

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

LC 65

In the Matter of

AVISTA CORPORATION dba AVISTA
UTILITIES, 2016

Integrated Resource Plan

Staff Initial Comments

The Public Utility Commission of Oregon Staff (Staff) files these initial comments on Avista Utilities' (Avista or Company) 2016 Integrated Resource Plan (IRP or Plan), filed on September 1, 2016. Staff's comments are organized according to subject and address Staff's primary areas of initial focus. Staff continues to evaluate the Company's plan, conduct discovery and will review the participants' comments prior to issuing its final comments and recommendations in January 2017. A final order is expected to follow the Commission Public Meeting on March 7, 2017.

Avista initiated a series of informal technical working group meetings on the IRP in January of 2016. The informal process included four technical meetings between January and April of 2016. Many participants attended and participated in these technical meetings, including Staff, Washington Utilities and Transportation Commission, Idaho Public Utilities Commission, Cascade Natural Gas, Northwest Natural Gas, Puget Sound Energy, Citizens' Utility Board of Oregon, Northwest Industrial Gas Users, Northwest Gas Association, Fortis, Northwest Pipeline Corporation, and TransCanada.

Following the technical working group meetings, Avista circulated a draft IRP, in May of 2016, for informal stakeholder comment.

The Action Plan

Discussion

Avista provides the following action plan for its 2016 IRP in Chapter 8 of the IRP:

2017-2018 Action Plan

Avista's 2017-2018 Action Plan outlines activities for study, development and preparation for the 2018 IRP.

New Activities for the 2018 IRP:

- *The price of natural gas has dropped significantly since the 2014 IRP. This is primarily due to the amount of economically extractable natural gas in shale formations, more efficient drilling techniques, and warmer than normal weather. Wells have been drilled, but left uncompleted due to the poor market economics. This is depressing natural gas prices and forcing many oil and natural gas companies into bankruptcy. Due to historically low prices Avista will research market opportunities including procuring a derivative based contract, 10-year forward strip, and natural gas reserves.*
- *Avista's 2018 IRP will contain a dynamic DSM program structure in its analytics. In prior IRP's, it was a deterministic method based on Expected Case assumptions. In the 2018 IRP, each portfolio will have the ability to select conservation to meet unserved customer demand. Avista will explore methods to enable a dynamic analytical process for the evaluation of conservation potential within individual portfolios.*
- *The Company will monitor actual demand for accelerated growth to address resource deficiencies arising from exposure to "flat demand" risk. This will include providing Commission Staff with IRP demand forecast-to-actual variance analysis on customer growth and use-per-customer at least bi-annually.*

Avista's 2015-2016 action plan review is also provided in Chapter 8 of its plan and has been included as Attachment A to Staff's Initial Comments.

Demand Forecasts

Discussion

In its Executive Summary Avista states that the Company is not resource deficient in any of its Oregon territory during the planning horizon but resource sufficiency is marginal in the final years of the planning horizon. Staff reviewed the Company's forecasting methodology for each of its forecasts including residential, commercial, and industrial and issued requests for information related to the Company's methodology and workpapers.

Comparisons to Avista's 2014 Forecasting Methodology

Recommendation

- Staff's first recommendation on Avista's 2014 IRP demand forecasts was that population be included as a predicting variable within the regressions, rather than used for outboard adjustments.¹ The Company has made this change.
- Staff's second recommendation on Avista's 2014 IRP demand forecasts was that all available data be used in the forecasting models.² In its 2016 IRP, Avista uses three and five years of data to compute use-per-customer coefficients. More than

¹ Staff's Final Comments at 9, Docket No. LC 61, available at <http://edocs.puc.state.or.us/efdocs/HAC/lc61hac133431.pdf>

² Id.

five years of data are available for some rate schedules, for example from 2004, but the Company explains that “three years struck a balance between historical and current customer usage patterns.” In support of using three years of data rather than all available data to compute use-per-customer, the Company states that use-per-customer has been on a downward trend since 2006 and that using less recent data might overstate use as efficiency. Staff finds the Company’s approach of comparing the use of different time periods of data reasonable and finds that whenever the Company uses less than all available data, it should provide a sound reason for doing so.

