Staff informal comments responding to Cascade's 2025 WA DRAFT IRP

Commendations

Staff would like to begin with commendations: noting improvements from the previous IRP and encouragement to pursue certain changes further.

Page 2-6, Staff wants to commend the creation of the EAG. Within the IRP Staff would like to see more connection between the EAG and planning. Staff recognizes the tension between keeping the content of the IRP salient planning, the contents of Final Order 09 requiring an equity lens in all aspects of its business, and the current lack of an appropriate filing or docket to demonstrate its progress on equity issues.

Page 2-8, Staff commends Cascade's efforts to improve equity with the CARES program. Staff recognizes the tension between salience to the IRP and planning, and the lack of another venue for Cascade to demonstrate its progress on equity issues. Quantification of program results, if available, may help communicate Cascade's progress.

Page 2-9, Staff commends the Environmental Community Opportunity Fund. Quantification of the size of this program may help communicate Cascade's progress.

Pages 2-9,2-10, Cascade discusses mapping Highly Impacted Communities and Distributional Equity Analysis. Staff is supportive of these efforts. Connecting these efforts to planning methods and outcomes will be critical and Staff enthusiastically looks forward to those conversations for the 2027 IRP.

Page 2-10, "Cascade will monitor equity considerations in other regional IRPs and follow guidance from the Commission and its EAG." Staff supports this.

Page 3-16 "The current restrictions under the 2021 WSEC regarding new construction, the Climate Commitment Act, the passage of initiatives such as I-2066, and the City of Berkley appeal causes forecasting natural gas customer counts to be difficult and must include wide ranges of outcomes." Staff agrees with the imperative to consider a wide range of outcomes.

Page 4-2, "In Cascade's last IRP, renewable natural gas was addressed in the Renewable Natural Gas chapter but is now included in this chapter." Notes like these are helpful.

Page 4-5, "QUICK REFERENCE TO RNG LOCATIONS IN IRP" Additions like this are helpful.

Page 8-10, "Pipe options" Many of these selection guidelines seem equity-related. Depending on the nature of this analysis, this could contribute to demonstrating Cascade's equity work. Cascade may want to consider describing this in greater detail.

Page 9-5, Footnotes 1-5, These are good steps toward improving accessibility. Defining these terms below is helpful. A step further would be lowering the reading level of these footnotes down to about 8th grade.

Page 9-25, "Electrification Model" Staff wants to highlight the hard work that Cascade IRP staff have put into developing and considering the electrification model. This is a large step in the right direction and Cascade IRP staff should be commended for their efforts. UTC Staff looks forward to working with Cascade to improve the model further for the 2027 IRP.

Page 9-25, "Cascade has made a "best effort" to outline key attributes of future electrification and has attempted to initiate associated intra-utility collaboration in lieu of no statewide entity coordinating meetings and analyses." Staff appreciates hearing that Cascade has taken these efforts for coordination.

Page 9-30, "Pipeline zone 20 (Tri Cities area per Figure 9-1) was chosen for illustrative purposes as it has the lowest electric rates in Cascade's service territory." This is useful context.

Page 10-2, "Cascade has notified these segments in the past in several ways, including" Cascade might consider adding some examples of outreach messaging to the appendices to demonstrate Cascade's procedural equity progress.

Page 10-3, "Cascade has a dedicated Internet webpage where customers and interested parties can view the IRP timeline, TAG presentations and minutes, as well as current and past IRPs.5,6 Cascade's webpage is also available in multiple language." Staff commends these steps to promote accessibility of the IRP process.

Response: Cascade appreciates Staff's kudos and has added language to the IRP in response to these comments.

Time-constrained Comments and Recommendations

Staff acknowledges that there are limitations to the amount of change and updates that can be made between the submission of Staff comments and the final IRP that the company submits.

Generally:

Much of the Equity content, while encouraging, isn't clearly connected to resource planning within the draft. Perhaps the document could articulate how the various equity strategies connect to the resource planning methods and outcomes of the IRP?

Response: Cascade is finalizing the agreement and scope of work with GTI Energy Community Benefits Team for its Distributional Equity Analysis (DEA). GTI will provide technical assistance to develop a guidance document that addresses Washington equity requirements for projects with a cost of $1M or more.

GTI Energy will focus on the development of a guidance document which includes instructions and tools, the compilation of resources, processes and other methods for each category in the DEA Checklist form. The guidance document will provide the necessary information and assistance for Cascade to complete the DEA Checklist for individual large projects in Washington state.

Figures are often presented without commentary. Clear analytical takeaways for figures might be helpful.

Response: Thanks for the feedback. Cascade will look at adding additional commentary for the Figures in the IRP.

Please state whether Cascade includes the purchase of price ceiling units as part of its strategy to comply with the Climate Commitment Act.

Response: Cascade's strategy to comply with the Climate Commitment Act is through the least cost compliance options, which is consistent with the Company's overall IRP objective of acquiring all least cost/least risk resources. As part of those options, Cascade does include the opportunity to purchase price ceiling units, if such a resource satisfies the modeling objective stated above. As described on Page 9-16, Cascade states that under current modeling assumptions, price ceiling units are a lower cost option compared to carbon capture until 2030 and RNG until 2040, even when acknowledging path dependency benefits of earlier procurement of these resources. Without knowing exact details of each entity's CCA compliance strategy, Cascade cannot determine whether or not price ceilings will be required to meet CCA. Cascade can and does analyze in this IRP whether or not price ceiling units may be a lower cost option compared to other low carbon alternative fuels, therefore choosing price ceiling units if needed.

Page 1-8, "Next, 10% was added to the avoided cost to account for nonquantifiable, environmental benefits." Staff notes this is not an environmental benefits adder but is a preferential adder stemming from statutory mandate. See the Pacific Northwest Electric Power Planning and Conservation Act. [Emphasis added by Staff] "3(4)(D) For purposes of this paragraph, the "estimated incremental system cost" of any conservation measure or resource shall not be treated as greater than that of any nonconservation measure or resource unless the incremental system cost of such conservation measure or resource is in excess of **110 per centum** of the incremental system cost of the nonconservation measure or resource."

Response: Cascade updated the language in the IRP to clarify the 10% adder.

Page 2-7, "The EAG, which began meeting December 13, 2024," and "Since its first monthly meeting in December 2023, the EAG". These dates don't align.

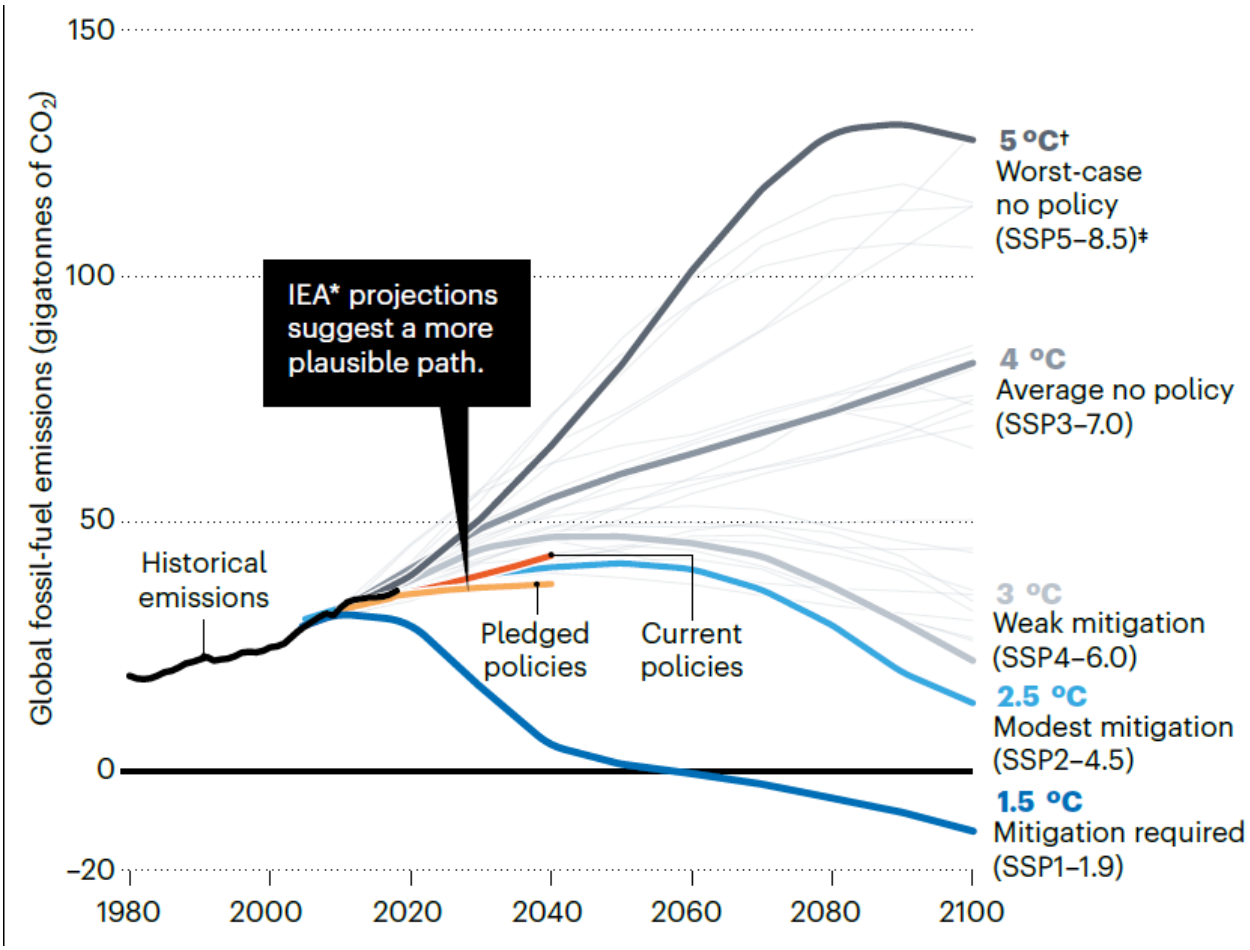
Response: The December 13 date has been updated to correctly reflect the year 2023.

Page 3-6, "Historically, Cascade has accessed data from National Oceanic and Atmospheric Administration (NOAA), but found many months/locations with missing data." This is concerning. Is this a recent development or just the nature of NOAA data? Was the data provided by Schneider Electric more complete?

Response: This issue has not been a recent development. Cascade's older weather normalization models utilized NOAA data and there are several instances where there are gaps of missing data. Schneider Electric uses many of the same NOAA locations, the National Weather Services, but reviews the data prior to providing them to their customers to ensure all data is provided. Any missing data is supplemented using a Forward Error Corrected process.

Page 3-8, Figure 3-5: Annual Usage by SSP Projection, These two datasets appear to be statistically indistinguishable, as Cascade notes, "The difference the impact between the two SSPs have on usage is minimal, which can be seen in Figure 3-5.". The graph appears to compare SSP2-4.5 and SPP3-7.0. The Hausfather article cited by Cascade indicates that by 2100 that SSP3-7.0 corresponds with 4 degrees Celsius of warming and SSP2-4.5 corresponds with 2.5 degrees Celsius of warming. Included below. Can Cascade explain this apparent discrepancy? It may be prudent to double-check these values or the data inputs.

Response: It's important to remember that Cascade's IRP only goes through 2050, where the gap between SSP3-7.0 and SSP2-4.5 is much smaller than the gap in 2100. Also, Cascade's usage is only impacted during winter and shoulder months, when it comes to weather impacts, which minimizes the differential impacts between the two SSP's.



Page 3-10, "Based on feedback from ICF's cold weather qualitative analysis, Cascade maintains the same peak day throughout the planning horizon and does not adjust it for climate impacts." What was the feedback?

Response: Cascade has added this narrative to Appendix B.

Page 3-10, "Climate change is projected to continue to drive warmer temperatures in the Pacific Northwest, reducing the overall frequency of extreme cold events across the region in the long term." How does this impact Cascade's utilization and contracting for storage resources?

Response: Cascade does not anticipate an impact on the utilization or contracting of storage resources currently. It's important to remember that while storage does offer additional capacity to meet peak loads, storage also provides opportunities to keep costs low for customers. Cascade currently holds a lower percentage of storage resources compared to peer utilities. With upstream pipelines being fully, or nearly fully subscribed, the Company is susceptible to operational flow orders under peak and non-peak situations. Operation flow orders could require Cascade to purchase gas at a much more expensive basin, where storage would provide relief opportunities until the operation flow orders are removed.

Page 3-12, "Cascade uses population and employment growth data from Woods & Poole (W&P)" How does Cascade consider these data for the low and no growth scenarios?

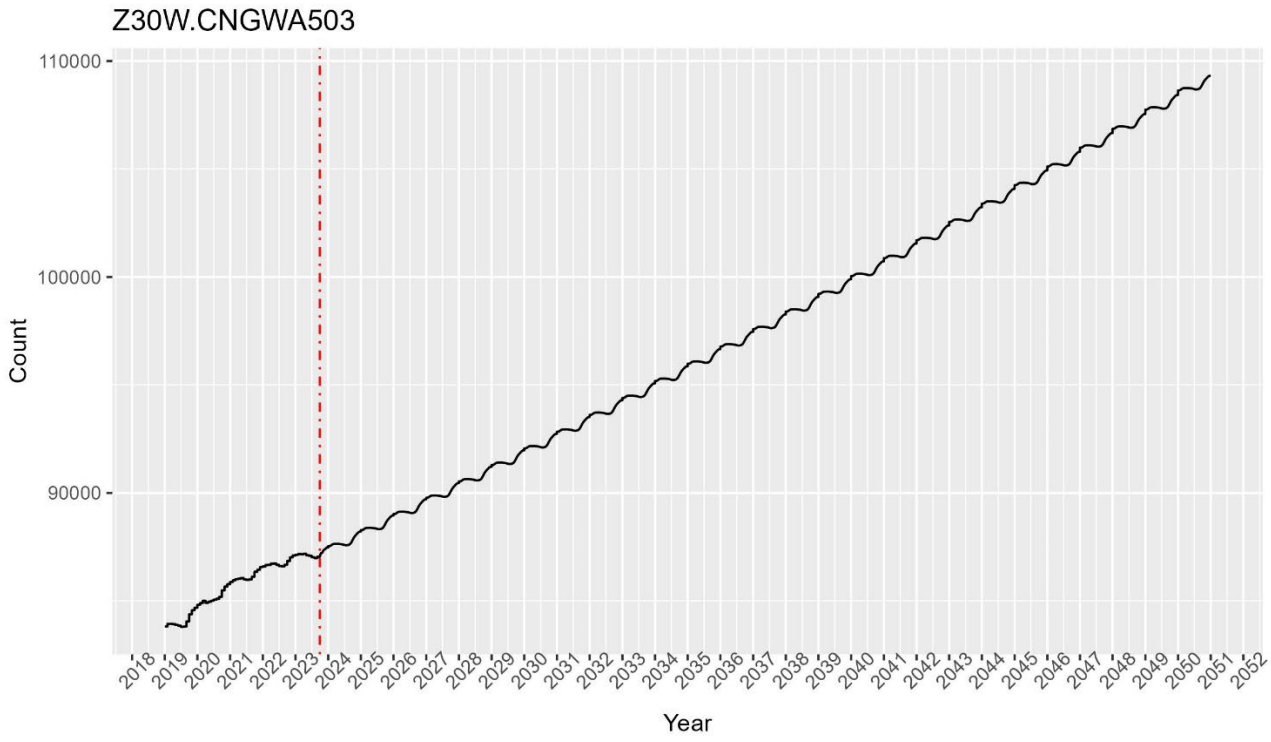
Response: The Woods & Poole data is used to create the base forecast. From the base forecast, Cascade assumes that the relationship between population and employment growth diverges from historical trends. This assumption is made because factors like building codes or compliance costs are influencing growth more significantly than population and employment impacts customer growth.

Page 3-12, "It should be noted that W&P forecasts can be adjusted where about a demand area indicates a significant difference from W&P regarding observed economic trends." Were W&P forecasts adjusted? How many times? How much did these adjustments impact the outcomes of the IRP?

Response: Cascade did not adjust the Woods & Poole data in the 2025 IRP.

Page 3-12, " $+ \alpha_3 Rate^{Zone} Fourier(k)$ " Does this mean that customer counts are a linear function of rates multiplied by a seasonal function? Can Cascade explain the theoretical basis for customer counts being a linear function of rates? Which types of customers have a seasonal existence as customers?

Response: The formula was incorrect. Cascade has updated it to include a plus sign between $\alpha_3 Rate^{Zone}$ and $Fourier(k)$. Cascade does not have seasonal impacts for rates. As can be seen in the CNGWA503 (Residential) and CNGWA504 (Commercial), these customers generally have a seasonal existence.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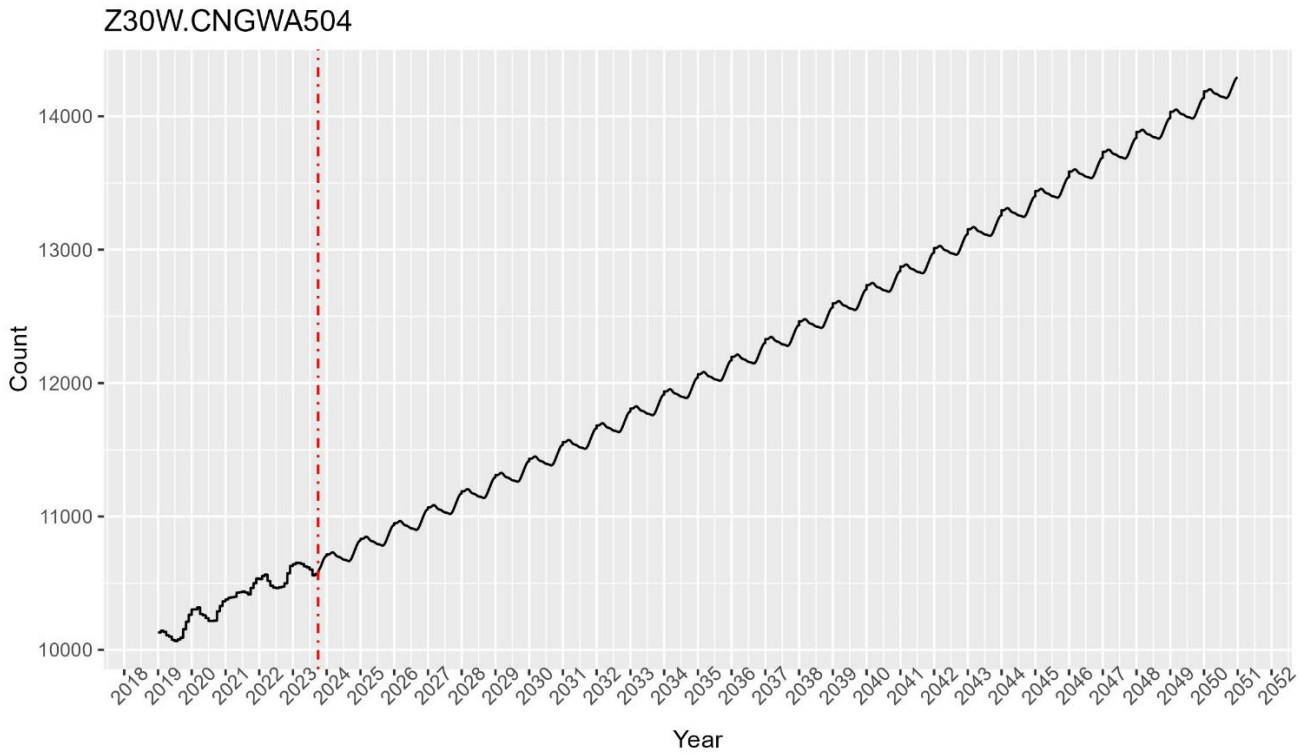
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Page 3-12, "Model Notes:" This list does not include "Rate"

Response: Thanks. This has been updated.

Page 3-19, "Load growth across Cascade's system through 2050 fluctuates due to accounting for leap years and including retail rates in the customer and load forecast models." What is the impact of retail rates on customer forecast models? What data was used to model this?

Response: The impact ranges depending on area and what customer class was impacted. Cascade did not find rates to be statistically significant within the residential class, but did find it statistically significant in some commercial and industrial customer classes. In one case, Cascade found it statistically significant, but the impact was very minimal. In that case, a $1 per dth increase in rates would result in a decline of 0.14 customers. In another case, Cascade found that a $1 per dth increase in rates would result in a decline of 60 customers.

Cascade utilized the rate impacts from the 2023 IRP that included compliance costs. In the low growth scenario, Cascade utilized the high rate impacts from the electrification scenario in the 2023 IRP. Cascade lagged these by 1 year to capture the lag rates have in a normal regulatory environment.

Page 3-19, "For the SSP 3-7.0 HDD projections, the reference case results in Washington growth rates of -0.09%. For the SSP 3-7.0 HDD projections, the reference case results in Washington growth rates of -0.06%." This appears to be the same sentence twice but with different values.

Response: The second SSP should be referencing SSP 2-4.5. This has been updated in the IRP narrative.

Page 3-23, Figure 3-14, What are the causes for different pipeline zones to change at different rates? Z10 seems to grow while GTN seems to decline the fastest. Generally, descriptions of the dynamics that drive the outcomes shown in graphs and figures would be appreciated.

