Cascade Natural Gas Corporation

Integrated Resource Plan
Technical Advisory Group Meeting #1

April 15th, 2020

Seoul Room at Seattle-Tacoma Airport

Seattle, WA

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Agenda

- Introductions
- Safety Moment
- About Cascade Natural Gas
- Purpose of the IRP
- IRP Process
- Best Practices Discussion
- IRP Team
- Regional Market Outlook
- Key IRP Discussions for Future IRP Meetings
  - Load Forecast
  - Hedging
  - Avoided Cost
  - Carbon
  - Energy Efficiency
  - Renewables
  - Distribution System Planning
  - Stochastic Analysis Techniques
- Additional Items
- 2020 OR IRP Timeline
- Next Steps

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

A LITTLE HISTORY LESSON…

- Prior to 1955, natural gas was virtually unheard-of in the Pacific Northwest. Seeing an opportunity, Lester Pettit, Spencer Clark, and Stewart Matthews led a group of associates to form a company that would rise to the challenge. Cascade Natural Gas Corporation was incorporated January 2, 1953.
- In July 2007, Cascade was acquired by MDU Resources headquartered in Bismarck, ND.
  - Founded in 1924 as an electric utility in eastern Montana.
  - Core businesses are construction, utilities, and pipeline.
  - Approximately 9,600 employees, operating in 48 states.
  - Operates four utilities across eight states:
    - Montana-Dakota Utilities Co.
    - Great Plains Natural Gas Co.
    - Cascade Natural Gas Corporation
    - Intermountain Gas Co.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

AND TODAY WE ARE …

- Cascade Natural Gas Corp. serves approximately 293,000 customers in 96 communities – 68 of which are in Washington and 28 in Oregon. Cascade's service areas are concentrated in western and south central Washington, and south central and eastern Oregon.
- Today, Cascade serves a diverse service territory covering more than 32,000 square miles and 700 highway miles from one end of the system to the other. Interstate pipelines transmit Cascade's natural gas from production areas in the Rocky Mountains and western Canada.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Purpose of the IRP

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

IRP GUIDELINES AND CONTENT

OREGON
IRP Guidelines from WUTC WAC 480-90-238.

CASCADE'S BASIC PHILOSOPHY
Primary purpose of Cascade's long-term resource planning process has been, and continues to be, to inform and guide the Company's resource acquisition process, consistent with state regulatory requirements.

Input and feedback from the Company's Technical Advisory Group (TAG) is an important resource to help ensure that CNGC's IRP is developed from a broader perspective than Cascade could have on its own.

Cascade continues its commitment to securing and supporting the appropriate internal and external resources necessary to work with all stakeholders to produce a 2020 Integrated Resource Plan that meets the requirements of Washington Administrative Code 480-90-238.

Purpose of the IRP

- The purpose of an IRP is to depict the overall company plan more transparently …
  - For immediately-contemplated actions (i.e., in the next two to four years);
  - To characterize emerging issues and related approaches for mitigation, if necessary; and
  - To outline the long-term direction a company is headed *vis-a-vis* the industry, including economic trends, industry structure (partners such as the pipeline(s) and their impact/actions), technology, customer usage, etc.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

IRP Objectives

- Present a transparent roadmap of the overall corporate plan per the previous slide.
- Promote internal coordination.
- Describe to key stakeholders and the public the complex utility system unique to the local distribution company (LDC) and management decision-making processes.
- Provide previews of future projects and issues which can lead to improved regulatory filings.
- Meet regulatory requirements.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Benefits

- A company can describe its unique circumstances, opportunities and challenges over the planning horizon.
- More specifically, while commissions do not approve the IRP—and, hence future actions—the description of potential actions generally provides for an improved process of future filings, because stakeholders have a basis, in advance, for what is driving those decisions.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

In Conclusion

- An IRP provides an understanding of industry and utility-specific practices.
- That the Commission acknowledges the plans, rather than approve them, does not lessen the process's regulatory importance.
- The commitment from Cascade's senior leadership has been outstanding and recognized by stakeholders.

