BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 69

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In the Matter of	)
	)
CASCADE NATURAL GAS	)
CORPORATION	)
	)
2018 Integrated Resource Plan.	)
	)

COMMENTS OF THE

OREGON CITIZENS' UTILITY BOARD

April 6, 2018

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I.   INTRODUCTION

The Oregon Citizens' Utility Board (CUB) submits these comments in response to

Cascade Natural Gas Company's (the Company) 2018 Integrated Resource Plan (IRP). CUB

appreciates the work of the Company and other stakeholders throughout the process, and the

ability to comment on the IRP.

During the March 27th, 2018 Public Meeting, the Company presented its primary

objectives for this current IRP cycle.[1] CUB would like to highlight the Company's fulfillment of

the following objectives:

1. Encourage and seek public participation in the IRP process. Ensure the process is

     collaborative, open and informative.

2. Describe to key stakeholders and the public the complex utility system unique to

     Cascade.

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[1] See LC 69 – The Company's Presentation for the 3/27/18 Public Meeting.

CUB and Cascade have met to discuss the IRP. Cascade's resource planning team fielded several questions from CUB, and we appreciate Cascade making a concerted effort to include us in the IRP process. Cascade provided an overview of the IRP and service territory.

II.   DEMAND FORECAST TIME SERIES MODELING

The Company uses an Autoregressive Integrated Moving Average (ARIMA) methodology to forecast customer growth and demand. ARIMA is a forecasting model used by econometricians and statisticians. An ARIMA model has the ability to breakdown a time series into a trend, seasonal and irregular components. For example, the United States Census Bureau uses ARIMA modeling to remove seasonality from demographic data.
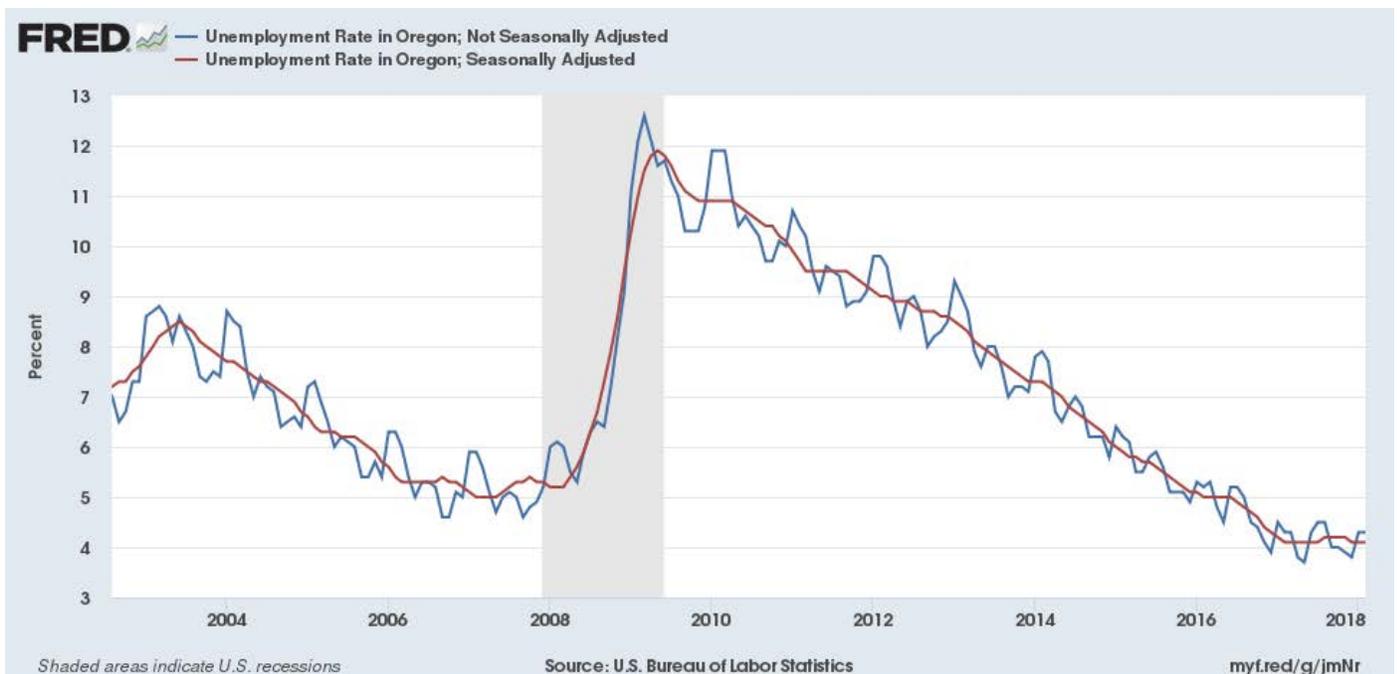
This chart is being presented to provide an overview of seasonality. The blue line is the observed unemployment rate in Oregon. The jagged pattern presented by the blue line is the seasonal variation of unemployment. For example, retail store firms hire temporary workers during the holiday season. Once the holiday season is over, the unemployment rate increases

