.56	$5.01	$5.92
168	$10.01	$2.52	$5.47	$8.90	$2.52	$5.67	$9.12	$4.12	$6.69
169	$8.47	$3.49	$5.29	$9.84	$5.37	$7.16	$8.51	$2.54	$5.15
170	$8.13	$3.34	$6.59	$8.01	$2.57	$4.79	$8.45	$2.57	$5.45
171	$7.63	$2.62	$4.89	$11.54	$2.57	$6.22	$9.60	$4.21	$5.95
172	$8.76	$3.52	$6.44	$7.58	$2.57	$5.38	$8.67	$2.74	$5.30
173	$9.08	$2.52	$5.43	$9.64	$2.67	$5.87	$8.68	$4.83	$6.43
174	$8.74	$4.29	$5.86	$8.01	$2.79	$5.86	$8.58	$2.54	$5.38
175	$7.33	$4.50	$6.18	$9.28	$4.30	$6.46	$8.76	$2.57	$5.33
176	$10.13	$3.53	$6.43	$8.08	$4.57	$6.56	$8.61	$2.72	$5.79
177	$6.51	$2.59	$4.69	$8.58	$3.89	$5.32	$6.85	$2.52	$5.00
178	$9.72	$2.72	$5.70	$8.24	$3.27	$5.66	$6.57	$3.51	$5.30
179	$8.51	$2.57	$6.39	$8.64	$2.58	$6.12	$8.48	$2.57	$5.47
180	$9.65	$3.25	$6.12	$7.83	$2.84	$5.56	$6.81	$2.54	$4.61
181	$6.71	$3.90	$5.17	$7.75	$2.96	$5.56	$8.34	$2.52	$5.57
182	$8.00	$3.78	$5.67	$9.58	$2.54	$5.22	$7.21	$2.54	$5.22
183	$8.87	$2.54	$5.54	$9.26	$3.65	$6.18	$9.28	$3.27	$5.64
184	$7.35	$2.74	$5.60	$10.77	$3.39	$6.56	$7.74	$2.54	$5.22
185	$7.68	$4.21	$5.79	$9.59	$2.49	$5.45	$7.71	$2.63	$5.51
186	$6.89	$2.54	$5.17	$9.02	$2.54	$5.64	$8.64	$2.62	$5.07
187	$7.47	$3.23	$5.59	$8.23	$4.17	$5.94	$8.21	$2.49	$5.96
188	$8.27	$2.49	$5.78	$10.83	$2.49	$5.49	$8.39	$2.49	$5.18
189	$9.93	$3.40	$6.17	$9.56	$3.92	$6.12	$6.99	$2.61	$4.84
190	$8.37	$4.17	$6.00	$7.34	$2.52	$4.86	$9.19	$2.96	$5.57
191	$7.78	$2.52	$5.52	$8.05	$4.30	$5.67	$7.32	$2.52	$5.01
192	$8.96	$3.86	$6.14	$10.16	$3.82	$7.06	$8.80	$2.49	$5.12
193	$8.74	$2.71	$6.51	$9.30	$3.47	$5.52	$7.87	$4.13	$5.55
194	$8.41	$2.86	$5.00	$7.82	$2.69	$5.14	$8.34	$3.36	$5.78
195	$8.61	$3.59	$6.12	$9.68	$4.06	$5.99	$6.96	$2.54	$5.09
196	$9.42	$2.58	$5.54	$9.32	$4.14	$6.61	$8.92	$2.89	$6.30
197	$9.51	$4.27	$6.02	$9.60	$2.67	$5.78	$7.13	$3.75	$5.40
198	$7.33	$3.18	$5.27	$8.79	$2.52	$6.32	$8.36	$2.52	$5.15
199	$9.52	$3.61	$6.37	$9.14	$3.17	$5.30	$8.75	$2.93	$5.65
200	$8.95	$3.26	$6.40	$9.53	$3.33	$6.01	$7.65	$4.14	$5.87
average	$8.34	$3.11	$5.64	$8.62	$3.24	$5.85	$8.23	$3.09	$5.56
Max	$11.29			$11.54			$10.49		
Avg			$5.64			$5.85			$5.56
Min	$2.49			$2.49			$2.49		
Range	8.80			9.04			8.00		

Draw	2021 max	2021 min	2021 avg	2022 max	2022 min	2022 avg	2023 max	2023 min	2023 avg
1	$8.07	$2.57	$5.68	$8.79	$4.07	$6.14	$10.37	$3.46	$6.56
2	$10.47	$4.08	$5.82	$8.05	$3.69	$6.17	$8.21	$3.62	$6.40
3	$9.33	$2.49	$5.98	$9.37	$2.49	$5.35	$8.69	$2.49	$5.82
4	$8.28	$3.76	$5.98	$8.42	$2.54	$5.66	$7.48	$4.03	$5.66
5	$12.28	$2.52	$5.68	$8.30	$3.39	$6.11	$8.96	$2.52	$5.94
6	$8.65	$3.71	$6.07	$8.97	$2.68	$5.46	$7.55	$3.33	$5.93
7	$8.02	$4.32	$6.06	$9.70	$3.60	$6.04	$12.45	$2.54	$5.53
8	$8.00	$2.57	$5.24	$7.78	$2.57	$5.24	$9.42	$2.57	$6.04
9	$7.73	$3.14	$5.83	$8.20	$2.54	$4.97	$9.14	$2.54	$5.53
10	$8.55	$2.66	$6.30	$7.58	$4.05	$5.65	$10.26	$3.96	$6.40
11	$6.48	$2.89	$5.32	$8.74	$3.68	$6.32	$8.00	$3.02	$6.07
12	$8.80	$2.81	$5.71	$9.84	$3.19	$6.36	$9.81	$4.91	$7.31
13	$9.43	$3.50	$5.96	$7.53	$2.66	$5.37	$10.40	$2.57	$6.52
14	$7.68	$2.92	$5.50	$9.54	$2.49	$5.82	$8.00	$3.46	$5.63
15	$7.12	$3.11	$5.54	$7.79	$2.57	$6.14	$9.12	$2.85	$6.49
16	$8.82	$3.81	$6.13	$7.41	$3.51	$5.54	$8.77	$3.35	$5.88
17	$7.46	$4.22	$5.46	$8.04	$4.16	$5.91	$9.69	$3.37	$6.49
18	$7.87	$2.49	$5.57	$8.57	$4.28	$6.03	$9.31	$3.88	$6.06
19	$10.22	$2.49	$5.80	$10.01	$2.85	$6.24	$8.20	$2.62	$5.56
20	$7.68	$3.26	$5.17	$8.53	$4.04	$5.91	$8.53	$3.40	$5.72
21	$7.60	$3.13	$5.42	$9.20	$2.54	$6.28	$7.88	$3.13	$5.34
22	$7.61	$4.68	$6.12	$7.75	$4.16	$5.88	$7.88	$2.77	$5.36
23	$7.07	$2.81	$5.48	$9.17	$2.83	$6.62	$9.89	$3.44	$6.48
24	$8.16	$3.12	$6.20	$7.40	$2.57	$5.31	$7.89	$3.52	$6.08
25	$8.29	$3.69	$5.48	$7.58	$4.39	$5.66	$10.13	$3.79	$6.59
26	$10.16	$4.07	$5.97	$8.09	$3.20	$5.70	$9.06	$3.42	$6.11
27	$8.19	$2.54	$5.57	$8.80	$2.52	$5.31	$9.28	$2.68	$5.52
28	$7.17	$2.54	$5.12	$7.86	$3.40	$5.39	$9.21	$4.56	$6.50
29	$8.97	$3.65	$5.62	$8.64	$3.48	$5.87	$8.06	$3.35	$5.91
30	$10.07	$4.27	$6.16	$10.60	$2.57	$5.44	$8.29	$2.57	$5.81
31	$7.82	$3.68	$5.73	$8.47	$3.19	$6.07	$8.49	$3.40	$6.40
32	$8.19	$3.83	$6.44	$8.26	$3.19	$5.78	$9.91	$4.31	$6.56
33	$9.60	$2.49	$4.94	$9.78	$2.49	$5.40	$9.41	$3.79	$7.08
34	$8.22	$4.71	$6.45	$9.93	$2.75	$5.71	$8.52	$3.57	$6.01
35	$8.27	$3.80	$6.05	$6.47	$3.02	$5.54	$9.59	$4.48	$6.68
36	$8.39	$2.69	$4.89	$7.92	$2.96	$5.60	$8.37	$2.82	$6.08
37	$8.94	$2.54	$5.64	$8.58	$2.94	$6.25	$8.96	$4.15	$6.76
38	$9.64	$2.52	$5.87	$8.26	$4.42	$5.76	$9.43	$3.12	$5.90
39	$7.01	$3.10	$5.20	$7.19	$3.38	$5.84	$7.25	$3.39	$5.55
40	$9.48	$2.57	$5.50	$8.34	$2.57	$5.85	$9.51	$2.57	$6.75
41	$7.36	$3.31	$5.61	$10.12	$3.87	$5.91	$8.15	$3.54	$5.63
42	$7.72	$2.49	$5.65	$8.21	$2.91	$6.29	$9.99	$3.76	$6.31
43	$8.38	$2.49	$5.85	$9.14	$2.59	$5.27	$9.06	$4.66	$6.26
44	$9.18	$3.09	$5.99	$7.39	$2.54	$5.53	$8.42	$2.54	$5.80
45	$8.35	$2.57	$5.09	$7.79	$2.62	$4.81	$7.71	$4.50	$6.10
46	$9.83	$3.43	$6.11	$8.16	$2.54	$5.75	$8.75	$4.20	$6.30
47	$8.47	$3.13	$5.06	$8.69	$3.28	$6.25	$8.43	$2.52	$6.26
48	$7.87	$2.49	$5.87	$9.20	$5.15	$6.55	$11.61	$3.76	$7.07
49	$6.50	$2.83	$4.85	$7.64	$2.77	$5.06	$8.58	$2.57	$5.34
50	$8.01	$2.57	$5.63	$8.83	$2.57	$5.48	$7.32	$3.81	$5.54
51	$10.85	$2.58	$5.93	$9.34	$2.65	$5.86	$8.77	$4.51	$6.53
52	$7.92	$5.10	$6.36	$8.29	$4.05	$5.73	$8.15	$4.45	$6.13

	2021			2022			2023		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$7.96	$2.77	$5.49	$7.48	$3.40	$4.76	$10.19	$4.43	$6.77
54	$9.46	$4.07	$6.08	$8.33	$3.15	$5.53	$9.23	$3.57	$6.00
55	$8.39	$2.86	$5.47	$8.87	$2.49	$5.79	$8.36	$3.78	$6.18
56	$9.76	$3.21	$6.08	$7.88	$2.64	$6.17	$10.00	$3.50	$5.73
57	$9.74	$2.57	$5.51	$9.00	$3.02	$6.24	$8.84	$4.02	$6.43
58	$10.04	$4.00	$6.32	$8.16	$2.57	$5.48	$9.02	$3.86	$6.23
59	$8.73	$2.91	$5.51	$9.15	$3.16	$5.72	$9.61	$2.54	$5.75
60	$7.26	$4.29	$5.97	$6.99	$2.63	$5.95	$7.91	$4.56	$5.76
61	$7.37	$2.63	$5.02	$8.53	$2.89	$5.53	$8.61	$3.83	$6.84
62	$9.58	$4.11	$6.09	$7.68	$3.77	$5.41	$8.41	$3.31	$6.26
63	$8.89	$2.54	$5.45	$9.37	$4.45	$6.38	$9.14	$3.54	$6.06
64	$7.82	$3.49	$5.93	$9.09	$3.54	$7.12	$8.90	$2.49	$5.55
65	$9.39	$2.49	$5.69	$8.93	$2.75	$6.21	$9.80	$4.82	$6.72
66	$7.59	$3.50	$5.80	$9.99	$3.47	$6.08	$9.17	$3.30	$6.23
67	$7.64	$3.70	$6.07	$9.99	$2.52	$5.28	$7.27	$3.55	$5.57
68	$9.13	$3.06	$5.65	$9.17	$4.41	$6.22	$8.17	$4.40	$6.39
69	$8.06	$3.59	$5.49	$9.88	$2.52	$5.08	$8.87	$4.89	$6.85
70	$8.73	$3.41	$6.09	$8.16	$5.28	$6.23	$6.83	$2.49	$5.21
71	$7.82	$3.53	$6.03	$9.71	$2.57	$5.58	$9.14	$4.25	$6.98
72	$6.73	$2.92	$5.08	$9.66	$2.49	$6.19	$8.69	$2.49	$5.84
73	$9.73	$3.58	$6.25	$8.92	$2.62	$6.11	$8.42	$3.75	$6.36
74	$6.93	$2.80	$5.53	$10.69	$2.52	$6.61	$8.80	$2.52	$6.17
75	$9.41	$4.07	$6.34	$9.31	$3.19	$6.39	$9.60	$3.12	$5.94
76	$8.01	$3.53	$5.71	$8.49	$2.49	$5.88	$7.96	$3.08	$5.73
77	$7.79	$2.49	$5.68	$7.67	$2.49	$4.93	$7.10	$2.86	$5.16
78	$7.75	$2.58	$5.33	$8.31	$3.36	$5.82	$8.28	$3.91	$6.22
79	$8.98	$3.85	$6.13	$8.06	$2.63	$6.06	$8.55	$2.73	$5.86
80	$7.53	$2.94	$4.98	$8.40	$3.07	$5.93	$9.85	$2.53	$5.81
81	$7.73	$2.61	$5.47	$10.48	$4.10	$6.74	$9.02	$4.91	$6.22
82	$8.30	$2.52	$5.81	$9.00	$4.42	$6.20	$8.58	$3.31	$5.84
83	$7.43	$3.04	$5.83	$7.53	$3.10	$5.42	$8.84	$2.67	$6.33
84	$8.31	$2.54	$5.99	$9.57	$2.54	$5.79	$8.24	$2.54	$5.77
85	$8.22	$3.37	$4.96	$10.18	$3.61	$6.04	$8.57	$3.48	$6.35
86	$6.79	$2.52	$4.86	$8.21	$3.30	$5.81	$7.77	$3.89	$6.15
87	$8.80	$2.99	$5.76	$9.60	$2.57	$6.32	$8.61	$3.86	$5.85
88	$8.20	$3.70	$5.75	$9.04	$4.65	$6.33	$7.72	$3.54	$5.90
89	$7.84	$3.35	$6.13	$8.49	$2.57	$5.99	$9.19	$4.88	$6.45
90	$7.49	$2.49	$5.79	$9.56	$2.49	$6.09	$8.73	$3.30	$6.53
91	$9.77	$2.81	$5.52	$7.18	$2.55	$5.30	$7.91	$3.19	$5.53
92	$8.85	$3.49	$5.94	$8.57	$2.52	$6.42	$10.36	$3.38	$6.24
93	$7.54	$3.56	$5.50	$9.42	$3.80	$5.44	$9.25	$4.70	$6.82
94	$7.66	$3.95	$5.64	$8.86	$3.12	$5.88	$8.59	$2.49	$6.55
95	$8.41	$2.57	$6.29	$9.27	$3.08	$5.76	$10.04	$2.57	$6.60
96	$7.25	$3.68	$5.13	$8.73	$2.57	$5.50	$9.84	$4.50	$6.60
97	$9.76	$2.96	$6.56	$8.24	$3.50	$5.55	$8.85	$3.52	$6.29
98	$7.41	$3.99	$5.69	$9.32	$2.57	$5.71	$10.33	$4.49	$6.11
99	$8.63	$2.52	$5.57	$7.44	$2.52	$5.33	$8.92	$3.15	$5.62
100	$8.60	$4.13	$6.92	$8.72	$2.55	$6.43	$7.75	$3.01	$5.54
101	$8.55	$2.54	$5.70	$6.72	$2.54	$4.59	$7.77	$2.61	$5.46
102	$7.08	$2.85	$5.46	$7.35	$2.57	$5.78	$7.12	$4.18	$6.23
103	$6.84	$3.24	$5.31	$9.18	$2.52	$5.52	$10.02	$3.51	$6.26
104	$8.20	$3.27	$5.78	$9.56	$3.90	$6.21	$8.89	$5.34	$6.60