- Staff’s third recommendation on Avista’s 2014 IRP demand forecasts was that Avista retain regression outputs including estimates and residuals.³ In its 2016 IRP, upon request, Avista provided these outputs. Staff analyzed these outputs. Staff found only minor issues, for example the autocorrelation function for the number of residential customers forecast for Roseburg had a lag that exceeded the 95% confidence interval boundaries.⁴

Residential Forecasts:

- Avista states that customer forecasts consider U.S. Gross Domestic Product (GDP) growth, national and regional employment growth, and regional population growth expectations. However, the model only really utilizes population growth estimations and lagged variables to predict population numbers for residential customers. Commercial customer forecasts are driven by an assumed relationship with residential customer growth; however, as stated on page 25 of the appendix and displayed visually in Figure 6 of the appendix, the relationship has broken down in recent years and may not be a reliable means for estimation. Further, as seen on Page 29 and Appendix 2.2 of the IRP, Avista is unclear as to how the methodology was changed to improve the forecast of conversion (retrofit) customers.

Recommendation

Staff finds the methodology and subsequent forecasts to be reasonable; however, Staff believes that Avista could be more clear and consistent with its explanation and stated reasoning:

- While the use of a scatter plot chart to “verify correlation visually” is sufficient in most circumstances, utilizing a correlation coefficient in addition to a visual inspection is both simple and provides an objective measurement.
- The decision to include a price elasticity of demand factor of -0.15 seems somewhat arbitrary and potentially contrary to empirical studies. Given Avista’s access to its own historical price and demand data, Staff recommends a regression analysis to verify the use and accuracy of the stated price elasticity.

Large Commercial Forecasts

- Avista’s commercial Schedule 424 (large general and industrial) and Schedule 444 (seasonal) number of customer forecasts are based on simple moving

³ Id.

⁴ Based on Avista’s response to Staff IR 1 in Docket LC 65.

averages.⁵ In Docket UG 288, Avista's most recent rate case, Staff found that using simple moving averages is reasonable when explanatory data are not available.⁶ For its small commercial number of customer forecasts the Company used residential customer growth as an explanatory variable; however, these schedules are not as closely correlated with the large commercial forecasts, and thus the Company does not employ them as explanatory variables.

Industrial Forecasts

- The Company uses simple moving average models for each of its industrial number of customer forecasts except for La Grande Schedule 444 seasonal customers. Historically there is wide variation in the number of La Grande Schedule 444 customers, with zero customers in some spring and early summer months.
- Avista has made each of its industrial forecasts without the use of any economic variables. The Company provides evidence that population growth is not a good predictor of growth in the number of industrial customers.

Recommendation

Staff recommends that the Company explore whether economic variables, other than population growth, are useful for prediction (for example in the UG 288 rate case the Company used an industrial production index).

New Markets

- In its demand sensitivity analysis the Company considers a scenario where the adoption of natural gas vehicles produces a five percent cumulative incremental demand.⁷
- The Company describes that less than one percent of natural gas vehicles in use worldwide are in the US.⁸

Recommendation

Staff recommends that the Company continue to analyze natural gas vehicles in its 2018 IRP as a potential demand increasing factor.

Recommendation

Staff makes the above individual recommendations in these initial comments regarding Avista's Demand Forecasts. Staff will have additional input on this subject matter in its final comments in January 2017.

⁵ Id.

⁶ UG 288, Staff/900, St. Brown/10.

⁷ Avista 2016 IRP Appendix at 82.

⁸ Avista 2016 IRP Appendix at 400.

