2021 Electric Integrated Resource Plan

Appendix C – Public Participation Comments

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Public Participation Comments

IRP Comments Provided by Technical Advisory Committee Members

Commenter	Comment	Avista Response
Idaho Conservation League	System wide vs state specific resource additions 1. We request Avista compare the results of this Idaho-specific study to the results of the same analysis at the system-wide level. 2. We request Avista compare the results of this Idaho-specific study to the results of the same analysis at the system-wide level. 3. We also request a study that documents the costs to implement, monitor and document the state-specific addition of resources to an interconnected system dispatched to meet combined customer loads.	1. Avista included a scenario in Chapter 12 with 100% clean energy by 2045. 2. Avista split resources and costs between its jurisdictions to understand the effect to each state. 3. All costs to meet resource requirements by state is included in the PRiSM model. The model is publicly available in Appendix I. Also, summary level information is provided in the IRP Chapter 11 and 12.
Idaho Conservation League	Existing Resources 1. We request Avista study a scenario that applies the Social Cost of Carbon to all resources, including those that serve Idaho, as offered in the first TAC meeting. 2. We request Avista study scenarios for Colstrip costs that reflect the changing ownership shares currently being considered by co-owners Puget Sound Energy, Northwestern Energy, and Talen. Further, we request a study of likelihood and scale of increases to Avista's share of common plant costs, remediation costs, and fuel supply costs, including minimum fuel supply and generation off-take, attributable to both the closure of Units 1 and 2 and the changing ownership share of Units 3 and 4. 3. We request a study of the accuracy of Avista wholesale natural gas price forecasting methodology by comparing forecasted prices in prior IRPs to prices Avista actually paid. We request this study include a comparison of the accuracy of consultant-supplied forecast to publicly-available forecasts covering the same time periods.	1. Avista conducted this study and it is available in Chapter 12. 2. Regarding the change in ownership percentages for Units 3 and 4, there are no changes to Avista's responsibilities or modeling inputs to alter because Avista's 15 percent share of both units remains static under the Colstrip ownership agreement. Avista's financial responsibility for the plant remains the same regardless of the non-Avista ownership or ownership percentages for Units 3 and 4. As in the last IRP, Avista is accounting for the shift (increase) in previously shared costs that are a result of the closure of units 1 and 2. Those costs increased, but Avista's share of those costs did not change. Avista has zero responsibility for the remediation costs associated with Units 1 and 2. The closure of those units did not end the financial responsibility of those remediation costs for the owners of those units (Puget Sound Energy and Talen). Avista's fuel contract is separate from the contracts that supplied Units 1 and 2. Avista's fuel contract and any subsequent mine remediation costs with our share of coal are already included in the prices being modeled in the 2021 IRP, consistent with past IRPs.

		3. The natural gas price forecast beyond the shorter term forward markets is always an area of concern because of the potential for volatility, timing and magnitude of outside events, much like the current pandemic we are now experiencing. It is in our own best interests to use good forecasts. Avista publishes its natural gas price forecasts in each IRP; including both consultant forecasts on an annual average basis. Actual natural gas prices are also publicly available. The consultants that we use work on a national as well as an international basis. They already perform their own internal analyses to make their forecasts as accurate as possible to maintain and grow their business. We are paying for their expertise and research into the natural gas market. Avista has not seen any evidence indicating that there are better forecasts available and we do not possess the resources to develop comprehensive fundamentals based natural gas forecast on our own. Some forecasts, like those provided by the Energy Information Administration, supply some more details about the fundamentals they are using, but they are also more dated and do not provide the level of granularity into specific trading hubs. These consultants would not be able to remain in business if they had to give away all of their research for free. Please let us know if you have found other evidence or research indicating better forecasts. Avista includes the natural gas prices used in the forecast in Appendix I.
Idaho Conservation League	Storage 1. We request Avista model loads and generation at the sub-hourly level. We recognize Avista began pursuing sub-hourly modeling in the 2017 IRP and further refined the ADSS system in the 2019 IRP. We request Avista fully implement sub-hourly modeling for all IRP studies and processes. 2. We request Avista study the optimal pairing of generation resources with storage of different technologies and lengths of supplying services. For example: pairing local solar or wind with Li-Ion 4hr, 6hr, and 12hr batteries; pairing pump hydro resources with regional solar, wind, and wholesale markets; pairing long term storage like hydrogen electrolysis and	1. Sub-hourly modeling is challenging due to model solution complexity and data availability. Further, modeling all sub-hourly periods is not technologically possible. Presently, modeling at one-hour granularity requires thousands of hours of computer processing time. Moving to intra-hour modeling would cause an exponential increase in solution time even if the data was available. ADSS and other modeling techniques are used to evaluate intra-hour values, and generally rely on sampling of relevant time periods. This is specifically the case with the complexity of modeling storage resources. Avista is working on this issue and is hopeful it will be available in future IRPs and will be added as an Action Item in the 2021 IRP if not completed for this plan. 2. As described in the first TAC meeting and distributed to the TAC afterwards and publically available on our website, this

	associated hydrogen storage with Avista's own resources and wholesale market generation." 3. We request Avista study the emission reductions possible from pairing storage with specific clean generation options along with the Proposal presented to the TAC to apply the average emissions rate of the region for storage paired to generic wholesale market resources.	IRP already includes a wide variety of stand-alone storage and combined renewables plus storage options. The options being modeled include distribution scale 6-hour Lithium-ion; 4-, 8- and 16-hour Lithium-ion; 4-hour Vanadium flow, 4-hour Zinc Bromide flow batteries; 16-hour 100 MW share pumped storage; and 100 MW solar photovoltaic with Lithium-Ion batteries. Avista is also modeling hydrogen using fuel cells or converted combustion turbines. Each of the hydrogen options will include long duration storage facilities as a backup to real-time deliveries. Avista's IRP modeling includes the benefits from a portfolio optimization in its current process between storage and renewable resources. Avista acknowledges there could be a benefit to pairing storage with renewables from a transmission perspective. The economic estimates of the IRP are exclusive of T&D investments. Although the locational benefits of storage paired with resources may not be optimal when considering other "better" locations to locate the storage. Avista agrees with this concept and is trying to determine the best methodology to model these potential benefits, but the modeling of this concept may not be available in time for this IRP. It will be added as an Action Item if we are not able to develop the concept and include it in the 2021 IRP. 3. Avista includes regional emissions for storage not connected to a facility; for paired resources, Avista does not include the emissions when using the paired resources. Although, over time as paired solar/storage resources are no longer obligated to use the paired resources storage technology to satisfy tax credit requirements will likely use a combined grid/local power for optimization of the system. [Avista's PRS did not include storage emissions, but scenarios were conducted to understand this effect].
Idaho Conservation League	Distribution Level Modeling 1. To help encourage the optimal growth of DERs on the Avista system, we request a Hosting Capacity Analysis. This analysis could support a distributed energy resource interconnection map that identifies where distributed energy resources exist on the system or	1. Avista's transmission and distribution departments are working on a public process for this type of planning. This process will likely be separate from the IRP process, but will inform the IRP. More details of this process and its findings will be shared with the TAC as they develop.

	where the distribution system is constrained and could benefit from energy storage or specific demand responses. This Hosting Capacity Analysis would benefit the IRP's load forecasting and overall integration of distributed energy within the IRP. We recommend Avista define DERs broadly for this study to include: customer-sited generation and storage, utility-sited generation and storage at substations or other locations on the distribution grid, as well as public and private electric vehicle charging stations." 2. We request Avista incorporate different load shapes that are indicative of customer generated power as well as the charging of electric vehicles to ensure accuracy in the load shapes for supply-side resource planning. The Smart Electric Power Alliance has an informative set of resources to help with this effort: https://sepapower.org/knowledge/proposing-a-new-distribution-system-planning-model/."	2. Avista welcomes the information, but at this time is using data collected from its local system for both solar photovoltaics and electric vehicles.
Idaho Conservation League	Flexibility Issues 1. With the technological changes of a modern grid system, including flexibility in both supply and demand studies is essential as we look to the future of electric service areas. As shown in the pilot program with the Catalyst Building, the savings from energy efficiency and flexible building loads can be extremely beneficial for the electric grid as a whole. Similarly, the micro-transaction grid project in the Spokane University District is demonstrating the value of flexible loads and new market opportunities for customers to manage their power bills. To fully explore the value that flexibility brings to Idaho customers, we request Avista study the potential to expand similar projects in the Idaho service territory. At minimum, a study to see the perspective of customers' willingness to participate in such a pilot program could have lasting results.	1. Avista appreciates the comment to also consider Idaho as a test bed for future projects and will take this under advisement. Avista utilizes the University of Idaho for several R&D efforts through a competitive grant process for a total of $270,000 to study efforts related to energy efficiency and flexible building loads. Example projects from the 2019/20 academic year include: a program design for energy trading system for consumers, using infrared cameras for building controls and gamification of energy use.
Idaho Conservation League	Climate Change Impacts to Avista's System and Costs 1. Loads - study changes to both long-term load forecast and the peak load forecast attributable to climate change. The 2020 IRP mentions a 1-degree increase in temperatures, but does not appear to describe how	1. Climate change is being included in the load forecast as a scenario, which was covered in the special TAC meeting on August 8, 2020 after receiving this letter. Further, all load forecast scenario data is available on the IRP website (Appendix I). Please let us know if you have any additional

	climate change is factored into the peak load forecast. The 2020 IRP also cites a temperature data set from 2013, which we recommend Avista update to the most currently available set. 2. Hydro - study the potential changes to hydroelectric power generation that could result from climate-caused changes to precipitation type and timing. This study should document the range of impacts to power costs that result from the changes in hydroelectric power generation. 3. Thermal plants - study potential changes to expected generation and production costs due to temperature changes. This study should include changes to expected generation and fuel costs as output varies with ambient temperatures and the impacts to cooling water needs due to changes in precipitation and water temperatures. The study should document the range of impacts to power costs due to the change in expected generation output, fuel needs, and cooling water needs."	questions or concerns that may have arisen since that presentation. 2. We have obtained the climate adjustments developed by the Power Council and included a scenario with these adjustments in Chapter 12. 3. Avista agrees temperature changes will impact the amount of production from its natural gas-fired facilities. This impact will was included in the climate change scenario.
Idaho Conservation League	Beneficial Electrification 1. The load forecast includes the baseline projection of electric charging services, as forecasted in the 2020 TEP. We also request scenarios that consider higher penetration of EV, especially for commercial fleets, delivery vehicles, and public transportation. 2. A study of how to optimize charging behaviors, including customer load management, and how to optimize the location of public and workplace charging stations to avoid distribution grid overload while maximizing grid flexibility and benefits to the system. For example, the TEP identified that the $1,206 in electric system benefits per EV could "be increased by another $463 per EV when load management shifts peak loads to off-peak."	1. Avista studied increasing EV penetration in the 2020 IRP. At this time, Avista needs to focus on other scenarios for this IRP because of the limited amount of time available for modeling. 2. Avista is updating its EV and demand response program assumptions and this will be discussed at the September TAC meeting. Avista welcomes this discussion at the upcoming meeting to ensure it has robust assumptions for this IRP.
Climate Solutions	Climate solutions provided additional information regarding ductless heat pumps and water heater heat pumps. This is in regards to the electrification scenarios. See attached letter in Appendix C- "Climate Solutions- Electrification End Use Efficiency Comments.pdf".	Avista adjusted a portion of the end use load for the electrification. Further detail regarding these comments are included in Appendix C- "Climate Solutions Email Response.pdf"

Northwest Power & Conservation Council	Preliminary market price forecasts for the 2021 Power Plan diverge from the pricing regime shown in this draft IRP. While understanding the underlying cause of that divergence would take a deep dive into our respective AURORA runs, given our work thus far we would expect that it's related to allowing AURORA to construct new natural gas generation outside the Northwest to replace expected retirements in the WECC thermal generation fleet (and the associated volume of those retirements). We were given guidance from the Council and from our advisory committees to limit the potential for new natural gas generation both inside and outside the region. In doing so, we see a wave of solar and wind generation construction that depresses future market prices substantially lowering them from prices seen today. While this is largely outside of the control of the region, it presents substantial risk to regional utilities making decisions consistent with market prices that assume natural gas resources will set the marginal price. We'd encourage all the utilities in the Northwest, including Avista, to test any IRP-based decisions against an aggressively low market price forecast. Many things are uncertain about the future of the power system in the WECC. We would not want to represent any forecast, including our own, as certain. But we do think it's a risk to consider and one that will be developing rapidly over the next few years. While we're still working on the 2021 Power Plan, we'd be happy to share an AURORA archive file of the work done to date.	Avista is concerned wholesale prices going forward will be extremely volatile, more than Aurora can quantify, much of this volatility will depend on how much and whether capacity resources will be developed or not. It is appropriate to understand the risk of higher and lower prices. From analysis in the short term, Avista's price forecasts are too low- specifically not including risk premiums we are seeing from resource adequacy issues we are seeing. Although, in the long run there is significant downward risk with more renewables- The future will depend on how far policy makers will take goals and ambitions to actual operations and construction. There will also likely be a feedback loop as well- such as changes in loads (both industrial losses and electrification opportunities and political changes due to ramifications of policy changes) and storage opportunities. Its possible storage could be key in keeping prices from getting too low- but that will depend on future costs of that technology. In the end there is a number of paths the future may take us and its really an issue of how much time should we make to look at the region versus our portfolio. The way things are trending there should be more focus toward our portfolio then market prices. In this case the real risk of having too low of forecast for prices could have an effect of less acquisition of EE, but in the end with our requirements of having clean energy and capacity- the price forecast really only impacts a solar vs wind decision- but so far wind is winning that decision due to capacity requirements and over reliance of solar elsewhere; then they question of should we build natural gas or storage- that decision is likely a matter of carbon pricing at this point. So where I'm going is and have been pondering for some time do price forecasts really matter for resource planning- given we have fewer resources to choose from and specific requirements to meet. For example, the energy price used to be a major component of our EE avoided cost- now the highest component is social cost of carbon and non-energy benefits- its seems the world has shifted from energy price forecasts.
Northwest Power &	Comments are included in the comment box of the draft IRP pdf. These comments are attached in "Avista 2021 Draft	Avista made numerous additions and corrections to comments provided by the Council.

Conservation Council	Electric IRP_councilstaff.pdf" Most comments were regarding providing additional context for statements	
Rye	Seek further information regarding modeling and assumptions for pumped storage o "State of Charge" assumed (table 9.12)? ▪ Table 9.12 indicates an 8-hour pumped storage project would only contribute 30% to Avista's peak capacity need and a 12-hur project would contribute 58%. These are much lower than Swan Lake and Goldendale would expect and drastically lower than those used by other NW utilities ▪ Swan Lake and Goldendale believe Avista is using a very low state of charge possibly 20% pond fill). This doesn't align with the operational realities associated with operating hydro or pumped storage facilities. ▪ Import assumptions during off-peak hours in the winter should be re-visted, given that these would be key hours when long-duration storage would charge for the winter on-peak reliability ▪ Swan Lake and Goldendale recommend that Avista consider optimizing the dispatch of their resource over a wide time window (1-2 weeks) allowing for greater flexibility and minimizing the need for daily charging/recharging o What duration of useful life? o Was the Swan Lake project specifically considered?	Avista met with Rye through a conference call on February 24th, 2021 to discuss their comments • Avista modelled several northwest pumped hydro projects in the 2021 IRP; including Swan Lake and Goldendale, based on publicly available data. Avista believes some of these comments could be derived from the 2020 IRP. • Avista acknowledges Rye's comment regarding re-charging capacity during off-peak hours. Avista disagrees with Rye that it can fully recharge a storage devise during off-peak hours of a northwest system peak event beyond the limits already included. • Pumped hydro is optimized on a 1 year basis and not 1 to 2 weeks. • Avista uses a 50-year life to amortize capital costs.
Rye	Avista should not seeks to construct new gas facilities • Given the state of Washington policy, Swan Lake and Goldendale request that Avista provide a detailed explanation for why a new gas resource would meet one of the few and limited CETA provisions allowing construction of such resources, particularly including violation of reliability standards and, if violations are possible, whether pumped storage could help alleviate or solve those potential violations.	Avista specifically modelled the availability of both Swan Lake and Goldendale in its PRiSM model. Given information available, these projects were not cost effective compared to natural gas. Avista's IRP is an indication of cost-effective resources, but a future request for proposals (RFP) will determine the most cost-effective resource acquisition.

Rye	Advocate that Avista issue a capacity RFP (strongly support) • Swan Lake is expected to achieve commercial operation in late-2026 • Only accurate way for Avista to fully evaluate potential pumped storage projects including various pricing information, timing for construction and whether the operating characteristics align with Avista's needs	Avista may release an RFP in late 2021 or early 2022 for its 2026 need.
Renewable Northwest	We recommend the Company review the data informing the levelized cost ($/kW) for the preferred 4-hour lithium-ion battery, as there appears to be a gradual price increase after 2033 rather than a steady decline, which would be expected.	Avista aligned its storage prices with bids received during its renewable RFP. Further, Avista also used publicly available studies for its future cost curves. One difference between our forecasted cost could be they are in nominal dollars rather than "real" dollars. Avista's storage costs are expected to decline significantly in "real" terms. Avista also recommends any suggestions regarding costs of resources come earlier in the process. Avista included these costs in its TAC meetings and posted all its cost information on its website six months prior to the draft IRP was made available.
Renewable Northwest	We recommend the use of the PLEXOS model to simulate generation on a sub-hourly timescale to calculate the balancing reserve requirements and the associated system costs and benefits to meet those intra-hourly dispatch requirements, as legally enforced through NERC's BAL series standards.	Avista is planning public process to evaluate both integration and ancillary services costs using its ADSS system. This process will begin in 2021 Q2. Also Avista is considering Plexos for potential reliability studies and other work, but has not acquired the model at this time.
Renewable Northwest	We recommend Avista study for its final IRP the different operational configurations and characteristics of hybrid resources and standalone storage to correctly evaluate the resource ELCC value.	Avista plans continue studying these resources in this IRP and the next. Avista disagrees with using alterative ELCC values for storage resources based on its analysis of its system. Specifically, Avista is concerned with relying on short duration storage in winter months because of its high winter energy needs, lack of reliable market power in critical events for recharging the system, and high largest single contingency units.
Renewable Northwest	For the Commission and stakeholders to better understand why Avista's capacity needs can only be met with new natural gas peaking capacity, we recommend that Avista provide at its upcoming TAC meeting or publish in its final IRP a projected loss-of-load event, displaying by hour where there is a deficiency in available capacity. This could be in the form of a 12x24 matrix of the peak demand or	Avista's current resource adequacy model does not report the information required to develop the 12x24 matrix. Avista agrees this could be a useful exercise and will consider developing this report in the next IRP as it continues to review ELCC studies.

	hours with the highest loss of load probability which were used to calculate the ELCC values for all resources.	
Renewable Northwest	We recommend the Company conduct one additional analysis to better understand how policy-driven changes in Avista's resource mix should impact the way the Company plans for meeting demand reliably and at least cost.	Avista agreed to conduct another portfolio scenario named 5B to remove Colstrip in 2022 (just as with the PRS) and follow the other logical requirements of the Portfolio 5. This portfolio is the 100% clean energy portfolio by 2045.
NW Energy Coalition	The preferred portfolio continues to develop energy efficiency and begins to lay out a strategy for acquiring demand response resources, although we believe the targets can be increased and the pace can be accelerated. The treatment of new renewable resources is somewhat more mixed, as described below. Finally, significant improvement is needed for both the cost and capacity value battery and pumped storage.	Demand response and new rate designs are a significant part of Avista future. Avista agrees some programs will take time to ramp up to large savings and some rate restructuring programs will take time to develop and get approval through multi-jurisdictions. Regarding battery & pumped hydro, Avista continues to use the best information publicly available for these resources. Avista even specifically modeled many of the Northwest proposed projects. Avista also recommends any suggestions regarding costs of resources come earlier in the process. Avista included these costs in its TAC meetings and posted all its cost information on its website six months prior to the draft IRP was made available.
NW Energy Coalition	We believe further analysis will show that there are substantial available and cost-effective clean energy resources that can defer or eliminate this new emitting resource.	Avista hopes to find these resources in a future RFP as costs for these emerging technologies decline.
NW Energy Coalition	The IRP analysis states "construction and operational greenhouse gas emissions are considered and priced using the SCC", but that the SCGHG was not applied to market purchases and sales in the PRS as done previously. The reason for the change from previous practice is not clear.	Avista is providing additional detail regarding this topic in the IRP document. In summary, after consultation with WUTC policy staff, Avista chose not to include the SCGHG/SCC as part of the market transactions specially because the CETA does not require these costs for short term transactions. Avista did conduct a study to see the implication of the change. Avista will discuss this option again in the 2023 IRP process.
NW Energy Coalition	Because of the current and proposed new addition of natural gas generation, we urge Avista to revisit this issue and adjust the upstream methane emissions factor represented in the Social Cost of Greenhouse Gas analysis.	Avista included an adder for methane emissions equal to approximately 10% of the natural emissions directly burned. By including these emissions as part of the social cost of carbon exceeds regulatory requirements in Washington. While upstream methane emissions will always have uncertainty due to life expectancy and the variety of sources, Avista will continue to make the best estimates for these emissions given its fuel sources.
NW Energy Coalition	The question we pose is whether a staged approach to capacity need could provide a balanced 2027 resource	Avista appreciates this comment and finds IRPs are a bit of a challenge compared to actual acquisition of resources since IRPs

	portfolio that is better aligned with CETA policy guidance while meeting reliability needs cost-effectively. The first stage involves maximizing the availability of so-called "energy limited" clean flexible resources, including demand response and storage. These are generally considered to provide capacity value of 4 hours duration and should suffice for meeting needs during typical peak periods. In the second stage, meeting rare long-duration peaks requires supplemental resources. The draft IRP suggests that new peakers can meet these supplemental needs. But once these very expensive and high-emitting new peakers are put into the resource mix, the IRP models will dispatch them not only for very infrequent long duration high peaks, but much more often across the year because they are now "existing" resources. As a result, these new peakers will displace less expensive, non-emitting resources. This creates a lost opportunity for CETA compliant clean energy resources.	do not account for existing resources available in the marketplace. Specifically the options to acquire resources for a5 to 10 year period will allow for a staged acquisition of cleaner resources that may potentially become available in the 2030s. While the IRP does a great job at evaluating new resources this shortcoming means IRPs will always identify a resource mix that may differ from the actual resource acquisitions obtained through an RPF or another competitive bidding process. Avista anticipates significantly more cost effective cleaner resource options will be available as it acquires new resources.
NW Energy Coalition	The CPA summarizes the technically achievable potential for DR at 90 MW in 2025 (about 5.1% of peak load) and 170 MW in 2045 (almost 10% of peak). NWEC agrees that this is a reasonable magnitude for total potential, but we believe it can be achieved considerably faster.	Avista uses ramp rates provided by Applied Energy Group to add demand response. Avista modeled these programs to be available to begin in any year and optimized our system over the full 24 years. Beginning programs earlier will add cost to customers prior to resource need.
NW Energy Coalition	However, the future costs for batteries and pumped storage simply don't seem reasonable. The values in Figure 9.1 show slight declines in battery costs, and then flat or rising costs through the remainder of the planning horizon. Most other estimates show consistently declining costs through the coming decades, though at varying rates.	Regarding battery and pumped hydro, Avista continues to use the best information publicly available for these resources. Avista even specifically modeled many of the Northwest proposed projects. Avista also recommends any suggestions regarding costs of resources be submitted to the Company earlier in the process as they're more likely to be able to be included. Avista included these costs in its TAC meetings and posted all of its cost information on its website six months prior to the draft IRP being made available.
NW Energy Coalition	There are at least two pumped hydro projects with a reasonable chance of commercial operation by 2027, and further specific project assessment would be useful.	Avista specifically modelled these projects and they were not found to be cost effective compared with a new natural gas peaker.
NW Energy Coalition	As Avista proceeds towards the 2021 capacity RFP, we encourage revisiting this key issue. Hybrid resources could provide a significant capacity benefit and defer the need for new gas peakers, as well as make more effective use of limited available transmission capacity for renewables and provide more operating flexibility.	Avista expects hybrid resources to be bid in future RFPs and will conduct further ELCC analysis to ensure proper peak credits of these resources so Avista customers have a reliable system.

WUTC Staff	**Clean Energy Action Plan** • Add a table to the CEAP that includes year-over-year capacity of all planned resources, including demand response. • Include planned Appendix G with details of about planned transmission and distribution improvements.	Avista added new tables to Chapter 15 and is including Avista's 10 year transmission plan and its 2019/2020 System Assessment
WUTC Staff	**Climate change** • Provide discussion regarding the implications of possibly moving from a winter peaking utility to a dual or summer peaking utility.	Avista provided additional detail regarding is climate change analysis in Chapter 3 and Appendix K. Further, Avista modeled a portfolio scenario in Chapter 12, outlining the changes in resource strategy with higher summer load and lower winter load.
WUTC Staff	**Load Forecasting** • Clarify the date in which its economic inputs were finalized. • Discuss any adjustments to the forecast made in response to the ongoing pandemic. • Clarify the high and low load growth ranges used on page 3-14. For example, how did the company settle on the high and low assumptions for annual service area employment and population growth outlined in table 3.3? Please explain. • Discuss the assumptions behind the EV and solar PV forecasts that are inputs into the load forecast. • Clarify which of the two climate change forecasts the IRP uses.	Avista included updates to Chapter 3 to address these comments.
WUTC Staff	**Upstream Emissions & SCGHG** • Include in the narrative description required by WAC 480-100-620(11) a clear articulation of how the company calculated the SCGHG. • Discuss assumptions about the SCGHG in market purchases and charging storage resources with market purchases. • Explain why 1.0 percent is an appropriate upstream emissions factor for U.S. Rockies natural gas.	Avista included additional language regarding social cost greenhouse gas analysis in chapters 9 & 11. Regarding the upstream emissions, this is in relation to the Natural Gas IRP.
WUTC Staff	**Sub-hourly Modeling Capabilities** • Clarify storage cost assumptions.	Avista added additional explanation of storage modeling in Chapter 9.

WUTC Staff	**Customer Benefit Provisions in CETA** • Provide a scenario or, at minimum, a narrative regarding possible changes to resource decisions that could increase customer benefit. • If available and time permits, incorporate the DOH data in the CIA.	Avista added a portfolio scenario in Chapter 12 to address the maximum customer benefits. Avista is also planning to engage a consultant to help estimate non-energy impacts for further analysis regarding customer benefits. These changes may be available in the CEIP, but at minimum the 2023 IRP. Unfortunately, the DOH data was not available for the 2021 IRP.
WUTC Staff	**Resource Adequacy and Uncertainty** • Clarify the company's peak credit methodology, including the definition of "peak" terms. • Explain how the company incorporates uncertainty in the RA assessment.	Avista added additional detail regarding peak credit analysis in Chapter 9. Regarding the uncertainty of the RA assessment, Avista added information in Chapter 7 using the risk topic discussed in the "Implications of regional resource adequacy program on utility integration resource planning".
WUTC Staff	**Public Participation** • Provide an IRP update based on any recent planned resource acquisition.	Resource selection from the 2020 Renewable RFP was not complete in time for the 2021 IRP. Avista plans to update the WUTC with a new Clean Energy Action Plan if any contracts are signed.
WUTC Staff	**Data Disclosure** • Ensure appendices include a record of stakeholder feedback and the company's response. • Provide context for the data files provided on the company's website and submit in the docket.	In addition to this summary, Avista is also including copies of comments from TAC members as well as Q&A and comments from the Company's Public IRP meeting.
WUTC Staff	**Natural Gas Design Day (Planning Standard)** • Explain the new design day methodology. • Explain why the new design day standard is now the most appropriate one.	See Natural Gas IRP
WUTC Staff	**Renewable Natural Gas** • Include details of RNG cost assumptions in the appendices.	See Natural Gas IRP
Tyre Energy	We noticed that there was not a Lancaster PPA extension scenario included in the 2021 draft IRP. Why the change from last year?	Avista included the Lancaster PPA extension analysis in the 2020 IRP based on a request by the Idaho Commission staff. For the 2021 IRP, no such request was made until now, so it was not included as a scenario. Given we do not have a firm price for a PPA extension, or any other existing resource, we don't think it would be appropriate to include it in the public IRP. One of my concerns with IRPs, is it is predominantly based on acquiring new resources and often does not or cannot do a good job of illustrating resource choices when existing resources are available. The IRP shows the resource options for new resource choices and does a relatively poor job at studying existing resources since we usually don't have pricing for these options. In

		the end, the IRP is a way to calculate the avoided cost of new generation or demand-side resources. The plan showing a need for new natural gas CTs does not preclude us from acquiring a different resource that is a better solution for customers through an RFP or another acquisition strategy. We have recognized our IRP analysis needs to improve how we review existing resource options and that has been identified as an Action Item for the next IRP to determine the best way to include the potential to extend existing contracts in the IRP.
Tyre Energy	Would you consider revising this draft to include a 10 year Lancaster PPA extension scenario? It seems unlikely to us that choosing not to extend the Lancaster PPA and turning around to immediately add 210+ MW of new peaking capacity in 2027 would be economically advantageous enough (compared to a Lancaster PPA extension scenario) to exclude the extension scenario from the IRP.	Avista believes the IRP illustrates the need for firm capacity, it shows natural gas is a viable option. The decision for an existing plant vs a new facility or any other option is best decided in an RFP rather than an IRP. In the future, if Lancaster should be considered in the IRP, Tyre should provide the IRP team with firm pricing for the resource option.
Tyre Energy	Will you share with us the unit parameters for Lancaster that would be used for a Lancaster PPA extension scenario? We'd like to understand what level of operational flexibility would be assumed in a Lancaster PPA extension scenario.	Avista would like to understand your options to improve flexibility of the machine. As you know we are transitioning to more intermittent resources will require us to have more ramping and start/stop requirements.
Dave Van Hersett	Biomass generation option should be included as one of the alternatives evaluated to determine relative economics of the three approved new generation types, wind, solar and biomass here in the Inland Empire. We have the moral obligation to utilize the forests for the benefit of mankind not to fuel forest fires to destroy property and kill our neighbors.	Avista included both an upgrade to Kettle Falls and a new biomass resource option in the IRP. The KF upgrade was selected in the PRS, a new facility was not cost effective in the PRS but will be continued to be modelled as an option.

Avista's Integrate Resource Plan Public Meeting

February 24, 2021

These are results of the poll questions given to the audiences in both the webinar and breakout rooms sessions.

Webinar Poll Questions

1. **What would you prioritize among the choices below, acknowledging they are all important?**
   - Environmental Issues: 32
   - A Reliable System: 75
   - Affordability: 33

2. **Which Avista system provides more energy to its customers?**
   - Natural gas: 66 (this answer is most correct)
   - Electric: 69

3. **If Avista were to offer a voluntary program to charge higher prices during 4:00 pm to 8:00 pm in exchange for lower prices in other hours would you be interested?**
   - Yes: 77
   - No: 59

Generation and Reliability Breakout Room

1. **When Avista acquires new generation resources- where should they be located?**
   - Indifferent to where resources are located: 6
   - All of the above: 26
   - Within our local communities: 9
   - Within our service territory, but not in our local communities: 6
   - Outside the service territory (i.e. another state or Canada): 1

2. **To meet reliability needs in the next 5 years, how should Avista meet this requirement**
   - Acquire natural gas generation with a modest environmental footprint- medium cost alternative: 33
   - Acquire storage resource with low operational environmental footprint- highest cost alternative: 11
   - Utilize customer outages to stabilize the grid- lowest cost alternative: 2

Affordability & Equity Breakout Room

1. **How much of your electric bill should go towards assisting or improving the lives of individuals and communities who are economically disadvantaged?**
   - $0 per month: 6
   - $5 per month: 9
   - $10 per month: 6
   - Other: 4

2. **What does an equitable transition to clean energy mean to you?**
    - Lowering their energy rates: 9
    - Making their homes more energy efficient: 12
    - Build clean generation resources within their community: 3
    - Beautification of Avista assets: 1
    - Other: 1

Natural Gas System Planning Breakout Room

1. **If you could no longer use natural gas, which fuel would you likely use in its place?**
    - Electricity: 12
    - Hydrogen: 2
    - Propane: 8
    - Renewable Natural Gas: 6
    - Wood: 6
    - Other: 3

Environmental Breakout Room

1. How should Avista best balance customer costs and environmental stewardship?
    - Do the minimum to meet environmental requirements and keep energy rates as low as possible: 1
    - Be a partner and leader in environmental stewardship for a mod rate increase: 5
    - Marginally exceed requirements for a small rate increase: 1
    - Make environmental improvements and reduce impacts no matter the cost: 1

2. What is the most important environmental issue for you related to Avista?
    - Reducing greenhouse gas emissions: 1
    - Minimizing air pollutants such as particulate matter, volatile organics and nitrous/sulfur dioxides: 3
    - Being stewards of the water and natural resources of the Clark Fork and Spokane Rivers: 4

Energy Efficiency Breakout Room

1. In exchange for slightly lower energy costs, are you are interested in the utility controlling your thermostat?
    - Never: 9
    - No more than 20 hours per year: 1
    - Yes, if I can override the request if I'm too cold or hot: 18

2. What is most important to you when you invest in energy efficiency for your home?
    - Increase comfort: 4
    - Reduce emissions: 4
    - Savings on your bill: 20

