BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of Avista Corporation d/b/a Avista Utilities 2023 Integrated Resource Plan	**DOCKET UG-220244**

COMMISSION STAFF COMMENTS REGARDING
AVISTA CORPORATION d/b/a AVISTA UTILITIES'
2023 NATURAL GAS INTEGRATED RESOURCE PLAN
RCW 80.01.040 and RCW 80.04.160
WAC 480-90-238

August 1, 2023

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Executive Summary

These comments from Utilities and Transportation Commission (Commission) staff (Staff) highlight the most important issues identified in our review of Avista's 2023 Gas IRP. This document does not represent an exhaustive summary of Staff's analysis, but instead focuses on particularly salient topics and themes. Staff stresses that any planning document represents a snapshot in time. This IRP was developed over a period of time during which new policies were at various stages of implementation or passage. With this in mind, Staff provides recommendations that Avista should implement in its next IRP filing in 2025.

Summary of the IRP

In this IRP, new policies such as the Climate Commitment Act (CCA), drive a markedly different and more uncertain future than the 2021 IRP. Acknowledging the difficulty of modeling impacts of new and still developing policies on future demand and customer counts, Avista considered 14 different scenarios and resource selections. Avista asserts that it has more than enough natural gas resources to meet peak day requirements, and it presents its plan for acquiring new resources for compliance with emissions regulations.[1] Staff outlines its analysis related to Avista's plan to meet current and future needs in its *Summary of Recommendations*.

Fossil natural gas is still the dominant form of energy delivered to customers throughout the study period, but synthetic methane is chosen in 2044. Additional resources for compliance are almost exclusively allowances and offset projects, which are considered interchangeable for this analysis.[2]

As required by rule, Avista outlines the actions it plans to take in the first two years of this IRP's study period in the 2023-2024 Action Plan.[3,4] These actions for the Washington service territory include:

- Purchasing allowances for 2023, 2024, 2025, and 2026 for emissions reduction compliance.
- Begin to offer transportation customers an energy efficiency program with a savings goal of 35,000 therms.
- Explore methods for using Non-Energy Impact (NEI) values in future IRP analysis to account for social costs in Washington to ensure equitable outcomes.
- Explore using end use modeling techniques for forecasting customer demand.
- Consider contracting with an outside entity to help value supply side resource options such as synthetic methane, renewable natural gas, carbon capture, and green hydrogen.

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[1] Docket UG-220244, "2023 Natural Gas Integrated Resource Plan" (Avista 2023 IRP), at pg. 6-14 thru 6-17.
[2] Avista 2023 IRP pg. 6-28
[3] WAC 480-90-238(3)(h)
[4] Avista 2023 IRP pg. 9-5

Summary of Recommendations

Staff summarizes the following recommendations to Avista for its 2025 IRP.

Topic	No.	Recommendations
Equity	1	Review the Cascade Natural Gas general rate case final order with the TAC and the EAG together, consider how the core tenets of energy justice apply to Avista's planning processes, and prepare to implement the order's equity framework. Dedicate time in the work plan for this topic.
	2	Staff recommends that Avista consult with its equity advisory group to develop equity criteria for the siting of distribution projects and reinforcements.
Changing Regulatory and Incentive Landscape	3	Include full accounting of the IRA in the 2025 IRP and provide sufficient time in the work plan for discussion within advisory groups.
	4	Work with the Department of Ecology, Staff, and advisory groups, to discuss the implication of this "cap" and how it is likely to be achieved.
	5	Provide a robust discussion of the "invest" portion of the "cap-and-invest" and discussion of the downstream impacts of CCA investments.
	6	Account for and provide a narrative discussion regarding electrification driven by the CCA and discuss the CCA within its advisory group early in the IRP development process.
Climate change impacts	7	Adopt representative concentration pathway (RCP) 8.5.
	8	For greater clarity, for tables like Table 2.3, replace with time series graphs with appropriate box and whisker plots.
	9	Revisit and update the winter peaking climate data and methodology as evidence and climate models improve.
Load forecasting	10	Where the specifics of future energy codes are unknown, project a forecast trend that accords with statutory goals and mandates.
	11	Develop a building stock attrition rate to represent the loss of customers due to buildings being demolished, remodeled without gas service due to incompatible use cases, or otherwise leaving gas service unrelated to changes in the price competitiveness of gas services.
	12	Adopt future building codes that are already imbedded in law as foundational assumptions for the primary demand forecast and not as a scenario.
	13	Analyze risks to customers and the distributional effects through the lens of equity, energy justice, and access to energy efficiency and electrification resources.

	14	Dynamically model the anticipated comparative costs between its natural gas services and electric utility services into the future as well as the interplay of customers, by class, responding to changing comparative cost.
	15	Incorporate the distributional analysis discussed below into the comparative cost analysis.
Demand-side Potential Assessments	16	Continue to refine the methods and approach of leveraging potential assessments for achieving equitable outcomes.
	17	Segment customers with different levels of gas to electric conversion costs rather than modifying costs only by scenario.
	18	Consider audits of specific transportation customer sites to better understand current equipment and practices to refine estimates of available potential for these customers.
	19	Target outreach to the largest transportation customers to understand their likelihood of participating in future energy efficiency programs, including to what extent and on what timeline, when considering program design.
Social Cost of Greenhouse Gasses Calculations	20	Explicitly note costs of greenhouse gas emissions established in RCW 80.28.395 when analyzing avoided costs.
	21	Clearly account for emissions occurring in the gathering, transmission, and distribution of natural gas, providing itemization, a total value of these emissions, and the ratio of these emissions to throughput for the purposes of avoided cost calculations.
	22	Incorporate distribution system emissions data into Distribution Scenario Decision-Making Process criteria if applicable.
	23	Include both the cost of compliance with the CCA and the SCGHG for conservation in the base case in the 2025 IRP.
	24	When calculating the natural gas energy efficiency target for 2024-2025, use the avoided cost from the Social Cost of Carbon Case in Appendix 6.4.
Alternative Fuels	25	Consider hydrogen and landfill gas for the purposes of lowest reasonable cost analysis unless it can demonstrate a reason not to consider these fuels.
	26	Convert figures similar to 4.16 through figure 4.21 to time series graphs featuring box and whisker plots.

IRP Modeling	27	Highlight and offer appropriate cautions in its analysis wherever PLEXOS yields results or behaviors that would be unlikely to be anticipated or enacted by a human planner.
	28	Highlight and offer appropriate caution in its analysis wherever PLEXOS uses resources in its portfolio in a manner that does not accord with current best practices or current technological means.
	29	Rely upon human expertise to vet and verify all results generated by PLEXOS.
Decarbonization Plan and Electrification Analysis	30	Consult with the TAC and parties to the GRC to discuss what a decarbonization plan should entail, submit a specific workplan, and provide a decarbonization plan in the 2025 IRP.
	31	Refine the electrification analysis with input from interested persons.
	32	Refine assumptions around electrifying loads and run additional sensitivities that illuminate a range of possible costs of electrification depending on how loads electrify.

