CASCADE NATURAL GAS CORPORATION®

A Subsidiary of MDU Resources Group, Inc.

*In the Community to Serve®*

# CASCADE NATURAL GAS CORPORATION'S 2016 INTEGRATED RESOURCE PLAN QUARTERLY UPDATE 1

**Item 1. Demand Forecast: For projecting customer growth, Cascade should use a regression model to more accurately gauge the correlation between demographic and employment growth and Cascade's load growth. The Company should also test the validity of its load forecasting model by conducting a back-cast with actual, observed data. For temperature data, the Commission prefers the use of National Oceanic and Atmospheric Administration (NOAA) data. If Cascade choses to rely on weather data from another source, it should provide detailed justification for doing so and verify the reliability of this data. Further, similar to other regulated utility IRPs, the Company should modify the regression models to account for seasonal differences in customers' weather sensitivity and use an autoregressive model to forecast load, when appropriate.**

**Response:** Cascade will be running, and has been running for the 2018 OR IRP, ARIMA time series analysis with seasonal indicators to create a customer and demand forecast model. The customer forecast model will use population and employment growth to analyze customer growth. Cascade has chosen Schneider because Schneider has proven to be more reliable and more responsive with data than NOAA. This is because Schneider uses multiple sources to compute weather data for an area, and with Cascade's wide service territory, we feel it gives a better representation of our service territory's. Cascade also uses Schneider data throughout the company, therefore, Cascade finds having one set of data to use is best for the Company.

**Item 2. Stochastic Analysis: The Commission requests that Cascade expand its stochastic analysis to include probability distributions of costs, such as system costs and resource mix, for multiple portfolios. The Company should run simulations to "stress test" different resource mix alternatives, including mixes with increased investment in conservation resources, which will provide more data and results for portfolio optimization.**

**Response:** For its 2018 IRP in Oregon, Cascade has modified its stochastic analysis to incorporate many of these recommendations. The Company first uses SENDOUT® to derive optimal deterministic portfolios using all potential resources. Cascade then derives additional candidate portfolios by allowing SENDOUT® to generate the optimal deterministic mix of resources using only NWP solves, only NWP solves with storage, only GTN solves, only GTN solves with storage, and only storage. These six portfolios are then tested stochastically. The company records the mean total system cost and the 95th percentile of total system costs to capture an intrinsic and extrinsic value of each portfolio, which is in turn used to rank the portfolios and ultimately create a preferred portfolio. The Company expects to use a similar methodology in its 2018 IRP for Washington.

In a 2017 update to its 2014 IRP in Oregon, Cascade performed an analysis on the impact of accelerated DSM to its anticipated shortfalls. The Company concluded that accelerated DSM would not generate a material impact on the timing or quantity of incremental resources needed. The Company will perform a similar analysis for the 2018 Washington IRP.

**Item 3. Conservation Potential Assessment (CPA) and Model: In consultation with its advisory group, Cascade should develop a request for proposal for a new CPA and new (or modified) model using the Northwest Power and Conservation Council's methodology for calculating conservation potential. The Company should continue to coordinate with the Northwest Energy Efficiency Alliance to include non-energy benefits in the CPA.**

**Response:** The Energy Efficiency Department released a Request for Proposal (RFP) to more than twenty qualified independent evaluators of Energy Efficiency programs on behalf of the Company's Washington State Conservation Incentive Programs as of July 11th, 2017. The Company advised we

were seeking a comprehensive reassessment of the Company's residential, commercial and industrial energy efficiency potential (Conservation Potential Assessment or CPA) under the methodology currently employed by the Northwest Power and Conservation Council (NWPCC). We also noted we were seeking an executable and dynamic model to support goal setting in future years allowing for annual reassessment to be performed internally by CNGC for Integrated Resource Planning, or alternatively if a model could not be provided then a proposal from a vendor to provide ongoing support to obtain an updated CPA biennially. The RFP was developed in consultation with the Conservation Advisory Group (CAG) which included feedback and recommendations provided by Staff from the WUTC, Public Counsel and Northwest Energy Efficiency Alliance (NEEA). The Company also sought recommendations and insights from Regional Technical Forum (RTF) members and NWPCC representatives while developing the RFP and included elements of cost test evaluation as part of the RFP including the Total Resource Cost (TRC) test non-energy benefits guidance and inclusion of the Resource Value Test (RVT) as one of three ways to evaluate cost-effectiveness of the programs moving forward.

Three vendors responded to the RFP by the August 2nd deadline. The Company evaluated the responses for adherence to the requested elements, developed a matrix and advised our CAG of the results of the RFP evaluation and the vendor which was awarded the project. We are moving forward with Applied Energy Group (AEG) as the CPA evaluator and will be using LoadMap in the 2018 IRP for potential forecasting. We are on track to meet the February 5th completion date and will have AEG present to the CAG during our quarterly meeting in October about the project timeline, modeling software and current status.