Questions from emails, breakout sessions, and chat box

Net Metering Questions	**Avista Response**
For those of us who have solar panels on our roofs and are producing more electricity than we use, what plans do you have to compensate us for our excess electricity?	Customers who participate in net metering currently receive kilowatt hour (kWh) compensation for their generation. Generation produced by customers in excess of consumption is held in a 'bank', allowing kWh credit to be used in future months as needed. The intent of net metering is to offset your own usage, based on this intent any remaining kilowatt hour bank is reset annually in March, according to Schedule 095 in both Washington and Idaho. There are no current plans under the net metering program to provide compensation beyond the banking provision. Please reference Schedule 095 in both Washington and Idaho for further details. https://myavista.com/about-us/our-rates-and-tariffs
Electric Vehicle Questions	**Avista Response**
Is there provision for increasing use of plug-in vehicles (hybrid and pure electric)?	Yes. Avista has a transportation electrification (TE) plan publicly available at: www.myavista.com/transportation This plan includes Low, Baseline and High adoptions scenarios for light-duty vehicles considered in Appendix B. starting on p. 81. Given the current state of policy support, industry investments, utility support, and local geographic and demographic considerations; we expect the trajectory of adoption to track between the medium and high scenarios in Washington, and between the baseline and low scenarios in Idaho.
What would it take to add incentives for charging at preferred times of the day, when other demand is less?	As demonstrated in the EVSE pilot and discussed in the TE Plan, Avista has shown that utility programs leveraging EVSE installations can accomplish this with participating customers. A new rate incenting off-peak charging may also be very effective, as demonstrated in other utility pilots and studies. Avista will continue to develop capabilities, with a goal to shift 50% or more of EV peak loads to off-peak in a cost-effective manner, by 2025.
How can you encourage the installation of more places to charge such vehicles, like in high use areas (central parking lots, shopping malls, park-and-ride lots)?	Avista will install, own and maintain a backbone of this charging infrastructure, up to 50% of the assessed market need. A variety of other programs and incentives including "make ready" investments, and a new commercial EV rate, will help encourage additional private investment. See the TE Plan, pp. 45-54.
To reduce company greenhouse gas emissions, is there a plan to convert Avista's vehicle fleet to electric?	Yes, Avista plans to electrify its fleet as it may be done reliably and cost effectively. See TE Plan pp. 72-73.
Has the waste from batteries from electric cars been added to the percent of emissions as a long term cost?	Avoided emissions resulting from light-duty EV adoption is shown in the TE plan on pages 41-42, based on Avista's generation mix. Likely emissions in the future based on effects from battery waste and other factors are very uncertain but may be incorporated in later studies and estimates as more

	knowledge and certainty is gained. See TE Plan pp. 22-24 for discussion related to battery research and development, including second-use and recycling. The future state of battery technology and production will most likely differ greatly from the current state.
What does your company anticipate the impact to be from the forthcoming increase in electric vehicles and how will you prepare for that?	Avista expects a 39 aMW increase in residential load from electric vehicles by 2045. The Company prepares for changed in forecasted load through this biennial resource planning process and issue RFPs for various resources as needs arise.
Policy Questions	**Avista Response**
Why doesn't AVISTA push back against Washington State's population-reducing polices? What plans do you have if the population is killed by lack of heat?	Avista isn't aware of any legislation that is specifically and explicitly intended to reduce population. Our engagement in public policy is first and foremost focused on the cost-effective operation of our energy system and the economic vitality of the communities we serve. Avista has an obligation to serve its customers electric and natural gas demands. When developing its resource plan, it determines the expected customer demand and the amount of resources and types of resources that can actually meet this target using standard utility practices. Avista plans for resources to meet a 1-in-20 standard. This means it has enough resources to meet all customer load in 19 of 20 possible extreme weather events.
A bill was recently introduced in WA to eliminate natural gas in new residential and commercial buildings by 2030 and to replace gas by heat pumps. At colder temps, heat pumps stop producing heat efficiently and can cause a spike in demand. Your presentation includes natural gas. Please comment.	Avista shares your concern about eliminating natural gas as a customer choice for residential heating. Avista agrees that electric heat pumps lose their efficiency at lower temperatures and an "electrification" policy that requires customers to convert their natural gas heating systems to electric heat pumps will increase electric peak loads, among other impacts.
With commercial and industrial businesses, the main targets of efficiency efforts, will the harsh legislative regs. drive commercial and industrial businesses our of our region? Result, loss of jobs as well as revenue losses?	Avista appreciates that certain policies will impact the financial viability of businesses and shares the concern that such policies will have dislocation impacts on business and workers. Avista's energy efficiency analysis shows commercial and industrial businesses have opportunities to save energy economically while maintaining current requirements by installing more efficient technology. Avista's energy efficiency programs will assist these customers with cost effective financial incentives. Lastly, the expected energy cost savings from these programs will help customers be more competitive.
Environmental	**Avista Response**
How do we protect our environment from natural gas companies that use fracking and other means to obtain natural gas?	Avista purchases natural gas from the wholesale market and it is delivered through the pipeline system. Natural gas from all sources is mixed together, and gas from wells that used fracking technology makes up the majority of natural gas currently. The environmental issues associated with drilling for and producing natural gas are subject to local, state and

	federal laws and regulation, which have increasingly been focused on the fracking process. Avista carefully manages natural gas once we receive it from pipelines. We were a founding member of the EPA's methane challenge in demonstrating our leak detection and maintenance efforts. In addition, natural gas producers are increasing efforts to reduce emissions of natural gas production and make this energy source more sustainable. See https://www.aga.org/natural-gas/clean-energy/ for more information.
Would Avista look at modern nuclear technology to create a carbon free source of power, electricity? What about Gen IV Nuclear? Is there any movement toward building these very clean energy plants near this region?	Avista considers modern nuclear energy in the context of our IRP analysis to determine if any specific offerings fit our resource needs. Currently Avista finds this technology not to be cost effective. Like others, we are watching to see how new emerging nuclear technology performs and how the cost changes as the technology develops.
I would like to know how Avista's plans align/don't align with Inslee? In particular, the use of natural gas, which I understand Inslee wants to limit or get rid of entirely.	Governor Inslee's energy policy priorities generally become part of the Washington State legislative landscape. We continue to engage in legislative settings to promote clean energy solutions that are affordable and which support reliability for our customers. Regarding natural gas, a specific bill was introduced during the 2021 legislative session. While this bill has not advanced, we will continue to work with our legislators and regulators on ways to address emissions associated with natural gas.
What kind of environmental impact (as well as machinery and maintenance cost) is there on the act of compressing natural gas?	CNG is natural gas compressed by an electric or gas-powered compressor to less than 1% of the original volume. While energy is needed for such compression and there are emissions associated with the compression process, the net effect of using CNG as a transportation fuel is reduced emissions. All fuel delivery systems, including CNG, include ongoing maintenance costs for machinery.
What is the problem with the Colstrip plant that it is my understanding, backs up the intermittent power from wind farms like the one in Pullman? Is it really that "dirty"? If the tribes don't want to run it, can't Avista lease it? Can you build a new state of the art coal plant? Coal presently provides over 60% of all electricity in the U.S. Our plans are super scrubbing in the U.S.!!	In the context of this IRP, we are focusing on the fact that Washington State law prohibits the delivery of coal-fired energy to customers after 2025. Colstrip is also subject to other state and federal environmental regulations, which continue to evolve. As one of six owners of the plant, Avista cannot independently determine Colstrip's future. We will continue to evaluate the role that Colstrip plays in meeting our customers' energy needs, and also how Colstrip's future impacts communities, including Tribes, in Montana. We rely on thermal generation from Colstrip, natural gas-fired plants, and our biomass plant in Kettle Falls, along with our significant hydro resources, to back up intermittent renewables. Consideration of this need is one of the key elements in our IRP.
Does Avista's goal for carbon neutrality consider methane emissions?	Avista's stated clean energy goal focuses on electricity. We are working to reduce emissions associated with natural gas and developing additional strategies with that in mind. Our natural gas IRP discusses the current state of these efforts, which we expect to build on and communicate further. Also included in both the natural gas and electric IRPs are

	estimates for the methane emissions as part of the upstream emissions from fuel suppliers and transporters.
Could you still sell coal energy in Idaho?	Yes. Currently there are no prohibitions currently in Idaho for serving our customers with coal-fired electricity.
Are there perceived or anticipated issues with relicensing the existing dams in the network?	Avista relicensed our Clark Fork hydro project (two dams) in 1999, receiving a license from FERC for 45 years. We relicensed the Spokane River hydro project in 2009, receiving a 50-year license. While we don't have "relicensing" issues, we are implementing agreements with numerous local, state, federal and tribal partners on both river systems. These collaborative efforts imbed flexibility in what specific projects we undertake, for the benefit of our customers and the natural resources associated with these rivers. Please see https://www.myavista.com/about-us/celebrate-our-rivers for more information.
Is VOC worse than CO2?	It depends on the volatile organic compound or VOC. Methane, the primary component of natural gas, for the first 5-10 years is 100 times the greenhouse gas potential of CO2. Refrigerant gasses are much more potent greenhouse gases.
So the decrease by 2030 in Greenhouse Gas Emissions is mostly from changes away from coal?	Yes, Avista's forecasted reduction in greenhouse gas will be primarily from exiting the Colstrip Coal plant. The second largest reduction could be utilizing other resources rather the buying power from the Lancaster Generation Station that uses natural gas.
How many other partial owners of the coal power producer are there?	We are 15% owner units 3 & 4. There is a total of 6 owners.
Rathdrum Prairie area, any coordination for solar or geothermal heat pumps. Plans to send out pamphlets, for swamp coolers, on demand water heaters, or ways to transition to higher demand.	We have a number of programs to help customers to reduce energy use. We work with developers regarding solar for residential and industrial plans in various ways. The IRP includes some of those plans. In the IRP, we look to fill resource needs by reviewing available options for new energy efficiency and demand response programs. Our energy efficiency team looks at developing programs based on the results of those plans. We are also adding another advisory group in Washington to reach out to communities for input about ways we can be most helpful to them within the next year. Some incentive programs are prescriptive, like lighting, while others are customer specific and require working with engineers to implement (usually for commercial and industrial customers). We have information on our website for programs for energy efficiency as well as placing solar on homes. There's a solar evaluation estimator tool that will provide solar potential for specific addresses in our service territory.
What effect with demolishing 4 dams on the low Snake River have on electric resources?	Avista does not purchase power from the Snake River Dams. The impact of the current proposal on Avista seems at this time to be indirect. However, its effect on communities served by the company could be significant. It could also have regional ramifications of clear interest to Avista. Gauging the precise extent and nature of the proposal's potential implications is difficult without more specific information about replacement generation and other measures (conservation, demand response, transmission upgrades) that the proposal does not yet define.

As a Washington-based company, will they be required to discontinue ownership of Colstrip based on the new laws that are under discussion (should those new laws be passed)?	Avista is required to stop delivering coal power to Washington customers in 2025 per the Clean Energy Transformation Act in 2019. The law does not require us to discontinue ownership of the plant and Avista must make future decisions about the plant in conjunction with the other owners.
I'd like to hear about the storage technology for variable renewables.	Avista includes many energy storage technologies in its resource planning as options to meet customer demand. These options include lithium-ion, pumped hydro, liquid air, hydrogen, and flow batteries. These technologies may be pursued in the future if they are an economic method of meeting our customer demand.
Does Avista have plans to address the impacts to fisheries due to the construction and operation of the hydroelectric facilities? The dams on the Spokane River are initially responsible for the complete extirpation of salmon in that basin. Avista should have some responsibility for recovering those runs and the communities that were impacted by their loss.	All of our hydro facilities, including the two dams on the Clark Fork and 6 on the Spokane River. Went through an extensive licensing process working with local tribes, state and federal agencies, and hundreds of stakeholders ranging from 5 to 7 years to work out the issues involved with the dams. Every week we work with the numerous tribes regarding the fisheries and bringing the steelhead back up to the upper regions. We do a lot of work together over those issues.
Solar produces less GHG short term. We do not know the environmental cost of solar waste from worn out panels long term.	This is outside of our required planning but think we will see this issue in upcoming plans regarding total life-cycle costs and the wastes associated with worn out solar panels.
Are there any plans to partner with Conmat for renewable natural gas plans?	There are opportunities regarding this, but none with Conmat specifically at this time.
One path to substantial GHG emissions is the deployment of EVs on a large scale, not only Avista's service fleet but also to private citizens but most of the Northwest doesn't have the EV charging infrastructure to support this market change. Is Avista working to address this because that is a massive increase electric demand?	Avista is committed to the development of EVs in our service area and its own fleet. The IRP includes this additional expected demand as part of our plans, but actual EV adoptions will depend on customer demand. Avista is committed to breaking down barriers to increase its adoption. Please see the EV section of these questions and answers for more details about Avista's EV plans.
Also, upgrades to street lights to reduce energy consumption?	Company-owned streetlights have been switched to LEDs. These 5-year implementation programs started in Washington in 2015 and Idaho in 2016.
As an Idaho customer, I am hoping that the stricter laws in Oregon and Washington do not equate to my power needs being met by a higher percentage of coal-based power. As new laws are passed, and since Avista has a plan to phase out from Colstrip, is it possible to assume that this coal-based power supplier will be closed?	Avista has no plans to increase coal generation as a percentage of Idaho's energy portfolio at this time. Avista does need to acquire new resources to replace capacity beginning in 2026; it is possible, but highly unlikely coal will be chosen to meet this need for Idaho customers. This issue will be brought up with the Idaho Public Utility Commission and they will review and approve any plans for phasing out coal power being used to serve Idaho customers with input from customers.
I'd like to hear a report on the "state of the salmon" and an acknowledgement of the successes in increasing salmon runs after hugely costly efforts.	Avista isn't directly involved with salmon recovery efforts. For a state of the salmon, refer to this federal site https://www.nwcouncil.org/reports/columbia-river-history/planningfishandwildlife.
Could Colstrip be leased by Avista and run by the utility if the tribes don't want to do it?	Avista is a 15% owner in Colstrip Units 3 & 4, the remaining owners are other utilities and energy companies. Due to

Could a new state of the art back up plant for wind farms and solar, be built at a reasonable cost?	Washington law, coal cannot be used to serve customers after 2025 and new coal is more expensive than other technologies available to serve Idaho customers.
Equity & Affordability	**Avista Response**
How does equity play into these decisions? Equity of what?	The Clean Energy Transformation Act (CETA) directs utilities to ensure "*that all customers are benefitting from the transition to clean energy: Through the equitable distribution of energy and noneenergy benefits."* RCW 19.405.040(8) "Equitable distribution" means a fair and just, but not necessarily equal, allocation intended to mitigate disparities in benefits and burdens, and based on current conditions, including existing legacy and cumulative impacts, which are informed by the assessment described in RCW 19.280.030(1)(k) from the most recent integrated resource plan. In accordance with the rules, Avista staff is currently forming an Equity Advisory Group that will advise the utility on equity issues including, but not limited to, vulnerable population designation, equity indicator development, data support and development and recommended approached for the utility's compliance with WAC 480-100-610 (4)(c)(i). This advisory group will help determine the answer to the equity question concerning how Avista serves customer's energy needs.
Do you plan to raise your prices instead of using your profits to pay for these upgrades?	Avista must invest in new resources to comply with state law and to maintain a safe and reliable system. When the company invests capital in these assets, the State Commissions determine if these expenses are prudent. If they find them prudent, Avista will get recovery of these expenses, if the expense is a capital investment, the company may earn a return on these investments. The Commissions also set the profit levels that Avista can earn up to.
If WA makes you get rid of coal and gas, how will the rate payers be charged for the increased cost on new "green" energy infrastructure? Will Idaho have to pay for the "green" energy that WA and OR want? Or can you make them pay more for the increase in green that they crave and cost so much more?	The cost to comply with both Washington and Idaho laws will be reviewed by each state's regulatory commission. It is expected the costs for state compliance will be borne by the customers within the state where additional costs are required. Both commissions specifically review rate requests to ensure that customers from their respective state are paying only their fair share.
How does equity play into these decisions? Equity of what?	Avista is forming an Equity Advisory group to ensure our most vulnerable customers are protected and benefit from the ongoing development of our electric system. This advisory group will also help shape how equity will be incorporated into future IRPs.
Transmission/Distribution	**Avista Response**
Does Avista have new builds/upgrades in distribution/transmission planned for the near future?	Avista has a publicly available transmission plan at the following website: https://www.oasis.oati.com/avat/index.html. Major Transmission projects planned for 2021 include: • Rebuild approximately 13-miles of 115kV Transmission between our Othello and Warden Substations.

	• Build new approximately 12-miles of 115kV Transmission between our Saddle Mountain and Othello Substations. • Rebuild approximately 7-miles of 115kV Transmission between Addy (BPA) and our Gifford Substation (1st Phase of 3-year project in Colville area). • Rebuild approximately 10-miles of 230kV Transmission between Oxbow (IPC) and our Lolo Substation (1st Phase of multi-phase project). • Integrate new 115kV Irvin Switching Station in the Spokane Valley. • Complete replacement of underground 115kV cables in downtown Spokane. • Replace approximately 3-miles of 115kV Transmission south of Springdale, WA. • Many smaller projects across the service territory for both Transmission and Distribution projects are included in the Oasis weblink above.
What is Avista's plan to invest in burying power lines? Will it be part of this 20-year plan?	While this is an important discussion as a method to address tree-related distribution outages, burying distribution lines is not a component of the Resource Plan. For new construction, Avista undergrounds facilities when appropriate. Avista has no systemic plans to underground existing facilities at this time.
Resource Selection	**Avista Response**
Can Avista team up with other energy providers and universities to get large federal grants to develop and field test new energy storage systems?	Avista has partnered with several universities in Idaho to fund research in storage. Avista has also been a recipient of Washington State grant funding and field tested a vanadium flow battery in Pullman and is currently developing a project in the U-district of Spokane to integrate smart building designs and energy storage.
Does Avista have new 24/7 electric production builds/upgrades planned for the near future?	Avista's current resource plan does not anticipate any baseload or 24/7 facilities. Current plans include new peaking resources, renewable resources, energy storage, energy efficiency and demand response in addition to our current resource mix.
How is Avista expanding to meet these needs (Rathdrum prairie), and how will it affect the reliability and price of our utilities? How are you dealing with the increase of population (and its need for power, natural gas, …)?	From a power perspective, Avista must connect anyone requiring service in our service territory, so the electrical and natural gas infrastructure will be built to meet the demand as it develops.
Does demand add in the 30% plus increase in population?	Population is a key component of a utility load forecast. Avista's economist conducts a forecast of future population and energy growth within Avista's service territory as part of the load forecast. This forecast is updated each year and all electric and natural resource plans developed meet this forecast's estimate for energy needs. Higher and lower load growth
Why is solar + storage pushed in the late 2030-early 2040s timeframe?	While this technology is available today, the cost of solar plus storage compared to other alternatives, including renewable alternatives without storage, is higher priced until that time based on our current cost assumptions. In the next 10 to 15 years these technologies are expected to be more cost

	competitive. We review and update these cost components every two years in the IRP cycle.
I think outside area resources particularly should be assessed. Especially Montana. Are outside area resources being assessed? (asked multiple times)	Avista includes wind in Montana in the IRP and has found it to be a viable and cost effective resource alternative to meet customer needs. When Avista issues request for proposals by energy suppliers in the future, this will determine if this resource is the best option.
Also, the Grand Coulee Dam is not even using their full capacity, it is clean energy, and cheap. Is it being utilized?	Avista does not receive power from Grand Coulee Dam. This power is controlled by the Bonneville Power Administration (BPA) and is sold to other utilities. Avista does buy power from BPA on a day-to-day basis and may buy power from BPA on a longer-term basis in the future if it is a less costly option than from other facilities.
Forest biomass- is this on our radar? Is this a storage resource?	Yes, forest biomass is an important resource to Avista. We are looking to upgrade our Kettle Falls biomass facility in 2026 and we also analyze new biomass resources in the IRP.
How can Montana wind resources be utilized? Also consider Rathdrum Prairie as a wind resource	Avista has found Montana wind to be a cost-effective option to help meet resource needs. Although, actual wind acquisition from Montana will depend on a completive bidding process. The Rathdrum Prairie's wind resource is not economically viable compared to other locations at this time.
Solar with storage- what is the storage with solar?	Storage with solar is a lithium-ion battery system coupled with a solar farm. The reason for colocation is due to tax credits and the sharing of interconnection costs.
Are there any limitation to transmission capacity specifically Canada or Montana?	There are always transmission constraints depending on location. Avista studies potential transmission interconnection points to test if the resource can connect or what will be required to facilitate the interconnection. More renewables will require more transmission or upgrades to existing to existing transmission resources.
Heard natural gas generators area being scrapped- please clarify if this is accurate given you have natural gas plans in your resource plan.	Avista is unsure which plants are being retired, although Avista does have plans to retire or end contracts with some of these resources it currently uses. Given current economics, we expect some construction of new and more efficient natural gas plants in the future.
Planning and deployment of storage why so late in comparison to building natural gas	Storage provides many options, but the ability to meet our peak planning requirements depends on several factors including costs and the duration of the storage device. We mainly need energy production and storage in winter peak months and could be more reliant on storage earlier, but it will need to be either lower cost or a modestly higher cost compared to longer duration capability resources such as new generation or pumped hydro storage.
Intermittent supply during peak demand times- Do you need back up these resources- are we doubling the energy production?	During operations we carry reserves to help handle variation from intermittent resources. These reserves are not necessarily doubling the generation required. For peak demand times we estimate a "peak credit' for the intermittent resource types which is a measurement of how well we can expect the resource to help us meet peak needs when they occur. Typically this is a relatively low percentage for renewables.
Electric Cars- The load forecast doesn't seem to reflect this increase	Avista forecasts future EV demand and EVs are planned for and expected. Each EV could add 5 to 10 kW of load to the system. This is similar amount of power to an electric water heater. Since the amount new EV's are unknown, Avista

	reevaluates its EV forecast each year and runs high and low EV scenarios to better understand how our plans could meet changes in that part of the load forecast.
All resources have problems and nothing is free. Nuclear is large piece of the US energy supply and the INL has DOE contract for modular nuclear. What is Avista's thought on nuclear.	Avista continues to evaluate nuclear and it is not being chosen in this plan due to high expected cost. Nuclear power also has additional risks from construction and waste disposal is an ongoing concern. Avista will continue to study nuclear in future IRPs and will update assumptions as more information about the modular nuclear systems is available.
Natural Gas- what is the source near Vancouver, Canada- what is the source of this Gas	Avista's natural gas for power production comes from Alberta. The Vancouver location referred to is likely the Sumas trading hub, where natural gas is traded between British Columbia and the I-5 corridor. Natural Gas may come from British Columbia wells, but it could go both ways.
What is a peaker?	A peaker is natural gas-fired generator that typically generates during peak load events. Its typically lower cost to construct but is often more expense to operate. More efficient natural gas-fired generation is available, but it is more expensive to build and would need to run a higher percentage of the time to justify the higher costs.
What about nuclear and hydrogen fusion- Is the carbon footprint of nuclear construction to great?	Nuclear is evaluated, but the cost is too high to be included at this time. Avista studied hydrogen resources in is IRP, but not hydrogen fusion. Avista also evaluates the carbon footprint of all resources when it looks to add to the system for both construction and operations.
Do we have enough geothermal resources?	Avista has not identified any local options for geothermal. Southern Oregon, southern Idaho and Nevada have good options for geothermal. So far, the costs of these projects have been higher than other alternatives in our competitive bidding processes when the transmission costs to get geothermal resources to Avista are included.
Pumped storage/hydro; Is this option more of rate scheme then a resource due to pumping and generating at different times of the day? What about losses of pumping- you're not creating energy- correct	Pumped hydro can take advantage of different pricing throughout the day or week. It could also be used for meeting peak load events and provide reserves for intermittent generation. Yes, pumped hydro does not create energy. It loses approximately 20% of its energy when operating, but it provides a large amount of capacity and energy over a much longer period of time than other storage resources.
How are outages used to meet resource adequacy?	Outages would be the lowest cost alternative to meet resource adequacy but planning for outages does not make for a reliable system. There are costs involved with making a system more reliable, and we are always trying to weigh the risk and cost trade off of making the system more reliable.
BPA had to generate its hydro at 1 GW higher then its demand- is that the case for Avista	Avista holds reserves for wind, solar, and load variations. To help with this issue, Avista is joining the energy imbalance market to pool resources with other utilities to handle this variation across a larger number of utilities and reduce the needs and costs across the wider system.
Microgrids	**Avista Response**
What is Avista's plans for microgrids?	Avista has no immediate plans to implement microgrids on a large scale but continue to test and monitor trends and changes in microgrid technology. This summer we will energize a small pilot microgrid in cooperation with a local

	university. This microgrid pilot will inform decisions about their use in the future.
Security	**Avista Response**
What are your plans for hardening the electrical system against terrorists or other people capable of damaging the key very large transformer's cooling systems with high powered rifles or explosive drones or malware?	Avista has a comprehensive security program based on nationally recognized security frameworks and standards to manage cyber and physical security related risks. These standards address protecting, detecting, responding and recovering from physical and cybersecurity threats. In addition, we work with industry and government partners to ensure we are aware of emerging security risks and how best to address them.
PLEASE comment about protection from hacking which COULD shut down energy supply (such as elec.)	Avista has a comprehensive security program based on nationally recognized security frameworks and standards to manage cyber and physical security related risks. These standards address protecting, detecting, responding and recovering from physical and cybersecurity threats. In addition, we work with industry and government partners to ensure we are aware of emerging security risks and how best to address them.
Natural Gas (or Renewable NG)	**Avista Response**
To what extent is linepack a factor in scheduling?	The amount of gas in the natural gas distribution is a factor in scheduling as linepack provides the ability to flow the gas for the necessary demand. As more linepack is needed, more supply will be brought on to the system to meet the demand and keep the linepack at necessary levels.
What is the impact of recent pipeline project changes (on linepack/scheduling)?	The system is constantly modeled and monitored to ensure the supply is available to our firm customers when they need it.
Can natural gas systems be merged with hydrogen technology for longer terms storage?	Yes, in some systems in the US and Europe, limited volumes of pure hydrogen is being blended directly with the natural gas. These systems are being studied for wider application. In other systems, hydrogen is first combined with waste CO2 to make methane before being blended. In this application, the limits are much less restrictive and much more hydrogen can be integrated with the natural gas.
What are the percentage of RNG or Hydrogen gas you want to attain in your natural gas supply and what is the timeframe?	Avista is in the process of developing our goal and will share it soon.
Will blending hydrogen into natural gas affect, reduce the btu's?	Yes, the overall heating value of the blended gas will be somewhat less than natural gas that does not have a hydrogen blend. Regardless, the customer is charged on the amount of energy consumer and not on volume.
Energy Efficiency & Demand Response Questions	**Avista Response**
What of Avista's plan for existing buildings to be more efficient so they don't lose or gain heat all the time?	Avista's resource plans identifies continuing energy efficiency programs. Many of these options include improving cost effective weatherization of homes. Please visit Avista's website for information on current energy efficiency rebates and programs. In addition to prescriptive offerings, commercial and industrial customers, can also access customized rebates

	through their account executive based on their unique energy needs and equipment.
I've been looking at solar as a potential option to reduce energy demands, but learned natural gas was the main usage we have and the ROI was negative. What offsets would be helpful on the Natural Gas side to replace our demand.	Avista offers natural gas energy efficiency rebates such as Energy Star appliances, space and water heating. In addition, there are rebates for LED lighting and smart power strips to reduce phantom loads. More information can be found on Avista's website at https://myavista.com/energy-savings/energy-savings-advice. From a resource planning perspective, in addition to energy efficiency on the natural gas side of the business, options include hydrogen and renewable natural gas. On the electric side of the business, reducing dependence on natural gas will require long term storage solutions to store renewable energy for use at a later time when those resources are not available.
How does Avista propose to deal with split incentives where the owner of a building passes heating and cooling bills to the tenants, but the tenants don't have long term incentives to benefit from capital investments in energy efficiency of the buildings and transportation systems?	This is a difficult question that Avista and other utilities continue to grapple with how to touch this hard-to-reach market. Utilities, regulators and legislators have been working on this issue, but there is no clear consensus yet on how to handle the split incentive problem.
As you say, DR has been around for many years. Why will it take until 2024 to launch these in Avista's territories?	Avista has conducted several pilot programs for Demand Response but has not pursued these programs due to their higher cost then alternative resource acquisitions. The latest analysis shows these programs may be cost effective as an option to meet Avista's capacity needs in 2026. We reevaluate the costs and benefits of Demand Response programs for each IRP and will continue to do so.
Regarding utility ability to control a homeowner's HVAC system, does that apply to given hours during a peak event? i.e., noon to 5 p.m.? Also, how would-this work? For example, if the peak event as heat related, would this be a device placed on the HVAC that would allow Avista to alternate AC to a fan-mode in 15-minute intervals?	The program design to control a home HVAC system was modeled to be used during peak heating and cooling times depending on the season for a two to four-hour time frame per participant. This can be done with either a temperature set back or by cycling the HVAC system. The customer impact is a two-degree offset during the requested/event period. Heating or cooling above/below the thermostat set point, ahead of the event period, (often called pre-heating or pre-cooling) was not included in the program design we evaluated. We modeled this program in two ways, one with temperature control and one with cycle control. Either program would be time based and would include specific parameters around when those programs would operate and how customers could opt out for a specific event.
Is there a service you would recommend to evaluate the energy usage of my home, such as efficiency of heating system ducts/furnace (gas), hot water (gas), and home insulation?	For residential customers, a home energy audit is the best way to understand ways you may be able to reduce energy consumption in your home. This is a free program, however, it is currently suspended due to the pandemic.
How is Avista compensated for EE? That is, how does Avista deal with the natural conflict between selling energy and conserving it?	All costs related to energy efficiency are funded by customers through a bill adjustment called the "EE Tariff Rider". All customers contribute to these expenses based on the amount of energy they use that in turn will lower the cost for all customers. Avista's conflict of selling energy versus

	conserving energy is mitigated as long-term profits do not relate to the amount of customer sales, but rather the investments it makes to its system that are prudent investments as determined by the state regulatory commissions.
How will Avista do more to incentivize energy efficiency for middle income and low income customers? will there be rebates for homes converting to ductless heat pump systems from natural gas? or rebates for insulating window inserts?	For low income customers, Avista fully funds energy efficiency programs such as weatherization and appliance upgrades. Community Action Agencies, such as SNAP for Spokane County, income-qualifies customers and administers the programs. For other customers, information on current energy efficiency programs can be found on Avista's website at https://myavista.com/energy-savings/energy-savings-advice.
Regarding EE upgrades, is that available only through rebates or is on-bill financing also an option? If so, would that be applicable to residential customers and business customers?	On Bill Repayment (OBR) is a new program Avista is implementing with a third-party lender. Avista will invoice and collect the monthly payment and remit to the lender for qualifying energy efficiency projects. This program will initially only be available to Avista's residential and small business customers in Washington State and is expected to be launched by the end of 2021. Avista is also looking at offering the OBR program to Oregon and Idaho customer in the future.
Can you explain what on-bill reimbursement is?	On bill reimbursement is when a customer chooses to have their Avista incentive payment for their qualifying energy efficiency measure credited towards their bill.
Sounds like we're doing what utilities do and just keeping up with regulation. Are we actually being proactive to lobby for EE improvement statewide, etc. in each jurisdiction or are you just reacting to state requirement?	Avista is part of multiple organizations to increase the amount of energy efficiency programs and offerings in the northwest. These include the Northwest Power and Conservation Council and the Northwest Energy Efficiency Alliance.
Many utility providers have developed effective "deemed and calculated" DR programs, such as more efficient charging of forklift batteries or switching to efficient lighting, so why can't Avista adopt some of those sooner than 2024?	Each utility plans for the most cost-effective programs for their unique system. Costs and customer needs are often different for each utility. Demand Response programs are different than Energy Efficiency Programs. Demand Response stops energy use for a period of time or shifts it, versus energy efficiency programs using less energy to get the same amount of work or process completed. Avista's first DR programs will be rate related programs to incent use in non-peak hours. Over time as more controllable load is added to the system, it is likely additional Demand Response options will be available.
Is Avista working with Energy Trust of Oregon to increase available options?	Avista partners with the Energy Trust of Oregon for its natural gas energy efficiency programs in Oregon.
Speaking of tariffs, what's happening with feed-in tariffs? Is Avista advocating for those?	Feed in tariffs guarantee a price paid for energy delivered to the utility. Currently the only program similar to this option is generation provided under PURPA (Public Utility Regulatory Policies Act). No other state regulation requires a feed in tariff at this time.
Haven't heard anything about neighborhood-scale geothermal, e.g. small thermal differential circulation pumps for neighborhood-scale heating and cooling.	Neighborhood scale geothermal is an option for reducing heating or cooling costs. Avista welcomes developers to pursue this option and it may qualify for energy rebates.
I haven't heard anything about neighborhood-scale renewable energy, such as solar gardens, Swedish-style	PACE programs are financing mechanisms implemented by local governments that allows property owners to finance energy efficiency and renewable energy improvements

neighborhood heating and cooling, and property-assessed clean energy financing (PACE).	through a property tax mechanism. Washington and Oregon have passed legislation allowing these programs, however, no counties in Avista's service area have an active PACE program. Avista is currently developing an On-Bill Repayment (OBR) program that will be available to owner occupied buildings for both residential and small business customers in Washington State by the end of 2021. Avista is also looking at possibilities to offer OBR for our Oregon and Idaho customers in the future.
Has Avista ever thought about putting timers on hot water heaters? I have one on mine and it's amazing how it keeps my energy down.	Avista has evaluated controlling water heaters and at this time found it to be non-economic compared to other options. Although Avista continues to evaluate this option and other options, so it may become cost effective in future plans.
What about AMI? Any EE benefits?	Yes, AMI energy efficiency benefits include customers reducing their usage from having access to near real time information and conservation voltage reduction on Avista's distribution system. The customer program for AMI energy efficiency has partially been implemented with the availability of near real time usage on-line. Usage alerts and notifications, as well as data analytics for "always on" usage is under development and will be made available soon. Conservation voltage reduction is currently in use in Avista's day-to-day operations. Additional AMI benefits, including energy efficiency, can be found on Avista's website at https://www.myavista.com/about-us/smart-meters.
Is Avista considering another community solar project as they once had in the past?	Avista is continuously evaluating the market and opportunities that will provide more renewable options to our customers. At this time, no additional community solar projects are planned.
When's the next energy fair?	The energy fairs have been suspended due to the pandemic, but Avista intends to continue the energy fairs in the future when it is safe for customers and employees.
Reliability	**Avista Response**
How will the lights stay on during a 10-day winter event when it is cold and dark with no wind or solar production?	Avista's current plans to continue to use natural gas and its hydro resources to maintain system reliability for extreme winter events until long-duration storage resources become available at an affordable cost.
What are Avista plans to move more of the power grid from reliable power sources like hydro, gas, coal and nuc, to unreliable sources like wind and solar?	Avista is adding renewable resources to its generation portfolio but will ensure reliable service by continuing to invest in capacity capable resources such as hydro and energy storage to ensure system reliability and resource adequacy.
What percentages of our power sources will be based on these unreliables in the next 10, 15, 20 years?	Avista's current resource plan estimates 78% percent of retail sales will be served by clean energy resources., A portion of this generation will be from wind and solar, as well as hydro and biomass.
What protection should be increased, to avoid the types of problems Texas just encountered? Are different plans needed to prepare for damage from wildfires?	Avista must ensure its generating resources and natural gas supply are designed to withstand cold temperatures. Because of our climate, this has already been done. The second protection is to ensure Avista plans to add or maintain enough generation to serve customers during high load hours like extreme winter weather. The purpose of the resource plan is

	to determine the mix of resources needed to serve loads in these types of events. Avista is currently working with outside agencies and regulators to develop a wildfire plan but is well positioned to repair and replace damage to infrastructure from various causes.
Do you expect the amount of renewable energy potential here to increase substantially? If so, how do you estimate the storage needed, for times when wind or solar or hydro. is supplying less than usual?	Avista expects to add significant new renewable resources including wind and solar, as other regional utilities are also planning to do. The plan calls for at least 400 MW of additional wind and nearly 500 MW of solar over the next 24 years. The amount of storage will depend on the actual acquisition of specific resources and whether Washington will require real-time delivery of clean energy to its customer. For now, Avista's resource plan only plans to add 266 MW of storage, but if costs decline additional amounts could be added. The resource plan uses several modeling tools to determine how much energy can be relied upon for wind, solar and hydro resources.
what is the provision to back up when wind and solar are not available	Avista plans to use its hydro, biomass, and natural gas resources to meet this demand from intermittent resources. In the future energy may be stored in batteries, pumped hydro or another technology to assist in meeting this demand.
Why is the assumption so strongly held that resources are limited?	Resources are not necessarily limited, but rather limited at a particular price or cost or during periods of extreme weather events.
If you don't see the same future for WA, OR, and ID as what Texas is experiencing--why not? How will AVISTA and these states avoid the same fate? How do you expect to do the same program and expect different results?	The major difference between Avista and the Texas market is Avista plans to meet extreme cold and hot events, second Avista plans for resource adequacy. Texas does not have a regulatory requirement to ensure capacity during cold or hot weather events. Another major issue in Texas was fuel suppliers, specifically for natural gas, were not prepared and their equipment was not designed for cold weather events. In Avista's case, its natural gas supply comes from Canada whose suppliers encounter cold weather events every winter.
With the fossil fuels used to operate wind energy, the problem with disposing of them when they are obsolete, and seeing the fiasco in Texas, should wind even be a consideration?	While wind may not have the reliability benefits of some other resources, the technology can still be economic to replace energy needs in other time periods.
How will Avista keep north Idaho people warm and safe in the winters beyond 2025?	While Avista's resource plan show shortages beginning in 2026, the Company intends to address this in many ways including the issuance of a capacity RFP, possibly as early as 2021. In addition, the current IRP does not include any resource acquisition that may result from the 2020 Renewable RFP.
General	**Avista Response**
Is or was Bill Gates an investor in AVISTA?	Avista does not comment on individual owners of its stock.

Comments provided in breakout sessions, email, or chat feature

Rate Structure
Inverted energy rates.

Hopefully people only home in the evening won't get penalized for using power at that time, but rather people fortunate enough to be home during times of lower use & lower costs could get the bonus of a lower rate.
Use-and-rate schedules are unnecessary. They are a recipe for prejudice. We have the resources to meet the needs of all people. Avista is playing games with the seriousness of human life.
Policy
I wish that AVISTA would honestly not move forward with the April plan. I am sure you can resist and not comply with a bureaucratic environmental agency or with elected representatives who are in office based on computerized counting procedures that do not mirror the interest of the public which was shown by candidate signs in yards this fall.
Reliability
I never want to hear from you that we're experiencing power outages because of reliance on green energy sources.
We need to use all sources of energy.
Finally, I'm certain the survey question regarding reliability is knee jerk to the situation Texas, even more than the outages due to the recent wind event.
Our grid isn't isolated, like in Texas.
I've taken a little time to review Avista's draft 2021 Integrated Resource Plan. Although Avista doesn't come out and say this will happen, it seems we should expect mid-winter rolling blackouts after 2025 when Avista's predicted demand will exceed electrical supply. Think of California with its utility-induced blackouts last summer, and the human tragedy and equipment destruction this winter caused by inadequate power planning in Texas. We don't want to fall into that kind of third-world situation here. I know we have a PUC and an Office of Energy and Mineral Resources but neither seems to be focused on this looming issue. I have attached some poignant excerpts from the IRP for your consideration. The full IRP can be found here: https://www.myavista.com/about-us/integrated-resource-planning It's not very comforting to learn that Avista is "concerned" about not having adequate power generation after 2025, and that they are "hopeful" that something will be done on the regional level, but sadly they have no concrete solution. This does not sound like a very good contingency plan to me. If the Region needs new generating capacity and novel utility coordination to meet peak winter demand, and considering how long it takes to plan, finance and build large projects, it sure seems the energy outlook is not looking good for our area. It's rather troubling that Avista has put its customers in this predicament after their failed attempt to merge with Canada-owned Hydro-One in 2018. I think Avista is putting our state at risk by relying so heavily on unrealized Regional solutions that are out of Avista's control. Avista hopes somehow the Regional players will create sufficient new generation and squeeze higher efficiencies out of a stressed and vulnerable network within the next 5 years. That seems far fetched; but if not, Avista should let us know the positive news before we all go out and buy whole house generators. It seems part of the diminishing supply problem stems from green initiatives of neighboring states and Federal mandates forcing the elimination of reliable "thermal" generation in favor of unreliable, and thinly available "renewable" energy sources. I see you are Chair of the Resources and Environment Committee, so hopefully you will have some ideas on how to pursue this issue. Idaho might already be behind the 8-ball because 2025 is looming mighty fast and there is hardly any clear answer to the coming power shortage, other than the obviously un-said "rolling black outs". According to Cliff Harris, our local weather guy, we are due for a really big winter, bigger than 2007-2008, due to the solar minimum, etc. So all I can suggest is maybe get the appropriate committees to ask Avista and the Governors Energy office the tough questions: how will they keep north Idaho people warm and safe in the winters beyond 2025?