Compliance with Commission Rules

In WAC 480-90-238, the Commission lays out the requirement that regulated gas utilities file an integrated resource plan (IRP) every two years. The Subsections within Section (3) of these rules describe the contents of these plans, which includes:

- A range of forecasts for natural gas demand (a);
- An assessment of commercially available conservation (b);
- An assessment of resources including nonconventional gas supplies, storage, and pipeline transmission resources [(c)-(e)];
- A comparative assessment of these resources and their cost-effectiveness (f);
- A long-range integrated resource plan to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers (g);
- A short-term plan of specific actions for the next two years (h);
- A report of progress towards implementing the recommendations in its previous plan (i).

As part of this IRP, Avista included its Conservation Potential Assessment (CPA). RCW 80.28.380 requires that gas company conservation targets be "based on a conservation potential assessment prepared by an independent third party and approved by the commission." Staff does not make a recommendation on the approval of this CPA in these comments; however, Staff plans to address gas company CPAs in a separate proceeding.

Public Participation

Avista continues to improve on public participation opportunities in planning processes. For this IRP the Company held five meetings of the Technical Advisory Committee (TAC) that are open to the public, and two public meetings. Outside of TAC meetings, Avista's IRP team continues to consult with the Energy Efficiency Advisory Group (EEAG) and Equity Advisory Group (EAG) on specific applicable topics. Staff fully expects Avista to continue making incremental improvements to public participation, outreach, and education for all planning processes.

Equity

While Staff makes equity related recommendations throughout this document, Staff would like to comment on equity more broadly here. The IRP states "Avista intends to incorporate increased equity considerations in the 2025 natural gas IRP and utilize lessons from our electric IRP process to assist in the development of metrics and use in analytics."[5] Staff commends Avista for this position and looks forward to working with Avista to incorporate and improve equity within the 2025 gas IRP process.

[5] Avista 2023 IRP page 5-18.

In its 2023-2024 action plan Avista noted the following "Explore methods for using Non-Energy Impact (NEI) values in future IRP analysis to account for social costs in Washington to ensure equitable outcomes."[6] Staff looks forward to this conversation for the 2025 IRP process.

Staff adds that equity analysis for gas IRPs will necessarily be different from the CEIP process. Staff highlights the recent Cascade Natural Gas Corporation's GRC Final Order, Docket UG-210755. The order stresses the importance of addressing equity in all public interest considerations.[7] Staff believes that the order provides guiding equity principles.

As Avista notes in this IRP, the core tenets of energy justice are:

> Distributional justice, which refers to the distribution of benefits and burdens across populations. This objective aims to ensure that marginalized and vulnerable populations do not receive an inordinate share of the burdens or are denied access to benefits.
>
> Procedural justice, which focuses on inclusive decision-making processes and seeks to ensure that proceedings are fair, equitable, and inclusive for participants, recognizing that marginalized and vulnerable populations have been excluded from decision-making processes historically.
>
> Recognition justice, which requires an understanding of historic and ongoing inequalities and prescribes efforts that seek to reconcile these inequalities.
>
> Restorative justice, which is using regulatory government organizations or other interventions to disrupt and address distributional, recognitional, or procedural injustices, and to correct them through laws, rules, policies, orders, and practices.[8]

Staff recommends that Avista thoroughly review the Cascade Natural Gas Corporation general rate case final order (Docket UG-210755) with the TAC and the EAG together, consider how the core tenets of energy justice apply to Avista planning processes, and prepare to implement the order's equity framework in its 2025 IRP, in part by dedicating time in the work plan for this topic. Staff looks forward to collaborating with other IOUs, advisory groups, and other interested parties while assisting Avista in this endeavor and learning process.

Additional equity questions appear in the IRP document that warrant discussion here. Avista notes that the costs associated with end use conversion may create an equity issue.[9] Staff agrees and looks forward to discussing more equitable pathways and strategies during the next IRP process.

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[6] Avista 2023 IRP page 9-5 item 8
[7] Final Order 09, UG-210755, pg. 19, ¶58.
[8] Final Order 09, UG-210755 (Aug. 23, 2022), pg. 18.
[9] Avista 2023 IRP at pg. 3-15.

On pages 8-5, Avista lists criteria for siting projects and reinforcements.[10] This list does not include any equity criteria. **Staff recommends that Avista consult with its equity advisory group to develop equity criteria for the siting of projects and reinforcements.**[11]

Changing Regulatory and Incentive Landscape

This IRP includes discussion and analysis of several pieces of new legislation and policy changes that impact Avista's gas system in some way. In this section, Staff discusses the federal Inflation Reduction Act (IRA) and Washington's Climate Commitment Act (CCA).[12]

Inflation Reduction Act (IRA)

The IRA was signed into law several months into Avista's IRP development process, which made including the full suite of its impacts a difficult, if not impossible, task. Staff appreciates Avista's attempts to include IRA impacts, such as assuming a 50 percent credit to the homeowner for gas to electric conversion costs, to the degree possible. **Staff expects Avista to include full accounting of the IRA in the 2025 IRP and provide sufficient time in the work plan for discussion within advisory group(s).**

Climate Commitment Act (CCA)

While the CCA was signed into law in 2021, the Department of Ecology (Ecology) adopted CCA rules in late September 2022 and the first auction for carbon allowances occurred in February 2023. Allowances for carbon emissions are one aspect of the CCA, but Staff believes Avista's approach fails to reckon with two important aspects of this law: the emissions cap, and the investment of carbon allowance auction revenues. Ecology describes the CCA as a "cap-and-invest" program, meaning that the law "caps" (or limits) Washington's greenhouse gas emissions and then "invests" the proceeds from its allowance auctions into "critical climate projects throughout the state."[13]

- The "cap" portion of the "cap-and-invest" program is an acknowledgement of the statute which requires statewide greenhouse gas emissions be limited to five million metric tons by 2050.[14] When considering only IRPs of other gas companies, not to mention other covered entities, Staff is skeptical that a portfolio resulting in this level of emissions

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[10] Avista 2023 IRP at pg. 8-5.
[11] WAC 480-90-238(3)(e) "An assessment of pipeline transmission capability and reliability and opportunities for additional pipeline transmission resources."

