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VIA: Electronic Mail

Public Utility Commission Oregon
Attention: Filing Center
550 Capitol St. N.E. Suite 215
Salem, OR 97308-2551

Re: Docket No. LC 72 – Avista Utilities 2018 Natural Gas Integrated Resource Plan Response Comments

Avista Corporation, dba Avista Utilities or (“Avista” and/or the “Company”), appreciates the participation of Commission Staff (Staff) and the Citizens’ Utility Board of Oregon (CUB) in the investigation of the Company’s 2018 Natural Gas Integrated Resource Plan (IRP) and their common goal of seeking the most reasonable resource plan for Avista’s customers in Oregon. The following comments are in response to the comments filed by Staff on November 19, 2018 in Docket No. LC 72.

Demand Forecasts including Price Elasticity

Avista generates its own near-term population forecast as averaging multiple forecasts reduces the systematic errors that can occur with a single-source forecast. Staff also raised some concerns regarding the terms and lack of differencing in Avista’s customer forecast model. To clarify, Avista does in fact utilize its annual growth rates as a form of first differencing. As an example of this, $GEMP = (EMP_y - EMP_{y-1})/EMP_{y-1}$, where EMP is the employment level in year y and y-1. In this case, the variable is this first difference of EMP normalized by the previous value of

EMP. Avista’s model selection process relies heavily on the Akaike Information Criterion (AIC). The AIC helps to identify the appropriate lag length for the ARIMA correction.

Fuel switching can be problematic to forecast. As Avista learned from Washington’s jurisdiction, integrating the impact of gas conversation programs can be difficult for the following reasons: (1) uncertainty over the timing of Commission approval of new programs; (2) uncertainty over the design of future programs; (3) the lack of similar past programs than can be used to gauge customer responses. Two years ago Avista started to look at how much gas penetration is possible in the Company’s major metropolitan areas, including Jackson County (Medford). This analysis, which is still ongoing, is focused on the share of owner-occupied housing to total housing, since owner-occupied housing is the most likely to adopt gas (compared to renter occupied).

Risk is a mainstay of Avista’s planning and analysis in the IRP. As a way to measure risk from expected population growth, a high and low growth customer forecast was developed. For residential customers, this is generated by substituting a high and low population growth case for the baseline population growth assumption. The high-low forecasts are based on the historical distribution of year-to-year changes in population growth rates to determine what would constitute a material change in the base-line population growth for a given jurisdiction. This analysis produces a monthly interpolated high and low population forecast series. Let $POPH_{t,y}$ be the high forecast for month t in year Y ; and let $POPL_{t,y}$ be the same for the low forecast. Regardless of the population series, it is assumed that the ratio of baseline residential customer forecast, $F(RES_{B,t,y})$, to base-line population forecast, $F(POPH_{t,y})$, is the same in both the high and low cases. That is:

$$[13] \alpha_{B,t,y} \equiv \frac{F(RES_{B,t,y})}{F(POPH_{t,y})}$$

Therefore, by assumption:

$$[14] \alpha_{B,t,y} = \alpha_{H,t,y} = \alpha_{L,t,y} = \alpha_{t,y}$$

This allows high and low RES series to be generated as follows:

$$[15] F(RES_{j,t,y}) = \alpha_{t,y} \cdot F(POP_{j,t,y}) \text{ for } j = H \text{ or } L$$

The high and low RES series can then be applied to generate a high and low commercial (COM) forecast series, as follows:

$$[16] \beta_{B,t,y} \equiv \frac{F(COM_{B,t,y})}{F(RES_{B,t,y})}$$

Similar to [8.14], assume:

$$[17] \beta_{B,t,y} = \beta_{H,t,y} = \beta_{L,t,y} = \beta_{t,y}$$

This allows high and low COM series to be generated as follows:

$$[18] COM_{j,t,y} = \beta_{t,y} \cdot F(RES_{j,t,y}) \text{ for } j = H \text{ or } L$$

This approach continues to assume a strong linkage between residential and commercial customers, which factors into the baseline forecast. By way of substitution:

$$[19] COM_{j,t,y} = \beta_{t,y} \cdot (\alpha_{t,y} \cdot F(POP_{j,t,y})) = \gamma_{t,y} \cdot F(POP_{j,t,y}) \text{ for } j = H \text{ or } L$$

Note that:

$$[20] \gamma_{t,y} \equiv \gamma_{B,t,y} \equiv \frac{F(COM_{B,t,y})}{F(POP_{B,t,y})}$$

The high and low industrial customer forecasts are handled independently from the population forecast. In this IRP, the high-low forecasts are based on the historical distribution of same month, year-to-year changes in industrial customers, to determine what would constitute a material change in the base-line industrial customer forecast for a given jurisdiction. Work is ongoing to determine if a more specific forecast driver, similar to population, can be found. Industrial activity is difficult to model because it is driven by complex factors related to regional recruitment and retention policies; domestic and international competition; environmental policy; local zoning and land availability; and technological change. One driver that has been examined is the number of employer firms in manufacturing and mining in a given jurisdiction. This data is available annually from the U.S. Census's County Business Patterns data. However, initial analysis shows a weak correlation between changes in the number of firms in a jurisdiction and the changes in the number of customers (i.e., billed meters).