I am no expert, just an ordinary retired person with questions about the future. Thank you for considering this concern.
Affordability & Equity
I'm not interested in wind/solar construction. It has its place, but it is not 24/7, w/out expensive and environmentally destructive storage.
isn't all this a windy way of saying you're going to charge us more and just in time for the new minimum wage that has driven the cost of goods and services up to match. but wait grasshopper, no one raised the checks of the retired and disabled. only the prices went up which lowered the living standard of the most defenseless among us. so now you want to join slaughter.
ROFL "Affordability"
Environmental
Move to a ZERO carbon dioxide emissions format ASAP.
I'm not interested in wind/solar construction. It has its place, but it is not 24/7, w/out expensive and environmentally destructive storage
Use renewable energy to affect the mixture of natural gas and hydrogen in pipeline systems.
I am very concerned about Governor Inslee's plan for green energy.
Wood biomass is pollutive.
I don't think that cost is a factor that should limit the use of Small Modular Reactors. Wind machines are expensive too. They harm birds. They harm people. They require bare land. They are unsightly. They are not biodegradable. They are a fool's errand.
Commitment to environment is a vague statement that doesn't give any information as to what you will do or not do.
What about the waste from windmill blades and old solar panels?
The United States of America has been quite clean thus far; we do not need to become more so. We need to maintain our life. This is getting to be a matter of survival. All electricity is electricity; it would be a fool's game to tell customers they are getting their electricity from wind or sun and not from hydroelectric dams. That is all bogus marketing. Telling customers they can pay for "green" energy is a credit that is all on the books and this is not tied to reality. Any way that financiers can play with money and that customers can be billed more or less for fees or peak loads or anything else is all "make-work" schemes for billing departments, computer programs, marketing webinars like these public forum meetings, which are a ploy to lead us to think we can stop what you are already planning to implement because you are "committed." Your company has co-opted the best, most noble vocabulary and is using it to name your plans which will actually destroy the lives of people and the economy of America. A sample of your vocabulary includes "power production," "load growth," "lens," "focus," "committed."
The shut down of the Colstrip plant in Montana is a real sore point with many in our circles. "Storable" consistent coal still accounts for over 60% of all the power generated in the U.S., and to pretend that intermittent wind and solar can in the near term (let alone ever??) replace coal without natural gas, nuclear and hydro expansions, is irritating to many of us. The tribal influence of less than 10,000 members in our region, over the welfare of millions of U.S. citizens, is of great concern to us. I had put in some questions about Colstrip that I hope get publicly answered. Is the power generated by U.S. plants like Colstrip really that "dirty"? (U.S. companies are leaders in scrubbing pollutants out of exhausts.) Is the public being sold a false narrative in that regard, due to political pressures? Could that plant be leased by Avista and run by the utility if the tribes don't want to do it? Could a new state of the art back up plant for wind farms and solar, be built at a reasonable cost?
Resource Selection
Liquid Metal Batteries, Pumped Hydro, Solar incentives, net metering buy backs over used power
CANCEL ALL PLANS FOR ADDITIONAL WIND TURBINES, I am totally against the removal of the J C Boyle Dam, Copco Dams 1 & 2, and Irongate Dam, I also support solar power, but within limits. I support properly designed nuclear power. And I support Avista's natural gas projects.
Avista clearly does not want to discuss "nuclear options". I keep hoping that the miserable and complex failure of WHOOPS won't sour this region forever on that possibility.

Since you have already seen the evidence of catastrophic failure in Texas, how does that not put you in legal jeopardy for future failures in WA, ID, and OR? Wind is a joke. There can be no wind. The turbines can freeze. The blades are made of fiberglass. They are so big, they must be brought in one per truck. Fossil fuels are needed to transport them. They are not biodegradable. Just like China, we need to forestall any changes from our present energy forms until we have more technologically advanced forms of energy. Wind and sun are NOT advanced forms. Our present federal-level administration is not legitimately elected. We are fools to limit ourselves to obeying their suicidal goals. We need to think other than wind and solar. It is primitive. Your questions are lose-lose. The multiple choices offered are not innovative and are not evidencing out-of-the box thinking.
General
Avista should look into internet and television and other services by using the resources that are already in place for remote area within the Avista service area
Choosing among affordability, environmental responsibility and reliability is a false choice. These need to be balanced, as you say.
Why is the assumption so strongly held that resources are limited? If we (mankind) are able to use the powers of the mind to make new discoveries of the physical world around us, why don't we get out of this doomsday outlook which says we are limited to the energy platform we are already on? We ought to be spending our time and strength building on the steps we have already taken to be able to land on the Moon and voyage to Mars, in order to get new forms of energy available to us. Specifically, environmentalists have blocked nuclear power energy. However, NuScale's Small Modular Reactors are as clean as wind, solar, and are cleaner than any fossil fuel. I think AVISTA ought to push back against Washington State's population-reducing polices. Our country was founded to promote the General Welfare of all the people, but Washington State, Oregon, and California's governors and Democratic Party controlled legislatures are horrifically proving they care nothing for the general public.
60% of my electric bill is how much money I already spend on gas. Ride sharing and mass transit is the answer.
I'm concerned about safety and shocked at the answers of indifference in where plants are located. I voted for away from communities.
When does Avista plan to stop extorting their customers then later boasting about record profits?
Avista overcharged customers by a total of $43 million, according to a ruling by the Washington State Court of Appeals.
The Washington Utilities and Transportation Commission has directed Spokane-based Avista Corporation to refund $8.4 million to electric and natural gas customers in Washington state.
The conversation is legitimizing foolish options. We are not limited the way you think we are. Please focus on scientific discovery of new ideas, like Benjamin Franklin and Thomas Edison did. We will not be able to maintain what we have because the production of these "green" "clean" energies are production-dependent on our present system.
More noble vocabulary being misused to promote the possibility of a Texas-type disaster: resources, reliability, clean, attentive to, responsible to the environment, generation, strategy, scalable, ensure, pre-credit, production history, resources, renewable, reduce carbon foot-print, need energy, build our needs, deliver, service territories, demand response, retiring existing resources, social cost of carbon, voluntary offering, energy efficiency, advancing technologies, lowering costs, hydrogen blending, opportunity matures, forecasted. All of this vocabulary puts a great-sounding face on plans for your reduction of perfectly good forms of energy in present use and divvying it out piece-meal to the result that the people will be diminished and in grave danger of dying off from supposedly new ideas, which are actually nothing at all beyond just sitting outside in the cold. I think "carbon-footprint" is a false boogey man that AVISTA is foolishly bowing down to and carrying the rest of the people to do the same. I think your assumptions and definitions need to be re-visited and reviewed. You are limiting yourselves, I believe.
Ecologists and environmentalists have a foolish and damaging overall philosophy and set of assumptions. Basically, they believe what Malthus said, namely, that the earth is not able to support a growing population. Actually, God said to be fruitful and multiply. He has made man with the ability (of his mind and powers of observation) to DISCOVER new ways to harness the natural laws and physical qualities of the earth. Please re-think your philosophy.

I found the meeting very informative. Another example of how Avista is a stellar partner in our community. I was interrupted in my second breakout meeting but I still have a question; “What does your company anticipate the impact to be from the forthcoming increase in electric vehicles and how will you prepare for that?” This is probably an industry wide question with a complex answer. You don’t need to answer me directly but point me to articles on the subject.
Why is wind/solar is renewable when you can’t renew them; but natural gas it’s not always there where natural gas is renewable as it comes from the earth

IDAHO CONSERVATION LEAGUE

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Sent Via email to: John.Lyons@Avistacorp.com

July 31, 2020

Mr. Lyons and the Avista IRP Team,

Thank you for the opportunity to request additional studies as part of the 2021 IRP process. Our requests below include some process improvements to the existing studies in the IRP as well as some new considerations. In each instance, our goal is to ensure the IRP leads to the least cost and least risk portfolio of supply side and demand side resources. As the complexity of the electric system increases, as the economics of resources change rapidly, and as new issues become even more acute, we encourage the Avista IRP team to lean into this process and set an example for the region for a best in class IRP process. We look forward to working with you and the rest of the Technical Advisory Committee to achieve these goals. Contact us anytime using the information below

Stay safe, stay healthy,

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Study and Process Improvement Requests

Systemwide v state specific resource additions

At the first Technical Advisory Committee meeting, Avista indicated the PRiSM model could add resources to Washington and Idaho separately or to the combined, interconnected system. We request a study of the costs and timeline necessary to replace the fossil-fueled component of the 35% of existing resources allocated to Idaho with an optimized portfolio of non-fossil resources including supply-side, demand-side, and storage resources. We request Avista compare the results of this Idaho-specific study to the results of the same analysis at the system-wide level. We also request a study that documents the costs to implement, monitor and document the state-specific addition of resources to an interconnected system dispatched to meet combined customer loads.

Existing resource costs

We request Avista study a scenario that applies the Social Cost of Carbon to all resources, including those that serve Idaho, as offered in the first TAC meeting.

We request Avista study scenarios for Colstrip costs that reflect the changing ownership shares currently being considered by co-owners Puget Sound Energy, Northwestern Energy, and Talen. Further, we request a study of likelihood and scale of increases to Avista's share of common plant costs, remediation costs, and fuel supply costs, including minimum fuel supply and generation off-take, attributable to both the closure of Units 1 and 2 and the changing ownership share of Units 3 and 4.

We request a study of the accuracy of Avista wholesale natural gas price forecasting methodology by comparing forecasted prices in prior IRPs to prices Avista actually paid. We request this study include a comparison of the accuracy of consultant-supplied forecast to publicly-available forecasts covering the same time periods.

Storage

Storage resources provide unique attributes that are not captured in traditional IRP modeling techniques that focus on energy and capacity needs in the hourly time scale. Storage technologies like Li-Ion batteries with fast reaction times, but only a few hours of capacity can address power quality and reliability needs within the hour. Medium term storage resources, such as Li-Ion batteries with 6 - 12 hour capacity, and pumped storage projects, can help integrate variable energy resources and address reliability needs. Longer term storage resources like hydrogen electrolysis paired with storage and repowered turbines, can address integration, reliability, and resiliency needs. By combining these storage resources with specific clean generation options, Avista can develop clean resources that meet the reliability metrics for flexibility, peaking, and renewable integration necessary to meet Avista's clean energy goals as well as CETA requirements.

To ensure a full and fair treatment of storage values we request the following:

- We request Avista model loads and generation at the sub-hourly level. We recognize Avista began pursuing sub-hourly modeling in the 2017 IRP and further refined the ADSS system in the 2019 IRP. We request Avista fully implement sub-hourly modeling for all IRP studies and processes.

- We request Avista study the optimal pairing of generation resources with storage of different technologies and lengths of supplying services. For example: pairing local solar or wind with Li-Ion 4hr, 6hr, and 12hr batteries; pairing pump hydro resources with regional solar, wind, and wholesale markets; pairing long term storage like hydrogen electrolysis and associated hydrogen storage with Avista's own resources and wholesale market generation.

- We request Avista study the emission reductions possible from pairing storage with specific clean generation options along with the Proposal presented to the TAC to apply the average emissions rate of the region for storage paired to generic wholesale market resources.

Distribution level modeling

Distributed energy resources are increasing as products diversify and the economic proposition improves. To help encourage the optimal growth of DERs on the Avista system, we request a Hosting Capacity Analysis. This analysis could support a distributed energy resource interconnection map that identifies where distributed energy resources exist on the system or where the distribution system is constrained and could benefit from energy storage or specific demand responses. This Hosting Capacity Analysis would benefit the IRP's load forecasting and overall integration of distributed energy within the IRP. We recommend Avista define DERs broadly for this study to include: customer-sited generation and storage, utility-sited generation and storage at substations or other locations on the distribution grid, as well as public and private electric vehicle charging stations. We request Avista incorporate different load shapes that are indicative of customer generated power as well as the charging of electric vehicles to ensure accuracy in the load shapes for supply-side resource planning. The Smart Electric Power Alliance has an informative set of resources to help with this effort: https://sepapower.org/knowledge/proposing-a-new-distribution-system-planning-model/.

Flexibility Issues

With the technological changes of a modern grid system, including flexibility in both supply and demand studies is essential as we look to the future of electric service areas. As shown in the pilot program with the Catalyst Building, the savings from energy efficiency and flexible building loads can be extremely beneficial for the electric grid as a whole. Similarly, the micro-transaction grid project in the Spokane University District is demonstrating the value of flexible loads and new market opportunities for customers to manage their power bills. To fully explore the value that flexibility brings to Idaho customers, we request Avista study the potential to expand similar projects in the Idaho service territory. At minimum, a study to see the perspective of customers' willingness to participate in such a pilot program could have lasting results.

Climate Change Impacts to Avista's System and Costs

In the 2020 IRP, Avista describes how climate change is causing a rise in temperatures today in the service territory and, therefore, is influencing the load forecast. To further examine how the currently changing climate can impact the system and costs, we request Avista build upon this by studying the following:

- Loads - study changes to both long-term load forecast and the peak load forecast attributable to climate change. The 2020 IRP mentions a 1-degree increase in temperatures, but does not appear to describe how climate change is factored into the peak load forecast. The 2020 IRP also cites a temperature data set from 2013, which we recommend Avista update to the most currently available set.

- Hydro - study the potential changes to hydroelectric power generation that could result from climate-caused changes to precipitation type and timing. This study should document the range of impacts to power costs that result from the changes in hydroelectric power generation.

- Thermal plants - study potential changes to expected generation and production costs due to temperature changes. This study should include changes to expected generation and fuel costs as output varies with ambient temperatures

and the impacts to cooling water needs due to changes in precipitation and water temperatures. The study should document the range of impacts to power costs due to the change in expected generation output, fuel needs, and cooling water needs.

Beneficial electrification

One of the most interesting long-term planning issues to address in the 2021 IRP is how increasing electrification of transportation can benefit the system and customers. Idaho currently imports 100% of our transportation fuels. Electrifying transportation can make Idahoans more energy secure and reduce costs since we pay above average fuel prices and below average electricity prices. And optimizing charging practices can deliver further benefits to all electric customers. The 2020 Transportation Electrification Plan (TEP) states that "In 2025, over 6,800 EVs are expected to provide Avista with gross revenue of $2.1 million from EV charging. Subtracting an estimated $0.5 million in marginal utility costs to generate and deliver this energy results in $1.6 million in net revenue – savings which may be passed along to all utility customers in the form of decreased rate pressure." To ensure Avista is prepared to serve Idaho's clean transportation needs, we request:

- The load forecast includes the baseline projection of electric charging services, as forecasted in the 2020 TEP. We also request scenarios that consider higher penetration of EV, especially for commercial fleets, delivery vehicles, and public transportation.

- A study of how to optimize charging behaviors, including customer load management, and how to optimize the location of public and workplace charging stations to avoid distribution grid overload while maximizing grid flexibility and benefits to the system. For example, the TEP identified that the $1,206 in electric system benefits per EV could "be increased by another $463 per EV when load management shifts peak loads to off-peak."

Hello Ben and Dainee,

Thank you for your continued participation and involvement in Avista's IRP. Here are the replies to your 2021 IRP study requests and suggestions for process improvements to ongoing studies.

System wide versus state specific resource additions

- "We request a study of the costs and timeline necessary to replace the fossil-fueled component of the 35% of existing resources allocated to Idaho with an optimized portfolio of non-fossil resources including supply-side, demand-side, and storage resources.

  Avista is developing a portfolio with all renewable/GHG emissions free resources as it did in its 2020 IRP.

- We request Avista compare the results of this Idaho-specific study to the results of the same analysis at the system-wide level.

  Yes, we will highlight the comparisons of the system-wide versus the Idaho-specific study in the IRP.

- We also request a study that documents the costs to implement, monitor and document the state-specific addition of resources to an interconnected system dispatched to meet combined customer loads.

  The cost allocation for new assets constructed to meet the Washington CETA law has not been decided by either Commission yet. An IRP does not answer this question. The 2021 IRP will attempt to evaluate the cost deltas between portfolios absent CETA mandated acquisition targets. Avista looks forward to working with both commissions and interested parties on this issue as new analyses become available.

Existing resource costs

- "We request Avista study a scenario that applies the Social Cost of Carbon to all resources, including those that serve Idaho, as offered in the first TAC meeting."

  Avista will conduct this study in the 2021 IRP.

- "We request Avista study scenarios for Colstrip costs that reflect the changing ownership shares currently being considered by co-owners Puget Sound Energy, Northwestern Energy, and Talen. Further, we request a study of likelihood and scale of increases to Avista's share of common plant costs, remediation costs, and fuel supply costs, including minimum fuel supply and generation off-take, attributable to both the closure of Units 1 and 2 and the changing ownership share of Units 3 and 4."

  Regarding the change in ownership percentages for Units 3 and 4, there are no changes to Avista's responsibilities or modeling inputs to alter because Avista's 15 percent share of both units remains static under the Colstrip ownership agreement. Avista's financial responsibility for the plant

remains the same regardless of the non-Avista ownership or ownership percentages for Units 3 and 4. As in the last IRP, Avista is accounting for the shift (increase) in previously shared costs that are a result of the closure of units 1 and 2. Those costs increased, but Avista's share of those costs did not change. Avista has zero responsibility for the remediation costs associated with Units 1 and 2. The closure of those units did not end the financial responsibility of those remediation costs for the owners of those units (Puget Sound Energy and Talen). Avista's fuel contract is separate from the contracts that supplied Units 1 and 2. Avista's fuel contract and any subsequent mine remediation costs with our share of coal are already included in the prices being modeled in the 2021 IRP, consistent with past IRPs.

- "We request a study of the accuracy of Avista wholesale natural gas price forecasting methodology by comparing forecasted prices in prior IRPs to prices Avista actually paid. We request this study include a comparison of the accuracy of consultant-supplied forecast to publicly-available forecasts covering the same time periods.

  The natural gas price forecast beyond the shorter term forward markets is always an area of concern because of the potential for volatility, timing and magnitude of outside events, much like the current pandemic we are now experiencing. It is in our own best interests to use good forecasts. Avista publishes its natural gas price forecasts in each IRP; including both consultant forecasts on an annual average basis. Actual natural gas prices are also publicly available. The consultants that we use work on a national as well as an international basis. They already perform their own internal analyses to make their forecasts as accurate as possible to maintain and grow their business. We are paying for their expertise and research into the natural gas market. Avista has not seen any evidence indicating that there are better forecasts available and we do not possess the resources to develop a comprehensive fundamentals based natural gas forecast on our own. Some forecasts, like those provided by the Energy Information Administration, supply some more details about the fundamentals they are using, but they are also more dated and do not provide the level of granularity into specific trading hubs. The consultants would not be able to remain in business if they had to give away all of their research for free. Please let us know if you have found other evidence or research indicating better forecasts.

Storage

- "We request Avista model loads and generation at the sub-hourly level. We recognize Avista began pursuing sub-hourly modeling in the 2017 IRP and further refined the ADSS system in the 2019 IRP. We request Avista fully implement sub-hourly modeling for all IRP studies and processes."

  Sub-hourly modeling is challenging due to model solution complexity and data availability. Further, modeling all sub-hourly periods is not

technologically possible. Presently, modeling at one-hour granularity requires thousands of hours of computer processing time. Moving to intra-hour modeling would cause an exponential increase in solution time even if the data was available. ADSS and other modeling techniques are used to evaluate intra-hour values, and generally rely on sampling of relevant time periods. This is specifically the case with the complexity of modeling storage resources. Avista is working on this issue and is hopeful it will be available in future IRPs and will be added as an Action Item in the 2021 IRP if not completed for this plan.

- "We request Avista study the optimal pairing of generation resources with storage of different technologies and lengths of supplying services. For example: pairing local solar or wind with Li-Ion 4hr, 6hr, and 12hr batteries; pairing pump hydro resources with regional solar, wind, and wholesale markets; pairing long term storage like hydrogen electrolysis and associated hydrogen storage with Avista's own resources and wholesale market generation."

  As described in the first TAC meeting and distributed to the TAC afterwards, this IRP is already including a wide variety of stand-alone storage and combined renewables plus storage options. The options being modeled include distribution scale 6-hour Lithium-ion; 4, 8 and 16-hour Lithium-ion; 4-hour Vanadium flow, 4-hour Zinc Bromide flow batteries; 16-hour 100 MW share pumped storage; and 100 MW solar photovoltaic with 200-MWh Lithium-Ion batteries. Avista is also modeling hydrogen using fuel cells or converted combustion turbines. Each of the hydrogen options will include long duration storage facilities as a backup to real-time deliveries. Avista's IRP modeling includes the benefits from a portfolio optimization in its current process between storage and renewable resources.

  Avista acknowledges there could be a benefit to pairing storage with renewables from a transmission perspective. Although the locational benefits of storage paired with resources may not be optimal when considering other "better" locations to locate the storage. Avista agrees with this concept and is trying to determine the best methodology to model these potential benefits, but the modeling of this concept may not be available in time for this IRP. It will be added as an Action Item if we are not able to develop the concept and include it in the 2021 IRP.

- "We request Avista study the emission reductions possible from pairing storage with specific clean generation options along with the Proposal presented to the TAC to apply the average emissions rate of the region for storage paired to generic wholesale market resources."

  Avista includes regional emissions for storage not connected to a facility; for paired resources, Avista does not include the emissions when using the paired resources. Although, over time as paired solar/storage resources are no longer obligated to use the paired resources storage

technology to satisfy tax credit requirements will likely use a combined grid/local power for optimization of the system.

Distribution level modeling

- "To help encourage the optimal growth of DERs on the Avista system, we request a Hosting Capacity Analysis. This analysis could support a distributed energy resource interconnection map that identifies where distributed energy resources exist on the system or where the distribution system is constrained and could benefit from energy storage or specific demand responses. This Hosting Capacity Analysis would benefit the IRP's load forecasting and overall integration of distributed energy within the IRP. We recommend Avista define DERs broadly for this study to include: customer-sited generation and storage, utility-sited generation and storage at substations or other locations on the distribution grid, as well as public and private electric vehicle charging stations."

  Avista's transmission and distribution departments are working on a public process for this type of planning. This process will likely be separate from the IRP process, but will provide information for the IRP. More details of this process and its findings will be shared with the TAC as they are developed.

- "We request Avista incorporate different load shapes that are indicative of customer generated power as well as the charging of electric vehicles to ensure accuracy in the load shapes for supply-side resource planning. The Smart Electric Power Alliance has an informative set of resources to help with this effort: https://sepapower.org/knowledge/proposing-a-new-distribution-system-planning-model/."

  Avista welcomes the information, but at this time is using data collected from its local system for both solar and electric vehicles.

Flexibility Issues

- "With the technological changes of a modern grid system, including flexibility in both supply and demand studies is essential as we look to the future of electric service areas. As shown in the pilot program with the Catalyst Building, the savings from energy efficiency and flexible building loads can be extremely beneficial for the electric grid as a whole. Similarly, the micro-transaction grid project in the Spokane University District is demonstrating the value of flexible loads and new market opportunities for customers to manage their power bills. To fully explore the value that flexibility brings to Idaho customers, we request Avista study the potential to expand similar projects in the Idaho service territory. At minimum, a study to see the perspective of customers' willingness to participate in such a pilot program could have lasting results."

  Avista appreciates the comment to also consider Idaho as a test bed for future projects and will take this under advisement. Avista utilizes the University of Idaho for several R&D efforts through a grant process for a total of $270,000 to study efforts related to energy efficiency and flexible building loads. Example projects from the 2019/20 academic year include:

a program design for energy trading system for consumers, using infrared cameras for building controls, and gamification of energy use.

Climate Change Impacts to Avista's System and Costs

- "Loads - study changes to both long-term load forecast and the peak load forecast attributable to climate change. The 2020 IRP mentions a 1-degree increase in temperatures, but does not appear to describe how climate change is factored into the peak load forecast. The 2020 IRP also cites a temperature data set from 2013, which we recommend Avista update to the most currently available set."

  Climate change is being included in the load forecast as a scenario, which was covered in the special TAC meeting on August 8, 2020 after we received this letter. Further, all load forecast scenario data is available on the IRP website. Please let us know if you have any additional questions or concerns that may have arisen since that presentation.

- "Hydro - study the potential changes to hydroelectric power generation that could result from climate-caused changes to precipitation type and timing. This study should document the range of impacts to power costs that result from the changes in hydroelectric power generation."

  We have obtained the climate adjustments developed by the Power Council and are reviewing them to determine how they might be incorporated into the 2021 IRP. More details will be presented at a future TAC meeting.

- "Thermal plants - study potential changes to expected generation and production costs due to temperature changes. This study should include changes to expected generation and fuel costs as output varies with ambient temperatures and the impacts to cooling water needs due to changes in precipitation and water temperatures. The study should document the range of impacts to power costs due to the change in expected generation output, fuel needs, and cooling water needs."

  Avista agrees temperature changes will impact the amount of production from its natural gas-fired facilities. This impact will be included in the climate change scenario.

Beneficial electrification

- "The load forecast includes the baseline projection of electric charging services, as forecasted in the 2020 TEP. We also request scenarios that consider higher penetration of EV, especially for commercial fleets, delivery vehicles, and public transportation."

  Avista studied increasing EV penetration in the 2020 IRP. At this time, Avista will need to focus on other scenarios for this IRP because of the limited amount of time available for modeling.

- “A study of how to optimize charging behaviors, including customer load management, and how to optimize the location of public and workplace charging stations to avoid distribution grid overload while maximizing grid flexibility and benefits to the system. For example, the TEP identified that the $1,206 in electric system benefits per EV could “be increased by another $463 per EV when load management shifts peak loads to off-peak.”

    Avista is updating its EV demand response program assumptions and this will be discussed at the September TAC meeting. Avista welcomes this discussion at the upcoming meeting to ensure it has robust assumptions for this IRP.

climate solutions
accelerating the transition to our clean energy future

August 18, 2020

RE: Electrification Assumptions in August 6 Avista IRP Presentation

Dear Mr. Gall, Mr. Pardee, Mr Lyons, and the Avista IRP team,

We appreciate the opportunity to provide comments on Avista's IRP. This comment letter focuses on considerations regarding the electrification of end uses scenario that the company is considering.

Washington state adopted greenhouse gas limits during the 2020 legislative session that direct the state to reduce total emissions by 95% compared to 1990 levels, or approximately 5 million tons of CO2e by 2050; for comparison, residential and commercial use of natural gas was responsible for approximately 7.3 million tons of CO2e emissions in 2015. In order for the state to achieve its overall limit, it is clear that this total must decline precipitously and studies indicate that electrification is likely the least cost pathway for doing so. Washington State's Deep Decarbonization Pathway Study, which was aimed at a less ambitious reduction target of 80% compared to 1990 levels, called for 85% reductions in residential gas use and 43% in commercial gas use reductions.

Evaluating electric sector impacts of this scale of reductions is important, and doing so must be informed by current and reasonable assumptions about appliance performance. Below we provide recommendations to update Avista's assumptions regarding representative heat pumps and water heaters, as well as additional considerations to properly model their impact on the company's system. In particular, we think it is reasonable to assume that over the period considered in the IRP, electric space and water heating choices will become dominated by heat pumps, especially with the salutary involvement of the company.

Washington's residential energy code already preferences heat pumps given their high efficiency, a preference that will only be strengthened as the code goes through subsequent updates along the path to 70% less energy consumption by new buildings by 2031[1] and as carbon is accounted for in code as it now is under WSEC 2018. Likewise, for customers that are converting from gas or another fuel source, they are likely to opt for the most cost-effective long-term option. This is already heat pumps rather than electric resistance units, and the economics of this choice will continue to improve.

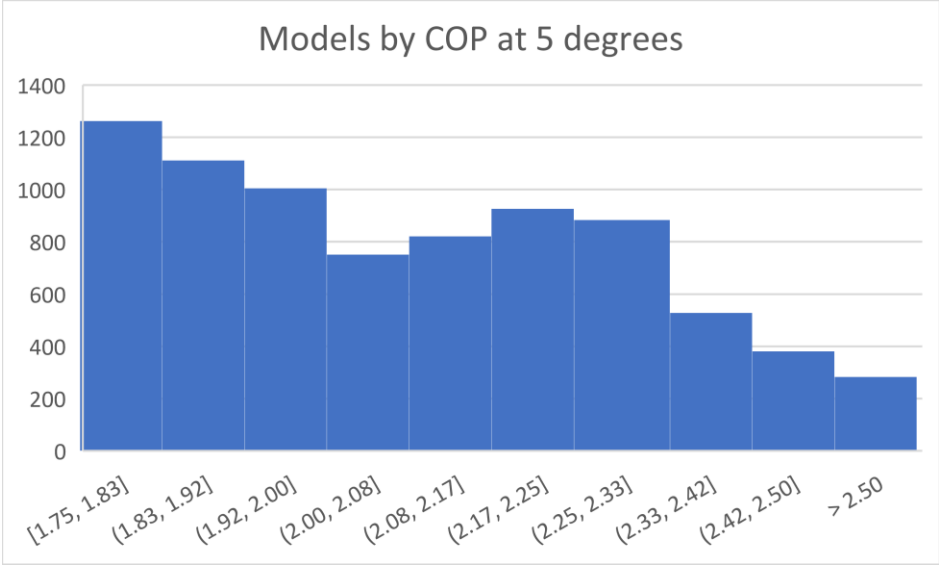
Electric Heat Pumps

Avista suggests that end use efficiency of electric space heating at 35 degrees would be 150% (COP=1.5) and 100% at 5 degrees (COP=1). This does not accurately reflect the current state of the market. Climate Solutions reviewed the Northeast Energy Efficiency Partnership's (NEEP) Cold Climate Air Source Heat Pump List. NEEP's definition of "cold climate" is any IECC climate zone of 4 or higher. Avista's service territory meets this definition, containing zones 5 and 6. NEEP's list contains nearly 8,000 air source heat pumps available on the market today from 89 manufacturers.

The average COP for the listed heaters operating at their maximum capacity at 5 degrees Fahrenheit is 2.09, and the lowest COP for the models they catalogue is 1.75 at that temperature. A number of models do indicate they would switch to backup heat at lower temperatures, but 4 out of 5 do not include a condition for switching and

[1] RCW 19.27A.160

would continue operating at the rated COP. Below is a histogram showing the distribution of various COPs within this product list.



Below we also provide the the average COP at a variety of other temperatures included in NEEP's list. Because customers living in cold weather are most likely to acquire a heat pump calibrated to their needs, and because this technology invariably will continue to improve, we recommend that Avista change its end use efficiency assumption for space heating to at least 200% efficiency at 5 degrees, and adjust the end use efficiency statistic at 35 degrees consistent with the data provided in NEEP's database.

Ambient Temperature (degrees Fahrenheit)	Average COP at Rated Capacity	Average COP at Max Capacity
17	2.75	2.45
47	3.81	3.58

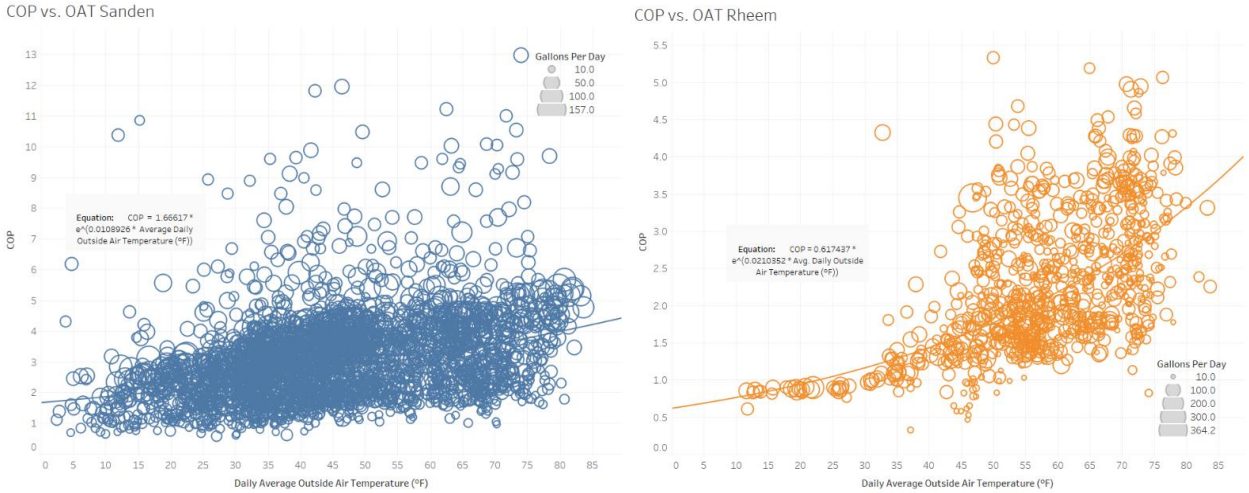
Water Heaters

While there are heat pump water heaters (HPWH) available that perform at the low level Avista selected for 5 degrees, we do not think selecting the bottom of the market is a prudent choice. In 2018, Energy 350 completed field tests in a variety of conditions of HPWHs in British Columbia, including at locations that lie just outside of Avista's service territory. A summary of their results are available here.

Energy 350 chose two HPWHs, one from Sanden and another from Rheem and evaluated their operation over the course of a year. The Sanden model was a split system, with a unit located outside, while the Rheem model was designed to directly replace a traditional water heater located in conditioned and semi-conditioned spaces. Their COP results bear out these differing designs. On the next page are scatter plots showing the observed performance of these systems at various temperatures, along with their lines of best fit.

From these results, and from a review of other comparable products on the market, we are concerned that the current choices Avista has made for water heater end use efficiency don't accurately reflect operational conditions. While there are indeed HPWH that would be rated at a COP of 0.9 at 5 degrees, these are *not* designed to be placed outside and instead reside indoors—in basements, garages, or even utility closets that stay at room temperature—preventing them from needing to operate in such ambient temperature conditions. If a customer opts instead to place their water heater outside, they would select a model designed for such

conditions, along the lines of the Sanden model tested by Energy 350 whose observed COP at that temperature is 1.76. Outdoor placement of water heaters is unusual, and the Sanden split model is more expensive than the



Rheem indoor option, so we would consider the proposed representative water heater the company is suggesting to be an exceedingly rare configuration on Avista's system.

For this reason, we request that Avista explain the assumptions the company is making about water heater locations, the ambient temperatures the model anticipates the water heaters will be exposed to over the course of a year, and make adjustments to more accurately reflect the product and appliance location choices customers are likely to make. At a minimum, we consider the current efficiency selected in the August 6th presentation to represent a circumstance that wouldn't occur—an indoor model placed outdoors.

Thank you for the opportunity to participate in Avista's electric Integrated Resource Plan, and for running an open and inclusive process to date. We look forward to continuing to engage with your IRP team on the resource plan and this scenario.

Sincerely,

Vlad Gutman-Britten
Washington Director, Climate Solutions

Gall, James

From: Gall, James
Sent: Monday, September 14, 2020 10:45 AM
To: Vlad Gutman
Cc: Lyons, John; Pardee, Tom
Subject: RE: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

Dear Mr. Gutman,

Thank you for taking the time to participate in our IRP process and provide information regarding heat pump technology. Avista encourages its customers to install heat pumps through energy efficiency education and financial incentives. Although heat pumps in our customer's climate have challenges, the technology offers savings when used with appropriate expectations.

After discussion with Avista's chief energy efficiency engineer, a few modifications to the efficiency calculation are in order. These modifications will decrease the electric load increase from home electrification. Avista is also including the workbook for this calculation on the IRP website. The modifications are as follows:

1) Removed the space heat effect to the efficiency of heat pump water heaters so the efficiency does not fall below 100%.
2) Increased space heat efficiency to include a small penetration of ductless heat pumps and to reflect how some customers shut off heat pumps to avoid the defrost cycle.
3) The hybrid scenario begins the load shift at 60 degrees, rather than 40 degrees, to reflect observed consumer behavior given economic inputs for fuel.

We also wanted to share our interpretation of the heat pump data you sent for both heat pumps and heat pump water heaters to clarify the whole home efficiency using the technology. Unfortunately, the COP values from vendors often do not accurately represent the actual system efficiency of heating a whole home. While the COP of the ductless units at lower temperatures are high, looking at this value alone does not consider the loss of load following ability or the 50% reduction of heating capability of the heat pump. The customer is left with a choice of either oversizing the heat pump for heating during periods of cold temperatures at a great economic first cost or by using auxiliary resistance heat to make up the load not being met by the diminished capacity of the heat pump. Also, needed items are not taken into account in the documents such as defrosting, the possibility of a reduction in efficiency due to snow and wind loads, and most homes are not entirely heated by ductless units. Our estimates are adjusted using the consumption records of the Regional Technical Forum and the regional residential building survey assessment (RBSA) which detail observed performance.