WAC 480-90-238(2)(b) "Lowest reasonable cost' means the lowest cost mix of resources determined through a detailed and consistent analysis of ... the risks imposed on ratepayers, resource effect on system operations, ...the cost of risks associated with environmental effects including emissions of carbon dioxide, and the need for security of supply."
[12] Building and energy code changes are discussed briefly in the Load Forecasting section of these comments.
[13] See Department of Ecology's Climate Commitment Act website.
[14] RCW 70A.45.020(1)(a)(iv)

represents a reasonable future given the statewide emissions limit required by law. **Staff encourages Avista to work with the Department of Ecology, Staff, and its advisory group, to discuss the implication of this "cap" and how it is likely to be achieved.**

- The "invest" portion of the "cap-and-invest" program refers to the way revenue from CCA allowance auctions will be used. Though Staff does not expect all investments funded through the CCA to go towards projects that will impact the gas system, the Climate Commitment Account is described on Ecology's website as projects "that support Washington's transition to a low-carbon economy, improve air quality, and increase access to clean energy for Washington residents."[15] One could argue that a low-carbon economy *could* include continued use of the gas system with alternative fuels like green hydrogen or renewable natural gas, but Avista's preferred portfolio envisions continued use of fossil natural gas for the bulk of its delivered product throughout the study period. Staff understands that the specific investments that CCA revenue will enable are unknown, but Avista must grapple with the fact that these investments are not likely to include further investment in a gas industry that envisions continuing to deliver mostly fossil-derived fuels to customers for the foreseeable future. Rather, the investments on the table include those that explicitly transition away from fossil fuels. **Staff expects to see a robust discussion of the "invest" portion of the "cap-and-invest" and discussion of the downstream impacts of CCA investments in Avista's 2025 IRP.**
- Staff also finds it important to note that Avista's purchase of CCA allowances, offsets, and/or zero- or lower-emission fuels will likely drive gas customer bills up.[16] Even without any specific programs for electrification, this price impact alone may well have the effect of incenting customers to voluntarily electrify. Avista does not fully account for this effect in this IRP. **Staff expects Avista to account for and provide a narrative discussion regarding electrification driven by the CCA in its 2025 IRP and discuss the CCA within its advisory group early in the IRP development process.** Staff understands this may entail an iterative modeling process, but we believe it is important that this effect be captured to accurately reflect likely market dynamics and account for the potential risks to customers.

State building code statutes

The Avista IRP document does not consider the impacts of new building codes upon customer counts.[17] However, Staff would like to emphasize the statutes driving these building code changes, RCW 19.27A.020(2)(a) and RCW 19.27A.160. These statutes are not new; they have

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[15] https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act/Auction-proceeds.
[16] Avista considers general rate impacts of new policies in both the electric and gas IRPs. Staff contends that bills have a bigger influence on customer choice of fuel.
[17] Avista 2023 IRP at pg. 2-2.

been law since 2009.[18] The Washington State Building Code Council has communicated the trajectory of state building codes regularly in its reports to the legislature. The Washington State Building Code Council is tasked with a 70 percent reduction in net annual energy consumption in newly constructed residential and nonresidential buildings by 2031. Additionally, RCW 19.27A.020(2)(a) states that the Washington state energy code shall be designed to construct increasingly energy efficient homes and buildings that help achieve the broader goal of building zero fossil-fuel greenhouse gas emission homes and buildings by 2031.[19] Customer and demand forecasts should reflect this future not just the current state of building codes. State building codes will be discussed at greater length in Staff's comments on Load Forecasting.

Climate Change Impacts

The 2023 IRP improves on previous IRPs by introducing climate change modeling into the weather modeling. Staff lauds Avista for beginning this work. However, Staff has concerns about the representative concentration pathway (RCP) 4.5 modeling Avista chose for use in this IRP.[20] **Staff recommends that Avista adopt RCP 8.5 as it is relied upon by the Northwest Power and Conservation Council.[21]** This would also bring Avista's modeling in line with other gas utility IRP climate modeling already submitted to the Commission.

Table 1: Comparison of Temperature Increases by Representative Concentration Pathway

	Scenario	2046-2065	2081-2100		
		Mean	Likely range	Mean	Likely range
Global Mean Surface Temperature Change (°C)	RCP 2.6	1.0	0.4 to 1.6	1.0	0.3 to 1.7
	RCP 4.5	**1.4**	**0.9 to 2.0**	**1.8**	**1.1 to 2.6**
	RCP 6.0	**1.3**	**0.8 to 1.8**	**2.2**	**1.4 to 3.1**
	RCP 8.5	2.0	1.4 to 2.6	3.7	2.6 to 4.8

Avista's shows "likely ranges" of "Global Mean Surface Temperature Changes" for 2046-2065, in the table below.[22] For RCP 4.5 the table indicates a range of .9-2.0 degrees. However, Staff notes that NASA data indicates that in 2016 a global average surface temperature change of 1.01 had occurred.[23] Similarly, in 2021, the IPCC stated "that emissions of greenhouse gases from

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[18] 2009 c 423 § 4; Chapter 423, Laws of 2009, 61st Legislature, 2009 Regular Session, FILED May 11, 2009.
[19] Diane Glenn, State Building Code Council Chair, WASHINGTON STATE ENERGY CODE Progress toward 2030, 2018 Report to the Legislature, November 25, 2020. Available at https://sbcc.wa.gov/sites/default/files/2020-12/Final 2018 Report.pdf.
[20] Avista 2023 IRP at pg. 2-8.
[21] "Specifically, the Council uses the Representative Concentration Pathway (RCP) 8.5 which reflects an end-of century radiative forcing of 8.5 watts per square meter." 2021 Power Plan, Page 54, Footnote 47, The 2021 Northwest Power Plan (nwcouncil.org).
[22] Avista 2023 IRP Table 2.3 at pg. 2-8.
[23] Global Temperature | Vital Signs – Climate Change: Vital Signs of the Planet (nasa.gov).

human activities are responsible for approximately 1.1°C of warming since 1850-1900, and finds that averaged over the next 20 years, global temperature is expected to reach or exceed 1.5°C of warming."[24] That is, temperatures are already within Avista's future "likely range." Further, expected temperatures will likely exceed Avista's 2046-2065 "mean" by 2041, 14 years before the mid-point of the 2046-2065 period. **For greater clarity, Staff recommends that tables like Table 2.3 be replaced with time series graphs with appropriate box and whisker plots.**

Peak Weather

Avista introduced a new method for determining peak weather in this IRP. The climate models used by Avista indicated increased winter volatility coincident with a long-term warming trend. "To smooth out the whipsaw effect of these values, and subsequent overbuilding or underbuilding of the required resources, a smoothing calculation was used which utilizes the coldest on record temperature and the peak temperature calculation in 2045 and connects the two linearly."[25] Staff appreciates the need to maintain a predictable peak planning standard. The question of winter volatility is an ongoing and evolving empirical question. **Staff recommends that Avista continue to revisit and update the winter peaking climate data and methodology as evidence and climate models improve.**

Load Forecasting

Avista's IRP presents two customer forecasts: a customer growth forecast and an electrification scenario.[26] The customer growth forecast anticipates between 0.7 percent and 1.4 percent growth based on historical trends.[27] In comparison, the electrification scenario anticipates a 33 percent reduction in residential customers by 2045.[28] Staff is supportive of Avista beginning to model electrification and decarbonization. Staff offers the following commentary and recommendations to improve on Avista's load forecast for the next IRP.