The population growth forecasts for the Douglas (Roseburg), Klamath (Klamath Falls); and Union (La Grande) counties come directly from Information Handline Services (IHS). This was the agreement reached with Oregon PUC staff in one of Avista's previous rate cases.

Avista presented price elasticity at its initial TAC meeting held on January 25, 2018. A portion of this presentation reviewed the study from the American Gas Association and other publications. During this discussion Avista stated the impact that smoothing effect items like general rate cases, purchase gas adjustments, hedging and geographic locations have on the difficulty of measuring overall elasticity. This can be seen specifically in the Washington and Idaho service territories. In prior years Avista used an elasticity of -0.15 as originally estimated from those outside studies mentioned above. In the 2018 IRP, an elasticity of -0.10 was utilized, which represents the average of Medford and Roseburg's measured elasticities and was applied across all service territories.

Demand Side Management

Effective January 1, 2017, all Oregon DSM programs, with the exception of low-income conservation, are delivered and administered by the Energy Trust of Oregon (ETO). In the forecasting done by the ETO, it was estimated that the amount of cost effective, achievable potential by 2037 was only 8.5 million therms out of 17.2 million therms of energy. The reasons for this can be found on page 81 of the IRP and is included below:

1. "Lost Opportunity Measures" – Measures that are meant to replace failed equipment (ROB) or new construction measures (NEW) are considered lost opportunity measures because programs have one opportunity to influence the installation of efficient equipment over code baseline when the existing equipment fails or when the new building is built. This is because these measures must be installed at that specific point in time, and if a program administrator misses the opportunity to influence the installation of more efficient equipment, the opportunity is lost until the equipment fails again. Energy Trust expects that most of these opportunities will be met in later years as efficient equipment becomes more readily adopted. In early years, the level of acquisition for these opportunities is smaller and ramps higher as time progresses.
2. "Hard to Reach Measures" – some measures that show high savings potential are notoriously hard to reach and are capped at 67% of total retrofit potential. These measures include insulation and windows.

3. New service territory – Avista is a new service territory for Energy Trust as of 2016 and it takes a few years for Energy Trust trade ally networks and systems to become established in new areas, which is reflected in this deployment. In territories where programs are already established, Energy Trust expects to achieve 100% penetration of all cost-effective retrofit potential and ramp to 100% penetration of lost opportunity measure potential in the later years of the 20-year forecast. For this forecast, these metrics have been reduced to 85% to reflect that Energy Trust programs are not yet fully established in Avista territory.
4. Measures under exception – 13% of the cost-effective potential identified by the model is due to the use of the cost-effective override for measures with exceptions. The measures that had this option applied to them included 0.67-0.69 Efficiency Factor (EF) gas storage water heaters and attic, floor, and wall insulation in the Residential Sector. Even under exception, these measures historically have low uptake as many are ‘hard to reach’ measures and a lower percentage of these measures are deployed.
 - a. This is a new point not found within the IRP.

Integrated Resource Portfolio Analysis

The 2018 IRP continued its use of sensitivities to help measure reaction to the changes in demand or price. In order to understand how these sensitivities change the demand, a reference case is used to assist in the starting point without any sensitivities or assumptions. Each sensitivity can be viewed in Table 2.4 Demand Sensitivities on page 40 of the IRP. Avista measures two types of sensitivities, direct and indirect. Direct influence revolves around different customer expectations, co-efficient ranges and demand side management. Price influence centers on elasticity, differing price curves and carbon legislation. Avista will continue to work with the TAC to get feedback on these sensitivities including the reference case.

Bringing together demand and supply into different sensitivities and scenarios requires careful consideration. The major factors considered and approved by the TAC for the 2018 IRP Expected Case include the following:

- Weather: Coldest day on record and an average 20 year rolling NOAA temperature
- Coefficients: A three-year base and heat coefficient
- Pricing: A mix of two consultants’ fundamental forecasts and a forward price

- Demand: Expected growth in customer count for Avista's five major territories (WA-ID; Klamath Falls, OR; Medford, OR; Roseburg, OR; La Grande, OR).