Demand Side Resources

Discussion

Interim preparations for collaboration with Energy Trust of Oregon (ETO)

Avista notes on page 14 of its Plan that it will change its IRP process for determining Demand Side Management (DSM) potential in the 2018 IRP. In 2017, Avista will fully transfer the delivery and administration of its regular income DSM programs to the ETO. The ETO has many years of experience working with Oregon's other investor-owned utilities on their IRP's. Avista should begin working with ETO in 2017 to develop the process to fully incorporate the ETO's independent analysis of DSM potential and conservation supply curves for Avista's Oregon territory as part of the 2018 IRP and will likely be a recommended addition as an action item to the Company's 2016 Action Plan in Staff's Final Comments.

Industrial Achievable Potential

Staff would like Avista to explain in its Reply Comments why on page 56 of its IRP it lists "Achievable Potential" from industrial customers of the Company's Oregon service territory when, during the transition of certain Avista DSM programs to the ETO, it was determined that nearly Avista's entire industrial load in Oregon comprises only transport customers and is thus ineligible for DSM services from the ETO.

Recommendation

Staff continues to review Avista's Demand Side Resource analysis in its Plan. At this time Staff has no further recommendations on this subject matter beyond the observations made in Staff's comments above.

Supply Side Resources

Avista describes in its 2016 IRP its supply side resources and states, "The supply mix includes long-term contracts for firm pipeline transportation capacity from many supply points and ownership and leasing of firm natural gas storage capacity sufficient to serve customer demand during peak weather events and throughout the year."

Discussion

Avista currently has no resource deficiencies and its analysis results demonstrate that there is no need to acquire incremental supply-side resources to meet peak day demands over the next 20 years. However, the Company indicates in its Plan that it will focus on the following normal activities in the near term:

- Continue to monitor supply resource trends including the availability and price of natural gas to the region, LNG exports, supply dynamics and marketplace, and pipeline and storage infrastructure availability.
- Monitor availability of resource options and assess new resource lead-time requirements relative to resource need to preserve flexibility.

- Appropriate management of existing resources including optimizing underutilized resources to help reduce costs to customers.

NWN holds firm transportation contracts for capacity on the following interstate pipeline systems:

- Northwest Pipeline Corporation;
- Gas Transmission Northwest;
- TransCanada's system in southeastern British Columbia;
- TransCanada's Alberta system;
- TransCanada's Tuscarora Gas Transmission; and
- Spectra energy – Westcoast Pipeline.

Avista utilizes storage at the Jackson Prairie facility in its current resource stack. Avista is one-third owner with Northwest Pipeline and Puget Sound Energy. The total working gas volume of Jackson Prairie is approximately 25 Bcf, with 398,667 Dth of daily deliverability rights.

Avista discusses new pipeline transportation in its 2016 IRP on pages 74 – 76 and displays proposed pipeline locations in Figure 4.3 on page 75. The Company recognizes the need of new pipeline transportation, which will bring supply diversity and reliability to the region. The Company is participating in discussions and analysis regarding possible regional pipeline projects that may move forward, however, with the current available information, a generic expansion represents a new pipeline build in the IRP analysis.

Avista includes the following two supply scenarios in its 2016 IRP:

- **Existing Resources:** This scenario represents all resources currently owned or contracted by the Company.
- **Existing + Expected Available:** In this scenario, existing resources plus supply resource options expected to be available when resource need are identified. This includes currently available south and north bound GTN, capacity release recalls, NWP expansions and satellite LNG.

Recommendation

Staff continues to review Avista's Supply-Side Resource Planning, and has no specific recommendation in its initial comments.

Integrated Resource Portfolio Analysis

Discussion

Avista uses linear programming to integrate the significant planning components, and to generate and evaluate long-term resource plans, using a gas supply and optimization software called Sendout.