	2021			2022			2023		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$10.34	$2.57	$5.66	$8.38	$3.31	$5.71	$8.36	$3.75	$6.27
106	$7.62	$3.73	$5.68	$9.11	$2.52	$5.46	$8.67	$4.71	$6.03
107	$7.41	$3.19	$5.51	$6.50	$3.32	$4.97	$8.64	$3.16	$5.74
108	$7.76	$3.64	$5.53	$8.65	$4.23	$6.55	$8.23	$3.84	$6.34
109	$7.84	$4.61	$5.90	$8.13	$2.67	$5.72	$8.91	$2.74	$5.25
110	$9.32	$2.86	$5.76	$8.22	$4.08	$5.94	$8.05	$3.52	$5.98
111	$6.67	$3.83	$5.93	$8.61	$3.77	$5.98	$9.47	$3.80	$6.63
112	$8.06	$3.10	$5.25	$7.05	$2.54	$5.82	$8.47	$3.92	$6.24
113	$8.89	$2.54	$5.59	$9.07	$4.70	$5.87	$7.15	$5.13	$6.23
114	$7.85	$2.70	$5.65	$9.58	$3.69	$5.87	$8.06	$3.13	$5.64
115	$9.53	$4.17	$6.49	$9.31	$3.31	$5.71	$9.07	$3.87	$6.73
116	$8.83	$2.67	$5.94	$8.62	$2.60	$5.34	$9.01	$2.49	$5.62
117	$7.05	$2.57	$4.90	$9.81	$3.04	$5.69	$7.93	$3.47	$5.87
118	$7.76	$3.37	$5.33	$8.30	$3.96	$5.71	$8.47	$3.72	$6.34
119	$9.29	$2.90	$5.66	$8.54	$2.52	$4.72	$9.08	$4.02	$7.30
120	$9.99	$3.62	$5.53	$10.60	$4.18	$7.38	$9.11	$4.23	$6.43
121	$7.88	$4.10	$5.79	$7.99	$2.57	$5.60	$8.97	$2.57	$5.39
122	$7.51	$2.91	$5.68	$8.47	$4.04	$6.29	$8.12	$3.44	$5.96
123	$8.20	$4.03	$5.75	$8.35	$2.81	$5.44	$8.25	$3.86	$6.05
124	$8.55	$2.86	$5.56	$8.56	$3.46	$5.32	$11.25	$4.18	$6.89
125	$8.42	$3.52	$6.05	$8.43	$3.16	$6.14	$9.11	$2.52	$5.25
126	$9.08	$2.92	$6.45	$8.59	$2.54	$4.86	$8.68	$3.83	$5.87
127	$8.33	$2.52	$5.29	$8.12	$3.16	$5.75	$10.03	$3.32	$6.61
128	$7.88	$2.49	$5.39	$8.41	$2.49	$5.44	$9.25	$2.49	$6.03
129	$9.14	$4.21	$5.99	$9.17	$3.36	$6.66	$8.80	$3.05	$5.79
130	$10.13	$2.57	$5.55	$9.27	$3.90	$6.24	$6.29	$4.07	$5.62
131	$7.88	$2.68	$5.65	$7.94	$2.95	$5.83	$8.91	$3.06	$6.13
132	$8.82	$3.60	$5.78	$7.55	$4.43	$5.61	$9.19	$4.17	$6.25
133	$6.71	$2.57	$4.76	$6.65	$2.78	$4.83	$9.07	$3.93	$6.00
134	$7.73	$3.20	$5.63	$7.99	$2.52	$5.52	$8.45	$2.57	$5.67
135	$7.63	$2.52	$5.32	$8.61	$3.90	$6.06	$7.38	$2.52	$5.14
136	$9.02	$2.93	$5.97	$8.70	$4.80	$6.19	$11.30	$3.32	$6.22
137	$8.81	$3.11	$5.78	$8.71	$3.52	$5.83	$8.90	$2.54	$5.97
138	$8.55	$2.49	$5.39	$9.06	$2.82	$6.19	$8.86	$3.61	$6.36
139	$8.08	$4.14	$6.33	$8.84	$4.47	$6.43	$7.97	$3.67	$6.27
140	$9.31	$2.67	$5.59	$8.43	$3.74	$5.71	$7.78	$3.15	$5.37
141	$8.54	$2.52	$5.45	$9.24	$3.23	$6.19	$10.02	$3.54	$6.22
142	$7.50	$3.17	$4.74	$8.05	$3.51	$6.00	$8.78	$2.49	$6.04
143	$7.84	$2.57	$5.05	$8.88	$2.57	$6.00	$8.64	$4.42	$5.77
144	$7.54	$3.50	$5.39	$8.75	$4.73	$6.56	$9.48	$3.88	$6.14
145	$7.33	$2.57	$5.25	$7.38	$3.17	$5.40	$8.14	$3.12	$5.92
146	$8.00	$2.52	$5.37	$8.38	$2.52	$5.99	$8.12	$2.52	$5.22
147	$10.03	$3.09	$5.73	$9.48	$2.52	$5.77	$7.98	$2.70	$5.30
148	$7.59	$2.68	$5.57	$8.97	$4.06	$6.15	$8.13	$2.54	$5.32
149	$7.52	$3.77	$6.01	$8.90	$2.49	$5.93	$7.94	$3.52	$6.14
150	$8.02	$2.60	$5.74	$7.63	$4.17	$5.37	$9.06	$3.34	$5.82
151	$9.53	$2.52	$5.86	$7.85	$3.30	$5.25	$8.63	$2.52	$5.18
152	$9.08	$3.65	$6.28	$9.11	$3.07	$6.31	$7.64	$2.54	$5.48
153	$8.28	$3.44	$5.48	$9.22	$4.35	$5.73	$9.95	$4.20	$6.40
154	$9.21	$2.52	$5.10	$7.76	$3.45	$5.53	$10.36	$3.82	$6.21
155	$7.90	$4.21	$6.50	$9.50	$2.54	$5.68	$7.92	$3.14	$5.63
156	$6.43	$2.52	$5.09	$8.87	$3.15	$6.15	$9.22	$3.11	$6.02

	2021			2022			2023		
Draw	max	min	avg	max	min	avg	max	min	avg
157	$8.79	$2.54	$5.95	$9.99	$2.61	$6.45	$9.45	$3.25	$6.16
158	$6.52	$2.89	$4.50	$9.78	$3.09	$6.46	$9.35	$2.49	$6.06
159	$10.22	$3.03	$6.75	$10.25	$4.11	$6.81	$9.33	$3.18	$6.26
160	$8.91	$3.02	$5.10	$8.25	$2.70	$6.06	$7.12	$2.54	$5.06
161	$5.85	$3.33	$4.67	$9.13	$2.81	$6.61	$8.77	$4.93	$6.43
162	$8.72	$3.17	$5.57	$10.66	$2.49	$6.33	$8.95	$3.37	$6.10
163	$7.97	$2.54	$5.44	$7.28	$3.18	$5.25	$7.96	$2.74	$4.66
164	$7.70	$2.52	$5.94	$8.36	$3.87	$5.97	$9.13	$2.52	$5.86
165	$8.49	$3.37	$5.78	$8.71	$2.52	$6.61	$8.41	$4.54	$7.29
166	$7.51	$2.82	$4.94	$9.26	$2.57	$5.99	$9.28	$3.22	$6.15
167	$8.50	$2.54	$5.11	$8.87	$3.50	$6.26	$9.16	$3.16	$6.27
168	$8.29	$3.04	$5.48	$10.05	$2.52	$5.64	$8.50	$2.52	$5.59
169	$7.71	$2.71	$5.36	$8.80	$3.81	$5.75	$8.51	$3.81	$6.38
170	$7.33	$2.73	$5.34	$10.13	$5.16	$7.07	$9.65	$2.57	$5.97
171	$8.15	$3.65	$5.83	$9.47	$2.97	$6.43	$8.57	$5.05	$6.27
172	$6.99	$3.28	$5.17	$9.96	$3.16	$5.68	$10.50	$4.09	$6.20
173	$10.26	$3.66	$5.72	$7.83	$3.32	$5.88	$8.35	$3.12	$5.46
174	$9.11	$4.28	$5.66	$10.05	$4.47	$7.04	$9.68	$4.08	$6.74
175	$7.90	$2.96	$5.70	$7.09	$3.68	$5.60	$9.09	$4.46	$6.60
176	$8.80	$2.49	$6.44	$9.26	$3.39	$6.49	$9.35	$3.07	$5.84
177	$9.52	$2.52	$5.58	$8.81	$3.10	$5.55	$9.98	$4.74	$6.44
178	$7.92	$2.52	$5.68	$7.76	$2.52	$5.34	$8.63	$3.17	$6.18
179	$9.11	$2.57	$5.23	$9.20	$2.57	$5.44	$9.43	$3.58	$6.51
180	$8.10	$2.68	$5.84	$7.24	$2.77	$5.23	$7.03	$5.32	$6.18
181	$9.35	$2.52	$5.47	$8.58	$3.21	$5.92	$8.86	$2.93	$6.06
182	$7.44	$2.54	$4.85	$8.60	$2.85	$5.63	$9.13	$2.88	$5.48
183	$11.71	$4.73	$7.39	$9.23	$3.21	$6.20	$8.53	$3.33	$6.08
184	$6.57	$2.87	$5.20	$8.88	$2.85	$5.48	$9.18	$4.61	$6.30
185	$9.35	$3.22	$5.77	$7.52	$2.49	$5.47	$9.78	$2.49	$5.91
186	$8.20	$3.31	$5.73	$10.10	$3.78	$5.84	$7.40	$2.54	$5.02
187	$10.14	$4.12	$5.79	$8.82	$3.42	$5.98	$6.31	$2.87	$4.49
188	$7.81	$3.73	$6.18	$11.28	$4.84	$6.56	$9.13	$3.58	$5.67
189	$7.65	$2.57	$5.12	$9.45	$2.57	$6.65	$8.18	$2.58	$6.17
190	$6.56	$2.52	$4.67	$8.28	$3.43	$5.83	$9.39	$2.65	$5.25
191	$8.75	$3.01	$5.64	$8.70	$2.52	$5.17	$9.49	$3.26	$6.13
192	$8.51	$2.49	$5.33	$7.84	$3.67	$5.54	$8.20	$5.20	$6.38
193	$7.25	$3.14	$4.96	$7.78	$2.57	$5.16	$7.90	$3.29	$6.28
194	$8.62	$2.54	$5.65	$8.11	$4.17	$5.79	$7.35	$2.85	$5.52
195	$7.85	$3.47	$6.21	$8.04	$2.54	$5.31	$8.95	$4.01	$7.01
196	$8.84	$2.54	$5.20	$7.92	$3.10	$5.10	$7.24	$3.39	$5.55
197	$9.07	$2.78	$5.26	$7.32	$3.89	$5.89	$9.59	$3.01	$6.24
198	$8.18	$3.82	$6.14	$7.79	$3.27	$5.30	$9.41	$3.06	$6.47
199	$7.99	$3.40	$6.10	$6.81	$3.10	$4.95	$9.19	$3.18	$6.08
200	$8.82	$2.49	$5.85	$8.40	$3.86	$5.72	$8.28	$3.85	$5.87
average	$8.35	$3.13	$5.66	$8.64	$3.21	$5.83	$8.79	$3.46	$6.06
Max	$12.28			$11.28			$12.45		
Avg			$5.66			$5.83			$6.06
Min	$2.49			$2.49			$2.49		
Range	9.79			8.79			9.96		

	2024			2025			2026		
Draw	max	min	avg	max	min	avg	max	min	avg
1	$8.17	$3.18	$5.85	$12.15	$3.01	$6.23	$8.00	$2.57	$5.15
2	$6.15	$3.55	$4.84	$8.96	$3.70	$6.23	$7.97	$2.82	$5.41
3	$7.62	$2.66	$5.14	$8.77	$2.71	$5.31	$8.19	$2.49	$5.79
4	$7.46	$2.54	$4.47	$8.47	$2.54	$5.61	$7.39	$2.54	$5.33
5	$7.15	$2.87	$5.05	$6.65	$2.97	$5.49	$6.58	$2.55	$5.38
6	$7.93	$2.61	$5.47	$8.86	$2.49	$5.36	$8.22	$3.65	$5.95
7	$9.54	$3.36	$6.38	$8.60	$2.54	$5.17	$9.29	$3.89	$6.64
8	$9.38	$2.57	$5.84	$7.05	$2.57	$4.85	$8.73	$2.57	$5.94
9	$8.27	$4.13	$6.02	$7.66	$3.19	$4.75	$8.55	$2.90	$5.94
10	$8.69	$2.49	$5.95	$9.09	$3.81	$6.37	$8.98	$3.51	$6.42
11	$9.33	$2.52	$5.57	$9.12	$4.10	$5.91	$8.54	$2.71	$5.52
12	$7.89	$2.52	$5.80	$6.31	$3.32	$5.02	$8.74	$3.39	$5.96
13	$8.68	$2.80	$5.71	$8.14	$3.31	$4.90	$9.08	$3.46	$5.90
14	$9.10	$2.81	$6.02	$7.32	$2.53	$5.27	$7.64	$3.87	$5.65
15	$7.49	$2.90	$5.31	$7.77	$2.57	$5.66	$9.55	$2.57	$6.19
16	$8.69	$3.92	$5.69	$8.63	$5.25	$6.77	$8.67	$5.17	$6.26
17	$8.84	$3.08	$6.09	$7.54	$2.54	$5.44	$8.34	$2.54	$5.35
18	$8.79	$3.09	$5.20	$7.98	$2.55	$5.68	$8.55	$2.49	$6.04
19	$9.66	$2.49	$6.18	$7.92	$2.81	$5.48	$7.17	$2.99	$5.28
20	$7.38	$3.03	$6.04	$7.18	$4.34	$5.53	$8.58	$2.49	$5.23
21	$8.91	$5.00	$6.69	$9.40	$2.54	$6.37	$6.92	$3.49	$5.24
22	$8.26	$4.60	$6.36	$8.07	$3.58	$5.60	$8.56	$2.54	$6.41
23	$8.74	$3.22	$6.05	$7.75	$2.57	$5.59	$7.13	$3.68	$5.72
24	$7.44	$3.12	$5.58	$7.99	$3.22	$4.86	$8.08	$2.57	$6.12
25	$8.35	$2.49	$5.60	$7.41	$2.63	$5.27	$7.79	$2.49	$5.03
26	$7.88	$2.85	$5.74	$9.40	$3.15	$5.99	$7.51	$3.02	$5.29
27	$6.21	$3.25	$4.77	$7.66	$2.52	$4.37	$9.66	$2.52	$6.15
28	$8.43	$3.78	$5.24	$7.93	$2.61	$5.32	$7.81	$2.54	$5.28
29	$7.97	$2.49	$5.49	$8.32	$3.00	$5.67	$8.63	$4.50	$6.22
30	$6.70	$2.57	$4.86	$6.66	$2.57	$5.13	$7.86	$2.57	$5.05
31	$8.45	$3.62	$6.30	$8.55	$2.57	$5.72	$8.50	$2.57	$5.54
32	$8.59	$3.25	$5.96	$9.38	$4.02	$6.02	$8.04	$2.72	$5.36
33	$8.97	$3.18	$5.73	$8.90	$3.20	$5.11	$9.70	$3.43	$6.41
34	$8.29	$3.97	$5.76	$6.94	$2.54	$5.02	$9.94	$2.54	$6.55
35	$8.15	$3.70	$6.33	$9.34	$3.20	$6.24	$9.05	$3.74	$6.69
36	$8.89	$2.54	$5.82	$8.07	$3.58	$6.03	$10.52	$2.82	$5.48
37	$8.73	$3.33	$5.93	$7.87	$3.21	$5.10	$7.89	$2.81	$6.03
38	$8.54	$3.67	$5.22	$8.15	$2.74	$5.47	$7.26	$3.73	$5.67
39	$8.23	$3.21	$5.39	$6.81	$2.89	$5.43	$9.62	$2.52	$5.86
40	$8.17	$4.33	$6.22	$9.26	$3.60	$5.89	$8.60	$3.72	$5.78
41	$7.66	$3.29	$5.46	$9.86	$4.13	$6.21	$6.88	$3.61	$5.18
42	$7.73	$2.49	$5.81	$6.59	$2.61	$4.90	$7.68	$3.48	$5.64
43	$8.25	$4.43	$6.07	$7.25	$2.79	$5.16	$9.27	$4.54	$6.61
44	$8.86	$2.54	$5.21	$7.14	$3.48	$5.61	$8.27	$3.58	$5.71
45	$9.01	$3.13	$5.90	$7.42	$4.12	$5.87	$8.15	$2.57	$5.07
46	$9.26	$2.54	$5.75	$8.92	$3.11	$5.83	$7.39	$2.92	$5.16
47	$10.50	$2.52	$5.75	$7.42	$3.09	$5.16	$8.81	$3.18	$5.82
48	$8.52	$3.00	$6.36	$8.11	$2.64	$5.84	$9.20	$3.23	$6.08
49	$8.38	$3.87	$6.20	$8.01	$2.95	$5.47	$6.30	$3.22	$4.92
50	$8.14	$3.60	$5.81	$8.31	$2.57	$5.01	$7.96	$2.57	$5.67
51	$9.02	$3.08	$5.96	$10.03	$2.57	$5.50	$8.38	$2.67	$5.56
52	$7.87	$3.49	$5.82	$9.29	$2.52	$5.55	$8.07	$2.52	$5.25

