



In the Community to Serve®

On March 30, 2018, Cascade filed the third quarterly progress report as requested in the 2016 Integrated Resource Plan's (IRP) Compliance Acknowledgment Letter. On April 18, Commission Staff filed a request that Cascade be required to file one more status report by June 30, 2018. The following list includes Staff's request as well as Cascade's response:

1. Provide detailed justification for using weather data other than from the National Oceanic and Atmospheric Administration (NOAA), and verify the reliability of such data;

The Company has provided a Weather Analysis spreadsheet (Weather Analysis.xlsx) with NOAA and Schneider data dating back to January 1, 1981. The steps the Company took to gather NOAA data is provided below:

Search <https://www.ncdc.noaa.gov/cdo-web/>

Select Search Tool under 'Discover Data By'

On the Climate Data Online Search Page Cascade selected Daily Summaries, selected date ranges from 1/1/1981 to 12/21/2017, and searched for Stations. Under Enter a Search Term: Cascade used the following to find the locations:

- Bellingham, WA
- Bremerton, WA
- Yakima, WA
- Walla Walla, WA
- Baker City, OR
- Pendleton, OR
- Redmond, OR

A map is then provided where the Company selected the following locations to be added to the cart:

- BELLINGHAM INTERNATIONAL AIRPORT, WA US
- HOQUIAM BOWERMAN AIRPORT, WA US
- YAKIMA AIRPORT, WA US
- WALLA WALLA REGIONAL AIRPORT, WA US
- BAKER CITY AIRPORT, OR US
- PENDLETON E OR REGIONAL AIRPORT, OR US
- REDMOND AIRPORT, OR US

Once added to the cart, Cascade selected the cart in the top right and selected view all items. The Custom GHEN-Daily CSV is selected under Select the Output Format. Confirm that the Select the Date Range is correct from the selected date range from earlier. Select Continue. Enter email address where the data will be received and select Submit Order.

Results of weather comparison:

One of the reasons Cascade finds Schneider to be more reliable than NOAA is the fact that NOAA publishes data with missing values while Schneider has not provided a day with any missing data. Below is a list of the weather stations from NOAA and the missing values between the years of 1981-2017. When pulling the data, some of the dates were simply not in the file. Other missing values had dates in the file but had empty TMAX or TMIN values. For example, 11/16/2002 was provided with empty data values in the TMAX and TMIN.

- BELLINGHAM INTERNATIONAL AIRPORT, WA US – 814
- HOQUIAM BOWERMAN AIRPORT, WA US – 137
- YAKIMA AIRPORT, WA US – 2
- WALLA WALLA REGIONAL AIRPORT, WA US – 1353
- BAKER CITY AIRPORT, OR US – 33
- PENDLETON E OR REGIONAL AIRPORT, OR US – 0
- REDMOND AIRPORT, OR US – 784

Another reason is because “Schneider Electric collects weather observations from a variety of sources.” as stated in Schneider Electric’s Observed, Normals and Forecast Data Methodologies and Processes document. This document has been provided in Cascades UG-170929 General Rate Case, named ‘UG-170929, CNGC Exh. BR-9C, 3.23.18(C) pdf’, under confidential treatment. The fact that Schneider uses multiple sources benefits Cascade because of the diverse service area the Company serves.

Cascade has provided an analysis in columns R:V showing the differences between the NOAA and Schneider data the Company has gathered. All but the Hoquiam (Bremerton) area have a mean absolute error on HDDs of less than one. The Company believes the big difference in the Hoquiam (Bremerton) area is because they are two different locations. Cascade believes the Bremerton location is better since most of the customers in the Hoquiam (Bremerton) area is in the Bremerton area.

2. Identify the cost of risks associated with environmental effects of emissions of carbon dioxide it will use in its IRP, and describe how the calculation of such cost will be accomplished;

Cascade will be analyzing a variety of potential carbon futures for the 2018 IRP, including but not limited to the social cost of carbon, legislation backed by Governor Inslee, and a ballot initiative proposed by various environmental groups. The cost of carbon compliance will then be converted into a dollar per dekatherm figure using regional standards for the carbon emissions of one dekatherm of natural gas. Once calculated, Cascade will generate a unique avoided cost for each potential carbon future, using the resulting DSM numbers in a variety of scenario and sensitivity analyses related to carbon compliance. Additionally, these costs will be used to analyze the cost effectiveness of renewable natural gas versus traditional natural gas purchase and transportation.

