

Attachment

Avista 2013 Integrated Resource Plan Docket UE-121421

WAC 480-100-238 directs investor-owned energy utilities (IOUs) to describe the mix of energy supply resources and conservation that will meet current and future needs at the lowest reasonable cost to the utilities and its ratepayers.¹ In determining the lowest reasonable cost mix of resources, a utility must consider such factors as resource cost, market-volatility risks, resource dispatchability, resource effect on system operation, public policies regarding resource preference adopted by Washington State or the federal government and the cost of risks associated with environmental effects including emissions of carbon dioxide.² The rule necessitates that IOUs conduct a cohesive analysis of the costs and benefits, including risk mitigation benefits, of various approaches to meeting future resource needs using the best available information.

Recent developments have created major changes in the utility industry, bringing new opportunities and challenges. Technological advances have increased the supply of natural gas while lowering its cost, and new resources like wind and solar have grown in capability and fallen in price. State policies for renewable portfolio standards, greenhouse gas reduction and mandatory conservation programs have created additional logistical challenges for utilities, and forthcoming federal environmental regulations may further restrain the use of coal.

In its 2013 Integrated Resource Plan (IRP or Plan), Avista Corporation d/b/a Avista Utilities (Avista or Company) described the evaluation of potential resource strategies for meeting resource need over the next 20 years. In doing so, Avista has complied with applicable statute and regulations. Avista's analysis of resource needs over a 20-year planning horizon presented in the Plan is comprehensive. While the Company's consideration of inputs, modeling, and analysis of results are well executed, Commission Staff (Staff) requested further analysis of certain parts of the Plan and more explanation of the development of its conclusions. After working with Commission Staff, Avista filed a revised action plan on January 27, 2014, which addressed concerns raised by Staff. The issues identified and Avista's proposals to address the specific requests for improvement for future IRPs are further described below.

Preferred Resource Strategy

Over the 20-year planning horizon, Avista's preferred resource strategy consists of investments in energy efficiency, demand response, simple-cycle and combined-cycle gas turbines, and upgrades

¹ WAC 480-100-238(2)(a).

² WAC 480-100-238(2)(b).

to the Company’s existing generation resources. With the exception of an upgrade to the Nine Mile hydroelectric facility on the Spokane River,³ for which construction is already underway, the first production resource acquisition is an 83 MW simple-cycle natural gas-fired peaker projected by the end of 2019. This resource acquisition fills a capacity deficit created primarily by the June 30, 2019, expiration of an 82 MW contract with the Bonneville Power Administration.⁴ Avista’s preferred resource strategy acquisition schedule is shown in Table 1.

Table 1 - Avista’s Preferred Resource Strategy under the Expected Case.⁵

Resource	Year(s)	Capacity (MW)	Energy (aMW)
Generation			
Nine mile hydro upgrade	2016	6	1
Simple Cycle CT	2019	83	76
Simple Cycle CT	2023	83	76
Combined Cycle CT ⁶	2026	270	248
Simple Cycle CT	2027	83	76
Rathrum CT upgrade	2028	6	5
Simple Cycle CT	2032	50	46
Total		581	528
Efficiency	Acquisition Range	Peak Reduction	Energy (aMW)
Energy Efficiency	2014-2033	221	164
Demand Response	2022-2027	19	0
Distribution Efficiency	2014-2017	<1	<1
Total		240	164

³ The existing 3 MW generators at Nine Mile units 1 and 2 are being replaced with 8 MW generators.

⁴ This expiring contract is related to the Washington Nuclear Plant No. 3 (WNP-3) settlement agreement signed September 17, 1985.

⁵ This table incorporates updates to Avista’s preferred resource strategy acquisition schedule filed with the Commission on December 20, 2013, in Docket UE-121421.

⁶ The proposed 270 MW combined cycle gas turbine is to replace the Lancaster tolling agreement expiring in 2026.

Although the Commission is satisfied with Avista’s general analytical approach and its identification of various resource options, it is not clear how Avista evaluated the risk associated with each possible resource portfolio along its efficient frontier⁷ of potential resource portfolios. In its analysis Avista identifies alternative portfolios with lower risk profiles than the Company’s preferred resource portfolio. However, it is not clear how the Company weighed that risk when choosing among competing resource portfolios nor is it clear why the Company ultimately decided not to select a different lower-risk or lower-cost resource strategy as its preferred resource strategy. Rather than rely upon a clearly defined quantitative approach to assessing the cost-risk tradeoffs of various portfolios, Avista relied upon the subjective risk tolerance of the Company’s management when selecting its preferred resource strategy.