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

IRP Process

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Overview of IRP Process

- Scoping
  - Work Plan, Outline, and Timeline
- Address Topical Areas
  - Studies, Analyses, and Narratives
- Gain input through iterative external engagement
- Integrate
- Draft Plan
- Final Plan

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

TAG Meetings in the IRP Process

- Cascade believes the TAG meetings are of significant value to the IRP process, and encourages as much active stakeholder participation as possible.
- Feedback from stakeholders is critical to the production of a document that clearly and effectively communicates the Company's plan to acquire the reasonable lowest cost mix of natural gas supply and conservation resources to serve forecasted demand.
- Five TAG meetings will be held, with a potential sixth scheduled if needed.
- Multiple opportunities for public participation will be made available.

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Meeting Principles

- TAG meetings will be effective if…
  - Start and end on time, with participants fully present.
  - Allow for open, inclusive and balanced participation and discussions.
  - Ask questions.
  - Slides are disseminated to stakeholders in advance, and reviewed by stakeholders prior to the meeting.
  - Be clear about next steps and action items.
  - Deadlines to hit milestones are described and respected by all parties.

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Importance of Milestones

- The IRP team plays an internal coordination role, assisting many departments working as one.
- This can be challenging, as each department has its own core function beyond the IRP.
- Milestones allow the Company to achieve this task while being respectful of each other's individual challenges and workload.
- The Company has critical milestones related to the completion of its load forecast, price forecast, avoided cost, and other critical processes. These often inform other parts of the IRP process, and must be met on time.

Best Practices Discussion

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Context

- Cascade is proud of its acknowledged 2018 IRP, but recognizes the importance of continuing to improve and grow.
- To this end, Cascade has actively been engaged in following the IRPs of other regional LDCs. This includes reading their IRPs and attending their versions of TAG meetings.
  - The goal has been to learn IRP best practices across the industry, and take back applicable elements to include in our IRP.
  - In the spirit of this, Cascade encourages stakeholder to tell us if there is an element of another LDC's IRP that they believe is particularly well done.
  - As stated earlier, Cascade has its own unique challenges and demographics, and will produce an IRP specific to Cascade.
- Cascade encourages feedback on its proposed approach to the following IRP elements, either today or future TAG meetings.

Key Items for Best Practices

- Welcomes input from stakeholders.
- Recognize stakeholders are busy so, therefore, seek to optimize participation (See Stakeholder Engagement Document).
- Provide for iterative and collaborative process.
- Promote gaining all perspectives.
- Reduce barriers with clear communication and data.

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Key Items (Continued)

- Create transparency with availability of Cascade staff for analyst-to-analyst discussions throughout process.
- Memorialize Cascade's commitments (per Stakeholder Engagement Document).
- Requests of stakeholders.
- Recognize important aspects, such as:
  - Cascade's need to lock down certain components early in process.
  - Stakeholders as point of contact within organization and coordinate organizational positions (as best as possible).

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

IRP Team

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

INTERNAL TEAM MEMBERS OF CNGC'S INTEGRATED RESOURCE PLAN:

LAST NAME	FIRST NAME	TITLE	COMPANY
Archer	Pam	Supervisor, Regulatory Affairs	Cascade
Burin	Kary	Supervisor, Conservation	Cascade
Chiles	Mark	Vice President, Customer Service and Regulatory Affairs	Intermountain
Connell	Kevin	Director, Gas Supply Utility Group	MDU
Cooley	John	Manager, Industrial Services	Cascade
Cowlishaw	Monica	Manager, Energy Efficiency & Community Outreach	Cascade
Cunnington	Brian	Manager, Industrial Services	Cascade
Davis	Ashton	Resource Planning Analyst, Gas Supply	Cascade
Folsom	Bruce	Consultant	Bruce W Folsom Consulting LLC
Goodman	Chad	System Administrator	Cascade
Hensyel	Phillip	Lead Economic Energy Efficiency Analyst II	Cascade
Krebsbach	Abbie	Director, Environmental	MDU
Madison	Scott	Executive Vice President, Business Development and Gas Supply	MDU
Martuscelli	Eric	Vice President, Operations	Cascade

