



# Oregon

Kate Brown, Governor

## Public Utility Commission

201 High St SE Suite 100

Salem, OR 97301

**Mailing Address:** PO Box 1088

Salem, OR 97308-1088

**Consumer Services**

1-800-522-2404

Local: 503-378-6600

**Administrative Services**

503-373-7394

November 20, 2020

***Via Electronic Filing &  
Huddle Workspace***

OREGON PUBLIC UTILITY COMMISSION  
ATTENTION: FILING CENTER  
PO BOX: 1088  
SALEM OR 97308-1088

**RE: Docket No. LC 76 – In the Matter of CASCADE NATURAL GAS CORPORATION, 2020 Integrated Resource Plan.**

Attached for filing are the following:  
Staff's Redacted Opening Comments (pages 7, 9, 10, Figure 6 of page 19, pages 20 and 22 has confidential information);  
Included with the comments are Attachment 1 and Public version of Attachment 2.

Also included with this filing are LC 76 Service List and Certificate of Service.

Parties with signatory page on file will receive a notification to retrieve the confidential version from Huddle workspace:

LC 076 (2) – Staff Comments (Service List Parties Only)

*/s/ Kay Barnes*

Kay Barnes

PUC- Utility Program

(971) 375-5079

kay.barnes@state.or.us

CERTIFICATE OF SERVICE

LC 76

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

Dated this 20<sup>th</sup> day of November, 2020 at Salem, Oregon

*/s/ Kay Barnes*

---

Kay Barnes  
Public Utility Commission  
201 High Street SE Suite 100  
Salem, Oregon 97301-3612  
Telephone: (971) 375-5079

LC 76 SERVICE LIST

<b>AWEC</b>	
EDWARD FINKLEA ALLIANCE OF WESTERN ENERGY CONSUMERS	545 GRANDVIEW DR ASHLAND OR 97520 efinklea@awec.solutions
CHAD M STOKES (C) CABLE HUSTON LLP	1455 SW BROADWAY STE 1500 PORTLAND OR 97201 cstokes@cablehuston.com
<b>CASCADE NATURAL GAS CORPORATION</b>	
CASCADE NATURAL GAS	8113 W GRANDRIDGE BLVD KENNEWICK WA 99336 cngcregulatory@cngc.com
MICHAEL PARVINEN CASCADE NATURAL GAS	8113 W GRANDRIDGE BLVD KENNEWICK WA 99336-7166 michael.parvinen@cngc.com
MARK SELLERS-VAUGHN CASCADE NATURAL GAS	8113 W GRANDRIDGE BLVD KENNEWICK WA 99336 mark.sellers-vaughn@cngc.com
<b>OREGON CITIZENS UTILITY BOARD</b>	
OREGON CITIZENS' UTILITY BOARD	610 SW BROADWAY, STE 400 PORTLAND OR 97205 dockets@oregoncub.org
MICHAEL GOETZ (C) OREGON CITIZENS' UTILITY BOARD	610 SW BROADWAY STE 400 PORTLAND OR 97205 mike@oregoncub.org
SUDESHNA PAL (C) OREGON CITIZENS UTILITY BOARD	sudeshna@oregoncub.org
<b>STAFF</b>	
JILL D GOATCHER (C) PUC STAFF--DEPARTMENT OF JUSTICE	BUSINESS ACTIVITIES SECTION 1162 COURT ST NE SALEM OR 97301-4096 jill.d.goatcher@doj.state.or.us
NADINE HANHAN (C) PUBLIC UTILITY COMMISSION OF OREGON	PO BOX 1088 SALEM OR 97308-1088 nadine.hanhan@state.or.us

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

Docket No. LC 76

In the Matter of

CASCADE NATURAL GAS  
CORPORATION,

2020 Integrated Resource Plan.

Staff's Opening Comments

# Table of Contents

- Introduction ..... 3
  - Company Overview ..... 3
- Demand Forecast ..... 4
  - Forecast Methodology ..... 4
    - Staff generally supports the changes in demand forecast methodology. .... 4
    - Improvements to consider ..... 5
- Supply Side Resources ..... 6
  - Natural Gas Price Forecast ..... 6
    - Cascade's extrapolation of NYMEX futures prices is inappropriate. .... 7
    - Futures prices are not known to be a good predictor of long-term natural gas prices. .... 8
    - Cascade's Age Dampening Mechanism (ADM) is unreasonable as proposed. .... 9
    - The natural gas price forecast should be updated to address Staff's concerns. .... 10
- Energy Efficiency ..... 10
  - 2018 IRP Recommendations ..... 10
  - Energy Efficiency in the 2020 IRP ..... 11
  - Avoided Costs ..... 14
    - 2018 IRP Recommendations ..... 14
    - Avoided Cost Methodology addressed in UM 1893..... 15
- Renewable Natural Gas ..... 15
  - Energy Policies..... 15
    - Compliance with Governor Brown's Executive Order 20-04 (EO 20-04)..... 15
  - Project Value & Cost Effectiveness ..... 16
    - Carbon Intensity..... 16
    - Cost Effectiveness ..... 17
- Distribution System Planning ..... 18
  - Projects that are complete, substantially complete, or settled in the rate case should not be acknowledged. .... 19
  - The Company should bolster details for Action Items in Reply Comments. .... 21
- Resource Integration and Portfolio Modeling ..... 23
  - NYMEX gas prices simulation ..... 23
  - Weather simulation..... 24
- Portfolio Evaluation ..... 25
- Action Plan and Conclusion ..... 26

## Introduction

The Public Utility Commission of Oregon (OPUC or Commission) Staff files these initial comments on the Cascade Natural Gas (Cascade, CNG, or Company) 2020 Integrated Resource Plan (IRP or Plan), filed in Docket No. LC 76 on July 31, 2020. The Commission is currently scheduled to make a decision on whether to acknowledge the IRP at the regular public meeting on April 27, 2021. Cascade has worked with Staff to improve upon the 2018 IRP

(LC 69). Staff recognizes Cascade for its improvements in technical modelling and planning for its 2020 IRP. The Company initiated a series of informal technical working group meetings throughout the process, and various participants attended these technical meetings. In

May 2020, following the technical working group meetings, Cascade circulated a draft IRP for informal stakeholder comment. Appendix K of the IRP contains Staff's comments on the draft IRP and Cascade's responses.

Staff's comments are organized according to subject and detail Staff's primary areas of focus for these initial comments. Staff will also address the Company's response to Staff recommendations from the 2018 IRP throughout these comments, and Staff continues to evaluate the Company's Plan, conduct discovery, and will review the participants' comments prior to issuing final comments and recommendations in March 2021.

## Company Overview

Cascade's service area consists primarily of small, rural communities in Central and Eastern Oregon, as well as communities across Washington, and also includes the city of Bend. It delivers natural gas service to more than 299,000 customers with approximately 77,000 of those customers located in Oregon.<sup>1</sup> The Company's Oregon service territory is located primarily in the communities in and surrounding Bend, Ontario, Baker City, and the Pendleton/Hermiston areas.<sup>2</sup> The Company indicates that as of fourth quarter 2019, its core customers make up about 25 percent of total natural gas delivered on its system (13 percent residential, 10 percent commercial, and 2 percent core industrial), with the remaining non-core industrial customers representing about 75 percent of gas usage.<sup>3</sup> Core customers consist of gas users who take all their service from Cascade (e.g., upstream service and directly from Cascade as end-users). Non-core customers are large volume transportation customers who purchase their own gas supplies and transportation services upstream of Cascade's distribution system.<sup>4</sup>

---

<sup>1</sup> LC 76 – Cascade 2020 IRP, page 2-2.

<sup>2</sup> LC 76 – Cascade 2020 IRP, page 2-3.

<sup>3</sup> LC 76 – Cascade 2020 IRP, page 2-5.

<sup>4</sup> LC 76 – Cascade 2020 IRP, page 2-5.

## Demand Forecast

### Forecast Methodology

In Staff's 2018 Comments, Staff recommended several demand forecasting changes for the 2020 IRP. In the 2018 IRP, Staff recommended that the Company amend its forecasts to describe and utilize a process that checks for autocorrelation and uses an automated stepwise regression function available in a software package. Further, Staff recommended that the Company provide all input files, including load forecasting files, with its initial IRP filing to allow Staff to replicate the Company's analysis. Finally, Staff recommended that the Company use city- and town-level usage data rather than citygate level data to avoid having to allocate customers to a citygate, and that the Company use a more flexible price elasticity of demand.

**Staff generally supports the changes in demand forecast methodology.**

While some of the requests and recommendations did not carry forward into the Initial Application, the Company nevertheless made significant improvements to its explanatory variable process in the 2020 IRP with significant modifications to its forecasting method. In general, Staff supports the changes. In Appendix K, Cascade states that its residuals are tested for autocorrelation using the auto.arima functionality within the "forecast" package of R Studio, which is a stepwise regression function.<sup>5</sup> This is an improvement and satisfies Staff's recommendation.

In general, Staff supports the demand forecast changes the Company has made in this IRP. Staff is especially pleased with the Company's use of cross-validation techniques to test its forecasting models. For example, in response to Staff IR 54, Cascade writes:

...with historical data beginning in 2015, Cascade would generate a model using consistent methodology with only data from 2015-2016, and then forecast 2017-2020 values. This forecast was then compared with actual data from 2017-2020. Statistics such as MAPE [Mean Absolute Percentage Error] were recorded for comparison. Cascade then repeated this for multiple ranges of data, 2015 to 2017, 2015 to 2018, and 2015 to 2019. Cascade also added another element of cross-validation by adding 2020 data that was not included in the original forecast model because the forecast is developed at a point in time. This provides two ways that Cascade can validate a model: 1) Using different sets of training data and comparing to actual historic usage and 2) Comparing the final model's performance to recent historical usage with data exogenous to the model.