Although the Commission does not consider Avista’s choice of preferred resource strategy to be inappropriate, we believe that the Company should enhance the transparency of the portfolio selection process and provide the rationale for its choice of preferred resource strategy. For future IRPs, the Commission urges Avista to describe the reasoning behind decisions relying upon subjectivity, and incorporate economic justification that includes an evaluation of risk into its decision-making processes.

In its updated action plan, Avista committed to involving the technical advisory committee (TAC) in an evaluation of the cost and risk tradeoffs associated with different resource portfolio options along the efficient frontier. The Commission supports this approach.

Basic Planning Margin

For the 2013 IRP, Avista chose a 22 percent total planning margin,⁸ and will rely on approximately 240 MW of market power to meet a 5 percent loss-of-load probability (LOLP)

⁷ The efficient frontier is the list of resource portfolios, each of which representing the lowest cost portfolio for a given level of risk. It is commonly represented graphically as the left boundary, i.e. the “frontier,” of a plot of all possible resource portfolios where portfolio risk is plotted on portfolio cost. Along the efficient frontier, portfolio risk decreases as portfolio cost increases.

⁸ The total planning margin is composed of a basic planning margin of 14 percent (which covers load variations, hydroelectric variability, and resource outages over 1 hour), 6 percent for operating reserves, and 2 percent for ancillary services. The Northwest Power and Conservation Council (NPCC) recommends a 23 percent total planning margin for the region.

metric.⁹ Using this total planning margin, Avista currently projects having adequate resources among its owned and contractually-controlled generation to meet energy and capacity needs through 2019.

Although this approach to projecting energy and capacity positions is generally sufficient, the Company did not provide a complete justification for its use of a 14 percent basic planning margin. While sufficiently demonstrating the cost and market-reliance implications associated with various planning margins, Avista does not explain why its choice of a 14 percent basic planning margin is superior to any other viable margin. Avista demonstrates that a 5 percent LOLP can be achieved even when using a 12 percent planning margin,¹⁰ albeit with an increased market contribution. However, Avista does not explain why an increased reliance on market purchases associated with a lower basic planning margin is unsuitable.

Nevertheless, Avista's overall planning margin of 22 percent is comparable to NPCC's recommendation of 23 percent for the region, and the Company does not project a capacity need until 2020 even with a 14 percent basic planning margin. However, in future IRPs, the Commission requests that the company fully justify its choice of planning margin. This will be particularly important to consider as the Northwest Power and Conservation Council develops its new resource adequacy plan. The Commission expects Avista to consult closely with the TAC in the choice of a basic planning margin for the development of its 2015 IRP.

In its updated action plan, Avista committed to re-assess with the TAC the benefits and costs of the Company's 2013 IRP planning margin to determine if a different level is warranted in the 2015 IRP. The Commission supports this approach.

Energy Efficiency Resources

Avista retained EnerNOC to conduct the Conservation Potential Assessment (CPA) for the IRP. The CPA identifies the 20-year potential for energy efficiency and provides data on resources specific to Avista's service territory for use in the 2013 IRP. The conservation potential considers

⁹ A 5 percent LOLP means the utility meets all customer demand in 19 of 20 years, or one loss of load event permitted on a planning basis in 20 years due to insufficient generation. Avista developed its LOLP model to simulate reliability events caused by poor hydro runoff, forced outages, and extreme weather conditions on its system, finding that forced outages are the main driver of reliability events.

¹⁰ Avista 2013 Electric IRP, Figure 2.20, Page 2-33.

the impacts of existing programs, the anticipated effect of known building codes and standards, technology developments and innovation, changes to the economic influences, and energy prices.

In its review of Avista’s IRP, Staff identified potential shortcomings in the Company’s approach to modeling energy efficiency resources within the IRP. Where PSE and PacifiCorp both allow the IRP model to treat efficiency as a selectable and scalable resource, Avista uses the achievable potential from its CPA as a direct input into the IRP model. The company first estimates its avoided cost using its conservation-adjusted load forecast and expected capacity acquisition schedule. The estimated avoided cost is then incorporated into the CPA as a benefit within the Total Resource Cost test.