	2024			2025			2026		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$6.92	$2.54	$4.92	$9.29	$3.28	$5.58	$7.48	$3.46	$5.71
54	$7.99	$3.82	$5.90	$8.61	$3.42	$5.74	$7.86	$2.49	$5.20
55	$9.25	$3.28	$6.38	$7.60	$2.71	$5.28	$7.35	$3.55	$5.32
56	$7.90	$2.61	$5.43	$8.22	$2.57	$5.25	$8.56	$5.26	$6.36
57	$7.11	$2.57	$5.05	$8.39	$2.96	$5.81	$9.56	$4.54	$6.89
58	$8.14	$2.59	$6.17	$8.25	$3.96	$5.79	$8.91	$4.53	$6.63
59	$7.99	$3.52	$5.15	$9.37	$2.60	$5.26	$7.43	$2.54	$4.93
60	$9.94	$2.54	$5.77	$8.01	$3.63	$6.07	$8.60	$3.27	$6.39
61	$11.30	$3.40	$6.88	$7.60	$4.05	$5.73	$8.56	$3.10	$5.87
62	$7.67	$3.04	$5.40	$9.89	$2.54	$5.62	$7.79	$2.54	$6.00
63	$5.96	$2.54	$4.43	$8.03	$2.97	$5.40	$8.57	$3.53	$5.21
64	$8.45	$3.38	$5.47	$7.27	$2.49	$5.47	$7.10	$3.56	$5.33
65	$7.56	$2.90	$5.43	$8.85	$3.19	$5.86	$7.28	$3.73	$5.37
66	$9.36	$2.52	$5.64	$8.10	$2.52	$5.64	$8.12	$4.33	$6.10
67	$7.35	$2.81	$5.58	$6.56	$2.52	$5.05	$7.90	$3.98	$5.95
68	$8.73	$3.48	$6.06	$9.31	$4.25	$5.71	$8.46	$4.13	$5.93
69	$8.56	$2.94	$5.57	$8.84	$2.52	$5.80	$8.16	$3.75	$6.16
70	$7.61	$2.79	$6.01	$9.77	$2.49	$4.90	$8.50	$2.49	$5.68
71	$10.34	$2.87	$5.63	$9.12	$2.57	$5.11	$8.10	$2.57	$5.48
72	$9.36	$3.16	$5.96	$7.81	$3.85	$6.21	$7.02	$2.49	$4.86
73	$10.07	$4.05	$6.00	$8.03	$3.77	$6.03	$9.07	$2.99	$5.97
74	$7.95	$2.52	$5.60	$7.71	$3.24	$4.99	$10.47	$2.52	$5.96
75	$6.44	$3.64	$4.88	$9.10	$3.65	$5.69	$8.43	$2.49	$6.40
76	$9.42	$2.49	$5.62	$8.57	$2.98	$5.85	$9.18	$3.31	$6.47
77	$10.00	$2.49	$6.16	$8.49	$3.10	$6.07	$9.01	$2.49	$5.73
78	$7.34	$3.80	$5.81	$7.85	$3.36	$5.47	$9.75	$4.39	$6.85
79	$7.35	$2.49	$5.43	$6.70	$3.81	$5.37	$8.62	$4.63	$6.47
80	$6.70	$2.49	$4.83	$7.34	$3.00	$5.66	$9.07	$2.49	$5.62
81	$9.36	$3.18	$5.62	$9.42	$2.54	$5.83	$8.36	$4.33	$5.67
82	$7.88	$2.52	$5.60	$8.59	$2.52	$5.39	$8.53	$2.97	$5.69
83	$8.09	$2.83	$5.39	$7.04	$2.56	$5.46	$8.39	$2.54	$5.12
84	$9.88	$3.57	$5.71	$7.48	$2.54	$5.37	$9.25	$2.54	$5.53
85	$9.19	$2.54	$5.81	$7.28	$3.02	$5.28	$8.20	$2.54	$5.66
86	$8.64	$3.30	$6.49	$7.59	$3.65	$5.67	$9.26	$2.52	$4.96
87	$6.40	$3.42	$5.07	$7.49	$2.57	$4.77	$7.81	$3.24	$5.62
88	$9.78	$2.87	$6.00	$7.43	$3.34	$5.32	$9.80	$3.81	$5.66
89	$8.12	$4.56	$6.21	$8.06	$2.57	$5.51	$9.14	$2.57	$5.86
90	$8.56	$4.39	$6.64	$9.63	$2.49	$5.83	$9.68	$3.17	$5.68
91	$8.22	$3.44	$5.54	$7.46	$3.21	$5.39	$9.31	$2.52	$5.63
92	$8.86	$2.52	$4.79	$8.66	$3.86	$6.24	$8.12	$3.39	$5.45
93	$9.13	$2.65	$6.04	$9.07	$2.54	$4.98	$8.69	$3.33	$6.24
94	$8.10	$2.91	$5.76	$7.74	$2.49	$5.29	$8.50	$2.66	$5.85
95	$7.21	$2.57	$4.23	$9.45	$2.61	$6.00	$9.44	$4.92	$6.59
96	$7.74	$4.29	$5.48	$8.44	$3.70	$6.27	$7.47	$3.52	$5.92
97	$9.16	$4.11	$5.55	$11.09	$2.49	$6.00	$8.24	$3.02	$6.13
98	$10.05	$2.90	$5.67	$9.80	$4.20	$6.25	$6.33	$3.14	$4.97
99	$8.72	$2.52	$5.54	$8.25	$2.52	$5.39	$8.29	$2.52	$5.69
100	$8.16	$3.42	$5.61	$7.72	$3.69	$5.49	$7.90	$2.77	$5.10
101	$8.17	$2.54	$5.04	$8.00	$3.77	$5.59	$8.33	$3.90	$5.98
102	$8.96	$3.33	$5.53	$8.35	$3.41	$5.71	$6.95	$2.57	$4.82
103	$9.58	$2.52	$5.38	$9.33	$2.52	$5.52	$9.03	$3.94	$5.84
104	$8.35	$3.59	$5.88	$7.03	$3.48	$4.95	$9.91	$4.46	$6.54

	2024			2025			2026		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$7.50	$3.58	$5.67	$9.57	$2.92	$5.78	$10.06	$3.32	$5.66
106	$7.60	$2.95	$5.71	$8.62	$3.32	$5.84	$7.55	$3.10	$5.18
107	$8.86	$2.87	$5.67	$7.80	$2.87	$5.28	$10.20	$2.49	$5.53
108	$8.82	$2.57	$5.72	$8.87	$3.66	$5.58	$9.30	$2.54	$5.98
109	$8.26	$2.57	$5.00	$7.21	$2.57	$4.56	$7.99	$2.57	$5.15
110	$6.64	$3.47	$4.95	$8.85	$2.57	$5.27	$9.89	$3.23	$5.88
111	$7.37	$3.43	$5.56	$8.99	$2.52	$6.38	$7.48	$2.52	$5.52
112	$7.70	$2.54	$5.62	$8.59	$5.09	$6.77	$8.18	$2.54	$5.00
113	$7.62	$2.54	$5.03	$9.46	$2.54	$4.97	$9.60	$2.54	$5.20
114	$8.13	$2.49	$5.86	$7.08	$2.49	$5.58	$9.13	$4.05	$6.50
115	$8.15	$2.49	$5.58	$8.05	$3.87	$5.74	$8.04	$3.94	$6.00
116	$7.47	$2.49	$4.97	$7.58	$2.65	$5.83	$8.54	$3.61	$5.68
117	$8.16	$2.57	$6.09	$8.64	$3.03	$5.55	$8.09	$3.36	$5.37
118	$6.92	$2.90	$5.07	$8.66	$3.59	$5.26	$8.07	$2.54	$5.10
119	$9.00	$2.52	$6.28	$8.36	$2.52	$5.75	$9.26	$3.70	$6.13
120	$7.52	$3.79	$5.87	$7.53	$2.87	$5.46	$9.80	$4.04	$5.64
121	$6.73	$3.87	$5.14	$7.30	$3.30	$5.35	$7.95	$2.57	$5.38
122	$7.32	$2.83	$5.37	$8.01	$2.52	$5.68	$8.01	$2.80	$5.37
123	$7.33	$2.57	$5.44	$8.05	$2.57	$5.31	$9.49	$2.75	$6.23
124	$9.36	$3.27	$6.52	$6.91	$3.37	$5.02	$8.14	$2.49	$5.51
125	$7.86	$2.81	$5.85	$8.83	$2.56	$5.13	$7.64	$2.52	$5.54
126	$9.08	$2.54	$6.19	$8.39	$2.54	$4.62	$7.71	$3.54	$5.73
127	$8.11	$3.01	$5.64	$7.93	$2.69	$5.55	$8.43	$3.08	$5.39
128	$9.84	$4.77	$6.80	$8.53	$4.84	$6.69	$8.80	$3.12	$5.14
129	$9.66	$3.33	$5.52	$9.20	$3.57	$6.06	$9.76	$2.90	$6.10
130	$9.71	$3.58	$6.01	$8.09	$3.89	$5.77	$9.92	$3.55	$6.32
131	$8.32	$2.52	$6.22	$7.86	$2.80	$5.75	$8.32	$3.61	$6.06
132	$7.42	$2.52	$4.67	$6.53	$2.52	$4.65	$9.52	$2.52	$5.29
133	$7.22	$2.57	$5.23	$8.41	$2.78	$4.80	$8.64	$3.52	$6.26
134	$8.66	$2.79	$5.18	$6.34	$2.52	$4.13	$8.29	$2.52	$5.66
135	$9.83	$3.57	$5.85	$8.83	$3.82	$6.38	$9.04	$2.64	$5.47
136	$8.75	$2.54	$5.31	$7.52	$4.58	$6.15	$8.31	$3.14	$5.44
137	$7.73	$4.91	$6.23	$10.36	$2.54	$5.66	$8.06	$5.03	$6.63
138	$7.58	$2.49	$5.07	$9.42	$3.12	$6.28	$8.05	$2.49	$5.73
139	$8.48	$2.52	$5.35	$7.58	$2.91	$4.92	$8.02	$4.25	$6.21
140	$8.43	$2.80	$5.72	$7.53	$2.57	$5.10	$7.18	$3.26	$5.68
141	$7.46	$3.43	$5.37	$7.80	$3.45	$5.63	$10.28	$4.23	$6.74
142	$7.94	$2.49	$5.20	$8.34	$3.55	$6.04	$9.02	$2.60	$5.04
143	$7.76	$3.28	$5.67	$6.68	$2.57	$5.34	$7.59	$4.20	$5.98
144	$9.01	$2.83	$6.71	$9.24	$2.57	$5.47	$7.40	$3.20	$6.10
145	$8.54	$3.13	$6.54	$6.53	$4.37	$5.80	$8.82	$3.54	$6.22
146	$8.30	$3.53	$5.63	$7.73	$3.58	$6.22	$7.99	$3.42	$6.30
147	$7.88	$2.66	$5.42	$9.57	$3.01	$5.70	$6.41	$2.52	$4.80
148	$7.34	$3.47	$5.20	$7.73	$3.89	$5.59	$8.66	$3.39	$5.93
149	$8.46	$2.49	$5.45	$6.81	$2.49	$5.10	$9.49	$3.40	$6.51
150	$7.40	$3.56	$5.21	$7.54	$2.52	$4.92	$6.69	$4.31	$5.50
151	$8.81	$2.52	$5.62	$8.03	$4.14	$5.45	$7.93	$2.52	$4.38
152	$7.53	$3.27	$5.06	$9.05	$2.54	$5.64	$7.86	$3.29	$5.90
153	$10.92	$2.57	$6.04	$8.37	$2.75	$5.36	$11.17	$2.57	$5.36
154	$8.38	$4.54	$6.32	$7.78	$2.74	$5.17	$7.81	$2.52	$4.93
155	$8.12	$2.54	$5.58	$7.97	$2.54	$5.63	$9.76	$2.57	$5.87
156	$7.70	$2.52	$5.73	$8.76	$2.68	$5.74	$8.07	$3.37	$5.71