In this way, the Company was able to "check" its forecasting methodology on real-world data. Staff believes that this out-of-sample model testing<sup>6</sup> used by Cascade in this IRP

---

<sup>5</sup> LC 76 – Cascade 2020 IRP, Appendix K, page 7.

<sup>6</sup> For an explanation of out-of-sample model validation, see <https://select-statistics.co.uk/blog/approaches-to-model-validation/#:~:text=from%20the%20model,-Out%2Dof%2Dsample%20validation,%3A%20its%20%E2%80%9Cpredictive%20performance%E2%80%9D>.

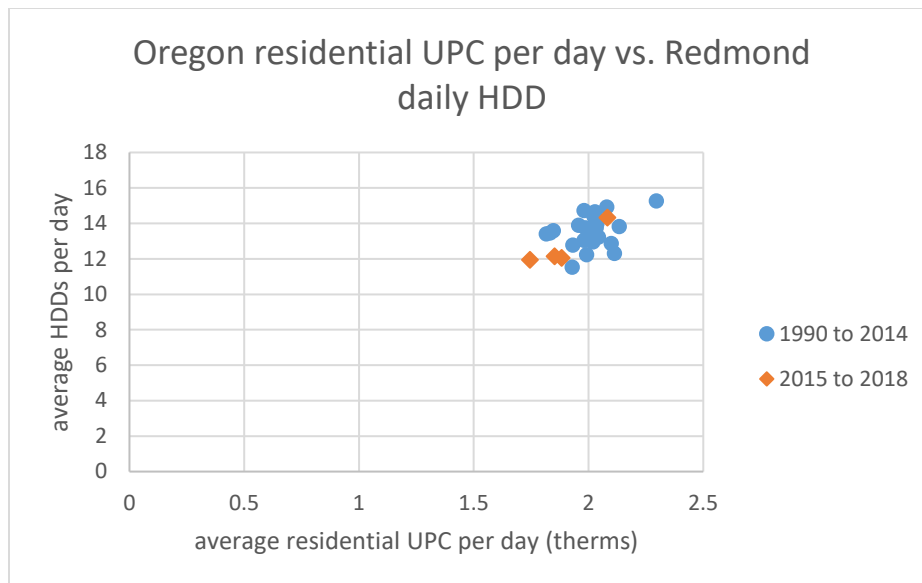
can be an example that other Investor Owned Utilities (IOUs) can follow, and Staff plans to encourage Oregon’s other IOUs to follow the Company’s lead in this respect.

### Improvements to consider

While the Company has improved its forecasting methodology, it has simultaneously reduced the number of months of historical data that are used. This IRP is the first time the Company uses ThoughtSpot data to better match daily usage to monthly rate schedule usage. Staff supported this change—that is, incorporating citygate information in a way that removes the need for its current allocation method—in Staff’s Comments on Cascade’s 2018 IRP. While the Company indicates that it is now able to pull monthly billing data for the IRP to avoid having to allocate customer data to a citygate,<sup>7</sup> the downside of this change is that only four years (48 months) of data are used. At a load forecasting technical workshop with the Company, Staff’s primary concern was that this might not be enough historical data to fully capture the relationship between weather and demand.

Staff recommends that the Company show that the new methodology is better overall. Specifically, the Company should show that its forecasts can capture the impact of extreme weather events given that it is only using four years of weather data. The scatterplot below depicts weather average daily Heating Degree Days (HDDs) versus annual residential use-per-customer (UPC) divided by 365 (366 for leap years) since 1990.<sup>8</sup>

Figure 1– Oregon Residential UPC Per Day vs. Redmond Daily HDD



The scatterplot above shows that years that are colder on average have higher gas usage per residential customer. Although averaging over an entire year is a crude

<sup>7</sup> LC 76 – Cascade 2020 IRP, Appendix K, page 7.

<sup>8</sup> The HDDs are found in Cascade’s IR 55 response. The residential UPC values are from the 1999, 2009, and 2019 PUC Utility Statistics books.



measure, the scatterplot also hints that a forecasting model that computes the sensitivity of gas usage to weather might compute significantly different sensitivities depending on which years of data are used in the model. Using a forecasting model that can use a longer historical series of weather data would provide a more robust measure of the relationship between gas usage and weather.

Regarding the remaining recommendations, it appears that the Company does not use price as an explanatory variable in its 2020 IRP demand forecasts, so Staff could not confirm the Company's response to Staff's price elasticity recommendation. The Company also did not provide its workpapers along with its Initial Application, though it did provide load forecasting workpapers in response to Staff IR 24.

Below are Staff's recommendations for the Company's Reply Comments:

- The Company should consider including a price variable in its next IRP;
- The Company should provide its load forecasting workpapers that support its initial filing;
- The Company should address why the new methodology is better overall. Specifically, the Company should show that its forecasts can capture the impact of extreme weather events given that it is only using four years of weather data. One method of comparison between potential models would be to compute measures of out-of-sample model accuracy for both Cascade's current forecasting model versus a forecasting model similar to the one used in its last IRP (which used additional years of data but which was less granular).

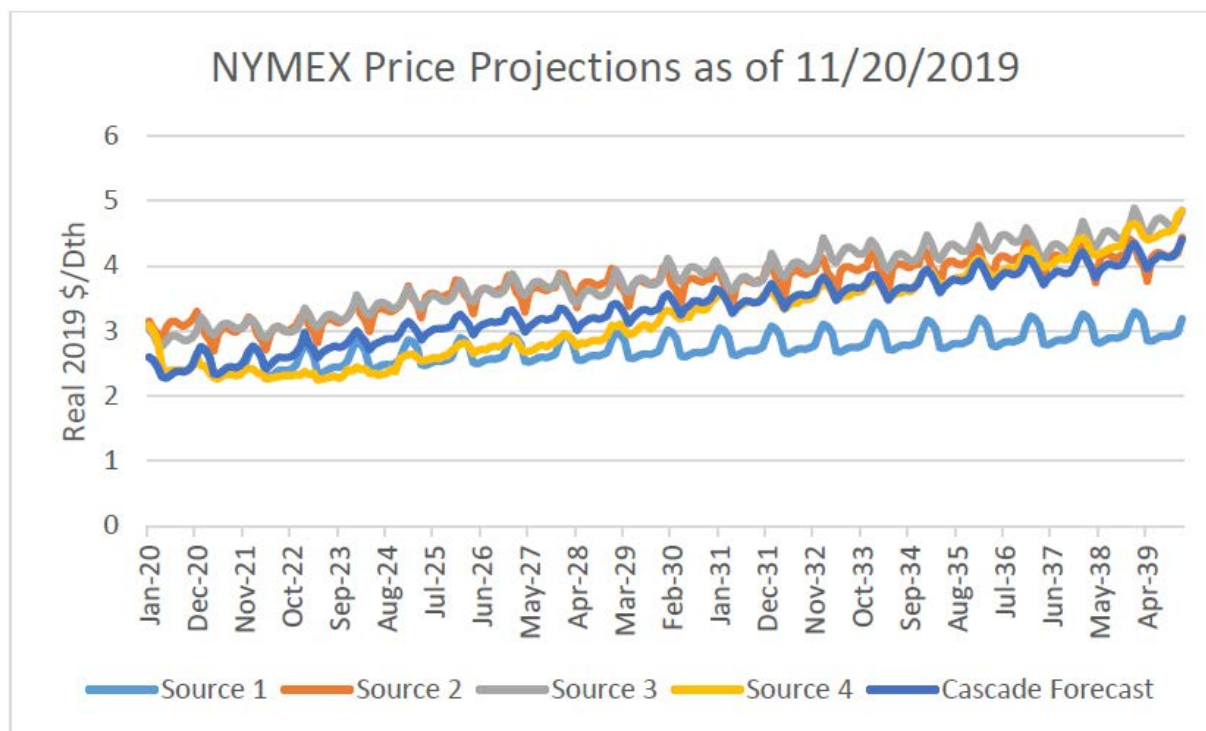
## Supply Side Resources

### Natural Gas Price Forecast

Chapter 4 of the 2020 IRP includes an explanation of the Company's natural gas price forecast. To summarize, the forecast is a blend of four separate price forecasts:

1. Near-term NYMEX natural gas futures prices extrapolated to the end of the planning horizon;
2. A market fundamentals-based price forecast by Wood Mackenzie;
3. The Energy Information Agency's (EIA) long term natural gas price forecast; and
4. Northwest Power and Conservation Council's (NWPCC) long term natural gas price forecast.

Figure 2– Price Projections<sup>9</sup>



Each forecast is weighted based on Cascade’s estimate of its historical accuracy, and the weighted forecasts are blended to create the Cascade Forecast.

Cascade’s extrapolation of NYMEX futures prices is inappropriate.

Staff generally does not take issue with the blending of several forecasts to generate a price forecast. However, Staff is worried about the Company’s implementation of the blended forecast for two reasons. First, it inappropriately uses an extrapolation of NYMEX futures prices as one of the long-term price forecasts ([Begin Confidential] [Redacted] [End Confidential]) in the graph above). Second, it introduces an Age Dampening Mechanism (ADM) that assigns an excessive weight to the NYMEX-futures-based forecast.