In theory, the amount of conservation selected within the CPA using this methodology should not differ dramatically from the amount that would be chosen in a more dynamic IRP model given that both methods compare the cost of conservation to the cost of alternative resources. However, by using an IRP model that does not select a dynamic quantity of conservation resources, the end result may suffer from two potentially significant setbacks:

1. The model cannot readily adapt to new scenarios, changes in model assumptions, or the different avoided costs generated under various resource strategies.
2. The model cannot choose to accelerate acquisition of conservation, even in cases where the acceleration of acquisition is the least-cost resource or provides substantial risk mitigation value. Instead, the acquisition rate is defined by the ramp rates within the CPA.

For these reasons, the Commission requests that Avista, together with input from the TAC, investigate incorporating energy efficiency into its 2015 IRP as a selectable resource within PRiSM.¹¹

In its updated action plan, Avista committed to work with the TAC to determine if the 2015 IRP should continue the historical method of conservation quantification or use the PRiSM resource selection model. The Commission supports this approach.

¹¹ PRiSM, or [P]referred [R]esource [S]trategy Linear Programming [M]odel, is the decision-making model Avista employs to generate potential resource mixes. The model’s objective is to meet resource deficits while accounting for cost, risk, capacity, energy, renewable energy requirements, and other constraints. Further discussion of PRiSM can be found in Avista’s 2013 IRP, pages 8-2 to 8-6.

Cost of Carbon

In the expected case in its 2011 IRP, Avista included a greenhouse gas emissions cost that was the weighted average of four different prospective reduction policies. For the current 2013 IRP, Avista determined that there was no imminent federal or state cap-and-trade or carbon tax policy and, therefore, did not include an explicit cost of carbon in its expected case. Rather, the Company assumed an acceleration of the retirement of certain coal generation facilities throughout the western interconnection. Avista estimated that 12,300 MW of coal generation could be shut down over the 20-year planning horizon. An implied upward pressure on market electricity prices caused by this level of coal retirement was included in the Company's expected case modeling.

In addition to the expected case, Avista evaluated the efficient frontier of resource portfolios under various prospective greenhouse gas policies. Several hypothetical climate change policies were included in the 500 Monte Carlo market futures to capture a range of policy alternatives. The results of this stochastic analysis indicate that if the probability of a cost-of-carbon inducing greenhouse gas policy increases, Avista's current preferred resource strategy may not continue to be a low-cost, low-risk resource strategy. Although the preferred resource strategy would be similar under the defined greenhouse gas policy future, the higher market prices resulting from greenhouse gas legislation would cause Avista to acquire an additional 20.5 aMW of energy efficiency over the 20-year planning horizon, a 12.5 percent increase over the expected case. This scenario also increases the total resource build, but natural gas-fired frame peaking units are replaced with hybrid combustion turbines.

The Commission appreciates Avista's dual approach to evaluating prospective carbon policy alternatives – by incorporating an implied cost of anticipated regulation into the expected case and then by performing a second full stochastic analysis with a number of carbon policy options from which the model can draw. However, carbon pricing policy is an evolving issue that will require further assessment in the next planning cycle. In particular, Avista should reassess prospective policy alternatives and include an expected value for the cost of carbon in its expected case. Further, given that uncertainty still exists about greenhouse gas regulation, the risk mitigation value of each resource portfolio cannot be determined adequately without also incorporating prospective carbon policy futures in the expected case's stochastic analysis.

Avista's preferred resource strategy under the expected case was not selected with a full accounting of risk given that (a) Avista's preferred resource strategy was developed using an expected case that assigned a 0 percent probability of a cap-and-trade or carbon tax policy, and (b) that such a policy, had it been given any weight other than zero, would have influenced the

Company's preferred resource strategy as evidenced by the efficient frontier comparison of greenhouse gas policies.

The Commission therefore requests that Avista quantify carbon policy risk when evaluating portfolios in the expected case. At a minimum this means incorporating into the expected case an expected value for the price of carbon that may be the weighted average of prospective carbon policies. If feasible, this also means assigning probabilities to prospective carbon policies and incorporating those probabilities into the expected case stochastic analysis.