**Item 4. Clean Air Rule (CAR): While we acknowledge that the CAR is currently the subject of litigation by Cascade and others, WAC 173-441 and 173-442 are in force in Washington state unless and until a court decides otherwise. In its 2018 IRP expected case, Cascade should model specific CAR impacts. Moreover, Cascade should consider the costs and risks of additional environmental regulations, including a possible carbon tax ($/ton of carbon dioxide equivalent).**

**Response:** Cascade is researching potential emission reduction unit (ERU) options for CAR compliance which include, but are not limited to, livestock projects, wastewater projects, renewable energy projects, renewable energy credits, transportation, natural gas system, and energy efficiency. We will evaluate the ERU options and costs, as well as any future carbon tax, and apply these costs in 2018 IRP cost modeling.

**Item 5. Avoided Costs: The Company should expand its analysis of avoided energy and capacity costs (on and off peak), by year and end use, quantifying the following cost streams: carbon-inclusive price and transport, capacity (supply resource), capacity (distribution system), emissions with expected case adder of incremental carbon policy (CAR analysis), and a ten percent conservation adder. The Commission recommends the Company provide additional information with regard to its avoided cost calculation methodology, clearly delineating carbon costs included in the price of natural gas and external costs related to state-specific carbon policies, including but not limited to Washington's Clean Air Rule.**

**Response:** Cascade has modified its avoided cost formula to incorporate many of these recommendations.

**Item 6. Distribution System Enhancements: As the Commission promulgates new rules related to IRP transmission and distribution system planning, the Company will need to provide more analysis on distribution system enhancements in future IRPs.**

**Response:** Late last year the WUTC opened Docket U-161024 to consider new, additional guidelines for Integrated Resource Plans (IRPs). These potential new rules impact all the areas of the IRP such as demand forecasting, price forecasts, DSM, environmental analysis, supply resources, integration modeling scenarios, stress testing of portfolios, and distribution system planning. Cascade has been an active participant in this process and anticipates making changes to its future IRPs to expand discussion of distribution resource planning to include date of resource need, analysis of least cost reasonable resources and alternatives considered. The Company also plans to implement other changes as needed once the WUTC provides final, updated guidelines.

**Item 7. Resource Cost Assumptions: The Commission strongly reminds the Company to regularly update its analyses based on new information and ensure that resource acquisition decisions are based on updated analyses using the most current data available.**

**Response:** Cascade agrees with the importance to have the most current, reasonably available information when modeling potential resource decisions. To this end, the Company has sought through its citygate study to confirm upstream pipeline receipt/flow information. Additionally, Cascade requested Northwest Pipeline (NWP) refresh their estimates for potential expansions along the I-5 corridor and the Yakima lateral. The Company is also currently in discussions with NWP about options to address potential concerns with flow on the Shelton lateral. Further updates will be provided in future quarterly updates and at 2018 WA IRP Technical Advisory Group meetings.

**Item 8. Quarterly Reports on Action Plan: Cascade should submit quarterly reports, beginning in Quarter 3 of 2017, explaining progress made towards resolution of the issues identified in the 2016 IRP Action Plan and issues identified in this letter and attachment. Each progress report must be received by the Commission no later than the final business day of each fiscal quarter.**

**Response:** Cascade has filed the first Quarterly Update on September 29, 2017.

**Item 9. Expanding forecasting to test non-linear regression methodology using SAS.**

**Response:** As mentioned in item #1, Cascade will be running ARIMA time series analysis with seasonal indicators to create a customer and demand forecast model. The customer forecast model will use population and employment growth to analyze customer growth.

**Item 10. Consider the new weather normalization model in the forecast**

**Response:** The Company filed a new weather normalization methodology using the forecast model in the most recent Rate Case (No docket number assigned yet)

**Item 11. Cascade will work on gathering growth information from other locations to compare with Woods & Poole. Also include analysis from State Economist Report**

**Response:** The Company produces an internal monthly market intelligence report that includes sources such as SNL, Wood Mackenzie, EIA's short and long-term energy outlooks, U.S. Census Bureau's state data center program, as well as regional and national newspapers. These sources are used in conjunction with Woods & Poole's growth data to confirm or challenge the information provided. The Company will consult with our regional LDCs and continue to work with Staff to identify other potential sources of growth information for Cascade to consider.