The Company highlights the following evaluated variables when modeling least cost solutions:

- Demand data, such as customer count forecasts and demand coefficients by customer type (e.g. residential, commercial and industrial);
- Weather data, including minimum, maximum, maximum and average temperatures;
- Existing and potential transportation data which describes the network for physical movement of natural gas and associated pipeline costs;
- Existing and potential supply options including supply basins, revenue requirements as the key cost metric for all asset additions and prices;
- Natural gas storage options with injection/withdrawal rates, capacities and costs; and
- Conservation potential.

Avista displays a Sendout network diagram of its demand centers and resources, illustrating the Company's current transportation and storage assets, flow paths and constraint points in Figure 5.1 on page 85 of the IRP.

Sendout also includes Monte Carlo capabilities enabling the modeling of price and demand uncertainty and detailed portfolio optimization techniques to produce probability distributions.

The Company provides graphic summaries of Average Case demand as compared to existing resources on a peak day in Figures 5.8 through 5.11 on pages 94 and 95 of its Plan. Figures 5.12 through 5.15 on pages 96 through 98 summarize Expected Case peak day demand compared to existing resources, as well as demand comparisons to its 2014 IRP. The Company notes in its summary conclusion of the Integrated Resource Portfolio section of its Plan that it has chosen to utilize the Expected Case for peak operational planning activities because this case is the most likely outcome given experience, industry knowledge and understanding of future natural gas markets.

The Company's avoided cost fell between its 2014 IRP and its 2016 IRP as shown in Figure 5.16 on page 103. During the October 25, 2016, Public Meeting of the Commission, the Company explained that much of the difference was due to falling commodity prices. The Company has identified several scenarios where carbon policy increases commodity prices. The Company included a carbon adder in its avoided cost for Washington but not Oregon, thus if Oregon institutes a carbon policy, the avoided cost will need to be updated.

Natural Gas Price Forecasts:

- Staff believes that the use of Monte Carlo simulations based on historical pricing data to produce upper and lower bounds for the pricing estimate fails to produce

sufficient results. Because the expected price increases over time, the upper and lower bounds should as well in order to maintain a symmetric risk profile. Utilizing bounds that are static overtime creates asymmetrical risks for the forecast at the tails of the forecast time horizon.

- While Staff understands the reasons behind the use of Henry Hub forecasts to estimate future natural gas prices, this methodology relies on an assumption that the relative price between Henry Hub and the primary physical supply points will remain fixed. Historically, the relationship between prices across the nation has varied based on many different circumstances, some of which are demand and weather driven. Staff recommends that care be taken to shape the forecasts seasonally so that the estimate reflects the closest approximation to gas prices the Utility will face in the future.

Recommendation

Staff continues to review Avista's Integrated Resource Portfolio analysis in its plan. At this time Staff has no further recommendations on this subject matter beyond the observations and individual recommendations made in Staff's comments above.

Alternate Scenarios, Portfolios, and Stochastic Analysis

Discussion

The "Alternative Scenarios, Portfolios, and Stochastic Analysis" section contained in Avista's IRP also relates to material in the Company's section regarding the Integrated Resource Portfolio. Staff notes that on page 105 of the IRP, the Company states in part, "...the Expected Case has no resource additions in the [twenty-year] planning horizon...."

In this context, "No resource additions" suggests "no meaningful alternative portfolio candidates," and the Company interprets "no meaningful alternative portfolio candidates," to mean that there is no need for stochastic modeling to establish statistical distribution functions of present-value-revenue-requirements from which comparative risks can be assessed in the pursuit for the portfolio which is best on a cost/risk basis. However, Staff has submitted five information requests to affirm those implications and to questions or explain the meaning and relevance of various other aspects of Avista's IRP results with answers that are still forthcoming from the Company. Also, Staff recognizes the value of this type of modeling in the Company's Plan, and the value and opportunity for the continuing refinement of this analysis during a period when no resource additions are needed. Staff provided input to the Company regarding its Stochastic Analysis throughout the technical portions of the previous and current IRP process as well as through comments.