The natural gas commodity price forecast is an important element in avoided cost calculations for energy efficiency and Renewable Natural Gas (RNG). The forecast heavily informs considerations of whether to acquire new efficiency and RNG projects. Staff requests that the Company file an updated natural gas price forecast with its LC 76 Reply Comments that addresses the overweighting of a single forecast.

While Staff finds it important to file an updated natural gas price forecast to inform future avoided cost calculations, Staff does not expect the Company to re-do the 2020 IRP portfolio modeling. Natural gas prices are generally not an important factor in the storage and transportation resource decisions made within the 2020 IRP portfolio

<sup>9</sup> LC 76 - Cascade 2020 IRP, page 4-11.

modeling process in the sense that the need to store and transport gas resources is largely independent of natural gas prices. Additionally, the Energy Trust of Oregon selects the right amount of energy efficiency based on the most up-to-date information in avoided cost filings, and Cascade has not yet integrated RNG supply side options into its portfolio modeling as NW Natural did in its 2018 IRP. While re-running the IRP portfolio analysis will most likely have limited impact on overall resource planning and portfolio selection in this IRP, Staff is still interested in an updated gas price forecast with the corrections above, in addition to an analysis, to understand the impact on avoided costs.

#### Futures prices are not known to be a good predictor of long-term natural gas prices.

One of the four price forecasts used by Cascade is based on NYMEX futures prices, also referred to as forward prices in the Company's IRP. In the NYMEX-futures-based price path, the Company uses an extrapolation of available *near-term* futures contract prices to predict *long-term* natural gas prices. This practice is concerning to Staff. Futures market liquidity decreases with time, and there currently are very few contracts traded with delivery dates beyond 2024.<sup>10</sup> Correspondingly, Cascade's futures price forecast stops using actual futures data after 2025, and begins escalating the 2025 futures prices by a forecast of GDP growth over the last fourteen years of the planning horizon.

Academic literature has shown that, in early years, futures prices can be about as accurate as economic forecasts at predicting prices.<sup>11</sup> Futures market participants generally adjust their contract prices to take into account their expectations about future supply and demand conditions.<sup>12</sup> However, futures prices are not commonly considered when forecasting prices more than six years into the future, partially because there is extremely limited data available. In Staff's review of the academic literature, no research was found that tested the accuracy of extrapolated futures prices as a long-term predictor of natural gas prices.

Staff finds that a forecast assuming gas prices will escalate at the expected rate of GDP growth for fourteen years is inappropriate. There is a wealth of other information to consider when forecasting prices. For example, Avista's 2018 IRP noted the wide range of information considered over the planning timeframe, including "regional supply/demand issues, weather conditions, storage levels, natural gas-fired generation, infrastructure disruptions, and infrastructure additions."<sup>13</sup> These considerations are all lacking in a simple escalation of near-term NYMEX futures prices.

---

<sup>10</sup> CME Group. Henry Hub Natural Gas Futures Quotes. Accessed on November 5, 2020 at: <https://www.cmegroup.com/trading/energy/natural-gas/natural-gas.html>.

<sup>11</sup> Wong-Parodi, G., Dale, L., & Lekov, A. Comparing Price Forecast Accuracy of Natural Gas Models and Futures Markets. Lawrence Berkeley National Laboratory. Page 4.

<sup>12</sup> Reeve, T. A. & Vigfusson, R. J. Evaluating the Forecasting Performance of Commodity Futures Prices. Board of Governors of the Federal Reserve System International Finance Discussion Papers. August 2011. Page 3.

<sup>13</sup> Avista 2018 Integrated Resource Plan. P 126.

Staff is not aware of any other utility under OPUC jurisdiction that used an extrapolation of NYMEX futures prices in its long term natural gas price forecast. Each utility used futures prices only in the first few years, if at all:

- In its 2018 IRP, Avista used futures prices in the first year, and reduced the weight of the futures prices incrementally for five years before relying entirely on consultant forecasts in year seven.<sup>14</sup>
- In its 2018 IRP, NW Natural did not use futures prices in its forecast. It used a market fundamentals-based forecast from IHS Global Gas service.<sup>15</sup>
- In its 2019 IRP, PGE only used three years of NYMEX futures prices in its natural gas price forecast, followed by one year that blended futures prices and a Wood Mackenzie (WM) long-term fundamental forecast, followed by the WM forecast for the rest of the planning horizon.<sup>16</sup>
- In its 2019 IRP, Idaho Power used NYMEX futures prices only to verify the reasonableness of its third party vendor's fundamentals-based forecast.<sup>17</sup>
- In its 2019 IRP, PacifiCorp used futures prices for the first three years of its natural gas price forecast. In the fourth year, the third-year futures prices were blended with a third-party expert forecast, and the third-party forecast was used exclusively after year four.<sup>18</sup>

The use of futures prices to contribute to the near-term natural gas price forecast is a reasonable practice, and many utilities take advantage of near-term futures price data. However, in later years after NYMEX futures market liquidity has decreased substantially or disappeared, Cascade should remove the NYMEX futures price path from the forecast, instead of escalating the 2025 price by a fixed percentage each month.

#### Cascade's Age Dampening Mechanism (ADM) is unreasonable as proposed.

Regarding the Age Dampening Mechanism introduced in this IRP, Staff does not approve of the mechanism as proposed. The ADM reduces the weight of third-party expert forecasts if they are over 12 months old, and adds the detracted weights back to the NYMEX-futures-based price forecast, increasing the influence of this already problematic forecast.<sup>19</sup>

The impact could be significant. While Cascade has informed Staff that **[Begin Confidential]** [REDACTED]

[REDACTED] **[End Confidential]** workpapers provided to Staff by Cascade indicate that **[Begin Confidential]** [REDACTED]

<sup>14</sup> Avista. 2018 Integrated Resource Plan, page 127.

<sup>15</sup> NW Natural 2018 Integrated Resource Plan, page 2.14.

<sup>16</sup> PGE 2019 Integrated Resource Plan, page 74.

<sup>17</sup> Idaho Power Amended 2019 Integrated Resource Plan, page 89.

<sup>18</sup> PacifiCorp 2019 Integrated Resource Plan, page 180.

<sup>19</sup> LC 76 - Cascade 2020 IRP, page 4-11.

[End Confidential]<sup>20</sup>

Staff has expressed its concern about the Age Dampening Mechanism to Cascade, and Cascade has agreed to take the feedback under consideration.

The natural gas price forecast should be updated to address Staff's concerns.

The natural gas commodity price forecast is important for determining the right amount of RNG and efficiency resource acquisition. The current IRP natural gas price forecast methodology relies heavily on a concerning long-term NYMEX-futures-based price path and is not appropriate for use in calculating avoided costs. Staff looks forward to further discussion with Cascade on this topic and requests the Company address Staff's concerns by filing a timely update to the natural gas price forecast for use in efficiency and RNG avoided cost calculations.

Staff's final concern with the natural gas price forecast involves typographical errors. Staff has identified typographical errors in the weighting methodology workpapers. Staff and Cascade had a phone conference on this topic and Cascade plans to update its natural gas price forecast to reflect its corrections.

Below are Staff's recommendations for the Company's Reply Comments:

- The Company should address Staff's comments around the ADM.
- The natural gas price forecast should be updated to address Staff's concerns.

## Energy Efficiency

### 2018 IRP Recommendations

In the 2018 IRP, the Company discussed its efforts to align with Energy Trust and outlined its strategy to work closely with Energy Trust to acquire cost-effective energy efficiency and to improve its forecast of conservation potential. Specifically, in Action Item 4 of the 2018 IRP, the Company committed to "examine the impact changes such as revised building codes, OPUC exemptions granted for non-cost-effective measures, and changes to avoided cost calculations stemming from Docket No. UM 1893, may have on the Company's long- and short-term conservation potential."<sup>21</sup>

The Company notes that Energy Trust accounts for building code changes in its forecasts. In addressing "OPUC exemptions granted for non-cost-effective measures," the Company indicates that 5.4 percent of savings are associated with these measure exceptions.<sup>22</sup> These forecasts also reflect what information was available through UM 1893 at the time. The first official UM 1893 filing and input review did not occur until

<sup>20</sup> Cascade's confidential reply to Staff Information Request 30. See Confidential Attachment 2.

<sup>21</sup> LC 69 – Cascade 2018 IRP, Amended Four-Year Action Plan page 10-4.

<sup>22</sup> LC 76 – Cascade 2020 IRP, page 6-25.

after the forecast was completed in 2019, but Cascade has been participating in the UM 1893 docket and has supported Energy Trust's implementation of these numbers.

In the Company's 2018 IRP Update, the Company explains that it met with Energy Trust to discuss the energy efficiency forecast for the next IRP. Cascade also noted:

The Company continues to hold ongoing meetings with the Energy Trust of Oregon in support of the organization's efforts to provide cost-effective energy conservation programs to Cascade Natural Gas customers. Meetings included coordination discussions on demand side management planning; strategic planning; program opportunities and challenges; and the organizations' data sharing agreement. Cascade personnel participated as part of the Energy Trust Conservation Advisory Council.<sup>23</sup>

Staff has observed and can attest to the participation of the Company in numerous meetings with Energy Trust.

In the prior IRP, stated in Action Item 6, Cascade indicated that it planned to look at different carbon scenarios. Staff also made the following recommendation 2b in the 2018 Staff Report:

**Staff Recommendation 2b:** In its 2018 IRP update, the Company should model the impact of lower than projected energy efficiency savings on supply availability.