**Item 12. Investigate incorporating distribution system costs into the avoided cost calculation**

**Response:** The Company has worked with internal stakeholders such as Engineering and Industrial Services to obtain more cost information regarding enhancements to the distribution system so that these may be considered in our avoided costs calculations. Additionally, Cascade has reached out to other utilities to understand how they each developed their methodologies for including distribution system costs into their avoided costs calculations. Cascade has some unique issues regarding allocation of distribution system costs due to the Company's wide geographical area. In addition, unlike many LDCs, Cascade's system is largely non-contiguous. The Company will continue to develop potential methodologies for inclusion of distribution cost into the avoided cost calculation for the 2018 WA IRP.

**Item 13. As specific carbon legislation is passed, the Company will update its avoided cost calculations, conservation potential and make modifications to its DSM incentive programs as necessary.**

**Response:** While no specific carbon legislation has yet passed during the time this update was written, the Company monitored all proposed carbon bills that emerged during the legislative session, and is actively monitoring the development of policy in this area. Cascade has also begun to communicate with environmental stakeholders interested in putting a price on carbon, petroleum, natural gas, electricity, and stationary sources in WA. This engagement will help us be proactive in updating avoided cost calculations, conservation potential and other DSM modifications if/when legislation is passed.

**Item 14. The Washington State Dept. of Ecology issued a new carbon rule. Cascade will need to consider IRP implications**

**Response:** Cascade continues to evaluate IRP implications of CAR, such as increasing costs and any potential changes with gas supply and delivery. Cascade will provide another update prior to the first 2018 IRP TAG meeting.

**Item 15. Expand Monte Carlo methodology to include analyses of a variety of potential portfolio scenarios (e.g., high growth, low pricing, etc.)**

**Response:** For its 2018 IRP in Oregon, Cascade has modified its stochastic analysis to incorporate many of these recommendations. The Company first uses SENDOUT® to derive optimal deterministic portfolios using all potential resources. Cascade then derives additional candidate portfolios by allowing SENDOUT® to generate the optimal deterministic mix of resources using only NWP solves, only NWP solves with storage, only GTN solves, only GTN solves with storage, and only

storage. These six portfolios are then tested stochastically. The Company records the mean total system cost and the 95th percentile of total system costs to capture an intrinsic and extrinsic value of each portfolio, which is in turn used to rank the portfolios and ultimately create a preferred portfolio. The Company expects to use a similar methodology in its 2018 IRP for Washington.

**Item 16. Negotiate with TransCanada for the needed incremental GTN capacity for November 2017**

**Response:** On August 30, 2017, Cascade's Gas Supply Oversight Committee authorized the Company to secure an incremental amount of GTN capacity. The path is Kingsgate to Malin. The volume is 10,000 dths/day. The effective date is December 1, 2017, terminating October 31, 2032. The principle reason for the acquisition of this capacity is to address potential capacity shortfalls in central Oregon through 2029. This incremental capacity may also provide some additional flexibility to move more AECO gas to Washington. The Company will use the interim period to consider potential DSM, capacity or changes in demand to address any suspected Oregon deficiencies beyond 2029.

**Item 17. Work with NWP to define what delivery rights can be modified to meet potential shortfalls**

**Response:** Over the course of summer 2017, Cascade and NWP have had on-going discussions regarding potential re-alignments. NWP has provided several proposals with are currently under review. It is expected that these modeling results will be presented to Cascade's Gas Supply Oversight Committee (GSOC) by year end.

**Item 18. Work with NWP and potentially other regional LDCs to determine if a combination of I-5, Wenatchee, etc. expansion or segmentation can address shortfalls and regional infrastructure concerns.**

**Response:** The Company has had informal discussions with several regional LDCs and NWP regarding potential expansions at a joint level. Options at this time for a joint undertaking faces several hurdles at this time (e.g., lack of common pathways, and shortfalls or potential anchor tenants). Consequently, while Cascade will continue to reach out to the parties regarding a joint effort, at this time it appears that the LDCs will likely work separately with NWP to address specific infrastructure needs.

**Item 19. Incorporate the citygate study into the IRP.**

**Response:** The Cascade Resource Planning team has completed the citygate study. Currently, the Company's engineering team has the study to confirm the accuracy of the physical capability numbers at each citygate.

**Item 20. Use the results of the Study to confirm aligning of alternative resources, specifically satellite LNG**

**Response:** This will be updated in the third progress report.

**Item 21. Upon confirmation of need for satellite LNG, proceed with implementation of facility**

**Response:** No determination has been made at this time regarding the need for satellite LNG. The Company continues to gather information about the need, costs and risks associated with satellite

LNG as a viable alternative resource. In addition, the Company continues to review other alternatives such as trucked-in LNG, pipeline expansions, DSM, etc. to address potential shortfalls.