Ultimately the Company will select one potential carbon future for its base case analysis. This may not be a representation of what the Company believes is the best way to capture the cost of carbon, but rather a reflection of what stakeholders have indicated is the preferred forecast for regional carbon analysis.

3. Provide the date by which the Conservation Potential Assessment will be completed;

The Conservation Potential Assessment is complete, dated March 16th, 2018, and was discussed with the CAG during the Q2 meeting on April 18th, 2018. Volumes 1 and 2 are available to the CAG with a few of the Appendices being available upon request due to email size constraints.

4. Provide calculation of the economic potential of conservation within the IRP, or anticipated date of completion of such calculation;

Economic Potential based on the revised inputs for the 2018 IRP will be available as of TAG 4, currently scheduled for August 16th. It will be developed throughout July and will be discussed during the DSM chapter review and incorporated into the IRP narrative.

5. Report to an expanded discussion of distribution resource planning to include date of resource need, analysis of least cost reasonable resources, and the alternatives considered;

The Resource Planning team has been working closely with the Engineering group to create a process that will provide the IRP with the information needed. This information includes the date of resource need, analysis of least cost reasonable resources as well as alternative analysis that was done but found to be not least cost. Cascade is also implementing any relevant projects into the avoided cost if they can be offset by demand side management. Cascade will also include the cost of each project in an Appendix under confidentiality protection.

6. Provide comparison between its growth forecast and information from the state economic report;

Cascade has provided a spreadsheet (W&P Comparison Workbook) that includes a comparison between Woods & Poole (W&P) as well as information from the state economic report in W&P Comparison Workbook.

The 'Data Comparison' tab includes WA and OR State forecast (medium) from the state economic report in yellow and the W&P WA and OR State forecast from W&P in green. The gold cells are a comparison between the two sources. The red columns contain counties that Cascade does not serve.

The 'W&P Data' tab includes the raw data Cascade receives from W&P.

The 'OR Population' tab includes the raw data Cascade pulled from the Office of Economic Analysis, Department of Administrative Services, State of Oregon. The data is a Forecast of Oregon's County Population and Components of Change, 2010-2050 as noted in cell A1 of that tab.

The 'WA Medium Forecast', 'WA Low Forecast', and 'WA High Forecast' are the respective medium, low, and high forecasts provided from data.wa.gov.

The 'Graphical Comparison' tab shows the comparison between the different sources. The comparison between W&P are very similar in the first few years and then the W&P projects a slightly higher growth in WA and a slightly lower growth in OR.

7. State whether proposals presented by NWP would modify delivery rights to meet potential shortfalls, or would otherwise address shortfall concerns; and