Avista's current electrification scenario presents a 2 percent annual reduction in customers.[29] The IRP document provides no basis for this assumption. The changing regulatory landscape introduces constraints and market pressures that likely will not follow a 2 percent annual reduction. Avista notes "… these forecasts reflect the 'status quo' and do not fully reflect emerging natural gas connection restrictions in Washington and Oregon."[30] Staff views the apparent "wait and see" approach as inadequate; the Company should not wait to anticipate the effects of future building codes when they are clearly anticipated by the State Building Code Counsel and/or Statutes. RCW 19.27A.020(2)(a) and RCW 19.27A.160 guide state building

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[24] Climate change widespread, rapid, and intensifying – IPCC — IPCC - published Aug. 9, 2021.
[25] Avista 2023 IRP at pg. 2-9.
[26] Avista 2023 IRP pg. 2-2 through 2-4.
[27] Avista 2023 IRP Table 2.2 at pg. 2-1 through 2-2.
[28] Avista 2023 IRP at pg. 2-3.
[29] Avista 2023 IRP at pg. 7-5.
[30] Avista 2023 IRP at pg. 2-2.

codes toward increased energy efficiency and the goal of zero fossil fuel emission from new buildings by 2031.

Customer and demand forecasts should reflect this future. Incorporating these separate statutes should result in declining growth until 2031 whereupon customer growth should effectively stop and then begin to decrease. **Where the specifics of future energy codes are unknown, Staff recommends that the utility project a forecast trend that accords with statutory goals and mandates.[31] Staff recommends Avista develop a building stock attrition rate to represent the loss of customers due to buildings being demolished, remodeled without gas service due to incompatible use cases, or otherwise leaving gas service unrelated to changes in the price competitiveness of gas services.[32,33] Staff further recommends that these assumptions be adopted as foundational assumptions for the primary demand forecast and not as a "demand scenario" or "Alternative Scenario" such as found in Table 2.8 or Chapter 7.[34,35]**

Additionally, the changing regulatory landscape imposes increasing costs that will translate into bill impacts for customers. Ecology's implementation of the CCA cap and invest program calls for exponentially increasing allowance prices as well as a shrinking number of free allowances.[36] This will result in increasing bill impacts that accelerate over time. Peer utility IRP filings have found that declining customer counts result in exponentially increasing bill impacts as fixed costs are distributed over a decreasing customer base.[37,38] Avista notes the price elasticity was not considered in determining customer counts.[39] Further compounding this question, Avista notes that the costs associated with end use conversion may create an equity issue.[40]

After 2031, Staff believes that the background rate of building stock attrition and the changing price-competitiveness of gas versus electric utility service will likely be significant drivers of customer forecasts. There is a clear possibility that a declining customer base could result in increased customer costs that further incent customers to switch to electric service, resulting in a feedback loop of declining customers and increasing customer costs. Staff notes the potential risk

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[31] WAC 480-90-238(2)(b) "At a minimum, this analysis must consider ... public policies regarding resource preference adopted by Washington state ..."
[32] This attrition rate could be estimated based on the Utility's own customer and address data, county records, or various studies on the longevity of various types of structures.
[33] WAC 480-90-238(3)(a) "A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type and efficiency of natural gas end-uses."
[34] Avista 2023 IRP, Table 2.8 at pg. 2-22.
[35] Avista 2023 IRP Chapter 7 at pg. 7-1.
[36] WAC 173-446-335(5) and WAC 173-446-240(2)
[37] Docket UG-210094, "2022 NW Natural Integrated Resource Plan," pg. 322
[38] Docket UG-220131, Cascade Natural Gas Corporation Integrated Resource Plan, Appendix K, Bill Impacts Analysis, 2023 IRP, pg. 12, 13.
[39] Avista 2023 IRP at pg. 2-1 & 2-2.
[40] Avista 2023 IRP at pg. 3-15.

of these feedback dynamics becoming unstable and accelerating beyond the control of Avista and harming customers with sharply increased bills. Staff acknowledges that changes to customer rates are determined in rate cases, separately from resource planning. However, estimating potential impacts of different scenarios or portfolios in an IRP can help regulators, customers, and consumer advocates interpret how planning decisions might affect energy affordability.[41] **Staff recommends that Avista analyze the risk of increased bill impacts to customers and the distributional effects through the lens of equity, energy justice, and access to energy efficiency and electrification resources.**[42, 43] **Staff recommends that Avista dynamically model the anticipated comparative costs between its natural gas services and electric utility services into the future as well as the interplay of customers, by class, responding to changing comparative cost.**[44] **Staff recommends that this comparative cost analysis incorporate the distributional analysis recommended above.**[45]

Demand-side Potential Assessments

Between the 2021 IRP and this 2023 Gas IRP, Avista made some important changes in its conservation potential assessment (CPA). Once again, the Company chose Applied Energy Group (AEG) to perform the CPA. For the first time the Company contracted for a natural gas demand response potential study and a transportation customer potential study. The 2023 gas IRP reflects a switch from using a Utility Cost Test (UCT) to the use of a Total Resource Cost test (TRC) as the primary test to evaluate energy efficiency resources in accordance with conditions of the 2022-23 gas biennial conservation plan (BCP).[46] Staff appreciates Avista including more quantified non-energy impacts (NEIs) in this CPA to better capture the full

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[41] Reimagining Resource Planning Report (January 2023) Rocky Mountain Institute at p. 62.
[42] WAC 480-90-238 (2)(b) "At a minimum, this analysis must consider resource costs, market-volatility risks, demand-side resource uncertainties, the risks imposed on ratepayers, resource effect on system operations, public policies regarding resource preference adopted by Washington state or the federal government, the cost of risks associated with environmental effects including emissions of carbon dioxide, and the need for security of supply." WAC 480-90-238(3)(g) "The integration of the demand forecasts and resource evaluations into a long-range (e.g., at least ten years; longer if appropriate to the life of the resources considered) integrated resource plan describing the mix of resources that is designated to meet current and future needs at the lowest reasonable cost to the utility and its ratepayers." [emphasis added by Staff]
[43] Docket UG-210755, "Final Order 09, Approving and Adopting Settlement Agreement Subject to Conditions" (GRC), at pg. 19 para 58, & pg. 18 para 56.
[44] WAC 480-90-238(3) (a "A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type, and efficiency of natural gas end-uses."
[45] WAC 480-90-238(3) (a) "A range of forecasts of future natural gas demand in firm and interruptible markets for each customer class that examine the effect of economic forces on the consumption of natural gas and that address changes in the number, type and efficiency of natural gas end-uses."
[46] UG-210827 Order 01 Attachment A Condition 3) a) ii)(1)(d), pages 2-3, January 18, 2022.

impact of conservation measures, allowing a more fully balanced TRC in accordance with Commission policy.[47]

The CPA includes a low-income sector separate from average residential customers. The identified conservation target for the 2024-25 biennium for low-income customers is 279,941 therms, adding approximately thirty percent to the overall residential target of 867,199 therms.