In its updated action plan, Avista proposes to evaluate and document various options for quantifying carbon costs and to work with the TAC to determine which carbon quantification method should be employed in the expected case of the 2015 IRP. The Commission supports this approach, and reiterates that a non-zero cost of carbon, and to the extent possible a quantification of risks associated with prospective carbon policies, should be included in the Company's expected case of the 2015 IRP.

Colstrip Units 3 and 4

Avista owns a 15 percent share of Colstrip Units 3 and 4. In its acknowledgement letter to Avista's 2011 IRP, the Commission stated:

The Company should model a scenario without Colstrip that includes results showing how Avista would choose to meet its load obligations without Colstrip in its portfolio, and estimates of the impact on Net Present Value (cost) of its portfolio and rates.¹²

As part of the 2013 IRP, Avista evaluated the costs associated with replacement of Avista's stake in Colstrip Units 3 and 4. The case focuses on the costs and risk to replace Colstrip's energy and capacity, not the revenues from a sale of the asset. Although there are minor differences in the timing and sizes of capacity resource acquisitions post-2017, the major difference between a portfolio with and a portfolio without Colstrip is the addition of a combined cycle gas turbine to replace units 3 and 4 in 2017.

¹² Docket UE-101482, Avista Corporation's 2011 Electric Integrated Resource Plan, Attachment to Acknowledgement Letter, page 4 (January 12, 2012).

Avista's analysis indicates that removing the units from the company's resource portfolio would have a large impact on portfolio costs. In the expected case, the present value of added cost is \$505 million, or \$52.4 million per year levelized. In the carbon-pricing scenario, the impact would be slightly less severe due to a reduction in costs associated with avoided greenhouse gas emissions. The added cost under such a scenario would be roughly \$47 million per year levelized.

While the Company satisfactorily demonstrated how Avista would choose to meet its load obligations without Colstrip in its portfolio, the Company did not present the overall impact of such a course of action on rates. The Commission requests that to the extent possible, in its 2015 IRP, Avista attempt to quantify the full range of costs and offsetting revenues (or avoided costs) associated with a hypothetical portfolio that does not include Colstrip units 3 and 4, as compared to a portfolio that includes these units.

In its updated action plan, Avista proposes to re-evaluate in the 2015 IRP scenarios related to Colstrip and how each scenario may impact power supply costs. The Commission supports this approach and further expects that Avista will evaluate the overall impact to rates of a hypothetical removal of Colstrip units 3 and 4 from the Company's resource portfolio.

Storage Technologies

In its acknowledgement of Avista's 2011 IRP, the commission stated

[W]e believe that the Company's next plan would be well served by a discussion of electric storage technologies and why they may or may not fit into the Company's resource portfolio.

...

The Company should include in its next IRP a discussion of the technologies of electric storage, their cost-effectiveness, commercial availability, and proper classification compared to other forms of generation.¹³

Although the Commission is aware that Avista has begun to look at energy storage technologies, the company did not include a discussion of storage technologies in this IRP. In its presentation to

¹³ Docket UE-101482, Avista Corporation's 2011 Electric Integrated Resource Plan, Attachment to Acknowledgement Letter, page 4 (January 12, 2012).

the technical advisory committee on November 7, 2012,¹⁴ Avista provided a high-level discussion of energy storage technologies, but did not present an economic analysis specific to Avista's circumstances.

In the Commission's view, Avista did not provide a level of analysis required to obtain meaningful information related to the viability of different storage options. For Avista's 2015 IRP, the Commission requests that Avista provide a more rigorous analysis of storage technologies. Avista indicated in its recent IRP presentation to the Commission that it had developed a dispatch model capable of assessing the full range of costs and benefits of various storage options for Avista's system. The Commission expects that Avista will use this model to provide a thorough analysis of storage in its 2015 IRP.

In its updated action plan, Avista agreed to use the Company's new modeling capabilities to further evaluate the benefits of storage resources to its generation portfolio, including the impacts on ancillary services. The Commission supports this approach.

Conclusion

The Commission acknowledges that Avista's 2013 Integrated Resource Plan complies with WAC 480-100-238. Consistent with the discussion above, the Commission expects that Avista's next IRP will contain further analysis in the areas of carbon pricing, energy storage, energy efficiency modeling, planning margin, portfolio risk analysis, and the rate impacts of decreased reliance on Colstrip units 3 and 4.

¹⁴ The slides presented at the November 7, 2013, technical advisory committee meeting were included in Appendix A to the 2013 IRP.