### Energy Efficiency in the 2020 IRP

For the 2020 IRP, the Company worked with Energy Trust to address both the Action Item and Staff's recommendation through a series of separate scenarios to model the following energy efficiency potential cases:

1. Base Case Ramp Rates / Social Cost of Carbon Avoided Costs (higher than Reference Case Avoided Costs)
2. Base Case Ramp Rates / Market Price of Carbon Avoided Costs (lower than Reference Case Avoided Costs)
3. Base Case Ramp Rates / NO Carbon Price included in Avoided Costs
4. Low (Slow) Ramp Rates / Reference Case Avoided Costs
5. High (Fast) Ramp Rates / Reference Case Avoided Costs<sup>24</sup>

These scenarios represent a range of carbon scenarios and also a "low" energy efficiency scenario, represented through a slower ramp rate. The different ramp rates create a reasonable range of variation in potential savings across scenarios at roughly 9 percent above and

---

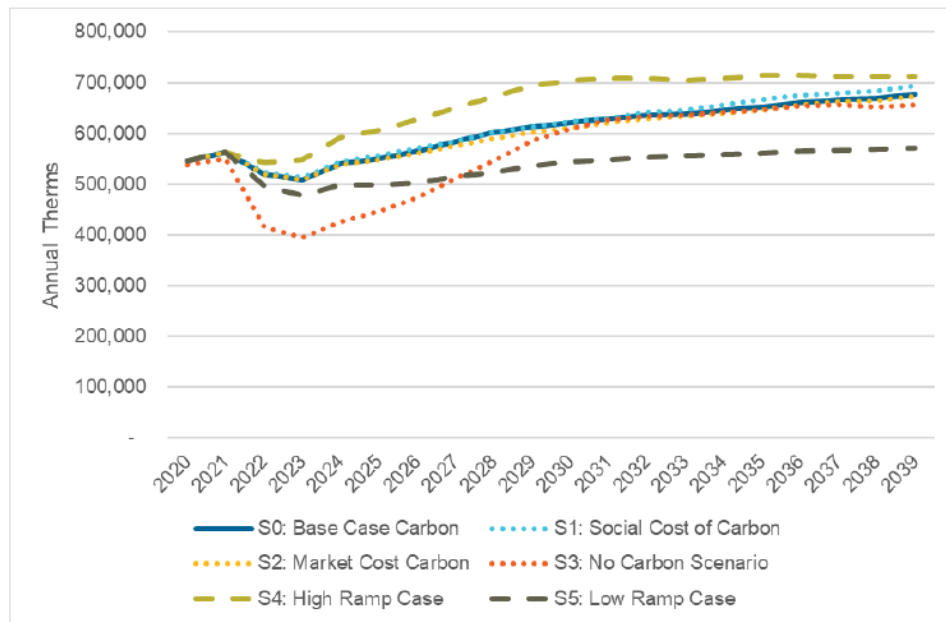
<sup>23</sup> LC 69 - Cascade Natural Gas 2018 IRP Annual Update, page 1-7.

<sup>24</sup> LC 76 - Cascade 2020 IRP, pages 6-26 - 6-29.



11 percent below the base case. However, as seen in the following figure from the 2020 IRP, three of the alternate carbon scenarios are clustered close to the base case.<sup>25</sup>

Figure 3: Annual Savings Comparisons by Scenario<sup>26</sup>



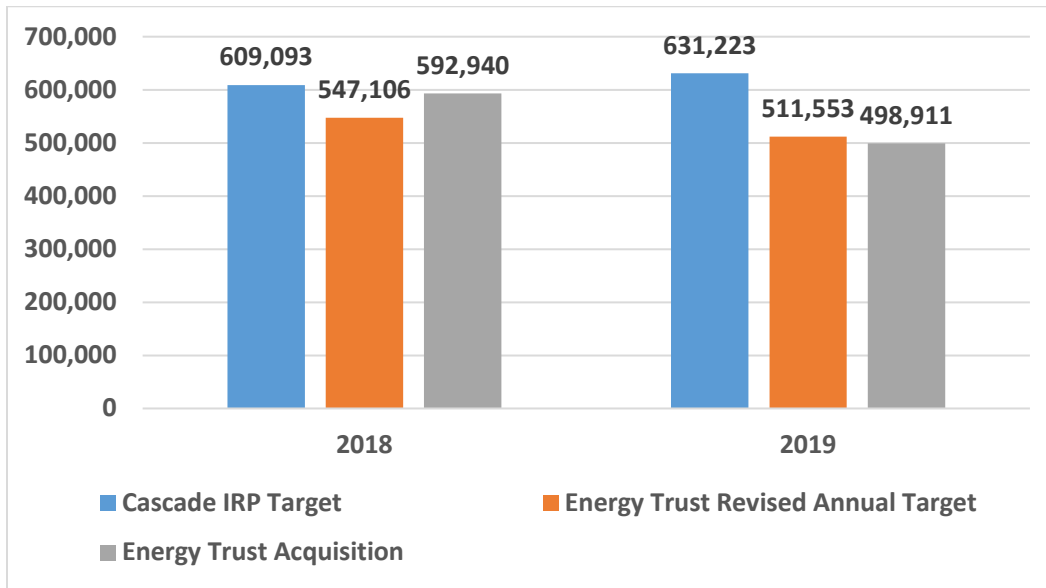
This figure indicates that there seems to be little impact between using the base case carbon scenario, social cost of carbon, and market cost of carbon. The figure also shows that having no carbon cost would have an impact initially, but would revert to the baseline scenario in later years. Staff will follow up with the Company and Energy Trust to understand these modeling assumptions as part of Staff’s IRP analysis.

In the 2020 action plan, the Company set energy efficiency goals. As Energy Trust updated its forecasts for each budget cycle, the forecast had declined from the initial forecast provided in the 2018 IRP. The following figure illustrates how energy efficiency forecasts have changed, and how the actual acquisition also varies from both the IRP forecast and the target set through the budget process.

<sup>25</sup> LC 76 – Cascade 2020 IRP, page 6-28.

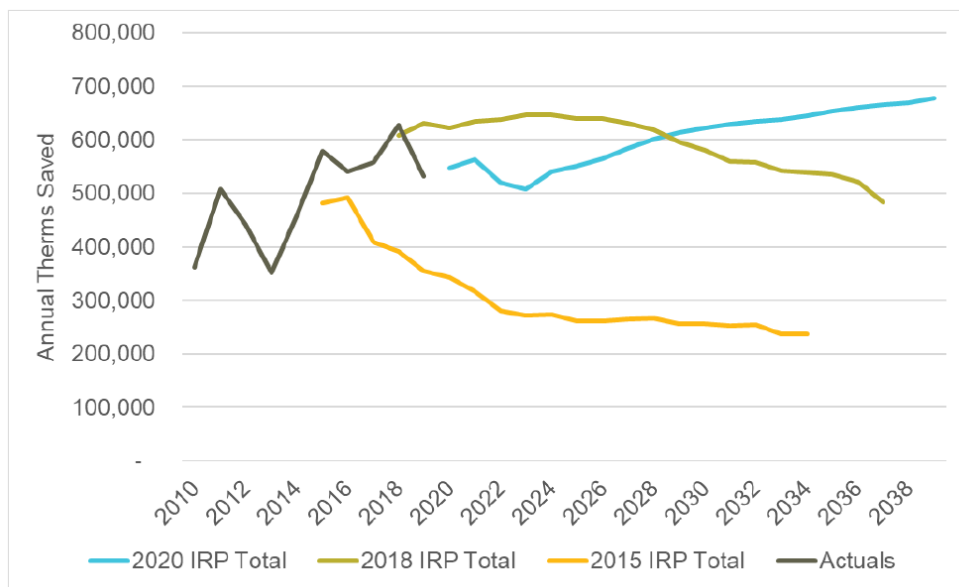
<sup>26</sup> LC 76 – Cascade 2020 IRP, Figure 6-20, p. 6-28.

Figure 4: Comparison of energy efficiency targets and actual acquisitions<sup>27</sup>



These fluctuations are further illustrated in the following graph provided by the Company:

Figure 5: Comparison of Energy Efficiency Forecasts<sup>28</sup>



<sup>27</sup> LC 69 – Cascade 2018 IRP, Cascade’s Amended Four-Year Action Plan page 10-2, 2018; Annual Report to the Oregon Public Utility Commission & Energy Trust Board of Directors p. 78; Annual Report to the Oregon Public Utility Commission & Energy Trust Board of Directors p. 31.

<sup>28</sup> LC 76 – Cascade 2020 IRP, Figure 6-19, p. 6-26.



As demonstrated in the graphs, while the 2020 IRP forecast starts lower than in the 2018 IRP, it suggests increased savings potential in the future. The 2020 energy efficiency forecast was created in 2019, however, which means it does not reflect assumptions based on COVID-19 impacts. Staff will be following up to review the longer term trends with Energy Trust, and compare the 2020 IRP action plan with the 2021 Energy Trust action plan once it is finalized in early December.

Overall, Staff concludes that the Company has improved its understanding and coordination with Energy Trust over the last few years, with the benefit of improved scenario modeling. It is unclear whether forecasting has also improved due to these efforts, but Staff expects it will over time.