Response: This is due to large volume core commercial or industrial customers that aren't subject to building code impacts being in areas where Cascade has seen recent growth for those customer types.

Page 3-23, Figure 3-15, Can Cascade explain why peak day demand does not decline despite energy efficiency efforts?

Response: Cascade's peak day demand under no growth and low growth (declining) scenario do decline. Figure 3-15 is prior to energy efficiency impacts.

Page 3-24, "Non-Core Outlook" This section does not mention the existence of curtailable contracts or the role it could have in Cascade's models. Curtailment isn't discussed at all in this IRP, in contrast to previous IRPs. Can Cascade either include curtailment in its analysis or explain why it was removed from the IRP?

Response: Cascade has provided information to WUTC explaining that Cascade does not purchase upstream transportation for non-core customers.

Page 4-4, The bottom half of this page might benefit from a visual.

Response: Cascade has added Figure 4-2 on page 4-5 to help give context to the gas purchasing options the Company has.

Page 4-8, "The Company's current timeline to incorporating RNG onto the system under its first contract is late 2023." Did this happen? Could this be updated?

Response: Cascade has removed this language as Page 4-12 best describes the Company's current RNG projects and timing.

Page 4-19, "coincidental demand basis" What does this term mean?

Response: Given Cascade's non-contiguous distribution system, Cascade can experience peak events in one location and not another. For example, Cascade could experience a peak event in pipeline zone 30-W while not experiencing a peak event in pipeline zone 11. In this context, coincidental demand basis refers to the method of planning and managing capacity with interstate pipeline transportation and Cascade's distribution system to meet the peak demand of all connected customers at the same time as the system's overall peak demand. This means that the system is designed to handle the highest level of demand that occurs simultaneously across all customers, ensuring that there is enough capacity to serve firm loads during peak periods.

Page 4-22, figure 4-9, How is geopolitical turmoil reflected in this forecast?

Response: The first year of the forecast is exclusively forwards contracts. Theoretically, geopolitical turmoil should be "baked-in" to this price. Regarding the tariffs, Cascade has been running a separate price forecast tacking on a 10% adder to the long-term forecasts. Under USMCA regulations, Cascade does not currently pay a tariff for Canadian natural gas. Due to this, the Company is monitoring the 10% adder forecast and using the original forecast.

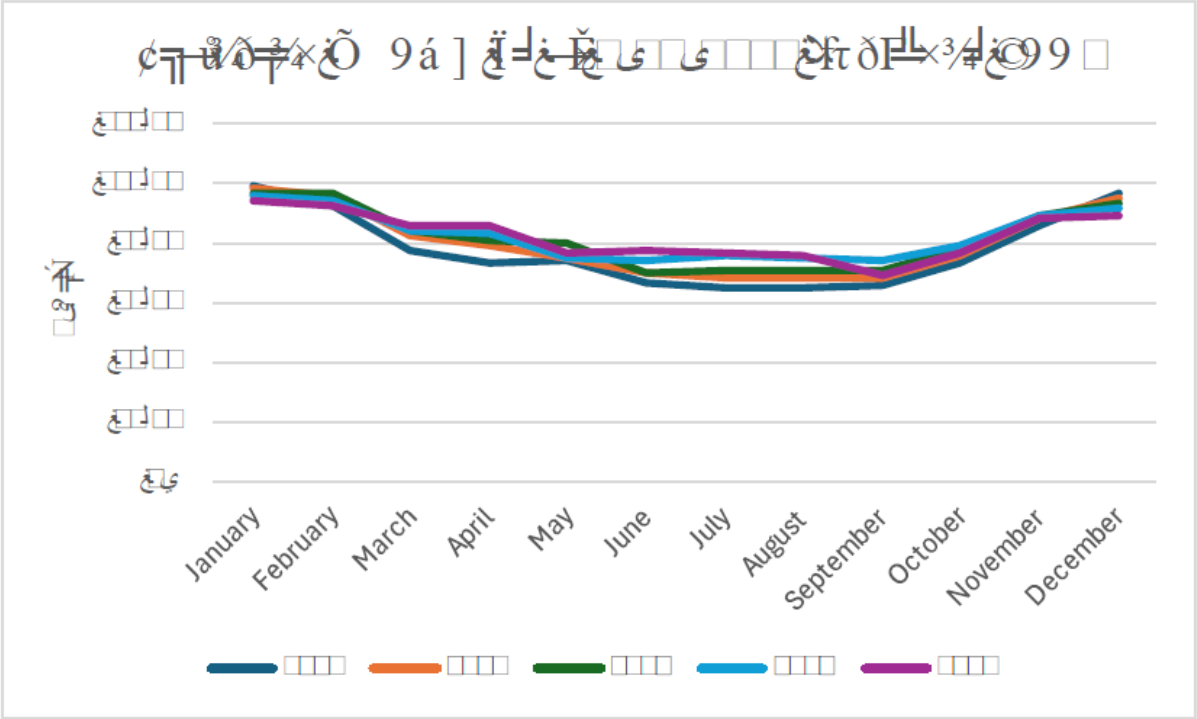
Page 4-25, "GTN Capacity Acquisition: The Company would acquire currently unsubscribed capacity on GTN in order to secure its gas supplies at liquid trading points primarily to serve Central Oregon." Page 9-13 "Additionally, the Company identified … acquiring currently unsubscribed GTN capacity that can be used to meet customer growth and address potential capacity shortfalls." What is the nature of GTN's capacity? From the previous IRP "It is Cascade's understanding that GTN is near fully subscribed."

Response: Cascade has updated the GTN Capacity Acquisition with this language "GTN has not announced expansion plans and currently defines itself as being fully subscribed through at least 2030. However, Cascade did consider the opportunity of acquiring any material capacity release to help secure its gas supplies at liquid trading points primarily to serve Central Oregon."

Page 4-33, Figure 4-10, The graph is glitchy.

Response: Thanks for catching this. This has been fixed.

Figure 4-10: Projected Cascade WACOG as of July 2024



Page 5-8, Figure 5-3, A graph might be more useful because all the zones have the same value. Further it would be helpful to explain what the main drivers of the AC are over time, and why it goes up and down.

Response: Cascade has language on page 5-8 that states "Overall, avoided costs for the 2025 IRP are higher than in the 2023 IRP. The main driver of this would be the increase in the commodity cost as well as the addition of the SCC."

Page 5-9, Figure 5-3 and Figure 5-4, Why are the real and nominal values for 2025 the same if they are in 2021 dollars? What variables in the model are driving the declining AC? Some narrative in the IRP describing these trends might make it clearer.

Response: These are in 2025 dollars but Cascade missed updating the chart titles. This has been updated.

Page 6-7, "As WEC fees go into effect starting in 2024, the cost of natural gas could increase as the upstream segments begin to pay their fees." Did this happen?

Response: Cascade has updated Chapter 6 with the current status of WEC fees.

Page 6-21, "The Company is now actively pursuing potentially viable TENs opportunities across our Washington service area." Is this included in the 2-year action plan?

Response: Cascade added language to the Short-Term Action Plan regarding TENs projects.

Page 6-26, "Cascade pulled historical data from 2017-2021 to see which customers would have been affected if this ban took place earlier and determined this impacted approximately 50 customers per year." What percentage of Bellingham commercial customers does this equate to? "However, it should be noted that the changes to Bellingham's allowed uses of natural gas are redundant to the state energy code that was later passed by SBCC, therefore, Cascade is not running a separate sensitivity analysis on just Bellingham in this IRP." Does Cascade anticipate a comparable percentage loss across impacted customer categories across its entire Washington service territory?

Response: 50 commercial customers is about 1.4% of Bellingham's commercial customer base. Yes, Cascade anticipates a similar impact to the residential and commercial customer classes throughout the entire WA service territory. Cascade's highest year over year growth rate prior to impacts of 2018 Washington State Energy Code (WSEC), which went into effect February 1, 2021 and the 2021 WSEC, which went into effect March 15, 2024, was 1.92%. Currently, Cascade's year over year growth rate is 0.63%.

Page 7-2, "The average nominal system Avoided Cost per therm increased from ~$0.94 in 2020 to ~$1.78 in 2024 representing an average increase of ~47%." Does the AC change between different scenarios?

Response: No, the avoided cost remained the same. For the 2027 IRP, Cascade will investigate if the AC should be adjusted between different scenarios.

Page 7-7, "Potential refines technical potential by applying customer participation rates that account for market barriers, customer awareness and attitudes, program maturity, and other factors that affect market penetration of conservation measures." How does EAG consider these variables? Does EAG make program improvement recommendations based on this analysis?

Response: The Achievable Technical Potential applies customer participation rates that affect all feasible measures that were used in the Technical Potential analysis. These ramp rates from the 2021 Power Plan were customized by AEG for use in natural gas programs and applied in a manner similar to the 2017 CPA. Since the 2021 Plan does not explicitly assign ramp rates for the majority of natural gas measures, AEG assigned these based on similar electric technologies present in the 2021 Plan as a starting point. AEG 's recommendations are based upon the UCT Achievable Economic Potential analysis which builds upon the Achievable Technical Potential by further refining with economic cost-effectiveness screening.

Page 7-18, Figure7-9, Why do cumulative savings go down around the year 2038? Cumulative savings appears to have a negative second derivative (concave down), is this trend corroborated in historic savings data?

Response: Therms savings are directly influenced by projected consumption, and the lower demand from the flat growth rate in the reference case forecast creates a net decline in potential savings. This along with additional assumption updates impacts the cumulative savings over time. This concave seen in Figure 7-9 can also be explained by the ramp rates from the Council's 2021 Plan and equipment measure saturation increasing towards 2045, which decreases the potential savings available.

Page 7-22, It is unclear what "regular income" means versus "moderate income" and "low income".

Response: The Low Income threshold corresponds with 200% of the Federal Poverty Level (FPL), which is also the eligibility cutoff for the Washington low income weatherization assistance program. Households in the Moderate income group are above the 200% FPL level but below the Washington state median income by household size. Regular income is classified as households that meet or exceed the Washington state median income level.

Page 8-7, "Cascade also completes annual reviews of its distribution system models as part of the annual budgeting process and continually updates the five-year budget, as needed, based upon new information that impacts the five-year plan." How do the five-year budgets interact with the two-year action plans?

Response: Any project over the $1 million threshold in the five-year budget related to meeting historical or future load growth are put into the two-year action plan.

Page 9-10, "System core peak day average annual growth over the planning horizon is expected to be approximately 0.11%." What factors contribute or subtract from peak day demand? If customer counts are flat and use per customer declines where does the growth come from?

Response: Cascade's customer classes that are not impacted by building codes, such as certain commercial customers and industrial customers, with some being large volume customers, are still showing growth in the 2025 IRP. The main reason for a small increase in usage during peak events is due to that growth. Cascade will note that this percentage is prior to demand side management is applied.

Page 9-14, " Under the reference case, Cascade not only doesn't anticipate a need for any additional upstream transportation, but the Company is considering a capacity release. Cascade added additional capacity on NOVA, Foothills, and GTN in 2024. With the recent drop in growth rates, the need for capacity has been delayed, allowing the Company to investigate options to reduce costs to customers." Can Cascade explain how the Williams Pipeline and acquisitions related to it factor into this analysis? Please provide quantified values to support this analysis.

Response: The Kelso-Beaver Reliability Project is related to the North Mist Storage Project. The additional capacity would allow the Company to get gas to and from between Northwest Pipeline

and the North Mist facility. This capacity does not increase the capacity to the Company's pipeline zones.

Page 9-15, Figure 9-7, This graph and its previous iteration in the 2023 IRP indicate that Cascade would add offsets to its portfolio. Why doesn't this IRP discuss acquiring any offsets? Has Cascade acquired any offsets?

Response: Cascade had included some language in Appendix A. Cascade has added language to Chapter 6 for the final filing.

Page 9-16, "When analyzing stochastic results…" This is useful analysis. Diagrams illustrating this point may be helpful.

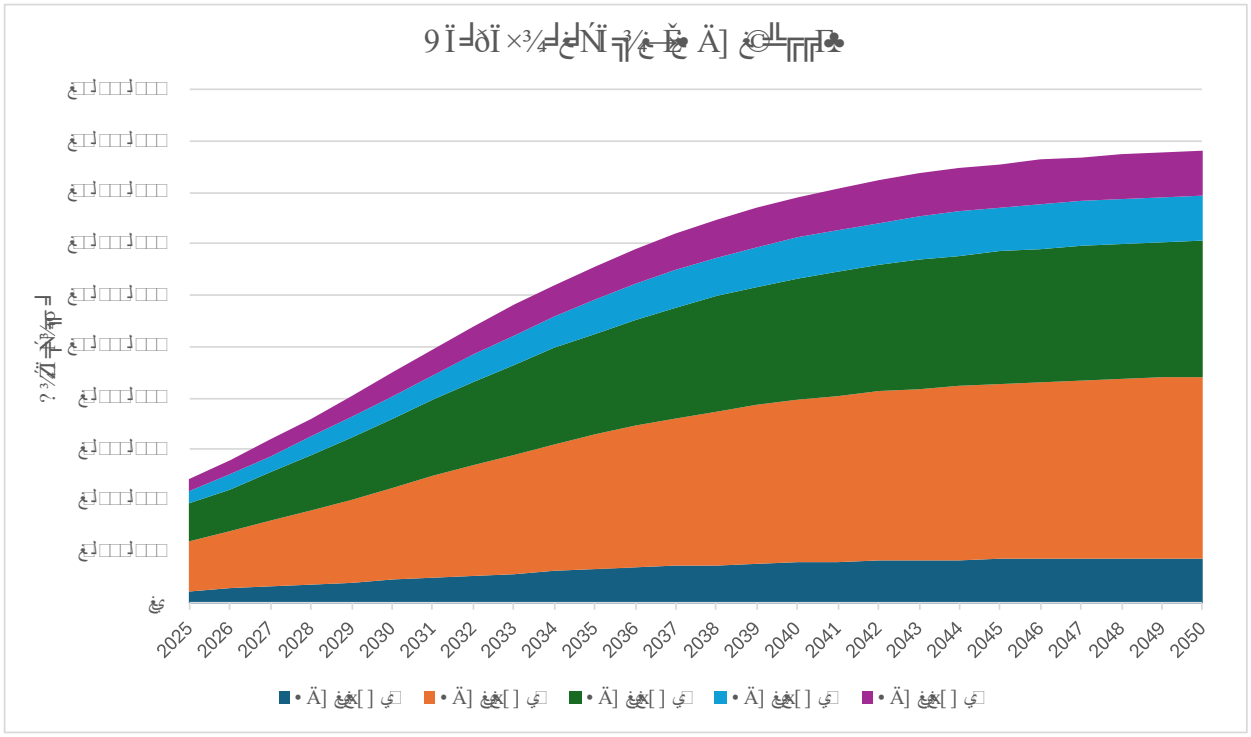
Response: Thanks for the feedback. Cascade provided results In Figure 9-10, 9-11, and 9-12 describing some of these results. Cascade would appreciate any specific feedback regarding diagrams WUTC would like to see.

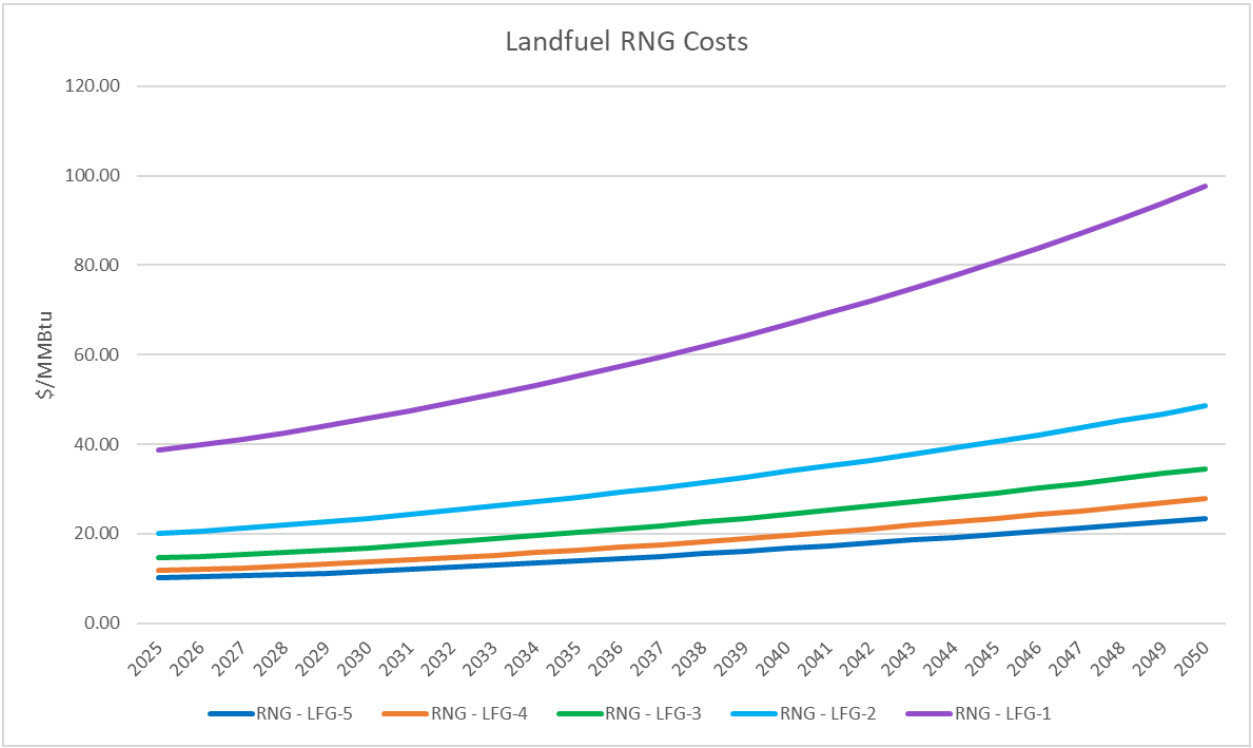
Page 9-19, Figure 9-12, Why do total system costs go down in 2050?

Response: As seen in Figure 9-8, costs go up over time. Plexos has the ability to bank no cost allowances in Washington and Oregon. Because the model runs through 2050, Plexos optimizes in a way that banks allowances until 2050 in order to not have to pay the highest prices in 2050. Cascade takes the total system costs and smooths out the results in order to capture a more realistic result before applying the costs to the bill impact analysis and electrification analysis.

Page 9-19, "Cascade's modeling shows the Company acquiring more RNG/RTCs in the low scenario. This is due to the fact that the lower cost options such as LFG-4 are not being fully acquired by Cascade in Oregon under the CPP, therefore, are still available for the CCA in Washington" This seems to contradict earlier statements regarding the abundance of non-conventional fuels. Can Cascade explain this apparent discrepancy?

Response: Cascade's statement regarding the abundance of non-conventional fuels applies to all buckets of non-conventional fuels in total, not to each individual resource or bucket of resources. As described on page 4-16, Cascade is looking at RTCs, Hydrogen, synthetic methane, and carbon captures. As Cascade shows in Figure 9-8, there are different levels of costs for these non-conventional fuels. For example, the lowest cost option for RTCs from RNG is LFG-5 and then LFG-4, so on and so forth, down to LFG-1. However, the amount of supply at each project size is limited. As can be seen in the first chart below, LFG-5 is limited to approximately 1 million dekatherms (MMBtu) and LFG-4 is limited to approximately 7 million dekatherms by 2050. The second chart provides each of the landfill gas buckets by cost. Under a lower growth scenario, Cascade's need for these resources is lower, specifically for Oregon's CPP, resulting in more of the cheaper resources being available for Washington's CCA. Supply takes can be seen in the third and fourth charts.