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

INTERNAL TEAM MEMBERS OF CNGC'S INTEGRATED RESOURCE PLAN:

LAST NAME	FIRST NAME	TITLE	COMPANY
McGreal	Devin	Resource Planning Analyst, Gas Supply	Cascade
Mellinger	Becky	Financial Analyst	Cascade
Myhrum	Isaac	Regulatory Analyst II, Regulatory Affairs	Cascade
Offerdahl	Linda	Engineering II, Engineering	Cascade
Parvinen	Mike	Director, Regulatory Affairs	Cascade
Robbins	Chris	Manager, Gas Supply and Control- CNGC/IGC	Cascade/ Intermountain
Robertson	Brian	Supervisor, Resource Planning, Gas Supply	Cascade
Sellers-Vaughn	Mark	Manager, Supply Resource Planning	Cascade
Senger	Garret	Executive Vice President, Regulatory, Customer Service and Administration	MDU
Sorensen	Renie	Manager, Engineering	Cascade
Spector	Alyn	Manager, Conservation Policy	Cascade
Stone	Carolyn	Gas Supply Analyst III	Cascade
Tyssen	Nathan	Network Administrator	Cascade
Wood	Eric	Supervisor, Gas Supply	Cascade/ Intermountain

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

2020 IRP Improvements

Validation of methods

- The Commission agrees that Cascade has made dramatic improvements in its modeling since its 2014 IRP. This is primarily the result of the expansion and increased expertise of the resource planning team. Their description in Appendix L of the Company's statistics and modeling methods, and the advantages and disadvantages of the modeling improvements, is detailed and refreshingly frank. The Commission appreciates the quality and transparency of this work. We encourage the Company to continue to review these methods for the purpose of validating whether they are producing the most accurate results possible.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

2020 IRP Improvements

Greenhouse gas emissions modeling

- With the passage of E3SHB 1257, requiring the use of the social cost of carbon in conservation planning, Cascade's future plans are required to incorporate the social cost of carbon. The Commission considers Cascade well positioned to achieve compliance with the law's planning requirements and full implementation of the achievable conservation potential.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

2020 IRP Improvements

Modeling of significant emergency events

- On October 9, 2018, a natural gas pipeline ruptured in northern British Columbia, Canada, causing Washington's natural gas distribution utilities (including Cascade) to take significant actions to ensure that they could continue to serve their customers. While this incident was an extreme occurrence not likely to be repeated, it was a significant enough event to warrant concern among the Commission and Washington's natural gas utilities.
- The British Columbia rupture event highlights the risks inherent in depending too heavily on any one resource to meet a Company's obligations to core customers. In its Plan, Cascade modeled several scenarios that limited supply from its various resources (including British Columbia) throughout the 20-year planning horizon. These scenarios could serve as the basis for modeling short-term emergency situations. The Commission encourages Cascade to expand upon the results of these scenarios, and work with Staff to identify the appropriate parameters around any additional emergency modeling that should be presented in the 2020 IRP.