## Avoided Costs

### 2018 IRP Recommendations

In response to the 2018 IRP, Staff made a number of additional recommendations to improve avoided cost estimates, including distribution, risk premium, and carbon costs. Staff recommended that Cascade include unrealized distribution costs in its avoided cost for energy efficiency calculation,<sup>29</sup> that the Company address issues of avoided distribution system costs and where relevant, non-cost-effective savings of energy efficiency in UM 1893,<sup>30</sup> and that as part of its next IRP, Cascade develop a methodology to incorporate distribution system costs into its avoided cost calculation.<sup>31</sup>

Staff also recommended that the Company model the impact of lower than projected energy efficiency savings on supply availability for the 2018 IRP Update. In the Update, Cascade indicated that it does not believe lower than projected DSM will have any impact on supply availability. However, Cascade did work with ETO to produce a DSM forecast in this IRP based on lower than projected energy efficiency (EE) savings by using different “ramp rates” for the speed of acquisition. Staff also highlighted serious concerns about avoided costs in the 2018 IRP. Specifically, Staff was concerned about the credibility of various calculations due to the omissions of avoided distribution costs and concerns about the certainty of the carbon price data. Ultimately, in light of the Commission’s Avoided Cost Docket No. UM 1893, Staff recommended that these avoided cost issues be addressed in UM 1893, not the IRP.

The 2018 IRP also discussed adding elements to the Company’s avoided cost calculations, which are primarily used for planning energy efficiency investments. The Company volunteered an action item in its 2018 Action Plan to incorporate distribution

---

<sup>29</sup> Order No. 18-279 Appendix A p. 8.

<sup>30</sup> Order No. 18-279 Appendix A p. 9.

<sup>31</sup> Order No. 18-279 Appendix A p. 11.

costs, stating that the Company would, “Investigate incorporating distribution system costs into the avoided cost calculation, following guidance from UM 1893.”

#### [Avoided Cost Methodology addressed in UM 1893](#)

To summarize, UM 1893 is the docket in which the Commission reviews and approves values to be used by Energy Trust in calculating energy efficiency avoided costs. The methodology was in development when the 2018 IRP was under review. The process was finalized in 2019, and the first official review of data was completed in December 2019.<sup>32</sup> As a result, since the 2018 IRP, the Company has developed a calculation of distribution costs for both the peak day and the peak hour, as it agreed to do through the UM 1893 docket. The method was presented and discussed in a UM 1893 workshop on July 3, 2019, and further presented at the #3 TAG meeting on November 6, 2019.

Staff is continuing to review the results in the context of other estimates submitted through UM 1893 and will follow up with questions about the methodology as part of Staff’s IRP analysis in Final Comments.

## [Renewable Natural Gas](#)

While Cascade does not have any RNG projects included in its action plan, the Company recognizes that regional energy policies signal an impetus for planning for RNG projects. The 2020 IRP explains that regional energy policies will likely require that Cascade plan for reduced GHG emissions and that RNG projects are anticipated to be one of the options available to the Company to help it meet those reduction targets. While the Company indicates that it does not currently have timelines for RNG projects, it has initiated market studies and calculators, akin to what is in UM 2030, to assess the cost effectiveness of potential projects.

## [Energy Policies](#)

### [Compliance with Governor Brown’s Executive Order 20-04 \(EO 20-04\)](#)

While the Company recognizes EO 20-04 as a policy driver, given that the Department of Environmental Quality’s (DEQ) rules for the associated Cap and Reduce program are not anticipated until late 2021, the Company has not yet articulated how it plans to comply with the proposed emission reduction targets.<sup>33</sup> Staff recommends the Company explore how it will consider complying with applicable emission targets associated with DEQ’s Cap and Reduce program in the next IRP update.

City of Bend Climate Action Plan – The Company describes its interest in participating in the City of Bend Climate Action plan through the creation of a voluntary offset program and the development of an RNG project in Bend.<sup>34</sup> In response to Staff IR 62, the Company indicated that they planned to create a voluntary program that could serve

---

<sup>32</sup> Order No. 19-430.

<sup>33</sup> LC 76, Cascade 2020 IRP, p. 7-7.

<sup>34</sup> LC 76, Cascade 2020 IRP, p. 7-7.

both Washington and Oregon customers. However, Washington's RCW 80.28.390 requires the creation of a voluntary renewable natural gas service program that requires the purchase of RNG to replace conventional natural gas, not be an offset program. The Company has indicated that it has had to change direction because of this requirement because to date it has been unable to "identify readily available products that meet the requirements of the law." Staff seeks to understand more about the Company's modified approach and recommends that the Company respond with an updated description of their anticipated program. This should include the design elements, pricing structure, level of customer interest, and whether Cascade anticipates that program would be limited to customers in Bend.

Regional RNG Policies and Programs – The Company describes the need to comply with RNG related legislation in Washington and Oregon. In the Market Research section of the RNG Chapter, the Company mentions a potential engagement with California's Low Carbon Fuel Standard (LCFS) program because of the value food waste and wastewater treatment projects could capture there. The Company goes on to describe the anticipated need for a specialized staff to manage RNG strategy. OPUC Staff generally supports the need for RNG goals and long-term strategy for the Company to manage the interplay between regional RNG policies and programs and associated expenses and revenue streams. To that end, Staff is concerned about being able to track the benefits of RNG projects supported by Oregon ratepayers. Staff requests that the Company provide cash flow scenarios that illustrate potential strategies in managing costs and revenues, including, but not limited to costs and benefits to Oregon ratepayers.

## Project Value & Cost Effectiveness

### Carbon Intensity

In the IRP, Cascade assumes a "scaling carbon tax, starting at \$21.13/metric ton in 2021 and capping at \$61.50/metric ton from 2030 onward."<sup>35</sup> Oregon PUC Staff provided informal comments on the draft IRP expressing concern as to whether that assumption captures the risk of higher carbon taxes, and Staff maintains this concern. This is an important issue because IRP page 7-10 projects that RNG projects could be cost effective in 2030 at a \$61.50/metric ton carbon tax. Under a higher carbon tax, RNG could be cost effective even sooner.

In its response to Staff IR 64, the Company indicates that it uses an average carbon intensity of four types of RNG projects. However, dairy cow manure projects reduce more than four times as much carbon as the four-project-type-average. Thus, dairy projects might be cost effective sooner than 2030. The Company's use of \$13.50 per dekatherm of RNG for a hypothetical average RNG project is a close approximation to ~\$21/metric ton and an appropriate starting place, but to accurately determine cost effectiveness, the calculation should consider carbon intensity.

---

<sup>35</sup> LC 76, Cascade 2020 IRP, p. 5-5.

In its response to Staff IR 66, the Company explains that it is evaluating potential RNG projects from all angles. In consideration of the high price of RNG in California's LCFS market and the developing Cap-and-Reduce program in Oregon, Staff encourages Cascade to monitor and be actively involved in DEQ's EO 20-04 activities. In addition, the Company should explore creative solutions, such as a long-term RNG projects participating in the LCFS market, and present those findings in its IRP update.

### Cost Effectiveness

Cascade modeled the cost effectiveness of a hypothetical on-system and off-system RNG project using SENDOUT software. As referenced above, while the assumption of \$13.40 per dekatherm of RNG is an appropriate starting place for this calculation, it may mask the cost effectiveness of projects with a lower carbon intensity. . The Company is developing a more robust RNG Cost-Effective Evaluation Model to compute the cost of RNG from specific projects and describes its work so far in confidential Appendix J. The Company invites feedback on its RNG Cost-Effective Evaluation Model. Staff provides initial feedback:

- Staff encourages Cascade to consider Northwest Natural's cost-effectiveness methodology that was developed as part of UM 2030.
- Based on reviewing another study of the cost of an RNG project conducted for Northwest Natural and other sponsors in California,<sup>36</sup> Cascade's model does a good job capturing the main cost elements of an RNG project.
- As described above, Cascade should focus on modeling the tradeoff in the relationship that lower-carbon-intensity RNG projects typically have higher project costs.
- Cascade is studying the rate impacts of RNG projects. Staff is supportive of this effort and encourages the Company in its future work to model the impact of qualified RNG capital investments and to share those results in not only the IRP update but with DEQ as part of its efforts to implement Cap-and-Reduce.

Below are Staff's recommendations for the Company's Reply Comments:

- The Company should submit an updated description of their voluntary renewable natural gas program for City of Bend. This should include the design elements, pricing structure, level of customer interest, and whether it anticipates that the program would be limited to customers in Bend.
- The Company should reconsider whether RNG projects are really outside of the planning horizon given potential cost effectiveness due to potential rises in carbon costs.
- The Company should provide cash flow scenarios for RNG projects that illustrate potential strategies in managing costs and revenues, including, but not limited to costs and benefits to Oregon ratepayers.

---

<sup>36</sup> Low-Carbon Renewable Natural Gas (RNG) from Wood Wastes, Gas Technology Institute (GTI), 2018, at page 49 <https://www.gti.energy/wp-content/uploads/2019/02/Low-Carbon-Renewable-Natural-Gas-RNG-from-Wood-Wastes-Final-Report-Feb2019.pdf>

- The Company should continue to develop its cost-effective evaluation model so that it can identify RNG projects that benefit Oregon ratepayers. Staff supports the Company offering a voluntary RNG program to its Oregon customers similar to the one it is developing for Washington State.
- The Company should explore cash flow scenarios for Oregon ratepayer funded RNG projects, including the Company’s potential to participate in California’s LCFS market.
- The Company should include modeling the impacts of qualified RNG capital investments in its study on RNG project rate impacts and share those results in the IRP update and with DEQ to inform the implementation of their Cap-and-Reduce program.