Landfuel RNG Costs
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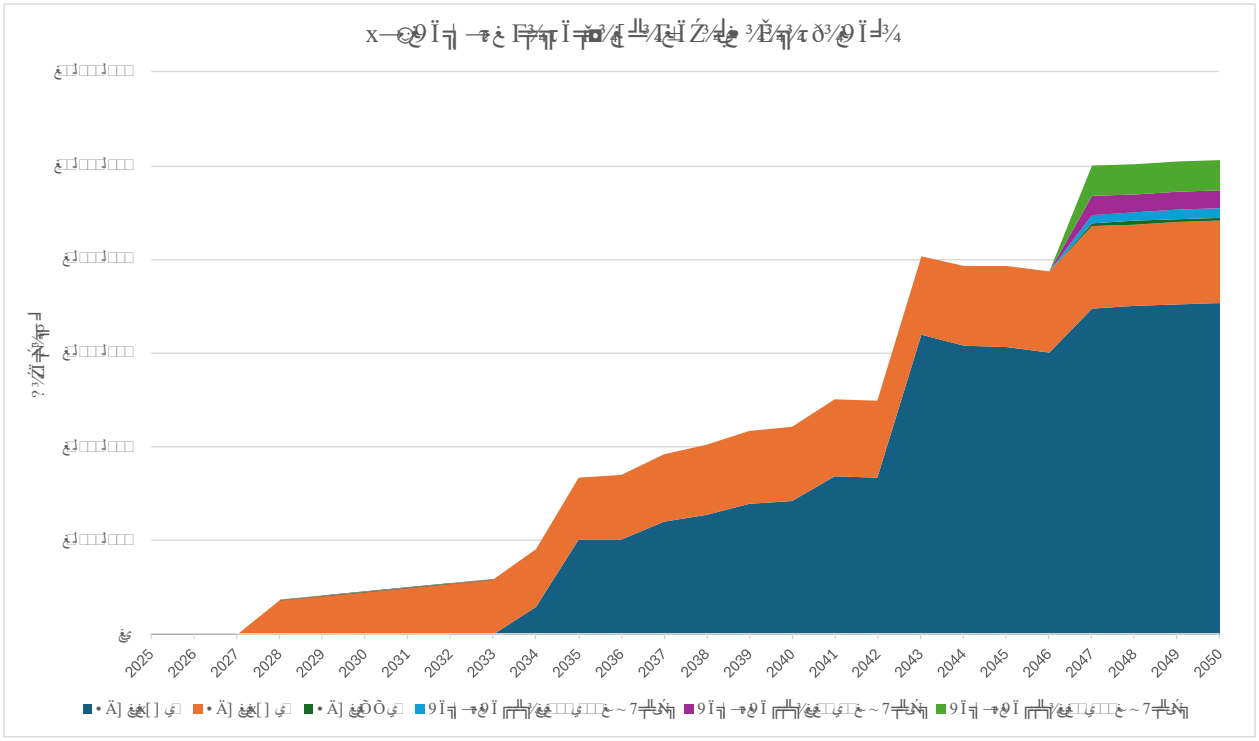
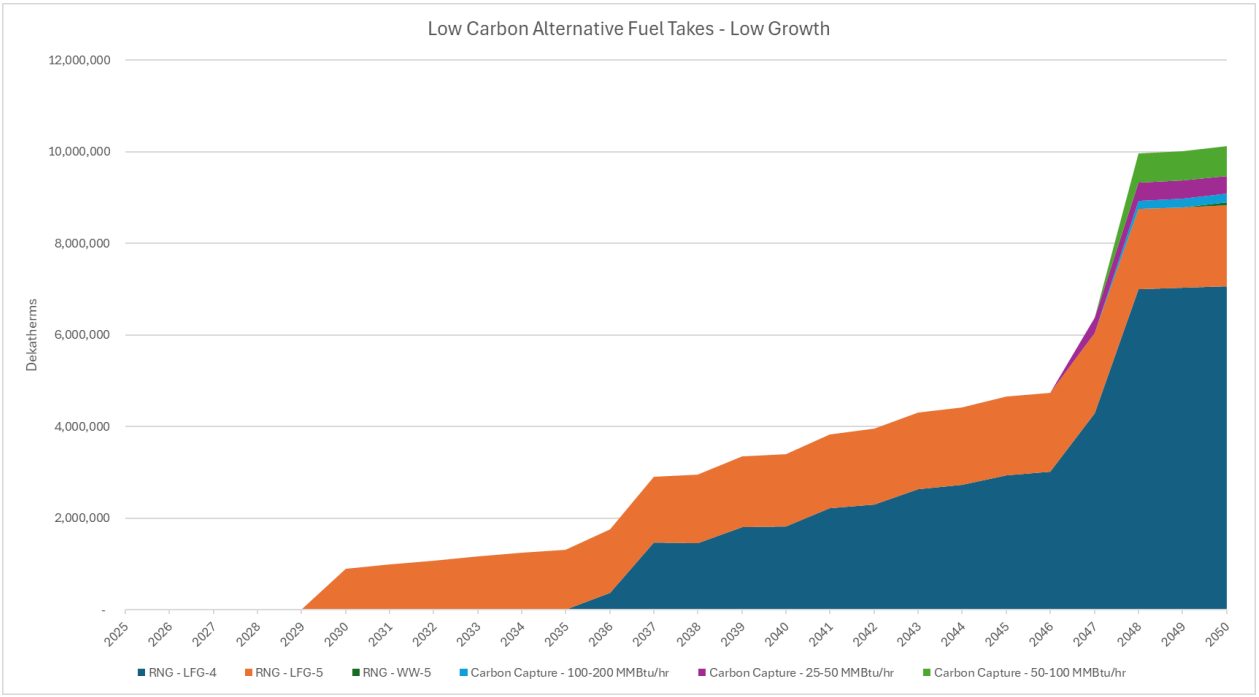




Page 9-23, Figure 9-17, Can Cascade provide some explanation about the shape of this graph? Why does it peak around 2045?

Response: Figure 9-15 through Figure 9-20 is a variety of customer impacts for reference case and Monte Carlos. For Figures 9-15, 9-17, and 9-19, the grey line is the estimated customers' average monthly bill with no compliance obligations and the orange line is the estimated customers'

average monthly bill with compliance obligations. The blue line is the difference between the orange line and grey line, in an incremental annual bill perspective. The reason bill impacts peaked in 2045 is because of Plexos optimizing banking allowances and utilizing them in the years with the highest costs for non-conventional fuels.

Page 9-24, Figure 9-17 and Figure 9-19, Both high and low cases seem to result in a 2050 bill that is higher than the reference case, but not by much. Can Cascade explain why? Is the reference case an optimized saddle point or is this coincidental?

Response: Cascade would not describe it as an optimized saddle point but would agree that it is an optimized saddle point compared to the high and low growth scenario. There may be other instances, slight growth for example, that would optimize at an even lower per customer cost. Cascade believes this is driven by higher growth scenarios having to purchase higher cost low carbon alternative fuels and low growth scenarios having higher bill impacts due to spreading out more fixed costs to a lower customer base.

Page 9-28, Figure 9-24, Does "HP" in the graph key refer to Heat Pump? And "Combined COP" refers to combined Heat Pump plus Gas?

Response: Yes, HP refers to Heat Pump. The combined COP refers to the coefficient of performance for a heat pump and auxiliary heat. Cascade has added additional language to the IRP to clarify Figures 9-24 through Figure 9-27.

Page 9-30, Figure 9-27, This graph could use some explanation.

Response: Cascade has added language to the IRP narrative.

Page 9-30, "The first is through a utility cost test, where the Company focuses on the costs and benefits to the utility itself." Which costs and benefits to the Utility were considered?

Response: Under the utility cost test, Cascade assumed that electrification would be a compliance option. Therefore, the Company would assume all costs required to electrify a home with no marginal benefit of not having to pay for a furnace. The benefits would include a reduction in carbon emissions, thereby requiring fewer carbon compliance measures.

Remaining Comments

Staff acknowledges that some changes and improvements cannot be implemented on a short timeline. Staff includes these last comments for the sake of transparency that they may be included in response to the final draft. If the company believes these comments stem from misreading or misunderstanding the draft document the final revision would be an opportunity to provide that clarification, discuss how it might be considered in the 2027 IRP, or provide clarification to Staff separately.

Generally:

Staff highlights the absence of discussion relating to GTN and the amount of curtailable demand (namely from transport customers) available to Cascade to help meet peak demand.

Response: Cascade clarified with Staff that the Company does not purchase upstream transportation for transport customers, nor is Cascade entitled to their upstream transportation by curtailing them.

Cascade has not been successful getting customers to attend IRP meetings.

Response: Cascade has notified customers of IRP meetings via social media, IRP webpage, bill inserts, flyers, through the equity advisory group, and emails. The Company has even held TAG meetings in Cascade's service territory with little success. Cascade has a dedicated webpage where the Company provides the IRP timeline as well as minutes, presentations, and videos of all TAG meetings. Cascade believes it has taken reasonable steps to inform customers of Cascade's IRP meetings. With that said, Cascade understands the importance of increasing customer attendance and will continue to monitor other LDCs to see what has been successful.

Cascade's IRP Draft is not lay person accessible. Staff also wants to acknowledge the inherent difficulty of making a complex planning document lay accessible. Staff does not see this as a criticism per se, but as a long-term goal.

Response: Cascade appreciates Staff's comments and understanding of the difficulty of making a complex planning document lay accessible. The Company will continue to work on the document to ensure it is accessible to everyone.

Staff hopes that with the development of the DEA, use of actual customer meter data, deeper examination of the demographics of program participation etc. that Cascade and Staff can work together to integrate analysis relating to the distributions of Cascade's customers into its core IRP modeling for 2027.

Response: Cascade looks forward to these discussions in the 2027 IRP.

Staff notes the lack of quantification of distribution system leak reductions. Previously in meeting with Cascade staff, Cascade staff spoke enthusiastically about the progress made addressing

distribution system leaks. This seems like a missed opportunity for Cascade to acknowledge good work that it has done.

Response: Cascade appreciates this feedback. While the Company would like to provide progress made on distribution system leaks, however, Cascade would feel more comfortable waiting to finalize the first survey prior to providing any quantified results.

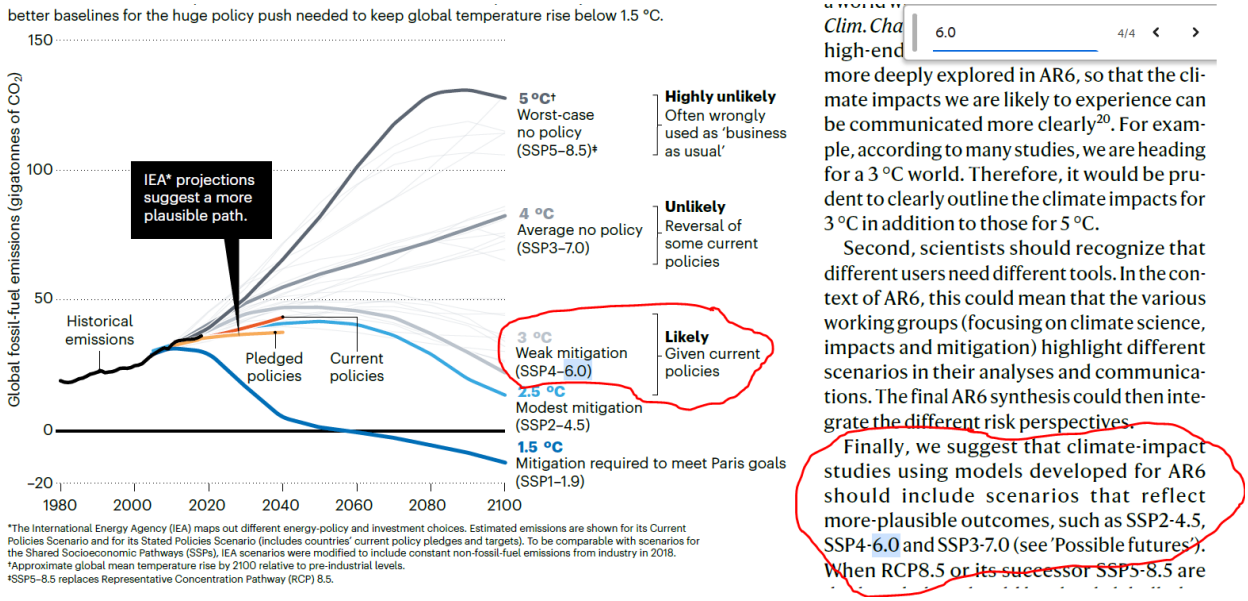
Staff would appreciate greater clarity about how modeling results will be translated into the design of the preferred portfolio. Staff highlights the discussion of methods contained in the email from Brian Robertson dated to 7/1/2024. Staff would appreciate a clearly articulated methodology and consistent application when designing the preferred portfolio.

Response: Cascade will add language to Chapter 9 regarding the preferred portfolio.

Staff stresses the imperative to model futures in which Cascade's emissions align proportionately with State emissions goals for consideration in its preferred portfolio and electrification analysis.

Response: Cascade added a scenario where the Company modeled meeting emission targets that align proportionately with State emission goals in Chapter 9.

Page 3-6, "SSP 2-4.5 represents a more likely scenario assuming meaningful greenhouse gas emissions reductions by mid-century when compared to the likely scenario in Figure 3-3. SSP 3-7.0 represents a less likely scenario assuming greenhouse gas emissions increase throughout the century." Staff highlights that the document cited in footnote 2, *Emissions – the 'business as usual' story is misleading*, by Zeke Hausfather, doesn't align with the quoted language from the IRP draft. Screenshot with relevant language circled in red included below. The cited document states that SSP 3-6.0 is regarded as "likely" and not SSP2-4.5.



Regarding the work of Hausfather, he appears to remain consistent in later work about the scope of anticipated emissions. See An assessment of current policy scenarios over the 21st century and

the reduced plausibility of high-emissions pathways - Zeke Hausfather, 2025

However, He also warns that, despite his assessment of emissions aligning with more mild scenarios like SSP4-6.0, those models do not appear to align with current heating trends. See We Study Climate Change. We Can't Explain What We're Seeing. - Document - Gale Academic OneFile. **Staff reiterates its position, responding to the 2023 IRP, that assessing more aggressive heating scenarios, such SSP5-8.5 that better align with the accelerating heating trend we are seeing, is likely prudent.**

Staff highlights the following additional sources:

Climate change: striking new visualization tells an alarming story about what's happening to the planet | CNN (note this data visualization is produced by Hausfather)

Climate Reanalyzer - Staff notes that the last three years have been large deviations in sea surface temperatures. That is, consistently, except for 3 days, the past approximately 760 days have been above all previous sea surface temperature extremes.

Climate Reanalyzer - Staff notes that daily surface air temperatures have been anomalously high for the last three years as well, though not as consistently as sea surface temperatures.

Copernicus: 2024 is the first year to exceed 1.5°C above pre-industrial level | Copernicus - Staff quotes "2024 is confirmed by the Copernicus Climate Change Service (C3S) to be the warmest year on record globally, and the first calendar year that the average global temperature exceeded 1.5°C above its pre-industrial level." Staff juxtaposes this reality with the models of AR6, AR6 Synthesis Report: Climate Change 2023:

> Footnote 29 of the "Summary for Policymakers" [Staff **bold** added]: Median five-year interval at which a 1.5°C global warming level is reached (50% probability) in categories of modelled pathways considered in WGIII is 2030–2035. By 2030, global surface temperature in any individual year could exceed 1.5°C relative to 1850–1900 with a probability between 40% and 60%, across the five scenarios assessed in WGI (medium confidence). **In all scenarios considered in WGI except the very high emissions scenario (SSP5-8.5), the midpoint of the first 20-year running average period during which the assessed average global surface temperature change reaches 1.5°C lies in the first half of the 2030s. In the very high GHG emissions scenario, the midpoint is in the late 2020s. {3.1.1, 3.3.1, 4.3} (Box SPM.1)**

Response: Cascade appreciates Staff's feedback on climate modeling. The chart below shows the decline in HDDs Cascade has experienced on an annual basis using NOAA actuals and then including the SSP 2-4.5 and SSP 3-7.0 projected slopes. While Cascade does not disagree with Staff's assessment of global temperatures, Cascade does point out that the Company's service territory has experienced minimal temperature impacts. With that said, Cascade does not disagree with ICFs projected HDD values as the past does not always predict the future. If Staff does

recommend Cascade uses SSP 5-8.5, Cascade does want to caution that projections that overly reduce HDDs will lead to lower projected usage, resulting in potential under planning for future resources and carbon compliance obligations.

Location	NOAA Actual Slope	SSP 2-4.5 Projected Slope	SSP 3-7.0 Projected Slope
Bellingham	-9.3	-18.2	-20.9
Bremerton	-6.7	-17.9	-21.1
Walla Walla	-4.4	-16.2	-20.3
Yakima	-5.6	-15.1	-19.2

Page 3-8, Figure 3-4: SSP 3-7.0 HDD projections, Staff appreciates the breadth of models considered by Cascade. Does Cascade weigh these models differently? Do some of them align with regional historical weather data better than others? Does Cascade have criteria for its selection of models?

Response: Cascade looked at the data in multiple ways. Cascade looked at individual models as consideration to run, however, as can be seen in Figure 3-4 there is a lot of variance from one year to the next year. Cascade did not want to have a singular model drive when low and high resource need and compliance obligations happened. Cascade also looked at an ensemble of models, as seen in the table below, to see which model performs at each quartile in terms of HDD reduction over time. Again, Cascade wants to avoid selecting a singular model. Cascade found that selecting all models smoothed out the data so there weren't any years that produced extremely high or low usage. Cascade will continue to analyze this data for future IRP selections.

Quantile	ssp245	SSP2-4.5 Model HDDs	ssp370	SSP3-7.0 Model HDDs
0	KACE-1-0-G	3779	CanESM5	3807
0.25	ACCESS-ESM1-5	4253	MIROC6	4202
0.5	AWI-CM-1-1-MR	4490	FGOALS-g3	4438
0.75	MPI-ESM1-2-LR	4752	GFDL-ESM4	4616
1	MPI-ESM1-2-HR	4952	MPI-ESM1-2-HR	4770

Page 3-10, Wind, Has Cascade considered how climate change might impact wind patterns? Is this an output of existing downscaled climate models? Does Cascade plan to apply climate change analysis to wind in the next IRP?

Response: Cascade has not considered impacts to wind and appreciates this feedback. The Company will consider it for the next IRP.

Page 3-13, "To achieve net-zero, emitting energy uses can be offset by renewable energy production (i.e., wind or solar) or energy that has a negative carbon intensity (i.e., renewable natural gas); thus, allowing for emitting (i.e., natural gas) energy use during severe weather events, while still having a house/building that has net-zero emissions." While Staff persists in its disagreement on the meaning of these statutes, perhaps more interestingly, if Cascade adopts this interpretation, then will Cascade model compliance where its fuel portfolio is "net zero" by 2031? Facially, this does not appear to align with any of Cascade's current scenarios. Staff anticipates that "net zero" by 2031 would be substantially more expensive than compliance with CCA rules or alignment with state emission goals.

Response: Cascade has clarified with WUTC that it is not Cascade's interpretation that the Company must achieve a net energy goal under these statutes, rather that the State Building Code Council is to achieve this net energy goal. Cascade's scenarios are attempting to align with what the SBCC is doing to meet these statutes.

Pages 3-15 to 3-16, "These assumptions are built with the understanding that Cascade will see very little growth, assuming only homes with gas stoves or other appliances are added to the system." Staff appreciates the need to make assumptions for the purposes of modeling unknown futures. However, Staff anticipates that going into 2027 that these assumptions can be replaced with data.

Response: Thanks for the feedback. Cascade anticipates having more information on building code impacts in the 2027 IRP.

Page 3-16, "Cascade loses approximately 0.15% customers per year as they shut off gas connection without reconnecting." Staff plans to object to this value after the year 2031 if not before. The value does not appear to align with historic losses of building stock. A century of this rate of building stock attrition would equate to 86% of the initial buildings still standing.

Response: Cascade would appreciate this feedback. Cascade is interested in gathering more information on building stocks, gathering more information on older vs newer homes, and finding studies that analyze building stock attrition rates changes based on energy supply changes in that area.

Page 7-3, "For example, a high-efficiency furnace will lower therm usage in the winter months and will provide little to no savings in the summer months." Does Cascade consider savings from cooling associated with weather dependent measures like wall insulation? Might there be additional savings to be gained through coordination with electric utility DSM programs?

Response: Cascade's Conservation Potential Assessment and related modeling factors in the value of natural gas therm savings. It is reasonable to assume additional savings could be gained by modifying this process in collaboration with an electric utility DSM, but Cascade postulates the

additional savings value would be fairly minimal. For example, Pacific Power offers an attic insulation rebate for customers without electric heat of only $.07/sq.ft. This is just 3.5% of Cascade's similar attic insulation rebate, and about 15% of the rebate Pacific Power offers for a home with electric heat, as of April 2025.

Page 9-26, "Cascade has gathered current residential rates for each electric entity that Cascade shares service territories with and has weighted them by customer counts for each pipeline zone." Staff notes the efforts Cascade IRP staff has gone to collect this data and the complexity of modeling these varied utilities. Staff appreciates the intuition to weight these values. Staff highlights the need to be aware of outliers who might electrify first. Has Cascade conducted any analysis regarding outliers?

Response: Cascade appreciates this comment as the Company had not analyzed these outliers. Cascade will include some narrative around outlier modeling in the final version of the IRP.

Page 9-27, Figure 9-23, Looking at the "Indoor Dry Bulb" column compared to the COP rows, if customers keep their homes cooler during the winter (perhaps at 68 degrees), would that improve the COP? How might the vagaries of customer circumstances factor into this analysis?

Response: Cascade understanding is that an Indoor Dry Bulb of 68 degrees would not have a significant impact on the COP. Cascade's goal for this model was to attempt at capturing an average customer. The Company understands that customer behavior can vary quite a bit, but capturing all these behavioral differences is quite difficult to nearly impossible. In an effort to gather more information, Cascade is pursuing a Heat Pump pilot in Oregon in which the results will help provide potential projects in Washington.[1]

Page 9-28, "This could occur if the differential between future natural gas prices and electricity prices is exacerbated." This is interesting analysis. How likely is this? Is there evidence builders are making this calculus?

Response: The quoted sentence is a forward-looking statement focusing on "could occur" if significant electrification happens in the near term. This situation could increase revenue requirements for electric utilities (due to the need for distribution strengthening and the potential for contributing to changing out customer equipment) disproportionately to natural gas utilities. Underlying data may be better known when all utilities file their IRPs with expectations of future costs based on differing electrification scenarios. The likelihood of material differentials depends on the trajectory of, or which scenario (e.g., high or medium) is occurring for, electrification. This, in turn, depends on public policy and funding. Since this portion of Cascade's IRP was written, the likelihood may be lesser due to IRA funding being in jeopardy and inflation continuing to increase, among other factors.