2020 IRP Improvements

Clarify distribution system planning priorities

- In Section 9, Cascade's IRP highlights three particular distribution projects and provides some details of each project. Unfortunately, these three projects are not necessarily the most important distribution projects planned by the Company. In future IRPs, we recommend that Cascade highlight projects of particular importance that would reasonably be of interest to the Commission, Staff, and the public.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

2020 IRP Improvements

Continue to monitor renewable natural gas opportunities

- Cascade for the first time evaluated potential renewable natural gas (RNG) supply options. As of the filing of the final IRP, the Company does not anticipate utilizing RNG during the planning period. The enactment of E3SHB 1257 encourages the development of RNG resources and provides guidelines to companies that opt to serve their customers with RNG. The Commission encourages Cascade to model any technically feasible RNG projects in its future IRPs. This should include a discussion of the quality of RNG, its suitability for integration into the utility's natural gas system, and quantities of RNG that the system can safely accommodate. In addition to technical modeling, Cascade should ensure the economics of a RNG project are consistent with the provisions of Section 13 of E3SHB 1257, particularly regarding cost and value of environmental attributes. We encourage Cascade to continue engagement with the Commission as well as the Department of Commerce on implementation of E3SHB 1257.

2020 IRP Improvements

Public participation

- The Commission understands that the IRP process is technical and information heavy. Still, we encourage Cascade to consider all options for engaging additional stakeholders in the process.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Regional Market Outlook

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Regional Market Outlook

- Although the market expects the Enbridge pipeline to be fully repaired by November of 2019, uncertainty regarding the timing for completion of repairs is causing instability and uncertainty in the market out to 2022 and winter Sumas prices to trade at a premium.
- Cascade's 2019 Hedge Execution Plan was presented to Cascade's GSOC (Gas Supply Oversight Committee) on July 9th. GSOC decided on a hedge level of 60% with a 5% cap on financial transactions. According to a July 16th workshop with the OPUC, Avista plans to hedge 40% and NW Natural plans to hedge 55%.
- The gas futures market indicates a bullish outlook towards natural gas pricing with August Henry Hub gas prices remaining <$2.40/MMBtu.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Regional Market Outlook (Cont.)

- Due to the US economy's continued growth and resulting confidence in the market, a number of new industrial projects have been jumpstarted in the medium term. Analysts at Wood Mackenzie claim "Stronger structural demand in North America will protect Henry Hub from further downside risk.
- According to the reference case of the EIA 2018 Annual Energy Outlook, Natural Gas is projected to lead the power sector in gross energy consumption over the next 20+ years.
- Currently, the major Columbia Basin reservoirs range from a height of 918'-1570', while the five major Oregon River Basins range from 52%-87% (2018: 52%-81%) filled.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Regional Market Outlook (Cont.)

- Jordan Cove LNG's final FERC review is due by October 11th. This final environmental impact statement will be followed by a final order set for January 9th, 2020.
- The 2019 U.S natural gas inventory injection season started at the lowest storage level since 2014 yet despite this, injections have outpaced the five-year average during the second quarter of 2019.
- GTN will potentially be having a Kingsgate south open season in the near future. Cascade has entered into a non-binding agreement to participate.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Key IRP Discussions for Future IRP Meetings

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Load Forecast

- The Company currently utilizes an Autoregressive Integrated Moving Average (ARIMA) methodology with Fourier terms to predict customer count and usage.
- Cascade uses a 60 degree reference temperature to calculate HDDs.
- Multiple scenarios are analyzed such as high/low growth, warm/cold weather, peak day events, etc.
- Cascade has continued to evaluate other potential predictors such as housing starts, but have encountered the same problem as other regional LDCs related to the availability of data to accurately reflect its service area.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Customer Forecast

- $C^{CG,Class} = \alpha_0 + \alpha_1 Pop^{CG} + \alpha_2 Emp^{CG} + Fourier(k) + ARIMA \in (p,d,q)$
- Model Notes:
  - C = Customers; CG = Citygate; Class = Residential, Commercial, Industrial, or Interruptible; $ARIMA \in (p,d,q)$ = Indicates that the model has p autoregressive terms, d difference terms, and q moving average terms; Pop = Population; Emp = Employment; Fourier(k) = Captures seasonality of k number of seasons.