## Distribution System Planning

The purpose of distribution system planning is primarily to anticipate demand requirements and identify potential constraints. The Company uses Geographical Information Systems (GIS) software to create system models through the use of Synergi software. Distribution system enhancements include analyses of pipelines, regulators, and compressor stations, and the Company also considers the impacts of proposed conservation resources on anticipated distribution constraints. In order to anticipate low-pressure events or potential outages, the Company uses Synergi to project “design day” conditions—peak day or worst case scenario conditions to identify problem areas where potential outages may occur.

In this IRP, Cascade has identified a series of enhancement projects stretching into 2023:

Figure 6– Distribution System Planning Projects<sup>37</sup>

Description	2020	2021	2022	2023	2024
FP-306990 - PENDLETON 4" IP REINFORCEMENT					
FP-306991 - PENDLETON 4" HP REINFORCEMENT					
FP-306992 - PENDLETON KORVOLA ROAD 4" PE REINF.					
FP-316851 - South Hermiston to Feedville Rd HP					
FP-316854 - BEND GATE REBUILD					
FP-316863 - Prineville Gate Rebuild					
FP-317586 - RF-REDM-6"S-4,750'-VETERANS WY					
FP-318466 - RF-Baker-GT-NW Baker Gate					
FP-318468 - RF-Baker-GT-NW Baker Regulation					
FP-318469 - RF-Baker-GT-NW Baker Gate Odorizer					
FP-318475 - RF-Baker-GT-NW Baker GT Line Heater					
FP-318682 - RF-BEND-6"S-1100'-SHEVLIN PK					
FP-318733 - RF-BEND-6"S-2MI-SHEVLIN PK					
FP-318737 - RF-BEND-R-SHEVLIN PK RD 2" STD					
FP-318741 - RF-BEND-6"PE-1200'-PONDEROSA ST					
FP-318744 - RP-PRINEVILLE-GT-TRANSCANADA					
FP-318745 - RP-BEND-GT-TRANSCANADA					
FP-318770 - RF-REDM-R-VETERANS WAY-2" STD					

For Oregon projects, the Company indicates that it has forecasted growth to a point where there may be capacity issues. As a result, it identified a need for several projects in Pendleton, Southern Hermiston, Bend, Prineville, Redmond, and Baker City.

**Projects that are complete, substantially complete, or settled in the rate case should not be acknowledged.**

As Staff compared the projects to those in the rate case, Staff discovered that a substantial amount of information had been redacted in the IRP that was non-confidential in the rate case. These were various developments associated with the Bend 6" HP, Shevlin, Ponderosa, and Redmond projects detailed in the rate case. It was not until Staff was developing these Opening Comments and cross-checking other dockets that Staff realized these redactions had been made. Staff contacted the Company about this and the Company agreed to undesignate a substantial amount of information.

As the Bend 6" HP, Ponderosa, and Redmond programs have already been approved for rates, Staff does not believe that recommending acknowledgment of these projects is appropriate. In Order No. 14-252, the Commission noted that energy utilities that desire acknowledgment of an investment decision should request acknowledgment before the required project is substantially completed. Several projects associated with the Bend 6" HP, Ponderosa, and Redmond projects will likely be substantially complete by the time the Commission issues an acknowledgement order. Further, because they have already been settled in the rate case, recommending acknowledgment of these projects is unnecessary and contradicts Commission precedent. This does not mean that the projects are not needed. Staff appreciates that the Company has included these in the IRP for completion, and Staff indicated in its rate case testimony that the Ponderosa, Bend HP 6" (2020), and Redmond projects were well supported.<sup>38</sup> Though

<sup>37</sup> LC 76 – Appendix I, page 3.

<sup>38</sup> UG 390/Staff/500/Fox/9-10.

the information provided in the IRP contained fewer details than the 2020 rate case,<sup>39</sup> through discovery and review of details in the rate case, Staff concurs that these projects appear to be consistent and supportable.

Several projects for which the Company is requesting acknowledgment are being installed in phases. The projects Staff is recommending the Company remove from its Action Plan are the portions of the project to be completed by 2020 or the projects that will be substantially complete by the time the Commission issues its acknowledgment order.

2020 projects or 2020 milestones include the following:

**[Begin Confidential]**

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

**[End Confidential]**

2021 milestones and projects include the following:

**[Begin Confidential]**

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

**[End Confidential]**

Note that for projects to be completed in phases, Staff is not recommending that the entire project be removed from the Action Plan—only portions that will be complete by the time the Commission issues its acknowledgment order. This level of detail was not included in the Action Plan, and the phases were redacted in Appendix I. See *Figure 8*. In Reply Comments, the Company should provide timelines for these projects to confirm or correct which projects will be complete or substantially complete by the acknowledgment date of April 27, 2021. For example, in the 2020 rate case, the Company indicated that the Shevlin project would be postponed to 2021.<sup>40</sup>

---

<sup>39</sup> UG 390/CNGC/200.

<sup>40</sup> UG 390/Staff/502/Fox/5.



### The Company should bolster details for Action Items in Reply Comments.

While Staff does not dispute that the Company is experiencing sizable growth in parts of its system, Staff does have some concerns with the distribution system projects and the way they were presented in the IRP. In particular, the Company's confidential Appendix I contained few details on several projects. Staff submitted discovery on pressures and outages in order to gain a better understanding of the needs in Cascade's system. For some of the projects, the Company seemed to be experiencing low pressures and outages, but the extent of these were unclear for most or all the projects.

Further, while the 2020 IRP contained more detail on distribution projects as compared to the 2018 IRP, Staff still believes that the Company can provide additional information as to the need of some of the projects. For example, while Appendix I contained more robust information on the Bend 6" HP Line projects, the Company provided few details on the South Hermiston Feedville Rd IP, Pendleton 4 inch IP Reinforcement, and Prineville Gate Rebuild projects.

In order to gain a better understanding about why all the projects in the Action Plan were needed, Staff asked the Company to produce alternative project studies, explanations of why those alternatives were rejected, outage reports illustrating why original design parameters and/or current operating conditions could no longer meet demand or safety standards, and pressure measurement metrics used to verify the Synergi peak design day model. Staff sought to understand more about the problem areas to be mitigated by projects in the Action Plan.

The Company provided additional detail for some, but not all, of these projects. Regarding outage reports, the Company stated:

The Bend District experienced minor outages and has performed one bypass operation on the Bend Distribution system in the past three years during a cold weather event in February 2018. Since then, and prior to this bypass operation, the district personnel have been called out, due to low pressures experienced in early winter mornings, averaging 6 times per winter season, to monitor closely the outlet pressures at regulator stations and preparing to bypass if necessary. The outage in the Bend area due to low pressure occurred in February 2018 and impacted fewer than 25 residential customers.<sup>41</sup>

Staff agrees with the need to mitigate outages. However, the Company did not provide the outage reports, and it is unclear which of the projects related to the Bend upgrades will specifically address outages.

Regarding the need to mitigate low pressures, Staff asked the Company to produce pressure recording charts and logs that identify abnormal conditions or problem areas representing a need for mitigation. Staff also asked Cascade to provide this information

---

<sup>41</sup> Staff Attachment 1 (DR 7).



for each distribution action item. In response, the Company provided pressure data for the following project areas:

**[Begin Confidential]**

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

[Redacted]

[Redacted]

**[End Confidential]**

The ongoing replacement of infrastructure for safety purposes is part of the Company’s basic obligation to provide safe and reliable service. However, the information provided by the Company in discovery and Appendix I is still a bit too thin for Staff to be able to recommend acknowledgement over the course of this IRP. In Reply Comments, the Company should provide a more comprehensive account behind the distribution projects and why they are least-cost/least-risk options. The Company indicates at the beginning of Appendix I that it is “in the process of creating a uniform reporting process and documentation for Distribution System plans that are put in the budget,”<sup>45</sup> and that is why the types of reports differ in the Appendix. The Company also explains that the earlier the project is in the budget timeline, the less detail they will have. However, if the Company is requesting acknowledgment of the projects, it must provide sufficient detail to defend the projects.

<sup>42</sup> Staff Attachment 2.

<sup>43</sup> Staff Attachment 2 (DR 14).

<sup>44</sup> Staff Attachment 2 (DR 5).

<sup>45</sup> LC 76 – Appendix I, page 2.

Finally, Staff would note that the proposed additions to the distribution system are taking place amidst the backdrop of Commission work on EO 20-04. The Commission's work will most likely include a fact-finding in 2021 on the utility customer dimensions of different decarbonization scenarios. Some decarbonization scenarios may include linking system growth to reduction in carbon emissions and/or carbon intensity. Staff recommends that CNG's IRP update in 2021 reflect any work or report completed by the Commission as part of its EO 20-04 efforts, with a specific focus on distribution system investments.

Below are Staff's recommendations for the Company's Reply Comments:

- The Company should bolster details for DSP projects in the IRP for which acknowledgment is appropriate.
- The Company's 2021 IRP update should reflect any work or report completed by the Commission as part of its EO 20-04 efforts, with a specific focus on distribution system investments.