[1] See: https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=24452

As space and water heating equipment are among key building expenses, most builders and some customers are highly attentive to energy sources and related costs (both initial installation and ongoing operating costs). Builders have different perspectives. Some "spec home" builders constructing residences for later sale to an unknown customer frequently focus on "first cost" space and water heating rather than life-cycle costs. While not true of all spec home builders, some may be indifferent to future energy pricing. Custom builders, or those who are retained by a customer with specific floor plans in mind, can generally be cognizant of future energy sources. While much of this is speculative (with more information available through current and future IRP cycles), an example can be found with electric utility sourcing of power. For publicly owned utilities having access to lower cost Federal power through the Bonneville Power Administration, end-use HVAC systems have historically been electric. Moreover, as electric rates have significantly increased in California, more customer-owned solar generation is being installed.

Cascade Natural Gas Integrated Resource Planning Feedback Report

Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
1	2/12/2024	Targeted TAG 2	WUTC	On slide 7, Cascade notes Environmental Compliance Costs as an element of its avoided cost calculation. Is Cascade considering how these costs will change over time? Both tendentially going up as more allowances are required and the price ceiling increases, and how there might be downward pressure on compliance costs due to the possibility of declining customer counts or per customer demand?	Environmental compliance costs are modeled on an increase price curve for all values considered. Marginal Compliance costs will increase over time as identified by Staff, while the Social Cost of Carbon is already presented on an increasing price curve. Declining customer counts/demand would only impact the avoided cost if it entirely eliminates the need for the highest cost resource, creating a potential stepwise impact on the compliance cost element of the avoided cost. Cascade is evaluating the marginal cost to serve the next highest cost unit of one therm of demand with traditional natural gas, to evaluate whether it would be more cost effective to reduce this demand via energy efficiency or not. Unless demand reductions fully eliminated the need for the highest cost tranche of environmental compliance, declining demand will not impact this element. To preempt a potential question about the need to look at this more holistically, as one could potentially argue that there could be enough demand reduction to exogenously move Cascade into a lower tranche of the stepwise function, the volumes we identified in the 2023 as part of the highest tier of the marginal abatement cost curve are significant, to the point that even aggressive conservation acquisition projections and projected demand decreases as outlined in prior IRPs would not move Cascade to a different step of the curve.
2	2/12/2024	Targeted TAG 2	WUTC	• On slide 8: o Are there avoided costs associated with keeping customers on the system or avoided costs associated with declining customer counts? o Commodity Costs are taken from Cascade's 27-year price forecast." Has this forecast changed since the previous IRP? Does it include non-conventional fuels? o Cascade will be requesting feedback regarding its methodology related to environmental compliance costs" Will cascade be reaching out to the Department of Ecology? Or is this a generalized request for the IRP process? o The Company's distribution system cost calculation looks at forecasted capital expenses related ONLY to growth, and uses the company's load growth forecast to translate these costs to a per therm basis." Staff would like to hear more. What is meant by "related only to growth"? o Risk premium is calculated as the delta from deterministic and stochastic pricing" How might this differ if Cascade were to use the brownian motion prices from the previous IRP?	o This is an interesting question and one that Cascade does not have a response to yet. The Company stated during the Targeted TAG 2 meeting that we'll discuss this idea internally to determine if this shoould be included and how it would be quantified. Cascade also asked Staff if they had any thoughts on how this would be quantified, and they responded that they would provide some thoughts a week after the Targeted TAG meeting. o It has been shifted one year from last year's 28-year forecast as Cascade ultimately aims to have projections out to 2050. Slide 11 discusses why this specific element only uses traditional fuels. o This is requested of the all participants of the TAG. o Distribution system projects can be broken down into two classifications: "System Integrity Enhancements" and "Growth Related Projects." System Integrity projects would only be avoidable if the demand associated with the project were eliminated entirely. Reducing demand, as is the objective of the twin processes of avoided cost calculations and conservation efforts, does not prevent embrittled pipes from needing to be replaced, for instance. Thus, these projects are not avoidable. Growth related projects, on the other hand, are projects that are identified as needed to support forecast demand growth on a given distribution system. Since the need is purely related to growth, these are potentially avoidable, or at the very least deferrable, and thus part of the avoided cost calculation. This line can become blurred when projections are identified as system integrity projects but also involve an upsizing of pipe. The system integrity side would not be avoidable or deferrable as there is a significant safety risk identified, but the upsizing element could theoretically be deferred. There are further economic challenges with deferral here, however, as you have already acquired permitting and committed labor toward digging up the pipe. It would rarely make sense to replace it twice, once for integrity and then again for growth, but a qualitative decision would need to be made as to whether that would make sense. o The stochastic element of this calculated does use the Geometric Brownian motion prices from the previous IRP for the "Shock" element of the "Drift & Shock" methodology as discussed in the IRP
3	2/12/2024	Targeted TAG 2	WUTC	• Slide 10, "For Cascade's system, all storage is off-system and provides a net-positive benefit to customers, so it does not qualify as an avoided cost" Staff would appreciate more explanation of this distinction.	Cascade fills its storage assets during the non-heating season, when gas prices are significantly lower than in the winter. When performing a life cycle analysis of a therm that is purchases from a basin, stored in the summer, and then injected in the winter, the cost savings of the summer/winter spread far supersede any costs associated with the storage of that therm, thus the statement that it is a net positive, and not a cost one would be able to avoid.
4	2/12/2024	Targeted TAG 2	WUTC	• Slide 12, "With the passing of the Climate Commitment Act, Cascade believes it may be more accurate to utilize the company's marginal compliance cost associated with this rule." What is the statutory/rule basis for excluding either cost?	Staff's historical position has been that Cascade has need to follow RCW 80.28.395 when evaluating the cost of carbon, which dictates the use of the Social Cost of Carbon with a 2.5% Discount rate, adjusted to real dollars, as the cost of carbon. With the passing of the Climate Commitment Act, Cascade knows what its marginal abatement cost for carbon is with regards to this piece of legislature, and believes this may be a more accurate representation of the Company's cost of carbon. Both of these items attempt to quantify the cost to abate one metric ton of CO2e, and thus using both would be double counting this this element.
5	2/12/2024	Targeted TAG 2	WUTC	• Slide 13, o The Company's new distribution system cost calculation looks at forecasted capital expenses related ONLY to growth, and uses the company's load growth forecast to translate these costs to a per therm basis." Staff inquires if there are avoided costs associated with the possibility of declining customer counts – either avoided costs in customers leaving or policies designed to retain customers. Put another way, would an energy efficiency rebate program that might function to keep customers on the system and works to avoid of some CCA compliance obligations be cheaper (to ratepayers) than the loss of customers due to the possibility of declining price competitiveness of gas service relative to electric service? Has Cascade considered this as a basis for avoided costs? o Since Avoided Cost is based on peak day, this deferral value is then multiplied by the ratio of peak day demand to an average day's demand to get the impact on peak day." Might the possible retention of customers through EE programs have broader impacts beyond peak day? o Staff would like clarification about the savings in deferring system enhancements might go to if there are savings?	o In response to bullet 1 and 2, this is an interesting question and one that Cascade does not have a response to yet. The Company stated during the Targeted TAG 2 meeting that we'll discuss this idea internally to determine if this shoould be included and how it would be quantified. Cascade also asked Staff if they had any thoughts on how this would be quantified, and they responded that they would provide some thoughts a week after the Targeted TAG meeting. o There isn't really a savings persay, but delaying the system enhancement, or removing it all together, would avoid costs being passed to the ratepayers through a rate case.
6	2/12/2024	Targeted TAG 2	WUTC	• Slides 14-21, how might the dynamics communicated in these slides work with a declining customer count? How would a decrease or decreasing peak load impact the model?	Addressed in item 5 response.
7	2/12/2024	Targeted TAG 2	WUTC	• Slides 18-20, Staff would appreciate more information regarding the calculation of present value of deferral.	To illustrate this with an example, suppose Cascade had a hypothetical project in Kennewick scheduled for 2026 to spend $1,000,000 towards what was identified as a needed distribution system expansion to satisfy growth. Relating to the figure on slide 15, this would represent the hypothetical point of deficit occurring in 2026. Furthermore, let's assume that peak day growth from 2026 to 2027 is 10,000. Finally, let's assume that the real discount rate is 4%. It's important to use the real discount rate as it's assumed that year over year costs will increase by inflation, so that must be backed out of the discount rate. The Company would now know that by reducing demand through conservation by 10,000 therms, Cascade would delay the point of deficit by one year. To quantify this value, first Cascade would need to adjust the capital outlay to 2024 dollars with a simple PV calculation of 1,000,000*(1/((1+Real Discount Rate)^(2026-2024)) or 1/1.04^2. This gives the Company the value of the cash outlay in today's dollars. From here, Cascade calculates the value of not spending the money in 2026, but rather spending it in 2027, by multiplying the PV of the 1,000,000 by the real discount rate, which represents Cascade's Real Weighted Average Cost of Capital. The value is deferral value, which the next step is to divide by the number of therms needed to avoid, 10,000 in this example, to get your deferral value per therm.

Cascade Natural Gas Integrated Resource Planning Feedback Report

Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
8	2/12/2024	Targeted TAG 2	WUTC	•Slide 25, "Accurately captures the increasing uncertainty around pricing, as nominal risk premium generally increases over time" Does this premium include CCA compliance cost uncertainties such as variations in prices at auction? Additionally, can you speak to Cascade's preference here for Stochastic prices over Brownian price forecasts?	Currently compliance costs are modeled at the Social Cost of Carbon which is a known quantity. If Cascade does shift to the Company's marginal abatement cost, there might be value in the certainty of conservation versus the risk in CCA Allowance price variance. Cascade will need more data to discern the nature of allowance price movements. If they ultimately follow a normal distribution, for instance, the risk of rising and falling prices would be equivalent, and thus no quantifiable value to mitigate. Cascade's position regarding stochastic modeling is that, due to the seasonal nature of natural gas pricing, it is most appropriate to use the "Drift and Shock" model as described in the IRP versus a pure Geometric Brownian price forecast. A Geometric Brownian Motion model is appropriate when there are no discernable seasonalities to what is being modeled, as is the case, typically speaking, with stock prices, a common application of Brownian or Geometric Brownian motion models. If applied to natural gas prices, such a model could commonly result in summer prices higher than winter prices which, while not impossible, is certainly improbable. The "Drift" or deterministic trend element of Cascade's model allows the model to consider this seasonality while still allowing for the desired variance of a stochastic model.
9	2/12/2024	Targeted TAG 2	WUTC	•Slide 28, "% CH4 per unit of natural gas: 93.4%". Are there CO2e emissions associated with the remaining 6.6%?	The remaining 6.6% is made up of N2, CO2, Ethane, Propane, Ibutane, Nbutane, Ipentane, Npentane, and Hexanes. It's Cascade's understanding that, other than CO2 and methane, the other gases don't have as much of a global warming impact and are not defined as Greenhouse gases under HB 1257. In the 2023 IRP, Cascade noted that in several areas where Cascade serves, the methane and CO2 content was approximately 93.5%, which is very similar to what others are reporting at 93.4%. Cascade will re-evaluate this figure for the 2025 IRP.
10	2/12/2024	Targeted TAG 2	WUTC	•Slide 28, How has Cascade considered distribution system emissions?	The distribution system emissions are captured in the Upstream Emission Loss Factor. The Upstream Emmission Loss Factor is supposed to represent the loss of fuel in emissions from production to delivery to the customer before it's combusted.
11	2/22/2024	Post Targeted TAG 2	WUTC	1.What actions are being taken by Cascade to increase the attendance of Energy Justice Communities during the IRP process?	In 2023, Cascade formed an Equity Advisory Group (EAG) consisting of seven members who live in and provide representation for six of the most vulnerable communities in the Company's service territory. To enhance collaboration with various community representatives, Cascade is also considering holding meetings throughout Cascade's service territory during the first circulation of the Company's Draft IRP. Cascade is also considering other means of increasing participation if bill inserts and hosting meetings at various sites within the Company's service territory are unsuccessful.
12	2/22/2024	Post Targeted TAG 2	WUTC	2.What actions are being taken by Cascade to inform their customers and community-based organizations about the IRP process and encourage attendance?	Cascade is fully committed to ensuring the public is invited to participate in its IRP process. The Company notifies five general segments of stakeholders using multiple communication channels. The five segments are: Commission Staff, customer representatives, community-based organizations, the expert public, and the general public. Many of the IRP members that have attended IRPs in the past, such as Commission Staff, customer representatives, and expert public, are notified via Cascade's email distribution list. Cascade did separately reach out to the Company's Washington Community Partners via email regarding the IRP and how to join as well. As mentioned in response one and the response below, the Company is looking into other methods to target community-based organizations, Energy Justice Communities, and the general public. Cascade notifies these segments in several ways, including: •Social media •Bill inserts provided in both English and Spanish •Meetings throughout service territory •Invite to docket distribution lists relevant to the IRP •Web page •Commission web page Cascade has a dedicated Internet webpage, which can be translated into multiple languages, where customers and interested parties can view the IRP timeline, TAG presentations, minutes, video recordings of the meeting, as well as current and past IRPs. Also, the Company provides information on how to join the IRP Stakeholder group. Cascade is exploring targeted outreach to increase attendance of Energy Justice Communities in the IRP process. This includes working with Health Districts, the Washington Department of Social and Health Services, Community Action Agencies, and the WorkSource Unemployment Office which are resources commonly accessed by vulnerable populations. In addition, Cascade participates in two separate coalitions which represent Energy Justice Communities. Both are made up of 80+ members including CBO's, small business owners, nonprofits, school districts, social services etc. Mid-Valley Providers Consortium Sunnyside United Unidos Monthly Coalition
13	2/22/2024	Post Targeted TAG 2	WUTC	3.Has Cascade considered hosting TAG meetings after typical work hours or on weekends to accommodate the needs of their customers whose schedules cannot accommodate a meeting at 9am?	Cascade is considering holding a meeting outside of typical work hours in a low-income or disadvantaged community. The Company is planning to run a series of questions by the Equity Advisory Group to gain a better understanding of topics such as timing, location, childcare services, and best ways to promote the meeting.
14	2/22/2024	Post Targeted TAG 2	WUTC	4.Staff acknowledges the highly technical nature of the IRP, however, in order to make the presentations more accessible, Staff offers that Cascade could provide frequent summary sentences that highlight key processes, trade offs or dynamics, and that these summary sentences could be written in non-Latinate English. (e.g. "I acquired an automobile" becomes "I got a car" or "the derivative rapidly increases" becomes "the slope of the line goes up").	Cascade will provide the presentations to the Company's communication's group when it is finalized in order to have someone review the presentation with an eye on making technical terms more accessible. Cascade cannot guarantee the edits will make it in the presentation that is provided a week in advance but will put in a best effort to ensure these edits are included in the presented version and the version that is posted on the Company's website.
15	2/22/2024	Post Targeted TAG 2	WUTC	5.During TAG 2, Cascade staff requested that WUTC Staff provide possible methods for determining the avoided costs associated with the retention of customers. That is, from a customer's perspective it may be cheaper to pay a higher rate knowing the rate increase goes to EE measures that keep other customers on the system and thereby avoiding the bill increase due to the increasing ratio of fixed costs to customers. This question presents many nuances and potential complications: a.The impacts of raising rates to pay for EE may drive customer losses, but at a slower rate and may require optimization. It may present short-term higher bill impacts with the promise of long-term lower bill impacts b.Converting the marginal bill impact incurred from customer loss into an additional component to the avoided cost seems straightforward, but it is unclear that EE expenditures would translate that directly into customer retention. Rather, the bill impact benefit of customer retention and the efficacy of EE programs at retaining customers may need to be a back-end determination - after Cascade has modelled customer responses to building codes, rising compliance costs, and incentives to electrify. This may be a guess and check process: running the model with various avoided cost values and honing in on a set of values that approximates optimal. c.Another approach might be to optimize the portfolio for lowest customer bill impacts and let the optimization software set/find the avoided cost associated with customer retention. This might be messy and create a moving avoided cost associated with this optimization. This would also have to be done on the back end once the other parts of the model were lined up. d.Alternatively, Cascade might consider conservation as a portfolio resource, with constraints, and have Plexos optimize the portfolio to retain customers.	Cascade is still trying to fully understand this request. From Cascade's understanding, the avoided cost calculation is looking at the avoidable costs from the Company's perspective, or in other words, the utilities cost or utility-centric measure. Cascade does agree that utilities have a responsibility to consider the interests of their customers, so the Company does not want to totally ignore this request. However, Cascade argues that if there is a fundamental change in the Avoided Cost, going from a utility-centric measure to also including customer-centric benefits, the Company would prefer this be discussed through a meeting with all utilities.
16	2/22/2024	Post Targeted TAG 2	WUTC	•Slide 28, Cascade clarified that "Upstream Emission Loss Factor" included losses in the distribution system. Has this loss factor associated with the distribution system been corroborated by Cascade's leak reduction efforts and data collection associated with those efforts?	The process of calculating the upstream emission loss factor is not a perfect science. When Cascade purchases gas, it is generally in blocks of 5,000-10,000 dekatherms which are then added to or cut based on actual usage. This value is not too difficult to track. The difficult part is that gas can either transfer from pipe to pipe or go into storage to be pulled out later. Finally, if Cascade was able to track those volumes, then the Company would have to estimate what is flowed to each customer due to billing cycles. Based on a rough estimate of 2023, Cascade estimates the loss from purchase to citygate is ~1.37% for NWP and GTN combined, giving slightly more weight to NWP as Cascade transports more gas on NWP. Cascade estimates the Company's distribution system loss rate is 0.2479% (which can be found on the Company's 663 tariff). Given the difficulty of calculating the loss from basin to citygate, the roughly estimated loss rate calculated by Cascade appears to be slightly higher than the calculation in the avoided cost model. Cascade does think that the values in the avoided cost model are better vetted and should be used in the avoided cost model. For the record, The current fuel loss rate on NWP is 0.93% and GTN is 0.0043% per mile, which is lower than what is currently used in the avoided cost and what Cascade estimates. Finally, the Company wants to also point out that the difference to the avoided cost when comparing Cascade's estimated loss rate vs the current loss rate is $0.014/therm on average.