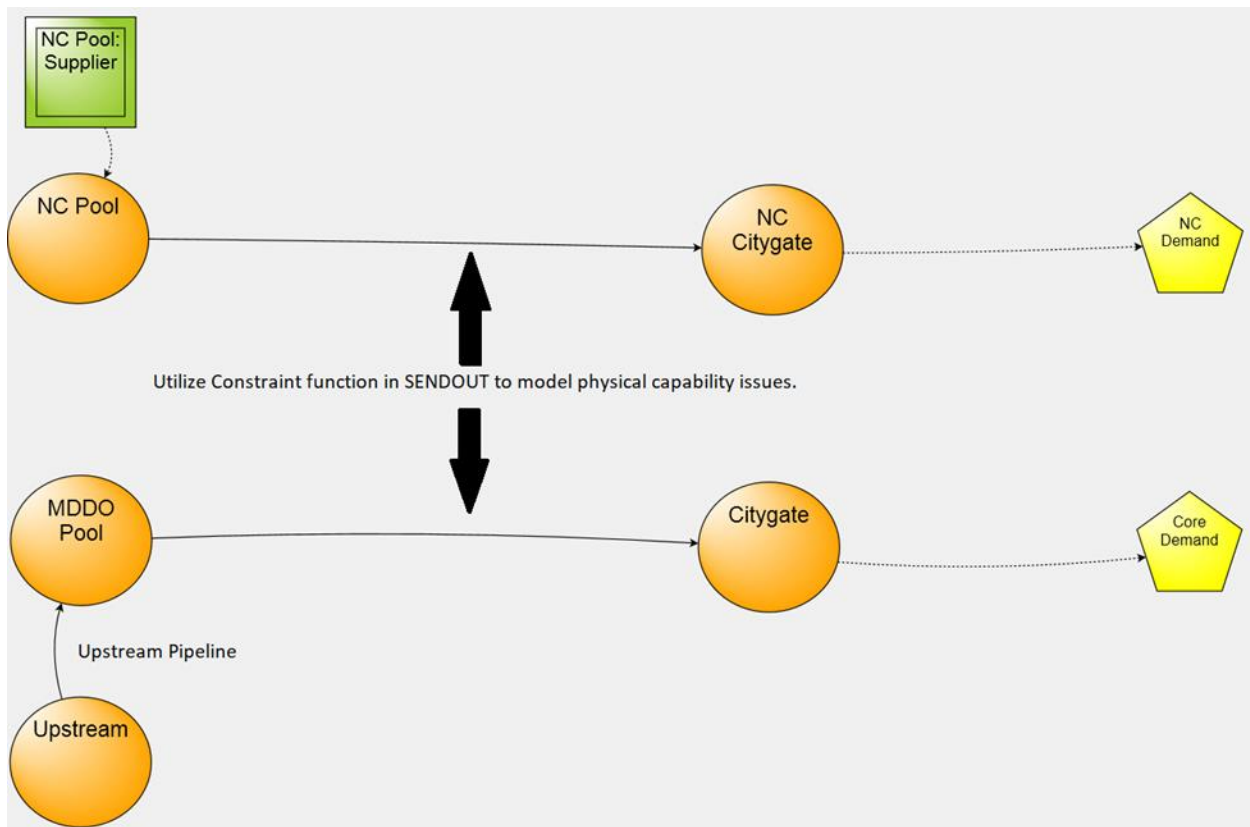
The Company will continue discussions with upstream pipeline and other parties to address the potential early 2020s shortfall along the I-5 corridor through incremental upstream pipeline capacity or through other parties via capacity release or other resources. Provide Gas Supply Oversight Committee (GSOC) with the model results from the most recent proposals from the upstream pipeline and other parties. Perform any additional analysis requested by GSOC. Communicate these findings to the WA IRP stakeholders for input and feedback. Seek GSOC approval of the appropriate action regarding acquiring additional capacity along the I-5 corridor.

8. Clarify response regarding incorporation of the citygate study into the IRP.

The purpose of the information below is to explain how Cascade currently plans to incorporate the citygate study into SENDOUT®. The citygate study was first built to determine if any citygates had a physical capability constraint. To calculate constraints, the Company needs to forecast both the core and non-core (NC) peak day demands. Since the physical constraint usually happens at the hourly level, and SENDOUT® is at the daily level, the Company converts the hourly physical constraint data into daily. Historically, the pipelines use a factor of 16.67 to get hourly MSCFH data into daily MSCFH.

How the citygate study is modeled

Once the daily physical capability in dekatherms is determined Cascade can then model it in SENDOUT. The diagram below illustrates how the citygate study will be modeled for each citygate. Optically, the diagram below looks odd because it separates the non-core and core when in reality they are on the same system. The reason for this is to make sure the upstream transportation is treated separately to model the fact that the core customers are bundled, and the non-core customers are unbundled. Being bundled means Cascade plans for the upstream capacity for the core where the NC customers must plan their own upstream capacity. Please note that NC Citygate and Citygate interconnects are the same citygate.



Since the Company does not plan for upstream purchases on the NC side the modeling will be simple. The Company will allow the NC to purchase the needed gas to meet demand. There will be no upstream transportation for the NC, so the gas will go straight to the NC pool. On the core side, Cascade will model

the upstream transportation as it has in the past. The MDDO Pool will consist of the gas transported for the demand at the citygate or citygates behind the demand tap (GTN) or zone (for NWP). Once the gas is gathered in the NC Pool and MDDO Pool the constraint function in SENDOUT® is utilized to model physical capability issues. The constraint function allows Cascade to treat two different transport lines as one. If we think of it as a formula where a is the line from NC Pool to NC Citygate, b is MDDO Pool to Citygate, and x is the physical capability. The formula would be $a + b \leq x$. If the demand for a and b is less than x, there will be no constraint. If a and b exceed x, there will be a constraint on the physical capability side and therefore may require a citygate upgrade.

Why the citygate study is modeled

By incorporating the citygate study into the 20-year planning horizon of the IRP, the Company will be better informed of potential physical capability issues at the citygates. The engineering team also runs a citygate study using Synergi and this will allow Cascade an opportunity to cross check results.