Use Per Customer Forecast

- $Therms/C^{CG,Class} = \alpha_0 + \alpha_1 HDD^{CG,D} + \alpha_2 Wind^{CG,D} + \alpha_3 I^w + ARIMA \in (p,d,q)$
- Model Notes:
  - Therms/C = Therms per customer; CG = Citygate; Class = Residential, Commercial, Industrial, or Interruptible; HDD = Heating Degree Days; Wind=Average Windspeed; D= Day; I_w = Indicator Variable set to 1 if it is a weekend; $ARIMA \in (p,d,q)$ = Indicates that the model has p autoregressive terms, d difference terms, and q moving average terms.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Hedging

- In the 2018 OR IRP, Cascade noted that the Company was actively participating in UM 1720, Investigation into Long-Term Hedging Policy.
  - On January 18, 2018 the docket was closed.
- Cascade is actively involved with Washington Utilities and Transportation Commission (WUTC) Docket UG 132019, Inquiry into Local Distribution Companies' Natural Gas Hedging Practices and Transaction Reporting.
  - Cascade filed the 2018 Annual Hedge Plan on September 28, 2018 and received an acknowledgement letter on April 29, 2019.
  - The 2019 Annual Hedging Plan will be filed on or before August 31, 2019.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Avoided Cost

- Cascade has continued its active participation in UM 1893, Staff Investigation of Methodology and Process of EE Cost-Effectiveness.
  - Elements of Cascade's 2019 avoided cost calculation, for use in the 2020 IRP, will be informed by the workbook provided by OPUC Staff during this docket.
- In the 2020 OR IRP, Cascade will be including values for distribution system costs and risk premium as part of the total avoided cost calculation, as well as a value for the impact of peak hour, to be used in conjunction with distribution system values.
- Based on stakeholder feedback from the 2018 OR IRP and UM 1893 proceedings, Cascade will ensure that all inputs to the avoided calculation are presented as transparently as possible.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Avoided Cost Formula

$$AC_{nominal} = TC_f + TC_v + SC_f + SC_v + (CC * C_{tax} * E_{adder}) + (DSC * HM) + RP$$

Where

- $AC_{nominal}$ = The nominal avoided cost for a given year. To put this into real dollars you must apply the following: Avoided Cost/(1+discount rate)^Years from the reference year.
- TC_f = Incremental Fixed Transportation Costs
- TC_v = Variable Transportation Costs
- SC_f = Incremental Fixed Storage Costs
- SC_v = Variable Storage Costs
- CC = Commodity Costs
- C_{tax} = Carbon Tax
- E_{adder} = Environmental Adder, as recommended by the Northwest Power and Conservation Council
- DSC = Distribution System Costs
- HM = Hourly Modifier
- RP = Risk Premium

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Energy Efficiency

- The IRP team actively engages with the Energy Trust (ETO) to effectively integrate its supply side and demand side planning.
- Cascade will also work with ETO to further examine how carbon tax scenarios impact which conservation measures are undertaken.
- The Company will keep apprised of other Energy Trust strategies to maximize customer's efficiency through targeted DSM, low income partnership, and potential biogas support.
- Recently passed state law SB 98, allowing natural gas utilities to recover prudently incurred qualified investments in RNG, may offer expanded opportunities to offer biogas options to customers.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Carbon

- The Company will continue to operate robust energy conservation programs in partnership with the Energy Trust.
- Cascade will continue to analyze various carbon reduction scenarios in its 2020 IRP.
- The Company will determine the impacts of regional carbon policy and will model the impacts of restrictions on the use of natural gas within local communities.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Renewables

- Cascade is continuing to look at renewables as an option for long-term supplies.
- The Company has met with several biodigester developers who are trying to capture value in the current Renewable Identification Number (RIN) market. However, none of these have moved passed the discussion phase to date.
- In addition, Cascade has met with the City of Richland (WA) to discuss the possibility of capturing biogas from their landfill. They have hired a consultant to assess the feasibility of that project.
- Cascade does have a renewable tariff in Oregon. This tariff is designed for the producer, and not the end users or core customers.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Distribution System Planning