Cascade Natural Gas Integrated Resource Planning Feedback Report

Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
17	2/22/2024	Post Targeted TAG 2	WUTC	• Previously UTC Staff inquired "Slides 14-21, how might the dynamics communicated in these slides work with a declining customer count? How would a decrease or decreasing peak load impact the model?" Cascade staff said that they would follow up on this question as it may relate to stranded assets.	As Cascade mentioned in an earlier response, a decrease or decreasing peak load would essentially eliminate all distribution system projects related to growth. Given that this is in context to stranded assets, the Company would need to determine the impact stranded assets would have on the customers remaining on the system. There are several remedies to stranded assets that Cascade could explore (e.g. sell assets to industrial or large volume customers, fiber optics, etc.), each being determined in a case-by-case situation. Cascade does anticipate customer counts to be relatively flat in the near future but does not anticipate customer counts to decline in any significant matter. With Staff's agreeance, Cascade would like to investigate stranded assets throughout the 2025 IRP in regard to the avoided cost for inclusion in future IRPs.
18	3/4/2024	Pre Targeted TAG 3	WUTC	o Staff recommends that Cascade spell out acronyms in full the first time they are used in the presentation to improve accessibility.	CNGC acknowledges and agrees.
19	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade considered the impacts of IRA and IIJA funding upon EE? If so, what steps have been taken to integrate those impacts into the EE and DSM programs?	CNGC is evaluating the relevance of IRA and IIJA funding for natural gas utilities. At this point it looks to be electric utility focused. This could be relevant for fuel switching programs, but that is yet to be fully investigated.
20	3/4/2024	Pre Targeted TAG 3	WUTC	o How does the low-income program factor into this analysis?	The Low-Income Weatherization program is administered independently from the LoadMAP analysis.
21	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade cultivated relationships with non-English speaking trade allies?	Cascade does not track non-English speaking trade allies, although CNGC is confident a subset of our trade allies does have this capability.
22	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade identified trade deserts in its service territory? Has Cascade cultivated trade allies in conservation deserts?	Yes, Cascade has created heat mapping and metrics for market penetration by county in the service territory. CNGC has found trade allies, in particular point of sale vendors, have penetrated into areas which have historically been thought to be underrepresented. An example of this is Benton and Yakima counties which are now being aggressively sought after for insulation and home sealing.
23	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade conducted an equity analysis of EE program participation?	We have begun to address equity considerations in our energy efficiency program with our low-income weatherization program. This program begins to bridge that gap between regular incentives accessible to all customers and the additional incentives available to income qualified customers who otherwise may not have the resources to access the standard Energy Efficiency program. We work with agencies across Washington who are funded by the Department of Commerce, our local Agencies give priority, but are not limited to provide Weatherization services to: • Elderly (60 years of age or older). • Persons with disabilities. • Children nineteen years of age, or under. • High Residential Energy Users • Households with High Energy Burden and • Native American, with particular emphasis on households residing on reservations. The Weatherization Incentive Program provides energy efficiency measures, health and safety and repairs to income qualified households at no cost to customer.
24	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade identified the demographics of customers who participate?	The only demographic data that is captured by our application is owner/renter status. We do, however, use aggerated population demographic data for modelling and program performance initiatives aimed at increasing participation.
25	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade Identified the steps to take advantage of EE rebates/trade allies and identified barriers within those steps that might limit more equitable participation? These barriers may include: • Knowledge of the program • Economic/financial barriers to participation • Asking for too much/sensitive information • Time poverty barriers to participation • Renter/property owner barriers • Finding/communicating with Trade allies • Forms/Paperwork – especially as it relates to language accessibility • Submission of rebate forms • Review of rebate forms	Knowledge of the program: Standard Rebate Program & Point of Sale: We use bill inserts, TAs, Energy Services Representatives, and regional events to provide education and create awareness of the Programs. Low-Income Program: We use bill inserts, Cascade Website, leverage Community Action Agencies (CAA) for program awareness, in the of form sandwich boards on active weatherization projects, flyers, word of mouth, radio slots. We leverage the bill discount program (CARES), auto enroll customers receiving Weatherization Assistance to our bill's assistance programs and vice versa. WA EE Outreach Analyst focused on targeted outreach, video/eligibility quiz development. Target audience housing authorities and Section 8 landlords to increase participation in Weatherization Incentive Program. Economic/financial barriers to participation: Standard Rebate Program & Point of Sale: Point of Sale provides an instant discount for EE measure upgrades; we do not offer any zero % financing. Low-Income Program: LI Programs we have worked to reduced economic financial barriers by aligning with department of commerce requirements, we do not add additional requirements to our customers/CAAs, we follow one set of requirements/guidelines based on the Weatherization Assistance Manual issued by the state. This ensures we align with the CAAs, we also increased our project coordination fees. As this was something the CAAs expressed as a continued barrier to project completion. The LI program is at no-cost to customers. Asking for too much/sensitive information: Standard Rebate Program & Point of Sale: Account information, heating source and payee information is required, and we regularly look for ways to reduce the friction in our rebate processes. Low-Income Program: Our CAAs collect and maintain confidential demographic information at agency level; information collected follow commerce guidelines as previously noted and is not collected directly by Company. We do not add any additional program requirements, this ensures we do not add undue burden to customer or agencies, guarantees we do not duplicate efforts, we use department of commerce eligibility and weatherization specifications.
26	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade Identified the steps to take advantage of EE rebates/trade allies and identified barriers within those steps that might limit more equitable participation? These barriers may include: • Knowledge of the program • Economic/financial barriers to participation • Asking for too much/sensitive information • Time poverty barriers to participation • Renter/property owner barriers • Finding/communicating with Trade allies • Forms/Paperwork – especially as it relates to language accessibility • Submission of rebate forms • Review of rebate forms	Time poverty barriers to participation: Standard Rebate Program & Point of Sale: The program is designed to require minimal time investment. Low-Income Program: CAAs handle eligibility for Company, there are multiple options for customer participation they can email documents, call, apply in person, mail in documents, depending on situations there are home visits available. Most information needed for applications can be completed via phone, prior to appointment to reduce time barriers for customers. CAAs also offer after hour appointments during harvest season for our migrant-seasonal workers. We now have a designated LI staff to address all LI inquiries to refer appropriate to agencies. Renter/property owner barriers: Standard Rebate Program & Point of Sale: EE recognizes the challenges to reach property owners and renters may apply if they are the account holder. Low-Income Program: On going barriers, fear of rent increase for tenants, owners not willing to agree to a 12 month no rent increase. Agencies continue to provide education of tenant rights and owner/landlord rights; however, it is an ongoing barrier. Finding/communicating with Trade allies: Standard Rebate Program & Point of Sale: EE has over 120 TAs and we monitor performance through random inspections and services like the Better Business Bureau Forms/Paperwork: Standard Rebate Program & Point of Sale: especially as it relates to language accessibility - Online portal has been launched and incentives and applications are available in Spanish; translation is also an option. Low-Income Program: Rebate forms are available to our CAAs in English and are available in Spanish by request. Our rebate applications are not customer facing, they are completed by CAA representatives.
27	3/4/2024	Pre Targeted TAG 3	WUTC	o Has Cascade Identified the steps to take advantage of EE rebates/trade allies and identified barriers within those steps that might limit more equitable participation? These barriers may include: • Knowledge of the program • Economic/financial barriers to participation • Asking for too much/sensitive information • Time poverty barriers to participation • Renter/property owner barriers • Finding/communicating with Trade allies • Forms/Paperwork – especially as it relates to language accessibility • Submission of rebate forms • Review of rebate forms	Submission of rebate forms: Standard Rebate Program & Point of Sale: Rebates are available through the Point of Sale program and can be submitted via email, post, FAX, the online portal, and occasional walk in. Low-Income Program: Rebates can be submitted via secure email (Biscom) CAA representatives can request a secure link from Sr. Conservation Analyst and or use our online portal for submissions. Review of rebate forms: Standard Rebate Program & Point of Sale: Rebate forms are reviewed, revised, and simplified in tandem with tariff updates. Our TAs have communicated their preference to minimize the changes/revisions to program forms. Low-Income Program: Same process followed for LI rebate forms, updated on calendar year and with tariff updates.
28	3/4/2024	Pre Targeted TAG 3	WUTC	o What drove the significant increase in EE savings from 2022 to 2023 and what did Cascade learn from that experience that it is implementing now?	Investment in The Point of Sale and Trade Ally programs are significant contributors to the increase in EE savings in 2023 compared to 2022. Over half of all applications received in the second half of 2023 were attributed to these offerings. CNGC is continuing to invest in and grow these offerings for the upcoming biennium.
29	3/4/2024	Pre Targeted TAG 3	WUTC	o What changes led to the shift in more residential therm savings?	Growth in the Point of Sale and Trade Ally programs were significant factors. The POS program in particular provides instant rebates for the work, from the customer's perspective. We have seen this being particularly effective in covering a large portion of the project cost for insulation and air sealing jobs. CNGC has increased insulation rebates while remaining extremely cost effective in the upcoming biennium to drive further growth and opportunity for all income levels.
30	3/4/2024	Pre Targeted TAG 3	WUTC	o What does CNG foresee as coming challenges for energy efficiency programs?	Consumer sentiment around energy codes, building codes, and the future of natural gas is a significant challenge and increases risk for program participants. Participants are less likely to make significant investments in their home and business when risks of fuel choice use are present. Additionally, supply issues with insulation materials are still being noticed by select contractors.
31	3/4/2024	Pre Targeted TAG 3	WUTC	o How does the likelihood of a decrease in gas customers/increase in customers who are electrifying factor into the CPA calculations?	Customer counts by segment (residential, commercial, industrial) and by climate zone are provided as inputs to the CPA calculation. Gas use and savings potential are generally directly related to customer count.
32	3/4/2024	Pre Targeted TAG 3	WUTC	o What kind of sensitivity analysis did CNG do when calculating the CPA? Staff would like to know more about the methods used to generate the CPA.	CNGC has conducted sensitivity analyses in the past. A recent example is alternative scenario modeling to inform chapter 7 of the 2023 Washington IRP. The alternative scenarios included an update to baseline fuel usage and avoided costs, a scenario of high future Renewable Natural Gas (RNG) usage, and a scenario combining high future RNG usage and increased municipal gas bans with decreasing customer counts. Further details can be found on pages 7-22 through 7-24 of the 2023 Washington IRP.
33	3/4/2024	Pre Targeted TAG 3	WUTC	o Staff would like some clarity to why the baseline forecast for therms goes up for industrial over time, but goes down for residential and commercial. What are the drivers both for decreases and increases?	This is a function of average use per customer per segment and total number of expected customers. On average, industrial customer count expectations increased more than commercial or residential in this CPA. Average use per customer for commercial and residential decreases over time, driven by energy code restrictions impacting gas use for residential and commercial construction.

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Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
34	3/4/2024	Pre Targeted TAG 3	WUTC	o Staff would like greater clarity what is causing the gap in the achievable technical and achievable economic potential in the CPA.	From page 7 of the 2023 CPA: UCT Achievable Economic Potential further refines achievable technical potential by applying an economic cost-effectiveness screen. In this analysis, primary cost-effectiveness is measured by the utility cost test (UCT), which assesses cost-effectiveness from the utility's perspective. This test compares lifetime energy benefits to the costs of delivering the measure through a utility program, excluding monetized non energy impacts. These costs are the assumed incentive, represented as a percent of the incremental cost of the given efficiency measure, relative to the relevant baseline course of action (e.g., federal standard for lost opportunity and no action for retrofits), plus any non-incentive costs that are incurred by the program to deliver and implement the measure. If the benefits outweigh the costs, a given measure is included in the economic potential. Note that we set the measure-level cost-effectiveness threshold at 0.9 for this analysis since Cascade may include non-cost-effective measures as long as the entire portfolio is cost-effective. This is important because a portfolio considers more than just energy savings. Cascade may include popular measures that are on the cusp of cost-effectiveness, accommodate variance between climate zones, maintain a robust portfolio, or include a measure that improves customer outreach and communication. It also supports the inclusion of borderline cost-effective measures, increasing overall savings through energy efficiency offerings.
35	3/4/2024	Pre Targeted TAG 3	WUTC	o How is CNG modeling scenarios with benefits from the Inflation Reduction Act	Repeating the response in item 19; CNGC is evaluating the relevance of IRA and IIJA funding for natural gas utilities. At this point it looks to be electric utility focused. This could be relevant for fuel switching programs, but that is yet to be fully investigated. CNGC welcomes modeling scenarios and inputs from the CAG and commission staff in regard to the IRA during the upcoming CPA cycle.
36	3/4/2024	Pre Targeted TAG 3	WUTC	"Customer Segmentation" Does this analysis include an equity analysis?	Customer segmentation involves allocating portions of the customer count per program segment: Residential, Commercial, Industrial. For each segment, the count is further segmented into income level, home size, type of business, type of production process, etc. Details on residential customer segmentation by income group can be found on page 25 of the 2023 CPA under docket 210838.
37	3/4/2024	Pre Targeted TAG 3	WUTC	o "Market size, Equipment Saturation, Technology Shares, Vintage distribution" Do these analyses include equity analysis? Does it consider demographics of the market? Does it consider demographics of equipment vintages and ownership?	This is separate from an equity analysis. It involves calculating the average of what exists in the market, equipment vintages, etc. per income level, home type, commercial business type, etc. A full description of this market characterization can be found on pages 21-32 of the 2023 CPA docket 210838.
38	3/4/2024	Pre Targeted TAG 3	WUTC	o "Unit energy consumption" Does unit energy consumption include an equity analysis? Are there distributional inequities in how much energy different customer groups might be consuming?	Unit Energy Consumption is a calculation for the average amount of energy a given piece of equipment is expected to use in one year. It is broken down by specific market segment in the CPA. It embodies an average level of service and average equipment efficiency for the specific market segment. This includes a calculation of average therm usage per home by building type and income level in the residential sector. Lower income homes and multifamily homes are assumed to use less energy on average. A summary of Energy consumption by income group can be found on page 26 of the 2023 CPA.
39	3/4/2024	Pre Targeted TAG 3	WUTC	o "New Construction Profile" In the past year how has participation in the new construction energy efficiency program changed? Have similar patterns been seen with new customer uptake?	One way to measure new construction participation is through incentives only available for new construction homes. In 2022 136 projects were submitted for the "Built Green Certified Home" offering. In 2023 only one project was received. This offering was deemed to no longer be viable with the implementation of WSEC 2021. New service points in the service territory dropped approximately 10% from 2022 to 2023.
40	3/4/2024	Pre Targeted TAG 3	WUTC	o "Customer growth" Has Cascade already calculated the customer growth or is this value determined at the end of the IRP process?	The customer growth for the 2023 CPA comes from the previous IRP cycle. The 2025 CPA is anticipated to use customer count figures from the 2025 IRP which is yet to be finalized.
41	3/4/2024	Pre Targeted TAG 3	WUTC	o "Elasticities" What types of elasticities is Cascade considering? Does 'elasticities' include an equity analysis of EE program participation?	Elasticities come from EPRI End-Use Models (REEPS and COMMEND). These models provide the energy-use elasticities applied to equipment prices, household income, home size, heating requirements, etc.
42	3/4/2024	Pre Targeted TAG 3	WUTC	o "Achievable Economic" Does achievable Economic include an equity analysis of who is able to participate?	Yes, savings potential screening methods do involve equity analysis, market segmentation, and participation assumptions. Within AEG's LoadMAP model, we estimate potential using the Council's preferred approach of beginning with technical potential, applying ramp rates to estimate achievable technical potential, and finally screening for cost effectiveness to estimate achievable economic potential. Cost effectiveness varies by commercial/industrial business type, income bracket, average equipment cost etc. More details on the potential screening can be found on pages 7 and 8 of the 2023 CPA.
43	3/4/2024	Pre Targeted TAG 3	WUTC	o "UCT/TRC Achievable Economic Potential" Do these future projections anticipate that EE measures will become more cost effective in the future?	Generally speaking, EE measures become less cost effective over time as the "low hanging fruit" becomes exhausted from the market. This is of course augmented by changes in technology, consumer behavior, avoided costs, and market adoption rates to name a few. Should avoided costs increase in the future, for example, we would anticipate measures becoming more cost effective. For the 2023 CPA, UCT achievable economic potential does increase year over year through a 20-year forecast window.

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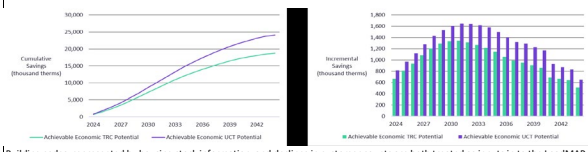
Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
44	3/4/2024	Pre Targeted TAG 3	WUTC	o"Technical Potential" Does technical potential assume increasingly efficient options in the future?	Yes, from page 7 of the 2023 CPA: Technical Potential is defined as the theoretical upper limit of energy efficiency potential. It assumes customers adopt all feasible measures regardless of their cost. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option. Technical potential also assumes the adoption of every other available measure, where technically feasible. For example, it includes the installation of high-efficiency windows in all new construction opportunities and furnace maintenance in all existing buildings with installed furnaces. These retrofit measures are phased in over a number of years to align with the stock turnover of related equipment units, rather than modeled as immediately available all at once. It also involves estimates for technology and equipment advances in the future.
45	3/4/2024	Pre Targeted TAG 3	WUTC	o"Summary of Energy Efficiency Potential as % of Baseline Projection" Does this projection contemplate the possibility of declining customer counts?	Customer counts is an input into the LoadMAP model. LoadMAP could handle a forecast with decreasing customer counts. In general, an input of decreasing customer counts would decrease energy efficiency potential and baseline energy usage.
46	3/4/2024	Pre Targeted TAG 3	WUTC	o"Cumulative UCT Achievable Potential Forecast, Around the year 2035 there is a change in concavity of the graph. What are the causes of this concavity change?	There are many factors at play in calculating UCT achievable potential. Around the year 2035 opportunity and retrofit ramp rates change concavity or begin to phase out which significantly impacts achievable potential. These graphs can be found in appendix D of the 2023 CPA.
47	3/4/2024	Pre Targeted TAG 3	WUTC	o"If the avoided cost analysis changes substantially (see Staff comments on TAG 2), is this analysis capable of pivoting to match the new data? What is the time lag/interaction between EE program data and IRP analysis data?	Yes, avoided costs will be a changeable input into the 2025 CPA. The CPA informs EE program data with inputs from the IRP including avoided costs, HDDs, customer counts, inflation assumptions, etc. The 2025 CPA is anticipated to include IRP data inputs through approximately Q4 2024.
48	3/4/2024	Pre Targeted TAG 3	WUTC	o"In the last BCP, many of the rebates offered had UCT and TRC ratios well above 1.0. If these ratios were lowered (by increasing the rebate offered) would it increase the achievable potential?	The achievable potential is impacted by a cost effectiveness screening. In the last CPA, this level was .90. Lowering this cutoff could increase the achievable economic potential by allowing more measures through cost screening. Adjusting rebate amounts comes much later in the process in the program planning phase, after the achievable potential has been set.
49	3/4/2024	Pre Targeted TAG 3	WUTC	"Furnace Direct Fuel" Do customers adopt these measures before their old furnace fails? Looking to the demand forecast, how might data associated with this measure inform the model of customer decision making when it comes to furnace replacement and electrification?	The average lifespan for measures assumes that some equipment items are replaced prior to failure and that some pieces of equipment last longer than anticipated. The average lifespan of the measure, or average energy usage per unit could be adjusted in future CPAs to reflect a higher rate of replacement prior to failure. More concrete data on consumer decisions would be useful in informing this.
50	3/13/2024	Post Targeted TAG 4	WUTC	Staff would appreciate it if the TAG meetings could be simulcast to YouTube. Cascade can use Puget Sound Energy's IRP process as an example. This would upload the meeting immediately and give staff ample time to review TAG meetings and give more informed feedback. In addition, this would give members of the public a way to monitor TAG meetings on a website they are more familiar with. If Cascade is unwilling or unable to do this, Staff request that Cascade provide Staff with a recording of the meetings prior to the deadline for comment.	Cascade does not have the resources to simulcast to YouTube. Cascade will do it's best to upload information post TAG meetings, but would like to remind Staff that the Resource Planning Team does not have access to update the IRP webpage. The Resource Planning Team must work with IT and their schedule to get information posted.
51	3/13/2024	Post Targeted TAG 4	WUTC	• If Cascade's CPA is, in part, aiming to focus on measures with long term benefits, has Cascade considered emphasizing EE measures that focus on envelope efficiency (especially in residential), and other measures that are beneficial for customers in the long run even if they leave gas service (i.e. not appliances)?	Cascade agrees that fuel agnostic Energy Efficiency Measures are optimal. Cascade has sought to increase uptake in these Residential envelope measures by increasing insulation incentives in the 2024-2025 BCP by 60-100% compared to the previous BCP. Additionally, Cascade has invested significant resources into the Point of Sale rebate program which is currently heavily skewed towards fuel agnostic envelope measures including ceiling insulation and air sealing.
52	3/13/2024	Post Targeted TAG 4	WUTC	• Why is achievable potential anticipated to go up for the next 20 years? Does this align with Staff concerns regarding building codes and compliance costs, and the potential for declines in customer counts?	It's important to note the difference between cumulative savings potential (compounding over time) and incremental savings potential (a single year snapshot). While the CPA did consider the impacts of Washington Energy Code on customer fuel adoption and future use of gas, many measures serving existing customers were still found to be cost effective and will continue to be important to help customers reduce their energy burden. Using adoption ramp rates and achievability methodology consistent with those used by the NWPCC 2021 Power Plan, the achievable remaining market for these measures is captured over the study period, which means new installations or captures of turnover equipment in each year. The cumulative savings from these annual measures are what is reported in the CPA. The available savings potential in each year (i.e., the incremental potential) does start to decline starting around 2030, partly due to the shape of Council's ramp rates, but also due to changes in the underlying market baseline loads expected.  Building codes, represented by housing stock information, and declines in customer counts are both treated as inputs in to the LoadMAP forecasting model. Impacts from building codes, compliance cost, and changing customer counts were modeled with information as of Spring 2023 for the 2023 CPA. These inputs will be updated for the 2025 CPA to reflect the most accurate understanding of housing stock information and customer counts at that time.
53	3/13/2024	Post Targeted TAG 4	WUTC	• Staff would like to remind Cascade that the 10% RTF preference adder does not relate to Non-Energy Benefits.	Cascade asked Staff to share their thoughts on what the 10% RTF preference adder does cover, from their perspective. Staff's response: UTC Staff cannot speak for the RTF. However, the RTF refers to the 10% preference adder as a "regional preference adder" (slide 11). In that 2019 presentation, the RTF cites to [Northwest Power Act, §3(4)(D), 94 Stat. 2699.] which states "3(4)(D). For purposes of this paragraph, the "estimated incremental system cost" of any conservation measure or resource shall not be treated as greater than that of any non-conservation measure or resource unless the incremental system cost of such conservation measure or resource is in excess of 110 per centum of the incremental system cost of the nonconservation measure or resource."
54	3/13/2024	Post Targeted TAG 4	WUTC	• Staff will be following up regarding how Cascade can put IRA/IIJA implementation assumptions into their modeling assumptions. There will be continued discussion around this issue.	Cascade appreciates the follow up.
55	3/13/2024	Post Targeted TAG 4	WUTC	• Staff emphasizes the need for an empirical foundation for the customer forecast theory that will guide the development of Cascade's model. Staff notes that understanding the conditions in which customers adopt "furnace - direct fuel – AFUE 97% (CEE Tier 3)" measures may shed like on future customer behaviors.	Cascade appreciates staff emphasizing this need and will look into it.
56	4/17/2024	Post Targeted TAG 5	WUTC	Staff lauds Cascade's initiative in developing a building stock attrition rate. Staff would appreciate greater clarification about what is captured by the building stock attrition rate; especially to avoid double counting between building/customer loss due to anticipated bill impacts/customer flight and non-economic drivers of customer loss.	Cascades intent for building stock attrition rate is that this rate would reflect natural building decay, in which a building is either demolished and rebuilt under current WA State Building Codes, or remodeled/renovated to a point in which the home must follow current WA State Building Codes.
57	4/17/2024	Post Targeted TAG 5	WUTC	Customer Count Forecast and Price Elasticities – Staff lauds Cascade's efforts to engage with this topic. Staff looks forward to further conversations with Cascade staff as it develops its methods. Has Cascade staff considered evaluating its historic customer count and retail price data by controlling for economic growth or some other econometric proxy for 'bullishness'? Further, Staff questions whether historic price data is probative since the prices and bill impacts anticipated from CCA compliance costs and the likely changing ratio of fixed costs to customers likely exceeds historic data in the intermediate to long run. Staff questions if customer choices to electrify might be better understood as a stepwise function? Has Cascade considered that customers, individually, may leave gas service at a service-price tipping point? Has Cascade considered the dynamics of a heterogenous population of such individuals as service prices increase?	Cascade does attempt at controlling for economic growth by including total household and employment growth in the Company's customer forecast model. Cascade agrees that historic price data may not be probative as Staff states. Thus, Cascade will also be inlcuding a separate electrification analysis that looks at service-price tipping points.
58	4/17/2024	Post Targeted TAG 5	WUTC	WA State Building Codes – The presentation noted "The new building codes have made it impractical for new residential and commercial buildings to use natural gas." Cascade staff noted during the TAG that, currently, new residential customers were typified by gas stoves, and barbeques and space heaters for shared spaces. On a use per customer basis how does this align with previous IRPs' assumptions around future use per customer? In addition to changes in customer end-uses, how has growth in customer counts changed in the last year?	If Cascade continues to see growth in residential homes with appliances such as stoves, barbeques, and space heaters in shared areas, the Company would anticipate the use per customer declining. Historically, Cascade's use per customer is flat the slowly declining, which is what we would anticipate with new residential homes being limited to stoves, barbecues and space heaters in shared areas. As of March 2023, Cascade experienced 1.05% growth. Update -- As of June 2023, Cascade's year-over-year growth is at 0.69%.
59	4/17/2024	Post Targeted TAG 5	WUTC	Cascade staff proposed running an alternative scenario modeling the possibility that the CCA and/or Washington State building codes are overturned. Staff supports modeling this alternative scenario.	Cascade appreciates Staff support.
60	4/17/2024	Post Targeted TAG 5	WUTC	Weather Normals and Climate Change Impact – Does Cascade or ICF have an evidentiary basis is for deviating from RCP 8.5 or SSP5-8.5 as used by the NWPCC? Staff stresses the centrality of empiricism in our work and urges that the baseline scenario represent the most likely future for Cascade Planning based on available data, even if that deviates from RCP 8.5. Staff also invites Cascade to consider climate change models that deviate from current expectations in additional scenarios. Staff would further appreciate more information about the "Cold Weather Review Relevant to Peak Forecasts".	Cascade does not plan on running the RCP 8.5 or SSP5-8.5. Cascade explained that the RCP 8.5 and SSP5-8.5 have been deemed as highly unlikely and Often wrongly used as 'business as usual'. See more in this article: comment article
62	5/17/2024	Post Targeted TAG 7	WUTC	Staff appreciates Cascade's receptivity to comments and feedback from Staff and interested parties. Staff highlights that Cascade's efforts in the current IRP process thus far have been quite productive. Staff looks forward to continued work with Cascade throughout the IRP process.	Cascade appreciates the feedback and the collaborative efforts in producing the IRP.
63	5/17/2024	Post Targeted TAG 7	WUTC	Staff appreciates Cascade's clarifications about future hydrogen strategies. Staff looks forward to Cascade investigating both hydrogen fuel blending and a parallel hydrogen-only system as pathways to decarbonization. Staff also looks forward to ongoing discussions with Cascade staff about the collateral costs of hydrogen blended fuels. Staff is supportive of Cascade investigating decarbonization strategies, but Staff also reiterates its concerns about hydrogen contained in its comments responding to the 2023 IRP.	Cascade understands Staffs concerns regarding hydrogen and looks forward to working through any concerns in the future.
64	5/17/2024	Post Targeted TAG 7	WUTC	Staff looks forward to future talks about equity in distribution system planning and analysis. Staff recommends that Cascade work with the EAG and future TAGs to develop an equity framework for distribution system planning for the 2024 IRP.	Cascade looks forward to continuing the collaborate efforts on equity in the IRP.