	2024			2025			2026		
Draw	max	min	avg	max	min	avg	max	min	avg
157	$8.38	$2.54	$6.07	$7.23	$4.45	$6.25	$7.06	$2.93	$5.42
158	$9.96	$3.67	$6.89	$8.92	$4.03	$6.02	$10.11	$2.49	$5.36
159	$8.65	$3.14	$5.20	$8.09	$2.57	$5.04	$7.52	$3.62	$6.37
160	$7.81	$2.54	$5.75	$8.82	$2.54	$5.50	$8.39	$3.34	$6.13
161	$8.69	$3.00	$5.40	$8.15	$2.54	$5.26	$8.01	$2.54	$5.73
162	$9.31	$2.49	$4.92	$7.52	$3.07	$5.28	$7.19	$4.23	$5.46
163	$8.77	$3.40	$5.96	$7.01	$3.19	$5.21	$7.62	$3.18	$5.86
164	$7.74	$2.52	$5.42	$8.36	$3.17	$6.27	$9.40	$2.71	$5.83
165	$9.43	$2.52	$6.88	$7.78	$2.81	$5.41	$7.50	$3.01	$6.04
166	$6.95	$2.96	$4.81	$9.57	$3.75	$6.23	$9.11	$2.57	$6.11
167	$8.92	$2.92	$5.93	$9.04	$2.56	$5.95	$8.57	$2.94	$5.91
168	$7.36	$4.47	$6.29	$9.81	$2.52	$6.18	$7.97	$2.52	$5.41
169	$7.23	$2.54	$5.15	$7.96	$3.31	$5.46	$8.97	$3.37	$5.72
170	$7.58	$3.30	$5.75	$9.00	$2.57	$5.24	$8.04	$2.57	$5.48
171	$9.66	$3.82	$5.64	$7.24	$2.57	$4.87	$7.61	$3.36	$4.93
172	$7.25	$3.45	$5.44	$9.02	$4.93	$6.08	$9.31	$3.65	$6.14
173	$9.92	$2.72	$5.82	$7.67	$2.52	$5.69	$8.93	$2.52	$6.25
174	$8.61	$2.54	$6.02	$7.65	$2.54	$5.02	$8.91	$3.12	$6.12
175	$9.25	$2.57	$5.89	$9.62	$2.95	$5.32	$6.84	$2.95	$5.45
176	$10.38	$3.98	$6.41	$6.72	$2.49	$5.08	$6.97	$3.72	$5.08
177	$6.45	$4.28	$5.46	$9.36	$2.71	$5.35	$9.14	$3.30	$6.23
178	$10.46	$2.75	$6.28	$7.63	$3.70	$5.18	$7.49	$3.26	$5.63
179	$8.55	$3.36	$6.35	$8.63	$2.57	$5.07	$9.71	$2.57	$5.43
180	$9.60	$2.98	$5.49	$7.83	$2.54	$5.29	$7.97	$3.52	$5.64
181	$9.25	$2.88	$5.82	$7.63	$2.78	$4.99	$8.99	$2.52	$6.28
182	$8.85	$4.22	$6.04	$7.06	$3.57	$5.44	$7.86	$2.72	$5.69
183	$8.50	$2.54	$4.91	$8.33	$3.97	$5.83	$7.44	$2.54	$4.97
184	$8.67	$2.54	$5.90	$8.35	$4.67	$6.54	$8.90	$2.71	$5.83
185	$7.71	$3.08	$5.44	$7.31	$3.05	$5.19	$9.63	$2.49	$6.14
186	$8.35	$2.76	$5.44	$8.02	$2.54	$5.66	$8.58	$2.96	$5.15
187	$9.22	$2.49	$5.37	$8.49	$2.96	$5.34	$7.99	$2.79	$6.40
188	$7.85	$3.66	$5.53	$8.34	$2.76	$5.74	$7.98	$3.22	$6.14
189	$9.49	$5.14	$6.29	$7.64	$3.70	$5.27	$9.96	$2.57	$5.08
190	$9.68	$3.65	$6.18	$9.27	$2.52	$5.71	$7.53	$4.95	$5.86
191	$8.59	$2.52	$4.32	$8.36	$2.52	$5.30	$9.94	$4.13	$6.72
192	$8.35	$3.17	$5.50	$10.06	$4.09	$6.37	$9.28	$4.24	$6.96
193	$7.98	$2.57	$5.04	$8.10	$2.57	$4.84	$8.64	$3.64	$5.87
194	$7.46	$2.84	$5.94	$6.91	$3.70	$5.56	$10.13	$2.54	$5.08
195	$8.89	$2.54	$5.54	$6.64	$2.54	$4.57	$8.47	$2.67	$5.98
196	$7.76	$2.55	$5.68	$8.07	$3.92	$5.70	$8.21	$2.75	$6.30
197	$7.89	$2.54	$5.45	$7.30	$2.54	$4.90	$8.37	$4.17	$5.73
198	$7.64	$2.52	$5.20	$7.67	$2.52	$4.56	$8.65	$2.52	$5.01
199	$7.09	$4.71	$5.90	$7.28	$2.73	$4.99	$9.14	$2.57	$5.69
200	$8.05	$2.89	$5.46	$7.79	$2.80	$5.65	$9.06	$3.14	$6.37
average	$8.36	$3.09	$5.66	$8.20	$3.08	$5.52	$8.45	$3.16	$5.75
Max	$11.30			$12.15			$11.17		
Avg			$5.66			$5.52			$5.75
Min	2.490364			$2.49			$2.49		
Range	8.812318			9.66			8.68		

	2027			2028			2029		
Draw	max	min	avg	max	min	avg	max	min	avg
1	$8.28	$3.68	$5.94	$7.07	$3.06	$5.38	$6.79	$2.57	$4.61
2	$7.97	$2.96	$4.81	$10.23	$2.57	$5.76	$9.37	$2.74	$5.85
3	$9.09	$3.13	$6.16	$8.93	$2.49	$5.76	$9.46	$2.49	$5.87
4	$7.19	$4.38	$5.59	$7.03	$3.65	$5.66	$8.71	$2.54	$6.42
5	$8.81	$4.38	$6.42	$8.15	$2.52	$4.78	$8.35	$2.78	$4.95
6	$10.96	$2.49	$6.44	$9.18	$4.15	$6.46	$9.50	$4.13	$5.86
7	$9.02	$2.54	$6.21	$8.74	$3.67	$5.89	$7.64	$2.66	$5.43
8	$8.93	$2.57	$5.14	$7.96	$2.57	$5.54	$7.87	$3.20	$5.65
9	$9.40	$4.28	$5.88	$9.57	$4.18	$5.96	$8.90	$2.54	$5.56
10	$8.70	$2.49	$6.09	$7.23	$2.52	$4.59	$9.23	$3.19	$5.64
11	$8.50	$4.34	$6.34	$8.73	$2.52	$5.79	$8.30	$2.52	$6.24
12	$7.99	$2.52	$6.25	$8.31	$2.66	$6.03	$10.11	$3.18	$7.38
13	$10.01	$5.82	$6.96	$8.16	$4.42	$6.34	$8.37	$3.80	$6.12
14	$8.70	$2.96	$6.30	$7.03	$3.32	$5.45	$8.15	$3.98	$5.76
15	$9.83	$3.12	$5.75	$7.84	$3.60	$5.31	$9.81	$3.34	$5.69
16	$8.59	$3.46	$5.40	$8.68	$3.40	$5.57	$8.06	$3.46	$5.50
17	$11.81	$3.42	$6.34	$7.48	$2.54	$5.01	$7.01	$3.08	$5.31
18	$8.86	$3.97	$6.60	$10.51	$2.49	$5.79	$7.75	$3.12	$5.34
19	$9.26	$2.49	$5.53	$9.46	$2.49	$5.45	$9.61	$2.49	$5.97
20	$9.18	$3.84	$7.28	$9.16	$3.64	$6.24	$11.88	$2.66	$6.08
21	$7.22	$4.12	$5.68	$8.59	$2.54	$6.18	$8.34	$3.50	$5.76
22	$8.34	$3.35	$5.58	$8.76	$4.57	$6.79	$8.50	$4.12	$6.48
23	$8.71	$4.07	$6.28	$7.14	$2.57	$5.03	$8.89	$2.57	$6.04
24	$8.90	$2.57	$5.62	$8.00	$3.30	$6.22	$6.91	$2.57	$4.93
25	$8.35	$4.47	$5.81	$8.85	$2.49	$6.08	$8.95	$3.26	$5.76
26	$8.88	$3.41	$5.64	$9.30	$4.02	$6.16	$8.88	$2.49	$5.94
27	$8.65	$3.61	$5.34	$10.16	$3.69	$6.56	$7.92	$2.52	$5.21
28	$10.44	$2.84	$6.01	$8.22	$4.88	$6.17	$7.54	$4.69	$6.68
29	$9.25	$2.49	$5.15	$8.29	$2.95	$5.75	$8.17	$2.79	$5.30
30	$10.26	$4.34	$6.33	$7.12	$2.57	$5.24	$10.04	$2.57	$6.52
31	$8.73	$2.57	$5.97	$8.18	$4.10	$5.91	$8.11	$2.57	$6.27
32	$8.20	$2.52	$5.59	$7.36	$3.38	$5.90	$7.36	$3.72	$5.46
33	$8.56	$3.58	$5.67	$8.50	$3.60	$6.72	$10.57	$4.74	$6.55
34	$10.00	$3.89	$6.73	$7.42	$2.54	$5.50	$7.64	$2.54	$5.64
35	$7.48	$3.92	$6.04	$8.28	$2.78	$5.26	$10.27	$3.77	$7.06
36	$9.41	$4.68	$6.71	$8.23	$3.78	$6.02	$8.72	$2.81	$5.68
37	$9.08	$2.54	$5.32	$8.39	$4.58	$6.07	$9.05	$3.12	$6.18
38	$7.95	$3.06	$5.58	$10.02	$3.99	$5.65	$8.07	$4.00	$5.69
39	$9.14	$3.29	$6.46	$8.09	$4.06	$6.31	$9.97	$3.84	$7.06
40	$9.67	$4.60	$6.49	$9.53	$3.74	$5.78	$8.46	$4.15	$6.04
41	$8.39	$4.56	$6.43	$10.04	$4.79	$6.25	$7.76	$2.88	$5.20
42	$10.13	$2.61	$5.70	$7.65	$2.49	$5.46	$9.78	$2.49	$6.07
43	$11.73	$2.49	$5.11	$7.71	$4.16	$5.72	$7.92	$4.13	$6.24
44	$9.94	$2.54	$5.78	$7.65	$2.54	$6.26	$8.41	$3.46	$5.89
45	$7.31	$2.57	$5.39	$7.31	$2.57	$5.06	$7.12	$3.22	$5.20
46	$9.22	$2.54	$5.83	$7.30	$3.89	$5.32	$8.49	$2.54	$5.46
47	$7.93	$3.32	$5.19	$9.43	$3.70	$6.34	$7.38	$2.52	$5.63
48	$11.93	$2.72	$6.68	$8.69	$2.50	$5.69	$8.64	$3.61	$5.76
49	$6.43	$2.87	$4.99	$7.73	$4.33	$5.59	$7.01	$4.44	$5.80
50	$9.37	$3.30	$6.04	$7.24	$2.62	$5.12	$8.83	$2.63	$5.63
51	$8.03	$3.19	$5.55	$8.59	$4.62	$5.54	$8.14	$4.02	$5.84
52	$8.14	$2.52	$5.50	$7.83	$3.56	$5.28	$9.50	$2.52	$5.60

	2027			2028			2029		
Draw	max	min	avg	max	min	avg	max	min	avg
53	$6.86	$2.54	$5.19	$9.02	$2.88	$6.42	$7.80	$2.54	$5.20
54	$8.04	$3.45	$5.56	$7.33	$2.49	$4.96	$9.67	$3.84	$6.46
55	$9.21	$4.72	$6.84	$7.77	$2.49	$4.62	$9.03	$2.49	$5.58
56	$7.83	$3.46	$5.43	$7.42	$3.26	$5.05	$8.54	$2.61	$5.54
57	$9.74	$3.32	$5.54	$9.25	$2.57	$6.07	$8.21	$2.57	$6.21
58	$8.16	$3.00	$5.50	$8.34	$2.57	$5.42	$9.11	$3.33	$6.23
59	$7.88	$4.60	$6.29	$8.72	$3.26	$5.78	$9.76	$3.06	$5.53
60	$6.31	$2.54	$4.47	$7.78	$4.13	$6.31	$9.07	$2.54	$5.25
61	$8.42	$3.01	$6.37	$7.15	$2.49	$5.73	$7.91	$3.74	$6.60
62	$8.04	$4.25	$6.09	$9.06	$2.54	$6.05	$8.44	$3.11	$6.22
63	$9.56	$3.64	$6.01	$7.88	$4.47	$5.64	$9.90	$2.54	$6.13
64	$9.77	$3.90	$5.78	$7.07	$2.49	$4.47	$12.07	$2.74	$6.03
65	$8.35	$4.01	$6.00	$7.24	$3.25	$4.61	$8.74	$3.29	$5.81
66	$9.29	$3.94	$6.06	$8.72	$3.10	$5.77	$8.28	$3.23	$6.01
67	$9.53	$3.08	$6.00	$7.29	$3.32	$5.38	$9.37	$2.80	$6.18
68	$8.64	$4.53	$6.17	$8.79	$2.54	$5.51	$7.50	$3.02	$5.68
69	$7.40	$3.46	$5.62	$9.56	$3.00	$6.05	$7.96	$4.01	$6.30
70	$8.62	$2.67	$4.85	$8.10	$2.72	$5.41	$9.67	$4.71	$6.65
71	$8.11	$2.82	$6.00	$8.68	$3.12	$5.92	$8.40	$3.78	$6.37
72	$8.60	$2.49	$6.72	$8.31	$2.49	$5.91	$6.77	$3.33	$5.25
73	$7.60	$2.52	$5.25	$8.29	$2.94	$5.42	$11.56	$2.52	$5.77
74	$8.70	$2.71	$5.10	$8.05	$3.56	$6.01	$7.30	$3.22	$5.75
75	$10.40	$4.58	$6.29	$9.92	$3.70	$6.25	$7.69	$3.41	$5.42
76	$8.00	$3.49	$5.62	$7.51	$3.07	$5.80	$8.42	$3.06	$5.90
77	$8.67	$3.84	$5.80	$9.45	$2.91	$5.32	$7.92	$3.65	$5.88
78	$7.93	$2.54	$5.60	$8.56	$2.54	$5.48	$8.44	$4.66	$6.47
79	$7.99	$2.72	$5.60	$9.35	$4.50	$6.53	$7.89	$2.49	$5.27
80	$9.06	$5.13	$7.11	$8.90	$3.74	$5.89	$7.47	$3.89	$6.03
81	$9.43	$3.04	$5.52	$7.39	$2.54	$5.14	$9.44	$3.18	$5.98
82	$7.88	$2.97	$5.59	$7.09	$3.15	$5.73	$9.54	$3.11	$6.16
83	$10.86	$2.54	$6.50	$7.81	$4.18	$6.32	$8.61	$3.04	$6.35
84	$9.15	$2.54	$6.00	$8.85	$2.95	$5.23	$7.64	$2.54	$5.50
85	$6.92	$3.13	$5.10	$7.24	$2.66	$5.42	$8.72	$2.98	$5.59
86	$8.34	$3.63	$6.04	$8.39	$3.65	$5.41	$10.23	$2.88	$6.50
87	$9.51	$5.05	$6.66	$9.41	$3.94	$6.75	$8.88	$4.20	$6.36
88	$8.03	$2.57	$5.33	$9.70	$4.66	$6.72	$7.34	$2.65	$5.45
89	$9.61	$3.96	$6.88	$7.84	$3.06	$5.37	$8.88	$2.57	$5.96
90	$7.70	$2.69	$6.01	$7.62	$2.80	$5.69	$7.81	$2.49	$4.98
91	$8.11	$2.52	$6.06	$8.68	$3.99	$5.86	$9.30	$3.48	$6.20
92	$9.18	$2.52	$6.07	$8.23	$3.14	$5.64	$10.30	$3.17	$6.17
93	$9.20	$2.90	$5.92	$7.75	$4.50	$6.41	$7.95	$3.11	$5.90
94	$8.38	$4.37	$6.10	$8.97	$2.49	$5.13	$11.06	$3.10	$5.96
95	$8.80	$2.91	$6.06	$9.61	$2.57	$6.54	$6.87	$2.94	$4.97
96	$9.37	$2.95	$5.71	$9.80	$3.74	$6.23	$7.76	$3.79	$6.03
97	$8.71	$2.49	$5.78	$7.28	$3.44	$4.84	$7.78	$2.76	$5.33
98	$10.56	$3.48	$5.46	$9.94	$2.90	$5.47	$9.59	$3.59	$5.34
99	$6.58	$2.52	$5.05	$8.18	$3.02	$5.27	$7.09	$4.06	$5.56
100	$10.46	$3.12	$6.21	$9.57	$2.79	$5.68	$8.44	$2.54	$5.51
101	$7.90	$3.75	$6.17	$8.50	$2.73	$6.00	$7.06	$2.94	$5.42
102	$8.07	$2.57	$5.08	$8.75	$3.33	$5.64	$8.29	$2.57	$5.72
103	$10.21	$2.52	$6.46	$8.82	$2.90	$6.19	$9.14	$2.52	$5.82
104	$10.58	$4.49	$6.62	$8.12	$3.36	$6.10	$8.01	$4.03	$6.15