- 2020 IRP includes a discussion of the elements utilized in distribution system planning to determine needed system enhancements.
- Cascade will provide all planned OR projects and costs under confidential treatment.
- Cascade encourages stakeholder feedback related to distribution system planning.
- Cascade will be monitoring/participating in UM 2005.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Stochastic Analysis

- Cascade appreciated Staff feedback requesting further stochastic analysis in the Company's 2018 IRP.
- In the 2018 IRP, Cascade only ran stochastic analysis on the preferred deterministic portfolio.
- For the 2020 IRP, Cascade will perform Monte Carlo simulations on all potential portfolios before scenario and sensitivity testing.

Resource Integration

- Cascade will stochastically test multiple portfolios in its 2020 IRP to capture the extrinsic value of all portfolios before selecting a candidate portfolio.
- This candidate portfolio will then be tested through stochastic scenario and sensitivity modeling.
- Cascade will compare the Value at Risk (VaR) of the candidate portfolio in each scenario/sensitivity to a VaR limit to ensure that the extrinsic risk of the portfolio is within tolerable levels.
- Cascade will detail its determination of future long-term resource needs, its analysis of the expected costs and associated risks of the alternatives to meet those needs, and its action plan to select the best portfolio of resources to meet those needs.

CASCADE NATURAL GAS CORPORATION®
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

2020 IRP Schedule

Date (Subject to change)	Process Element	Location (Subject to change)
Wednesday, April 8, 2020	TAG 1 slides distributed to stakeholders	
Wednesday, April 15, 2020	**TAG 1: Process, Key Points, IRP Team, Timeline, Regional Market Outlook, Plan for dealing with issues raised in the 2018 IRP**	**SeaTac Airport - 9 am to 12 pm**
Wednesday, May 13, 2020	TAG 2 slides distributed to stakeholders	
Wednesday, May 27, 2020	**TAG 2: Demand and Customer Forecast and Non-Core Outlook, Drilling down into segments of demand forecast. Upstream Pipeline presentation.**	**SeaTac Airport - 9 am to 12 pm**
Wednesday, June 17, 2020	TAG 3 slides distributed to stakeholders	
Wednesday, June 24, 2020	**TAG 3: Distribution System Planning, Planned Scenarios and Sensitivities, Alternative Resources, Price Forecast, Avoided Costs, Current Supply Resources, Transport Issues.**	**SeaTac Airport - 9 am to 12 pm**
Wednesday, July 29, 2020	TAG 4 slides distributed to stakeholders	
Thursday, August 6, 2020	**TAG 4 Carbon Impacts, Energy Efficiency, Bio-Natural Gas, Preliminary Resource Integration Results.**	**Community Service Room in Bellingham, WA - 9 am to 3 pm**
Wednesday, September 16, 2020	TAG 5 slides distributed to stakeholders	
Wednesday, September 23, 2020	**TAG 5: Final Integration Results, finalization of plan components, Proposed new 4-year Action Plan.**	**SeaTac Airport - 9 am to 12 pm**
Tuesday, November 17, 2020	Draft of 2020 WA IRP distributed	
Wednesday, December 23, 2020	Comments due on draft from all stakeholders	
Wednesday, January 27, 2021	TAG 6, if needed	WebEx Only
Friday, February 26, 2021	IRP filing in Washington	

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Questions/Next Steps

- Review Plans for TAG 2 Discussion
  - Demand and Customer Forecast.
  - Non-Core Forecast.
  - Pipeline Capacity Overview.
  - Next TAG is Wednesday, May 27th in the Amsterdam room at the Seattle-Tacoma Airport Conference Center.

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®

Cascade Natural Gas Corporation

Integrated Resource Plan
Technical Advisory Group Meeting #1

April 15th, 2020

Seoul Room at Seattle-Tacoma Airport

Seattle, WA

CASCADE NATURAL GAS CORPORATION
A Subsidiary of MDU Resources Group, Inc.
In the Community to Serve®