Space Heating Conversion

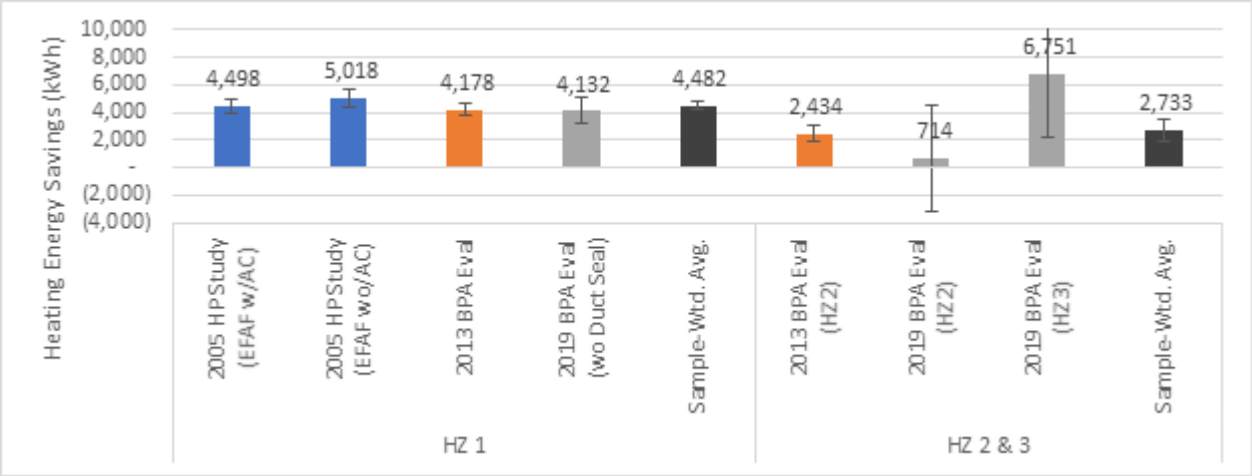
Fuel conversion from natural gas to electric heating will likely be to a central heat pump instead of a ductless heat pump system because current natural gas customers already have ducted systems in their homes and usually replace their heating systems with a centralized system. This situation also applies when adding a heat pump to the natural gas furnace. The central system heat pumps are not as efficient as ductless heat pumps because the system must work in conjunction with a furnace and duct system that was not created to perfectly pair with the heat pump hardware. A home with too little return air, or return air only coming from one floor, can reduce the rated efficiency of the heat pump. With a ductless system, all of the airflow characteristics are controlled by the heat pump manufacturer resulting in a more efficient unit.

Central systems require a defrost mode when temperatures are below freezing, reducing the efficiency below 100% if the consumer does not shut this feature off. We find this occurs in 80% of homes; therefore, we assume a 90% efficiency rating at very cold temperatures when a peak load would likely occur (given this analysis assumes a 10% efficiency credit we effectively model cold temperature at 100% efficiency). Heat pump systems in our climate also experience snow coverage where the homeowner would need to physically create air space around the unit. This often does not occur during periods of inclement weather and further reduces efficiency.

Avista believes this technology will continue improving over time by utilizing similar technology as ducted systems, but due to the current limitations in these systems described above heat pumps will not achieve similar efficiencies now.

The Regional Technical Forum table shown below identifies residential single-family HVAC statistics for converting electric forced air furnaces to air source heat pumps. The savings shown for climate zones 2 and 3 show an average of 2,733 kWhrs which given the resistive load of these two climate zones represents a seasonal COP less than 1.4 for the electric heat pump. This document uses data from the residential building stock assessment. The fact that this technology works so well

in heating zone 1 makes it difficult when we would like to see those same benefits and performance used more in colder climates like ours.

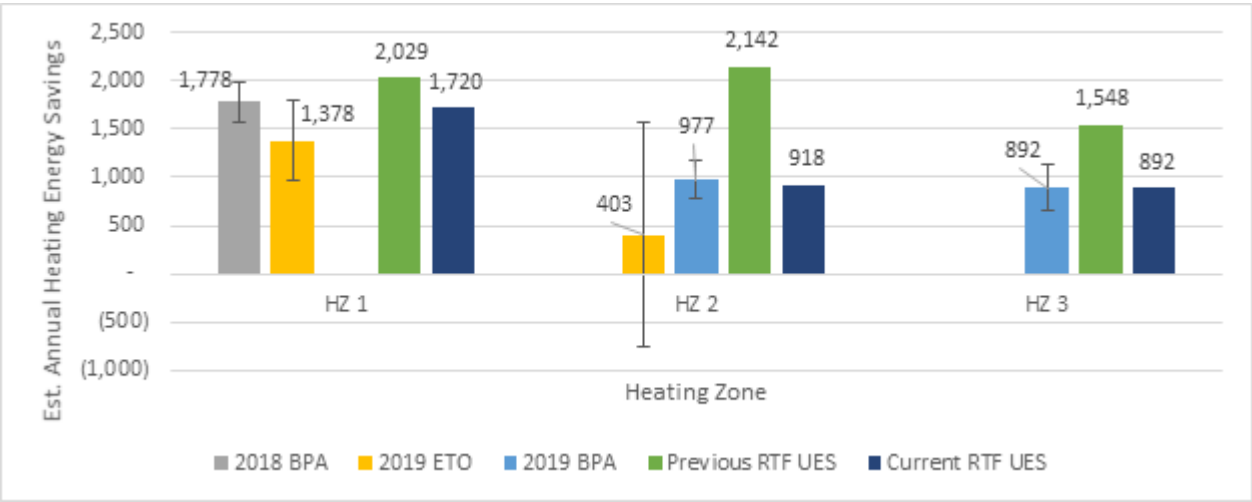


New homes that would previously include natural gas ducted systems could be ductless heat pumps in the future. This discussion continues below.

Ductless Heat Pumps

If a natural gas home converts to a ductless heat pump system (DHP), the whole house would not see a COP in the 3 to 5 range for homes with cold temperatures as commonly advertised by the vendors. First, the amount of BTUs produced in a ductless system significantly reduces as temperatures decline. This requires the system to run longer, contain more units, or be supplemented with additional resistance heat to maintain house temperature. Further, most homes with DHP do not use this system for the entire house and typically only heat one or two rooms while putting very low cost resistive heating in smaller rooms and areas of the house not frequently used.

Practically, in colder temperatures, it is possible to have a whole house heating COP above 1, but it is likely to be closer to 1 than 2 given the other heating requirements. Avista will revise IRP modeling to include some new homes using ductless heat pumps with slightly better than 1 COP values. The following graph from the current DHP data shows a savings in heating zones 2 and 3 of less than 920 kWhrs per unit installed. This is in homes where the average annual heating consumption is over 5,000 kWhrs. The best study here also shows other fuel influences like wood heat that can increase electric use due to the high cost of resistance electric heat after the addition of a ductless heat pump. This seasonal efficiency is less than a COP of 1.25.



Water Heating

The data included on heat pump water heating is consistent with Avista's assumptions. This data does not include the impact of the heat pump system consuming space heat from the house, when adjusting for this consumption, cold weather efficiency values are closer to 100% on a net basis. Avista's first draft reduced these efficiencies below 100%, but has since revised them to not be below 100% as they will be in resistance mode for space heating.

Thanks again for the questions regarding this scenario it has improved the assumptions and our understanding of the complexities of electrification,

James Gall
IRP Manager, Avista
509-495-2189

From: Vlad Gutman <vlad@climatesolutions.org>
Sent: Tuesday, August 18, 2020 10:23 AM
To: Gall, James <James.Gall@avistacorp.com>
Cc: Lyons, John <John.Lyons@avistacorp.com>; Pardee, Tom <Tom.Pardee@avistacorp.com>
Subject: RE: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

Attached please find some comments from us. In the letter, we reference a NEEP heat pump list which is available online for review (link inside). NEEP does provide it in excel form, which eases review, but they asked us not to share it for now, though I think they're checking about whether or not I can provide it to you all. In either case, you can receive the list from them directly if you become a member.

Thanks again for all your work to date, and I look forward to hearing more this afternoon.

--Vlad

Vlad Gutman-Britten
Washington Director
Climate Solutions
206-886-4616

From: Gall, James <James.Gall@avistacorp.com>
Sent: Wednesday, August 12, 2020 5:19 PM
To: Vlad Gutman <vlad@climatesolutions.org>
Cc: Lyons, John <John.Lyons@avistacorp.com>; Pardee, Tom <Tom.Pardee@avistacorp.com>
Subject: RE: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

Please send it when you can. I plan to make any modifications to the assumptions in the next two weeks prior to posting the data file. After you see the new data file we can discuss more then. This is a more straight forward scenario so it can be refined later in the process compared to other scenarios.

From: Vlad Gutman <vlad@climatesolutions.org>
Sent: Wednesday, August 12, 2020 4:42 PM
To: Gall, James <James.Gall@avistacorp.com>
Cc: Lyons, John <John.Lyons@avistacorp.com>; Pardee, Tom <Tom.Pardee@avistacorp.com>
Subject: RE: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

We've collected some data on what's available on the market now, vs bleeding edge, that we intend to share with you for your consideration. I'm going to work up a letter—remind me when would be timely to have it to you by?

Vlad Gutman-Britten

Washington Director
Climate Solutions
206-886-4616

From: Gall, James <James.Gall@avistacorp.com>
Sent: Wednesday, August 12, 2020 4:37 PM
To: Vlad Gutman <vlad@climatesolutions.org>
Cc: Lyons, John <John.Lyons@avistacorp.com>; Pardee, Tom <Tom.Pardee@avistacorp.com>
Subject: RE: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

Hi Vlad,

COP for heating is probably the closest definition, but not for other appliances which is why we labeled it differently. Also there are lots of options out there and we attempted to make an estimate of the average customer- not the bleeding edge of available technology. Given technology change potential, we decided to conduct a scenario with much higher efficiency ratings in the event. My hope is in the next week or two we will post the spreadsheet of our assumptions and methodology for this scenario and you can take a look.

From: Vlad Gutman <vlad@climatesolutions.org>
Sent: Wednesday, August 12, 2020 4:14 PM
To: Lyons, John <John.Lyons@avistacorp.com>; Gall, James <James.Gall@avistacorp.com>; Pardee, Tom <Tom.Pardee@avistacorp.com>
Subject: [External] RE: Avista Draft TAC 2 Presentations for 8/6/20

Hi all--

On the electrification scenario assumptions, I just want to ensure I properly understand the inputs you're using—when you say "end use efficiency", you're referring to the COP of the appliance at that temperature. Is that correct? Not some other rating I'm not thinking of? Just want to make sure I'm properly understanding the metric.

Thanks,

Vlad

Vlad Gutman-Britten
Washington Director
Climate Solutions
206-886-4616

From: Lyons, John <John.Lyons@avistacorp.com>
Sent: Tuesday, August 4, 2020 1:53 PM
To: 'gsbooth@bpa.gov' <gsbooth@bpa.gov>; 'elizabeth.hossner@pse.com' <elizabeth.hossner@pse.com>; 'forda@mail.wsu.edu' <forda@mail.wsu.edu>; Kalich, Clint <Clint.Kalich@avistacorp.com>; Vermillion, Dennis <Dennis.Vermillion@avistacorp.com>; Rahn, Greg <Greg.Rahn@avistacorp.com>; Gall, James <James.Gall@avistacorp.com>; Wenke, Steve <Steve.Wenke@avistacorp.com>; Lyons, John <John.Lyons@avistacorp.com>; 'Gervais Falkner, Linda' <IMCEAEX-_O=CORP_OU=Site1_cn=Recipients_cn=7E2D1DA9@avistacorp.com>; Ehrbar, Pat <Pat.Ehrbar@avistacorp.com>; McGregor, Ron <Ron.McGregor@avistacorp.com>; 'SJohnson@utc.wa.gov' <SJohnson@utc.wa.gov>; 'DReynold@utc.wa.gov' <DReynold@utc.wa.gov>; 'ChuckM@CTED.WA.GOV' <ChuckM@CTED.WA.GOV>;

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Subject: Avista Draft TAC 2 Presentations for 8/6/20

Hello TAC members,

Here are the draft presentations for Thursday's joint meeting with the Natural Gas TAC and the call in information for the meeting.

Thank you,

John Lyons
Avista Corp.

509-495-8515

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Gall, James

From: Tina Jayaweera <TJayaweera@NWCouncil.org>
Sent: Friday, February 26, 2021 4:41 PM
To: Lyons, John; Gall, James; Finesilver, Ryan
Cc: Daniel Hua
Subject: [External] RE: Avista's Draft 2021 Electric IRP
Attachments: Avista 2021 Draft Electric IRP_councilstaff.pdf

Hi Avista team,
Thanks for the opportunity to review the draft 2021 Electric IRP. Council staff appreciate the level of engagement from Avista throughout the TAC process. Attached is a copy of the IRP with embedded comments in it. Many of our comments are asking for clarification or additional detail. However, one more substantial comment from staff is on the market price forecast:

Preliminary market price forecasts for the 2021 Power Plan diverge from the pricing regime shown in this draft IRP. While understanding the underlying cause of that divergence would take a deep dive into our respective AURORA runs, given our work thus far we would expect that it's related to allowing AURORA to construct new natural gas generation outside the Northwest to replace expected retirements in the WECC thermal generation fleet (and the associated volume of those retirements).

We were given guidance from the Council and from our advisory committees to limit the potential for new natural gas generation both inside and outside the region. In doing so, we see a wave of solar and wind generation construction that depresses future market prices substantially lowering them from prices seen today. While this is largely outside of the control of the region, it presents substantial risk to regional utilities making decisions consistent with market prices that assume natural gas resources will set the marginal price.

We'd encourage all the utilities in the Northwest, including Avista, to test any IRP-based decisions against an aggressively low market price forecast. Many things are uncertain about the future of the power system in the WECC. We would not want to represent any forecast, including our own, as certain. But we do think it's a risk to consider and one that will be developing rapidly over the next few years.

While we're still working on the 2021 Power Plan, we'd be happy to share an AURORA archive file of the work done to date.

Tina Jayaweera (she/her)
Northwest Power & Conservation Council
503-222-5161

From: Lyons, John <John.Lyons@avistacorp.com>
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Subject: Avista's Draft 2021 Electric IRP

Hello TAC Members,

Attached is a copy of the draft 2021 Electric IRP for your review. Please provide any comments or edits back to us by Monday, March 1, 2021 to me at john.lyons@avistacorp.com. The final IRP and completed appendices will be filed on April 1, 2021 with the Idaho and Washington Commissions.

Our fifth and final TAC meeting will be held on Thursday, January 21, 2021. The meeting invitation and agenda will be available by the end of this week. There will also be an opportunity to provide written comments about the draft IRP to

the Washington Commission and a public meeting on February 23, 2020. We will provide more details at the fifth TAC meeting.

Thank you for all of your participation in the 2021 IRP,

John Lyons
Avista Corp.
509-495-8515

Northwest Power and Conservation Council

In line comments on draft Electric IRP

Page 13: See comment in email re: suggestion to do sensitivity study with significantly lower market prices

Page 16: DR capability is for summer or winter or either?

Page 16: In section 5, the target EE is 113 aMW

Page 57: Be more clear which climate trend you are using from the Council, as we have several projected futures

Page 66: Is there any analysis of how climate change will affect hydro availability on a monthly basis?

Page 87: Also, the achievable technical potential includes a max achievability. Did the CPA use the 7P or the 2021P assumptions?

Page 88: I read this that AEG didn't use the RBSA, which is fine if Avista has sufficient res data, but it would be good to explain this. Also, since CBSA is regional, how was it downscaled to Avista. Perhaps this is in the CPA report?

Page 89: I don't understand this sentence

Page 90: How are these adjusted? Since the 2021P starts in 2022, what recent accomplishments would be incorporated?

Page 90: I think this is a bit confusing - i would recommend breaking out the "ramp rate" from the "achievability factor", since the 85- 100% is not really the ramp rate

Page 91: Incorrect units

Page 91: Typo in figure "cumulative". Also, the terminology is getting confusing here, you mean achievable *economic* potential, right?

Page 92: It's a little confusing that this chart goes to 2045, while the above table is through 2041. Add a sentence in paragraph above about that?

Page 93: 2022-2023, right?

Page 94: If this is utility cost, not total cost, then what assumption was made for portion of total cost made for by the utility?

Page 97: I'm not sure what this is referencing. The methodology we recommend uses 5-10 years historic and/or forward-looking, data available. What is this referencing?

Page 97: Non-energy impacts could be benefits or costs

Page 97: There is also language in the report about how these values should not be used past 2022.

Page 98: Given how Avista's generation supply is getting cleaner over the IRP time horizon, is that incorporated into this analysis?

Page 98: Has applying the 10% credit for Idaho been discussed?

Page 107: I'm confused about the numbers in this bullet compared to the bullet above that indicates the TOU opt-in has a 4.3 MW potential

Page 109: Are these costs net of anything? e.g. T&D deferrals? How are incentives treated? It would be helpful to have a brief discussion of what is included in the levelized cost calcs.

Page 109: It might be nice to have these presented in order of increasing cost?

Page 111: 8 continuous hours? That is quite long for a DR program

Page 120: How is this price determined?

Page 172: How are you incorporating other states (mostly CA) clean energy policies?

Page 179: It's not clear if/how REC prices are being incorporated

Page 193: Since renewables have zero emissions, it seems that they would be more often built in a SCC world, and thus there would be less interaction between the thermal plant and the market price.

Page 194: It is not intuitive why there would be less wind in the SCC scenario

Page 229: I think this is an overly pessimistic view of HPs. Newer units that are installed well with good controls can certainly provide a capacity benefit. I see later you explore the impact of higher efficiency units which is good. This leads me to think the Avista EE program should be focused more on ensuring installed ASHP are operating optimally

Gall, James

From: Gall, James
Sent: Monday, March 1, 2021 12:01 PM
To: Tina Jayaweera; Lyons, John; Finesilver, Ryan
Cc: Daniel Hua; Kalich, Clint
Subject: RE: [External] RE: Avista's Draft 2021 Electric IRP

Hi Tina and Dan,

Thank you for the review of our document. I've conducted a quick look at your comments and it appears you spend significant time in it and we will attempt to make a number of corrections and additions. I also appreciate the comments regarding the price forecast. I have concerns that prices going forward will be extremely volatile, more than Aurora can quantify, much of this volatility will depend on how much and if capacity resources will be developed or not- I also think its appropriate to understand the risk of higher and lower prices. From my work in the short term, Avista's price forecasts are too low- specifically not including risk premiums we are seeing from resource adequacy issues we are seeing. Although, in the long run there is significant downward risk with more renewables- I guess this future will depend on how far policy makers will take goals and ambitions to actual operations and construction.

There will also likely be a feedback loop as well- such as changes in loads (both industrial losses and electrification opportunities and political changes due to ramifications of policy changes) and storage opportunities. I think storage could be key in keeping prices from getting too low- but that will depend on future costs of that technology. I guess where I'm going is there is a number of paths the future may take us and its really an issue of how much time should we make to look at the region versus our portfolio.

The way things are trending I would say more focus is going toward our portfolio. In this case the real risk of having too low of forecast for prices could have an effect of less acquisition of EE, but in the end with our requirements of having clean energy and capacity- the price forecast really only impacts a solar vs wind decision- but so far wind is winning that decision due to capacity requirements and over reliance of solar elsewhere; then they question of should we build natural gas or storage- that decision is likely a matter of carbon pricing at this point. So where I'm going is and have been pondering for some time do price forecasts really matter for resource planning- given we have fewer resources to choose from and specific requirements to meet. For example, the energy price used to be a major component of our EE avoided cost- now the highest component is social cost of carbon and non-energy benefits- its seems the world has shifted from energy price forecasts.

Thanks for raising this important issue.

James

From: Tina Jayaweera <TJayaweera@NWCouncil.org>
Sent: Friday, February 26, 2021 4:41 PM
To: Lyons, John <John.Lyons@avistacorp.com>; Gall, James <James.Gall@avistacorp.com>; Finesilver, Ryan <Ryan.Finesilver@avistacorp.com>
Cc: Daniel Hua <DHua@NWCouncil.org>
Subject: [External] RE: Avista's Draft 2021 Electric IRP

Hi Avista team,

Thanks for the opportunity to review the draft 2021 Electric IRP. Council staff appreciate the level of engagement from Avista throughout the TAC process. Attached is a copy of the IRP with embedded comments in it. Many of our comments are asking for clarification or additional detail. However, one more substantial comment from staff is on the market price forecast:

Preliminary market price forecasts for the 2021 Power Plan diverge from the pricing regime shown in this draft IRP. While understanding the underlying cause of that divergence would take a deep dive into our respective AURORA runs, given our work thus far we would expect that it's related to allowing AURORA to construct new natural gas generation outside the Northwest to replace expected retirements in the WECC thermal generation fleet (and the associated volume of those retirements).

We were given guidance from the Council and from our advisory committees to limit the potential for new natural gas generation both inside and outside the region. In doing so, we see a wave of solar and wind generation construction that depresses future market prices substantially lowering them from prices seen today. While this is largely outside of the control of the region, it presents substantial risk to regional utilities making decisions consistent with market prices that assume natural gas resources will set the marginal price.

We'd encourage all the utilities in the Northwest, including Avista, to test any IRP-based decisions against an aggressively low market price forecast. Many things are uncertain about the future of the power system in the WECC. We would not want to represent any forecast, including our own, as certain. But we do think it's a risk to consider and one that will be developing rapidly over the next few years.

While we're still working on the 2021 Power Plan, we'd be happy to share an AURORA archive file of the work done to date.

Tina Jayaweera (she/her)
Northwest Power & Conservation Council
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Subject: Avista's Draft 2021 Electric IRP

Hello TAC Members,

Attached is a copy of the draft 2021 Electric IRP for your review. Please provide any comments or edits back to us by Monday, March 1, 2021 to me at john.lyons@avistacorp.com. The final IRP and completed appendices will be filed on April 1, 2021 with the Idaho and Washington Commissions.

Our fifth and final TAC meeting will be held on Thursday, January 21, 2021. The meeting invitation and agenda will be available by the end of this week. There will also be an opportunity to provide written comments about the draft IRP to the Washington Commission and a public meeting on February 23, 2020. We will provide more details at the fifth TAC meeting.

Thank you for all of your participation in the 2021 IRP,

John Lyons
Avista Corp.
509-495-8515

USE CAUTION - EXTERNAL SENDER
Do not click on links or open attachments that are not familiar.
For questions or concerns, please e-mail phishing@avistacorp.com

February 5, 2021

Mark Johnson
Executive Director and Secretary
Washington Utilities and Transportation Commission
621 Woodland Square Loop SE
Lacey, WA 98504-7250

RE: Comments of Renewable Northwest, Docket UE-200301
Utilities and Transportation Commission's January 5, 2021, Notice of Opportunity to File Written Comments Relating to Avista's 2021 Draft Integrated Resource Plan for Electricity, Docket UE-200301.

I. INTRODUCTION

Renewable Northwest thanks the Washington Utilities and Transportation Commission ("the Commission") for this opportunity to comment in response to the Commission's January 5, 2021, Notice of Opportunity ("Notice") to File Written Comments relating to Avista Corporation d/b/a Avista Utilities' ("Avista" or "the Company") 2021 Draft Integrated Resource Plan ("Draft IRP") for Electricity, published January 4, 2021.

Renewable Northwest participated in Avista's Technical Advisory Committee ("TAC") meetings during development of the Draft IRP, and we were generally pleased with the Company's consideration of stakeholder input during its public participation phase. Still, we have noted in these comments various areas for improvement in the Draft IRP for Avista and the Commission to consider, bearing in mind the important role of this IRP to plan for compliance with the clean energy standards of Washington's Clean Energy Transformation Act ("CETA"), and as such, to inform Avista's first Clean Energy Implementation Plan ("CEIP"), set to be published later this year.[1]

In these comments, we identify areas where Avista's Draft IRP does not align with the most current resource costs and characteristics. We offer recommendations for revising Avista's flexibility analysis, resource adequacy considerations, and sensitivity analyses with the goal of nudging the Company toward a least-cost portfolio with the best likelihood of meeting CETA's clean energy standards.

[1] WAC 480-100-640

Finally, we appreciate Avista's commitment to achieving carbon neutrality in its electric operations by 2027 and to provide customers with one hundred percent carbon-free electricity by 2045.[2] We think the Company is making strides in creating a path toward meeting those goals, but we urge Avista and the Commission to consider where the Draft IRP may be hindered by traditional resource planning assumptions not relevant to an energy transformation toward a dynamic mix of non-emitting resources. We look forward to continued participation in the development of Avista's 2021 IRP.

II. COMMENTS

A. Regulatory Context

CETA broadly requires Washington utilities to achieve greenhouse gas neutrality by 2030 and to serve Washington customers with one hundred percent non-emitting and renewable electricity by 2045.[3] Utilities must identify steps to achieve these standards using the new tool of Clean Energy Implementation Plans, and those CEIPs must in turn "identify specific actions to be taken by the investor-owned utility over the next four years, *consistent with the utility's long-range integrated resource plan* and resource adequacy requirements, that demonstrate progress toward meeting the standards under RCW 19.405.040(1) and 19.405.050(1)" as well as interim targets to ensure incremental progress.[4]

The Commission worked for months with many stakeholders, including Renewable Northwest, to craft new rules aligning utility IRPs with CEIPs and CETA's substantive requirements. These new rules point to some key downstream effects of IRPs: first, "[t]he commission will consider the information reported in the integrated resource plan when it evaluates the performance of the utility in rate and other proceedings"[5]; and second, a utility's "CEIP must describe how [its] specific actions ... [a]re consistent with the utility's integrated resource plan."[6] The main takeaway of this structure is that it is important to get as much correct as possible in the IRP, as analytical missteps could have repercussions both for utility cost recovery and for achieving CETA's critically important substantive standards.

With that backdrop in mind, we offer the following comments on Avista's Draft IRP, assessing elements of the Draft IRP not only against specific provisions of the Commission's rules as

[2] Avista Connections, *available at* https://www.myavista.com/connect/articles/2019/08/this-is-clean-energy-for-the-future.
[3] RCW 19.405.040(1) & 19.405.050(1) (emphasis added).
[4] RCW 19.405.060(1)(b)(iii).
[5] WAC 480-100-238(6).
[6] WAC 480-100-640(6)(d).

appropriate, but also against the broader context of how the information in this IRP will be used in future planning, procurement, and ultimately cost recovery efforts.

B. Supply Side Resource Options

Assumptions

Avista may have rounded up its solar capital costs, judging by current estimates, but the Company should consider revising its solar capital costs to reflect the slightly lower values estimated at this time. For example, Lazard's Levelized Cost of Energy Analysis for 2020 estimates solar capital costs to lie in the range of $825 to $975.[7]

Considering Avista's assumptions for lithium-ion battery storage, we recommend the Company review the data informing the levelized cost ($/kW) for the preferred 4-hour lithium-ion battery, as there appears to be a gradual price increase after 2033 rather than a steady decline, which would be expected.[8] For example, the National Renewable Energy Laboratory's ("NREL") 2020 Annual Technology Baseline ("ATB") reports a trend of cost reductions (illustrated as $/kW in *Figure 1*) through to 2050.

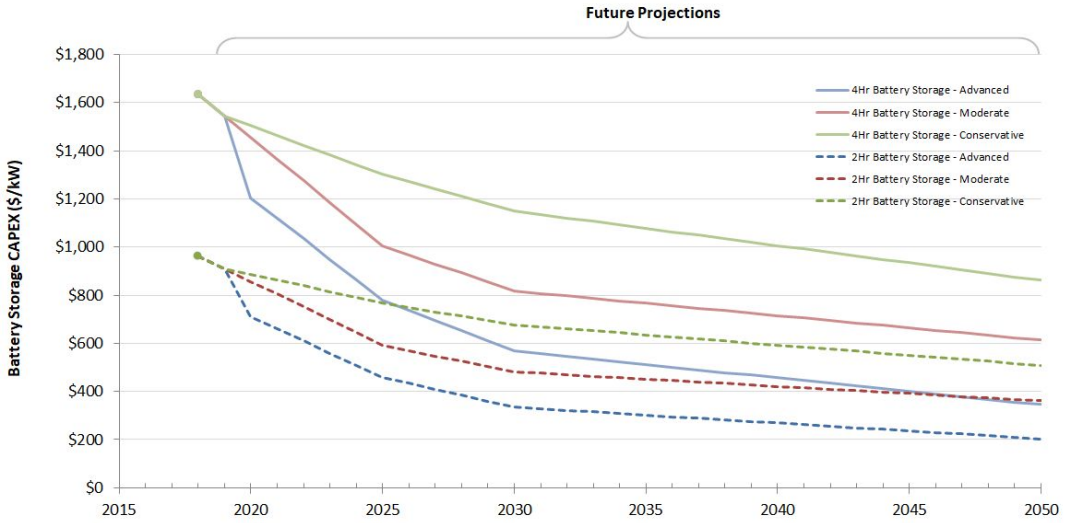

Figure 1. Li-ion battery storage projection (in $/kW) from NREL's Annual Technology Baseline 2020.[9]

[7] *See, e.g.*, Lazard's Levelized Cost of Energy Analysis (Oct. 2020), at 11, *available at* https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf.
[8] Table 9.7. Lithium-ion Levelized Cost $/kW, p. 9-14
[9] Battery Storage cost values from W. Cole and A. W. Frazier, "Cost Projections for Utility-scale Battery Storage: 2020 Update," NREL/TP-6A20-75385. Golden, CO: National Renewable Energy Laboratory, *available at* https://www.nrel.gov/docs/fy20osti/75385.pdf.

Ancillary Services Value

We appreciate Avista's proactive approach in valuing ancillary services of emerging resources using sub-hourly modeling. Because there are a number of impending questions that the Company is working through, the comments provided below will shed some light on the broader concept of system flexibility and how emerging resources are able to provide the flexibility needs arising from an increasing share of renewable resources in a reliable manner.

Flexibility has always been part of power system operation because the normal demand for electricity varies significantly on a daily and seasonal basis. Traditional approaches to planning have supported flexibility that is sufficient to meet load reliably. However, increasing renewable generation sources may make traditional approaches to planning inadequate to ensure sufficient flexibility. System flexibility can be characterized along four dimensions: first, the ***absolute power output capacity*** range (in "MW"); second, the ***speed of power output change***, or ramp rate (in "MW/min"); third, the ***duration of energy levels*** (in "MWh"); and finally the ***carbon intensity*** (in "CO_2e/MWh"). Resources which have a larger range between their minimum and maximum "MW" output, such as pumped-hydro storage systems, can provide the flexibility to adjust to a wider range of power system conditions. Resources that can change their output quickly or can be easily turned on or off, including 2-, 4- & 6-hour lithium-ion, flow battery storage systems and demand response ("DR"), have a higher ramp rate and are more flexible because they adjust faster to changes in power system conditions. Resources which can deliver energy for longer durations increase flexibility because they can address prolonged disturbances or outages. Resources such as conventional combustion turbines and combined cycle can provide dispatchable power but have low capacity utilization and are emission-intensive when ramped up or down rapidly. These different dimensions are important to consider in any holistic flexibility analysis and, thus, in calculating benefits, considering not just the frequency of flex violations but their magnitude, speed, duration, and carbon intensity.

In addition to the ADSS system, we recommend the use of the PLEXOS model to simulate generation on a sub-hourly timescale to calculate the balancing reserve requirements and the associated system costs and benefits to meet those intra-hourly dispatch requirements, as legally enforced through NERC's BAL series standards. As defined in BAL-005.5, each Balancing Authority Area is required to have Automatic Generation Control ("AGC"), calculate Area Control Error ("ACE"), and deploy balancing reserves to balance resources and demand. It is important to recognize that with the changing supply-and-demand paradigm, flexibility needs are changing as system variability migrates from load to generation. With Avista's participation in the Energy Imbalance Market ("EIM"), it has the ability to tap into the diversity benefits of multiple resources to balance their demand and supply.

At the same time, new technologies (such as controllable solar and wind power plants, battery storage systems, pumped-hydro systems, and demand response resources) and operational practices provide new options for flexibility. These emerging needs and solutions increase the benefit of a transparent flexibility value, which can help system operators efficiently maintain reliability and enable market participants to make informed investments. Controllable solar and wind power plants have the ability to respond to dispatch instructions much more quickly than conventional generators, in addition to having a zero variable cost. "Flexible solar" not only contributes to solving operating challenges related to solar variability but can also provide grid services, essentially creating dispatchable renewable power plants.[10] A similar study was conducted by Avangrid, NREL, and GE showing that a utility-scale wind power plant can provide regulation-up, regulation-down, and other grid services.[11] Since the flexibility benefit is calculated based on the difference between "day-ahead" and "intra-hour" dispatch, resources with zero variable cost and fast response times, like controllable renewable, battery storage, demand response and pumped-hydro, would generate much higher values than conventional thermal resources.[12] In addition, it has also been proven through many studies that geographical resource diversity and aggregation reduce the need for reserve requirements by reducing short-term variability.[13]

In conclusion, we appreciate the effort Avista has put into modeling ancillary services and providing draft results to stakeholders, but we recommend additional considerations to (i) operational flexibility (both up & down) offered by controllable solar and wind power plants, (ii) detailed analysis of multiple lithium-ion battery durations to the flexibility resource options, (iii) the modeling of sensitivities around the nameplate capacity of flexible resources, and (iv) the draft value of "diversity savings" from participation in the EIM. In addition, it would be useful to see different dimensions of the flex violations and how they are being addressed using the fleet of resources modeled in the flex analysis conducted using PLEXOS. We are also interested to view the flex benefit results coming out of the modeling for pumped-hydro and DR resources, which we believe would be higher than conventional solutions to provide the necessary intra-hourly supply and load flexibility.

Resource ELCC Analysis

[10] Investigating the Economic Value of Flexible Solar Power Plant Operation First Solar & E# Study. October 2018. https://www.ethree.com/wp-content/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf

[11] Avangrid Renewables: Demonstration of Capability to Provide Essential Grid Services.. http://www.caiso.com/Documents/WindPowerPlantTestResults.pdf

[12] Determining Utility System Value of Demand Flexibility From Grid-interactive Efficient Buildings. https://pubs.naruc.org/pub/2E1DDEEC-155D-0A36-3137-0FC3D941B1A4

[13] Ancillary Service and Balancing Authority Area Solutions to Integrate Variable Generation. Available at: https://www.nerc.com/files/ivgtf2-3.pdf

While we appreciate the detailed analysis that Avista has conducted and the provision of peak capacity credit values for different supply side resource options, we are concerned that these values significantly under value storage and hybrid resources.

To start, the Draft IRP references an E3 report in stating that, "4-hour duration storage can provide high levels of resource adequacy in small quantities because it has other resources to assist in its re-charging; but as its proportion gets larger, there is not enough energy to refill the storage device for later dispatch."[14] This statement is confusing and misrepresents operating characteristics and values of energy storage systems. As we know, reliability should be valued during the times when the system is in stress (i.e. hours with the highest probability of loss of load). As Avista mentions, 4-hour duration storage can provide high levels of resource adequacy. The quantity of adequacy depends on the operating characteristics of the power plant and how it is being operated to meet the reliability risks. In addition, storage capacity can be easily refilled during off-peak hours when solar and wind are usually curtailed (mid-morning for solar and late night for wind), either directly or indirectly, from the grid. It is also worth noting that hybrid resources are not physically restricted to charge from the renewable component since the Federal Investment Tax Credit (ITC) is a financial not a physical restriction. Thus, a power plant operator may choose to charge the storage partially from the grid to ensure that it meets the capacity requirement during critical periods.

The Draft IRP also mentions that "[h]igher levels of penetrations for renewables may lower their effect on resource adequacy." While this statement is true due to diminishing marginal ELCC from increasing penetration of renewables, it is also true that the capacity credit of storage increases with increasing penetration of renewables since they are complementary resources, by changing the shape of net demand patterns and effectively shifting delivery of energy to meet the reliability needs.[15] An analysis conducted by Astrape Consulting commission by joint IOUs in California showed that solar paired with 4-hour storage provides greater than 95% ELCC on average including analysis and values pertaining to the BPA region.[16] Avista's value provided in Table 9.12 shows a 17% value which is extremely low based on recent IRP filings and technical reports in the region. Therefore, we recommend Avista study for its final IRP the different operational configurations and characteristics of hybrid resources and standalone storage to correctly evaluate the resource ELCC value.

[14] P. 9-27

[15] The Potential for Battery Energy Storage to Provide Peaking Capacity in the United States. Denholm et al, 2019. Available at: https://www.osti.gov/biblio/1530173-potential-battery-energy-storage-provide-peaking-capacity-united-states

[16] 2020 Joint CA IOU ELCC Study Report 1. Astrape Consulting. August 2020. Available at: https://www.astrape.com/2020-joint-ca-iou-elcc-study-report-1/

C. Preferred Resource Strategy

To begin, we request that Avista incorporate the results of its 2020 Renewable RFP in the preferred resource strategy ("PRS") for its final IRP, including how Avista's improved knowledge of current market prices may adjust resource assumptions informing the 2021 IRP model.