Recommendation

Staff does not have a recommendation in these initial comments regarding Avista's Alternative Scenarios, Portfolios, and Stochastic Analysis. Staff will have additional input on this subject matter in its final comments in January 2017.

Distribution Planning

Avista summarizes the cost and timing, as of the filing date of its 2016 IRP, of major distribution system enhancements required to address growth-related system constraints, system integrity issues and the timing of the associated expenditures in Table 7.1 on page 136 of the Plan.

Discussion

Avista describes its Distribution Planning Capital Projects criteria on page 135 of its Plan as follows:

- Prioritized need for system reliability (necessary to maintain reliable service);
- Scale of project (large in magnitude and will require significant engineering and design support); and
- Budget approval (will require approval for capital funding).

Avista has a key, near-term reinforcement project to resolve a capacity constraint at the La Grande Gate Station in Oregon. The Company explains that the distribution system can't maintain adequate pressures at Elgin during cold winter conditions. This project will require the installation of approximately 16,900 feet of high pressure steel gas main beginning in 2017. The estimated cost of this project is \$3,500,000. The Company describes two additional near term distribution projects in service areas outside of Oregon on pages 135 and 136 of its Plan. There is the North Spokane Reinforcement project in Washington and the Coeur d'Alene High Pressure Reinforcement project in Idaho.

Recommendation

Staff continues to review Avista's overall distribution system planning and has no initial concerns or comments on the Company's analysis at this time.

Environmental Considerations

Discussion

Avista has taken steps to include a carbon price adder reflecting potential risk of regulation. However, Staff is concerned that Avista's approach to climate policy and environmental regulation and climate risks falls short. Additionally, Staff is further concerned that Avista did not fulfill the direction from the Commission when the Commission acknowledged Avista's 2014 Integrated Resource Plan. Further Avista makes no mention of the compliance costs and strategies within its Washington service territory in response to Washington's Clean Air Rule.⁹ Lastly, Avista has not discussed or reviewed federal actions that may either directly or indirectly affect Avista's operation

⁹ Chapter 173-442 Washington Administrative Code, Clean Air Rule.

either through compliance requirements or through market shifts affecting the price of natural gas.

Order 15-063 Acknowledgment of Avista's 2014 IRP

When the Commission acknowledged Avista's 2014 IRP in Order 15-063, the Commission directed Avista to convene discussions with Staff and stakeholders to discuss potential impacts of new methane regulations and potential gas price increases resulting from the implementation of the Environmental Protection Agency's (EPA) Clean Power Plan (CPP).

*"As part of its next IRP process, Avista must convene discussions with Staff and stakeholders to discuss potential impacts associated with: (1) new regulations to reduce methane emissions; and (2) potential increases in natural gas prices stemming from increased demand for natural gas for generation under Section 111 (d) of the Clean Air Act."*¹⁰

Staff is concerned that it has not been properly engaged for Avista to have fulfilled this requirement as directed by the Commission in Order 15-063. There is no discussion in Avista's 2016 IRP regarding the impacts of potential Clean Power Plan implementation or the impact on natural gas demand from either new gas plants or redispatch to existing natural gas plants around the country. Staff notes that Avista does forecast increased market demand for natural gas:

*"An ever growing demand for natural gas-fired generation to integrate variable wind and solar resources along with an increasing demand from coal retirements and fuel switching has developed over the last few years. This demand is expected to increase due to the availability of natural gas combined with its lower carbon emissions."*¹¹

But Avista makes no analysis as to the impact of the Clean Power Plan on natural gas markets.

EPA Methane Emission Rules

On May 16, 2016, EPA released final updates to its 2012 New Source Performance Standard for the oil and gas industry aimed at reducing GHG emissions. The updates apply to equipment at natural gas transmission compressor stations. The rule applies to large emission sources and to emission sources upstream of the point of custody transfer at the citygate. Although these regulations do not currently affect Avista operations, they may in the future and may have an effect in the upstream market where Avista purchases gas.