Staff encourages Avista to continue to refine its methods and approach leveraging potential assessments for achieving equitable outcomes. Areas for potential refinement may include:

- Expanding equity-based segmentation beyond low-income and outside of the residential sector
- Exploring the feasibility of a gradient of vulnerability rather than using a simple binary identification.

Electrification as a Resource

This IRP does not forecast fuel switching but treats building electrification as a resource. Building electrification measures are picked whenever cost-effective, similar to energy efficiency. Staff appreciates Avista's efforts in this area but has concerns that this approach may not be adequate to anticipate and plan for the clean energy transition.

While methods for including energy efficiency as a resource are well vetted, there are inherent inaccuracies with CPAs, which rely on averages, that are magnified when using the method to analyze electrification. This is particularly true when considering conversion costs. Conversion costs to change an appliance from gas to electric can vary widely, depending on the prior state of the building. Avista acknowledges that these are wide ranging costs and used 50 percent and 150 percent of a generic cost to account for low-cost and high-cost conversion scenarios in addition to the expected scenario.[48] In reality, some customers will have buildings that require little to no conversion with minimal cost at the *same time* some customers will have buildings that require extensive retrofitting with prohibitively high conversion cost. The customer who can easily convert from gas to electric at lower costs may be likely to switch while another with extensive retrofitting needs will be more likely to stay on the gas system due to the high cost of fuel switching. Instead of a particular building electrification measure being cost-effective or not, conversion to electric appliances will likely be chosen by a certain percentage of Avista gas customers for whom it makes sense. If Avista chooses to use this type of analysis in the 2025 IRP, **Staff recommends segmenting customers with different levels of conversion costs rather than modifying only by scenario.**

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[47] UG-121207 Policy Statement on the Evaluation of the Cost-Effectiveness of Natural Gas Conservation Programs, October 9, 2013.
[48] Avista 2023 IRP pg. 7-5

Transport Customers

Avista's 2023 CPA analyzed the amount of achievable technical conservation potential in the transport customer segment as some of these entities' emissions are Avista's obligation under the Climate Commitment Act (CCA).[49,50] Avista included these customers as a separate customer class and estimated their conservation potential by assigning each an appropriate market segment (e.g., "college," "health," etc.) and end use (e.g., "process," "space heating," etc.). The methodology used to estimate small transport customers' conservation potential largely matches that used for Avista's other commercial and industrial customers. The CPA found 1,234,253 Dth of achievable economic potential by 2045.

Staff believes the approach that Avista used in its estimation of transport customer conservation potential is reasonable and echoes the recommendations made by the CPA consultant, AEG.[51] Since the CPA relies on averages across market segments and thus may not reflect potential at any particular site, **Staff recommends that Avista consider audits of specific transportation customer sites to better understand current equipment and practices to refine estimates of available potential for these customers.** In addition, since a small number of transportation customers account for a large amount of the potential savings, **Staff recommends targeted outreach to the largest transportation customers to understand their likelihood of participating in future energy efficiency programs, including to what extent and on what timeline, when considering program design.**

Social Cost of Greenhouse Gasses Calculations

Upstream Emissions Estimates

As of 2019, gas companies must account for "emissions occurring in the gathering, transmission, and distribution of natural gas" for the purposes of calculating avoided costs used for conservation targets.[52,53] Avista quantifies upstream emissions as a rate of their throughput (measured in lbs. CO2e/MMBtu.)[54] but provides no calculation of total upstream emissions or the costs associated with these emissions. The avoided cost analysis does not describe how these emissions were incorporated as required by statute.[55] **Staff recommends that Avista explicitly**

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[49] RCW 70A.65.080(1)(e)(i)
[50] Prior to the CCA, it was unclear if the statute required utilities to include gas transportation customers in energy efficiency programs. See Docket UG-210462, Open Meeting Memo, October 14, 2021.
[51] Avista 2023 IRP Appendix page 220- Applied Energy Group Memorandum RE: Avista Washington and Oregon Natural Gas Transportation Customer Conservation Potential Assessment.
[52] See RCW 80.28.395
[53] RCW 80.28.380
[54] Avista 2023 IRP at pg. 5-2.
[55] RCW 80.28.380 "The cost-effectiveness analysis required by this section must include the costs of greenhouse gas emissions established in RCW 80.28.395."

account costs of greenhouse gas emissions established in RCW 80.28.395 when analyzing avoided costs.[56]

Avista provides an estimate of the rate of distribution system leaks roughly 2-4 times the national average.[57] The Company states "Such levels within Avista's distribution system from July 2019 – June 2022 average 0.51 percent."[58] No further analysis or quantification is provided. Avista provides no indication of the range of values or statistical distribution of distribution system emission levels. It is unclear how representative this average value is. **Staff recommends that Avista more clearly account for emissions occurring in the gathering, transmission, and distribution of natural gas and discuss it with the Advisory Group. Staff recommends that Avista incorporate discussions of distribution system emissions data into its IRP analysis, including its Distribution Scenario Decision-Making Process criteria if applicable.[59] Staff also recommends that Avista discuss its approach to statistical analysis to communicate the accuracy of the estimates that are provided in the IRP document.**

SCGHG interaction with CCA costs

In addition to complying with the CCA, the cost of greenhouse gas emissions must be included when identifying cost-effective conservation.[60] Avista used the SCGHG "in place of costs included in the CCA … to compare resource selections" since the SCGHG "is higher than the program cost of the CCA…"[61] Staff understands the concern that since both of these costs relate to greenhouse gas emissions, applying both could raise concerns of double counting the cost of emissions. However, we do not believe this to be the case. Compliance with the CCA is a *direct cost* to be paid by Avista and reflected in customer bills. The SCGHG is an adder used in resource selection for natural gas conservation reflecting the cost of pollution to society as a whole. **Staff recommends that Avista include both the cost of compliance with the CCA and the SCGHG for conservation in the base case in the 2025 IRP.**

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[56] RCW 80.28.380 "Each company must establish an acquisition target every two years and must demonstrate that the target will result in the acquisition of all resources identified as available and cost-effective. The cost-effectiveness analysis required by this section must include the costs of greenhouse gas emissions established in RCW 80.28.395."
RCW 80.28.395 "For the purposes of RCW 80.28.380, the cost of greenhouse gas emissions resulting from the use of natural gas, including the effect of emissions occurring in the gathering, transmission, and distribution of natural gas to the end user."
[57] Avista 2023 IRP, at pg. 5-3.
[58] Avista 2023 IRP at pg. 5-3.
[59] WAC 480-90-238(2)(b) "Lowest reasonable cost" means the lowest cost mix of resources determined through a detailed and consistent analysis of a wide range of commercially available sources. At a minimum, this analysis must consider resource costs, ...the risks imposed on ratepayers, resource effect on system operations, public policies regarding resource preference adopted by Washington state or the federal government, the cost of risks associated with environmental effects including emissions of carbon dioxide, and the need for security of supply."
[60] See RCW 80.28.380.
[61] Avista IRP Appendix page 24.