	2027			2028			2029		
Draw	max	min	avg	max	min	avg	max	min	avg
105	$7.79	$3.57	$5.80	$7.79	$2.57	$5.16	$8.78	$3.41	$6.33
106	$8.04	$2.97	$5.88	$8.02	$4.93	$6.27	$8.39	$2.97	$5.30
107	$8.52	$3.43	$5.76	$7.28	$2.78	$5.59	$8.52	$3.66	$5.63
108	$8.13	$3.85	$5.84	$9.73	$3.72	$5.97	$8.18	$3.63	$5.97
109	$7.80	$2.57	$5.71	$10.25	$2.57	$5.30	$7.75	$3.01	$5.42
110	$7.97	$3.90	$5.04	$8.78	$3.38	$5.02	$8.33	$3.32	$5.86
111	$7.92	$3.61	$6.02	$9.53	$2.52	$5.92	$9.24	$2.93	$6.26
112	$8.93	$2.54	$5.49	$8.08	$3.97	$6.21	$9.75	$2.54	$5.20
113	$7.92	$3.33	$5.38	$7.35	$2.54	$4.48	$6.97	$2.85	$4.64
114	$8.22	$3.23	$5.80	$7.91	$2.49	$5.42	$10.40	$2.75	$6.79
115	$7.13	$2.49	$5.17	$7.73	$3.43	$5.94	$8.27	$2.76	$5.43
116	$8.99	$2.49	$6.03	$8.68	$2.49	$5.44	$7.60	$2.49	$5.11
117	$7.66	$3.32	$5.74	$9.55	$2.90	$5.52	$8.16	$2.57	$5.16
118	$8.45	$4.37	$6.03	$9.44	$3.08	$5.12	$10.23	$4.50	$6.78
119	$8.48	$2.52	$6.00	$8.60	$3.42	$5.55	$7.66	$2.52	$5.29
120	$7.56	$3.25	$5.36	$9.67	$2.64	$5.71	$9.24	$4.69	$7.15
121	$7.64	$3.01	$6.04	$8.29	$3.27	$6.07	$8.23	$4.43	$6.15
122	$9.69	$4.44	$6.57	$7.84	$2.70	$5.23	$9.40	$2.97	$5.24
123	$8.67	$3.05	$5.35	$7.69	$4.43	$5.63	$9.38	$4.16	$6.47
124	$9.12	$3.04	$6.29	$10.33	$2.52	$5.29	$7.92	$2.67	$5.84
125	$7.15	$2.77	$5.32	$8.24	$3.24	$6.06	$10.76	$4.14	$6.10
126	$7.18	$2.54	$4.40	$7.14	$2.54	$4.81	$7.01	$3.43	$5.51
127	$10.07	$3.81	$6.48	$9.72	$3.44	$5.63	$11.18	$2.52	$5.33
128	$8.87	$2.75	$6.20	$8.16	$2.49	$5.43	$8.65	$2.49	$5.86
129	$7.68	$2.52	$6.10	$9.30	$2.95	$5.59	$8.74	$3.17	$5.37
130	$7.68	$3.54	$5.86	$8.82	$3.19	$5.39	$9.10	$5.05	$6.86
131	$8.76	$2.52	$5.51	$6.23	$3.88	$4.98	$7.70	$2.84	$5.73
132	$8.74	$4.09	$5.86	$7.62	$2.52	$4.75	$8.97	$3.91	$6.12
133	$10.31	$2.73	$5.98	$8.21	$4.38	$5.60	$10.41	$2.82	$6.15
134	$8.04	$2.52	$5.46	$9.30	$2.75	$5.61	$7.38	$2.71	$5.34
135	$9.11	$2.52	$5.58	$10.33	$4.24	$6.32	$8.21	$4.72	$6.31
136	$8.47	$3.46	$5.88	$8.73	$4.88	$6.09	$10.41	$4.67	$6.20
137	$10.02	$2.54	$5.60	$7.90	$2.54	$5.64	$8.25	$3.53	$5.79
138	$7.56	$3.38	$5.66	$8.15	$3.33	$5.30	$8.91	$3.13	$6.27
139	$6.93	$2.80	$5.11	$7.78	$2.57	$5.32	$10.00	$3.75	$6.32
140	$8.44	$2.57	$6.07	$7.66	$2.69	$5.57	$7.54	$3.69	$5.73
141	$9.03	$2.52	$5.87	$9.30	$5.35	$6.61	$7.89	$3.58	$6.03
142	$7.74	$2.73	$5.66	$8.58	$2.69	$4.83	$8.26	$3.46	$5.51
143	$7.72	$2.57	$5.74	$7.90	$2.57	$5.23	$7.73	$4.15	$5.85
144	$9.36	$4.63	$6.66	$8.83	$3.86	$6.05	$8.11	$3.58	$5.63
145	$9.15	$2.69	$6.29	$10.00	$2.57	$6.12	$8.05	$4.24	$5.87
146	$7.68	$3.37	$5.83	$8.13	$2.52	$5.42	$8.40	$3.55	$5.79
147	$8.21	$2.69	$5.51	$8.58	$2.52	$5.46	$9.47	$4.75	$6.26
148	$9.08	$2.66	$5.92	$7.96	$3.95	$6.00	$8.93	$3.41	$6.18
149	$7.53	$2.49	$5.54	$7.64	$4.12	$6.01	$7.51	$3.99	$6.05
150	$9.28	$2.52	$5.85	$8.81	$3.07	$5.89	$8.10	$3.01	$5.80
151	$9.02	$2.98	$5.49	$8.88	$2.52	$5.19	$10.17	$3.41	$5.91
152	$7.69	$2.54	$5.29	$7.36	$2.54	$4.60	$7.65	$3.37	$5.51
153	$8.56	$2.57	$5.27	$7.72	$3.65	$5.71	$9.17	$2.57	$5.96
154	$8.50	$3.73	$6.09	$8.54	$2.52	$6.09	$7.24	$2.52	$4.89
155	$8.40	$3.25	$6.29	$8.77	$3.01	$6.40	$9.97	$2.89	$6.55
156	$8.79	$2.64	$6.02	$7.11	$4.52	$5.75	$8.13	$3.05	$5.58

	2027			2028			2029		
Draw	**max**	**min**	**avg**	**max**	**min**	**avg**	**max**	**min**	**avg**
157	$8.08	$2.75	$5.99	$8.60	$2.54	$5.97	$7.99	$4.96	$6.12
158	$8.16	$3.59	$5.70	$7.18	$3.94	$5.37	$9.50	$2.49	$5.84
159	$8.67	$2.57	$5.71	$7.89	$2.57	$5.78	$8.28	$2.95	$5.95
160	$9.66	$2.92	$5.38	$8.94	$3.36	$5.54	$7.69	$2.94	$5.83
161	$9.24	$2.54	$6.36	$7.80	$2.54	$5.52	$8.67	$3.21	$5.27
162	$7.73	$3.97	$5.95	$9.55	$3.22	$5.61	$8.30	$2.59	$5.37
163	$9.56	$2.54	$6.38	$10.39	$2.54	$6.22	$8.07	$4.15	$5.61
164	$8.55	$2.79	$5.75	$8.77	$2.52	$5.89	$8.89	$3.75	$6.14
165	$8.25	$3.25	$5.29	$9.75	$2.96	$6.25	$7.57	$4.14	$6.05
166	$10.47	$3.90	$6.11	$8.38	$3.48	$6.03	$9.04	$3.43	$5.85
167	$8.87	$3.02	$5.91	$8.21	$2.83	$6.35	$8.29	$3.87	$5.94
168	$7.44	$2.72	$5.20	$8.41	$3.61	$5.41	$9.83	$3.13	$5.89
169	$9.12	$3.23	$6.19	$8.33	$2.54	$5.24	$9.63	$4.02	$5.98
170	$9.59	$3.06	$6.31	$7.81	$4.50	$5.86	$9.42	$4.00	$6.52
171	$7.52	$2.57	$5.40	$7.48	$2.57	$5.18	$9.30	$2.57	$5.13
172	$7.69	$2.57	$4.92	$7.63	$3.81	$5.22	$8.93	$3.22	$5.56
173	$10.16	$3.21	$5.42	$8.31	$3.39	$6.19	$8.67	$2.98	$5.52
174	$7.96	$4.71	$6.33	$7.25	$2.54	$5.63	$8.71	$5.24	$6.49
175	$7.80	$3.37	$5.41	$7.63	$3.08	$5.25	$8.13	$2.74	$5.36
176	$8.93	$2.49	$5.46	$7.53	$2.77	$5.37	$8.51	$2.63	$5.62
177	$7.62	$3.69	$5.78	$9.97	$3.69	$5.73	$8.19	$3.49	$5.54
178	$9.28	$3.39	$6.93	$9.67	$3.70	$5.61	$8.06	$3.34	$6.32
179	$7.73	$3.56	$5.56	$8.33	$3.76	$5.82	$8.31	$3.55	$6.26
180	$9.06	$4.16	$5.91	$7.54	$4.07	$6.07	$9.32	$3.54	$5.72
181	$7.76	$4.07	$6.37	$7.46	$4.36	$5.92	$8.16	$4.33	$6.42
182	$7.39	$4.42	$6.28	$9.62	$3.68	$6.99	$7.28	$4.01	$5.57
183	$7.69	$4.06	$5.30	$8.97	$4.73	$6.20	$8.63	$3.06	$5.81
184	$10.42	$3.65	$6.59	$8.11	$3.67	$5.48	$8.81	$3.01	$5.60
185	$8.45	$2.82	$5.42	$7.85	$2.83	$6.00	$8.27	$3.40	$5.87
186	$9.19	$3.33	$6.05	$8.15	$3.92	$5.50	$9.38	$4.58	$6.37
187	$9.24	$2.49	$5.79	$7.00	$3.44	$5.54	$8.42	$2.88	$5.53
188	$8.72	$2.67	$5.26	$7.71	$2.49	$5.64	$7.80	$3.41	$5.12
189	$9.94	$2.64	$5.64	$8.06	$3.17	$5.29	$8.82	$2.57	$5.25
190	$8.86	$3.32	$5.97	$7.41	$3.64	$5.50	$8.53	$2.52	$5.65
191	$9.28	$4.56	$6.80	$6.98	$3.59	$5.30	$8.22	$3.17	$5.37
192	$8.89	$4.51	$6.71	$7.92	$3.75	$5.59	$8.82	$3.10	$5.49
193	$7.77	$3.71	$5.66	$9.36	$3.39	$6.05	$8.95	$5.28	$6.57
194	$9.70	$4.75	$7.34	$9.83	$2.54	$6.36	$8.57	$2.54	$5.27
195	$8.64	$4.45	$5.98	$8.74	$3.51	$5.61	$10.36	$3.23	$5.77
196	$9.24	$2.54	$6.55	$10.20	$2.54	$5.91	$7.63	$3.27	$5.42
197	$8.16	$4.42	$6.14	$8.81	$2.93	$6.00	$8.05	$4.00	$5.73
198	$8.14	$4.35	$6.46	$8.43	$2.52	$5.91	$8.95	$4.21	$6.11
199	$7.40	$2.57	$5.35	$8.64	$3.38	$6.13	$8.63	$3.36	$6.08
200	$8.52	$2.49	$5.79	$8.35	$3.16	$5.90	$7.22	$2.49	$5.00
average	$8.67	$3.27	$5.87	$8.40	$3.24	$5.70	$8.61	$3.29	$5.83
Max	$11.93			$10.51			$12.07		
Avg			$5.87			$5.70			$5.83
Min	$2.49			$2.49			$2.49		
Range	9.44			8.02			9.58		

Draw	2030			2031		
	max	min	avg	max	min	avg
1	$9.33	$4.02	$6.21	$8.61	$5.10	$6.28
2	$9.33	$5.50	$7.01	$8.84	$3.12	$6.09
3	$8.45	$2.84	$5.31	$10.10	$4.25	$7.32
4	$8.66	$2.99	$5.52	$8.18	$3.72	$6.03
5	$7.63	$3.67	$6.00	$8.99	$3.52	$5.42
6	$8.13	$3.24	$5.51	$9.41	$3.25	$6.30
7	$9.44	$3.42	$6.37	$8.26	$4.06	$6.18
8	$9.16	$2.74	$5.89	$9.64	$2.76	$6.06
9	$8.41	$2.95	$6.50	$9.20	$2.54	$5.59
10	$10.31	$5.42	$7.33	$8.63	$2.49	$5.96
11	$7.12	$3.76	$5.64	$7.78	$3.24	$5.96
12	$8.85	$2.83	$5.68	$9.23	$2.75	$6.74
13	$9.23	$3.28	$6.20	$8.97	$4.69	$6.17
14	$8.39	$3.50	$5.95	$8.25	$3.77	$6.16
15	$8.45	$2.57	$6.07	$10.21	$2.80	$6.46
16	$9.07	$4.29	$6.22	$9.93	$3.51	$6.69
17	$9.81	$4.34	$6.39	$9.28	$5.21	$7.40
18	$9.58	$3.47	$5.65	$8.50	$3.01	$6.33
19	$6.91	$3.84	$5.60	$9.02	$5.10	$7.02
20	$9.26	$4.06	$6.48	$9.42	$4.89	$7.01
21	$7.75	$3.68	$5.54	$7.99	$3.16	$5.70
22	$8.24	$2.54	$6.01	$8.82	$3.70	$6.55
23	$9.24	$3.84	$6.24	$11.25	$2.57	$6.49
24	$9.94	$4.46	$6.56	$7.70	$3.43	$5.77
25	$9.06	$4.65	$6.66	$8.00	$3.05	$5.82
26	$9.66	$3.47	$6.84	$8.02	$2.80	$6.09
27	$9.26	$2.52	$5.09	$11.49	$4.21	$6.19
28	$8.71	$2.54	$5.62	$9.55	$2.54	$6.12
29	$8.33	$3.60	$6.26	$6.90	$3.92	$5.60
30	$8.40	$3.86	$6.03	$8.15	$3.48	$5.82
31	$8.63	$4.51	$7.18	$7.90	$3.59	$6.23
32	$10.75	$3.28	$6.30	$8.57	$3.40	$6.28
33	$8.60	$2.80	$5.88	$8.26	$3.48	$5.94
34	$8.14	$3.66	$5.86	$9.31	$3.83	$6.38
35	$10.60	$3.57	$6.43	$10.03	$3.56	$6.14
36	$8.92	$4.39	$6.26	$10.96	$2.54	$6.84
37	$7.66	$3.40	$6.40	$8.79	$3.68	$6.18
38	$9.52	$4.11	$6.30	$9.27	$4.77	$6.87
39	$8.95	$3.04	$6.30	$7.88	$2.82	$5.91
40	$7.49	$2.63	$5.54	$10.33	$3.91	$7.30
41	$9.57	$3.82	$6.22	$9.96	$2.57	$5.68
42	$7.33	$2.73	$5.03	$7.29	$2.49	$5.60
43	$8.24	$3.54	$5.65	$8.36	$3.41	$6.43
44	$8.00	$3.49	$5.57	$7.36	$2.54	$5.56
45	$7.85	$2.57	$5.82	$7.62	$4.35	$5.77
46	$8.71	$2.65	$6.27	$10.69	$4.14	$7.53
47	$9.65	$3.52	$6.17	$12.53	$4.12	$6.90
48	$9.03	$3.37	$6.59	$8.10	$2.72	$5.91
49	$8.83	$2.64	$5.84	$10.55	$5.06	$6.53
50	$7.81	$3.48	$5.58	$9.67	$2.57	$6.26
51	$9.13	$4.34	$6.07	$9.96	$3.67	$5.99
52	$8.88	$3.12	$5.67	$8.76	$4.21	$6.22

