ORDER NO. 19-106

ENTERED Mar 25 2019

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 72

In the Matter of AVISTA CORPORATION, dba AVISTA UTILITIES, 2018 Integrated Resource Plan.	ORDER

DISPOSITION: STAFF'S RECOMMENDATION ADOPTED

At its public meeting on March 12, 2019, the Public Utility Commission of Oregon adopted Staff's recommendation in this matter. The Staff Report with the recommendation is attached as Appendix A. Appendix B is a summary, from the Administrative Hearings Division, consolidating all acknowledged and approved items from both Avista Corporation, dba Avista Utilities, and Commission Staff.

BY THE COMMISSION:

Nolan Moser
Chief Administrative Law Judge

A party may request rehearing or reconsideration of this order under ORS 756.561. A request for rehearing or reconsideration must be filed with the Commission within 60 days of the date of service of this order. The request must comply with the requirements in OAR 860-001-0720. A copy of the request must also be served on each party to the proceedings as provided in OAR 860-001-0180(2). A party may appeal this order by filing a petition for review with the Circuit Court for Marion County in compliance with ORS 183.484.

ORDER NO. 19-106

ITEM NO. 3

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: March 12, 2019

REGULAR	**X**	**CONSENT**	____	**EFFECTIVE DATE**	**Upon Commission Approval**

DATE: February 28, 2019

TO: Public Utility Commission

FROM: JP Batmale JPB

THROUGH: Jason Eisdorfer JE

SUBJECT: AVISTA UTILITIES: (Docket No. LC 72) Acknowledgement of Integrated Resource Plan.

STAFF RECOMMENDATION:

The Commission acknowledge Avista Corporation's (Avista or Company) 2018 Integrated Resource Plan (IRP) as consistent with the Commission's IRP guidelines, acknowledge Staff's nine recommendations, and acknowledge the Company's revised 2018 IRP action plan.

DISCUSSION:

Issue

Whether the Commission should acknowledge Avista's 2018 IRP with revised action plan.

Applicable Law

The Commission adopted least-cost planning as the preferred approach to utility resource planning in 1989.[1] In 2007, the Commission updated its existing least-cost planning principles and established a comprehensive set of "IRP Guidelines" to govern the IRP process. The IRP Guidelines found in Order No. 07-002 (corrected by 07-047) clarify the procedural steps and substantive analysis required of Oregon's regulated

[1] Order No. 89-507.

utilities in order for the Commission to consider acknowledgement of a utility's resource plan.[2]

The IRP Guidelines and Commission rules require a utility to file an IRP with a planning horizon of at least 20 years within two years of its previous IRP acknowledgment order, or as otherwise directed by the Commission.[3] Further, the IRP must also include an "Action Plan" with resource activities that the utility intends to take over the next two to four years.[4] The utility's IRP should satisfy the IRP Guidelines and Commission rules for its determination of future long-term resource needs, its analysis of the expected costs and associated risks of the alternatives reviewed to meet its future resource needs, and its near-term Action Plan to achieve the IRP goal of selecting the "portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers."[5] This is often referred to as the "least cost/least risk portfolio."

The Commission reviews the utility's plan for adherence to the procedural and substantive IRP Guidelines and generally acknowledges the overall plan if it is reasonable based on the information available at the time.[6] However, the Commission explains: "We may also decline to acknowledge specific action items if we question whether the utility's proposed resource decision presents the least cost and risk option for its customers."[7] Also relevant is whether this IRP complies with all of the Commission's requirements in the Company's previously acknowledged IRP.

Avista's 2016 IRP (LC 65) was acknowledged in Order No. 17-119. The Commission required several activities for Avista to undertake and include in its 2018 IRP filing. Thus, in addition to IRP Guideline compliance, Staff reviews whether Avista has complied with the Commission's order in LC 65.