Table 2: 2023 IRP Scenarios[62]

2023 IRP Scenarios	Natural Gas Prices	DSM Potential	CCA	Customer Growth	Electrification Conversion Costs	Renewable Prices	Renewable Supply	Pipeline Outages	Carbon Intensity Natural Gas	Carbon Intensity Renewables	Cost of Carbon	Weather	UPC	CPP
PRS	Expected	Expected	Expected Price (Allowances)	Expected	Expected	Expected	Expected	None	117 lbs. per Dekatherm	0 lbs. per Dekatherm	Carbon Tax Beginning 2030 Idaho Only	Climate Change	5-Year UPC - OR 3-Year UPC - ID 3-Year UPC WA Space Heat Demand Only for New Residential + New Commercial Customers in Washington	Emission Targets + CCI Prices
PRS - Low Prices	Low	Low												
PRS - High Prices	High	High												
PRS - Allowance Price Ceiling	Expected	Expected	Ceiling Price (Allowances)											
Electrification - Expected Conversion Costs			Expected Price (Allowances)	Electrification										
Electrification - High Conversion Costs					High									
Electrification - Low Conversion Costs					Low									
High Customer Case				High	Expected									
Limited RNG Availability				Expected		High	Low							
Interrupted Supply						Expected	Expected	50% Capacity Station 2, Sumas, and Rockies	128.27 lbs. per Dekatherm	Carbon Intensity				
Carbon Intensity														
Social Cost of Carbon								None	117 lbs. per Dekatherm	0 lbs. per Dekatherm	Social Cost of Carbon @ 2.5%	20 Year Average		
Average Case											Carbon Tax Beginning 2030 Idaho Only	Climate Change	Space Heat Demand Only for Hybrid Customers	
Hybrid Case														

As shown in Table 2, it appears to Staff that the only scenario that uses both the CCA costs and the SCGHG is the "Social Cost of Carbon Scenario." **When calculating the natural gas energy efficiency target for 2024-2025, Avista should discuss with the EEAG if it is more appropriate to use the avoided cost from the Social Cost of Carbon Case in Appendix 6.4.**

Alternative Fuels

Additional fuel choices are a fairly recent phenomenon in gas IRPs. While Staff is pleased with the number of options Avista made available to the model, Staff recommends clarification and changes in several areas.

Avista's plan to adopt alternative fuels is not clearly communicated in the IRP document. The graph of Avista's Preferred Resource Strategy, Figure 1 below, shows scant dark green pixels, visible in Figure 2, representing synthetic methane, just below the lime green DSM line throughout the planning period until 2044. [63]

[62] Avista IRP pg. 7.1 Table 7.1.
[63] Avista 2023 IRP at pg. 6-27.

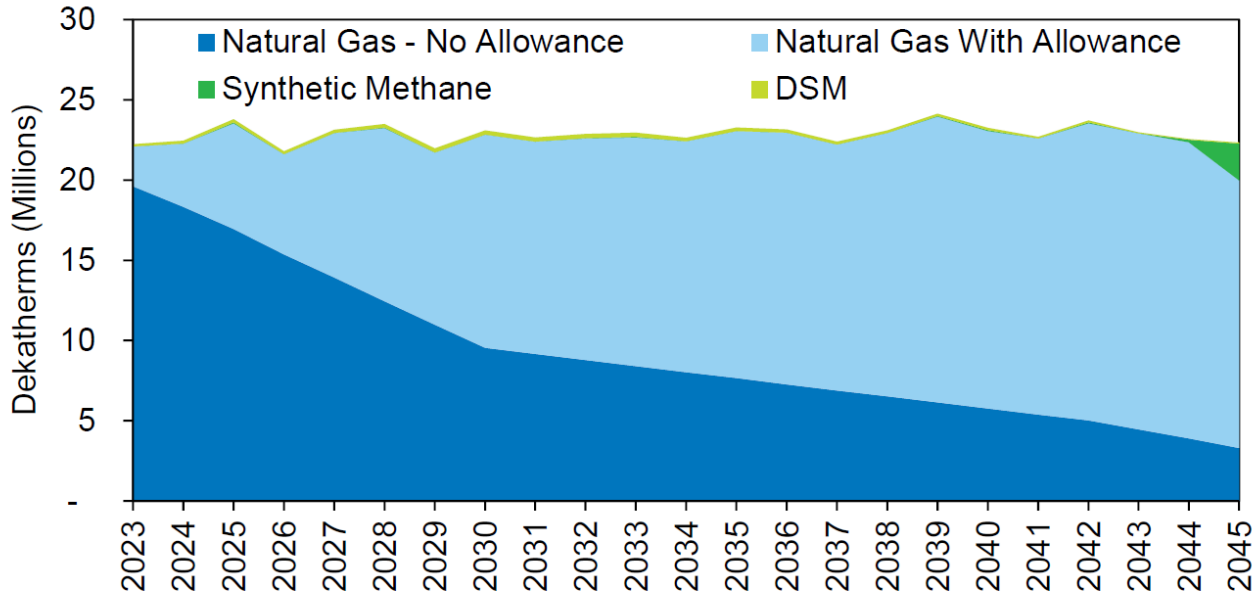

Figure *1: Washington Preferred Resource Strategy*[64]

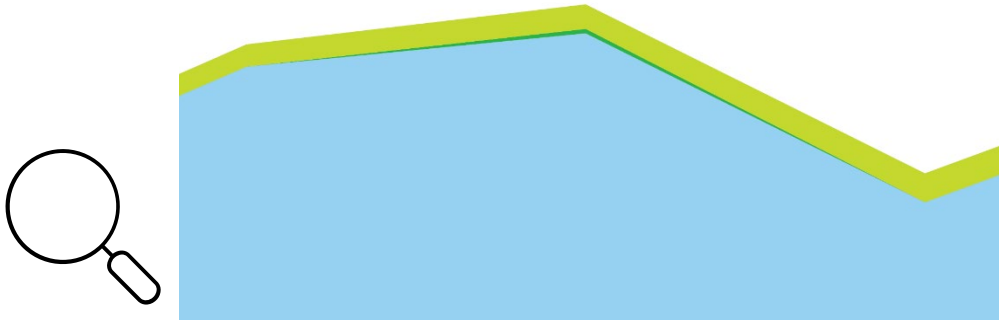

Figure 2: Detail of Figure 1: Washington Preferred Resource Strategy, between years 2026 and 2029, showing acquisition of synthetic methane.

The inconsistent and marginal adoption of synthetic methane is reflected in Table 6.5 within the IRP.[65] In this table, between 2023 and 2037, average daily resource quantities of synthetic methane vary between zero and 141 dekatherms (Dth) and go from a positive value to zero on four occasions. To Staff, this does not appear to be an actionable strategy. Contracting for such varied and miniscule amounts of synthetic methane is not practical and likely not lowest

[64] Avista 2023 IRP at pg. 6-27, Figure 6.22.
[65] Avista 2023 IRP at pg. 6-28.

reasonable cost. If one interprets these graphs and tables practically, it suggests that Avista does not plan to meaningfully include alternative fuels on its system until 2044/2045.