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Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
65	5/17/2024	Post Targeted TAG 7	WUTC	Staff questions whether a 5-year planning horizon is appropriate for distribution system planning. Staff questions if a shorter planning horizon might result in path dependency issues compared to a longer planning horizon. Staff acknowledges the difficulties of accurate planning with longer time horizons, but recommends that Cascade investigate the possibility of longer planning horizons that align with the 2050 planning horizon of the IRP document. Staff questions whether useful, though perhaps generalized, information might be gleaned from a longer planning horizon that might provide insights into strategies and capabilities to mitigate risks to rate payers and the utility.	Cascade appreciates Staff's feedback. With growth uncertainty being at an all time high, it is extremely difficult to plan for a longer planning horizon. With that said, Cascade does agree that there are some benefits that could be explored looking further out into the future when planning distribution system upgrades.
66	6/6/2024	Post Targeted TAG 8	WUTC	During Targeted Tag 8, Cascade requested other sources for electrification data. Staff offers the following resources, however UTC Staff cannot vouch for the accuracy or reliability of these resources, nor does the following list convey any endorsement of these resources: Avista offers a Heating Comparison Calculator (apogee.net) on its website. While this does not predict future electric rates, it does compare indoor heating costs. Avista's work papers associated with its 2023 Gas IRP and Electric Progress Report are publicly available under docket UE-200301. Puget Sound Energy also has various of its work papers publicly available under docket UE-200304.	Cascade appreciates Staff's feedback.
67	6/6/2024	Post Targeted TAG 8	WUTC	Staff is concerned about the lack of a preferred portfolio. Staff is open to having an extended conversation about this with the Company and the Oregon PUC.	Cascade appreciates the feedback on the lack of preferred protfolio. Cascade has re-evaluated the preferred portfolio and will be including one in this IRP.
68	6/6/2024	Post Targeted TAG 8	WUTC	Staff would like to see Cascade's data that supports "Reference Case: Washington State Building Code Council rules w/ flat customer growth".	Cascade was able to put together a report that pulls service line retirements without reconnection. When a line that feeds a customer is retired, Cascade does not collect a reason for why they're being disconnected. This is the best estimate the Company has been able to establish for customers leaving, whether it be through home destruction or electrification. Here are the results from this report for our Washington service territory: Year / Customers / Retirement / % of customers 2011 / 196,015 / 399 / 0.20% 2012 / 197,548 / 369 / 0.19% 2013 / 199,949 / 407 / 0.20% 2014 / 202,195 / 396 / 0.20% 2015 / 204,867 / 432 / 0.21% 2016 / 207,868 / 420 / 0.20% 2017 / 211,164 / 410 / 0.19% 2018 / 214,996 / 400 / 0.19% 2019 / 218,811 / 366 / 0.17% 2020 / 222,778 / 341 / 0.15% 2021 / 226,633 / 342 / 0.15% 2022 / 229,418 / 391 / 0.17% 2023 / 231,539 / 314 / 0.14% This is showing that the number of service line retirements each year is in the ballpark of .15% to .20% per year, which is much flatter than the 1.5% decay rate that has been discussed between the parties in the past. Cascade is still seeing customers who are interested in adding non-space and water heating appliances, which are allowed under the current building codes. This is currently how Cascade is coming to the conclusion for utilizing a flat growth rate, with a declining upc, for the reference case.
69	6/6/2024	Post Targeted TAG 8	WUTC	During Targeted-Tag 8, Staff asked for a more detailed description of PLEXOS' selection criteria for electrification. Staff would like to schedule a meeting with Cascade staff to walk through this aspect of the model.	Cascade is still working on the electrification analysis. Cascade will present this at TAG 2, or at a Targeted TAG meeting after TAG 2.
70	6/6/2024	Post Targeted TAG 8	WUTC	Staff continues to stress the benefits of conducting a plausible worst-case scenario where all variables that are demonstrated to increase systemic instability are each simultaneously increased/decreased, within plausible parameters, to increase systemic instability. Staff urges Cascade to consider the non-arithmetic impacts of model inputs.	Cascade understands Staffs concern regarding a plausible worst-case scenario. Cascade will address this under the declining customer growth scenario.
71	6/6/2024	Post Targeted TAG 8	WUTC	Staff reiterates its previous feedback regarding the possibility of targeted energy efficiency/elevated avoided costs to mitigate customer losses.	Cascade appreciates Staff's feedback.
72	6/6/2024	Post Targeted TAG 8	WUTC	Staff reiterates its previous feedback regarding the possibility of system pruning as a strategy to lower fixed costs	Cascade appreciates Staff's feedback.
73	9/10/2024	Pre-TAG 1	WUTC	How was the Company able to adjust the model based on the extra time it was given by the Commission?	The Company utilized the extra time to gather information on Cascade's system to understand the number of customers who disconnect and do not reconnect each year. Cascade also used this time to understand decomposing regression models in order to adjust the forecasts for flat and declining growth. This has also allowed the Company time to ensure the climate data was accurately being incorporated into the final forecast. This time has also allowed Cascade to continue to build out an electrification workbook, which will analyze electric costs vs natural gas costs across the service territory and income levels.
74	9/10/2024	Pre-TAG 1	WUTC	Slide 14 "Likely- given policies" Does Cascade see itself in alignment with these larger policy goals? Does Cascade believe this is likely given the Annual Energy Outlook 2022 - U.S. Energy Information Administration (EIA) citation from slide 32?	The CMIP6 models that are listed as likely-given policies are created by several expert groups from several different countries who take into account policy goals from around the globe. It's important to note that natural gas is approximately 1/3 of greenhouse gas emissions and the CMIP6 models consider all GHG emission policies. Natural gas has and continues to be a resource that is replacing coal.
75	9/10/2024	Pre-TAG 1	WUTC	Slide 17 "The non-Gaussian temperature distribution in the Pacific Northwest" Does Cascade have a chart/graphic to represent this?	Cascade utilized this source to come to this conclusion: https://doi.org/10.1175/JCLI-D-19-0344.1. See section 4 for Non-Gaussian cold tails spatial patterns and section 5b for long tail individual cases, specifically Pendleton, OR.
76	9/10/2024	Pre-TAG 1	WUTC	Slide 19 Might the portfolio choices impact the customer count?	Possibly. The customer forecast is merely a starting point. Each portfolio choice will have an electrification analysis that could impact the customer counts.
77	9/10/2024	Pre-TAG 1	WUTC	Slide 20 "Unifying inputs is an important part of the forecasting process." What does it mean to unify inputs?	Under the current forecast model, Cascade uses pipeline data because it aligns with temperatures since Cascade can get pipeline data at a daily level. However, pipeline data does not provide data by customer class. To allocate the pipeline data to the customer class, Cascade must align the customer care and billing data to the pipeline data to determine how much usage is coming from each customer class.
78	9/10/2024	Pre-TAG 1	WUTC	What is the theory regarding Retail Price and the Customer Forecast? Has Cascade considered household income instead?	In the 2023 IRP, Cascade included price as a forecast in the upc forecast as the theory is that as prices go up, customers will use less gas. The theory behind retail price as a regressor for customer count is that if there is a negative relationship between increasing prices and customer counts, indicating customers leaving the gas system, the regressions would capture that. Cascade has considered household income and has begun testing it on fixed network data in addition to the income included in the current forecast model. However, fixed network implementation has yet to be complete, creating issues with the results of the analysis on customer count. Cascade will continue to analyze the data once fixed network implementation is complete. Another way Cascade is looking at impacts to customer counts is in the electrification model, which analyzes electrification at varying levels of customer income.
79	9/10/2024	Pre-TAG 1	WUTC	In a zero or low-growth scenario, what is the theoretical basis for HH as a regressor to forecast customers?	HH and employment is used to build out the business-as-usual customer forecast. Then the model is decomposed, which provides seasonal components, the trend (which is the growth), and randomness of the regression. For the flat growth, Cascade removes the trend and for the declining growth, Cascade implements a decay rate.
80	9/10/2024	Pre-TAG 1	WUTC	What are the drivers of retail cost? Does it include Fixed costs, CCA, and Cascade's Financial ratings?	Retail costs include fixed costs and CCA costs from the previous IRP.
81	9/10/2024	Pre-TAG 1	WUTC	What effect does the data indicate that Retail Price and Income have on the Customer Forecast? What data is being relied upon?	Retail price was not found to be statistically significant in any customer forecast results.
82	9/10/2024	Pre-TAG 1	WUTC	Why does the Customer Forecast rely on average incomes? Are there insights that could be gleaned from looking at the actual distribution, such as which customers are more likely to electrify? How is customer income data being used to forecast customers? What progress has Cascade made in its equity analysis and how has that factored into this analysis?	Cascade's customer count models found income to be statistically significant, however, the impact is very minimal. Cascade has utilized the fixed network data and Cascade's equity mapping to analyze customer counts with an equity lens. However, since the fixed network implementation is not yet complete, Cascade cannot accurately account for customer counts yet. Cascade will continue to look at fixed network data for future IRPs. With that said, Cascade is looking at income levels in the electrification model that would be able to glean more information than analyzing historical data.
83	9/10/2024	Pre-TAG 1	WUTC	Slide 23 "Note that this is a goal, not a mandate." While Staff can appreciate the difference in theory, in practicality, does Cascade have any basis to believe that both imperatives are not being pursued with diligence?	Cascade does not have a stance on how it is being pursued. Cascade must understand the risks to customers, therefore it is reasonable to note when a policy is a goal vs a mandate. As can be seen in Cascade's customer forecast ranges, the Company is modeling multiple outcomes of potential building code policy futures.
84	9/10/2024	Pre-TAG 1	WUTC	Slide 26 What is the basis for the return to normal growth assumption? Why does this not take other policy into account?	The basis for the return to normal growth assumption is that the building codes are redacted. Again, it would be a risk for customer if Cascade's growth returned to normal and Cascade did not have a plan in place to meet high CCA carbon compliance targets.
85	9/10/2024	Pre-TAG 1	WUTC	Slide 24 "The new building codes have made it impractical for new residential and commercial buildings to use natural gas." How impractical? In quantifiable terms where are the impacts of the codes?	It has yet to be determined the exact quantifiable impacts of the building codes. With that said, Cascade had a 1.42% growth rate prior to the 2018 building codes going into effect in February of 2021 and a 0.81% growth rate when 2021 building codes went into effect in March of 2024. As of August 2024, Cascade's year-over-year growth rate is at 0.78%. As a reminder, building codes have a trickling effect once they're effective as in most cases buildings can still be built under old building codes as long as the permitting was complete prior to the effective date.

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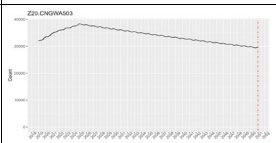
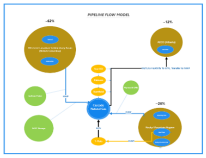
Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
86	9/10/2024	Pre-TAG 1	WUTC	Slide 26 "Base – Washington State Building Code Council rules w/ flat customer growth" What is the basis for a flat customer growth? What data or literature supports this? Is it currently the case that customers leaving = customers joining?	Cascade utilized a report that pulls service line retirements without reconnection. When a line that feeds a customer is retired, the Company does not collect a reason for why the customer is being disconnected. This is the best estimate Cascade has established for customers leaving, whether it be through home destruction, electrification, or any other reason. Here are the results from this report for Cascade's Washington service territory: Year | Customers | Retirement | % of customers 2011 | 196,015 | 399 | 0.20% 2012 | 197,548 | 369 | 0.19% 2013 | 199,949 | 407 | 0.20% 2014 | 202,195 | 396 | 0.20% 2015 | 204,867 | 432 | 0.21% 2016 | 207,868 | 420 | 0.20% 2017 | 211,164 | 410 | 0.19% 2018 | 214,996 | 400 | 0.19% 2019 | 218,811 | 366 | 0.17% 2020 | 222,778 | 341 | 0.15% 2021 | 226,633 | 342 | 0.15% 2022 | 229,418 | 391 | 0.17% 2023 | 231,539 | 314 | 0.14% The table shows that the number of service line retirements each year is in the ballpark of .15% to .20% per year, which is much flatter than the 1.5% decay rate that has been discussed in the past. Cascade is still seeing customers who are interested in adding non-space and water heating appliances, which are allowed under the current building codes. This is currently how Cascade is coming to the conclusion for utilizing a flat growth rate, with a declining upc, for the reference case.
87	9/10/2024	Pre-TAG 1	WUTC	"Low - Washington State Building Code Council rules w/ 1.5% decay in building stock attrition" What is the basis for 1.5% decay rate? What data or literature supports this?	Cascade includes a 2% per year rate where a housing stock drops out of the existing building shell class in the Energy Efficiency model. So while some decline in Existing customers is possible from either voluntary electrification and/or complete demolition, it probably won't be at 2% per year. Cascade would want a second assumption for what portion of those renovating properties (the 2% in our model) would choose to fully disconnect from gas as their path to compliance credits vs those who would continue with HE gas equipment and take higher building shell credit paths. Unfortunately, there is no specific analysis for this assumption. Although Cascade believes a 1.5% decline is conservative, it is a plausible decline to model for a low customer count rate.
88	9/10/2024	Pre-TAG 1	WUTC	 Why does the customer forecast seasonally go up?	Historically, Cascade's customer base has a seasonal effect due to people suspending service for several reasons such as vacationing, seasonal business, or simply not needing gas services until the winter period.
89	9/10/2024	Pre-TAG 1	WUTC	What are the impacts of this potential customer loss on bill impacts?	This will be determined later on in the IRP process when low-carbon alternative fuels are modeled.
90	9/10/2024	Pre-TAG 1	WUTC	Slide 27 Why are there slight bumps in usage in the more recent IRP scenarios?	This is due to retail prices being included in the upc forecast and the retail prices are lumpy due to the optimization process of Plexos.
91	9/10/2024	Pre-TAG 1	WUTC	Do the demand forecast results include Demand Side Management?	It includes demand side management programs that have been implemented in the historical data. It does not include future DSM yet, but it will once the demand side management analysis is complete for the IRP.
92	9/10/2024	Pre-TAG 1	WUTC	Slide 30 "Cascade's transportation customer forecast decreased from the previous forecast." How much did it decrease?	The previous forecast was 243. One thing to note is that Cascade will often times have customers move from core to non-core and vice versa, creating some volatility in the non-core customer counts.
93	9/10/2024	Pre-TAG 1	WUTC	"Cascade projects the non-electric gen transportation customers in Washington and Oregon to consume approximately 525 million therms in 2025." What is the long-term trend beyond 2025?	Cascade projects relatively flat growth. The Company is still receiving interest from transport customers that would like to add natural gas. With that said, long term impacts on non-electric gen transport customers remains uncertain.
94	9/10/2024	Pre-TAG 1	WUTC	"Cascade is communicating with the transportation customers on CCA impacts, but it is too early to determine the impact CCA will have on these transport customers." Tentatively what does the data indicate? How indeterminate are the impacts? What is the nature of the ambiguity?	This was a carry over sentence from the previous iteration this was presented. Since that presentation, Cascade has provided this notice to the public: https://www.cngc.com/wp-content/uploads/PDFs/Brochures/2024/2024_03_cngc_wa_cca_bilingual_bw_8halfX7.pdf. Cascade will continue to communicate with transport customers regarding future CCA impacts.
95	9/10/2024	Pre-TAG 1	WUTC	Slide 32 Is similar analysis being conducted for non-conventional fuels?	Yes, Cascade has contracted with ICF on a low-carbon alternative fuels study which contains short- and long-term outlooks on non-conventional fuels.
96	9/10/2024	Pre-TAG 1	WUTC	Slide 33 "Electric power generation is the primary driver for natural gas consumption during the hot summer months. The electric power sector consumed 13% (5 Bcf/d) more natural gas in July than it did in June because of a heat wave and subsequent spike in natural gas-fired electricity generation." Does this assumption hold when reviewing the Clean Energy Implementation Plans shared by electric utilities?	The quote referenced here is based on actual recorded data for June and July of 2024.
97	9/10/2024	Pre-TAG 1	WUTC	Slide 37 "EEadder = Environmental Adder, as recommended by the Northwest Power and Conservation Council" Staff notes that it is a preference adder, not an Environmental Adder, and that it is required by Federal statute.	Thanks. Cascade has clarified language around the 10% adder in the IRP.
98	9/10/2024	Pre-TAG 1	WUTC	Slide 38 "The Company's distribution system cost calculation looks at forecasted capital expenses related ONLY to growth, and uses the company's load growth forecast to translate these costs to a per therm basis." Why does this aspect of avoided costs apply only to growth and not degrowth?	It applies to growth, whether it's positive or negative.
99	9/10/2024	Pre-TAG 1	WUTC	Slide 39 As of right now the policy statement in U-230161 has been withdrawn. Staff does not recommend doing anything differently and has no other guidance on this.	Thanks. Cascade is aware of the policy statement being withdrawn and will make note of this during the presentation.
100	9/10/2024	Pre-TAG 1	WUTC	Slide 40 "The avoided cost has increased by about 30-40% from the 2023 IRP due to the increase in commodity costs as well as the addition of the SCC to the carbon tax based off Staff's policy statement." Staff does not issue policy statements.	Noted and fixed.
101	9/10/2024	Pre-TAG 1	WUTC	Slide 46  This diagram appears to show all transmission lines terminating on "Cascade Natural Gas" in the center. It also indicates the proportions of gas supply from Canada, AECO, and the Rockies. However, the diagram on slide 43 shows that Cascade has non-contiguous service territory And the image on slide 44 indicates that there are various transmission pipelines going between the various non-contiguous elements of Cascade's service territory. Further, the table on slide 40 indicates a consistent avoided cost between the various zone.	This is intended to be a simplistic model to show flow into Cascades System. While CNG is non-contiguous this is not intended to indicate otherwise. The proportions of supply are estimated, and the size is an approximate representation.
102	9/10/2024	Pre-TAG 1	WUTC	Why doesn't the proximity of various zones to various supplies and their position relative to different transmission routes result in different avoided costs by zone?	The way fixed costs and commodity costs are recovered are spread throughout the customer base. A customer in the Kennewick area on a 503 rate is paying the same rate as a customer in Bellingham on a 503 rate.
103	9/10/2024	Pre-TAG 1	WUTC	Slide 47 "PORTFOLIO PROCUREMENT DESIGN BASED ON A DECLINING PERCENTAGE EACH YEAR, ACCORDINGLY" What is declining each year? "Annual load expectation (Nov-Oct) is approximately 37,000,000 dths, consistent with recent load history." Is this expectation just for the next year, through 2025?	The percentage of portfolio acquired declines each year (Year 1 is 90%, Year 2 is 60%, year 3 is 30%). The load expectation is approximately 37,000,000 each year for all three years of the portfolio design. Slide 48 better describes these calculations. In year 1, the annual expectation is 36,680,873 with a hedge target of 55%, or 20,174,480.