Analysis

General Description of the IRP

Avista's 2018 IRP is a plan for meeting customer natural gas needs over the next 20 years in the least cost and least risk manner. While the primary focus of the IRP is

[2] Orders 07-002 and 07-047. Additional refinements to the process have been adopted: See Order No. 08-339 (IRP Guideline 8 was later refined to specify how utilities should treat carbon dioxide (C02) risk in their IRP analysis); Order No. 12-013 (guideline added directing electric utilities to evaluate their need and supply of flexible capacity in IRP filings).
[3] Order No. 07-002 (Guidelines 1(c) and 3(a)) and OAR 860-027-0400.
[4] Order No. 14-415 at 3.
[5] Order No. 07-002 at 1-2.
[6] *Id.* at 1.
[7] *Id.*

meeting customers' needs under peak weather conditions, the IRP process also provides a methodology for evaluating customer needs under normal or average conditions and assessing new opportunities and risks that have emerged since the previous IRP was acknowledged. The IRP brings together customer demand forecasts with analyses of resource options, including supply-side resources and demand-side measures to provide a valuable planning tool for Avista, its customers, regulatory agencies, and other stakeholders.

Procedural History

Prior to the official filing of the 2018 IRP, Avista held four Technical Advisory Committee meetings. These meetings ran for five months (January to May 2018) and covered a wide range of topics, including the incorporation of the recommendations from LC 65 into the 2018 IRP analyses.[8] The 2018 IRP was then filed in August 2018. The table below provides an overview of the key procedural activities that took place as part of the 2018 IRP (LC 72).

Date	Procedural Activity in LC 72
8/31/18	Avista files 2018 IRP.
9/18/18	Pre-hearing conference setting schedule.
10/23/18	Avista presents overview of 2018 at public meeting.
11/19/18	Staff and Oregon Citizen's Utility Board (CUB) file opening comments.
12/10/18	Avista files reply comments.
12/18/18	Avista files revised Action Plan for the 2018 IRP that covers four years, instead of two.
2/4/19	Staff files final comments.

Avista's 2018 IRP

There were two defining, interrelated features of this IRP. The first was that overall growth in Oregon was lower than in the 2016 IRP. The second was that Avista IRP analysis of forecasted supply and demand called for no new, major investments during the action plan time horizon.

Generally, Staff found Avista's analysis and conclusions in the 2018 IRP were documented appropriately and that the 2018 IRP was an adequate assessment of least-cost, least-risk planning. Staff and a CUB did identify some improvements for the next IRP. These improvements are captured in Staff's recommendations below.

[8] https://myavista.com/about-us/our-company/integrated-resource-planning.

The only area of Staff concern for the 2018 IRP was that Avista's initial IRP filing had an Action Plan time horizon that was limited to two years. The IRP guidelines require an action plan that covers the next four years. Staff raised this oversight as part of our first round of comments and in other communications with the Company. Avista immediately addressed this shortcoming and filed a revised action plan within a month. Despite revising the Action Plan to a longer time horizon, Avista still required no new, major investments in its territory.

This was Avista's first full IRP cycle working with Energy Trust of Oregon (Energy Trust).[9] As part of this arrangement, Energy Trust identifies all cost-effective energy efficiency for Avista to include in the IRP forecasts. Staff would note that since Energy Trust began administering energy efficiency programs for Avista there has been a sizeable increase in acquired and forecasted energy savings.

Avista's 2018 Revised Final Action Plan
Staff finds this revised final action plan accurately reflects the IRP and fully adheres to the Commission's requirements.

The Company's proposed 2018 Action Plan filed for acknowledgement and revised in December 2018 is detailed below.[10] Much of action plan lists activities preparing for the 2020 IRP.

New Activities detailed in the 2018 IRP in preparation for the 2020 IRP

1. Avista's 2020 IRP will contain an individual measure level for dynamic DSM program structure in its analytics. In prior IRP's, it was a deterministic method based on Expected Case assumptions. In the 2020 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.
2. Work with Staff to get clarification on types of natural gas distribution system analyses for possible inclusion in the 2020 IRP.
3. Work with Staff to clarify types of distribution system costs for possible inclusion in our avoided cost calculation.
4. Revisit coldest on record planning standard and discuss with TAC for prudency.
5. Provide additional information on resource optimization benefits and analyze risk exposure.

[9] As part of UG 288/UM 1753, Order No. 16-076 (Feb. 29, 2016) Avista decoupled and Energy Trust began administering energy efficiency programs for Avista in Oregon.
[10] *See* LC 72, Updated Action Plan to the 2018 Natural Gas IRP, Dec. 18, 2018. https://edocs.puc.state.or.us/efdocs/HAH/lc72hah142034.pdf.