Avista does not include hydrogen or landfill gas as selections in its Preferred Resource Strategy even though the analysis indicates that hydrogen and landfill gas have a lower price/Dth than synthetic methane throughout the planning period, as shown in Table 3.[66] Further, Avista does not provide an explanation in the IRP document to explain why hydrogen and landfill gas were not selected while synthetic methane was. While Staff has some concerns about the use of hydrogen in the gas system, as expressed in previous IRP comments,[67] **Staff recommends that Avista consider hydrogen and landfill gas for the purposes of lowest reasonable cost analysis unless it can demonstrate a reason not to consider these fuels.**

Table 3: All resource price comparison $/Dth[68]

Year	Hydrogen	Dairy	Food Waste	LFG	Wastewater	Synthetic Methane	AECO
2025	$35.43	$36.84	$50.43	$9.62	$16.68	$48.35	$3.43
2030	$25.20	$41.05	$56.15	$10.72	$18.54	$32.90	$3.03
2035	$19.05	$45.72	$62.49	$11.93	$20.60	$30.48	$3.55
2040	$16.09	$50.92	$69.56	$13.28	$22.91	$23.13	$4.19
2045	$12.19	$56.71	$77.43	$14.79	$25.47	$14.84	$5.05

Staff recommends additional clarification in the Alternative Fuel Supply Price Risk analysis.[69] To Staff, the graphs presented are unclear. For example, figure 4.21 on page 4-30, claims an average and median price of $31.41 and $29.11 respectively, but neither of these values fit within the bounds of the x-axis. **For greater clarity, Staff recommends that these graphs be converted to time series graphs featuring box and whisker plots.**

Finally, Staff would like to highlight Avista's renewable natural gas (RNG) price estimates. Peer utilities have also provided price estimates for RNG.[70, 71] Avista's analysis indicates an expected price increase of about 53 percent for RNG by 2045.[72] In contrast, Cascade anticipates costs to remain steady after 2029.[73] NWN similarly does not anticipate a price increase.[74] Staff expects

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[66] Avista 2023 IRP, Table 4.4 at pg. 4-26.
[67] Docket UG-220131, "Commission Staff Comments Regarding 2023 Natural Gas Integrated Resource Plan" at pg. 19-22. And Docket UG-220242, "Commission Staff Comments Regarding Puget Sound Energy's 2023 Natural Gas Integrated Resource Plan" at pg. 17-19.
[68] Avista 2023 IRP, Table 4.4 at pg. 4-26.
[69] Avista 2023 IRP pg. 4-26 through 4-30.
[70] Docket UG-220131, "2023 Integrated Resource Plan" at pg. 4-17.
[71] Docket UG-210094, "2022 NW Natural Integrated Resource Plan" at pg. 225.
[72] Avista 2023 IRP at pg. 4-26.
[73] Docket UG-220131, "2023 Integrated Resource Plan" at pg. 4-17.
[74] Docket UG-210094, "2022 NW Natural Integrated Resource Plan" at pg. 225.

alternative fuel price estimates to achieve greater alignment between utilities over time as the resources mature, utility experience with the resources increases, and methodologies improve.

IRP Modeling

Avista adopted PLEXOS modelling software for portfolio optimization for the first time in this IRP. Peer utilities, Cascade Natural Gas Corporation and Northwest Natural Gas Company also adopted PLEXOS for the 2022/2023 IRP cycle. Staff is supportive of this improvement as it allows for carbon emission modeling.

Avista offers no caution regarding the use or interpretation of PLEXOS model results in the IRP. Staff cautions against overreliance on PLEXOS and affirms the ultimate responsibility of Avista for all content found in the IRP document.

The following two examples highlight PLEXOS model outcomes that necessitate expert vetting to ensure that they are plausibly actionable by the utility in the future:

First, consider the acquisition of synthetic methane discussed by Staff in the alternative fuels section above. Table 4 below is generated by PLEXOS. [75] Note the column labeled "Synthetic Methane." Between 2023 and 2037 the table indicates Avista would start and stop the use of Synthetic Methane numerous times. The table indicates that Avista would transact for amounts of Synthetic Methane so small they are recorded as zero as well as three other years with single digits. This is not a plausible or actionable strategy for the Company. Staff surmises that Avista's power supply team would not enact this plan.

[75] Avista 2023 IRP Table 6.5 at pg. 6-28.

Table 4: Average Daily Resource Quantities by Year - Washington[76]

Year	Energy Efficiency	Natural Gas	Synthetic Methane	Allowances DTh Equivalent	Natural Gas - No allowance	Natural Gas with allowance
2023	404	60,537	-	6,807	53,730	6,807
2024	507	60,881	-	10,804	50,077	10,804
2025	558	64,507	136	18,075	46,432	18,075
2026	519	59,228	-	17,105	42,122	17,105
2027	563	62,859	-	24,688	38,171	24,688
2028	612	63,497	119	29,472	34,026	29,472
2029	685	59,521	3	29,412	30,109	29,412
2030	717	62,552	0	36,417	26,135	36,417
2031	723	61,364	-	36,236	25,128	36,236
2032	717	61,759	52	37,748	24,011	37,748
2033	686	62,066	141	39,023	23,043	39,023
2034	641	61,415	-	39,422	21,994	39,422
2035	585	63,193	3	42,210	20,983	42,210
2036	546	62,735	-	42,884	19,851	42,884
2037	496	60,887	5	42,055	18,833	42,055
2038	427	62,836	20	44,967	17,869	44,967
2039	372	65,626	157	48,772	16,854	48,772
2040	340	63,017	177	47,287	15,730	47,287
2041	300	61,895	20	47,151	14,744	47,151
2042	287	64,523	159	50,754	13,769	50,754
2043	154	62,775	14	50,559	12,217	50,559
2044	136	61,087	428	50,438	10,649	50,438
2045	129	54,741	6,313	45,678	9,063	45,678

The values reported by Avista in Figure 3, below, were generated by PLEXOS. In 2040 and 2041, the "Social Cost of Carbon" and "PRS - Allowance Price Ceiling" scenarios modelled an extremely rapid 2-year collapse in Allowance demand. The IRP document does not articulate any actionable policy pathways that would align with either of these outcomes. PLEXOS chose the least-cost outcome and Avista reported the output.

[76] Avista 2023 IRP Table 6.5 at pg. 6-28.