We appreciate Avista's transparency in revealing that the early economic contractual exit from Colstrip Units 3 & 4 would benefit its Washington and Idaho customers. If the joint owners of this resource were to agree on the terms of early exit from or retirement of these units, it would in part be because of this modeling effort by Avista. However, we recognize the complexity of exiting a jointly-owned resource, and we understand Avista's decision to maintain the 2025 Colstrip exit date in its PRS.

As indicated above, Avista may be undervaluing storage and hybrid resources, especially considering Washington's and the entire region's transition away from fossil resources, thus increasing the penetration of renewables on the grid and the capacity credit of storage. Avista does note their intention to study additional benefits of storage by modeling additional scenarios including price and renewable penetration.[17] We hope Avista will conduct these analyses to inform the PRS of the final IRP, as we urge the Company and the Commission to acknowledge that traditional methods of resource planning -- especially those driving standards for determining resource adequacy -- will likely continue to favor new natural gas builds and delay the clean energy transition.

Avista mentions throughout the Draft IRP that upon exit from coal contracts by 2025, limited capacity options are available as replacement. For example, Avista notes, "With the exit of Colstrip and the expiration of the Lancaster PPA in the fall of 2026, the PRS adds 211 MW of natural gas-fired CTs. The 2020 IRP assumed the capacity lost from Colstrip and Lancaster could be met with long duration pumped hydro, but the updated cost and construction schedule information for pumped hydro caused this resource to not be selected in this IRP."[18] For the Commission and stakeholders to better understand why Avista's capacity needs can only be met with new natural gas peaking capacity, we recommend that Avista provide at its upcoming TAC meeting or publish in its final IRP a projected loss-of-load event, displaying by hour where there is a deficiency in available capacity. This could be in the form of a 12x24 matrix of the peak demand or hours with the highest loss of load probability which were used to calculate the ELCC values for all resources.[19]

[17] P. 9-26
[18] P. 11-5
[19] *See, e.g.,* Energy+Environmental Economics (E3), "Capacity Value Framework & Allocation Options," Oregon

D. Portfolio Scenario Analysis

While there is certainly value in many of Avista's twenty modeled sensitivities, we recommend the Company conduct one additional analysis to better understand how policy-driven changes in Avista's resource mix should impact the way the Company plans for meeting demand reliably and at least cost. For example, especially considering our previous comments regarding pricing and ELCC values for storage resources, a sensitivity analysis of must-take storage (not limited by resource type or duration characteristics) combinations in place of new natural gas peaking plants would inform Avista how much current storage technologies would change levelized portfolio costs. Avista's Portfolio #5 -- "Clean Resource Plan (2027)" -- does not prohibit new gas procurements, and Portfolio #6 -- "Clean Resource Plan (2045)" -- does prohibit new gas procurements but curiously allows Colstrip to exit at any time.[20]

III. CONCLUSION

Renewable Northwest thanks Avista and the Commission for its consideration of this feedback. We are optimistic that the changes and additional analysis we have recommended above will help Avista to identify a least-cost portfolio that also puts the Company on a path to achieving CETA's clean energy standards and the company's own emission reduction goals. We look forward to continued engagement as a stakeholder in this 2021 IRP process.

Sincerely,

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Public Utilities Commission (UM 2011) at slide 39 (Jul. 9, 2020), *available at* https://edocs.puc.state.or.us/efdocs/HAH/um2011hah17397.pdf.

[20] P. 12-6

Rye Development

220 NW 8th Ave. Portland, OR 97209

February 5, 2021

Puget Sound Energy
355 110th Ave NE
Bellevue, WA 98004

RE: Comments of Swan Lake and Goldendale
Avista Corporation – Draft Integrated Resource Plan
UTC Docket UE-200301

The companies working to develop the Swan Lake and Goldendale pumped hydro storage projects ("Swan Lake and Goldendale") appreciate Avista Corporation's ("Avista") work that went into preparing its draft Integrated Resource Plan ("Draft IRP"), which was filed in the above-referenced proceeding on January 4, 2021. The Washington Utilities and Transportation Commission ("Commission") subsequently issued a notice, on January 5, 2021, indicating it would accept comments on Avista's Draft IRP until February 5, 2021.[1] In response to that notice, Swan Lake and Goldendale are filing these comments.

These comments advocate for Avista to further consider pumped storage resources instead of new natural gas facilities, which are politically infeasible to build and do not align with Washington State's Clean Energy Transformation Act ("CETA" requirements. Specifically, these comments: (1) seek further information regarding Avista's modeling and assumptions for pumped storage; (2) argue that Avista should not seek to construct new gas facilities, given the current political realities associated with new gas facilities and CETA's requirements; and (3) advocate for Avista to issue a capacity request for proposals ("RFP") as soon as possible, as an RFP is the only mechanism through which Avista will receive accurate pricing and capacity proposals, particularly for large resources like pumped storage.

I. Overview of Pumped Storage in the Draft IRP

According to Avista's Draft IRP, long duration pumped hydro storage was identified as the capacity resource to meet future long duration deficits; however, it appears the Draft IRP did not include them in the Preferred Resource Strategy because "long duration pumped hydro is likely available later than the timelines used in the 2020 IRP and at higher costs."[2] As a result, the Draft IRP states, "The resource analysis identifies a natural gas CT to replace resource deficits if pumped hydro is not a feasible resource to meet the 2026 shortfall."[3] These statements suggest that pumped storage was Avista's preferred resource, if not for a mismatch in timing and updated cost figures.

[1] Notice of Opportunity to File Written Comments, Docket UE-200301, Jan. 5, 2021, available at: https://www.utc.wa.gov/_layouts/15/CasesPublicWebsite/GetDocument.ashx?docID=11&year=2020&docketNumber=200301.
[2] Draft IRP at 14-5.
[3] *Id*.

Through these comments, Swan Lake and Goldendale suggest that Avista reconsider including pumped storage in its Preferred Resource Strategy. Specifically, as further explained below, Swan Lake and Goldendale are two of the most mature projects in the region, one of which (Swan Lake) is likely to be available in 2026, which matches Avista timeline of capacity need. Furthermore, Swan Lake and Goldendale are in the process of refining their cost assumptions and, should Avista issue an RFP, would likely be able to provide update cost figures that may make pumped storage a more attractive option, particularly considering the infeasibility of constructing a new natural gas plant, as explained below.

II. Swan Lake and Goldendale Request Further Information on Avista's Modeling Assumptions for Pumped Storage

Swan Lake and Goldendale appreciate that Avista has been forthcoming with a significant amount of data that was used to develop the Draft IRP. That said, Swan Lake and Goldendale request Avista provide some additional information and data on the modeling assumptions used for the various pumped storage resources considered in the Draft IRP. Specifically, Swan Lake and Goldendale request further information regarding: (1) the "state of charge" assumed by Avista in order to develop its capacity values for pumped storage, as seen in Table 9.12; (2) what duration Avista assumed for the useful life of a pumped storage project; and (3) whether Avista's analysis of pumped storage considered the Swan Lake project specifically, which is expected to be available in 2026 and, therefore, aligns with Avista's capacity need.

a. Swan Lake and Goldendale Request Further Information on Avista's Modeling Assumptions Regarding a Pumped Storage Project's State of Charge

Swan Lake and Goldendale believe one of the impediments to long-duration pumped storage performing even better in Avista's Draft IRP is the very low capacity values being assigned to pumped storage resources. For example, Table 9.12 indicates an 8-hour pumped storage project would only contribute 30% to Avista's peak capacity need, and even a 12-hour project would contribute only 58%.[4] Considering these figures are much lower than Swan Lake and Goldendale would expect, and drastically lower than those used by other utilities in the Pacific Northwest,[5] Swan Lake and Goldendale request that Avista provide further information regarding the assumed "state of charge" for these resources. Swan Lake and Goldendale assume the "state of charge" assumptions are the genesis for these low figures.

If the highest priority for pumped storage is reliability, then Avista would always have the ability to charge it for its longest available durations, eight hours or more. Understanding that Avista will always prioritize reliability over economic optimization, adjustments to the state of charge modeling may be appropriate. Swan Lake and Goldendale believe that Avista's model may be using a very low state of charge entering into the next operating day for pumped storage (possibly as low as 20% pond fill); however, this planning assumption does not align with the operational

[4] *Id*. at 9-28, Table 9.12.

[5] Swan Lake and Goldendale would also note for the Commission's benefit that both PacifiCorp and Portland General Electric use capacity contribution figures in the range of 80-95% for pumped storage in their respective IRPs.

realities associated with operating hydro or pumped storage facilities. Operationally, peak load days are fairly predictable, meaning that Avista's operations folks would set up for those days in advance to ensure its hydro (or pumped storage) facilities have sufficient pond fills to cover the expected peak load hours. Furthermore, the pumped hydro facility would not necessarily need to deplete its full reservoir daily to address capacity needs (low frequency of 8-hour reliability events), reducing the total amount of charging required to address all potential loss of load events.

A low capacity contribution value (ELCC) for pumped hydro implies that the facility is energy limited and does not have access to the market or other on-system resources to charge for peak load events. Swan Lake and Goldendale understand that Avista may be concerned about the evolving market for peak import assumptions during the winter, given the emerging regional capacity shortage documented in several NWPCC studies. However, import assumptions during off-peak hours in the winter should be re-visited, given that these would be key hours when long-duration storage would charge for the winter on-peak reliability. Additionally, if not already doing so, Swan Lake and Goldendale recommend that Avista consider optimizing the dispatch of their resources over a wider time window (1-2 weeks). A wider optimization time window in resource adequacy models allow for greater operational flexibility of long duration storage and minimize the need for daily charging and discharging. For the foregoing reasons, at minimum, pumped storage should be treated like a traditional hydro facility with storage capability, which the Draft IRP assigns a 60-100% peak capacity credit.[6]

b. Swan Lake and Goldendale Request Further Information on Avista's Assumed Useful Life for a Pumped Storage Project

Similarly, Swan Lake and Goldendale request that Avista provide further information on the assumptions they used for the expected useful life of a pumped storage project. Swan Lake and Goldendale's experience—which is informed by discussions with pumped storage turbine manufacturers and industry examples throughout the U.S. and abroad—suggests that a pumped storage resource's useful life is, at minimum, 40 years, and more likely will last 50 years or more. Using an appropriate useful life will ensure pumped storage's costs are properly considered over the long time horizon in which a pumped storage resource will continue to reliably operate.

c. Swan Lake and Goldendale Request Further Information on Whether Avista's Pumped Storage Analysis Specifically Considered the Swan Lake Project

Given the statements in the Draft IRP noted above regarding a potential mismatch of timing, Swan Lake and Goldendale request further information from Avista on whether it specifically considered the Swan Lake project. While both Swan Lake and Goldendale are among the most mature and viable pumped storage projects in the region, it appears Avista's analysis assumes Swan Lake will not be available to meet its small 2026 capacity need of 12 MW, nor would Swan Lake be available to meet the much larger need of 301 MW in 2027.[7] However, Swan Lake is expected to achieve commercial operation in late-2026, so Swan Lake and Goldendale are concerned that Avista's

[6] Draft IRP at 9-28, Table 9.12.
[7] *See id*. at 7-3.

analysis is not considering the Swan Lake project, despite it being a viable option that aligns with Avista's capacity needs.

Furthermore, Avista's capacity figures assume Colstrip remains part of its portfolio through 2025; however, this assumption may not be prudent, considering the faster-than-expect push to retire coal plants throughout the region. In a scenario where Colstrip retires earlier than expected—which Swan Lake and Goldendale believe is more likely than not—Avista's capacity need would significantly increase, thereby further supporting Avista's early action on a potential capacity RFP, as further explained in Section IV below.

III. The Draft IRP Should Remove New Natural Gas as a Viable Resource Option

In addition to the CETA requirements that mandate the removal of emitting generation sources from Avista's generation portfolio, Governor Inslee also recently announced legislation that would phase out all natural gas in homes and businesses by 2050.[8] Furthermore, Avista has a stated goal of having a carbon neutral electricity supply by 2027 and having 100 percent clean electricity by 2045.[9]

Given these recent developments, which highlight the unfriendly political environment for natural gas, instead of proposing to construct new natural gas facilities, Avista should focus its efforts on a Preferred Resource Strategy that aligns with both CETA and this evolving political landscape. To the extent Avista believes new natural gas resources are allowable under CETA, Swan Lake and Goldendale request that Avista provide a detailed explanation for why a new gas resource would meet one of the few and limited CETA provisions allowing construction of such resources, particularly including violation of reliability standards and, if violations are possible, whether pumped storage could help alleviate or solve those potential violations. Furthermore, considering the unfriendly political climate for new gas resources and Avista's own commitments to transitioning to a carbon-free future, Swan Lake and Goldendale request that Avista re-run its IRP analysis with a constraint of no new natural gas resources. Doing so would likely result in pumped storage being in the Preferred Resource Strategy, considering the statements noted above.

Swan Lake and Goldendale would also remind Avista and the Commission that, Avista need only look to Portland General's IRP process for evidence of the political realities associated with permitting new gas resources. Specifically, a few years ago, Portland General attempted to expand its Carty Generating Station (referred to as "Carty 2"). When Portland General proposed expanding the capacity of Carty in its IRP process, significant stakeholder opposition immediately arose and effectively killed the gas-fired plant as a potential solution to meet Portland General's future capacity needs. Therefore, Avista should be aware that environmental groups, renewable resource developers, and many stakeholders will likely align to uniformly oppose any new gas facility. As a result, Avista should instead remove new gas as an option from its Draft IRP and re-

[8] *See Washington State Proposes Legislation to Phase Out Natural Gas Utility Service*, S&P Global, Jan. 6, 2021, available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/washington-state-proposes-legislation-to-phase-out-natural-gas-utility-service-61819435.

[9] *Avista Declares Clean Electricity Goal*, April 18, 2019, available at: https://www.myavista.com/-/media/myavista/content-documents/our-environment/cleanelectricitygoalnewsrelease-pdf.pdf.

run the analysis to determine a Preferred Resource Strategy that aligns with both CETA and Avista's own climate goals.

IV. Swan Lake and Goldendale Strongly Support Avista Issuing a Capacity RFP As Soon As Possible

In the Draft IRP, Avista indicates may release a capacity RFP as early as 2021. Specifically, the Draft IRP states, "To meet the January 1, 2026 capacity shortfall and to validate Avista's preferred choice of long duration pumped hydro to meet this deficit, Avista may release a capacity RFP as early as 2021. . . Avista is still committed to releasing a capacity RFP subject to the needs of the final 2021 IRP."[10] Swan Lake and Goldendale strongly support Avista's plan to release a capacity RFP as soon as possible.

While Swan Lake and Goldendale have highlighted some of their concerns regarding the modeling and assumptions used for pumped storage in these comments, the only accurate way for Avista to fully evaluate potential pumped storage projects—including the various projects' pricing information, timing for construction, and whether the operating characteristics align with Avista's needs—is through actual proposals received through an RFP. Without an actual offer submitted through an RFP, Avista will be relying on its own assumptions and expectations regarding the price, timing, and operating characteristics of pumped storage. Furthermore, because pumped storage resources are relatively unfamiliar to many utilities in the Pacific Northwest, these resources are at a disadvantage in the IRP modeling and evaluation process, particularly when compared to other resources with which utilities are more familiar and have better data.

Therefore, Swan Lake and Goldendale overwhelmingly support Avista issuing a capacity RFP as soon as possible to evaluate potential clean-capacity resources to meet its identified capacity needs. Swan Lake and Goldendale request that Avista confirm its intention to do so and, if necessary, the Commission and Commission Staff specifically direct Avista to prepare and issue such an RFP as promptly as possible.

[10] Draft IRP at 14-5.

V. Conclusion

Swan Lake and Goldendale appreciate the opportunity to provide these comments on the Draft IRP. While Swan Lake and Goldendale are encouraged by some of the statements in the Draft IRP that suggest pumped storage is the preferred resource, Swan Lake and Goldendale believe further work needs to be done on the pumped storage modeling and analysis, as well as to remove natural gas as a viable option for fulfilling Avista's future capacity needs.

If you have any questions, please contact the undersigned.

Sincerely,

/s/ Nathan Sandvig

Nathan Sandvig
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February 5, 2021

Mark Johnson, Executive Director/Secretary
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Re: Avista 2021 Draft Integrated Resource Plans for Electricity and Natural Gas
Dockets UE-200301 (electricity) and UG-190724 (natural gas)

Mr. Johnson;

The NW Energy Coalition ("NWEC" or "Coalition") appreciates the opportunity to comment on the draft Integrated Resource Plan ("IRP") submitted by Avista Utilties on January 4th, 2021, per the Notice of Opportunity to File Written Comments issued by the Commission on January 5th, 2021.

The Coalition is an alliance of more than 100 organizations united around energy efficiency, renewable energy, fish and wildlife preservation and restoration in the Columbia basin, low-income and consumer protections, and informed public involvement in building a clean and affordable energy future.

The Coalition notes Avista's timely submission of a draft integrated resource plan (IRP) in compliance with the schedule established by the Commission. We hope our comments will be useful in revising the IRP for its final submission. The utilities must soon prepare their first CEIPs under CETA. It is extremely important that the IRP/CEAP be technically correct and thorough, since it "informs" the CEIP. The specific actions the utility plans to undertake as described in the CEIP per 19.405.060(1)(b)(i) and (iii) are intended to be informed and consistent with the IRP. Shortcomings in an IRP/CEAP must not be used as a means to limit the utilities' attainment of CETA standards in their CEIP. A CEIP based on an insufficient IRP/CEPA analysis that fails to create a path towards meeting the 2030 standards will not be acceptable.

Our comments address both the overall context for planning and specifics issues in the IRP.

The standard for integrated resource planning has changed

Unlike previous planning cycles, CETA unequivocally established standards for 2030 and 2045. The approach to integrated resource planning and resource acquisition planning should have changed accordingly. IRPs are no longer simply analyzing lowest reasonable cost alternatives,

but lowest reasonable cost alternative *pathways that lead to achieving the 2030 and 2045 standards*. That is the analysis needed to provide the data and context for specific targets and actions in the CEIP.

CETA's intent is to transform the electric system - it requires a utility to: (1) eliminate coal fired resources from a utility's allocation of electricity by the end of 2025; (2) achieve cost-effective conservation and efficiency to reduce load; (3) reduce demand as much as possible with demand response actions; and (4) use electricity from renewables and non-emitting generation 1 to serve 80% of the remaining retail load by 2030, and 100% by 2045.

This first round of IRPs under CETA should be clearly focused on how to reach the goals, not how to approximate the standards or to reach a utility's own vision of "carbon neutrality", while ignoring the statutory requirements.

Avista's explanation for the Clean Energy Targets table (CEAP p. 15-4, table 15-2) indicates that may be the case in the CEAP. Avista raises the strawman that "use" of electricity from renewable and non-emitting sources means "minute-by-minute tracking" of electrons. That is not the case. While the rules regarding "use" are still being developed, the language of the statute is clear. As Avista states in the introduction to the CEAP "this Action Plan is subject to change prior to the April 1, 2021 IRP filing date to account for potential renewable resource acquisitions from the 2020 Renewable FRP and as final CETA rules by the Washington Utility and Transportation Commission (WUTC) are issued". An IRP should analyze the various pathways to meet the standards as set out in statute.

For example, using the data from that chart for a quick "back of the envelope" calculation, it appears likely that Avista could meet the 2030 compliance standards for using electricity from renewables and non-emitting to meet the 80% standard. Using the data in WA Clean Energy Targets table 15.2, adjusting the net retail load of 641 aMW in 2030 to 80% amounts to 512.8 aMW. Most of that can be met with the 436 aMW from the renewable resources Avista already owns. The shortfall of 76.8 aMW can be met with a little more than half of the planned 144 aMW from Montana wind. The 20% portion of retail sales, or 128.2 aMW, could be met with various other resources listed on that chart.

Key Outcomes for the 2021 Avista IRP

The Avista 2021 IRP has two high priority tasks:

- First, to set a new direction in electric system planning in accordance with the policy direction and compliance requirements of CETA. Both the policy and compliance aspects are important.

- Second, to address system needs after the conclusion of 222 MW of coal plant service to Avista customers by the end of 2025, as required by CETA, and other system changes, especially the termination of the Lancaster 257 MW natural gas contract in 2026.

Recognizing that the draft IRP takes significant steps in the right direction, NWEC believes additional improvements can be made for both tasks. We address these questions below in two sections focusing on the overall IRP and the 2027 preferred resource portfolio.

While the draft IRP is not fully complete, Avista has presented a clear and detailed analysis, provided work products and responded to stakeholder questions. The preferred portfolio continues to develop energy efficiency and begins to lay out a strategy for acquiring demand response resources, although we believe the targets can be increased and the pace can be accelerated. The treatment of new renewable resources is somewhat more mixed, as described below. Finally, significant improvement is needed for both the cost and capacity value battery and pumped storage.

We also give special commendation to Avista's Energy Equity analysis in chapter 13. This is a strong first step in assessing energy burden and service quality across Avista's Washington service territory, especially for vulnerable populations and highly impacted communities. Avista's work is already setting a standard for utilities across the Northwest. We look forward to further enhancements, including assessment of whether services and programs for customer side resources like energy efficiency, demand response, distributed generation and electric vehicle support are equitably available.

All that said, a significant question still should be addressed. While the draft IRP anticipates retirement of Colstrip coal as early as 2021 and Lancaster gas in 2026, we are concerned about the addition of 211 MW of new gas peaking capacity in 2027 to help address the gap. A new peaker unit of that size would have a capital cost above $200 million, with additional fixed and variable O&M including fuel cost, and would continue in operation for many years. We believe further analysis will show that there are substantial available and cost-effective clean energy resources that can defer or eliminate this new emitting resource.

Cross-Cutting Issues for CETA Policy and Compliance

A. Natural Gas Resource Risk

Even if the Avista gas fleet as a whole operates at a lower annual capacity factor over time, continued additions of new gas capacity resources could pose both reliability and cost concerns. Recent episodes including the BC pipeline explosion in October 2018, ongoing restrictions in pipeline delivery and Jackson Prairie storage through the spring of 2019, and more recently maintenance problems on the Williams pipeline through the Columbia Gorge in the fall of 2020, highlight the tenuous situation for gas deliverability.

B. Market Reliance

We commend Avista for a thorough market analysis (chapter 10) and provide the following observations.

The price and availability risk in the short-term market (primarily the Mid-C trading hub) has been growing in recent years. Underlying recent price disturbance episodes, including very high prices in February-early March 2019 due to exceptionally cold weather and gas delivery constraints, there is an underlying structural change in the Northwest bilateral market with two key drivers.

First, a recent PacifiCorp presentation in an IRP workshop shows that the transaction volume for the Mid-C trading hub has basically fallen in half over the last five years. There is some evidence that much of the decline is the result of transactions moving to the Energy Imbalance Market which is more liquid and has a favorable real-time pricing regime compared to the outmoded high load hour/low load hour Mid-C construct. While EIM energy flows to load in an economically beneficial manner, the EIM cannot assist with day-ahead and operational unit commitment and dispatch.

Second, the retirement of Northwest coal resources and other changes is continuing to diminish market supply relative to demand. This poses increasing price and availability risk going forward.

Two other developments may counter the trend somewhat. For short term capacity, the proposed Northwest Power Pool resource adequacy program could alleviate peak risk both through advance commitments and an operational program. On the energy side, the Enhanced Day Ahead Market expansion of the EIM could move forward, providing much deeper and more liquid market access.

All that said, we conclude that the short-term market is increasingly risky, but we are also confident that enhanced development of clean energy resources can help reduce market exposure.

C. Social Cost of Greenhouse Gases (SCGHG)

The IRP analysis states "construction and operational greenhouse gas emissions are considered and priced using the SCC", but that the SCGHG was not applied to market purchases and sales in the PRS as done previously. The reason for the change from previous practice is not clear. The statute at 19.280.030(3)(a) states a utility must incorporate the SCGHG when evaluating and selecting conservation policies, programs and targets; when developing integrated resource plans and clean energy action plans; and when evaluating and selecting intermediate term and long-term resources. The SCGHG is a variable cost used in planning to internalize the costs of emitting CO2e. The SCGHG does not function as a tax that is passed through to customers. In the *modeling* process, for both the IRP and CEAP, the SCGHG should be applied to variable costs, dispatch modeling and unspecified or fossil fueled market purchases.

The impact of adding the SCGHG to market purchases is tested in portfolio #19 – SCC on Purchases/Sales Resource Selection (IRP p. 12-29). This results in relatively little impact relative to the PRS portfolio, except to select less solar. That result might well change if hybrid resources, such as solar+battery were assessed, instead of charging storage with market purchases.

Further, the Optimized SCGHG Carbon Future Portfolio shown in Table 12.24 not only improved costs over the PRS, reduced natural gas by 88MW and increased energy efficiency and wind. This option also reduced solar, but probably for the same storage charging reasons as in portfolio #19.

In the final IRP/CEAP Avista should model a portfolio in which the SCGHG is optimized as a variable cost and applied to unspecified and fossil fueled electricity brought in state for customer use. This portfolio should also include hybrid resources, as discussed later.

D. Upstream Methane Emissions

An issue linked to the application of SCGHG is the life cycle emissions for gas power plants. As we explained in a submission to the Northwest Power and Conservation Council,[1] recent peer-reviewed research has revised upstream methane emissions factors sharply upward. Because of the current and proposed new addition of natural gas generation, we urge Avista to revisit this issue and adjust the upstream methane emissions factor represented in the Social Cost of Greenhouse Gas analysis.

2027 Preferred Resource Portfolio

With the cessation of coal power supply after 2025 and the expiration of the Lancaster gas contract in 2026, the year 2027 is a useful point for evaluating system need and proposed new resources.

In 2027, the draft IRP indicates a need for 301 MW of capacity. The draft proposes to fill the gap with ongoing energy efficiency, the beginning of a demand response program, 200 MW of Montana wind, a 12 MW upgrade at Kettle Falls, and 211 MW of peaker resources (85 MW for Idaho and 126 MW for Washington/Idaho).

NWEC believes further review is needed on several categories of clean energy resources to see if they can provide additional capacity value and defer or eliminate the need for new peaker resources.

[1] NWEC letter to Northwest Power and Conservation Council, June 15, 2020, https://www.nwcouncil.org/sites/default/files/2020_0616_2.pdf

A. Two Types of Capacity Need

The pivotal point to understand about the period after 2026 is that there are basically two types of capacity need. We refer to these as typical and long-duration peak periods.

A typical peak period is that observed in most years, where demand peaks within a range described by the median or "1-in-2" demand forecast.

Once or more per decade, a long-duration peak condition may occur, with extended high daily peaks that may recur for two or more consecutive days, as reflected in a "1-in-10" forecast. In the winter, these conditions may occur during very cold "Arctic express" periods where demand is very high on a sustained level and renewable energy production is low. In such conditions, the entire Northwest will be energy limited, market supply will be very expensive and perhaps restricted, and gas supply from Canadian sources and storage withdrawals may also be constrained.

In the late summer, similar heat wave conditions may occur. The reduced availability of hydro peaking compared to winter stress conditions is an additional factor.

The question we pose is whether a staged approach to capacity need could provide a balanced 2027 resource portfolio that is better aligned with CETA policy guidance while meeting reliability needs cost-effectively.

The first stage involves maximizing the availability of so-called "energy limited" clean flexible resources, including demand response and storage. These are generally considered to provide capacity value of 4 hours duration and should suffice for meeting needs during typical peak periods.

In the second stage, meeting rare long-duration peaks requires supplemental resources. The draft IRP suggests that new peakers can meet these supplemental needs. But once these very expensive and high-emitting new peakers are put into the resource mix, the IRP models will dispatch them not only for very infrequent long duration high peaks, but much more often across the year because they are now "existing" resources. As a result, these new peakers will displace less expensive, non-emitting resources. This creates a lost opportunity for CETA compliant clean energy resources.

Avista should investigate the availability of firm capacity or other term resources to meet infrequent long-duration event needs, for example from regional imports or merchant gas plants. As time goes on, those resources could be replaced with new long-duration storage from sources such as renewable hydrogen, renewable natural gas and pumped storage.

Below, we suggest the additional potential for clean flexible resources including demand response, storage and hybrids to meet typical peaks.

B. Demand Response

The Conservation Potential Assessment (CPA) includes estimates for the technically available potential of demand response, and the preferred portfolio includes initial steps toward achieving that potential.

The CPA summarizes the technically achievable potential for DR at 90 MW in 2025 (about 5.1% of peak load) and 170 MW in 2045 (almost 10% of peak). NWEC agrees that this is a reasonable magnitude for total potential, but we believe it can be achieved considerably faster.

The preferred portfolio indicates 53 MW of DR in 2027 (3% of peak) in 2027. We believe further assessment will show this amount can be increased.

For example, we estimate about 7 MW per year of technically achievable potential is available from one specific resource – stock turnover and conversion to grid enabled residential electric water heaters, or about 35 MW between now and 2027. In addition, new construction and gas-to-electric conversions could increase the potential. This resource is facilitated by Washington's incoming requirement for all new electric water heaters to have a CTA-2045 communications interface, providing a common access standard.

It remains to be seen what level of customer participation can be achieved for a grid enabled water heater program, but we anticipate that with effective customer engagement strategies it can be higher than the 50% saturation assumed by Avista and the savings potential of 48.9 MW by 2045 can be increased and significantly accelerated.

For demand response and load management as a whole, it is apparent that program launches can be moved forward considerably. In the Clean Energy Action Plan, Table 15.1 indicates that the first programs will appear in 2024, and the last in 2031. It would make more sense to launch a coordinated set of DR programs earlier so they can scale up rapidly to meet capacity need in 2027 and beyond. Portland General Electric has already succeeded in taking that path, including both coordinated pilot programs and the Smart Grid Testbed. Their new Flexible Load Plan lays out a strategy for moving DR to full maturity in the next 5 years.

Table 15.1: Demand Response and Load Management Programs

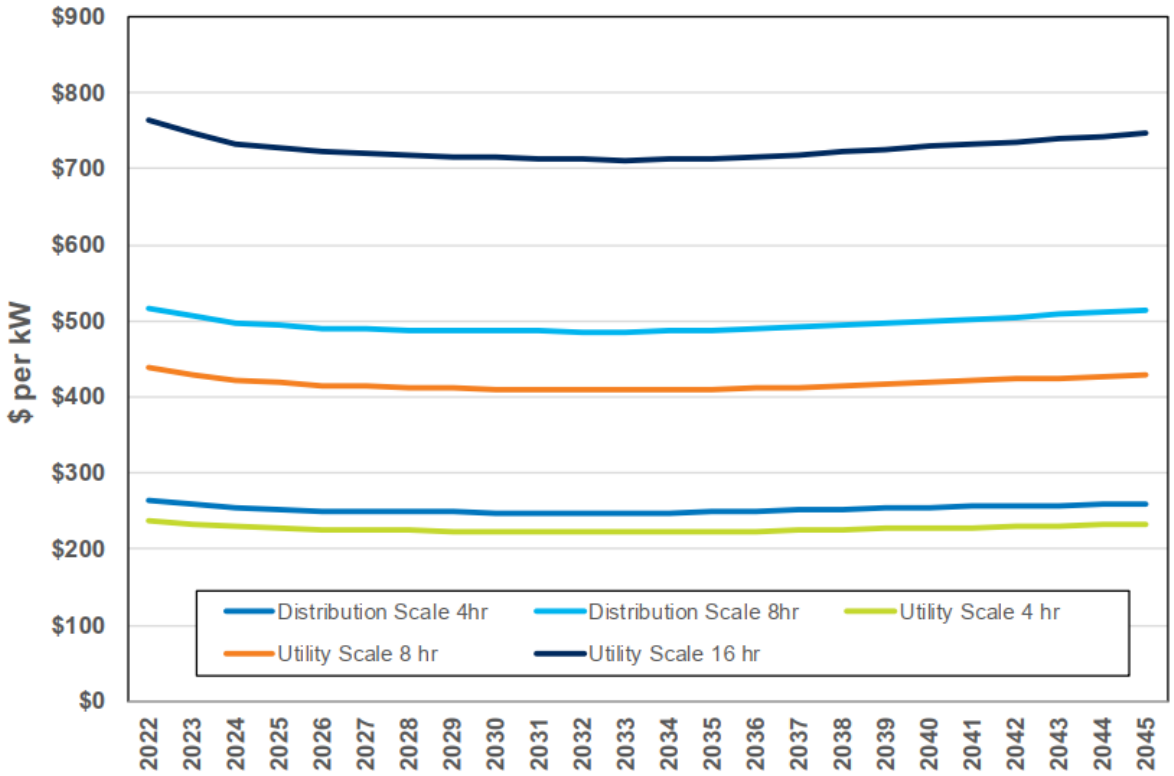
Program	Washington
Time of Use Rates	3.1 MW (2024)
Variable Peak Pricing	8.9 MW (2024)
Large C&I Program	25.0 MW (2027)
DLC Smart Thermostats	0.6 MW (2031)
Total	37.6 MW (2031 Total)

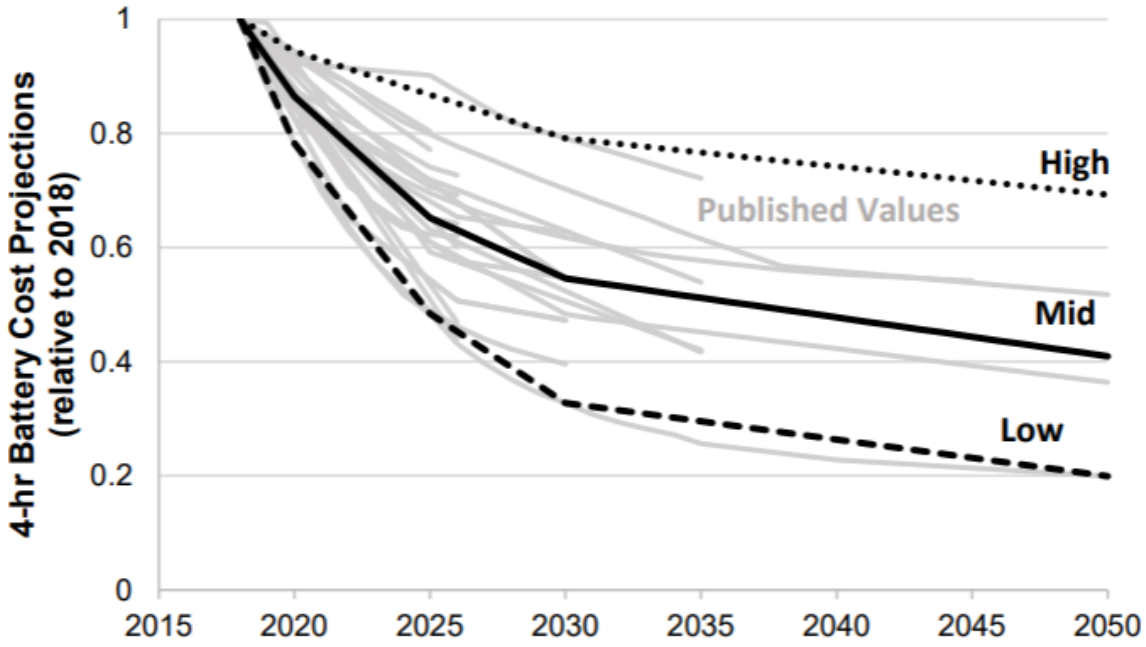
C. Storage Cost

NWEC believes that most of the reference resource costs in the draft RFP are in the reasonable range, though we may have different views on specific resources and future cost trajectories.

However, the future costs for batteries and pumped storage simply don't seem reasonable. The values in Figure 9.1 show slight declines in battery costs, and then flat or rising costs through the remainder of the planning horizon. Most other estimates show consistently declining costs through the coming decades, though at varying rates.

Figure 9.1: Lithium-ion Capital Cost Forecast





Cost Projections for Utility-Scale Battery Storage, National Renewable Energy Laboratory (2019). NREL/TP-6A20-73222, https://www.nrel.gov/docs/fy19osti/73222.pdf

Turning to pumped storage, the draft IRP states:

> With the exit of Colstrip and the expiration of the Lancaster PPA in the fall of 2026, the PRS adds 211 MW of natural gas-fired CTs. The 2020 IRP assumed the capacity lost from Colstrip and Lancaster could be met with long duration pumped hydro, but the updated cost and construction schedule information for pumped hydro caused this resource to not be selected in this IRP. This modeling result is consistent with a scenario analysis performed in the 2020 IRP showing natural gas CTs would be required if low cost long-duration pumped hydro was not available by 2026. Avista will continue to follow pumped hydro developments for future consideration.
> Draft IRP at 11-5.

Table 9.6, Pumped Hydro Company-Owned Options, provides a summary of costs, but NWEC does not fully understand the presentation and has not been able to pinpoint the underlying data for this conclusion. There are at least two pumped hydro projects with a reasonable chance of commercial operation by 2027, and further specific project assessment would be useful.

D. Storage and Hybrid Capacity Value

A notable aspect of the preferred portfolio is the lack of composite (hybrid) resources before 2038, when the first solar+battery resource appears.

The rapid emergence of hybrid resources around the nation and in the Northwest indicates the importance of composite resources to meet both energy and capacity needs. A leading example is PGE's acquisition of a large portion of the NextEra Wheatridge project, an innovative three-way hybrid of wind, solar and storage.