	2030			2031		
Draw	max	min	avg	max	min	avg
53	$8.25	$3.70	$6.47	$9.12	$4.60	$6.43
54	$8.81	$4.02	$6.18	$7.79	$2.54	$5.37
55	$8.16	$2.57	$5.51	$7.33	$3.52	$5.11
56	$8.97	$4.23	$6.17	$7.89	$3.43	$5.89
57	$8.55	$3.15	$6.42	$7.42	$4.12	$6.08
58	$8.99	$3.97	$6.21	$7.27	$4.07	$6.33
59	$8.80	$3.88	$5.83	$8.91	$2.93	$6.12
60	$8.70	$4.19	$6.13	$8.23	$2.93	$6.10
61	$9.01	$3.68	$6.28	$9.16	$4.47	$6.52
62	$8.73	$4.88	$6.74	$6.84	$2.91	$5.34
63	$10.81	$4.20	$7.21	$8.83	$3.56	$6.40
64	$9.82	$3.48	$6.21	$9.33	$3.74	$6.43
65	$8.52	$4.23	$5.88	$8.70	$4.00	$5.77
66	$7.41	$3.14	$5.67	$9.87	$2.87	$6.21
67	$9.55	$3.43	$6.26	$8.28	$3.67	$6.62
68	$8.72	$4.06	$6.50	$8.42	$4.90	$6.65
69	$8.56	$2.89	$5.43	$8.50	$3.21	$6.20
70	$7.34	$2.49	$4.62	$8.72	$3.57	$5.61
71	$10.38	$3.02	$6.11	$8.08	$3.20	$6.07
72	$9.03	$2.87	$6.64	$8.34	$4.26	$6.30
73	$9.04	$4.19	$5.85	$9.07	$2.64	$6.33
74	$9.43	$2.52	$5.69	$9.14	$3.63	$6.31
75	$7.81	$4.04	$5.74	$8.65	$5.07	$6.80
76	$8.89	$3.12	$6.51	$8.12	$4.30	$6.87
77	$8.51	$3.95	$6.25	$8.93	$2.49	$5.55
78	$9.50	$3.96	$6.50	$10.69	$4.83	$7.23
79	$8.22	$4.54	$6.36	$7.51	$2.49	$5.21
80	$9.02	$4.29	$6.27	$10.27	$3.02	$5.56
81	$7.98	$3.51	$6.16	$11.70	$4.88	$7.05
82	$10.49	$2.52	$5.91	$8.76	$4.09	$6.75
83	$10.48	$4.64	$6.91	$8.02	$2.54	$6.17
84	$8.19	$2.71	$6.02	$8.17	$3.24	$5.63
85	$9.04	$2.88	$6.31	$8.33	$2.54	$6.09
86	$9.20	$2.52	$5.60	$11.16	$2.52	$7.05
87	$7.87	$3.43	$6.02	$9.85	$3.93	$6.40
88	$9.58	$3.14	$6.07	$10.90	$2.69	$6.21
89	$8.98	$3.70	$6.81	$7.29	$4.08	$6.53
90	$9.29	$3.80	$6.61	$8.07	$3.43	$6.31
91	$8.89	$2.52	$6.23	$10.01	$2.52	$6.01
92	$10.20	$3.52	$6.83	$7.20	$5.07	$6.33
93	$7.01	$3.08	$5.83	$8.88	$3.73	$5.91
94	$9.73	$2.97	$5.69	$9.58	$4.43	$7.21
95	$8.16	$3.42	$5.47	$8.24	$4.67	$6.67
96	$9.17	$4.89	$6.58	$8.29	$3.68	$6.31
97	$9.97	$3.59	$6.74	$8.15	$5.51	$6.56
98	$9.73	$3.73	$6.20	$9.63	$4.63	$6.57
99	$9.32	$2.52	$6.29	$7.92	$3.50	$6.38
100	$8.68	$2.54	$5.19	$10.31	$2.84	$6.21
101	$7.58	$3.98	$5.57	$9.13	$3.34	$5.98
102	$8.51	$4.02	$6.45	$7.94	$2.77	$5.04
103	$8.48	$2.62	$5.21	$10.38	$4.40	$7.27
104	$8.85	$3.40	$5.89	$9.34	$2.92	$6.28

	2030			2031		
Draw	max	min	avg	max	min	avg
105	$7.71	$3.70	$5.66	$9.23	$4.38	$6.29
106	$9.34	$3.37	$6.48	$8.81	$2.87	$5.92
107	$9.55	$2.56	$5.22	$9.47	$4.38	$6.72
108	$7.63	$2.76	$5.18	$12.04	$5.41	$7.22
109	$7.77	$4.47	$5.65	$8.33	$4.51	$6.60
110	$9.47	$3.06	$6.24	$9.55	$3.03	$5.73
111	$8.59	$2.52	$6.44	$7.60	$3.23	$6.23
112	$8.89	$2.92	$6.03	$9.81	$3.10	$6.35
113	$9.43	$3.07	$6.25	$8.73	$4.69	$6.64
114	$7.82	$3.76	$5.92	$8.61	$3.73	$6.34
115	$7.75	$2.60	$5.67	$9.50	$2.49	$6.49
116	$8.94	$3.78	$6.14	$9.12	$2.49	$6.02
117	$9.39	$2.57	$6.40	$9.04	$3.97	$6.56
118	$10.96	$4.50	$6.58	$9.57	$4.31	$6.51
119	$9.32	$4.73	$7.35	$7.66	$2.52	$5.99
120	$10.44	$4.44	$7.26	$7.47	$3.48	$5.79
121	$8.52	$2.57	$5.11	$9.70	$4.20	$6.31
122	$10.59	$3.30	$7.14	$8.54	$4.26	$6.38
123	$8.75	$2.57	$5.69	$7.17	$2.59	$4.91
124	$10.20	$4.47	$7.01	$11.19	$4.58	$7.09
125	$8.67	$3.50	$6.55	$10.64	$3.91	$6.65
126	$8.78	$2.63	$5.55	$10.03	$4.85	$6.56
127	$7.83	$2.52	$5.51	$10.19	$4.12	$6.47
128	$7.96	$3.66	$6.20	$9.08	$2.64	$6.52
129	$8.27	$3.57	$6.47	$7.89	$3.28	$5.89
130	$7.83	$2.57	$5.71	$9.27	$3.58	$6.27
131	$8.54	$3.46	$5.96	$8.97	$3.21	$6.24
132	$8.64	$4.31	$6.54	$8.77	$3.43	$6.32
133	$9.23	$2.99	$6.38	$10.05	$2.85	$6.21
134	$8.46	$2.55	$5.96	$8.06	$2.58	$5.60
135	$8.46	$3.86	$6.55	$8.93	$4.71	$6.37
136	$10.77	$4.18	$6.36	$8.57	$4.11	$5.71
137	$9.21	$4.60	$6.90	$10.18	$3.13	$6.29
138	$9.16	$2.49	$5.58	$8.43	$2.49	$6.22
139	$7.13	$3.02	$5.45	$8.14	$4.81	$6.57
140	$8.11	$3.43	$5.30	$8.63	$3.49	$5.89
141	$9.22	$2.92	$5.90	$9.46	$4.54	$6.19
142	$9.32	$2.73	$6.16	$8.65	$3.05	$5.54
143	$8.44	$2.93	$6.08	$8.47	$2.76	$6.07
144	$8.62	$2.57	$5.85	$8.17	$3.16	$5.93
145	$7.68	$3.48	$6.15	$7.73	$3.29	$6.12
146	$8.66	$3.44	$5.83	$8.74	$2.52	$6.31
147	$9.87	$3.61	$6.47	$9.04	$3.01	$5.97
148	$10.91	$2.92	$6.78	$7.80	$4.04	$6.18
149	$9.22	$2.75	$6.25	$8.20	$3.05	$6.21
150	$8.06	$3.24	$5.48	$8.04	$3.59	$6.40
151	$7.69	$2.73	$5.49	$9.20	$2.52	$6.88
152	$8.21	$4.10	$6.23	$7.25	$3.44	$5.29
153	$10.17	$3.47	$6.54	$7.66	$3.75	$5.40
154	$9.11	$2.52	$5.48	$8.40	$4.45	$6.11
155	$8.67	$2.54	$5.63	$9.35	$3.84	$6.51
156	$7.02	$2.52	$5.09	$9.13	$2.52	$6.11

	2030			2031		
Draw	**max**	**min**	**avg**	**max**	**min**	**avg**
157	$9.48	$2.92	$6.35	$10.35	$4.20	$7.21
158	$8.95	$4.22	$6.28	$7.95	$3.35	$6.29
159	$7.73	$3.04	$5.73	$9.50	$2.57	$6.66
160	$10.11	$2.54	$6.22	$8.14	$2.54	$5.92
161	$6.83	$3.45	$5.77	$8.67	$3.37	$6.52
162	$8.86	$3.83	$5.62	$8.03	$3.35	$5.41
163	$9.12	$4.27	$6.12	$8.29	$3.05	$5.30
164	$10.27	$4.93	$7.28	$11.38	$4.76	$6.99
165	$7.39	$3.38	$5.34	$10.62	$3.89	$6.90
166	$7.81	$3.59	$5.65	$8.53	$4.15	$5.90
167	$8.86	$4.15	$6.27	$8.11	$3.72	$5.92
168	$6.90	$3.59	$5.69	$8.19	$2.67	$5.58
169	$9.93	$4.08	$6.35	$8.10	$4.60	$5.84
170	$9.77	$3.11	$6.59	$8.40	$3.38	$6.72
171	$9.88	$3.98	$6.60	$8.20	$3.45	$5.60
172	$8.81	$3.69	$6.58	$7.30	$3.08	$5.44
173	$11.46	$4.57	$7.41	$8.33	$2.63	$5.62
174	$6.91	$2.54	$5.23	$9.58	$3.05	$6.31
175	$9.04	$2.57	$6.60	$9.50	$4.12	$6.85
176	$11.34	$3.44	$5.94	$8.98	$3.33	$6.40
177	$10.12	$3.25	$6.37	$8.91	$3.13	$6.52
178	$7.42	$2.52	$5.51	$8.00	$4.83	$6.23
179	$10.79	$3.70	$5.92	$7.54	$3.00	$5.78
180	$8.74	$3.57	$5.82	$8.65	$2.56	$5.46
181	$7.95	$2.83	$6.08	$7.74	$4.15	$6.32
182	$8.33	$3.46	$6.25	$7.85	$4.89	$6.47
183	$8.30	$3.11	$6.36	$8.09	$2.54	$5.80
184	$8.13	$2.78	$5.27	$8.63	$4.12	$6.07
185	$8.56	$3.71	$5.82	$8.15	$3.86	$6.58
186	$8.18	$4.16	$6.25	$8.34	$4.40	$5.83
187	$9.76	$4.79	$6.39	$8.47	$4.05	$6.50
188	$8.25	$2.95	$5.84	$7.03	$4.15	$5.52
189	$8.79	$2.57	$5.25	$7.19	$3.83	$5.32
190	$8.81	$2.52	$5.46	$8.60	$4.49	$6.39
191	$9.95	$3.06	$5.72	$7.68	$2.93	$5.67
192	$8.81	$4.31	$6.22	$9.88	$2.49	$6.35
193	$8.46	$3.14	$6.48	$9.34	$3.43	$6.37
194	$9.35	$2.54	$6.00	$9.98	$3.04	$6.28
195	$9.42	$2.66	$6.78	$8.28	$2.54	$5.45
196	$10.04	$2.78	$6.66	$8.93	$3.52	$6.91
197	$8.54	$2.54	$6.13	$7.76	$4.96	$6.02
198	$8.01	$2.52	$5.80	$8.64	$3.84	$5.87
199	$8.25	$2.57	$6.16	$9.82	$4.52	$6.85
200	$8.45	$4.48	$6.70	$10.66	$2.49	$6.02
average	$8.85	$3.41	$6.09	$8.85	$3.57	$6.22
Max	$11.46			$12.53		
Avg			$6.09			$6.22
Min	$2.49			$2.49		
Range	8.97			10.04		

Appendix H

Avoided Cost Calculations

PRELIMIINARY AVOIDED COST ESTIMATES
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM

	YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	Non-Energy Benefits %	PORTFOLIO COSTS INCLUDING CONSERVATION CREDIT	COST-EFFECTIVENESS LIMIT
2011	1	$ 0.58	$ 0.62		$ 0.58	5%	$ 0.61	
2012	2	$ 0.58	$ 0.67	7.5%	$ 1.16	5%	$ 1.22	
2013	3	$ 0.57	$ 0.71	5.7%	$ 1.73	5%	$ 1.82	
2014	4	$ 0.58	$ 0.78	10.1%	$ 2.32	5%	$ 2.43	
2015	5	$ 0.56	$ 0.81	4.9%	$ 2.89	7.5%	$ 3.11	
2016	6	$ 0.52	$ 0.81	-0.1%	$ 3.43	7.5%	$ 3.68	
2017	7	$ 0.48	$ 0.81	-0.6%	$ 3.92	7.5%	$ 4.22	$0.7072
2018	8	$ 0.46	$ 0.83	2.4%	$ 4.40	7.5%	$ 4.73	
2019	9	$ 0.44	$ 0.85	2.0%	$ 4.85	7.5%	$ 5.21	
2020	10	$ 0.39	$ 0.82	-2.8%	$ 5.26	10.0%	$ 5.78	$0.7190
2021	11	$ 0.37	$ 0.82	-0.1%	$ 5.64	10%	$ 6.20	
2022	12	$ 0.35	$ 0.85	3.1%	$ 6.00	10%	$ 6.60	
2023	13	$ 0.34	$ 0.88	3.9%	$ 6.36	10%	$ 6.99	
2024	14	$ 0.30	$ 0.84	-4.6%	$ 6.67	10%	$ 7.34	
2025	15	$ 0.27	$ 0.81	-3.4%	$ 6.96	12.5%	$ 7.83	
2026	16	$ 0.26	$ 0.83	2.6%	$ 7.23	12.5%	$ 8.13	
2027	17	$ 0.24	$ 0.84	1.4%	$ 7.49	12.5%	$ 8.42	
2028	18	$ 0.23	$ 0.86	2.4%	$ 7.73	12.5%	$ 8.70	
2029	19	$ 0.22	$ 0.87	1.3%	$ 7.96	12.5%	$ 8.96	
2030	20	$ 0.20	$ 0.89	1.7%	$ 8.18	12.5%	$ 9.21	$0.6877
2031	21	$ 0.19	$ 0.92	2.6%	$ 8.40	15%	$ 9.65	
2032	22	$ 0.19	$ 0.94	2.6%	$ 8.60	15%	$ 9.89	
2033	23	$ 0.18	$ 0.97	2.6%	$ 8.79	15%	$ 10.11	
2034	24	$ 0.17	$ 1.00	2.6%	$ 8.97	15%	$ 10.32	
2035	25	$ 0.16	$ 1.03	2.6%	$ 9.15	15%	$ 10.52	
2036	26	$ 0.16	$ 1.06	2.6%	$ 9.32	17.5%	$ 10.95	
2037	27	$ 0.15	$ 1.09	2.6%	$ 9.48	17.5%	$ 11.14	
2038	28	$ 0.14	$ 1.13	2.6%	$ 9.64	17.5%	$ 11.32	
2039	29	$ 0.14	$ 1.16	2.6%	$ 9.78	17.5%	$ 11.49	
2040	**30**	**$ 0.13**	**$ 1.20**	**2.6%**	**$ 9.92**	**17.5%**	**$ 11.66**	**$0.6884**
2041	31	$ 0.13	$ 1.23	2.6%	$ 10.06	20%	$ 12.07	
2042	32	$ 0.12	$ 1.27	2.6%	$ 10.19	20%	$ 12.23	
2043	33	$ 0.12	$ 1.31	2.6%	$ 10.31	20%	$ 12.38	
2044	34	$ 0.11	$ 1.35	2.6%	$ 10.43	20%	$ 12.52	
2045	35	$ 0.11	$ 1.39	2.6%	$ 10.55	20%	$ 12.65	
2046	36	$ 0.10	$ 1.43	2.6%	$ 10.65	20%	$ 12.78	
2047	37	$ 0.10	$ 1.47	2.6%	$ 10.76	20%	$ 12.91	
2048	38	$ 0.09	$ 1.51	2.6%	$ 10.86	20%	$ 13.03	
2049	39	$ 0.09	$ 1.56	2.6%	$ 10.95	20%	$ 13.14	
2050	40	$ 0.08	$ 1.61	2.6%	$ 11.04	20%	$ 13.25	
2051	41	$ 0.08	$ 1.65	2.6%	$ 11.13	20%	$ 13.36	
2052	42	$ 0.08	$ 1.70	2.6%	$ 11.21	20%	$ 13.46	
2053	43	$ 0.07	$ 1.76	2.6%	$ 11.29	20%	$ 13.55	
2054	44	$ 0.07	$ 1.81	2.6%	$ 11.37	20%	$ 13.64	
2055	45	$ 0.07	$ 1.86	2.6%	$ 11.44	20%	$ 13.73	