6. DSM—Integration of ETO and AEG/CPA data. Discuss the integration of ETO and AEG/CPA data as well as past program(s) experience, knowledge of current and developing markets, and future codes and standards.
7. Carbon Costs – consult Washington State Commission's Acknowledgement Letter Attachment in its 2017 Electric IRP (Docket UE-161036), where emissions price modeling is discussed, including the cost of risk of future greenhouse gas regulation, in addition to known regulations.
8. Avista will ensure Energy Trust (ETO) has sufficient funding to acquire therm savings of the amount identified and approved by the Energy Trust Board.
9. 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 our Oregon territory for the next four years, based on current projections. However, in Chapter 9: Action Plan, 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 to our customers, the Company is not precluded from doing such work. Examples of these necessary capital investments include the following:
    a. Natural gas infrastructure investment not included as discrete projects in IRP:
        i. Consistent with the preceding update, these could include system investment to respond to mandates, safety needs, and/or maintenance of system associated with reliability
            1. Including, but not limited to Aldyl A replacement, capacity reinforcements, cathodic protection, isolated steel replacement, etc.
        ii. Anticipated PHMSA guidance or rules related to 49 CFR Part §192 that will likely requires additional capital to comply
            1. Officials from both PHMSA and the [American Gas Association] 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
        iii. Construction of gas infrastructure associated with growth
        iv. Other special contract projects not known at the time the IRP was published
    b. Other non-IRP investments common to all jurisdictions that are ongoing, for example:
        i. Enterprise technology projects & programs
        ii. Corporate facilities capital maintenance and improvements

An updated table 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+

10. 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.

2018 Action Plan Ongoing Activities

- Continue to monitor supply resource trends including the availability and price of natural gas to the region, LNG exports, methanol plants, supply and market dynamics 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.
- Meet regularly with Commission Staff to provide information on market activities and significant changes in assumptions and/or status of Avista activities related to the IRP or natural gas procurement practices.
- Appropriate management of existing resources including optimizing underutilized resources to help reduce costs to customers.

2018 IRP Compliance with Commission Guidelines and Previous Orders

Staff concluded that Avista complied with the Commission's IRP Guidelines. All resources appeared to have been evaluated on a consistent and comparable basis. Risks and uncertainties were appropriately considered and the selected resource portfolio balanced costs and risks well. Avista followed all procedural requirements and the IRP included all of the proper components, per the IRP guidelines.

Staff has, however, identified additional analysis and improvements that should be part of Avista's next IRP. They are found in Staff's recommendations later in this memo.

Staff also determined that Avista complied with the recommendations from the previous order acknowledging Avista's 2016 IRP. Specifically, the company received six recommendations to either improve the 2016 IRP or to undertake prior to the next IRP as part of Order No. 17-119. They are listed below:

2016 IRP Recommendations	Completed
Update methodology around price curves for 2018 IRP.	✓
Use two methods to forecast customers for 2018 IRP.	✓
Revise 2016 DSM action item.	✓
Provide regular updates on possible regional pipelines.	✓
Update stochastic analysis for better assessing cost and risk.	✓
Include four improvements around weather and environmental considerations in the 2016 IRP.	✓

Staff Recommendations

Below is a listing of each of Staff's recommendations. These recommendations exactly match those found in Staff's Final Comments as Staff received no objections from the Company or stakeholders regarding what was proposed.

Staff Recommendation No. 1 & 2 – Demand Forecast Improvements

Staff's initial comments on Avista's 2018 IRP included twelve recommendations for the Company's demand forecasts.[11] Staff's final recommendations are all intended to incrementally improve the accuracy of Avista's forecasts for the next IRP.

Staff's recommendations ranged from clarifications on modeling choices, the incorporation of economic drivers, to suggestions on modeling weather. CUB also requested that Avista consider the possible impacts of regional policies that encourage fuel switching in its next IRP; specifically, how a "high" fuel switching scenario would impact the IRP overall. Staff looks forward to continuing discussions with the Company on these topics.

Staff Recommendations on Demand Forecasts

- Avista continue to pursue improvements to its demand and growth models for its next IRP, including:
  - the incorporation of economic drivers for the industrial forecast;
  - the penetration rate of new homes with gas service;
  - improvements to long-run price elasticity;
  - engagements with regional experts to find creative solutions for weather forecasting in the IRP during this time of rapid change;
  - the development and use of low-carbon policy, also known as fuel-switching, scenarios in the IRP.

[11] *See* LC 72 Avista 2018 IRP, Staff's Initial Comments, November 19, 2018, pg. 5.