With regard to PacifiCorp's current all-source RFP, it is widely expected that solar+battery hybrids will be selected for half or more of the total acquisition, potentially amounting to more than 2000 MW of solar capacity and over 1000 MW of battery storage.

A recent study by Astrape Consulting for Pacific Gas & Electric, Southern California Edison and San Diego Gas & Electric found a substantial increase in ELCC value for Northwest (BPA Balancing Area) wind hybrid resources. No value for solar hybrids was provided for the Northwest because of insufficient data, but the effect is expected to be similar.

Table A2. ELCC Values for 2026 (expressed as a percentage of assumed interconnection capability)

Region	BTM PV	Fixed PV	Tracking PV	Tracking PV Hybrid	Wind	Wind Hybrid
CA-N	1.3%	2.1%	3.4%	100%	17.9%	94%
CA-S	0.6%	1.2%	1.9%	100%	17.8%	95%
AZ APS	N/A	~0.0%	1.9%	97%	30.8%	97%
NM EPE	N/A	~0.0%	1.9%	95%	30.8%	97%
BPA	N/A	N/A	N/A	N/A	32.8%	90%
CAISO	**1.0%**	**1.7%**	**2.7%**	**100%**	**17.9%**	**94%**
Average	**1.0%**	**0.8%**	**2.3%**	**98%**	**26.0%**	**95%**

The values in the Astrape analysis are not directly comparable because they are with reference to California ISO summer peak conditions. That said, the dramatic effect of battery availability to shift energy to peak periods is clear. Yet the draft IRP indicates only a 17% peak credit value for solar plus 4-hour battery resources and 15% for standalone 4-hour storage.

Table 9.12: Peak Credit

Resource	Peak Credit (percent)
Northwest solar	2
Northwest wind	5
Montana wind[10] 100-200 MW	35 to 28
Hydro w/ storage	60-100
Hydro run-of-river	31[11]
Storage 4 hr duration	15
Storage 8 hr duration	30
Storage 12 hr duration	58
Storage 16 hr duration	60
Storage 24 hr duration	65
Storage 40 hr duration	75
Storage 70 hr duration	90
Demand response	60
Solar + 4 hr Storage[12]	17
Solar + 2 hr Storage[13]	12

Whether the renewable resource is Montana wind with batteries or pumped storage shifting energy into the morning and evening peaks, or eastern Washington solar plus batteries shifting mid-day peak solar into late afternoon demand, NWEC views Table 9.12 as likely underestimating peak value. In addition, there is no value listed for wind + storage (either battery or pumped hydro), which is a clearly relevant use case.

As Avista proceeds towards the 2021 capacity RFP, we encourage revisiting this key issue. Hybrid resources could provide a significant capacity benefit and defer the need for new gas peakers, as well as make more effective use of limited available transmission capacity for renewables and provide more operating flexibility.

Conclusion

The Coalition appreciates the work that has gone into the preparation of this draft IRP. We look forward to collaborating on analyzing the changes we have suggested.

Respectfully,

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BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of Avista **Draft 2021 Electric Integrated Resource Plan**	**DOCKET UE-200301**
In the Matter of Avista **Draft 2021 Natural Gas Integrated Resource Plan**	**DOCKET UG-190724**

COMMISSION STAFF COMMENTS REGARDING AVISTA CORPORATION d/b/a AVISTA UTILITIES DRAFT INTEGRATED RESOURCE PLANS SUBMITTED IN COMPLIANCE WITH RCWs 19.405, 19.280 and WACs 480-90-238, 480-100-600 through -630 AND UNDER CONSOLIDATED DOCKETS UE-191023 AND UE-190698, Order R-601

February 5, 2021

Contents

Introduction

On January 4, 2021, Avista Corporation d/b/a Avista Utilities (Avista or company) submitted its draft Integrated Resource Plan (Draft IRP) in Dockets UE-200301 and UG-190724. The Washington Utilities and Transportation Commission (UTC or commission) posted a Notice of Opportunity to File Written Comments and Notice of Recessed Open Meeting. Written comments are due by February 5, 2021, and the recessed open meeting is scheduled for 9:30 a.m. on Tuesday, February 23, 2021. The company will file its completed 2021 IRP (Final IRP) with the Commission by April 1, 2021.[1]

Commission staff (Staff) prepared these comments to assess whether Avista's Draft IRP satisfies the rules and statutes governing the company's IRP filings, highlight areas of strength in the Draft IRP, suggest opportunities for improvement in the final IRP, and make recommendations for the clean energy implementation plan and the next integrated resource planning cycle. In developing these comments, Staff consulted with Jeremy Twitchell from Pacific Northwest National Laboratory.

Summary of Staff Assessment

Electric: Avista's public process, data transparency, and analysis of results were executed well. While the company's handling of equity and the customer benefit mandate is understandably underdeveloped, Staff is comfortable with the trajectory and looks forward to working closely with the company. However, the company's Draft IRP can be improved in terms of clarity and thoroughness in certain areas. Staff has concerns that the utility is undervaluing flexible resources such as storage, solar, and distributed energy resources (DERs), because of incomplete analysis of the impact of climate change, lack of sub-hourly modeling, the lack of a comprehensive DER resource assessment, and limited application of nonenergy impacts.

Avista plans to meet or exceed the clean energy standard by acquiring 375 MW of clean energy resources by 2031. As shown in Figure 1, the preferred portfolio (or preferred resource strategy as labeled in the Draft IRP) has Avista economically exiting Colstrip in 2021 and over 300 MW of natural gas plants by 2040. The preferred resource strategy includes the addition of new natural gas peakers for system reliability in 2027 and 2036.

Natural gas: Overall, Staff is satisfied with Avista's analysis and resulting preferred portfolio for natural gas with the data available to-date and through Advisory Group participation. Without inclusion of the appendices with the Draft IRP, there are details missing Staff has not been able to fully analyze. Given that no new, large resource acquisitions are anticipated for natural gas this document is heavily focused on the electric IRP. Recommendations for the IRP process for natural gas often overlap with electric; Staff provides targeted comments on separate areas specific to natural gas.

[1] *See* Docket UE-180738, Order 02 (Nov. 7, 2019) and Docket UG-190724, Order 01 (Feb. 6, 2020).

Resource Type	Year	State	Capability (MW)
Colstrip	2021	WA/ID	(222)
Montana wind	2023	WA	100
Montana wind	2024	WA	100
Lancaster	2026	WA/ID	(257)
Kettle Falls upgrade	2026	WA/ID	12
Natural Gas Peaker	2027	ID	85
Natural Gas Peaker	2027	WA/ID	126
Montana wind	2028	WA	100
NW Hydro Slice	2031	WA	75
Rathdrum CT Upgrade	2035	WA/ID	5
Northeast	2035	WA/ID	(54)
Natural Gas Peaker	2036	WA/ID	87
Solar w/ storage (4 hours)	2038	WA/ID	100
4-hr Storage for Solar	2038	WA/ID	50
Boulder Park	2040	WA/ID	(25)
Natural Gas Peaker	2041	ID	36
Montana wind	2041	WA	100
Solar w/ storage (4 hours)	2042-2043	WA	239
4-hr Storage for Solar	2042-2043	WA	119
Liquid Air Storage	2044	WA	12
Liquid Air Storage	2045	ID	10
Solar w/ storage (4 hours)	2045	WA	149
4-hr Storage for Solar	2045	WA	75
Supply-side resource net total (MW)			1,024
Supply-side resource total additions (MW)			1,581
Demand Response 2045 capability (MW)			71
Cumulative energy efficiency (aMW)			121
Cumulative summer peak savings (MW)			111
Cumulative winter peak savings (MW)			116

Figure 1: *2021 Preferred Resource Strategy*[2]

Gas Transportation Customer Conservation

One tangential issue Staff brings to the Commission's attention is the requirement in RCW 80.28.380 for the utilities to identify and acquire all conservation measures that are available and cost-effective. While it has been the practice of the utilities to exclude gas transportation customers from participating in their conservation programs, Staff struggles to find an exclusion for gas transportation customers in the statutory language of RCW 80.28.380. Staff notes that the IRP does not address the provision of gas for these customers; they acquire their own gas. Thus, the CPA typically included in a gas IRP has not historically included any assessment of conservation for these customers. There is, however, a linkage between the conservation potential for these very large gas transportation customers and the expected distribution system improvements the company includes in the IRP. Acquiring that conservation should reduce the need for distribution system improvements.

[2] *Avista Draft 2021 Electric Integrated Resource Plan*, Docket UE-200301, pp. 1-5, Table 1.1 , (Avista Draft Electric IRP) (Jan. 4, 2020).

Staff expects the issue of conservation from gas transportation customers and its inclusion or exclusion from the target can be addressed on a case-by-case basis with each company during the approval of each company's CPA and target.

Recommendations related to the 2021 Final IRP

- **Clean Energy Action Plan**
  - Add a table to the CEAP that includes year-over-year capacity of all planned resources, including demand response.
  - Include planned Appendix G with details of about planned transmission and distribution improvements.
- **Climate change**
  - Provide discussion regarding the implications of possibly moving from a winter peaking utility to a dual or summer peaking utility.
- **Load Forecasting**
  - Clarify the date in which its economic inputs were finalized.
  - Discuss any adjustments to the forecast made in response to the ongoing pandemic.
  - Clarify the high and low load growth ranges used on page 3-14. For example, how did the company settle on the high and low assumptions for annual service area employment and population growth outlined in table 3.3? Please explain.
  - Discuss the assumptions behind the EV and solar PV forecasts that are inputs into the load forecast.
  - Clarify which of the two climate change forecasts the IRP uses.
- **Upstream Emissions & SCGHG**
  - Include in the narrative description required by WAC 480-100-620(11) a clear articulation of how the company calculated the SCGHG.
  - Discuss assumptions about the SCGHG in market purchases and charging storage resources with market purchases.
  - Explain why 1.0 percent is an appropriate upstream emissions factor for U.S. Rockies natural gas.
- **Sub-hourly Modeling Capabilities**
  - Clarify storage cost assumptions.
- **Customer Benefit Provisions in CETA**
  - Provide a scenario or, at minimum, a narrative regarding possible changes to resource decisions that could increase customer benefit.
  - If available and time permits, incorporate the DOH data in the CIA.
- **Resource Adequacy and Uncertainty**
  - Clarify the company's peak credit methodology, including the definition of "peak" terms.
  - Explain how the company incorporates uncertainty in the RA assessment.
- **Public Participation**
  - Provide an IRP update based on any recent planned resource acquisition.
- **Data Disclosure**

  - Ensure appendices include a record of stakeholder feedback and the company's response.
  - Provide context for the data files provided on the company's website and submit in the docket.
- **Natural Gas Design Day (Planning Standard)**
  - Explain the new design day methodology.
  - Explain why the new design day standard is now the most appropriate one.
- **Renewable Natural Gas**
  - Include details of RNG cost assumptions in the appendices.

Recommendations for the CEIP and future IRP planning cycles

- **Climate change**
  - Incorporate a suite of variables, including snowpack, streamflow, and rainfall parameters; meteorological trends; and load risks into the analysis. Staff believes further study is needed.
  - Consider additional resources, such as a climatologist or climate change specialist, to analyze climate impacts over time on Avista's system.
- **Load Forecasting**
  - Conduct a back cast of the load forecasting model, using actual values for their independent variable inputs to their load forecast to assess whether their models have systematic bias.
  - Include a section in the load forecasting chapter that "assess[es] the effect of distributed energy resources on the utility's load," as per WAC 480-100-620(3).
- **Sub-hourly Modeling Capabilities**
  - Develop a workplan to expand sub-hourly modeling and discuss with stakeholders.
  - Expand sub-hourly modeling capability to appropriately evaluate DERs on equal footing with utility-scale renewable and other supply-side resource options.
- **Demand-Side Resources and Distributed Energy Assessment**
  - Treat DERs as generation resource in modeling, not just net from load.
  - Optimize DERs with supply-side resources.
  - Account for rate increases or pricing signals that can move peak demand and change DER uptake.
  - Consider issuing a RFI for DR without prescriptive screens to better understand potential.
  - Take a proactive approach to DR program implementation in the CEIP, accounting for longer lead time of customer sited programs.
  - Ensure programs in the CEIP are scalable.
- **Distribution Planning and Non-Wires Alternatives**
  - Start a public distribution planning process in 2022.
- **Nonenergy Impacts**
  - Identify which nonenergy impacts are required and allowed for resource selection.
  - Include NEIs for all resources, as appropriate.

    - Consider how NEIs do and do not overlap with equity requirements.
    - Identify where real data collection makes sense and where continued use of proxy is fine.
- **Customer Benefit Provisions in CETA**
    - Incorporate the Department of Health Cumulative Impact Assessment (CIA) into the IRP CIA.
    - Utilize the customer benefit indicators developed through the equity advisory group to design and model a maximum customer benefit scenario.
- **Resource Adequacy and Uncertainty**
    - Incorporate the results of the regional resource adequacy program, as appropriate.
    - Discuss "peak" definitions within the advisory group.
- **State Allocation of Resource Need**
    - Facilitate a discussion between Washington and Idaho stakeholders concerning state allocation of resources.
- **Electrification Scenarios**
    - Consider effects of policy trends towards electrification on both the electric and natural gas systems.
- **Public Participation**
    - Provide additional time to review presentations prior to meetings.
    - Post meeting minutes in a timely manner and allow opportunity for revision.
    - Consider if additional staffing is required to adequately meet new IRP requirements.
- **Data Disclosure**
    - Provide contextual aids alongside data input files.
- **Natural Gas Design Day (Planning Standard)**
    - Explore the feasibility of using projected future weather conditions in its design day methodology, rather than relying exclusively on historic data. The company is conducting a similar analysis for a climate change scenario in its electric IRP.
- **Natural Gas CPA and Conservation Targets**
- **Renewable Natural Gas**
    - Use any up-to-date cost and other data that is available to model potential RNG resources.

Staff Assessment of 2021 Draft Integrated Resource Plan by Focus Area

Clean Energy Action Plan

To comply with statute and rules, Avista presented a ten-year clean energy action plan that *works towards implementing* the lowest reasonable cost solution, including incorporation of the social cost of greenhouse gas emissions as a cost adder in its analysis.[3] Specifically, each CEAP should:

- meet clean energy transformation standards, including customer benefit provisions[4];
- be informed by the utility's ten-year cost-effective conservation potential assessment;
- identify the potential cost-effective demand response and load management programs that may be acquired;
- establish a resource adequacy requirement and demonstrate how each resource, including renewable, nonemitting, and DERs, may reasonably be expected to contribute to meeting the utility's resource adequacy requirement;
- identify any need to develop new, or to expand or upgrade existing, bulk transmission and distribution facilities; and
- identify the nature and extent to which the utility intends to rely on an alternative compliance option identified under RCW 19.405.040(1)(b), if appropriate.

Avista's presents its draft CEAP as the lowest reasonable cost plan of acquisitions, given societal cost, clean energy, and reliability requirements.[5] Table 15.2 outlines Avista's CEAP energy-related projected new resources, identifying the year-over-year, resource ramp needed in the next ten years to meet energy needs of both Idaho and Washington[6] customers, including initial "targets" to acquire an **additional 375 MW** by 2031 of <u>new</u> clean energy resources:

- 180 aMW of clean energy by 2031
  - 144 aMW (300 MW) of Montana Wind
  - 31 aMW from renewing a (75 MW) long-term hydro purchase power agreement in 2031
  - 5 aMW from a 12 MW upgrade to the Kettle Falls Generating Station (existing)
- Along with, under median hydro conditions, 41 aMW of clean energy purchases *from* Avista's Idaho customers and 20 aMW of RECs.[7]

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[3] WAC 480-100-620(12).

[4] WAC 480-100-610.

[5] Avista's plan exceeds goals of Washington's Energy Independence Act (EIA), relying on the Palouse and Rattlesnake Flat Wind contracts, generation from the Kettle Falls biomass facility and upgrades to the Clark Fork and Spokane River hydroelectric developments.

[6] Avista notes its CEAP is specific to Washington's portion of Avista's system needs in compliance with CETA.

[7] Avista notes, depending on the determination of the WUTC's decision regarding compliance with the 100 percent goal, Avista may need additional clean energy and/or RECs if renewable and non-emitting energy must be delivered to customers ***instantaneously***. Chapter 12 of the 2021 Draft IRP outlines the cost and energy acquisition impacts of this scenario.

Avista is planning to procure resources capable of meeting *Washington load*. Questions remain regarding whether such resources could be dispatched in a manner to serve Washington demand: Does this clean energy resource acquisition imply clean energy operations? Operationally, how this energy is getting used and whether such "use" meets the spirit and letter of CETA remains a topic of discussion during Washington clean energy legislation implementation.[8]

In the Draft CEAP, Avista signaled preference for renewable projects located in vulnerable population areas to "further develop those economies," indicating this does not include new generation facilities in Washington except for an upgrade to the Kettle Falls wood-fired facility, which Avista believes is not located in a vulnerable population area.[9]

Avista also provides a narrative and series of commitments related to the customer benefit provisions of CETA. The company plans to form an Equity Advisory Group (EAG) that is responsible to review the indicators and vulnerable populations, asserting the EAG will also help guide the design of the vulnerable population outreach and engagement and be used to distinguish and prioritize additional indicators and solutions needed to develop the upcoming Clean Energy Implementation Plan. Avista's CEAP also includes a discussion of its analytical enhancements to include energy and non-energy benefits, and the company concludes these enhancements *should* benefit vulnerable communities. Staff agree that identifying non-energy benefits is a good first step towards identifying customer benefit indicators and implementing programs in a manner that ensures equitable distribution of energy and non-energy benefits.

Staff notes Avista's projections outlined in this CEAP may change. Avista flagged in its Draft IRP analysis that a future request for proposal (RFP) may identify a lower cost clean resource to meet the first significant reliability shortfall and could yield resources more beneficial than those more broadly identified in the CEAP.

For the draft CEAP, Staff is unable to provide an overarching recommendation due to the extent of Avista's draft submittal, including lack of complete appendices and modeling data for examination. However, Staff offers several observations and suggestions for the Final IRP:

CEAP Presentation. The draft CEAP includes Table 15.1 with an outlay of DR programs, from 2024 through 2031, and a narrative, which identifies potential to reduce load by 37.6 MW by 2031, noting a 25 MW large commercial customer program offering *may come to fruition* before the Lancaster PPA ends in 2026. Staff appreciates the company's CEAP presentation in Table 15.2, representing the company's year-over-year resource need in average capacity (aMW), or the average power output of the facility over a given period, percent clean energy target and goal, available resources, including owned and contracted, delineated by resource type and general location (as appropriate), and projected shortfall.

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[8] *See* "Use" discussion docket notice relating to Clean Energy Implementation Plans and Compliance with the Clean Energy Transformation Act, Docket UE-191023 (June 12, 2020).

[9] Avista Draft Electric IRP at 15-5. Note that Avista formats the pages of the IRP with dashes. To avoid confusion, throughout these comments Staff cites a single page as "XX-XX", and multiple pages in the draft IRP with a "XX-XX to XX-XX" format.

For nameplate capacity presentation (MW), Avista provides Table 1.1 in the IRP, which provides the company's "preferred resource strategy" through the 2045 but lists Demand Response at the bottom of the table with no timing specified, other than "2045 capability."[10] Staff points to the new IRP rules, which define CETA-related *resource need* as:

> *any current or projected deficit to reliably meet electricity demands created by changes in demand, changes to system resources, or their operation to comply with state or federal requirements. Such demands or requirements may include, but are not limited to, capacity and associated energy, capacity needed to meet peak demand in any season, fossil-fuel generation retirements, equitable distribution of benefits or reduction of burdens, cost-effective conservation and efficiency resources, demand response, renewable and nonemitting resources.*[11]

For the final CEAP, Staff suggest Avista also include incremental nameplate capacity (MW), or maximum capacity, including in tabular form year-over-year, showing the timing of all planned capacity resources: (1) existing and contracted resources (identified by resource type, location, or potential location); (2) peak import projections; (3) peak capacity needs before demand-side resources (developed from forecast + planning margin); (4) demand-side resources; and (5) peak capacity resource need net demand-side resources.

CEAP resources. The evaluation of delivery systems, including transmission expansion is becoming increasingly important because resources are becoming more geographically diverse and shared among utilities.[12] The definition of lowest reasonable cost in the IRP rules includes planned resources and "related delivery system infrastructure," which shows consistency with chapters 19.280, 19.285, and 19.405 RCW. Staff notes Avista's CEAP does not discuss significant transmission or distribution improvements. Instead, the company briefly explains these resources are "likely to be off system or utilize existing transmission assets, not requiring new investment in the next ten years," as shown in Appendix G.[13] Staff looks forward to reviewing Appendix G in the Final IRP, noting details were not provided for stakeholder review as part of the Draft IRP.

Recommendations for the Final IRP:

- Add a table to the CEAP that includes year-over-year capacity of all planned resources, including demand response.

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[10] Staff notes in Table 1, demand response and load management programs are essentially footnoted, not included in the resource year-over-year ramp in the table or represented side-by-side with other resource type, contracts, or other plant acquisitions.

[11] WAC 480-100-605.

[12] Juan Pablo Carvallo et al., *Implications of a regional resource adequacy program on utility integrated resource planning - Study for the Western United States*, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, p. 15, Table 3.5 (November 2020).

[13] Avista Draft Electric IRP at 15-4.

- Include planned Appendix G with details about planned transmission and distribution improvements.

Climate change

Staff is concerned Avista's modeling of climate change in this IRP is not comprehensive. Avista considered historical weather trends during load forecasting and ran a climate change scenario. Still, the possible risks of climate change on resource adequacy and optimal resource portfolio deserve a more complete and nuanced approach in the future.

Avista's expected case load forecast incorporated historical trends that show HDD gradually declining and CDD gradually increasing. The company *contemplated* using two different data sets of trending HDD and CDD forecasts, one using Avista-specific data and the other using Northwest Power and Conservation Council (NWPCC) state-level data. Both forecasts indicate that Avista's summer peak will grow faster than the winter peak, with the average summer peak eventually higher than the average winter peak.[14] However, the NWPCC trended forecast shows the summer peak increasing faster, where the winter peak is growing slower than Avista's trended forecast.

Recent regional climate change analysis in the Northwest shows, "anticipated increases in temperature will alter the pattern of electricity use, where higher temperatures and more precipitation tend to result in more rain and less snow during the winter months, thus reducing the snow pack and subsequent summer flow."[15] Importantly, Avista's forecast shows the high end summer peak (95 percent confidence level) is never higher than the high end winter peak, while the NWPCC forecast shows the high end summer peak is expected to be higher than the winter peak around 2040.[16]

This analysis demonstrates to Staff there is a strong potential that climate change will likely move Avista from a winter peaking utility to a dual or summer peaking utility in the near future.

Avista is incrementally moving in the right direction in the 2021 IRP with respect to incorporating the effects of temperature changes over time; but overall, Avista's climate change analysis as fairly minimal. The company modeled only one *climate shift scenario* that deterministically examined impacts to hydro production and reduced gas plant maximum capabilities expected to result from climate change. Avista used NWPCC data that estimated additional hydro generation in the winter and less in the spring and summer. To simulate climate change impacts to load, Avista, with assistance from the Pacific Northwest Utility Conference Committee, used NWPCC data to create linear trends in load by month. This scenario results in marginally lower wholesale electricity prices and slightly lower emissions due to increased hydro production.

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[14] Avista Draft Electric IRP at 3-23, Table 3.7

[15] Northwest Power and Conservation Council, "Update on Climate Scenario Selection for the 2021 Power Plan". *Available at* https://www.nwcouncil.org/sites/default/files/2020_04_p2.pdf.

[16] Avista Draft Electric IRP at 3-24 to 3-25, Figures 3.20 and 3.21.

Avista refers to the NWPCC assessment of climate change impacts in its preliminary resource adequacy assessment presented in December 2020. The company expresses concerns with the limited inputs used to derive the potential climate adjusted load and hydro conditions but does agree that there are great regional resource adequacy risks in this area.[17] Staff agrees and encourages Avista to use more rigor in its analysis exploring the effects of climate change on their system.

Further, to adequately account for the effect of climate change, Avista could consider acquiring additional expertise regarding temperature impacts over time on Avista's system, especially considering the company's hydro-reliance position, as shown in Figure 2. Staff suggests the company take a closer look at the methods peer utilities are taking. For example, Seattle City Light included a study on "Climate Change Effects on Supply and Demand," as an appendix to its IRP, dedicating resources to assess the IRP climate sensitivity on the utility's load-resource balance, including reduced snowpack, earlier melt, higher winter inflows, and lower summer inflows. This additional information provided insights into climate change scenarios' effects to potentially change the *expected base portfolio* for supply and demand.[18]

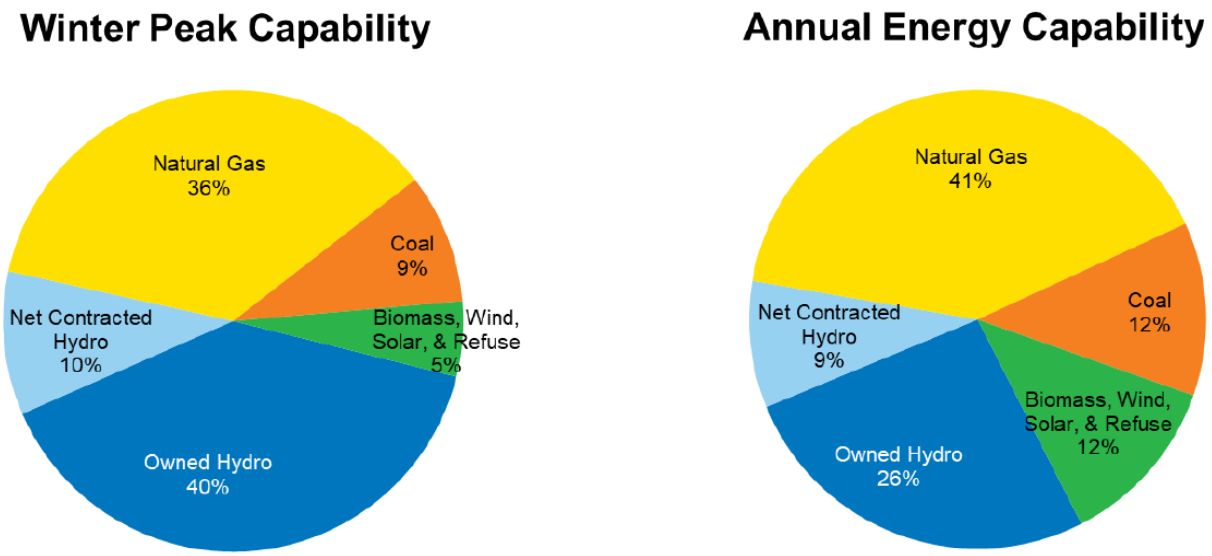

Figure 2: *2020 Avista Capability and Energy Fuel Mix*[19]

[17] Avista Draft 2021 Electric IRP at 7-12.

[18] NWPCC presentation on Climate Change and the 2021 Power Plan Workshop; *Seattle City Light* (May 1, 2019). Also see *Seattle City Light 2016 IRP*, Appendix 12.

[19] Avista Draft 2021 Electric IRP at 4-1, Figure 4.1.

Recommendation

For **Final IRP**:

- Provide discussion regarding the implications of possibly moving from a winter peaking utility to a dual or summer peaking utility.

For **next IRP**:

- Incorporate a suite of variables, including snowpack, streamflow, and rainfall parameters; meteorological trends; and load risks into the analysis. Staff believes further study is needed.
- Consider additional resources, such as a climatologist or climate change specialist, to analyze climate impacts over time on Avista's system.

Load Forecasting

In addition to the climate change-related recommendations above, Staff finds that the load forecast section could use some clarification in the Final IRP. Avista conducted base, high-, and low-load growth forecasts, as did its peer utilities. Comparisons to the other two utilities are difficult because the Draft IRP narrative lacks sufficient detail, including how Avista derived the input assumptions for the high- and low-load growth scenarios.

One area where the Avista Draft IRP falls short of its peer utilities is discussing whether and how the ongoing COVID-19 pandemic has impacted its load forecast. For example, the company does not specify when its economic inputs into the forecast were finalized, or whether it has made any adjustments to the forecast to account for observed load impacts from the state's stay-at-home orders. The state's (and the nation's) economy has been severely impacted since the pandemic's onset in early 2020. For Staff to appropriately evaluate Avista's forecast, especially considering the new 10-year Clean Energy Action Plan requirements which create mid-term requirements within the company's 2045 planning horizon, more information is needed.

Recommendation

In the **Final IRP**:

- Clarify the date in which its economic inputs were finalized.
- Discuss any adjustments to the forecast made in response to the ongoing pandemic.
- Clarify the high and low load growth ranges used on page 3-14. For example, how did the company settle on the high and low assumptions for annual service area employment and population growth outlined in table 3.3? Please explain.
- Discuss the assumptions behind the EV and solar PV forecasts that are inputs into the load forecast.
- Clarify which of the two climate change forecasts the IRP uses.

In the **next IRP**:

- Conduct a back cast of its load forecasting model, using actual values for their

independent variable inputs to their load forecast to assess whether their models have systematic bias.
- Include a section in its load forecasting chapter that "assess[es] the effect of distributed energy resources on the utility's load," as per WAC 480-100-620(3).

Upstream Emissions & SCGHG

For both the electric and natural gas IRP, Avista includes the social cost of greenhouse gases (SCGHG) as a cost adder in its portfolio optimization of resource options, including upstream emissions from natural gas. Avista describes the application of the SCGHG in several places in the IRP. However, Staff finds the Draft IRP lacks a separate detailed methodology as to how the company applies this cost adder in its electric portfolio optimization and preferred portfolio selection. Staff expects Avista to provide a narrative illustrating step-by-step how the SCGHG cost adder is applied throughout its modeling logic, including associated cost calculations, with the Final IRP.[20]

For upstream methane emissions, Avista uses a global warming potential (GWP) factor that was calculated based on the International Panel on Climate Change's Assessment Report 5 (IPCC AR5), which Staff prefers over older analyses. Avista uses the upstream methane leakage factor of 0.77 percent for Canadian natural gas, and uses 1.0 percent for the U.S. Rockies natural gas factor. Given that this U.S. Rockies natural gas emissions factor is significantly lower than any of the factors analyzed by the NWPCC in its analysis of upstream natural gas emissions, Staff recommends the Final IRP explain why the factor is appropriate.

In the expected case, Avista did not apply the SCGHG for market transactions but did include a scenario to test the effect of applying SCGHG to the annual average emissions rates of net market purchases. Including this value on market emissions led to additional procurement of wind and less storage and solar. This is likely due to the assumption that the energy used to charge storage resources comes from market purchases. Staff recommends additional narrative describing how Avista selected these assumptions regarding market purchases.

During the advisory group process, the company was responsive to Staff's request to use the annual *incremental* emissions rate instead of the annual *average* emissions rate when assuming a value for SCGHG reduction for energy efficiency. Avista performed a sensitivity to understand how this assumption changed the selection of energy efficiency. The company found that using the average rate savings are 12 percent lower by 2045 (10 aMW less) than when using the incremental rate.

Due to the uncertainty during rule development, Avista developed and performed three different scenarios to help inform the cost of CETA mandates:

- Baseline 1 incorporates the SCGHG but does not include the clean energy standards,
- Baseline 2 achieves the clean energy standards in CETA without using the SCGHG,
- Baseline 3 excludes both the clean energy standards and the SCGHG.

[20] WAC 480-100-620(11).

By varying the baseline assumptions and modeling the SCGHG in several ways, Avista provided useful insights into the effect of legislation. However, the Draft IRP provided insufficient narrative describing how the company included SCGHG in the scenarios and the preferred portfolio. Staff recommends a separate narrative that focuses on the different methods Avista used to model the SCGHG in addition to the individual explanations throughout the document.

Recommendation:

In its **Final IRP**, Avista should:

- Include in the narrative description required by WAC 480-100-620(11) with a clear articulation of how the company calculated the SCGHG.
- Discuss assumptions about the SCGHG in market purchases and charging storage resources with market purchases.
- Explain why 1.0 percent is an appropriate upstream emissions factor for U.S. Rockies natural gas.

Sub-hourly Modeling Capabilities

To fully capture the value of flexible resources such as storage or demand response, IRP models need to have enough granularity to capture intra-hour variables. Modeling sub-hourly dispatch can readily integrate resources offering more granular grid services into portfolio development. For storage resources, it is unclear what is included in the company's cost assumptions and Staff expects these details to be included in the Final IRP.

Staff is concerned about Avista's current ability to optimize <u>all</u> the resources needed for a reliable one hundred percent clean system. With increasing renewable energy on the grid Avista will be challenged to match generation and load. The current paradigm of planning to a peak in winter when the wind isn't blowing must be realigned to recognize that the utility must also plan to a summer peak with an intra-hour weather anomaly. Staff looks forward to updates from Avista regarding its sub-hourly modeling functionality in its ADSS software for the next IRP.[21]

Avista must expand its sub-hourly modeling capability to appropriately evaluate DERs on equal footing with utility-scale renewable and more traditional fossil resource options. Avista could also transition to a LTCE optimization platform that endogenously considers the sub-hourly benefits of DERs. Alternatively, the company can apply cost credits to better characterize the sub-hourly grid services DERs provide, which in turn may increase the likelihood Avista's preferred resource portfolio solution would include these resource options. As discussed within the *Demand-Side Resources and Distributed Energy Assessments* section of these Staff comments, Avista should not assume future IRPs that handle distributed generation simply as a load forecast decrement will be CETA compliant.

[21] Avista Draft Electric IRP at 14-6.

Recommendation

In the **Final IRP**:

- Clarify storage cost assumptions.

Prior to the **next IRP**:

- Develop a workplan to expand sub-hourly modeling and discuss with stakeholders.
- Expand sub-hourly modeling capability to appropriately evaluate DERs on equal footing with utility-scale renewable and other supply-side resource options.

Demand-Side Resources and Distributed Energy Assessments

Energy efficiency, demand response (DR), and other distributed energy resources (DERs) are essential to a clean energy system that adequately serves and benefits all customers. Avista has made a reasonable attempt to value acquisition of energy efficiency and demand response in the Draft IRP but has not sufficiently analyzed other DERs. Avista, like PSE and Pacificorp, performed potential assessments for EE and DR but only used a forecast of EV and PV adoption.

The modeling of DER is a major weakness in the Draft IRP. Electric vehicle charging and net-metered generation are accounted for in the load forecast, but DERs, except for EE and DR, are not otherwise valued as potential resources. Avista signaled plans to further integrate DERs in the 2025 IRP.[22] This is discussed further in the *Distribution Planning and Non-Wires Alternatives* section below.

Energy efficiency

CETA has not made any notable changes to the methods used to model energy efficiency (EE). Avista once again retained AEG to perform the conservation potential assessment (CPA) for both the electric and gas IRP. The draft IRP and associated data provide sufficient information to calculate the ten-year, four-year, and two-year cost-effective conservation potential under both CETA and the EIA. The pro-rata share of the ten-year potential is 101,566 MWh.[23] Avista used an iterative process to identify the cost-effective EE to be removed from the load forecast.

Figure 3 below shows the avoided cost of EE for energy and capacity with components broken out. Over the planning horizon the levelized price of EE is projected to be 3.5 cents per kWh.

[22] Avista Draft Electric IRP at 2-11 and 14-8.

[23] *Id*. at 5-8.

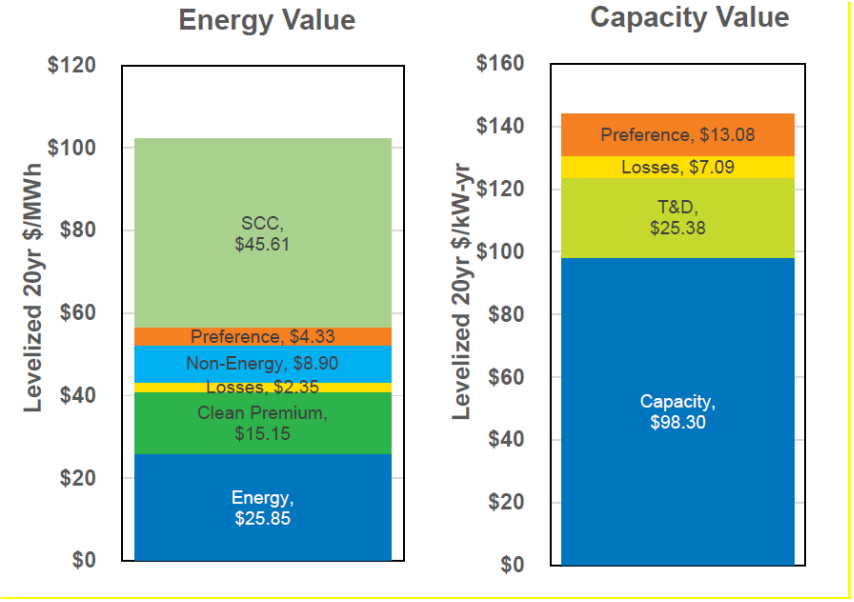

Figure 3: *Washington Energy Efficiency Avoided Cost*[24]

Demand response

To identify all cost-effective demand response as required by CETA, Avista hired AEG to perform a demand response potential assessment (DRPA) like the CPA for conservation and similar to the DRPA performed in the last IRP. [25] The DRPA includes sixteen residential and commercial programs, and Avista added Large Industrial Curtailment potential outside of the DRPA.[26] The programs include both controllable DR and rate design programs. Where automated metering infrastructure (AMI) is an enabling technology, Avista assumes AMI deployment will be complete in Washington in 2022 (in Idaho the company assumes full deployment in 2024).