## Resource Integration and Portfolio Modeling

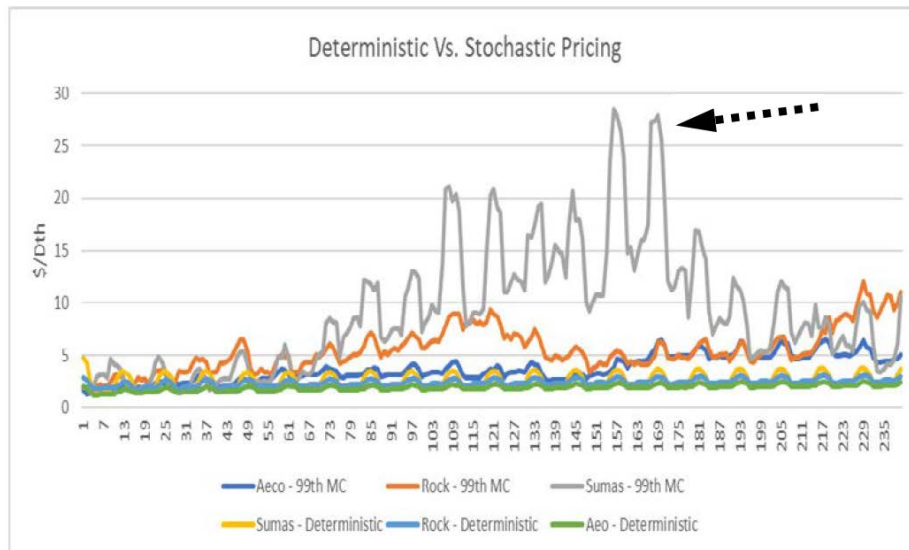
In Staff's 2018 Comments, Staff was unconvinced that 200 Monte Carlo draws was enough for a robust analysis, so using 10,000 draws in this IRP is an improvement. Cascade introduced a new stochastic modeling technique in this IRP. The stochastic model looks at unexpected conditions by running 10,000 Monte Carlo simulations on NYMEX gas price and weather. Related to NYMEX gas prices, in each simulation draw, the price at each gas price hub receives a random shock to increase or decrease the price. Related to weather, in each simulation draw, HDDs are drawn from a normal distribution with an identical mean to the weather station. NYMEX gas prices and weather do not seem to be correlated in the model, so for example, the coldest day in the 10,000 draws maybe could randomly have the lowest gas prices.

### NYMEX gas prices simulation

In the first month, the Company models NYMEX gas prices as randomly above or below their forecasted price. In the second month, the price is randomly above or below its first month price. Thus from month two onwards, the price can randomly move farther and farther away from its expected price, although on average the quantity of positive and negative price shocks should roughly balance out. The fact that prices build upon each other over time can create odd results. For example, the Company's stochastic analysis has a price above \$25 per dekatherm in some Monte Carlo draws. This is significantly above 99<sup>th</sup> percentile of a normal distribution since there is relatively low variance and a mean of about \$3 per dekatherm. For reference, Staff pastes a copy of Cascade's Figure 9-28 below with emphasis arrow added:

Figure 7: Deterministic vs. Stochastic Pricing

Figure 9-28: Deterministic Vs. Stochastic Pricing



In its response to Staff IR 52, the Company states, “The source of the numerous spikes in the Sumas forecast [in Figure 9-28] is the relatively high historical volatility that is applied to the model, caused in part by the Enbridge explosion at the end of 2018.” Staff submitted four information requests on the topic. Staff is submitting additional information requests to explore the impact of the dataset encompassing the time-period of the Enbridge explosion, and Staff will report the findings of this exploring in Final Comments.

### Weather simulation

The Company models correlation between weather stations. This is appropriate because indeed in reality, Cascade will have limited ability to deploy resources from one geographical region to another on the coldest day because it will be very cold in all geographic regions.

In Cascade’s next IRP, the current peak day will fall outside of a 30-year window. The weather variance used in the Company’s 10,000 Monte Carlo weather draws produces less extreme weather than Cascade’s actual peak day. In Cascade’s next IRP, the Company will need to consider the possibility that a day within the IRP planning horizon will set the new coldest day record, and that historically cold days will be ignored if the Company sticks to its 30-year window frame. On IRP page 11-3 Cascade describes that it is looking into a new peak day methodology, Staff supports this effort. In Final Comments, Staff will explore the extremely high prices in the Company’s NYMEX gas prices simulation.

## Portfolio Evaluation

Cascade uses the SENDOUT model to find an optimal solution for forecasted resource deficiencies and alternative portfolios. The Company estimated a three-day “peak event” to anticipate potential deficiencies, then introduced additional resources to meet these potential deficiencies.

Unlike in an electric IRP, where a utility has a range of resource options to select from (wind, market purchases, coal, natural gas, solar, etc.), the gas IRP operates from a more limited bundle of “resources.” Key resource inputs that SENDOUT evaluates include individual transportation segments, storage, and supply and demand side resources (both existing and potential). These are all targeted to various demand segments, or “citygates—” the point where natural gas is transferred from larger pipeline company like Northwest Pipeline (NWP) or Gas Transmission Northwest (GTN) to Cascade.

The peak day design estimates potential resource need, and once the optimal portfolio is found under these conditions, it is stress-tested through stochastic and deterministic scenarios using Value at Risk (VaR) analysis, where the VaR is the upper threshold of cost (\$5.37 billion in NPVRR<sup>46</sup>) and the 99<sup>th</sup> percentile of unserved demand (essentially a worst-case scenario). In the 2020 IRP, if the cost of a portfolio exceeded the “VaR” threshold, the Company rejected the portfolio. Cascade gave preference to any portfolio that fully solved for unserved demand in both stochastic and deterministic analysis. Portfolios were ranked based on a risk-adjusted total system cost metric, which gave 75 percent weight to the total system cost under deterministic conditions for a given portfolio, and 25 percent weight to the costs under stochastic conditions.<sup>47</sup>

For the 2020 IRP, Cascade evaluated seven different portfolios using the VaR analysis. The Company considered a range of resources for consideration but ultimately settled on a select few to make up the seven portfolios: Resources the Company already employs, such as gas purchases from the Rockies, British Columbia (Sumas), and Alberta (AECO) through bundled or unbundled contracts;<sup>48</sup> storage services at the Jackson Prairie, Plymouth LNG, and Mist facilities;<sup>49</sup> energy efficiency; and additional or “new” resources not already available to Cascade: Incremental GTN N/S, 1-5 Mainline Expansion, Wenatchee Lateral Expansion, Spokane Lateral Expansion, and Spire Storage.<sup>50</sup>

Ultimately, through a series of iterations, SENDOUT selected the preferred portfolio the Company calls the “All-in” portfolio, which refers to all the resources already available to Cascade (Gas purchases from the Rockies, Sumas, and AECO through bundled or unbundled contracts and storage services at the Jackson Prairie, Plymouth LNG, and Mist facilities). The preferred portfolio is the least-cost portfolio (\$4.31 billion risk-

---

<sup>46</sup> LC 76 – Cascade IRP, p. 9-31.

<sup>47</sup> LC 76 – Cascade IRP, p. 9-3.

<sup>48</sup> LC 76 – Cascade IRP, p. 4-2.

<sup>49</sup> LC 76 – Cascade IRP, p. 4-7.

<sup>50</sup> LC 76 – Cascade IRP, p. 9-23.

adjusted) and includes contracts needed from only those resources, in addition to incremental DSM.<sup>51</sup> Apart from distribution upgrades discussed in the DSP section above, the Company is not planning any pipeline additions or resource acquisitions. As the Company notes, for the first time in recent Cascade IRP history, the only “additional” resource selected by the SENDOUT model (other than the normal gas contracts and storage) for the top-ranking portfolio was incremental energy efficiency.<sup>52</sup>

In general, Staff thought the Company’s portfolio ranking and methodology process was reasonable. However, the Company should explain the use of the 25 percent vs. 75 percent weighting in assessing portfolio ranking. In the workshop, the Company seemed to indicate that the weights were assigned based on the Company’s past experience and likely outcomes, but it should clarify this further in Reply Comments. The Company should also explain the methodology behind the selection of the VaR thresholds. The Company provides limited detail in the IRP about this determining metric, and additional detail is warranted.

Cascade finds that it could experience a resource shortfall in 2022 under Peak Day conditions.<sup>53</sup> When Staff asked about this, the Company indicated that it would likely be able to acquire transport releases from GTN and other markets, and that it would be unlikely that the Company would need to cover a small capacity shortfall over a several-day period as modeled under peak day conditions. The capacity shortfall presumably would not equate to the physical deliverability of the Company’s system.<sup>54</sup> Appendix F shows Cascade’s ability to use flexible reallocation contracts to meet demand. In aggregate, the Company forecasts realigning capacity from Washington to Oregon and predicts that existing contracts can cover demand. The one exception is the procurement of a small amount of incremental Maximum Daily Delivery Obligations (MDDOs) in some locations, such as Bend loop, in the short term. On IRP pages 3-6, Cascade explains that it is “actively expanding its peak day methodology” and Staff supports this effort.

Below are Staff’s recommendations for the Company’s Reply Comments:

- The Company should explain the use of the 25 percent vs. 75 percent weighting in assessing portfolio ranking.
- The Company should explain the methodology and reasoning behind the selection of the VaR thresholds.

## Action Plan and Conclusion

The vast majority of Action Items in the Action plan are not resource decisions, but are mostly study initiatives the Company intends on pursuing for the next IRP. Staff appreciates the inclusion of an RNG candidate portfolio, improvements to its demand forecasts, its continued work with Energy Trust and other research proposals. Staff

---

<sup>51</sup> LC 76 – Cascade IRP, p. 9-2.

<sup>52</sup> LC 76 – Cascade IRP, p. 9-26.