every year. The seasonally adjusted unemployment data is commonly used to describe unemployment, because it captures the general trend of unemployment.

The company is using the Box-Jenkins method to determine the model's autoregressive and/or moving average terms. The Box-Jenkins method is an iterative process of selecting ARIMA terms. When viewing the Autocorrelation Function (ACF) and the Partial Autocorrelation Function (PACF) of a time series, the analyst has to make several subjective calls as to which AR or MA term is applicable. During the identification phase of the Box-Jenkins method, the process is more of an art than a science. It is common for two analysts to view the same data and determine two different ARIMA models. In short, the Box-Jenkins method can easily produce different outcomes due to its subjective nature. However, ARIMA does not require a human to be modeled.

The Company stated in its two-year action plan it intends on using the Auto ARIMA function to estimate ARIMA models.[2] CUB supports this approach. R is an open source statistical software environment. In order to expand the capabilities of R, a user can install packages to add additional features. The forecast package created by Professor Rob Hyndman to forecasting tools such as the Auto ARIMA function to base R.[3] Additionally, R code can be used in tandem with the SAS software used by the Company.

The Auto ARIMA function uses an algorithm to select the ARIMA model based on a quantitative quality estimator. [4] The ARIMA model can be produced by the Company. Additionally, the Auto ARIMA package enable stakeholders and Staff to more easily replicate the ARIMA modeling approach used by the Company.

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[2] *See* LC 69- Cascade Natural Gas Corporation, 2018 Integrated Resource Plan, page 1-12.

[3] *See* https://cran.r-project.org/web/packages/forecast/forecast.pdf for documentation on the forecast package.

[4] The following estimators are used in time series analysis to determine the quality of a statistical model: Akaike information criterion, Bayesian information criterion and AICc.

The Company has stated it expects an average customer growth rate of 1.54% between 2018 and 2037 in its service territory. [5] Washington's Office of Financial Management expects the population growth rate of 1% for the state of Washington from 2017 to 2037. [6] The Oregon Office of Economic Analysis has forecasted that statewide population growth will be 1.05% from 2020 to 2025. [7] The Company has indicated it expects growth in Bend, Oregon, Walla Walla, Washington and the Tri-Cities region to be drivers of service area growth.[8] CUB accepts this explanation.

III.   ACTION PLAN

Commission Order 07-002 establishes basic guidelines of an IRP before the Oregon Public Service Commission. This order establishes Guideline 4(n), which requires each IRP to have "an action plan with resource activities the utilities intends to undertake over the next two to four years to acquire the identified resources, regardless of whether the activity was acknowledged in a previous IRP, with key attributes of each resource specified as in portfolio testing."[9] CUB asks the Company to add the specific resources it intends on acquiring over the next two to four years in its action plan.

IV.   CONCLUSION

CUB will continue to be involved in the Company's IRP. CUB is planning on attending several of the Company's TAG meetings in Washington, in order to gain further insight into its planning process.

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[5] *See* LC 69- Cascade Natural Gas Corporation, 2018 Integrated Resource Plan, page 3-8.
[6] https://www.ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/state-population-forecast
[7] http://www.oregon.gov/das/OEA/Documents/appendixc.pdf
[8] *See* LC 69- Cascade Natural Gas Corporation, 2018 Integrated Resource Plan, page 3-9.
[9] See Order 07-002, Page 12.

Signed this 6th of April, 2018.

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