- Staff recommends that the Company report in its first IRP update on how it is addressing these recommended improvements for its customer growth forecast models.

Staff Recommendation No. 3 – Energy Efficiency and Demand Side Resources

Staff's initial comments on EE and demand side resources generally focused on peak day factor calculations and the methodology used to select the final program savings potential. Avista has stated that the Company will work through the TAC to consider additional peak day factors by the next IRP. Additionally, Staff was satisfied with Avista's response regarding the cost-effective, achievable potential through 2037 for energy efficiency.

Staff Recommendation on Energy Efficiency and Demand Side Resources

- Work with the Avista TAC to consider additional peak day factors by the next IRP.

Staff Recommendation No. 4 – Supply Side Resources

In response to Staff's opening comments that questioned the possible need for pipeline projects during the four year Action Plan time horizon, Avista clarified at the December 18, 2018 public meeting and in its revised Action Plan that it does not anticipate any new pipeline projects. The Company also agreed to update Staff and stakeholders as necessary on future plans.

Staff Recommendation for Supply Side Resources

- The Company update Staff and stakeholders in the future regarding possible pipeline projects.

Staff Recommendation No. 5 – Considerations for Alternative Scenarios

Based on the comments filed by CUB regarding alternative scenarios to test IRP portfolios, Staff has two policy-based recommendations for the next IRP:

1. Develop and use a low-carbon policy scenarios, also known as fuel-switching, by the IRP *(captured above in the Demand Forecast section).*
2. Include a section in the next IRP that explores large-scale supply interruptions, like the October 2018 Enbridge incident, and the role of Avista's storage resources.

Staff Recommendation for Considerations of Alternative Scenarios

- Include a section in the next IRP that explores large-scale supply interruptions, like the October 2018 Enbridge incident, and the role of Avista's storage resources.

Staff Recommendation No. 6 – Portfolio Modeling Assumptions

Staff expressed a desire to work with Avista to develop a better understanding of best practices and improved forward price curves for the next IRP. Avista stated that it was open to this type of iterative collaboration and reiterated that the purpose of the Technical Advisory Committee was to reach consensus on any potential analysis improvements suggested Staff and stakeholders.

For purposes of the present IRP, Staff remains satisfied that the Company's portfolio analysis is within the realm of that which has been previously accepted by this Commission. Staff continues to recommend that the Company hold a TAC meeting before its first IRP update for the purposes of a discussion with Staff and stakeholders to develop a shared understanding of forward price curve development techniques. The development of standard data sources and model assumptions will be critical to improving the reproducibility of models.

Staff Recommendation on Portfolio Modeling Assumptions

- Dedicate a TAC meeting, prior to the IRP update, to working with Staff and stakeholders to develop a shared understanding of forward price curve modeling techniques.

Staff Recommendation No. 7 – Stochastic Analysis

In its opening comments, Staff raised concerns with the Company's application of Monte Carlo analysis for its stochastic analysis. The issues related to Monte Carlo stochastic modeling were discussed in detail by Staff and the Company at the December 18 meeting, as well as informally over email and telephone. Staff points out that while the Monte Carlo analysis has been a standard stochastic planning tool used by industry in IRP analysis, the Commission (as well as the Company) has recognized the need to develop more reliable stochastic modeling tools. The Company has agreed to hold a TAC meeting for the purposes of identifying a scientifically valid stochastic modeling approach to implement in future IRPs.

Staff Recommendation for Stochastic Analysis

- Staff recommends that the Company hold a TAC meeting prior to its first IRP update to identify a scientifically accurate and reliable stochastic modeling approach to replace the 200-draw Monte Carlo technique.

Staff Recommendation No. 8 – Distribution System Planning
Staff made several recommendations regarding distribution system planning as part of this IRP. Specifically:

- Avista include distribution plan upgrades in its Action Plan going forward.
- Avista model and explicitly state which distribution plan upgrades it anticipates between the present and 2022 (i.e., Sutherlin and Klamath Falls), such that a 4-year rather than 2-year Action Plan horizon is reported.
- Avista provide information and analysis on whether operational assumptions match the actual operations in prior years, especially regarding the operation and capacity of compressors and regulator stations.