<sup>53</sup> LC 76 – Cascade IRP, p. 9-29.

<sup>54</sup> See Staff Attachment 1 (DR 50).

supports these efforts and looks forward to working with the Company on these endeavors. Regarding the DSP Action Items, Staff has addressed those above.

Overall, Staff believes the Company has selected a least-cost/least-risk portfolio. As indicated, Staff believes the Company has made several improvements to its IRP in 2020, and commends the Company for continuing to improve upon previous methodologies. With this being said, Staff also has some concerns that the Company should address in its Reply Comments.

Below are Staff's recommendations for the Company's Reply Comments:

- The Company should consider including a price variable in its next IRP;
- The Company should provide its load forecasting workpapers that support its initial filing;
- The Company should address why the new methodology is better overall. Specifically, the Company should show that its forecasts can capture the impact of extreme weather events given that it is only using four years of weather data. One method of comparison between potential models would be to compute measures of out-of-sample model accuracy for both Cascade's current forecasting model versus a forecasting model similar to the one used in its last IRP (which used additional years of data but which was less granular).
- The Company should address Staff's comments around the ADM.
- The natural gas price forecast should be updated to address Staff's concerns.
- The Company should submit an updated description of their voluntary renewable natural gas program for City of Bend. This should include the design elements, pricing structure, level of customer interest, and whether it anticipates that the program would be limited to customers in Bend.
- The Company should reconsider whether RNG projects are really outside of the planning horizon given potential cost effectiveness due to potential rises in carbon costs.
- The Company should provide cash flow scenarios for RNG projects that illustrate potential strategies in managing costs and revenues, including, but not limited to costs and benefits to Oregon ratepayers.
- The Company should continue to develop its cost-effective evaluation model so that it can identify RNG projects that benefit Oregon ratepayers. Staff supports the Company offering a voluntary RNG program to its Oregon customers similar to the one it is developing for Washington State.
- The Company should explore cash flow scenarios for Oregon ratepayer funded RNG projects, including the Company's potential to participate in California's LCFS market.
- The Company should include modeling the impacts of qualified RNG capital investments in its study on RNG project rate impacts and share those results in the IRP update and with DEQ to inform the implementation of their Cap-and-Reduce program.

- The Company should bolster details for DSP projects in the IRP for which acknowledgment is appropriate.
- The Company's 2021 IRP update should reflect any work or report completed by the Commission as part of its EO 20-04 efforts, with a specific focus on distribution system investments.
- The Company should explain the use of the 25 percent vs. 75 percent weighting in assessing portfolio ranking.
- The Company should explain the methodology and reasoning behind the selection of the VaR thresholds.

This concludes Staff's Opening Comments.

Dated at Salem, Oregon, this 20<sup>th</sup> of November, 2020.

*Nadine Hanhan*

---

Nadine Hanhan  
Senior Utility Analyst  
Energy Resources and Planning Division

**CASCADE NATURAL GAS CORPORATION**  
**Oregon Public Utility Commission**  
**LC 76**  
**IRP**

Request No. 7

Date prepared: 8/25/2020

Preparer: Linda Offerdahl

Contact: Mark Sellers-Vaughn

Telephone: (509) 734-4589

7. Regarding the proposed distribution projects in the Action Plan, please provide any outage reports illustrating why original design parameters and/or current operating conditions can no longer meet demand or safety standards.

**Response:**

The Bend District experienced minor outages and has performed one bypass operation on the Bend Distribution system in the past three years during a cold weather event in February 2018. Since then, and prior to this bypass operation, the district personnel have been called out, due to low pressures experienced in early winter mornings, averaging 6 times per winter season, to monitor closely the outlet pressures at regulator stations and preparing to bypass if necessary. The outage in the Bend area due to low pressure occurred in February 2018 and impacted fewer than 25 residential customers.



**CASCADE NATURAL GAS CORPORATION**  
**Oregon Public Utility Commission**  
**LC 76**  
**IRP**

Request No. 50

Date prepared: 10/29/2020

Preparer: Eric Wood

Contact: Mark Sellers-Vaughn

Telephone: (509) 734-4589

50. Please see page 9-30 of the IRP. The Company explains that it is “confident in its ability to contract for third party citygate deliveries to serve its customers on a peak day without the need to acquire additional GTN capacity in 2022.” Please provide a narrative explanation of why the Company is confident. Please include in the Company’s response additional specifics about how it will acquire these third party citygate deliveries.

**Response:**

The transport capacity release market is fluid and changing monthly and can vary dependent upon many market factors. Currently there are often Transport releases available on GTN on a monthly basis that Cascade can bid on if there were a longer shortfall expected. This would be one approach to ensuring enough capacity for a given timeframe. Secondly, there are counterparties that deliver into the California market from Stanfield to Malin. These marketers often have transport available that the Company could purchase and have delivered to any of the citygates in central Oregon. While these types of transport are not market based, they would be based on a counterparty to counterparty basis. Cascade maintains relationship with multiple marketers along with Cascade’s AMA provider Tenaska Marketing Ventures that would have this ability to do this type of transaction. There are also marketers that currently have transport direct to specific gates on system to serve their own customers. These marketers would also be an ideal candidate to serve that type of need given that they already have transport to serve customers.

In addition to the above, it would be unlikely that Cascade would need to cover a small capacity shortfall over a several-day period. Cascade does have the ability to flex on Cascade’s Operation Balancing Agreement over a short period. The capacity shortfall would not equate to the physical deliverability of the Company’s system. The gate capacity of the system is much greater, and Cascade can flex small amounts over a short period of time.

**CASCADE NATURAL GAS CORPORATION**  
**Oregon Public Utility Commission**  
**LC 76**  
**IRP**

Request No. 52

Date prepared: 10/21/2020

Preparer: Devin McGreal

Contact: Mark Sellers-Vaughn

Telephone: (509) 734-4589

52. Please see figures 9-27 and 9-28 on page 9-35 of the IRP filing. Please provide a narrative explanation of the numerous spikes represented by the Sumas forecast. Additionally, please specify whether this is regular behavior for this market.

**Response:**

The high Sumas forecasts shown in figures 9-27 and 9-28 are the stochastic result of Cascade's Monte Carlo simulation. The source of the numerous spikes in the Sumas forecast is the relatively high historical volatility that is applied to the model, cause in part by the Enbridge explosion at the end of 2018. The objective of the Company's stochastic analysis to stress test the top ranking candidate portfolio under extreme pricing sensitivities, so this forecast is, by design, far from regular behavior for the market. While not impossible, it would be considered a black swan event for Sumas pricing to ultimately reach the levels shown in these figures.

**CASCADE NATURAL GAS CORPORATION**  
**Oregon Public Utility Commission**  
**LC 76**  
**IRP**

Request No. 64

Date prepared: 11/4/2020

Preparer: Devin McGreal

Contact: Mark Sellers-Vaughn

Telephone: (509) 734-4589

64. See pages 7-9 and 7-10 of IRP Chapter 7, which describes a price of \$13.50 per dekatherm for RNG before environmental attributes. If available, please provide a narrative response of the price range Cascade has analyzed after environmental attributes.

**Response:**

Using the 2020 Avoided Cost calculation, Cascade established a cost of carbon compliance for conventional natural gas that started at \$1.233/dth and capped at \$3.587/dth. Using the carbon intensities from the attached DR 64 Jaffe 2016 Carbon Intensities.xlsx, we can analyze the carbon intensities for conventional natural gas, as well a number of types of RNG. Without knowing specifically what type of RNG is being evaluated, Cascade takes a simple average of the intensities of the various types cited in the study to have one number for the carbon impact of RNG.

The carbon intensity of conventional natural gas is 82,685 gCO<sub>2</sub>e/Dth, while that of RNG is -61,565. Qualitatively, this mean that not only is RNG not expected to emit CO<sub>2</sub>e, but because it is using gas that would have otherwise been emitted into the environment from, for instance, dairy cow refuse, there is an additional environmental benefit to be accounted for. Quantitatively, this means that value of the environmental attributes is equal to the costs established in the avoided cost calculation, plus an additional approximately 74.46% of those costs for the avoided emitted gas. This calculated to a value ranging from \$2.15/dth to \$6.26, resulting in a price range of \$11.35/dth to \$7.24/dth.

It is important to caveat this with a statement that this methodology is still preliminary and not something Cascade is seeking acknowledgment on in its IRP.

**CASCADE NATURAL GAS CORPORATION**  
**Oregon Public Utility Commission**  
**LC 76**  
**IRP**

Request No. 66

Date prepared: 11/2/2020

Preparer: Chanda Marek

Contact: Mark Sellers-Vaughn

Telephone: (509) 734-4589

66. See page 11-3 of IRP Chapter 11. Please provide Cascade's Renewable Natural Gas studies, provide any accompanying data in excel format.

**Response:**

The "Renewable Natural Gas studies" language on page 11-3 refers to the analysis of potential projects that may involve injecting RNG into Cascade's system. While we will continue to evaluate all such potential projects from all angles (a 3<sup>rd</sup> party producer injecting gas into Cascade's system for sale to a 3<sup>rd</sup> party, projects that may involve both injection into Cascade's system as well as RNG purchase by Cascade, etc.), we have not completed a full evaluation/study of any projects in Oregon from the perspective of an RNG acquisition. The projects we have evaluated in some level of detail, only include an estimate of the infrastructure required to flow RNG into our system and preliminary discussions with the producer.

Staff Attachment 2 is confidential subject to Protective Order No. 20-243.