Currently, there is no federal regulation addressing emissions from the distribution sector. However, Avista does participate in the EPA's GHG reporting Program under the Clean Air Act by providing emissions data annually to the agency through two

¹⁰ Docket LC 61, Order 15-063 at 3.

¹¹ Avista 2016 IRP at 43.

pathways, 40 CFR 98 Subpart W and Subpart NN. The EPA GHG Reporting Program requires owners or operators of facilities that contain petroleum and natural gas systems and emit 25,000 metric tons of carbon equivalent or more per year to report system emission to the EPA. Under Subpart NN, Local Distribution Companies (LDCs) must report the GHG emissions that would result from the complete combustion or oxidation of the annual volumes of natural gas provided to end users on their distribution system. Although EPA's pattern of conducting voluntary emission reduction pilots, such as GasStar, and reporting requirements seems to follow the same playbook exercised in the electric sector leading up to the release of the Clean Power Plan, Avista seems to ignore this trend, hoping to capture the risk by simply including a carbon adder and risk of carbon regulation factor into its pricing forecast. Staff feels that, like the example set by Northwest Natural, Avista needs to demonstrate to the Commission and stakeholders that it is cognizant of, and is actively analyzing, the regulatory adjustments within the energy sector.

Washington's Clean Air Rule

The State of Washington has for the last year plus been constructing carbon reduction regulation. This summer Washington finalized a Clean Air Rule.¹² The Clean Air Rule (CAR) regulates entities in Washington who emit more the 50,000 metric tons of CO₂ equivalent (CO₂e) in a single year. Natural gas utilities are liable under the rule for the complete combustion of their product including combustion from end-use.¹³ Under the rule there are various emission reduction pathways which include conducting transportation activities, combined heat and power activities, energy efficiency projects beyond those mandated by law or those otherwise deemed cost effective, waste and waste water activities among others. However, Avista gave no attention to this important market shift in its IRP. There is no analysis or discussion about the implication of this regulation on Avista's operations. Within Avista's IRP Staff only found a single statement implying some small recognition of the CAR: "In Washington, a \$10/ton carbon cost starting 2020 was included to account for the potential carbon reduction approaches currently occurring in the state."¹⁴

Implications of Climate Change

In its Draft 2017 IRP, Portland General Electric (PGE) submitted as Appendix E a study of climate change projections for the PGE service territory. Of note to PGE and informative to its IRP process in forecasting load and seasonal resource need was a finding from the Oregon Climate Change Research Institute indicating that there is a statewide decrease in winter energy requirements as the winter season warms. This reduction in winter demand is dramatic over the IRP planning horizon. The winter heating season is Avista's highest demand season. Forecasted changes in winter heating needs that affect demand for Avista's natural gas should be accounted for in Avista's IRP. Staff suggests Avista's load projections may not be as sound as they should be given the requirements that Avista consider environmental risk when constructing its IRP. Staff suggests Avista conduct a study on the implication of climate change on load and load forecasting over the IRP planning horizon.

¹² WAC Chapter 173-442.

¹³ WAC 173-442-020(1)(j)(ii).

¹⁴ Avista IRP at 45.

Recommendation

At this time Staff recommends:

- The Commission require Avista to fulfill the directive set out in Order 15-063;
- That Avista conduct a compliance cost assessment of Washington's Clean Air Rule and determine how compliance may or may not affect Oregon ratepayers or Avista's operations; and
- That Avista conduct a study of climate change implications on natural gas demand and its long term implications for Avista.

Conclusion

Staff appreciates the amount of work that has gone into the completion of Avista's 2016 IRP, the vast amount of time and effort that has been required throughout the entire process, and the Company's proactive engagement with stakeholders. Avista will file reply comments by December 15, 2016.

This concludes Staff's comments.

Dated at Salem, Oregon, this 8th day of November, 2016.



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