DR is treated consistently among the Washington IOUs, including peak reduction as the primary use case of demand response. The amount of reliable capacity contribution from DR should vary by program type, number of events, and by length of event. PSE and Avista each appropriately evaluated sixteen potential demand response programs, including direct load control and pricing options. However, the utilities did not vary assumptions around the *number* and *length of events*, potentially underestimating the potential that a different program design might provide a better fit with the utility system needs. The amount of peak capacity credit given to DR for Avista was 60 percent of a gas-fired combustion turbine.

[24] Avista Draft Electric IRP at 5-14, Figure 5.7.

[25] WAC 480-100-610(4)(a)

[26] Potential assessments assume average market penetration and savings over sizeable populations. Large industrial potentials in Avista's service territory are more appropriately treated individually than on an average basis.

In line with the NWPCC methodology for 2021, the utilities assumed that energy efficiency takes place prior to demand response. In general, Staff agrees with this assumption. However, the specifics of each company's approach lacked the nuance needed to appropriately capture the potential for EE and DR programs to enhance or interfere with each other. Staff acknowledges that this is a complicated task but anticipates efforts to model the interaction effects will be enhanced by utility efforts to integrate EE and DR program efforts during implementation.

In recent years, utility modelling of demand response potential has received negative critiques from stakeholders. With the new mandate to pursue all cost-effective demand response, Staff expected the utilities to refine the modeling of this resource. Unfortunately, this round of IRPs has not made notable improvements over the last round. While Avista and AEG provided ample opportunity for public involvement around the achievable potential for DR, costs for DR were not made available during these meetings, thus not vetted by the advisory group.

Staff has significant concerns regarding the treatment of grid enabled water heaters. Washington has established that electric storage water heaters sold in the state that are manufactured after January 1, 2021, must include a demand response communications port.[27] Turnover of the state's electric water heater stock will take some time but will steadily increase the potential of this resource without additional equipment being required at customer premises. This technology allows frequent load curtailment requests by the utility while ensuring a large supply of hot water remains available to the customer.[28] While each utility included this technology in the potential assessments, no utility provided sufficient discussion of potential program costs and assumptions with the advisory group. Staff requests Avista give this technology additional consideration. Given the large size of a potential program and the current inexperience of northwest utilities with demand response, it is likely costs are overestimated and reliability is underestimated.

Recommendation

In the Final IRP:

- Provide the conservation potential assessment model and underlying data.
- Provide the demand response potential model and underlying data.

In the **next IRP:**

- Treat DERs as generation resource in modeling, not just net from load.
- Optimize DERs with supply-side resources.
- Account for rate increases or pricing signals that can move peak demand and change DER uptake.
- Consider issuing a RFI for DR without prescriptive screens to better understand potential.

In the **CEIP:**

[27] RCW 19.260.080

[28] *See* Bonneville Power Administration, CTA-2045 Water Heater Demonstration Report, (Nov. 9, 2018).

- Take a proactive approach to DR program implementation, accounting for longer lead time of customer-sited programs.
- Ensure programs are scalable.

Distribution Planning and Non-Wires Alternatives

The IRP rules require the utility to include assessments of a variety of distributed energy resources and the effect of distributed energy resources on the utility's load and operations.[29] Further, the commission strongly encourages utilities to engage in a distributed energy resource planning process as described in RCW 19.280.100. If the utility elects to use a distributed energy resource planning process, the IRP should include a summary of these results.

In the Draft IRP, Avista provides a narrative of its distribution planning efforts, explaining how the company continually evaluates its distribution system for reliability and level of service requirements, including voltage and power quality, for current and future loads. However, Avista did not identify any projects meeting the criteria for an economic non-wire alternative in the Draft IRP. The company contends its near-term distribution projects require capacity *increases* and duration requirements due to load growth exceeding the distributed energy resources (DERs) capability.[30]

Although distribution systems will vary from one utility to another based on the unique characteristics of each system, Staff points to Puget Sound Energy's Draft IRP, which illuminates the capacity value of such resource additions and illustrates the nexus between distribution system and integrated resource planning. For example, PSE includes a line item of distribution system planning incremental nameplate capacity for non-wires alternatives, beginning in 2022 and growing to 118 MW total in the outer years of the plan.[31] Staff supports Avista's continued efforts to continue to study new technologies and grow its situational awareness of other utilities' actions in this space.[32]

Staff suggests Avista continue to engage Staff and keep stakeholders updated on their commitment in the Draft IRP to *start a public distribution planning process in 2022* to identify and plan for future distribution needs. This will allow the company to better anticipate future impacts under CETA and:

- analyze interdependencies among customer-sited energy and capacity resources;
- reduce, defer, or eliminate unnecessary and costly transmission and distribution capital expenditures;
- identify and quantify customer values that are not represented in volumetric electricity rates and maximize system benefits for all retail electric customers; and

[29] WAC 480-100-620(3) Distributed energy resources.

[30] Avista Draft Electric IRP at 8-9.

[31] Puget Sound Energy Draft 2021 IRP, Docket UE-200304, pp. 1-4, Figure 1-4 ("DSP Non-Wire Alternatives").

[32] Avista describes its distribution system as consisting of approximately 350 feeders covering 30,000 square miles, ranging in length from three to 73 miles.

- identify opportunities for improving access to transformative technologies for low-income and other underrepresented customer populations.[33]

Recommendation

In **2022:**

- Start a public distribution planning process.

Nonenergy Impacts

As described in the appendix to this document, CETA has emphasized the consideration of nonenergy costs and benefits of resources in system planning. In the past, Staff has pushed utilities to account for nonenergy impacts (NEIs) such as the expected emissions of greenhouse gases and particulate matter with quantified health risks.[34] Avista's treatment of nonenergy costs and benefits in this IRP has gone further than any past effort, in large part because of the requirement to include the social cost of carbon.

To address other NEIs connected to public interest objectives such as public health, energy security, environmental benefits, costs, and risks, all three electric IOUs relied on a proxy method using data from the Environmental Protection Agency (EPA).[35] The EPA data includes NEI values generally applicable to all energy efficiency and renewable energy in the Pacific Northwest. Avista analyzed this data to align with its service territory, landing on a benefit value of $8.90 per MWh. The company then applied this benefit uniformly to energy efficiency measures to approximate unquantified NEIs.

While all utilities started with the EPA data, Avista's proxy benefit value is approximately one half what PSE used and one third of what Pacific Power plans to use in the 2021 IRPs.[36] Staff acknowledges that none of these proxy values accurately capture the value of NEIs, but we appreciate each utility acknowledging that the nonenergy benefits of EE are, on the whole, greater than zero. Prior to the next IRP, Staff expects significant work with utilities and stakeholders to identify which NEIs should be valued, what values can be adequately quantified, and when the use of proxy values is most appropriate.

The primary limitation to the approach Avista took to account for NEIs in the IRP is only applying NEIs (outside of the SCGHG) to energy efficiency. NEIs exist for ***all resources*** but most have traditionally only been included when evaluating demand-side resources, as the proximity of these resources to customers naturally increases impacts.

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[33] RCW 19.280.100.

[34] *Staff Comments on 2018-2019 Biennial Conservation Plans*, Dockets UE-171087, UE-171091, and UE-171092, p. 8-9 (Dec. 1, 2017)

[35] Environmental Protection Agency, *Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States: A Technical Report*, (July 2019).

[36] PSE used a proxy value of $0.02 per kWh ($20.00 per MWh), Pacific Power used $28.70 per MWh, Avista used $8.90 per MWh.

Recommendation

In the **next IRP:**

- Identify which nonenergy impacts are required and allowed for resource selection.
- Include NEIs for all resources, as appropriate.
- Consider how NEIs do and do not overlap with equity requirements.
- Identify where real data collection makes sense and where continued use of proxy is fine.

Customer Benefit Provisions in CETA

In the Draft IRP, Avista did not perform a maximum customer benefit scenario or sensitivity as required by the new rule.[37] Staff understands that this work dramatically departs from the traditional planning done in the IRP and including it in the Draft IRP may not have been feasible. Staff encourages Avista to make best efforts to model a scenario that would maximize customer benefits in the Final IRP. Given that the maximum customer benefit scenario is a new requirement that will be improved upon and clarified over time, Staff requests the company develop a narrative describing Avista's current interpretation of the rule and proposed next steps regarding intent to model the scenario.

Avista completed commendable work by developing a preliminary methodology for geographically identifying highly impacted communities and vulnerable populations. Avista identified two census tracts as qualifying highly impacted communities. To identify vulnerable populations, the company used the Environmental Health Disparities Map maintained by the Department of Health (DOH) to score areas based on pollution burdens and population characteristics. The company acknowledges that this is an ongoing process that is currently missing several important inputs.

For the Draft IRP, no utility was able to incorporate the Cumulative Impact Assessment (CIA) prepared by DOH, which was expected by the end of 2020.[38] DOH's work on this has been delayed and may not be available for inclusion in the Final IRP. The baseline analysis Avista performed in this IRP identified where there are significant differences in energy use, energy cost, reliability, resiliency, and higher densities of power plant emissions. Avista will need to change its methods to incorporate the DOH data into the next IRP, but Staff is satisfied with the progress to date.

Plans for an equity advisory group (EAG) are well underway at Avista.[39] The company is conducting outreach and carefully considering how to successfully engage marginalized and hard to reach populations. The EAG is separate from the IRP advisory group and will identify

[37] WAC 480-100-620(10)(c).

[38] RCW 19.405.140.

[39] WAC 480-100-655(2).

vulnerable populations and develop customer benefit indicators that will be incorporated into the CEIP planning and the next IRP. Staff look forward to Avista growing its current robust low-income programs to serve other highly impacted communities and vulnerable populations.

Recommendation

In the **Final IRP:**

- Provide a maximum customer benefit scenario and a narrative regarding Avista's current interpretation of the rule and next steps for improvement.
- If available and time permits, incorporate the DOH data in the CIA.

Before the **next IRP:**

- Create the Equity Advisory Group by May 1, 2021, to provide useful and timely input for the planning cycle. Staff understands that Avista has already begun organizing this group and commends the company approach.
- Incorporate the DOH CIA into the IRP CIA.
- Utilize the customer benefit indicators developed through the equity advisory group to design and model a maximum customer benefit scenario.

Resource Adequacy Assessment and Uncertainty Analysis

As required by CETA, Avista must determine "resource adequacy metrics for the resource plan," and identify "an appropriate resource adequacy requirement and measurement metric consistent with prudent utility practice."[40] The IRP uses Avista's Reliability Assessment Model (ARAM) to test the current resource portfolio's reliability metrics and the contribution of each resource. Continuing from previous IRPs, Avista retains a 5 percent LOLP metric to ensure future system reliability.

In Table 11.5, Avista also shows resource adequacy analysis related to three other reliability metrics, including Loss of Load Hours (LOLH), Loss of Load Expectation (LOLE), and Expected Unserved Energy (EUE). The company currently targets a 16 percent planning margin to meet winter peaks, and 7 percent for summer peaks. This is in addition to meeting operating reserves and regulation requirements.

Avista begins its resource adequacy analysis narrative with a discussion of regional coordination, signaling that it is participating in the development of a potential regional resource adequacy program. The company estimates participation in a resource adequacy program will reduce its needs for new capacity by up to 70 MW in 2031 based on the current draft program design, where these savings will potentially allow the utility to require lower future resource acquisition if the program is developed and implemented.

Avista's draft IRP analysis shows a capacity need of 83 MW of natural gas-fired capacity for Washington customers by 2026, replacing the Lancaster Power Purchase Agreement (PPA), to maintain reliability targets for Washington customers during peak load hours. The company

[40] RCW 19.280.030(1)(g) and (i).

assumes 330 MW of market availability for the 2021 IRP, compared to 250 MW in the 2017/2020 IRPs. Avista also indicates that a future RFP may identify a lower cost clean resource to meet this reliability shortfall, but the current IRP modeling results selected a gas-fired resource in 2026.

The analysis of the contribution to RA by storage, DR, and variable energy resources is of particular interest to Staff in the first post-CETA IRP review. For the Final IRP, and into next IRP cycle, Staff suggest Avista include more information about how the company treats, or plans to treat, uncertainty in RA modeling within the IRP, including the following elements of its RA assessment:

Resource ELCC Analysis
For its (effective load carrying capability) ELCC analysis, Avista assigned peak credits to renewable and storage resources depending on resource ability to meet peak loads using its ARAM model. The company's ELCC calculations should be a measurement of that resource's ability to produce energy when the company is most likely to experience electricity shortfall, showing how that resource uniquely contributes to reliability requirements.

Avista appears to translate its "peak savings" for demand response into a peak credit that differs depending on duration. Specifically, Staff requests more description about how Avista derived the Peak Credit shown in Table 9.12. For energy storage, when an 8-hour resource only gets a 30 percent credit and a 70-hour resource only gets to 90 percent, Staff questions how the utility uniquely defines *peak* and *peak-related* demand terms.[41] Staff requests additional narrative related to the company's methodology related to Peak Credit, including how Avista specifically defines the terms "peak" and "peak-related" in the Final IRP.

Incorporation of uncertainty into RA assessment
Avista indicates "resource analysis identifies a natural gas CT to replace resource deficits if *pumped hydro* is not a feasible resource to meet the 2026 shortfall. Avista will conduct *transmission* and air permitting studies to prepare for this contingency. Avista expects this process to take at least two years."[42] Relatedly, in the Draft IRP narrative for resource adequacy, risk, and uncertainty analyses, it is not clear how the company accounts for *renewable contribution*, *storage efficiency*, or *construction*.[43] For example, construction risks could include delays for new assets, other future considerations for resource maintenance, plant upgrades, or transmission expansion uncertainties. Staff request additional narrative how the company incorporates uncertainty in the RA assessment in the Draft IRP, or if the company plans to address these elements in the next IRP cycle.

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[41] *See* Natalie Mims Frick et al., *Peak Demand Impacts From Electricity Efficiency Programs Report*, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, Appendix B, Table B-2 (Nov. 2019).

[42] Avista Draft Electric IRP at 14-5.

[43] *See* Juan Pablo Carvallo et al., *Implications of a regional resource adequacy program on utility integrated resource planning - Study for the Western United States*, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, p.17, Table 3.5 (Nov. 2020).

Recommendation

In the **Final IRP:**

- Clarify the company's peak credit methodology, including the definition of "peak" terms.
- Explain how the company incorporates uncertainty in the RA assessment in the Draft IRP, or if the company plans to address these elements in the next IRP cycle.

In the **next IRP:**

- Incorporate the results of the regional resource adequacy program, as appropriate.
- Discuss "peak" definitions within the advisory group.

State Allocation of Resource Need

Historically, Avista's allocation of planned electric system resources between states has been determined using the Production-Transportation ratio, which is approximately 65 percent Washington and 35 percent Idaho. As the two states' policy objectives diverge, capacity and energy needs result from different drivers. In the Draft IRP, Avista has done an admirable job attempting to assign resource needs between one hundred percent Washington, one hundred percent Idaho, and a combined system need. Soon, both state commissions will need to grapple with complicated cost recovery allocation.

Avista faces difficult questions related to future rate recovery resulting from long-term resource planning in two states for one utility system: Idaho customers will not want to pay increased rates that may result from CETA and Washington customers will not want to pay for potentially stranded assets from new gas resources. Staff encourages the company to bring stakeholders together for an in-depth discussion and analysis prior to any formal filing. Ultimately interstate cost allocation must be adjudicated, but Staff believes a collaborative process is worth pursuing.

Recommendation

Before the **next IRP:**

- Facilitate a discussion between Washington and Idaho stakeholders concerning state allocation of resources.

Electrification Scenarios

In the electric IRP Avista performed three separate scenarios considering the effects that electrification of space and water heat in Washington could have on the portfolio. Avista states that the IRP is not the best vehicle to conduct these studies and recommends a separate regional study. While Staff does not disagree about the usefulness of a regional or statewide study, the company should continue to consider local policy trends towards electrification in both the electric and natural gas IRPs.

Recommendation

In **future IRPs**:

- Consider effects of policy trends towards electrification on both the electric and natural gas systems.

Public Participation

Avista demonstrated a robust public participation process during this IRP. They began by seeking input on a draft work plan and once filed, stayed true to the plan. Avista originally scheduled five technical advisory group meetings. When the scheduled meetings could not cover all the material with the depth the company and advisory group members wanted, Avista added additional webinars and a workshop. Avista provided Staff and the advisory group meaningful opportunities to discuss complex resource planning processes, data assumptions, and other interest topics throughout the IRP planning process. Avista's IRP advisory group is open to all members of the public who wish to participate.

Avista's IRP Team is exceptionally responsive to members of the advisory group, taking input under consideration and taking time to explain complex issues to ensure members were comfortable with their understanding. Deadlines on comments and requests were clear but not rigid. Further, the company provided draft presentations before meetings and followed-up with a final version that contained any last-minute changes or corrections.

Staff recommends more time to review presentations before IRP advisory group meetings, which is crucial for utilities to receive meaningful feedback during the meetings, especially considering Avista's IRP meetings now cover both gas and electric IRP topics. The company should provide advisory group members meeting minutes and follow-up documentation promptly, allowing members an opportunity to suggest revisions or clarifications as necessary. In the future, the company may need to expand its core IRP team to include additional administrative support, especially considering the new customer benefit provisions.

The company filed its Draft IRP on January 4, 2021, mostly complete, except for appendices. Staff notes the lack of appendices is mostly balanced by the excellent data access and availability of Avista staff to stakeholders. Staff also highlights the company's outstanding approach to transparent data access in the *Data Disclosure* section of this document.

In 2020, Avista put out a request for proposals (RFP) for renewable resources. **The RFP process is in its final stages, and there is a possibility that the company will finalize the acquisition of a resource before filing the Final IRP.** To the degree possible, Avista should update the Final IRP with any known resource. If an acquisition occurs soon after the Final IRP is filed, Staff recommends the company file, at minimum, an update to the preferred resource strategy and clean energy action plan so it can develop its CEIP based on the best available information.

Overall, Avista's public participation process is comprehensive and facilitates trust and transparency in the IRP development process. Staff provides recommendations to improve its

public participation process for the next IRP cycle, particularly related to the new documentation and administrative requirements outlined in the rule.[44]

Recommendation

In the **Final IRP:**

- Provide an update based on any recently completed resource acquisition.

In the **next IRP:**

- Provide additional time to review presentations prior to meetings.
- Post meeting minutes in a timely manner and allow opportunity for revision.
- Consider if additional staffing is required to adequately meet new IRP requirements.

Data Disclosure

Avista appears to have best satisfied the data disclosure objectives Staff have highlighted for this first CETA-compliant 2021 IRP cycle of the three Washington electric investor-owned utilities. Overall, the company seems to have provided the data stakeholders requested during the 2021 planning process on time.

Staff notes the *record of stakeholder comments and company responses* is one of the appendices not included in the draft.[45] Unlike peer utilities, Avista's IRP website does not contain an ongoing record of stakeholder comments, data requests, and questions received and addressed by the company.[46] Staff understands that Avista plans to provide this information in the Final IRP but suggests a contemporaneous documentation strategy.[47]

Avista made many data input files available in native format to facilitate stakeholder review of data underlying the company's planning decisions. Staff applauds Avista's commitment to make data and models accessible to stakeholders by posting them to the company's website and providing a webinar dedicated to understanding the PRiSM long-term capacity expansion model.

To further increase accessibility and transparency, the company should provide contextual aids and organize its Final IRP deliverable by including a master table of contents, readme files, and categorically grouping related data.

Recommendation

In the **Final IRP:**

- Ensure appendices include a record of stakeholder feedback and the company's

[44] WAC 480-100-620, -625, and -630.

[45] Appendix C of Avista's Draft Electric IRP serves as the placeholder for public participation comments. However, the company has not filed any appendices with its draft deliverable.

[46] PacifiCorp's 2021 IRP stakeholder feedback website posts stakeholder feedback forms and company responses to said forms, when available. Avista's IRP website does not appear to include similar postings.

[47] WAC 480-100-620(17).

response.
- Provide context for the data files provided on the company's website and submit data files in the docket.

In the **next IRP:**
- Provide contextual aids alongside data input files.

Natural Gas Design Day (Planning Standard)

Avista's peak day planning standard for natural gas is new to this IRP. In previous plans, the company had used a coldest-on-record standard and has changed to a 99 percent probability of experiencing an extremely cold temperature in each of its service areas. The data underlying Avista's new design day calculation indicates a warming trend in parts of its service territory, but it is still based on historic data, not projections of future temperatures.

Staff requests Avista include a future climate change sensitivity similar to that provided by PSE in its next natural gas IRP and provide more explanation around the new design day methodology, including why this new standard is the appropriate choice. Staff believes a few extra sentences explaining how it combines temperatures "with a 99% probability of a weather occurrence" would make the methodology clearer. In its explanation, Avista should provide additional narrative around Table 2.4 and Figures 2.4 through 2.8 to further describe the trends they depict. On the surface, it seems counterintuitive, for instance, that the new design day methodology has Medford's planning standard significantly warmer than the previous methodology did, while Klamath Falls' peak day has gotten slightly colder, even though the two cities are not that far apart.

Recommendation

In the **Final IRP**:
- Explain the new design day methodology, providing a more detailed narrative.
- Further explain why the new design day standard is now the most appropriate one.

In **future IRPs**:
- Explore the feasibility of using projected future weather conditions in its design day methodology, rather than relying exclusively on historic data. The company is conducting a similar analysis for a climate change scenario in its electric IRP.

Natural Gas CPA and Conservation Targets

Avista once again retained AEG to perform the potential assessment for both the electric and gas IRP in Washington and Idaho. (Avista uses the Energy Trust of Oregon to conduct its Oregon CPA.) The continuity in CPA contractors allowed Avista to make very few minor changes to the CPA methodology. AEG estimated that Avista's achievable economic conservation potential for its Washington territory is 3.6 million dekatherms by 2040.

Staff has no suggested changes concerning natural gas CPA and conservation targets *at this time*. It is important to note that Staff will be further analyzing the details of the CPA, including

avoided costs, as part of the CPA approval process described in Appendix 1 to these comments.

Renewable Natural Gas (RNG)

The Draft IRP discusses RNG at length, including state and regional policy considerations, internal steps the company has been taking to prepare for an RNG program, gas quality specifications, and options to build or buy projects. Avista acknowledges that its cost-effectiveness evaluation methodology for RNG is a work in progress. A voluntary RNG program is currently in development. Staff look forward to reviewing detailed assumptions of RNG in the Final IRP.

Recommendation:

In the **Final IRP:**

- Include details of RNG cost assumptions in the appendices.

In **future IRPs**:

- Use any up-to-date cost data that is available to model potential RNG resources.

Appendix 1

Introduction

The passage of the Clean Energy Transformation Act (CETA, E2SSB 5116) in 2019 introduced many critical changes to the ways in which electric utilities conduct their integrated resource planning (IRP) processes. CETA also created a separate, new planning requirement called the clean energy implementation plan (CEIP). The new legislation directed the Commission to issue rules related to IRPs, which occurred midway through the previous IRP 2019 planning cycle. Faced with the likelihood the 2019 IRPs may not be fully CETA-compliant, Staff petitioned, and the Commission ordered, the 2019 IRPs be considered IRP progress reports.[1] The Utilities and Transportation Commission (Commission) initiated rulemakings[2] in January 2020 to develop rules that would implement the new law. The IRP and CEIP rules were finalized on December 28, 2020.[3]

The new rules require IRPs to be submitted on January 1, 2021, and on January 1 every four years thereafter.[4] However, given the changes to the IRP process required by CETA, the Commission ordered each electric utility (Puget Sound Energy [PSE], Avista Corporation [Avista], and PacifiCorp) to submit draft 2021 IRPs by January 4, 2021, with the final versions by April 1, 2021.[5]

All three utilities filed their draft IRPs on January 4, 2021. Both Avista and PSE filed joint electric and gas IRPs. On January 5, 2021, the Commission issued a notice of opportunity for comment from interested parties in the IRP dockets for these three companies by February 5, 2021.[6] The notices also announced recessed open meeting dates and times where the companies will present their draft plans and respond to questions from the Commission and interested stakeholders. The recessed open meeting dates are:

- PacifiCorp: Monday, February 22, 9:30 a.m.
- Avista: Tuesday, February 23, 9:30 a.m.
- PSE: Friday, February 26, 10:30 a.m.

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[1] PacifiCorp, Docket UE-180259, Order 03, ¶¶ 24-25; Puget Sound Energy, Dockets UE-180607 & UG-180608, Order 02, ¶ 15 (Puget Sound Energy); Avista, Docket UE-180738, Order 02, ¶ 15.
[2] Dockets UE-191023 & UE-190698 (*Consolidated*), implementing the Clean Energy Transformation Act codified as RCW 19.405 and changes to RCW 19.280 - Electric Utility Resource Plans.
[3] *In re Adopting Rules Relating to Clean Energy Implementation Plans and Compliance with the Clean Energy Transformation Act and Amending or Adopting rules relating to WAC 480-100-238, Relating to Integrated Resource Planning*, Dockets UE-191023 & UE-109698 (*Consolidated*), General Order 601, pp. 58-59, ¶ 168 (CETA Rulemaking Order) (Dec. 28, 2020).
[4] WAC 480-100-625(1).
[5] *See supra* n.1.
[6] *Notice of Opportunity to File Written Comments*, Avista, Dockets UE-200301 and UG-190724, and UE-200420; Puget Sound Energy, UE-200304 and UG-200305; and PacifiCorp, Docket UE-200420 (Jan. 5, 2021).

This appendix is organized by subject area as they appear in the Commission's rules and describes the statute and rule requirements that govern the IRP process for both electric and natural gas IRPs. The main body of Staff's comments (to which the current document serves as an appendix) is also organized by subject area, and discusses three things:

- How each IRP meets (or does not meet) the requirements laid out in this appendix;
- Whether each utility's IRP modeling is consistent with its peers; and
- What changes Staff recommends to enable acknowledgment of the 2021 final IRP and Clean Energy Action Plan (CEAP), support the development of the Clean Energy Implementation Plan (CEIP), or in each company's next IRP.

Overview of Electric IRP Statute and Rule Requirements by Topic

Public Participation

The Commission's new rules facilitate more opportunities for deeper, cross-topical conversations between interested persons and utilities on a variety of IRP issues, such as equity, to implement CETA directives.[7] Staff highlights two of these public engagement components: participation and involvement of the IRP advisory group, and the two-step draft IRP and final IRP submittal, which will eventually help inform the shape and style of a CEIP. [8]

First, to develop an effective IRP, CEAP, two-year progress report, and CEIP, the utility must demonstrate and document how it considered input from its advisory group, including scenarios and sensitivities the utility used.[9] Throughout the IRP planning processes, it is incumbent upon each utility to provide staff, the advisory group, and the public meaningful opportunities to engage and discuss complex resource planning processes, data assumptions, and other topics such as upstream emissions and the SCGHG emissions used in IRP modeling analyses.

Second, utilities are now required to submit a draft IRP, which provides stakeholders, the media, and the public a meaningful *first glimpse* into the utility's thinking around energy and capacity resource planning in the post Clean Energy Transformation Act world, before the utility files its final IRP four months later.[10] Presenting a draft plan for complex energy and capacity planning is not new. In fact, requiring a mostly complete draft to be filed prior to the issuance of a final document is common practice. For example, the Northwest Power and Conservation Council's (NWPCC or Council) power plan development process includes a two-stage process of issuing a draft plan, taking public comment, conducting the appropriate analysis to respond to public comment, and issuing a final plan.[11]

Due to the ongoing COVID-19 public health crisis, the 2021 IRP public participation process

[7] WAC 480-100-620; -625; and -630.
[8] WAC 480-100-625; WAC 480-100-630; CETA Rulemaking Order at ¶ 137.
[9] WAC 480-100-625; -630; and -655.
[10] WAC 480-100-625(3).
[11] CETA Rulemaking Order at ¶ 166.

cycle looked very different as compared with previous IRP cycles. Staff is acutely aware the first post-CETA IRP cycle was decidedly more difficult for all involved, with most advisory group meetings held virtually via webinar. Plus, the utility faced unprecedented CETA modeling and timing challenges. Staff comments highlight specific areas of success in the public engagement arena and potential areas of improvement for future IRP cycles.

Data Disclosure

To comply with CETA, electric utilities should address three primary data disclosure themes during the 2021 IRP cycle. First, companies should provide the information that stakeholders request during the planning process in a timely manner or provide clear justification why the request cannot be met.[12] This circulation of information in the development and reporting of IRPs should primarily occur during the advisory group process.[13] Adherence to this principle is important as it will align utility planning with the overarching ethos of CETA – one of accessibility, transparency, responsiveness, and clarity.

Second, to maximize transparency, the electric utilities must file with the Commission all data input files in native format as appendices to the draft IRPs.[14] The Commission, Commission Staff, Public Counsel, and other parties with a substantial interest in a company's plan must be able to understand a utility's decisions. Companies disclosing such data in native format facilitates parties independently determining if those actions were in the public interest and represent the lowest reasonable cost option.[15]

Finally, the data a utility provides during the IRP planning process should be easily accessible.[16] Release of such information should be more than large data dumps, whose sheer size can overwhelm the recipients thus reducing the likelihood questions get answered. Instead, companies should tailor the data provided to the requestor's specific query.[17] While utilities can still designate relevant data confidential in keeping with the Commission's rules,[18] Staff's expectation that accessible information is readily shared amongst stakeholders fosters meaningful and inclusive public engagement throughout the IRP advisory group process.

Load Forecasting and Climate Change Impacts

One of the most critical steps in the IRP analyses involves the assessment of how much total energy the utility's customers are expected to consume over a 20-year period (load), including the maximum amount expected to be consumed instantaneously (peak demand). In the IRP, the utility must assess projected economic and population growth for the region. Further, recently updated IRP rules set forth additional requirements in the load forecasting step of the IRP

[12] *Id*., at ¶ 178.
[13] WAC 480-100-630(3).
[14] WAC 480-100-620(14) requires utilities undertake IRP data disclosure actions suggested in RCW 19.280.030(10)(a).
[15] CETA Rulemaking Order at ¶ 173.
[16] WAC 480-100-620(14).
[17] CETA Rulemaking Order at ¶ 178.
[18] WAC 480-07-160.

development process. These include requiring the utility to conduct a new assessment of Distributed Energy Resources or DERs, develop climate change scenarios, and other relevant load assessments.[19]

In addition to their existing requirement to pursue all cost-effective, reliable, and feasible energy efficiency, CETA now requires utilities to pursue all "cost-effective, reliable, and feasible" demand response (DR).[20] Thus, utilities must perform forecasts of cost-effective potential of both resources, where these forecasts must in turn inform the load forecast. Second, CETA requires utilities to conduct an overarching DER forecast, "and an assessment of their effect on the utility's load." The Commission's rules adopted to implement CETA require such forecasts to include energy efficiency, DR, and energy assistance, as well as other DERs like energy storage, electric vehicles (EVs), and solar photovoltaics (PV).[21]

Finally, risks are changing because of climate change. The recently revised IRP rules require utilities to include ***at least one*** future climate change scenario, incorporating "load changes resulting from climate change."[22] As compared to the expected 'base case' or 'do nothing' portfolio, the utility should also consider load impacts, higher risks of changing river flows, disaster frequency, and temperature effects over time on the utility's load-resource balance.

IRP Modeling

Modeling is central to a utility's resource planning because the IRP is essentially a numerical solution for how the company will keep the lights on in the short- and long-term, addressing resource need and balancing supply and demand, given a host of constraints.[23] In determining this IRP solution, the company and stakeholders must examine a range of forecasts and analyses when identifying options for how to meet customer demand, compare these options, and ultimately decide what resources to build or acquire.[24] The 2021 IRPs are the utilities' first roadmaps for realizing the transformative change required by CETA as these plans couple modeling with the supporting narrative required to explain companies' decisions to a wide stakeholder audience.

Utilities must develop and validate their planning models with additional rigor since electric IOUs' 2021 preferred portfolios will establish the baseline for achieving CETA's coal elimination, GHG neutral, and clean electricity targets over the next 25 years.[25] To comply with CETA directives and adaptively manage modeling methodologies, utilities must determine how best to incorporate the social cost of greenhouse gases (SCGHG) into their analytics, properly integrate distributed energy resource (DER) assessments into resource planning, and undertake more sophisticated scenario and sensitivity modeling as compared with previous IRP cycles. These three modeling topics constitute focal points of the 2021 draft IRP staff review.

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[19] WAC 480-100-620(3) and (10).
[20] RCW 19.405.040(6)(a); -.050(3).
[21] WAC 480-100-620(3).
[22] WAC 480-100-620(10)(b).
[23] RCW 19.280.030(1).
[24] WAC 480-100-620(11).
[25] RCW 19.405.030(1); -.040(1); -.050(1).

As required by statute and rule, utilities must incorporate SCGHG as a cost adder when evaluating and selecting conservation and resource options. Within their IRP narrative companies should evaluate the robustness of their analytical approaches and describe how the IRP solution incorporates the SCGHG cost adder throughout the modeling stages. Appropriately handling SCGHG within IRP analyses is likely the most important modeling consideration for utilities during the 2021 cycle as this adder applies across the range of resource strategies considered.[26] Modeling SCGHG also serves as an insightful linkage for comparing how Washington's three IOUs are pricing new CETA requirements into resource selection.

Reflective of CETA, both statute and accompanying rule continue to require the lowest reasonable cost (LRC) solution,[27] but are now more prescriptive when it comes to the types of resources, especially clean alternatives, and analyses that must be considered when planning for future targets. Utilities must now consider a wide range of DER options and undertake quantitative methods (e.g., forecasts of demand response and other demand side management) to determine the impact such efforts will have on utility planning.[28] Utilities should appropriately incorporate DER potential into portfolio development. Staff's goal is to ensure appropriate utility valuation of resources like demand response (DR) and energy efficiency (EE), which is crucial to meet CETA standards and implement specific targets identified in the CEIP.

Additionally, utilities' portfolio development must quantify the impact and risk associated with crosscutting concerns like ensuring resource adequacy and equitably distributing customer benefits and costs.[29] Companies need to develop a CETA "counter factual" scenario that identifies the alternative LRC portfolio the companies would have implemented if the CETA requirements around greenhouse gas neutrality by 2030 and clean electricity by 2045 were not in effect. Second, companies need to run a climate change scenario that incorporates the best science available to assess climate change impacts, including hydrological conditions, temperature, and load changes.

Finally, utilities are required to run a sensitivity that examines how their 2021 preferred portfolio performs when benefits for all customers are maximized, before balancing other objectives.[30] This analysis seeks to quantify how all customers, including vulnerable populations or highly impacted communities, are benefiting from the transition to clean energy.[31] The analysis should only adjust variables specific to an IOU's Washington service territory. The intent of this modeling exercise is to maximize the hypothetical benefit utilities' Washington customers could realize. There is no "right answer" for how to optimize this benefit so utilities should brainstorm what activities or actions are most efficacious. Once determined, companies could "hardcode" given levels of these benefits and subsequently co-optimize other modeling variables. Staff recognize competing constraints may prevent a company's 2021 IRP from ultimately reflecting these sensitivity attributes. For the 2021 IRP, the primary result of this sensitivity is additional

[26] RCW 19.280.030(3)(a); WAC 480-100-620(11)(j).
[27] RCW 19.280.030(1)(d); WAC 480-100-620(7) and (11)(a).
[28] RCW 19.280.030(1)(h) and (j); WAC 480-100-620(3) and (11)(c).
[29] RCW 19.280.030(1)(g), (i), and (k); WAC 480-100-620(8), (11)(f) and (g).
[30] WAC 480-100-620(10)(a) – (c).
[31] RCW 19.405.040(8).

data and analyses utilities can further refine for their 2022 CEIP and subsequent planning cycles.[32]

Nonenergy Impacts

The IRP statute changes in CETA require the IRP to address the clean energy transformation standards.[33] This results in the need for nonenergy impacts (NEIs) of the utility's energy system and programs to be included in the 2021 IRP more prominently as compared with previous IRP cycles. Historically, NEIs were nearly all associated with energy efficiency programs and measures. Under CETA, NEIs should be included with all resources when applicable.

Utilities are required to account for nonenergy costs and benefits not fully valued elsewhere in an IRP model within distributed energy resource assessments.[34] For example, a CPA should not include a separate value for the SCGHG if that value is appropriately accounted for elsewhere in the selection of energy efficiency. A nonenergy benefit that occurs exclusively or primarily on the demand-side should be included within the CPA (or other DER assessment). Some values of nonenergy impacts are well documented in the region, particularly those vetted by the Regional Technical Forum. However, there are many impacts for which data is currently unavailable, not monetized, attributable to a program instead of a measure, out-of-date, or not applicable to a particular utility service territory. In these instances, Staff finds it appropriate to use proxy data to identify nonenergy costs and benefits.