Avista adequately addressed the first two concerns above in the Company's IR replies, its filed reply comments, and at the December 18, 2018 public meeting. Avista states clearly in each instance that in its 4-year Action Plan, no specific distribution plan upgrades are anticipated, and that no gate station upgrades are planned in Oregon for the next four years.

Staff notes that Avista replies that it assumes that all regulators are operating and at full capacity, and that it is does not have any compressors in its distribution system. Staff notes that the Company did not reply as to whether the assumption that the regulators are always operational and at full capacity matches actual operations. If the regulators are not typically all operational and at capacity, but modeled as such, Staff is concerned that actual distribution system operation not matching the model assumptions could lead to discontinuities in distribution planning.

Staff Recommendation for Distribution System Planning

- Staff recommends that the Company clarify the historical use and capacity of regulators and if the data does not match planning assumptions that the Company re-evaluate the use of operational assumption in its distribution planning by the next IRP

Staff Recommendation No. 9 – Action Plan Time Horizon
In its Opening Comments, Staff made the following recommendation:

- Avista must file a 4-year Action Plan for this IRP by extending its 2019-2020 Action Plan through 2022, which includes a pipeline of proposed projects in Oregon.

On December 18, 2018, the Company re-filed the 2018 IRP Action Plan with a 4-year time horizon, as required for compliance with Commission IRP guidelines.

Upon reviewing the Action Plan and the Company's responses to Staff's comments and questions, Staff notes that no specific capital investments or upgrades are anticipated by the Company in the 4-year Action Plan term. Staff is also satisfied that, despite improvements which must be made in future IRP models, the supply and demand side forecasts, when taken in the context of known factors, Oregon's gas service and distribution needs will be met by the Company during this IRP's Action Plan time horizon.

Staff Recommendation on the Action Plan Time Horizon

- All future IRPs utilize a 4-year Action Plan.

Summary of Comments

The only stakeholder filing comments in LC 72 was CUB. They filed written comments in November 2018 and spoke at the December 18, 2018 Public Meeting. CUB requested that Avista consider the possible impacts of regional policies that encourage fuel switching in its next IRP; specifically, how a "high" fuel switching scenario would impact the IRP overall. CUB also requested that Avista explore large-scale supply interruptions, like the October 2018 Enbridge incident, and the role of Avista's storage resources to mitigate such interruptions as part of the next IRP.

Conclusion

Staff recommends that the Commission acknowledge (a) Avista's 2018 IRP as meeting the IRP guidelines; (b) Staff's nine recommendations; and, (c) the revised 2018 Action Plan. Staff looks forward to its continued, collaborative work with Avista and other stakeholders to adopt the suggested improvements as part of the Company's next IRP.

Staff Recommendation No. 1

Avista continue to pursue improvements to its demand and growth models for its next IRP, including:

- the incorporation of economic drivers for the industrial forecast;
- the penetration rate of new homes with gas service;
- improvements to long-run price elasticity;
- engagements with regional experts to find creative solutions for weather forecasting in the IRP during this time of rapid change;
- the development and use of low-carbon policy, also known as fuel-switching, scenarios in the IRP.

Staff Recommendations No. 2
Staff recommends that the Company report in its first IRP update on how it is addressing these recommended improvements for its customer growth forecast models.

Staff Recommendations No. 3
Work with the Avista TAC to consider additional peak day factors by the next IRP.

Staff Recommendations No. 4
The Company update Staff and stakeholders in the future regarding possible pipeline projects.

Staff Recommendations No. 5
Include a section in the next IRP that explores large-scale supply interruptions, like the October 2018 Enbridge incident, and the role of Avista's storage resources.

Staff Recommendations No. 6
Dedicate a TAC meeting, prior to the IRP update, to working with Staff and stakeholders to develop a shared understanding of forward price curve modeling techniques.

Staff Recommendations No. 7
Staff recommends that the Company hold a TAC meeting prior to its first IRP update to identify a scientifically accurate and reliable stochastic modeling approach to replace the 200-draw Monte Carlo technique.

Staff Recommendations No. 8
Staff recommends that the Company clarify the historical use and capacity of regulators and if the data does not match planning assumptions that the Company re-evaluate the use of operational assumption in its distribution planning by the next IRP

Staff Recommendations No. 9
All future IRPs utilize a 4-year Action Plan.

PROPOSED COMMISSION MOTION:

Acknowledge Avista Corporation's 2018 IRP as consistent with the Commission's IRP guidelines, acknowledge Staff's nine recommendations, and acknowledge the Company's revised 2018 IRP action plan.