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104	9/10/2024	Pre-TAG 1	WUTC	Slide 51 Generally, Staff would find more discussion of storage useful. "At 100% of demand, Cascade can meet approximately 67% of Peak Day Needs." What does 100% of demand mean? Can Cascade meet 67% of peak day needs with storage? Does this consider curtailable users, Energy Efficiency, or Demand Response?	Typically, we plan on Nov 1-March 31 to use storage. Not all days are used and not all days are storage withdrawals. There were only 27 days over the past winter that there were no storage withdrawals/injections for the winter period of 152 days. Storage has become a more and more integral part of operating the system given the constraints on the pipeline, annual throughput increases and increasing days with entitlement warnings and/or entitlement periods.
105	9/10/2024	Pre-TAG 1	WUTC	"Total storage capacity accounts for approximately 14.75% of winter demand" What percentage of days in the winter is storage typically tapped into?	At a 275,000 Dth peak day, CNG could deliver approximately 67% of that demand from Storage resources if available, dependent upon storage levels, Not taking into account any curtailments, EE or Demand response. We can discuss more around EE, Demand Response and curtailments which are not useful tools to be considered for high usage days.
106	9/10/2024	Pre-TAG 1	WUTC	Slide 55 What is Cascade's peak day methodology?	Based on ICFs cold weather qualitative analysis, Cascade's understanding is that there is uncertainty on how climate change will impact peak day. Although there is a warming trend on annual HDDs, this does not preclude cold snaps from occurring and some evidence has suggested climate change could worsen cold extremes. Cascade will continue to use the 99th percentile of peak days, similar to the 2023 IRP.
107	9/10/2024	Pre-TAG 1	WUTC	Slide 57 "Electrification - Expected Costs" How is electrification considered by Cascade's model? How does the decision logic work in the model? What resources/data/literature does Cascade rely on for the expected costs?	Cascade will provide more information on Electrification at a later TAG meeting.
108	9/10/2024	Pre-TAG 1	WUTC	Does Cascade consider accelerated depreciation of fixed costs, targeted energy efficiency, or elevated avoided costs to estimate their impact on avoiding undesirable outcomes or systemic instability?	Cascade does not consider accelerated depreciation. If Cascade had distribution system plans for the reference case, targeted energy efficiency would be considered.
109	10/22/2024	Pre-TAG 2	WUTC	Page 5, "Cascade Natural Gas, along with MDU Resources Group's other natural gas companies, established a GHG reduction target to reduce methane emissions 30% by 2035 compared to 2022 levels." What is the scope of this 30% reduction? Does it include customer emissions?	The target includes distribution system methane emissions. It does not include emissions resulting from customer combustion of natural gas.
110	10/22/2024	Pre-TAG 2	WUTC	Page 6, "Cascade reported 1,721 mT CO2e emissions from leak emissions per HB 2518 to the UTC in 2023. Cascade reported 27,198 mT CO2e emissions for distribution system and compressor station emissions to the Department of Ecology and the EPA's GHG Reporting Program in 2023." According to the MethaneSAT new findings and other scientific findings, methane loss at gas sites is much greater than the EPA estimates. Is Cascade planning to reflect the new available data in the model?	As discussed during Cascade's TAG 2 meeting, the emissions included on page 6 are operational emissions and are not included in the supply-side modeling in Plexos.
111	10/22/2024	Pre-TAG 2	WUTC	Page 7, "Cascade is committed to methane emissions reductions" What is the scale of the emissions that Cascade intends to reduce?	We do not currently have specific WA total methane emissions broken out of our total 8-state company-wide emissions total. For understanding the scale of these emissions, a 30% reduction of our company-wide distribution system methane emissions from 2022 would result in a reduction of about 49,000 metric tons CO2e. This reduction would include a portion of methane emissions from Cascade's Washington distribution system.
112	10/22/2024	Pre-TAG 2	WUTC	Page 9, "Anthropogenic GHG Emissions Reductions" In terms of modeling compliance with reductions goals, what is Cascade planning to do for the IRP?	Cascade is considering both CCA rules and State emissions goals in modeling.

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Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
113	10/22/2024	Pre-TAG 2	WUTC	Page 14, "Other: Carbon Capture, Synthetic methane, etc." What other options are encapsulated by "etc"?	etc would encapsulate electrification among other resources that may not be available yet.
114	10/22/2024	Pre-TAG 2	WUTC	Page 15, Please explain the shape of this graph.	Prior to 2024, Cascade is sharing total Washington Customer Emissions. After 2024, Cascade is only sharing the customer emissions that Cascade is responsible for under the Climate Commitment Act.
115	10/22/2024	Pre-TAG 2	WUTC	Page 16, What will make up the "compliance need"? How will that be modeled?	It is important to note that this is just an example. What will make up the compliance need could potentially be banked allowances as well as low carbon alternative fuels that will be stress tested against electrification.
116	10/22/2024	Pre-TAG 2	WUTC	Page 16, From an equity perspective, how would these costs fall on customers? What are the distributive equity consequences of this?	Cascade will continue to follow the requirements of the CCA and spread the costs of RNG in the appropriate way, whether that's via the CCA methodology, or through a typical rate design, or through a different option all together. Specifically for low-income (LI), there are ways that the CCA can offset costs for the LI customers. There is also the CARES program to consider. Aside from the CCA, all other RNG investments would flow through rates (however applicable at the time), but the overall bill impacts to low-income customers would then be assisted by the CARES program.
117	10/22/2024	Pre-TAG 2	WUTC	Page 17, "WA IA 2066 could have a large impact on the WA State Energy Codes (WSEC). If passed in November, there will likely be a review and/or rewrite of the current WSEC." What impacts will it have on the IRP if IA 2066 does not pass?	The impacts would be consistent with how Cascade projected outcomes were associated with the current WA energy code, essentially flat growth. There could also be the possibility of additional limitations on the use of gas in future.
118	10/22/2024	Pre-TAG 2	WUTC	Page 26, Why are the reference graphs so wiggly?	This is due to including retail rates in the customer and upc regression models. In future IRPs, Cascade will investigate ways to smooth out those jumps.
119	10/22/2024	Pre-TAG 2	WUTC	Page 29, Why is there so much less savings?	Therm savings potential is directly influenced by projected consumption. The top 2 graphs on pages 26-28 show that projected consumption, the red line, is pretty significantly lower in the 2025 reference case, high growth, and low growth scenarios compared to the 2023 CPA throughout the forecast horizon.
120	10/22/2024	Pre-TAG 2	WUTC	Page 30, How does Cascade anticipate new technological developments in this analysis?	For the CPA, AEG developed a preliminary list of efficient measures which assessed their energy saving characteristics, incremental cost, service life, non-energy impacts, and other performance factors. Over 150 unique energy savings measures were considered in the CPA, with permutations across vintage and segment adding up to over 4,000 variations. Following the measure characterization, AEG performed an economic screening of each measure, which serves as the basis for developing the economic and achievable potential scenarios.
121	10/22/2024	Pre-TAG 2	WUTC	Page 30, Some values in this table vary while some do not, why?	The variance that arises depends on the changes that were made between the different scenarios. For example, if HDDs, weather normal inputs, avoided costs, inflation, and demand are all updated then that will produce different results than if only demand is changed. The variables across scenarios will then change based on the correlation with what is being changed.
122	10/22/2024	Pre-TAG 2	WUTC	Page 33, Is cascade doing any equity analysis regarding the sourcing and siting of RNG?	Cascade is currently working with the Equity group in the development of the Distributional Equity Analysis (DEA) along with leadership. The Company has a first draft, however, Cascade is diligently working on identifying all potential areas of reporting that must be considered in the DEA.
123	10/22/2024	Pre-TAG 2	WUTC	Page 34, "Typically priced similar to regional gas pricing" Does this mean that RNG without green attributes has a similar market price as conventional natural gas?	Yes, relative to the basin its closest to.
124	10/22/2024	Pre-TAG 2	WUTC	Page 36, "Principles of RNG Cost-Effectiveness Evaluation" Is RNG being considered on a cost-effective basis or lowest reasonable cost basis?	The first test when evaluating an RNG project is always cost-effectiveness. A cost-effective project would theoretically always want to be acquired, unless there was no identified need for the RNG, and even then, the project should be considered on a non-regulated basis. After testing for cost-effectiveness, the next evaluation is on a lowest reasonable cost basis relative to all other marginal abatement alternatives.
125	10/22/2024	Pre-TAG 2	WUTC	Page 41, "pipelines while maintaining the benefits of reliability and resiliency provided by our distribution system" Is Cascade investigating competing demand for Hydrogen and the impacts that other uses beyond space heating will have on the price and practicality of meeting its customers' demand with hydrogen?	Cascade is utilizing a 3rd party consultant that is providing Hydrogen cost and technical supply projections.
126	10/22/2024	Pre-TAG 2	WUTC	Page 45, What is the cost of synthetic methane?	We're still working with our 3rd party consultants to finalize synthetic methane projections.
127	10/22/2024	Pre-TAG 2	WUTC	Page 45, "Cascade is looking at Carbon Capture for all customers." What might this look like for residential customers?	This has been fixed to indicate that we're only looking at carbon capture on large industrial customers.
128	10/22/2024	Pre-TAG 2	WUTC	Page 47, how does this price forecast compare/contrast to the previous IRP's forecast?	This EIA forecast is comparable to our price forecast used in the 2023 IRP. Prices drop between $2-$4 in the short-to-medium-term and rise to around $4/MMBtu in the long-term.
129	10/22/2024	Pre-TAG 2	WUTC	Page 52, how does this method compare/contrast to the previous IRP's forecast?	The methodology is the same.
130	10/22/2024	Pre-TAG 2	WUTC	Page 54, how does Cascade consider future gas price volatility and the increasing uncertainty the further into the future that the forecast looks?	Cascade will include Monte Carlo simulations on natural gas prices.
	11/8/2024	Post-TAG 2	NWEC	During the second TAG meeting, Cascade showcased an example on Page 16 of the slide deck regarding the purchase limit of available allowances, capping it at 10% of the allowances up for auction. NWEC values the planning team for including this figure, as it was a useful visual aid. In 2024, Washington enacted SB 6058, which initiated several adjustments to the state's carbon market to better align with California and Quebec. This legislation stipulates that, under certain conditions, Cascade would be restricted to acquiring no more than 25% of allowances during an auction. It would be beneficial to create a similar graphic illustrating the purchase limit at this 25% threshold to understand its potential impact on Cascade's Washington IRP action plan in the event of linkage.	Thanks for this information. Cascade has updated it's modeling to reflect the 25% purchase cap.
	11/8/2024	Post-TAG 2	NWEC	NWEC would like to know if the Company has found that purchasing up to the allowance limit is viable as an economic auction strategy. When a covered entity such as Cascade Natural Gas submits bids into a quarterly auction, covered entities submit bids detailing the quantity and price of bids it plans on submitting in the auction. Covered entities can submit more than one bid in an auction. The CCA auction process is not revenue maximizing for the state. Instead, the quarterly CCA auction process is a sealed-bid uniform price auction. Bids are sorted from the largest price bid to the lowest price bid. A fixed quantity of allowances is allocated for each auction. The highest bidder receives their requested quantity of allowances first, and so on until the amount of allowances is fully allocated. The settlement price of the bid is the lowest winning bid. In future CCA compliance periods, Cascade would have to place high-priced bids to guarantee that it receives 100% of available allowances in auctions. NWEC would like the Company thoughts on this being a prudent bidding strategy or if this is an assumption to simplify modeling.	NWECs summary of the CCA auction is accurate. As described in Chapters 4 and 9, Cascade provides a chart that includes the allowance forecast, monte carlo's, as well as the price ceiling along with other low carbon alternative fuels. Throughout the discussion in Chapter 9, Cascade showed that allowances, even at the price ceiling, are generally lower than other compliance options in the near- and mid-planning horizon. Cascade's resource planning strategy in regards to carbon compliance is to acquire the least cost, least risk option, which in many instances is through allowance purchases. Cascade cannot disclose it's bidding strategy.
	11/8/2024	Post-TAG 2	NWEC	NWEC acknowledges that the Climate Protection Program has yet to finalize its rulemaking process. Final guidelines should have included more detailed information regarding CPP compliance and its specific implications for Cascade Natural Gas operations in Oregon. Despite these uncertainties, NWEC finds it plausible to assume that the framework for Community Climate Investments will be a compliance option for the CPP. In this context, NWEC posits that it is reasonable to project limits on the use of CCI credits for compliance purposes, suggesting a threshold of 20% for CCI credits in the initial compliance period of the CPP. NWEC recommends a more conservative limit of 15% for subsequent compliance periods. Furthermore, NWEC advocates for Cascade Natural Gas to consider an updated forecasting approach regarding Oregon's customer growth. Specifically, it is suggested that Cascade should formulate its growth projections under the assumption that the allowance for line extensions—a financial mechanism supporting the expansion of utility infrastructure—will gradually diminish to zero in its preferred or reference customer scenario. This recommendation is informed by the practices of peer utilities in Oregon, such as Avista and NW Natural, which have progressively reduced their line extension allowances in response to direction from the Oregon Public Utility Commission. NWEC is aware that Cascade currently has an LEA for residential customers. Lastly, NWEC is strongly interested in reviewing Cascade's analytical framework surrounding funding opportunities for electrification programs. NWEC is particularly receptive to exploring incentives such as rebates for hybrid heating equipment and water heating solutions.	Cascade can confirm that Cascade's modeling has been updated to reflect the final ruling of the CPP. Cascade is gathering information in order to include line extension allowances as an explanatory variable in the next iteration of the customer forecast model.
	11/8/2024	Post-TAG 2	NWEC	When assessing renewable natural gas (RNG) resources, NWEC believes it would be best helpful to the planning process to consider the impact of changing the carbon intensity factor of RNG. In Washington, the Climate Commitment Act exempts "carbon dioxide emissions from the combustion of biomass, renewable fuels of biogenic origin, or biofuels from any facility, supplier, or first jurisdictional deliverer." Similarly, in Oregon, prior rules under the Climate Protection Program clarify that covered emissions do not include "emissions resulting from the combustion of biomass-derived fuels." These biomass-derived fuels encompass biomethane, biodiesel, renewable diesel, renewable propane, woody biomass, and ethanol. NWEC acknowledges that RNG is currently considered carbon-free according to existing regulations in Washington and Oregon. However, the emission factor for RNG can differ based on the feedstock used. NWEC deems it essential to evaluate this risk and remain vigilant about potential shifts in emission factors and regulations for RNG in the planning process.	Cascade appreciates NWECs comments. Cascade does not include the emission factor of RNG in Resource Planning at this time, however, the Company does consider the emission factor when contracting for RNG.
	11/8/2024	Post-TAG 2	NWEC	If this IRP intends to acquire RNG, NWEC is interested in understanding Cascade's risk assessment methodology between purchasing renewable thermal credits through a contractual agreement and utilizing traditional utility financing to obtain them.	Cascade's action plan does not recommend purchasing RNG in the short term.