Cascade's Long Term Real Discount Rate: 4.170%
IRP Discount Rate = 7.234%
Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

Conservation Credit % attempts to recognize non-quantifiable benefits associated with conservation, including benefits of price certainty & hedge against future carbon costs

PRELIMIINARY AVOIDED COST ESTIMATES
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER-With Carbon 1 Scenario
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM

	YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	Non-Energy Benefits %	PORTFOLIO COSTS INCLUDING CONSERVATION CREDIT	COST-EFFECTIVENESS LIMIT
2011	1	$ 0.58	$ 0.62		$ 0.58	5%	$ 0.61	
2012	2	$ 0.58	$ 0.67	7.5%	$ 1.16	5%	$ 1.22	
2013	3	$ 0.57	$ 0.71	5.7%	$ 1.73	5%	$ 1.82	
2014	4	$ 0.58	$ 0.78	10.1%	$ 2.32	5%	$ 2.43	
2015	5	$ 0.56	$ 0.81	4.9%	$ 2.89	7.5%	$ 3.11	
2016	6	$ 0.52	$ 0.81	-0.1%	$ 3.43	7.5%	$ 3.68	
2017	7	$ 0.54	$ 0.91	-0.6%	$ 3.98	7.5%	$ 4.28	$0.7173
2018	8	$ 0.51	$ 0.93	2.4%	$ 4.51	7.5%	$ 4.85	
2019	9	$ 0.49	$ 0.96	2.0%	$ 5.01	7.5%	$ 5.39	
2020	10	$ 0.45	$ 0.94	-2.8%	$ 5.48	10.0%	$ 6.02	$0.7491
2021	11	$ 0.42	$ 0.94	-0.1%	$ 5.91	10%	$ 6.50	
2022	12	$ 0.40	$ 0.98	3.1%	$ 6.33	10%	$ 6.96	
2023	13	$ 0.39	$ 1.02	3.9%	$ 6.74	10%	$ 7.41	
2024	14	$ 0.35	$ 0.99	-4.6%	$ 7.10	10%	$ 7.81	
2025	15	$ 0.32	$ 0.97	-3.4%	$ 7.44	12.5%	$ 8.37	
2026	16	$ 0.30	$ 1.00	2.6%	$ 7.76	12.5%	$ 8.73	
2027	17	$ 0.29	$ 1.02	1.4%	$ 8.07	12.5%	$ 9.08	
2028	18	$ 0.28	$ 1.05	2.4%	$ 8.37	12.5%	$ 9.41	
2029	19	$ 0.26	$ 1.08	1.3%	$ 8.65	12.5%	$ 9.73	
2030	20	$ 0.25	$ 1.10	1.7%	$ 8.92	12.5%	$ 10.03	$0.7493
2031	21	$ 0.24	$ 1.14	2.6%	$ 9.18	15%	$ 10.55	
2032	22	$ 0.23	$ 1.19	2.6%	$ 9.43	15%	$ 10.84	
2033	23	$ 0.22	$ 1.23	2.6%	$ 9.67	15%	$ 11.12	
2034	24	$ 0.21	$ 1.27	2.6%	$ 9.90	15%	$ 11.38	
2035	25	$ 0.21	$ 1.32	2.6%	$ 10.12	15%	$ 11.64	
2036	26	$ 0.20	$ 1.37	2.6%	$ 10.34	17.5%	$ 12.15	
2037	27	$ 0.19	$ 1.41	2.6%	$ 10.55	17.5%	$ 12.39	
2038	28	$ 0.18	$ 1.46	2.6%	$ 10.74	17.5%	$ 12.62	
2039	29	$ 0.18	$ 1.50	2.6%	$ 10.93	17.5%	$ 12.85	
2040	**30**	**$ 0.17**	**$ 1.55**	**2.6%**	**$ 11.12**	**17.5%**	**$ 13.06**	**$0.7710**
2041	31	$ 0.16	$ 1.60	2.6%	$ 11.29	20%	$ 13.55	
2042	32	$ 0.15	$ 1.65	2.6%	$ 11.46	20%	$ 13.75	
2043	33	$ 0.15	$ 1.70	2.6%	$ 11.62	20%	$ 13.94	
2044	34	$ 0.14	$ 1.75	2.6%	$ 11.77	20%	$ 14.13	
2045	35	$ 0.14	$ 1.81	2.6%	$ 11.92	20%	$ 14.30	
2046	36	$ 0.13	$ 1.86	2.6%	$ 12.06	20%	$ 14.47	
2047	37	$ 0.12	$ 1.92	2.6%	$ 12.20	20%	$ 14.63	
2048	38	$ 0.12	$ 1.98	2.6%	$ 12.33	20%	$ 14.79	
2049	39	$ 0.11	$ 2.04	2.6%	$ 12.45	20%	$ 14.94	
2050	40	$ 0.11	$ 2.11	2.6%	$ 12.57	20%	$ 15.08	
2051	41	$ 0.10	$ 2.17	2.6%	$ 12.68	20%	$ 15.22	
2052	42	$ 0.10	$ 2.24	2.6%	$ 12.79	20%	$ 15.35	
2053	43	$ 0.10	$ 2.31	2.6%	$ 12.90	20%	$ 15.48	
2054	44	$ 0.09	$ 2.38	2.6%	$ 13.00	20%	$ 15.60	
2055								
			0.6129836					

Cascade's Long Term Real Discount Rate: 4.170%
IRP Discount Rate = 7.234%
Years 21-45 Escalation = 2.60% (EIA Inflation Rate)

Conservation Credit % attempts to recognize non-quantifiable benefits associated with conservation, including benefits of price certainty & hedge against future carbon costs
Carbon estimated $15/ton, applies to Natural Gas 2016

PRELIMIINARY AVOIDED COST ESTIMATES
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER- With Carbon 2 scenario
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM

	YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	Non-Energy Benefits %	PORTFOLIO COSTS INCLUDING CONSERVATION CREDIT	COST-EFFECTIVENESS LIMIT
2011	1	$ 0.58	$ 0.62		$ 0.58	10%	$ 0.64	
2012	2	$ 0.58	$ 0.67	7.5%	$ 1.16	10%	$ 1.27	
2013	3	$ 0.57	$ 0.71	5.7%	$ 1.73	10%	$ 1.90	
2014	4	$ 0.58	$ 0.78	10.1%	$ 2.32	10%	$ 2.55	
2015	5	$ 0.56	$ 0.81	4.9%	$ 2.89	10%	$ 3.18	
2016	6	$ 0.52	$ 0.81	-0.1%	$ 3.43	10%	$ 3.77	
2017	7	$ 0.55	$ 0.81	-0.6%	$ 4.00	10%	$ 4.40	$0.7370
2018	8	$ 0.53	$ 0.83	2.4%	$ 4.54	10%	$ 5.00	
2019	9	$ 0.50	$ 0.85	2.0%	$ 5.06	10%	$ 5.57	
2020	10	$ 0.46	$ 0.82	-2.8%	$ 5.54	10%	$ 6.10	$0.7581
2021	11	$ 0.43	$ 0.82	-0.1%	$ 5.99	10%	$ 6.59	
2022	12	$ 0.42	$ 0.85	3.1%	$ 6.43	10%	$ 7.07	
2023	13	$ 0.40	$ 0.88	3.9%	$ 6.85	10%	$ 7.54	
2024	14	$ 0.36	$ 0.84	-4.6%	$ 7.23	10%	$ 7.96	
2025	15	$ 0.33	$ 0.81	-3.4%	$ 7.59	10%	$ 8.34	
2026	16	$ 0.32	$ 0.83	2.6%	$ 7.92	10%	$ 8.72	
2027	17	$ 0.30	$ 0.84	1.4%	$ 8.25	10%	$ 9.07	
2028	18	$ 0.29	$ 0.86	2.4%	$ 8.56	10%	$ 9.41	
2029	19	$ 0.28	$ 0.87	1.3%	$ 8.86	10%	$ 9.74	
2030	20	$ 0.26	$ 0.89	1.7%	$ 9.14	10%	$ 10.05	$0.7510
2031	21	$ 0.25	$ 0.92	2.6%	$ 9.41	10%	$ 10.36	
2032	22	$ 0.25	$ 0.94	2.6%	$ 9.68	10%	$ 10.65	
2033	23	$ 0.24	$ 0.97	2.6%	$ 9.94	10%	$ 10.93	
2034	24	$ 0.23	$ 1.00	2.6%	$ 10.18	10%	$ 11.20	
2035	25	$ 0.22	$ 1.03	2.6%	$ 10.42	10%	$ 11.46	
2036	26	$ 0.21	$ 1.06	2.6%	$ 10.65	10%	$ 11.72	
2037	27	$ 0.20	$ 1.09	2.6%	$ 10.87	10%	$ 11.96	
2038	28	$ 0.20	$ 1.13	2.6%	$ 11.08	10%	$ 12.19	
2039	29	$ 0.19	$ 1.16	2.6%	$ 11.29	10%	$ 12.41	
2040	**30**	**$ 0.18**	**$ 1.20**	**2.6%**	**$ 11.48**	**10%**	**$ 12.63**	**$0.7455**
2041	31	$ 0.17	$ 1.23	2.6%	$ 11.67	10%	$ 12.83	
2042	32	$ 0.16	$ 1.27	2.6%	$ 11.85	10%	$ 13.03	
2043	33	$ 0.16	$ 1.31	2.6%	$ 12.02	10%	$ 13.22	
2044	34	$ 0.15	$ 1.35	2.6%	$ 12.18	10%	$ 13.40	
2045	35	$ 0.14	$ 1.39	2.6%	$ 12.34	10%	$ 13.58	
2046	36	$ 0.14	$ 1.43	2.6%	$ 12.49	10%	$ 13.74	
2047	37	$ 0.13	$ 1.47	2.6%	$ 12.64	10%	$ 13.90	
2048	38	$ 0.13	$ 1.51	2.6%	$ 12.78	10%	$ 14.06	
2049	39	$ 0.12	$ 1.56	2.6%	$ 12.91	10%	$ 14.20	
2050	40	$ 0.12	$ 1.61	2.6%	$ 13.04	10%	$ 14.34	
2051	41	$ 0.11	$ 1.65	2.6%	$ 13.16	10%	$ 14.48	
2052	42	$ 0.11	$ 1.70	2.6%	$ 13.28	10%	$ 14.61	
2053	43	$ 0.10	$ 1.76	2.6%	$ 13.39	10%	$ 14.73	
2054	44	$ 0.10	$ 1.81	2.6%	$ 13.50	10%	$ 14.85	
2055								

Cascade's Long Term Real Discount Rate: 4.170%
IRP Discount Rate = 7.234%
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Conservation Credit % attempts to recognize non-quantifiable benefits associated with conservation, including benefits of price certainty & hedge against future carbon costs
Carbon estimated $20/ton, applies to Natural Gas 2016

PRELIMIINARY AVOIDED COST ESTIMATES
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER-With Carbon 3 Scenario
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM

	YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	RESOURCE PORTFOLIO COST - % CHANGE	PV OF RESOURCE PORTFOLIO COST/THERM	Non-Energy Benefits %	PORTFOLIO COSTS INCLUDING CONSERVATION CREDIT	COST-EFFECTIVENESS LIMIT
2011	1	$ 0.58	$ 0.62		$ 0.58	5%	$ 0.61	
2012	2	$ 0.58	$ 0.67	7.5%	$ 1.16	5%	$ 1.22	
2013	3	$ 0.57	$ 0.71	5.7%	$ 1.73	5%	$ 1.82	
2014	4	$ 0.58	$ 0.78	10.1%	$ 2.32	5%	$ 2.43	
2015	5	$ 0.56	$ 0.81	4.9%	$ 2.89	7.5%	$ 3.11	
2016	6	$ 0.52	$ 0.81	-0.1%	$ 3.43	7.5%	$ 3.68	
2017	7	$ 0.59	$ 0.99	-0.6%	$ 4.03	7.5%	$ 4.33	$0.7263
2018	8	$ 0.56	$ 1.02	2.4%	$ 4.61	7.5%	$ 4.95	
2019	9	$ 0.54	$ 1.05	2.0%	$ 5.16	7.5%	$ 5.55	
2020	10	$ 0.49	$ 1.04	-2.8%	$ 5.67	10.0%	$ 6.24	$0.7761
2021	11	$ 0.46	$ 1.06	-0.1%	$ 6.16	10%	$ 6.77	
2022	12	$ 0.45	$ 1.10	3.1%	$ 6.62	10%	$ 7.29	
2023	13	$ 0.43	$ 1.15	3.9%	$ 7.08	10%	$ 7.79	
2024	14	$ 0.39	$ 1.12	-4.6%	$ 7.49	10%	$ 8.24	
2025	15	$ 0.36	$ 1.11	-3.4%	$ 7.88	12.5%	$ 8.86	
2026	16	$ 0.35	$ 1.15	2.6%	$ 8.25	12.5%	$ 9.28	
2027	17	$ 0.33	$ 1.18	1.4%	$ 8.60	12.5%	$ 9.68	
2028	18	$ 0.32	$ 1.23	2.4%	$ 8.94	12.5%	$ 10.06	
2029	19	$ 0.31	$ 1.26	1.3%	$ 9.27	12.5%	$ 10.43	
2030	20	$ 0.29	$ 1.30	1.7%	$ 9.59	12.5%	$ 10.78	$0.8055
2031	21	$ 0.28	$ 1.35	2.6%	$ 9.89	15%	$ 11.37	
2032	22	$ 0.27	$ 1.41	2.6%	$ 10.19	15%	$ 11.71	
2033	23	$ 0.26	$ 1.47	2.6%	$ 10.47	15%	$ 12.04	
2034	24	$ 0.26	$ 1.53	2.6%	$ 10.75	15%	$ 12.36	
2035	25	$ 0.25	$ 1.59	2.6%	$ 11.02	15%	$ 12.67	
2036	26	$ 0.24	$ 1.66	2.6%	$ 11.27	17.5%	$ 13.25	
2037	27	$ 0.23	$ 1.71	2.6%	$ 11.52	17.5%	$ 13.54	
2038	28	$ 0.22	$ 1.77	2.6%	$ 11.76	17.5%	$ 13.82	
2039	29	$ 0.21	$ 1.82	2.6%	$ 11.99	17.5%	$ 14.09	
2040	**30**	**$ 0.20**	**$ 1.88**	**2.6%**	**$ 12.21**	**17.5%**	**$ 14.35**	**$0.8470**
2041	31	$ 0.19	$ 1.94	2.6%	$ 12.42	20%	$ 14.91	
2042	32	$ 0.19	$ 2.00	2.6%	$ 12.63	20%	$ 15.15	
2043	33	$ 0.18	$ 2.07	2.6%	$ 12.82	20%	$ 15.38	
2044	34	$ 0.17	$ 2.13	2.6%	$ 13.01	20%	$ 15.61	
2045	35	$ 0.16	$ 2.20	2.6%	$ 13.19	20%	$ 15.82	
2046	36	$ 0.16	$ 2.27	2.6%	$ 13.36	20%	$ 16.03	
2047	37	$ 0.15	$ 2.34	2.6%	$ 13.52	20%	$ 16.23	
2048	38	$ 0.14	$ 2.42	2.6%	$ 13.68	20%	$ 16.42	
2049	39	$ 0.14	$ 2.49	2.6%	$ 13.83	20%	$ 16.60	
2050	40	$ 0.13	$ 2.57	2.6%	$ 13.98	20%	$ 16.78	
2051	41	$ 0.13	$ 2.65	2.6%	$ 14.12	20%	$ 16.95	
2052	42	$ 0.12	$ 2.74	2.6%	$ 14.26	20%	$ 17.11	
2053	43	$ 0.12	$ 2.83	2.6%	$ 14.38	20%	$ 17.26	
2054	44	$ 0.07	$ 1.81	2.6%	$ 11.37	20%	$ 13.64	
2055	45	$ 0.07	$ 1.86	2.6%	$ 11.44	20%	$ 13.73	

Cascade's Long Term Real Discount Rate: 4.170%
IRP Discount Rate = 7.234%
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Conservation Credit % attempts to recognize non-quantifiable benefits associated with conservation, including benefits of price certainty & hedge against future carbon costs
Carbon estimated $30/ton, applies to Natural Gas 2016

Appendix I

Action Plan Progress Report

2008 IRP 2-Year Action Plan Progress

Action Item 1: In continuing efforts to create a more accurate load forecast, Cascade will research the viability of expanding the detail of the data by determining therm usage per customer per degree day by customer class (residential, commercial, etc.) along with the non-heat sensitive baseload usage. This is largely dependent upon the capabilities of the Company's new Customer Information System which is currently anticipated to "Go-Live" during mid-2009.