Finally, nonenergy costs and benefits are required by the new rules to be listed in the avoided costs section of the IRP and identify if they accrue to utility, customers, participants, vulnerable populations, highly impacted communities, or the public.[35]

New Customer Benefit Provisions of CETA

The clean energy transformation standards described in rule address the affirmative mandate to ensure all customers are benefiting from the transition to clean energy, identifying three *separate* components of the customer benefit requirement.[36] Each component should be addressed in the IRP in multiple ways.

Specifically, the rule requires each utility to include an assessment of economic, health, and environmental burdens and benefits in the IRPs.[37] While the cumulative impact analysis (CIA) conducted by the department of health that should inform the assessment was not available in

[32] Conservation Energy Planning and Energy Policy staff customer benefit discussion, January 20, 2021.
[33] RCW 19.280.030(1) requires an IRP to address the ". . . implementing [of] RCW 19.405.030 through 19.405.050, at the lowest reasonable cost and risk to the utility and its customers, . . ." including an assessment of "Energy and nonenergy benefits and reductions of burdens to vulnerable populations and highly impacted communities; long-term and short-term public health and environmental benefits, costs, and risks; and energy security and risk;"
[34] WAC 480-100-620(3).
[35] WAC 480-100-620(13).
[36] WAC 480-100-610(4)(c)(i)-(iii).
[37] WAC 480-100-620(9).

time for the 2021 IRP, the requirement that the assessment be informed by the CIA does not waive the requirement for an assessment if the CIA is unavailable.[38] Each utility IRP must include an assessment of energy and nonenergy benefits and reductions of burdens to vulnerable populations and highly impacted communities; long-term and short-term public health and environmental benefits, costs, and risks; and energy security and risk using other sources of information relevant to the assessment. One use of this assessment is to inform the current distribution of benefits and burdens within a utility's service territory.

While it is hard to overstate the impact of CETA's clean energy mandates, the statute's customer benefit provisions are perhaps even more of a divergence from the utilities' (and the Commission's) traditional approaches to system planning and operations. For decades, utilities have been tasked with building a plan that can meet anticipated system needs at lowest reasonable cost, considering risk. CETA has added another priority that the utilities must achieve: ensuring all customers are benefiting from the transition to clean energy.

In future IRPs, this customer benefit mandate will largely focus on customer benefit indicators (CBIs). However, the utilities' inaugural CEIPs will emphasize CBI determination and details.[39] Instead, the CETA statutory and rule applicable to the 2021 planning cycle covers three topical areas: current-state assessment of economic, health, and environmental burdens and benefits;[40] maximum customer benefit modeling sensitivity discussed above;[41] and each utility's formation of an equity advisory group.[42]

The new economic, health, and environmental burdens and benefits assessment includes developing a current-state "snapshot" of the energy impacts and NEIs vulnerable populations and highly impacted communities experience within the electric IOUs' Washington service territories. Similarly, the IRP also needs to consider risks associated with long-term and short-term public health and environmental impacts as well as energy security.[43] These current conditions are the basis for determining whether the allocation of benefits and burdens from the utility's transition to clean energy results in equitable distribution.[44] This current-state assessment is critical for establishing baseline geographic and demographic datapoints, including identifying the vulnerable populations and highly impacted communities a given utility serves.[45] While the original intent was for electric IOUs to consider the Washington Department of Health's cumulative impact analysis (CIA) in developing their assessments,[46] the CIA's delay past December 31, 2020, does not waive the assessment requirement. Utilities should consider

[38] CETA Rulemaking Order at ¶ 54.
[39] WAC 480-100-640(4).
[40] WAC 480-100-620(9).
[41] WAC 480-100-620(10)(c).
[42] WAC 480-100-625(2)(b), WAC 480-100-655(1)(b).
[43] WAC 480-100-620(9).
[44] CETA Rulemaking Order at ¶ 53.
[45] *See* WAC 480-100-605 for definitions of "highly impacted community" and "vulnerable populations."
[46] RCW 19.280.030(1)(k).

alternative references (e.g., U.S. Census data) relevant to the assessment.[47] Each electric utility must provide this assessment as part of its 2021 IRP to comply with CETA.[48]

Lastly, the equity advisory group required for utilities' forthcoming CEIPs should also inform IRP planning.[49] In this fashion, an IOU's comprehensive attention to vulnerable populations and highly impacted communities serve as a common thread linking successive CETA deliverables (i.e., IRPs, CEAPs, CEIPs).[50] Hence, each company should create an equity advisory group by May 1, 2021, to provide useful and timely input for the planning cycle. Further, this advisory group must be Washington-focused, comprised of Washington stakeholders, and include representatives from highly impacted communities and vulnerable populations. A multi-state utility cannot simply apply a systemwide advisory group to also serve as the company's equity advisory group to comply with CETA.

Conservation and CPA

The Energy Independence Act (EIA) (RCW 19.285) was not replaced or modified by the passage of CETA. When the activities undertaken to comply with the EIA meet the requirements of CETA, they qualify for compliance with both statutes. Staff expects that the customer benefit mandate, with its provisions to account for additional nonenergy impacts such as public health benefits, and requirement to reduce of burdens to vulnerable populations and highly impacted communities, will make additional energy efficiency a cost-effective resource choice.

The new IRP rule requires an energy efficiency and conservation potential assessment of current and potential policies and programs needed to obtain all cost-effective conservation, efficiency, and load management improvements; including the ten-year conservation potential used in calculating a biennial conservation target under WAC 480-109.[51] This requirement should not change utility standard practice to any real degree. Staff expects that incremental improvements to the potential assessment are ongoing.

Each IRP should, at minimum, provide sufficient data points to calculate the ten-year, four-year, and two-year cost-effective conservation potential under both CETA and the EIA.

Demand Response

The IRP must contain a demand response potential assessment of current and potential policies and programs needed to obtain all cost-effective demand response.[52] The statutory definition of demand response is broad and includes pricing structures (such as time of use or critical peak pricing), measure-based programs controlled by the utility, and behavioral programs that include

[47] CETA Rulemaking Order at ¶ 54.
[48] Conservation Energy Planning and Energy Policy staff customer benefit discussion, January 20, 2021.
[49] WAC 480-100-625(2)(b), WAC 480-100-655(1)(b).
[50] CETA Rulemaking Order at ¶ 162.
[51] WAC 480-100-620(3)(b)(i).
[52] WAC 480-100-620(3)(b)(ii).

an incentive payment.[53] In order to determine all cost-effective demand response as required by CETA, a potential assessment must include a broad range of options that include each of these types of demand response.[54]

Energy Storage

Energy storage is identified in CETA and in the recently adopted WAC rules implementing CETA as a key component of the transition to clean energy.[55] Energy storage can address many types of system needs: energy, capacity, ancillary services, integration of renewable resources, balancing, spinning and non-spinning reserves, and emergency power. Energy storage can also play a role in deferring or preventing some transmission and distribution projects. The newly adopted WAC includes the following requirements related to energy storage:

- WAC 480-100-605 – energy storage included in definition of a DER.
- WAC 480-100-620(3)(a) – DER assessments in a utility's IRP "must incorporate nonenergy costs and benefits not fully valued elsewhere within any integrated resource plan model."
- WAC 480-100-620(3)(b)(iv) – storage identified as a DER "that may be installed by the utility or the utility's customers," and which the "IRP must assess[.]"
- WAC 480-100-620(5) – battery and pump storage identified as potential way to integrate renewable resources and address overgeneration events.
- WAC 480-100-620(11)(e) – acquisitions made after CETA's passage must "rely on renewable resources and energy storage, insofar as doing so is at the lowest reasonable cost."

While CETA has changed the regulatory landscape in Washington, energy storage is not new to the Commission.[56] Accurate modeling and optimal use of energy storage within a utility's system planning tools was identified as the main limitation to full consideration of energy storage as a resource in the Commission's policy statement. The value of energy storage is more apparent when a system planning model uses a granular timescale – the more granular the modeling timescale, such as an hourly or sub-hourly dispatch simulation, the more value of energy storage can be identified. Many IRP modeling tools' optimizations are not typically performed on an hourly or sub-hourly basis.

In the policy statement, the Commission also discussed policy principles related to energy

[53] "Demand response" means changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentive payments designed to induce lower electricity use, at times of high wholesale market prices or when system reliability is jeopardized. "Demand response" may include measures to increase or decrease electricity production on the customer's side of the meter in response to incentive payments.
[54] WAC 480-100-610(4)(a).
[55] RCW 19.405.040(6)(a)(iii); RCW 19.405.050(3)(c); WAC 480-100-620(11)(e).
[56] *Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition*, Dockets UE-151069 and U-161024, ¶ 15 (Oct. 11, 2017) (Policy statement identified "barriers that prevent energy storage from being fairly considered in resource planning and develop[ed] policies to overcome them").

storage, many of which are also reflected in the newly adopted Part VIII of Chapter 480-100 WAC. We briefly summarize some components of the policy statement that continue to be relevant in the context of CETA and the revised WAC:

- Utilities should move toward a "new planning framework that more cohesively considers the relationship between generation, transmission, and distribution, allowing for a fair evaluation of hybrid resources such as energy storage."[57]
- Utilities should adopt modeling platforms capable of sub-hourly modeling, and in the interim should use an external model capable of modeling the sub-hourly benefits of storage over the resource's useful life, including transmission and distribution benefits, then calculate the net present value of those benefits and deduct that value from the resource's modeled capital cost in the IRP."[58]
- Utilities should consider at least "a reasonable, representative range of storage technologies and chemistries," working with their advisory groups to identify these resources, [59]
- Utilities should vet storage cost assumptions by reviewing third-party data and applying "a reasonable learning curve to storage costs to account for forecasted declines."[60]
- Finally, utilities should ensure that storage is considered in evaluating distribution system projects, including all locational benefits.[61]

As utilities use resource modeling software that is more sophisticated as compared with previous IRP cycles, and as CETA's equity components are better understood, Staff expects that the importance of energy storage as a resource that can address multiple system needs and inequities will only grow, as will Staff's focus on its accurate modeling and full consideration in each utility's IRP.

Qualifying Facilities – Avoided Cost Methodology

The Public Utilities Regulatory Policies Act, or PURPA, requires utilities to purchase energy and capacity made available to them by qualified facilities (QFs) at a price based on the utility's avoided costs.[62] The IRP estimates what the utility's system needs, and at what cost. The goals of making avoided costs understandable for all stakeholders and of strengthening the connection between the IRP analysis and PURPA rates were both key factors driving the adoption of the new WAC 480-100-620(13) and (15).

[57] *Id.* at ¶ 36.
[58] *Id.* at ¶ 43.
[59] *Id.* at ¶ 46.
[60] *Id.* at ¶ 47
[61] *Id.* at ¶ 48.
[62] The Commission revised its implementation of PURPA recently through a rulemaking that culminated in Chapter 480-106 WAC, which prescribes a methodology for setting PURPA rates for QFs with a nameplate capacity of 5 MW or less, and which requires that utilities file for the Commission's consideration and approval a methodology to calculate avoided cost rates QFs larger than 5 MW. These methodologies were submitted by all three utilities and approved by the Commission in the following dockets: UE-191062 for PSE, UE-200455 for Avista, and UE-200573 for PacifiCorp.

- WAC 480-100-620(13): "Avoided cost and nonenergy impacts. The IRP must include an analysis and summary of the avoided cost estimate for energy, capacity, transmission, distribution, and greenhouse gas emissions costs. The utility must list nonenergy costs and benefits addressed in the IRP and should specify if they accrue to the utility, customers, participants, vulnerable populations, highly impacted communities, or the general public. The utility may provide this content as an appendix."

- WAC 480-100-620(15): "Information relating to purchases of electricity from qualifying facilities. Each utility must provide information and analysis that it will use to inform its annual filings required under chapter 480-106 WAC. The detailed analysis must include, but is not limited to, the following components:

> (a) A description of the methodology used to calculate estimates of the avoided cost of energy, capacity, transmission, distribution and emissions averaged across the utility; and
> (b) Resource assumptions and market forecasts used in the utility's schedule of estimated avoided cost required in WAC 480-106-040 including, but not limited to, cost assumptions, production estimates, peak capacity contribution estimates and annual capacity factor estimates."

Resource Adequacy and Uncertainty Analysis

Resource adequacy (RA) studies in the IRP, including RA metrics and methodologies, are extremely important to ensure the lights stay on. Specifically, CETA requires an electric utility's IRP to determine "resource adequacy metrics for the resource plan" and to identify "an appropriate resource adequacy requirement and measurement metric consistent with prudent utility practice."[63] Staff's review of resource adequacy in the IRP is broad in scope and involves all aspects of load service and modeling, including: energy, capacity, flexibility, availability, and performance characteristics of specific resources, such as demand-side, storage, wind resources, and batteries.[64] The analysis of the contribution to RA by storage and variable energy resources is of particular interest to Staff in the first post-CETA IRP review. Staff comments also address the incorporation of uncertainty into the RA assessment, often in the form of sensitivity analysis.

Distribution Planning Process

The IRP rules require that the utility must include assessments of a variety of distributed energy resources and the effect of distributed energy resources on the utility's load and operations.[65] Further, the commission strongly encourages utilities to engage in a distributed energy resource planning process as described in RCW 19.280.100. If the utility elects to use a distributed energy resource planning process, the IRP should include a summary of these results.

[63] *See* RCW 19.280.030(1)(g) and (i).
[64] WAC 480-100-620(8).
[65] WAC 480-100-620(3).

Overview of Clean Energy Action Plan (CEAP) Requirements

To comply with statute and rules, each utility must develop a ten-year clean energy action plan that works toward implementing the IRP's lowest reasonable cost solution, including incorporation of the social cost of greenhouse gas emissions as a cost adder in its analysis.[66] As the intermediary plan between the IRP and the CEIP, the CEAP should identify the utility's ten-year resource "ramp" needed to meet energy, capacity, and associated flexibility in order to maintain and protect safe, reliable operation and balancing of the electric system, while achieving other clean energy transformation objectives.[67] Specifically, each CEAP should:

- meet clean energy transformation standards, including customer benefit provisions[68];
- be informed by the utility's ten-year cost-effective conservation potential assessment;
- identify the potential cost-effective demand response and load management programs that may be acquired;
- establish a resource adequacy requirement and demonstrate how each resource, including renewable, nonemitting, and DERs, may reasonably be expected to contribute to meeting the utility's resource adequacy requirement;
- identify any need to develop new, or to expand or upgrade existing, bulk transmission and distribution facilities; and
- identify the nature and extent to which the utility intends to rely on an alternative compliance option identified under RCW 19.405.040(1)(b), if appropriate.

Overview of Natural Gas IRP Statute and Rule Requirements by Topic

Design Day (Planning Standard), particularly in the context of climate change data or future studies

"Design day" refers to the peak temperature assumption that natural gas local distribution companies (LDCs) use to develop the plan for their natural gas supply and distribution pipeline systems. Neither statute nor rule impose any specific requirements for design day in the natural gas IRPs. Each LDC has the flexibility to identify its design day as appropriate. The utility must include the design day in its natural gas IRP, and provide a discussion justifying its selection, particularly addressing climate change risk of gradually increasing temperatures over time.

Upstream Emissions & SCGHG

For the first time, statute requires LDCs to model a price on greenhouse gas emissions in the IRP. The statute specifies the price assigned to these emissions, but only for the purposes of

[66] WAC 480-100-620(12).
[67] WAC 480-100-610(4)(b).
[68] WAC 480-100-610.

setting conservation targets.[69] That price is set at the social cost of greenhouse gases (SCGHG), using a 2.5 percent discount rate, where the utility must also model and account for upstream emissions or "emissions occurring in the gathering, transmission, and distribution of natural gas to the end user."

CPA and Conservation Targets

RCW 80.28.380 requires gas companies to identify and acquire all conservation measures that are available and cost-effective, with an acquisition target approved by the commission every two years beginning in 2022. The target will be reviewed with the next conservation plan, but the IRP will be a main source of the data. A determination of cost-effective conservation in the IRP will be the start of the target calculation and must be clearly included in the IRP.

The cost-effectiveness analysis required by this section must include the costs of greenhouse gas emissions established in RCW 80.28.395. This could be included in the CPA or in a different IRP model. The IRP must include a clear description of how and where the SCGHG is included.

The targets must be based on a conservation potential assessment (CPA) prepared by an independent third party and approved by the commission. In order for Staff to recommend the commission approve a CPA there must be:

1. Transparent review of model.
2. Vetting through advisory groups.
3. Consistency with the Council's method.
4. Internal consistency with load forecast.

While it has been the practice of the utilities to exclude gas transportation customers from participating in their conservation programs, Staff struggles to find an exclusion for gas transportation customers in the statutory language of RCW 80.28.380. Thus, in order to identify all cost-effective conservation, it will be necessary for the utility to separately consider and evaluate the energy efficiency potential of any customers too large to include in the CPA.[70] All available and cost-effective conservation potential must be included. The method chosen should be discussed with the advisory groups. Staff expects that if this conservation from large industrial customers is included in the IRP analysis, it is likely to reduce the utility's need for distribution system improvements.

Renewable Natural Gas (RNG)

Natural gas LDCs "must" offer their customers a voluntary RNG service by tariff.[71] Such service

[69] RCW 80.28.395. The conservation targets for LDCs are also a new requirement: HB 1257 for the first time requires LDCs to identify and acquire all cost-effective conservation and requires them to set two-year acquisition targets that will accomplish this goal. RCW 80.28.380.
[70] Potential assessments assume average market penetration and savings over sizeable populations. Conservation potential from large industrial customers, including transportation customers, are more appropriately treated individually than on an average basis.
[71] RCW 80.28.390.

would "replace any portion of the natural gas that would otherwise be provided by the gas company." Second, LDCs "may" propose an RNG program that "would supply renewable natural gas for a portion of the natural gas sold or delivered to its retail customers."[72] These two provisions contain an important distinction: The first *requires* LDCs to offer RNG to those customers that want it, while the second *allows* them to offer an RNG program that would serve all customers. The latter is subject to cost and environmental limitations. Analysis in the IRP will support the utility's proposals in this area. Further, the utility's IRP must discuss its plans concerning RNG.

Storage

WAC 480-90-238(3) requires LDCs to "assess" opportunities to use company-owned or contracted storage in their IRPs, and also includes storage options as one of many resource options to be evaluated using a "consistent method to calculate cost-effectiveness."

Distribution Planning

Each LDC must provide a short-term plan outlining the specific actions to be taken to implement the long-range integrated resource plan during the two years following submission.[73] Each LDC also typically outlines a multi-year budget for engineering projects through a distribution scenario decision-making process. LDCs identify areas with growth forecasted to create capacity issues, focusing on areas for future improved distribution capacity needs, and highlight these projects in the IRP.

[72] RCW 80.28.385.
[73] WAC 480-90-238(3)(h).

Gall, James

From: Andrew Argetsinger <aargetsinger@tyrenergy.com>
Sent: Tuesday, February 16, 2021 4:31 PM
To: Lyons, John; Gall, James
Cc: Kevin Calhoon; Stuart McCausland
Subject: [External] RE: Avista's Draft 2021 Electric IRP

John / James – Hope all is well. We are reviewing the current draft of the 2021 IRP and had a few questions:

(1) We noticed that there was not a Lancaster PPA extension scenario included in the 2021 draft IRP. Why the change from last year?
(2) Would you consider revising this draft to include a 10 year Lancaster PPA extension scenario? It seems unlikely to us that choosing not to extend the Lancaster PPA and turning around to immediately add 210+ MW of new peaking capacity in 2027 would be economically advantageous enough (compared to a Lancaster PPA extension scenario) to exclude the extension scenario from the IRP.
(3) Will you share with us the unit parameters for Lancaster that would be used for a Lancaster PPA extension scenario? We'd like to understand what level of operational flexibility would be assumed in a Lancaster PPA extension scenario.

Please let me know if you have any questions or clarifications regarding these requests.

Best,

Andrew Argetsinger
Senior Director, Corporate Strategy
Tyr Energy, Inc.
7500 College Blvd., Ste. 400
Overland Park, KS 66210
913.626.0772 (mobile)
aargetsinger@tyrenergy.com

From: Lyons, John <John.Lyons@avistacorp.com>
Sent: Monday, January 4, 2021 5:20 PM
To:
Subject: Avista's Draft 2021 Electric IRP

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
Hello TAC Members,

Attached is a copy of the draft 2021 Electric IRP for your review. Please provide any comments or edits back to us by Monday, March 1, 2021 to me at john.lyons@avistacorp.com. The final IRP and completed appendices will be filed on April 1, 2021 with the Idaho and Washington Commissions.

Our fifth and final TAC meeting will be held on Thursday, January 21, 2021. The meeting invitation and agenda will be available by the end of this week. There will also be an opportunity to provide written comments about the draft IRP to the Washington Commission and a public meeting on February 23, 2020. We will provide more details at the fifth TAC meeting.

Thank you for all of your participation in the 2021 IRP,

John Lyons
Avista Corp.
509-495-8515

November 14, 2020

To: John Lyons, John Barber, Dennis Vermillion, IPUC, WPUC & TAC committee members

From: Dave Van Hersett, TAC Member Emeritus

Subject: Biomass Generation omitted from considered IRP Options

Just read the draft IRP and found that Biomass Generation has been omitted from considered options for analysis. We have a substantial renewable biomass fuel supply in our Inland Empire. We should utilize it for the good of man rather than fuel for forest fires. So here is the case for Biomass Generation to provide new generation that meets CETA and brings back the forest products industry to the Inland Empire.

1. CETA approved three options for new power generation, Wind, Solar and Biomass.
2. Kettle Falls 50 MW Biomass generation plant has been operating since the early 80's utilizing sawmill biomass fuels generated during the processing of round logs to make rectangular lumber and other products.
3. The logging process does not utilize the tops and branches of the tree. The tops and branches equal the weight of the saw logs delivered to the sawmill.
4. Sawmill biomass fuel is ten percent of the weight of the saw logs brought into the sawmill.
5. The tops and branches weigh ten times the weight of the sawmill biomass fuel. This ratio is dependent on type and specie of forest growth.
6. Since the 50 MW Kettle falls Biomass power plant utilizes sawmill biomass fuels, the tops and branches logging biomass would have enough fuel for 500 MW of biomass generation.
7. Biomass fueled generation works when the sun does not shine and works when the wind is not blowing and can be scheduled to meet the load profile of the customers. Thus, less generation capacity is needed due to load factors of Wind and Solar to meet given customer loads.
8. Avista has the experience and trained staff to operate thermal biomass power generation plants.
9. Note that every year Logging fuels are left in the forest to rot and/or be fuels for forest fires. This is because the trees grow every year independent of politics. Forest fuels are a renewable bioenergy resource. We have been wasting this energy source for years.

Utilizing Logging Biofuels would reduce the fuel available for forest fires. Utilizing Logging biofuels would provide excellent forest management practices to optimize the production of timber products for the good of mankind. Eliminating forest fire fuels would bring back timber supplies to the 11 former sawmill towns in the Inland Empire. Bringing back the forest products industry would bring back jobs needed for the ever-increasing population (2% per year).

Both Wind and Solar receive financial incentives to make them competitive with existing generation resources. Biomass fuels should qualify for the same incentives. These incentives would then improve the cost of recovering the logging biofuels and delivering them to one or more power plant locations. The assumption here is that the wind and solar resource utilized in the draft IRP will continue to receive incentives.

A typical sawmill supports a 5 MW biomass power plant utilizing sawmill biomass fuel. Thus, each sawmill's logging biofuels would support a 50 MW biomass power plant utilizing logging biofuels. This would minimize fuel transportation expense. Integrating 55 MW into the local electrical distribution system would be easier than one 500 MW power plant.

As the demand for wind and solar increases, the supply of these resources will be subject to the market demand. The price of wind and solar will likely increase as demand increases and delivery extended. Biomass fueled power plants are readily available today from several experienced builders and contractors.

From an operating perspective, Avista could go into partnerships with the sawmills, building and operating the biomass power plants. The sawmills would provide fuel and utilize steam for their dry kiln operations. Timber from area forests has been for hundreds of years assuring a firm fuel supply. Sawmills have been operating in this area since the 1800's and will continue to operate as long as the ever-growing population requires timber products for their use. In the recent 40 years the supply of timber has been subject to politics and the degrading of forest management practices.

The above concept would be like the former TWWPCO management committing to the development and investing in hydro and fossil fuel power plants to insure a reliable and low-cost power cost for its customers. TWWPCO sold excess capacity until it was needed for its own customers loads.

Biomass generation option should be included as one of the alternatives evaluated to determine relative economics of the three approved new generation types, wind, solar and biomass here in the Inland Empire. We have the moral obligation to utilize the forests for the benefit of mankind not to fuel forest fires to destroy property and kill our neighbors.

Guest Commentary

THE GREEN OPPORTUNITY: Executive Summary

The 40-year Green movement has brought devastation to the forests, destruction to property and death to inhabitants and created 11 sawmill ghost towns in the Inland Empire. In 2020 the Conservation Energy Transformation Act (CETA) was enacting into law providing the key ingredient enabling complete recovery from 40 years of devastation. This act requires that any new electric generation be from Wind, Solar and *BIOMASS*. *Biomass* is wood fuel remaining from harvesting forests to make products for mankind. We now can bring back the vibrant forest, clean air, and return the forest products industry and jobs for the inhabitants of the Inland Empire.

A little history: When I grew up in Spokane in the 50's I do not remember smoke filled skies at the lake in the summer. We had lots of towns participating in the Lilac Parade, logging contests, and fun high school games all around the area.

I remember EXPO 74. All the rides and summer entertainment it brought. EXPO 74 brought the River Front Park that cleaned up the town and provide a major improvement to the Spokane downtown. This came about from the foresight and leadership of local businesses and government at the time. No smoke-filled skies during the EXPO.

Now it is time for our current leadership to take advantage of the enabling CETA law to bring back our forest products industry and the 30,000 or so jobs with it. We need this to provide employment for our children and our ever-growing population. We need to utilize our forests for the benefit of mankind rather than fuel for forest fires and to clean up the air.

BIOMASS FOREST RESOURCES is our solution!

A BIOMASS project is an electric generating plant that uses wood waste for fuel instead of fossil fuels. The Kettle Falls 50 Megawatt Biomass fueled power plant has been operating since the 1980's. What do we have to do to make this happen?

First, we have to educate our local governments, our captains of industry, our utility leadership, and our congressional representatives on the biomass recovery opportunity that is here today. Then they must put their heads and resources together for the betterment of its citizens and the husbanding of our local forest resources.

Second, we have to pre-license Biomass Project sites at the former sawmill towns. These sites are in the logical locations to minimize the cost of the transportation of the forest harvested products. These sites will receive a very enthusiastic approval from the occupants of the former mill towns. Pre-licensing sites will prove that the public has an extremely high approval of biomass electric generation. Pre-licensing sites will verify the acceptance of utilization of the local forests for the benefit of mankind rather than fuel for forest fires. The local utilities have the skills and resources to accomplish this.

Third, the forest management practices must be changed to allow the use of timber for products for mankind instead of growing fuel for forest fires. This will require the assistance of our congressional representatives to make changes to US Forest Service and State forest management practices.

Fourth, the utilities in this area must require that Biomass be their preferred new generation resource instead of Wind and Solar. They must incorporate the benefits of the renewed 10,000 mill jobs and supporting 30,000 jobs in our area into their financial evaluations when comparing to the Wind and Solar options. The infrastructure for the utility distribution systems remains in place from the days of the operating sawmills. No major transmission systems are needed as compared to Wind and Solar. Benefits from the Biomass investment to the local area would include more jobs, more tax basis to support local government and schools, reduction in forest fire prevention and recovery costs, and cleaner air to name a few.

Finally, bringing back the forest products industry will create a major economic boon to the Inland Empire. As our population grows our children will not have to leave the area to find employment. Our region's natural resource will be returned to be used to benefit mankind. The forest and our population grow every year independent of politics.

Bringing back the forest products industry will be our legacy!!

Now for more detail:

Consequences of Going Green

The consequences of going green for the past 40 years are as follows:

1. More fuel for forest fires, property destruction and killing persons.
2. Loss of timber supplies for local sawmills.
3. Lost jobs for the inland empire population.
4. Loss of land for growing food.
5. Loss of scenery viewing from wind and solar.
6. Loss of investment in Inland Empire towns.
7. Loss of tax revenue to support local schools and government.
8. Double to triple electric rates.
9. Triple the generation capacity installed needed to meet customer loads.
10. Increased mining of resources over traditional generation to provide materials to manufacture and build wind and solar.
11. Loss of birds. Wind power plants kill 30% of the bird population from blade strikes.

Reflections of a lifetime

Author: A 5th generation of Spokanite, 82-year-old, Veteran, Retired Professional Engineer, businessman, four great children, Jaycee, Rotarian, Eagle Scout, Scout Master, Soccer Coach, Spokane School District Citizens Advisory Committee, 50-year home owner in Spokane, NCHS graduate, WSU BSME & MBA. Career in coal, oil, natural gas and biomass fueled Power Plant Development and performance-based Energy Conservation in the commercial, industrial and institutional sectors. I am 82 now in my twilight and have limited time left to pass on my observations of a lifetime. My classmates are showing up in an ever-increasing number in the obituary notices daily. Time is getting short for me give something back. I am a product of the values of our area and the education system provided by our citizens. My name is Dave Van Hersett, SR., a proud Spokane citizen.

INLAND EMPIRE NATURAL RESOURCES

We have been blessed with the following natural resources in our area to manage and harvest for the benefit of mankind. They are (1) Water, (2) Mineral resources underground, (3) farmlands to produce food, (4) forests to grow products for mankind and finally, our (5) population. We need to husband each of the resources to support our ever-growing population.

Our forefathers found minerals, gold, silver & lead in the Kellogg wilderness. Timber from the forests built the railroads to ship the minerals to markets. Timber provided housing and heat for the population. Water was used to make electric power to enable mining, industry and support the population. We enjoy the benefits of our predecessors efforts.

AVISTA ABANDONED THE MAJORITY:

Since renaming The Washington Water Power Company to Avista we customers have increased the officers compensation from hundreds of thousands to millions. This makes their compensation ten times that of the President of the USA and the Gov of Washington State. The average income of Avista customers is $40,000 per year, about 100 times less than the Avista management compensation. For what we customers pay Avista management, we expect that they can accomplish the impossible like Superman and make real improvements for their 300,000 customers. So, what has the Avista MGT done for its customers?

(1) They have adopted a strategy to increase the customer monthly billing by up to three times.

They took their knee to the Green movement indifferent to the will of majority of its customers. **99% of the customers chose not to participate in Avista's option's to purchase higher cost wind and solar power.** The customers gave an extraordinarily strong signal that they want reliable and low-cost electrical power. The Avista Utility 20 year plan for generation removes fossil fuel generation and adds wind and solar. The utility has not come up with any plans to develop additional revenue to offset the huge increase coming to our energy costs and bills.

(2) **They abandoned their Forest Products industry**

The result is the creation of 11 ghost towns from the loss of the sawmills in these towns. These natural forest industries were one of the reasons that founded the WWP over 100 years ago in 1889. The forest products industry has been abandoned to grow fuel for forest fires instead of products for mankind. This accounts for a loss of over 10,000 forest industry jobs and the 30,000 people supporting the forest products industry in Avista's service area. Where do these people go now? Our children leave the area to find employment. To get an idea of the impact on our forest products towns compare the vibrant town of Colville with former sawmill towns like Usk, Cusick, Republic, Kellogg, Athol to name a few.

(3) Tried to sell the utility two times.

Washington and Idaho Utility Commissions did not approve these sales. In both cases the management would have received a substantial sale commission. I was never in favor of selling our utility.

Historical Innovation and Leadership in Inland Empire

We enjoy the benefits of our forefathers innovation and leadership to bring benefits to the local economy and provide employment of our population. In the 1889 The Washington Water Power Company was formed to provide power and energy to the industries of the time, timber, mining and agriculture. Hydro power was developed to provide low cost and reliable energy for the ever-growing industry and populations of this region. Noxon and Cabinet Hydro power projects were developed to serve the ever-increasing population and industrial customers. The 1400 MW Centralia Coal Plant and Coal Strip projects were partnered in to provide reliable and low-cost power for the ever-growing customer loads. Excess power was sold to other utilities here in the PNW to keep our energy costs low.

In the 70's TWWPCO developed the Kettle Falls 50 megawatt Biomass Power Plant utilizing sawmill wood waste that was disposed of in sawmill teepee burners smoking up the air. This biomass project provided a waste disposal solution for the forest products industry in the Inland Empire. This plant is operating today.

Proposed Action Plan to offset higher energy costs:

In 2020 WA legislature passed a law that requires the utilities to eliminate the use of plentiful fossil fuels to provide electric power to its customers. It is called the Clean Energy Transformation Act (CETA). Eliminating fossil fuel generation will triple our electric rates. The approved new electric generation resources are Wind, Solar and Biomass.

CETA creates the opportunity to develop up to 750 MW of renewable biomass generation utilizing our regions biofuels from the improved management of our region's forests. Excess generation would be sold to offset the increase in power costs from the adoption of wind and solar generation in place of low cost and reliable fossil fueled power generation. This similar to selling our excess hydro generation until needed for our customers. These biomass projects would also bring back thousands of jobs to the abandoned forest products industry and revive the ghost towns in our area. The infrastructure for these ghost towns is still in place so the incremental revenue benefits would again benefit the customers.

Develop Renewable Bioenergy Power Plants like Kettle Falls. Install 5 to 10 MW wood fueled power plants at each of the 11 ghost towns former sawmills and 50 MW like Kettle Falls Power Plant at each of these ghost towns to bring back the forest products industry. Initiate an aggressive program to clean up the forests in our area due to the lack of management for the past 40 years. Refer to the Vaagen Brothers web site to see what a managed forest looks like. Cleaning up the forest floor will bring biomass fuels along with the residue from logging operations. There is some 750 MW of biofuels for renewable electric generation available from the forests in the Inland Empire.

Solicit the help from our congresswoman, Kathy McMorris Rodgers to change federal laws to enable the forest management practices to support utilizing biomass for benefit of mankind instead for fuel for forest fires. We need jobs for our population, we do not want to destroy forests, property or kill persons.

Developing these generation resources will give us the ability to sell excess energy to the other areas in WA state that will have to meet the 2005 date required by CETA regulation passed by our Legislature. The sale of this renewable energy will offset the higher cost of wind and solar such that our electric rates will

not increase three times. This development effort will also bring 10,000 forest products jobs and their supporting 30,000 population back to our area and reduce the fuel available for forest fires. We will go back to the notion of raising trees to produce products for the ever-increasing population and not for fuel for forest fires. Let's provide jobs for our children instead of forcing them to leave our area for employment.

Pre-license Biomass Project sites

Development of Biomass generation requires more effort than wind and solar. Biomass plants utilizing forest residues will require changes to forest management practices, changes to new generation priorities, enacting legislative changes and changes to forest industry logging practices. This is in addition to the more complicated Environmental Impact Statements and a mirid of permits from multiple agencies. Our utility management can make these changes happen for the benefit of their customers. It is easier to develop wind and solar as you only need vacant land.

Wind and solar benefit from the government incentives to reduce their net generation costs to compete with fossil fuel generation. These same financial incentives should be made available to Biomass Generation. The utility should be working to make this happen.

To make Biomass electric generation possible, the utilities pre-license plants sites would enable biomass project contractors to be competitive with wind and solar proposals. Pre-licensing will eliminate the unknown from their proposals and allow them to focus on what they do best, build power plants. Thus, we would get competitive prices and that is good for the customers and the region forests.

Renewable generation from Garbage.

Populations generate garbage, a fuel. The fuel heating value of garbage is the same as forest fuels. Each person generates about 1 ton of garbage per year. Thus the 500,000 persons in our area generate about 500,000 tons of fuel per year, enough for 50 MW of power. The city of Spokane uses about 300 MW of electric power. We have an existing 25 MW at the waste-to-energy plant at the Spokane Airport. There is enough unused fuel in our area for an additional 25 MW from Spokane County and Coeur' d Alene's garbage.

Right now, the extra non burned garbage is hauled 210 miles by truck to Roosevelt, Washington landfill. This creates land that is unusable for decades. A local example of this is the former land fill you can see south of the I-90 at Liberty Lake. The vacant land between the apartment units on the hill is a former land fill site.

TIME FOR OUR LEADERSHIP TO STEP UP AND CREATE A LEGACY

Only once in your lifetime do you get the opportunity to really create a legacy that will stand the test of time. Bringing back the forest products industry to the Inland Empire is one of those unique opportunities. Our home grown talent can make this happen just like our predecessors. We ,the customers, will all benefit from this effort and like our predecessors you will have the gratitude of your fellow men and women forever. This task will not be easy. It will take the cooperative efforts of all of us to make it happen. So let us be like our predecessors who against all odds, made legacies like mining, hydro power, forest products industry, EXPO 74 to name a few.