Cascade Natural Gas Integrated Resource Planning Feedback Report

Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
	11/8/2024	Post-TAG 2	NWEC	When Cascade evaluates hydrogen resources, NWEC would appreciate more clarity on the cost assumptions the Company is making regarding its electricity acquisition plans. It is NWEC's understanding that clean hydrogen production tax credits are available. Cascade's Washington service territory includes electricity service from Puget Sound Energy, PacifiCorp, and other public power organizations. In Oregon, the service territory involves PacifiCorp, Idaho Power, Hermiston Electric Co-op, and Oregon Trail Electric Co-op. The carbon intensity differs across these territories; generally, public power companies tend to have a lower carbon intensity than their investor-owned counterparts. NWEC seeks detailed insights into Cascade's assumptions about electricity costs associated with hydrogen production. Additionally, NWEC would like to know if Cascade Natural Gas intends to use a book-and-claim system for hydrogen facilities or is only assess system hydrogen resources.	Cascade does include clean hydrogen production tax credits. The Company has consulted with ICF, who has provided Cascade with support on Low Carbon Alternative Fuel (LCAF) projections, including hydrogen. In this analysis, there are assumptions around electric rates. This can be found in Appendix L where ICF discusses their assumptions for LCAFs.
	11/8/2024	Post-TAG 2	NWEC	NWEC understands that Cascade does not own any natural gas storage projects and instead relies on contracted storage at Jackson Prairie and Mist. NWEC values natural gas storage facilities for their reliable and cost-effective services to Cascade's customers. In this IRP, NWEC wishes to explore how the future actions outlined in the action plan might affect Cascade's use of natural gas storage.	As mentioned in the TAG 4 and Chapter 9, Cascade is planning to add additional supply capacity beginning in 2029.
	11/8/2024	Post-TAG 2	NWEC	NWEC appreciates Cascade's efforts to provide information on Thermal Energy Networks in Washington. In the upcoming IRP, NWEC would like to see more details regarding these Thermal Energy Networks' economics and resource characteristics. Furthermore, NWEC inquires whether Cascade also plans to explore Thermal Energy Networks in its Oregon service territory.	Cascade has hired a Geothermal Network manager in January of 2025 who is focusing on TENs projects in both Washington and Oregon. Cascade will likely have limited information in the 2025 IRP on TENs, but anticipates that TENs will be a larger part of future IRPs.
131	1/3/2025	Pre-TAG 3	WUTC	Slide 5 "Cascade is considering removing low carbon alternative fuels from the model that are lower than current market prices" What does this mean?	Some of the ICF projections that were provided for RTCs in 2025 were lower can Cascade was seeing when in talks with RTC producers and marketers. Cascade used the different ICF buckets to blend the values into a reasonable cost assumption.
132	1/3/2025	Pre-TAG 3	WUTC	Slide 5 Why does CNG not anticipate doing CC in the near future? What is the near future? (5 years, 10 years, 20 years)	While carbon capture costs look reasonable through the ICF low carbon alternative fuels, Cascade has had discussions with developers but it doesn't appear a project will be ready to implement prior to 2030.
133	1/3/2025	Pre-TAG 3	WUTC	Slide 6 "Prices are averaged between Northwest and National to reduce model inputs" How do these prices compare	Generally, they're close.
134	1/3/2025	Pre-TAG 3	WUTC	Slide 6 "Cascade is allocated 13% each of Northwest and National" Can you expand on what it means for Cascade to be allocated 13% of national?	National refers to the Low Carbon Alternative Fuels in the rest of the nation (outside the Northwest) that are expected to be available to the Northwest. ICF allocated the National values into a Washington and Oregon share. ICF also put together projections for WA and OR specifically, and called it Northwest. Cascade is expected to get 13% of that percentage alloted to the Northwest share as well as 13% of the Northwest share of the national share.
135	1/3/2025	Pre-TAG 3	WUTC	Slide 6 "All low carbon alternative fuels except Carbon Capture will be evaluated as off-system" Does off system mean that it won't flow in Cascade's distribution system? What are the ramifications of this assumption?	This is correct. At this time, there are no ramifications that Cascade anticipates. In the future, if these are determined to be peak day reliable resources, then it would impact upstream transportation and distribution system modeling.
136	1/3/2025	Pre-TAG 3	WUTC	Slide 6 What is ICF and is there another source of data that CNGC is using for price?	ICF Resources, LLC is their technical name, and they are a business consulting service that proves technical, administrative, and project management support for the public interest energy research program, geothermal resources development account program, and other energy-related research and development activities. Other than market prices that Cascade sees through conversations with brokers and developers on low carbon fuels.
137	1/3/2025	Pre-TAG 3	WUTC	Slide 6 What are some examples of IRA incentives that will be applied?	For hydrogen, there is the 45V tax credit. CCUS, RNG, and RTCs consider the Investment Tax Credit or Production Tax Credit until 2030.
138	1/3/2025	Pre-TAG 3	WUTC	Slide 7 Good charts. "Renewable Natural Gas Prices" Does this include green attributes	These costs are the cost only for the green attribute. These are unbundled and do not include the cost of the gas molecule itself. The reason RNG and RTC are treated separately is because an RTC that is bundled with the gas is generally cheaper than if you're just buying the RTC.
139	1/3/2025	Pre-TAG 3	WUTC	Slide 7 What are the differences between the price models? What are specific examples of differences?	I assume this question is about the difference between the different buckets, like FW-1 vs FW-2 vs FW-3. The difference has to do with the sizing. The smaller the number the smaller the facility.
140	1/3/2025	Pre-TAG 3	WUTC	Slide 8 "Renewable Thermal Credit Prices" Are these unbundled from the gas?	Yes, see the response to Slide 7, first bullet, for more info on RTC vs RNG. This is item number 138 in this sheet.
141	1/3/2025	Pre-TAG 3	WUTC	Slide 8 What are the differences between the price models? What are specific examples of differences?	Again, just the size of the facility.
142	1/3/2025	Pre-TAG 3	WUTC	Slide 8 Waste Water and Landfill Gas seem significantly cheaper, will this change anything in the portfolio?	We haven't finalized the portfolio modeling, but likely this will result in WW and LFG being chosen as the selected RNG and RTC choice, if chosen. This is not different that what Cascade has seen in the current market.
143	1/3/2025	Pre-TAG 3	WUTC	Slide 9 "Synthetic Methane" Can you explain the shape of this plot?	These are just real dollars for the cost of synthetic methane.
144	1/3/2025	Pre-TAG 3	WUTC	Slide 10 Can you please explain why some of the hydrogen fuels appear so cheap on this graph?	We don't expect those hydrogen fuels to be available for a couple of years. In the original graph, the hydrogen fuel prices were incorrectly input as $0 for the first year and slowly ramped up to when hydrogen was first available. The graph has been fixed to remove the pricing before hydrogen is available.
145	1/3/2025	Pre-TAG 3	WUTC	Slide 11 "Cascade had a weighted share of 13% of the Northwest" how important is this assumption to Cascade's forecasting? What happens if this value is higher or lower? Will the value fluctuate and if so how will that be handled?	This value represents the amount of low carbon alternative fuel technical supply that is available to Cascade vs the other utilities in the Northwest. If the value decreases, this would reduce the amount available for Cascade to purchase. Currently, Cascade does not anticipate that value to fluctuate in the 2025 IRP.
146	1/3/2025	Pre-TAG 3	WUTC	Slide 12 Are these graphs scaled to Cascade's 13%? Is there enough at any point in the future to fully decarbonize	Cascade has not completed the full resource integration modeling to determine a response to this at this time.
147	1/3/2025	Pre-TAG 3	WUTC	Slide 18 "There are several hundred air-source heat pump models. Cascade must reduce this for modeling purposes." Which make/model did Cascade select? What was the selection criteria?	In order to keep modeling consistent with other utilities, Cascade chose the same heat pump that Avista is using.
148	1/3/2025	Pre-TAG 3	WUTC	Slide 20 How do these systems' costs compare annually?	This is explained in slide 26.
149	1/3/2025	Pre-TAG 3	WUTC	Slide 24 "Assuming a lognormal distribution with a standard deviation of 1, 41.3%, 24.6%, and 34% of people would fall under the first, second, and third threshold from the above bullet, respectively." Staff understands the need to have a functional assumption for the purposes of modeling. In future IRPs, getting actual distributional data may be a useful incremental improvement.	Agreed. Cascade will look into this further. I'll also note that this is merely a calculation exercise to understand the impact of the IRA dollar allocation and how that impacts the number of projects that can be done.
150	1/3/2025	Pre-TAG 3	WUTC	Slide 24 Will CNGC be modeling effects from the CCA in line with IRA rebates and incentives?	The intent of having a low-income residential vs residential for the gas when comparing electrification costs, this is the goal.
151	1/3/2025	Pre-TAG 3	WUTC	Slide 26 "Annual Cost Preliminary Results (Whole Home)" Annual cost of what? The following graphs could benefit from more explanation.	Cascade has added narrative to the resource integration chapter that discusses electrification modeling.
152	1/8/2025	Post-TAG 3	WUTC	Slide 6 "All low carbon alternative fuels except Carbon Capture will be evaluated as off-system" Staff would like to know what "off-system" means in this case. Is it Cascade's plan to purchase non-conventional fuels and circulate those fuels in its distribution system to avoid emissions, to purchase RTCs to offset emissions, or a combination of the two? At what point will these resources start to become peak day resources?	Off-system means that the company would use book and claim to purchase the renewable thermal credits needed to offset emissions. Outside of RNG, Cascade is not looking at purchasing non-conventional fuels and circulating those fuels on the Company's distribution system. Cascade recently added RNG projects to the system and will evaluate how well these projects do in peak conditions to see if these facilities are reliable under a peak event. There is no timetable to determine this as these results are dependent on weather.
153	1/8/2025	Post-TAG 3	WUTC	Slide 7 Staff appreciates the comparison of various alternative fuel inputs. For the IRP, Staff would appreciate a graph that shows the anticipated prices of the less expensive alternative fuels compared to natural gas (combined with CCA compliance costs). Comparisons like this may be helpful for Staff and interested parties reviewing the IRP's lowest reasonable cost findings.	Cascade will aim to include a comparison of this in the IRP.
154	1/8/2025	Post-TAG 3	WUTC	Slide 11 Do volumes for the purpose of this analysis include transportation customers or is it only metered customers? If it does not include transportation customers how would that change the analysis? How broadly are other industrial customers considered for this analysis.	This includes all customers, transport and core customers.
155	1/8/2025	Post-TAG 3	WUTC	Slide 11 How important is the 13% weighted share to Cascade's analysis? If the share is larger or smaller how might this impact Cascade's portfolio? In the previous IRP Cascade discussed the compliance strategy of aggressively acquiring CCA allowances early. Might a similar logic apply to non-conventional fuels?	The 13% determines the potential supply Cascade has to the projected low carbon alternative fuels. Cascade will provide scenario analysis around the reference case with different weights. The previous IRP included a compliance strategy that aggressively acquired CCA allowances because of the relative cost of an allowance vs a low carbon alternative fuel. This is the same case for the 2025 IRP. Cascade would appreciate Staff's thoughts on aggressively pursuing non-conventional fuels that may not be the least cost option when compared to a CCA allowance.
156	1/8/2025	Post-TAG 3	WUTC	Slide 24 Staff encourages Cascade to decide on interest rate assumptions for electrification measures. Traditional bank loans and HELOC rates might be some rates to look into depending on where installation costs seem to fall.	Thanks for that feedback.
157	1/8/2025	Post-TAG 3	WUTC	Slide 24 Staff is encouraged by Cascade considering the distribution of income groups in its service territory. Staff looks forward to seeing how Cascade refines this analysis in future IRPs.	Cascade appreciates the feedback. I will reiterate that this is the first time Cascade has modeled electrification in the IRP and welcomes any and all feedback in order to improve the modeling.
158	1/8/2025	Post-TAG 3	WUTC	Will CNG be considering a reduction in installation costs with the possibility of the SHEAP program funded through the CCA like it is with IRA funding?	The Resource Planning team was not aware of the SHEAP program so we appreciate you putting this on our radar. The Company will need to do some research and understand how this can apply and intertwine with the IRA funding. Cascade will give it's best effort to include it in this IRP.
159	2/4/2025	Pre-TAG 4	WUTC	Slide 5 The decrease in demand appears to be the result of DSM. Are there other losses and gains of demand that are not readily apparent here? In this chart, the decrease is from DSM.	Cascade does include a low case where there is naturally occurring decline in customer counts. Cascade will also utilize bill impacts in the electrification model.

Cascade Natural Gas Integrated Resource Planning Feedback Report

Item #	Date	TAG Meeting	Name/Company	Comment/Question	Cascade Response
160	2/4/2025	Pre-TAG 4	WUTC	Slide 5 Does DSM in this graph account for the increased cost of CCA compliance and RNG/RTC/CCUS?	The avoided cost included the Social Cost of Carbon as well as the Company's highest marginal compliance cost. At the time of doing the avoided cost, Cascade only had compliance results from the 2023 IRP and therefore, utilized allowances as the marginal compliance cost.
161	2/4/2025	Pre-TAG 4	WUTC	Slide 5 The graph appears to consider the acquisition of offsets this year. What offsets is Cascade considering? Will Cascade's process for considering offsets mirror its discussion of RNG?	Cascade is not currently looking at developing any offset programs, but rather procuring offsets from the market similar to how the Company evaluates secondary market allowance purchases. As such, Cascade is agnostic to the typic of offset, so long as it complies with the WA CCA. While the Company will evaluate all types of offsets in terms of invalidation period, Cascade expects to prioritize Golden Offsets to mitigate invalidation risk, so long as they are price competitive. At this time, offsets are a supplemental resource with Allowances, so the evaluation of the procurement of offsets is done relative to allowances as opposed to RNG. Additionally, since there is not currently a robust Offset market, it is difficult to do alternatives analyses with Offsets as the Company would do with RNG.
162	2/4/2025	Pre-TAG 4	WUTC	Slide 6 If Cascade adopts RNG/RTC in Oregon like this, how will this impact rate payers in Washington? If Customers respond to these costs by electrifying then what might happen to Washington rate payers? Are Washington customers in Walla Walla vulnerable to stranded fixed costs in Bend?	No impact on WA for CPP. Each state's recovery of CPP and CCA are independent. As the RNG portfolio grows Cascade will continue to evaluate which state will utilize the resource in order to assign the assets. If the assignment changes over time, a deferral request in each state would be needed to match the recovery of the asset with the use of the associated attributes. WA rate payers, such as Walla Walla rate payers, could be impacted by reallocations of certain assets. Certain asset classes are allocated by customer counts. Some general assets are allocated using the three-factor formula which uses customers as one of the three factors. Of course, the company would constantly be looking at selling such assets if not used and useful.
163	2/4/2025	Pre-TAG 4	WUTC	Slide 7 Why do WA Auction and WA Offsets drop around 2035/6?	This has to do with several climate goals in WA State that have a target or a goal set in 2035 as part of the broader goal of achieving a 95% reduction by 2050. For example, the Zero-Emission Vehicles policy states that new light-duty cars and trucks sold in WA must be zero-emissions vehicles after 2035. There is also a level of uncertainty around linkage with the CA/Quebec allowance market as well.
164	2/4/2025	Pre-TAG 4	WUTC	Slide 8 Why do the values appear to bottleneck around 2042/3 The monte carlo pricing profiles are tethered to the expected allowance forecast that is seen on slide 7.	Since the expected forecast drops while the allowance floor price rises, this gives the appearance of a bottleneck.
165	2/4/2025	Pre-TAG 4	WUTC	Slide 8 Why do the values appear to spread out in the last 5 years?	The values provided by ICF were in real dollars, which were then adjusted to nominal dollars for inclusion in Cascade's modeling. When adjusting to nominal dollars, this has created a widening in costs over time.
166	2/4/2025	Pre-TAG 4	WUTC	Slide 8 "Cascade utilized returns (quarter over quarter changes) from the California/Quebec auction as a proxy for standard deviation." Are these values log normally distributed similar to historical prices changes? Is there any historical trend in the data?	The returns, or quarter over quarter percentage change, were considered normally distributed, which results in a log normal price change. The Monte Carlo simulations utilize the Geometric Brownian Motion (GBM) to develop random movement of allowance pricing. With the GBM, the allowance forecast, which likely includes historical trends, is used as the trend (drift) term.
167	2/4/2025	Pre-TAG 4	WUTC	Slide 8 Does this data account for the Quebec, CA, and WA carbon markets eventually integrating?	There is a level of uncertainty around linkage that is baked into the expected allowance price forecast, which in turn is utilized in the Monte Carlo pricing profiles.
168	2/4/2025	Pre-TAG 4	WUTC	Slide 12 The graph appears to show a greater adoption of RNG/RTC/CCUS under low growth conditions relative to high growth. Why?	This is due to the availability of lower cost RNG/RTC/CCUS resources still available in future years.
169	2/4/2025	Pre-TAG 4	WUTC	Slide 12 Between 2047 and 2050 the amount of RNG/RTC/CCUS and Purchased allowances go up and down. Is this actionable? Why do these values move this way? This happens in the Oregon slide as well.	Cascade is an active participant in low carbon markets and expects to be in the future for current and evolving markets as would be the case for CCUS. This would allow the company to be price responsive to the lowest cost resources for its customers, as the Company would expect to implement a strategy similar to its current hedging philosophy, where certain volume targets would be procured in advance while others would be procured on a shorter-term basis.
170	2/4/2025	Pre-TAG 4	WUTC	Slide 14 Why do customer bills increase until around 2040 and then decline?	This is due to Plexos optimizing in a way that may not be totally realistic. Plexos, in general, will optimize allowance banking in both Washington and Oregon in order to avoid paying for the more expensive options in the future. Cascade has levelized these results, however, it's not totally unreasonable to expect a slight decline when banked allowances are finally utilized.
171	2/4/2025	Pre-TAG 4	WUTC	"Cascade expects average bills to double from 2025 to 2050 under the reference case." Does Cascade anticipate any customer flight from this?	Cascade is still finalizing the electrification model and will have results for the Draft IRP.
172	2/14/2025	Post-TAG 4	WUTC	Slide 5, What offsets is Cascade currently looking to add to its portfolio?	1) Cascade is currently looking at any and all offsets that qualify for the WA CCA, which are referred to as Washington Carbon Offsets, or WCOs, in the market. Cascade is agnostic to the type of offset, as long as it meets WA CCA guidelines for offsets, which typically fall under one of four categories a)US Forestry b) Urban Forestry c) Livestock Projects d)Ozone Depleting Substances. Additionally, there are different levels of protection you can purchase an offset with based on how long claw back exposure is shifted from the buyer to the seller. This element ranges from a WCO-8 - where the buyer has 8 years of claw back risk from the project being found to not generate the amount of offsets expected - to Golden WCOs - where that liability is fully shifted to the seller. Being more risk adverse, Cascade is more than likely to procure golden WCOs, but this is an economic decision that depends on the premium Cascade would have to pay for this extra level of protection for its customers. Cascade is looking to acquire offsets as soon as May 2025.
173	2/14/2025	Post-TAG 4	WUTC	DSM appears to be the only loss of demand. Are there other losses and gains to demand that may not be readily apparent?	DSM is the main loss of demand in the reference case and high growth.
174	2/14/2025	Post-TAG 4	WUTC	Slide 6, Are there any collateral impacts to Washington ratepayers if Oregon adopts the resources in this graph? Are there any risks to Washington ratepayers if Oregon ratepayers respond to this portfolio selection by electrifying?	No impact on WA for CPP. Each state's recovery of CPP and CCA are independent. As the RNG portfolio grows Cascade will continue to evaluate which state will utilize the resource in order to assign the assets. If the assignment changes over time, a deferral request in each state would be needed to match the recovery of the asset with the use of the associated attributes. WA rate payers, such as Walla Walla rate payers, could be impacted by reallocations of certain assets. Certain asset classes are allocated by customer counts. Some general assets are allocated using the three-factor formula which uses customers as one of the three factors. Of course, the company would constantly be looking at selling such assets if not used and useful.
175	2/14/2025	Post-TAG 4	WUTC	Staff is not sure the assumption around lowering of auction prices as a result of allowance buyers dropping out because they decarbonize is a sound assumption. Staff would like to see the information that CNGC staff is using to make that assumption.	Cascade will clarify that the expectation is not that buyers will withdraw, but rather that their demand will decrease as allowance costs rise. This is mainly due to the marginal abatement costs, primarily low carbon alternative fules that impact the transportation and electric sectors, will become more cost-effective.
176	2/14/2025	Post-TAG 4	WUTC	If the above assumption is relaxed and WA Auction continues to increase after 2030 similar to how it increased before 2030, what impact would that have on the portfolio selected by Cascade on slide 5	These assumptions are tested in the monte carlo analysis of low carbon alternative fuels as Cascade also includes monte carlo's on allowance pricing.
177	2/14/2025	Post-TAG 4	WUTC	Slide 8, The graph appears to bottleneck around 2043, what are the causes for this apparent narrowing of values?	See item 175.
178	2/14/2025	Post-TAG 4	WUTC	Slide 12, Why does the low customer growth scenario appear to result in more RNG being selected relative to the high customer growth scenario?	This is due to the availability of lower cost RNG/RTC/CCUS resources still available in future years.
179	2/14/2025	Post-TAG 4	WUTC	In the last few years the amount of RNG goes up and down, why?	This is due to Plexos optimizing in a way that may not be totally realistic. Plexos, in general, will optimize allowance banking in both Washington and Oregon in order to avoid paying for the more expensive options in the future. It's important to remember that Plexos results provide helpful information, but Cascade must utilize that information in a more practical manner. Cascade will likely take a much more balanced approach in reality. Cascade has levelized the total system cost results in order to show the more balanced approach.
180	2/14/2025	Post-TAG 4	WUTC	Slide 13, similar to slide 12, this graph goes up and down during the last few years, is such volatility actionable? Does Cascade consider RNG to be responsive to demand in this way? Or is RNG more typically purchased in long term contracts more akin to yearly supply contracts?	As mentioned in response to item 179, Cascade will likely take a more balanced approach than the results Plexos is providing. Yes, RNG is more typically purchased as long term contracts. However, it's not uncommon to find short term
181	2/14/2025	Post-TAG 4	WUTC	Slide 14, why does incremental annual spike around 2045?	This is due to Plexos optimizing in a way that may not be totally realistic. Plexos, in general, will optimize allowance banking in both Washington and Oregon in order to avoid paying for the more expensive options in the future. It's important to remember that Plexos results provide helpful information, but Cascade must utilize that information in a more practical manner. Cascade levelized the total system cost results in order to show the more balanced approach, which resulted in bill impacts to be at the highest level in 2045 and a levelized impact for the final five years.
182	2/14/2025	Post-TAG 4	WUTC	Staff will follow up with information on TENs. We would like to see if they do show up as a generic resource.	Cascade appreciates the information that Staff has shared with Cascade. The Company just recently hired a TENs manager and will actively work with the new manager in determining how TENs best fits in the Company's plans. Cascade will likely have limited information in the 2025 IRP, but expects TENs to have a much larger roll in future IRPs.
183	2/14/2025	Post-TAG 4	WUTC	Slide 23, "We export current CC&B billing data to CMM to create an updated demands file" Staff sees many benefits if these data were applied to the electrification analysis contained in TAG 3. Particular the analysis in slides "Annual Cost Preliminary Results", and "Levelized Cost Preliminary Results". Understanding the distribution of comparative levelized costs might be useful to understanding the spectrum of customer responses. Staff believes this would be an important step toward recognition justice and distributional justice. Staff highlights this as a paramount recommendation for the 2027 IRP process.	Thanks for this recommendation.
184	2/14/2025	Post-TAG 4	WUTC	Slide 41, "Segment of pipe that minimizes environmental concerns and impacts to the community" Staff would appreciate this being explained in detail in the IRP. There is a lot of opportunity for Cascade to demonstrate its ongoing application of energy justice and equity principles in this topic, or for Cascade to seek feedback for improvement to demonstrate its desire to work toward equity and energy justice.	Cascade has added narrative to the distribution system planning chapter.
185	2/14/2025	Post-TAG 4	WUTC	Slide 46, "Provides capacity for continued growth in Aberdeen" does Cascade anticipate growth in some areas but not others?	The level of anticipation depends on the building codes and if they continue as is. Cascade has always had varying levels in growth, for example Richland, WA had over 4% growth from 2018-2022 while an area like Walla Walla, WA only saw growth of about 1.5% in that same timeframe, even with the relative proximity of the two cities. The gap between cities growth rate has shrunk, mainly due to the limitations that building codes have put on adding new construction buildings. In 2024, Richland saw 2% growth while Walla Walla saw .2% growth, for example.
186	2/14/2025	Post-TAG 4	WUTC	Slide 47, "Solves capacity deficit in Richland and provides a back feed to Richland HP" Is this a current deficit or a forecasted deficit?	This is a current deficit.
187	2/14/2025	Post-TAG 4	WUTC	Slide 48, "Addresses high pressure capacity deficit in Pasco" Is this a current deficit or a forecasted deficit?	This is a current deficit.
188	2/14/2025	Post-TAG 4	WUTC	Staff is curious about what modeling results would look like if CNGC modeled more storage and is also curious about the possibility of CNGC adding company-owned storage resources.	Currently, Cascade doesn't have any additional storage opportunities to model. As mentioned during TAG 4, Cascade has been looking for storage opportunities for several years, however, the demand for storage is extremely high and availability of storage is scarce. Cascade won't have time to model company-owned storage during the 2025 IRP, but the Company will consider this feedback for future IRPs.