Progress:
Cascade continues to evaluate the ability to determine use/customer/degree day by customer class. At this time, the Company has not been able to fully assess the capabilities associated with the new Customer Information System and the ability to extract detailed usage data by customer class since the new Customer Information System only became operational on July 1, 2010.

Action Item 2: Cascade will continue to monitor outside determinants of natural gas usage, such as legislative building code changes and electrical "Direct Use" campaigns as they are determined to significantly affect the Company's forecast.

a. Cascade will analyze the potential impact of Puget Sound Energy's Direct Use campaign on customer usage in Washington by June 2010.

Progress:
Cascade has remained active in monitoring external developments at the state and national level which carry potential impacts to customer usage within our service territory. In Oregon, legislation passed in 2009 which required improvements to commercial building by 15-25% over existing code. These new code requirements took effect in Fall 2010. This will likely further reduce the anticipated load growth in the commercial/industrial sector. On the Washington side, changes to the Washington Residential and Commercial building codes which were initially scheduled to go into effect on July 1, 2010 but have since been delayed until October 29, 2010 and there is the potential for a further delay until April 1, 2011. Currently, only Puget Sound Energy has a Direct Use campaign that has the potential to impact Cascade's customer usage. To-date, the Company has seen little impact on the Company's load.

Action Item 3: The Company continues to explore the incorporation of price elasticity in future forecasts of demand. The integration of this variable in future models will be dependent upon the practicality of its application and significance of its effect.

Progress:
Cascade continues to explore the incorporation of price elasticity in development of its demand forecast. To-date, the Company has not found the data to be statistically valid and therefore has not incorporated this variable in its model. The Company will continue to review this information and will revisit with the development of the upcoming plan.

Action Item 4: Cascade will continue to monitor the effectiveness of the Oregon Public Purpose Fund to ensure the funds are adequate to capture significant portions of achievable therm savings in Oregon. If it is determined that an increase in this Fund will create a subsequent increase in therm savings, the Company will move to act appropriately.

a. Oregon's incremental annual therm savings targets for the 2009 and 2010 period are 282,657 and 329,937 therms respectively. Estimated spending to achieve the therm savings targets outlined above are $1,494,000 and $1,746,000 respectively.

Progress:
Cascade continues to work closely with the Energy Trust of Oregon, keeping closely apprised on both their establishment of annual therm savings targets and determination of needed funds to acquire those therm savings. As reported by the ETO in their 2010 report to the commission, the 2009 therm savings achievements were . ETO's 2011 budget for Cascade is $2,497,836 to deliver its projected annual savings of 391,754 therms (Cascade's IRP target). ETO entered 2011 with $526,412 in carryover funds from the 2010 program year. Public purpose funding from Cascade was estimated to be around $886,000. On paper, this would leave ETO short of funding for program year 2011 by around $1,085,000 – again leaving nothing toward the 5 percent reserve that ETO prefers to enter into each new program year with. In this case, the 2011 planning reserve is an additional $124,892, or 5 percent of the $2,497,836 budget.

On August 3, 2011, the Commission approved in Order No. 11-285 Cascade's request for authorization to defer incremental funding of Public Purpose Funding payable to ETO to support conservation. This order granted Cascade authorization to defer an amount of funding of up to $1,300,000. This additional deferred funding would enable Cascade to be able to adequately fund ETO's planned budget needs for 2011 and provide a sufficient cash reserve at the end of the year. As of July 31, 2011, ETO reports that their year-to-date fully loaded program expenses for Cascade are $1,013,323. This figure is about 15 percent below budget.

However, it appears that ETO will easily exceed its 2010 expenditure levels during the 2011 program year. It is hoped and expected that ETO can make up any expenditure shortfalls, and corresponding therm savings, by the end of 2011. However, Cascade will be working closely with ETO staff toward the end of the year to most effectively calibrate the final provision of deferred funding so as not to provide an excess of funding should the expenditures finish below budget for 2011. ETO is currently in the process of developing utility budgets for 2012. Part of the discussion and analysis about 2012 budgets revolve around potential Oregon Business Energy Tax Credit (BETC)-related mitigation impacts that go beyond the 2011 BETC mitigation process currently underway. The current 2012 “Base Case” budget for Cascade is $2,757,540 which may be subject to some adjustment as we continue to go through the budget development process. The current 2012 “Mitigation” budget for Cascade is $2,923,625 which is also subject to adjustment before the end of the year. Assuming that Cascade is given authorization to increase public purpose fund collections as outlined in this proposal, there will still be a need for additional deferred funding during 2012. Cascade will then make the application for re-authorization of deferred accounting treatment later in 2012 as the ETO budget becomes firm and the actual program expenditures become known.

<u>Action Item 5:</u> The Company will continue to follow and analyze the impacts of the Western Climate Initiative and proposed carbon legislation at both the state and federal level as they pertain to natural gas conservation, as well as other such acts that may arise from these efforts. The Company will continue to monitor the timing and the costs associated with carbon legislation and analyze the impacts on the Company’s overall portfolio costs. As specific carbon legislation is passed, the Company will update its avoided cost calculations, conservation potential and make modifications to its DSM incentive programs as necessary.

a. The Company is evaluating the potential costs associated with the Waxman/Markey legislation and estimating the impacts on its resource portfolio.

Progress:
Cascade continues to follow closely both potential federal and state level legislation associated with Greenhouse Gas Legislation. Although the proposed legislation has been stalled, the Company continues to review and assess the potential impacts associated with the Kerry/Lieberman bill, which was the latest climate change proposal at the federal level.

<u>Action Item 6</u>: The Company will continue to monitor the cost effectiveness of existing conservation measures and emerging technologies to ensure that the current mix of measures included in the Washington Conservation program is appropriate. Areas for further analysis include the impacts associated with modifications to building codes

along with the cost effectiveness of newer technologies such the next generation of high efficiency water heaters (.70 EF) and high-efficiency hybrid heat pumps. The applicability of these measures within Cascade's service territory will be analyzed and the Company's Conservation Incentive Program will be modified as necessary.

Progress:
Cascade continues to monitor the viability of .70 conventional water heaters and other emerging technologies in order to assess their applicability to our Washington service territory. If, and when, such measures become market available, we will take steps to include them in our Washington conservation portfolio. In Oregon, Cascade works closely with the Energy Trust of Oregon to ensure that the therm savings targets are achieved and strongly encourages their efforts to pursue innovative and emerging gas conservation technologies such as next generation water heaters and high efficiency natural gas heat pumps.

Action Item 7: The Company will continue to work with its Conservation Advisory Group, its third party vendors and its Low income weatherization network to ensure that the therm savings targets identified in the plan are met.

a. As outlined above, the Company's targeted therm savings for Oregon for the 2009 and 2010 period are 282,657 and 329,937 therms respectively.

Progress:
As noted earlier in this document, the ETO indicated a 2010 therm savings achievement for Cascade's service territory in the amount of 367,875, just shy of their annual goal for that year, but above their IRP target for the same timeframe. Spending was $1.3 million, a notable reduction from their initial estimates. The ETO estimates that that their 2011 achievements will be on par with their existing target therms and are expected to be achievable despite economic conditions and the ETO's significant downward revisions to 20 year therm savings potential for the Company.

Cascade continues to work closely with its Oregon Low Income Advisory Group to better understand the capacity of the WAP (Weatherization Assistance Program) to serve Cascade homes and evaluate strategies designed to maintain active Agency participation in the program. Program modifications discussed with the Advisory Group and implemented in 2010 included an extension of the OLIEC program to incorporate rebates for high efficiency natural gas water heaters, and allow participation by non-profit entities engaged in providing affordable, energy-efficient housing for low-income individuals. Cascade will continue its efforts to identify opportunities to utilize the available OLIEC funds in a manner that achieves the greatest amount of cost-effective therm savings at homes occupied by low-income households. From January 1st through December 31, 2010, 132 homes have been weatherized in Oregon with an annual cumulative savings of 21,168 therms and with $261,057.66 provided in rebates. This represents a significant growth in program participation and low-income CNGC households served during the calendar year. Through September, 2011, Cascade's Oregon Low Income Energy Conservation Program (OLIEC) has served 36 homes and achieved a savings figure of approximately 4,953 therms with a total expenditure of approximately $60,256. This is slightly lower than the achievement numbers from the same time in the prior year, reflecting the impending expiration of the ARRA monies, but still a significant upward improvement from the previous level of savings to CNGC low income households.

Action Item 8: The Company will continue to update its distribution system analysis to reflect the impacts of conservation. The Company will continue to target its conservation acquisition efforts in those areas where potential distribution constraints have been identified in the hope that some of those investments maybe delayed.

a. The Company will work with the Energy Trust to ensure that conservation acquisition efforts are targeted to central Oregon and Hermiston area.
b. The Company will update its Oregon distribution analysis during Summer 2009 to re-assess the reinforcement requirements during the 2010 to 2013 period in light of the current recession and actual conservation achievements in 2008 and 2009 by the Energy Trust.

Progress:
The Company continues to promote conservation and focuses attention on those areas identified as having distribution system constraints. The Company is currently updating its models and anticipates that a number of anticipated reinforcement needs may be delayed due to changes in the long term load forecast as a result of both increases in conservation achievements and improvement to building codes.

Action Item 9: Cascade will continue to evaluate gas supply resources on an ongoing basis including supplies of varying lengths (base, swing, peaking) and pricing alternatives. We will continue to analyze the uncertainties associated with volatile supply and demand relationships and will closely monitor and participate in industry discussions regarding diminishing Canadian gas exports. Of particular concern to us are changing conditions on Northwest Pipeline. As our principle upstream pipeline, Northwest Pipeline is a displacement pipeline dependent upon receiving large amounts of Canadian natural gas exports. The risk associated with reduced Canadian exports is a significant concern and therefore it is critical for Cascade to continuously look for opportunities to improve our supply/capacity diversification.

Progress:
The Company continues to examine the various supply side alternatives available on an on-going basis. The Canadian export outlook has brightened somewhat since acknowledgment of the 2008 IRP. While the levels of exports have

decreased due to increased demand in Canada, the prolific shale gas plays, such as Horn River, are expected to ensure that adequate Canadian supplies are available to the Pacific Northwest. Additionally, shale gas plays on the east coast are limiting some of the needs for the western supplies along with increased production in both the Rockies and the Horn River basin in Northern BC/Alberta provide a rosier supply picture than just 2 years ago. As a result, there is little concern that the supplies will be available for the foreseeable future. However, the Company will continue to monitor activities and participate in industry task forces on the various Canadian pipelines to encourage supply availability and price liquidity at important transaction points for our service territory such as Station 2, Sumas, and AECO.

Action Item 10: The Company will continue to monitor the proposed pipeline expansion projects to access more supplies out of the Rockies. As cost estimates change, the Company will analyze those resources under consideration to determine if modifications to the preferred portfolio are necessary.

a. The Company participated in the initial Open Season associated with the Sunstone/Blue Bridge pipeline in 2008

b. Update analysis completed and response from CNG Board due late Summer 2009

Progress:
The Company continues to evaluate incremental pipeline capacity proposals that would bring additional Rockies supplies to Cascade's service territory. Two major developments have occurred since acknowledgement of the plan that may impact the resources selections identified in the preferred portfolio. First of all, in fall 2009, Northwest Pipeline announced that it was abandoning its proposed Sunstone pipeline project due to a lack of participation in the open seasons. It appears that going forward Ruby is likely to be the new pipeline from the west with service to Malin operational as early as March 2011 and it also appears that GTN is considering firm backhaul capabilities to move the additional supplies to the Pacific Northwest and the Company continues to evaluate this as option to provide supply diversity to the Company's Central Oregon service territory. On the other side, the need for incremental capacity to serve the Company's central Oregon load has been delayed due to the Central Oregon load forecast being closer to the Low Load forecast than the medium forecast as originally anticipated. As identified earlier, the Palomar, Blue Bridge and Pacific Connector projects do not look to move forward. However, we have found that Ruby Pipeline combined with GTN backhaul represents a reasonable way to improve diversity of supply to Oregon (utilizing Rockies supplies) and providing additional operational flexibility.

Action Item 11: Continue to refine our specific peak day resource acquisition action plans to address anticipated capacity shortfalls on the Wenatchee and Shelton laterals. Possible solutions include Satellite LNG or pipeline looping to meet the growing requirements of the firm core load. Specifically, the Company will further analyze issues such as determination of project siting issues and risks, project cost estimates, and construction/acquisition lead times.

Progress:
Cascade has continued to monitor and develop plans to address anticipated shortfalls on both the Wenatchee and Shelton Laterals. Since acknowledgement of the plan, the Company has addressed shortfalls on the Shelton lateral as a result of a gate station upgrade and the acquisition of vintage capacity on Northwest Pipeline through a long-term release. To address anticipated shortfalls on the Wenatchee lateral, the Company has notified non-core customers that it will recall the long-term released capacity at the end of the primary term. The returned capacity will allow the Company to meet peak loads through the 2020 period. Additionally, the Company continues to evaluate short-term peaking solutions such as satellite LNG/peak shaving facilities and a propane air plant to address concerns on this lateral.

Action Item 12: The Company will continue to explore options to incorporate BioGas into its portfolio, as specific projects are identified in our service territory. Price, location and gas quality considerations of the BioGas supply.will be evaluated.

Progress:
No specific BNG projects have materialized within the Company's service territory. As those opportunities arise, they will be evaluated for inclusion in the Company's portfolio.

Action Item 13: The Company will continue to monitor proposed LNG import facilities as information becomes available and will evaluate the various options that, if built, could be used to meet core requirements. Issues to monitor include specific cost, the availability of pipeline capacity and project timing.

Progress:
Cascade continues to monitor LNG import facility proposals, however, it appears that it is highly unlikely that any will be sited in the Northwest due to both the complex environmental issues and the competition for those supplies from other higher priced markets.

Action Item 14: The Company will continue to monitor the futures market for price trends and will evaluate the effectiveness of its risk management policy.

Progress:

The Company continues to monitor price trends and evaluates the effectiveness of its risk management policy. Since completion of the Company's 2008 IRP, the forward price curves for natural gas have stabilized considerably. A combination of factors (contango market and economic outlook) have led the Company to modify its hedging strategy for the near-term to hedge less supplies and leave more at the market.