The TAC process provides an opportunity to develop planning criteria used to build the Expected Case. The above elements are grouped into a scenario and loaded into the SENDOUT model. These results help provide the most reasonable methodology around expectations of a peak day scenario based upon direct input from the TAC members. Avista will consider additional factors in its 2020 IRP that may include a loss of load probability as an alternative to coldest on record weather, combined with the incorporation of wind chill data into its analysis. Avista will share the analysis with the TAC in addition to providing a description of methodologies for peak day factors and the respective calculations.

Natural Gas Price Forecasts

The methodology used to create the natural gas price forecasts for the low, expected and high price curves were different. The expected curve is a blend between two consultants and NYMEX. It originates from assumptions and models maintained and delivered in pricing by the consultants. Forward prices are used most heavily in the near term as they represent a legal agreement or contract to buy or sell the price of natural gas between two parties. This is important to note as they represent an actual and known value of the commodity, on the given day and for a given timeframe, for both sides of the monetary equation. The combination of these prices creates an upward rising curve from an increased demand level through the IRP horizon. Assumptions were made for a differing set of inflation rates to help create a high and low price curve, while maintaining symmetry to the expected price. Avista will continue its collaboration with the TAC for best practices and definitions for developing forward curves in future IRP's.

Distribution

Avista Utilities does not have any compressors in its distribution system. Regulators, or pressure limiting devices, are included in district regulator stations (Avista-owned) and city gate stations (interstate pipeline-owned).

In the Company's analysis, all district regulator stations are assumed to be operational. Additionally, there is no intentional redundancy designed into the distribution system (no N-1

planning scenarios). When new stations are built, there is a certain amount of additional capacity designed into them to account for future growth.

City Gate Stations are reviewed at least bi-annually to compare the design day capacity needs and the physical capacity of the city gate station. When projected needs approach the physical capacity, the city gate station is added to a list of City Gate Station Upgrades (Table 8.2) where they undergo further evaluation to determine priority and schedule.

Below is an updated “Table 8.2 City Gas Station Upgrades” for those distribution projects in Oregon to show the timeframe is outside of a 4 year capital requirement.

Location	Gate Station	Project to Remediate	Cost	Year
Klamath Falls, OR	Klamath Falls #2703	TBD	-	2023+
Sutherlin, OR	Sutherlin #2626	TBD	-	2023+

Conclusion

As a result of Staff’s review of the 2018 IRP and continuing review through the submission of their final comments/recommendations on February 4, 2019 per the Procedural Schedule, Avista will work with Staff to file an amended action plan prior to the Public Meeting on March 12, 2019, that will include the following commitments:

1. Avista will work with members of the OPUC to determine an alternative stochastic approach to Monte Carlo analysis prior to Avista’s 2020 IRP and share any recommendations with the TAC members.
2. Regarding high pressure distribution or city gate station capital work, Avista does not expect any supply side or distribution resource additions to be needed in Oregon’s territory for the next four years based on current projections. However, should conditions warrant that capital work is needed on a high pressure distribution line or city gate station in order to deliver safe and reliable services, the Company is not precluded from doing such work. Examples of these necessary capital investments include the following:
 - Natural gas infrastructure investment not included as discrete projects in the IRP

- Consistent with the preceding update, these could include system investments to respond to mandates, safety needs, and/or maintenance of system associated with reliability:
 - Including, but not limited to Aldyl A replacement, capacity reinforcements, cathodic protection, isolated steel replacement, etc.
- Anticipated PHMSA guidance or rules related to 49 CFR Part §192 that will likely require additional capital to comply:
 - Officials from both PHMSA and the AGA have indicated it is not prudent for operators to wait for the federal rules to become final before improving their systems to address these expected rules.
- Construction of gas infrastructure associated with growth
- Other special contract projects not known at the time the IRP was published
- Other non-IRP investments common to all jurisdictions that are ongoing, for example:
 - Enterprise technology projects & programs
 - Corporate facilities capital maintenance and improvements

An updated table 8.2 for distribution projects in Oregon:

Location	Gate Station	Project to Remediate	Cost	Year
Klamath Falls, OR	Klamath Falls #2703	TBD	-	2023+
Sutherlin, OR	Sutherlin #2626	TBD	-	2023+

Lastly, in the path of a transparent process and meeting stakeholder expectations, Avista works with the TAC as a sounding board and major contributor to its IRP document. Avista looks forward to working with the TAC and its members in future IRP meetings and encourages all participants to offer their feedback while the IRP is being developed. Avista also welcomes more analysis and TAC member input surrounding all considerations in the 2020 IRP.

Please contact Tom Pardee with any questions regarding these comments at 509-495-2159 or tom.pardee@avistacorp.com.

Sincerely,

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