LC 72 Acknowledgement

Avista's 2018 IRP Action Plan with Staff's Recommendations Incorporated

A. Demand Forecasts

Avista Action Item #4
Revisit coldest on record planning standard and discuss with Technical Advisory Committee (TAC) for prudency.

Avista Action Item #7
Carbon Costs – consult Washington State Commission's Acknowledgement Letter Attachment in its 2017 Electric IRP (Docket UE-161036), where emissions price modeling is discussed, including the cost of risk of future greenhouse gas regulation, in addition to known regulations.

Staff Recommendation on Demand Forecast
Avista continue to pursue improvements to its demand and growth models for its next IRP, including:

- the incorporation of economic drivers for the industrial forecast;
- the penetration rate of new homes with gas service;
- improvements to long-run price elasticity;
- engagements with regional experts to find creative solutions for weather forecasting in the IRP during this time of rapid change;
- the development and use of low-carbon policy, also known as fuel switching, scenarios in the IRP.

Staff Recommendation on Demand Forecast
Staff recommends that the Company report in its first IRP update on how it is addressing these recommended improvements for its customer growth forecast models.

B. Demand Side Management (DSM) Resources

Avista Action Item #1
Avista's 2020 IRP will contain an individual measure level for dynamic DSM program structure in its analytics. In prior IRP's, it was a deterministic method based on Expected Case assumptions. In the 2020 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.

Avista Action Item #3
Work with Staff to clarify types of distribution system costs for possible inclusion in our avoided cost calculation.

Avista Action Item #6
DSM—Integration of Energy Trust of Oregon (ETO) and Applied Energy Group's Conservation Potential Assessment (AEG/CPA) data. Discuss the integration of ETO and AEG/CPA data as well as past program(s) experience, knowledge of current and developing markets, and future codes and standards.

Avista Action Item #8
Avista will ensure ETO has sufficient funding to acquire therm savings of the amount identified and approved by the ETO Board.

Staff Recommendation on Energy Efficiency and DSM Resources
Work with the Avista TAC to consider additional peak day factors by the next IRP.

C. Supply Side Resources

Avista Action Item #5
Provide additional information on resource optimization benefits and analyze risk exposure.

Avista Action Item #9
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 our Oregon 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 to our customers, 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 IRP
  Consistent with the preceding update, these could include system investment 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 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+

Staff Recommendation on Supply Side Resources
The Company update Staff and stakeholders in the future regarding possible pipeline projects.

Staff Recommendation on the Action Plan Time Horizon
All future IRPs utilize a 4-year Action Plan.

Avista On-going Activity
Monitor availability of resource options and assess new resource lead-time requirements relative to resource need to preserve flexibility.

Avista On-going Activity
Meet regularly with Commission Staff to provide information on market activities and significant changes in assumptions and/or status of Avista activities related to the IRP or natural gas procurement practices.

Avista On-going Activity
Appropriate management of existing resources including optimizing underutilized resources to help reduce costs to customers.

D. Alternate Scenario, Portfolios, and Stochastic Analysis

Avista Action Item #10
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.

Staff Recommendation on Stochastic Analysis
Staff recommends that the Company hold a TAC meeting prior to its first IRP update to identify a scientifically accurate and reliable stochastic modeling approach to replace the 200-draw Monte Carlo technique.

Staff Recommendation on Portfolio Modeling Assumptions
Dedicate a TAC meeting, prior to the IRP update, to working with Staff and stakeholders to develop a shared understanding of forward price curve modeling techniques.

Staff Recommendation for Consideration of Alternative Scenarios
Include a section in the next IRP that explores large-scale supply interruptions, like the October 2018 Enbridge incident, and the role of Avista's storage resources.

Avista On-going Activity
Continue to monitor supply resource trends including the availability and price of natural gas to the region, LNG exports, methanol plants, supply and market dynamics, and pipeline and storage infrastructure availability.

E. Distribution Planning

Avista Action Item #2
Work with Staff to get clarification on types of natural gas distribution system analyses for possible inclusion in the 2020 IRP.

Staff Recommendation on Distribution System Planning
Staff recommends that the Company clarify the historical use and capacity of regulators; and if the data does not match planning assumptions, the company re-evaluate the use of operational assumptions in its distribution planning by the next IRP.