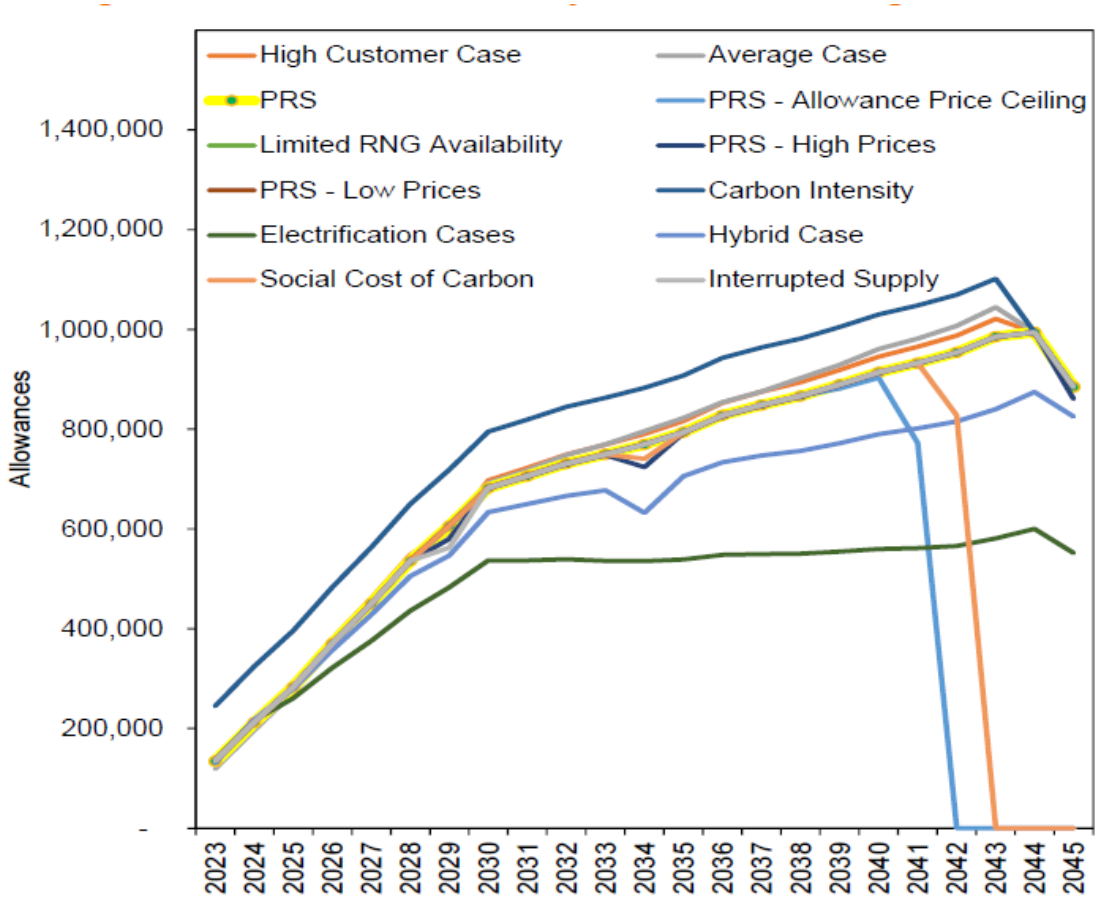

Figure 3: Allowance Demand by Scenario- Washington CCA[77]

Staff also provided similar commentary on a peer utility's use of PLEXOS[78]. Due to the way that PLEXOS optimizes in a perfect-knowledge space, the model can make portfolio choices that would not be practical for human policy makers. **Staff recommends that Avista highlight and offer appropriate cautions in its analysis wherever PLEXOS yields results or behaviors that would be unlikely to be anticipated or enacted by a human planner. Staff further recommends that Avista highlight and offer appropriate caution in its analysis wherever PLEXOS uses resources in its portfolio in a manner that does not accord with current best practices or current technological means. Staff recommends that Avista ultimately rely upon human expertise to vet and verify all results generated by PLEXOS**.

[77] Avista 2023 IRP, Figure 7.7 at pg. 7-13.
[78] Docket UG-220131, "Commission Staff Comments Regarding 2023 Natural Gas Integrated Resource Plan," at pg. 23-25.

Decarbonization Plan and Electrification Analysis

In addition to compliance with Commission rules, the 2023 gas IRP must comply with Commission order approving Avista's last general rate case.[79] In Appendix 5.1 Avista describes compliance with conditions to the settlement stipulation requiring a natural gas decarbonization plan for compliance with the CCA. Staff is concerned that, while Avista included some elements of a decarbonization plan, no actual decarbonization plan is presented in the IRP. The preferred portfolio aims for compliance with the CCA but cannot be considered a *decarbonization* plan while relying almost entirely on allowances, with a near zero reduction in emissions. **Staff recommends Avista consult with the TAC and parties to the GRC to discuss what a decarbonization plan should entail, submit a specific workplan, and provide a decarbonization plan in the 2025 IRP.**

Avista looked at electrification in this IRP, both 1) as a resource, as described in our Demand-side Potential Assessment comments, and 2) as an occurrence happening outside of utility programs as described in our Load Forecasting comments.

Staff appreciates Avista's attempt to provide a look at possible electric and gas system impacts of electrification of end-use loads. This is a complicated exercise that requires more coordination between Avista's gas and electric teams than previous cycles and iterative modeling. **Staff encourages Avista to refine this electrification analysis in the 2025 IRP with input from interested persons.**

Staff encourages Avista to refine its assumptions about *how* loads are electrified and run sensitivities exploring the implications of a "smart" transition versus a "business as usual" transition.[80] Electrification will result in capacity needs on the electric system, but the magnitude of this need will vary significantly depending on how this transition occurs. **Staff recommends that in its 2025 IRP Avista refine its assumptions around electrifying loads and run**

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[79] UE-220053 Appendix A to Order 10 – Settlement-Stipulation, June 28, 2022, page 12.
21. Natural Gas Transition Issues d) Avista agrees to include in its 2023 Natural Gas IRP, a natural gas system decarbonization plan for complying with the Climate Commitment Act.
i. The Natural Gas IRP's decarbonization plan shall include a supply curve of decarbonization resources by price and availability, e.g. energy efficiency bundle 1 costs X$/ton of carbon dioxide equivalent (CO2e) reduction and can reduce Y tons of CO2e, dairy RNG costs A$/ton and can reduce B tons of CO2e.
ii. The decarbonization plan shall consider a comprehensive set of strategies, programs, incentives, and other measures to encourage new and existing customers to adopt fully energy efficient appliances and equipment or other decarbonization measures, which could include electrification.
iii. The decarbonization plan shall include targets for the ratio of new gas customers added relative to new electric customers added in future years.

[80] Staff uses "smart" transition to mean an electrification process that uses available mitigation strategies to limit the negative impacts of such a transition. Mitigation techniques may include incentivizing appliances with lower peak hour demand, increasing enrollment of newly electrified loads in demand response and time-of-use programs, etc. Staff uses "business as usual" transition to mean an electrification process that allows loads to electrify in an unmitigated way.

additional sensitivities that illuminate a wide range of possible costs of electrification depending on how loads electrify.

Summary of Public Comments

As of the filing of these comments, no public comment about Avista's 2023 Gas IRP has been received in the docket.