

November 14, 2024

Jim Smith
General Manager
Klickitat Public Utility District
P.O. Box 187
White Salmon, Washington 98672

Dear Jim,

The Bonneville Power Administration values Klickitat PUD's ongoing involvement in our Resource Program process and continued engagement with the Resource Program team. We appreciated your attendance and participation in the October 19th meeting to discuss the resource solver and surrounding processes. This letter responds to your letter of October 20th offering thoughts and comments on the information that was shared. Thank you for your insight and feedback, which helps us dig deeper into our assumptions to ensure we are developing the best Resource Program possible.

We provide some specific responses below but are unable to respond to all your comments and recommendations for inclusion in the 2024 Resource Program (RP24). As you know, we are nearing the end of the development period for RP24 and are currently finishing work in preparation for the December 19th public workshop. Due to the timeline, we have limitations on the scale of adjustments that we can make to the RP24 plan. However, with the 2026 Resource Program (RP26) starting up immediately following the publication of the RP24 document, we are already preparing our list of potential updates and will consider your recommendations as we transition to RP26.

We offer the following specific responses to some of your thoughtful comments to provide background and insight on our current process.

Comment 1: This overview specifically excluded discussion on reliability metrics and I understand that the intent was to review the model, not the constraints. However, I want to be very clear that the 18 hour reliability metric used is not sufficient. It is just not relevant in a world where multi-day extreme cold and extreme hot weather events are occurring as frequently as they do. I will state that a model that does not solve for the actual conditions we are seeing will deliver results that are wrong, even if the model is perfect. I have heard comments, including from the Power Council, that stringent reliability requirements lead to results that are expensive or would require resources that they do not want built. However, a resource plan should inform decisions and should not be designed to deliver predetermined results. A true multi-day metric is required.

We provide a similar response as shared in our August 7th letter. This remains an area for work in the 2026 Resource Program. For RP24, as in prior Resource Programs, BPA will ensure resource solutions meet all modeled energy and capacity needs. We agree with your feedback that it is prudent for BPA to revisit the duration of the extreme weather



events in our modelling to better reflect reliability and will therefore consider a longer duration extreme weather event metric for the 2026 Resource Program.

Comment 2: There are only two zones for transmission constraints and costs. This clearly is not accurate and will not return correct solutions. I also did not see a constraint that would provide solutions based on the real timeframes for transmission builds to occur. We all know that major transmission build times are in excess of ten years. The location matters with respect to timing, cost and wildland fire and other risks.

Resource capacities for the first portion of the study horizon are based on the assumption that a small (< 10%) portion of projects currently in the transmission queue would be available for BPA to acquire. The expected online dates for these resources include time for the necessary transmission interconnection construction. We have assumed that BPA could not build a new resource before 2035 due, in part, to estimated transmission construction times. We also do not consider resource options outside the BPA footprint that may require more substantial transmission projects.

We are working with BPA Transmission to develop more specific estimates of transmission constraints and costs for potential projects. We anticipate integrating more project-specific information into future resource program models, as these data become available.

Comment 3: I do not believe that the capacity values that are assigned to wind and solar are correct. I think I have heard in previous discussions that WRAP capacity numbers are being used. These values are not applicable to multiday events. We are all familiar with the January 2024 cold weather event. There was no wind or solar in the BPA's BA for more than 5 days during that time. None.

We appreciate this feedback and reviewed the data to double check VER generation during the January 2024 weather event. BPA BA data show small amounts of wind during the event. In RP24, we are evaluating large (300 MW+ nameplate capacity), utility scale, single axis tracking solar plants in multiple locations throughout OR, WA, and ID. Because these types of solar plants were not operating in the BPA BA in January 2024, the absence of BA historical solar data is not evidence that they would have 0 value during these events. To clarify how we are calculating the capacity contributions of wind to the 18 hour needs: It is based on the hourly BPA system load and wind generation data for the past 10 years. For each month, we first selected the 6 years with highest 18hr event loads, then calculated aMW wind generation (divided by nameplate capacity) during the 18 hour event in that month for each year, then took the across-year median.

Comment 4: There is no declining ELCC for solar or battery storage, and it is not clear there are recurring replacement costs as panels and cells need replacing. This under-estimates the actual cost of production.

The recurring replacement costs are included in fixed operations and maintenance costs for solar and storage resources.

Comment 5: The model does not integrate with the hydro system. Given the magnitude and limitations of the hydro system, and the magnitude of new resources that are forecast, this seems a fundamental part of any model in solving for new resources.

We agree that the model would be improved through integration with a hydro model. As we discussed at the workshop, this is an enhancement that would require significant overhauls to BPA's current modeling frameworks and will require further consideration of relative costs and benefits. This is not a significant concern at this time as the Resource Program is not a decision document, but provides an indication of the least cost resources that could be deployed to meet any deficiencies that BPA forecasts may occur. Any decision to acquire a resource will require a business case that may include additional analysis of how the resource would integrate with the hydro system.

Comment 6: The net resource cost used a fixed revenue value. That is just not correct and yet plays a major role in the model solutions.

Our use of the fixed revenue value is intentional. For a given scenario or sensitivity, we have one expected net cost for each resource option that is the averaged across a wide variety of potential future conditions. We will include additional cost considerations that include potential variations.

Comment 7: Market purchases do not distinguish between day ahead or real time pricing and do not include capacity value. This again is not correct and affects the resource choices differently. This will drive incorrect valuations of different resources and therefore incorrect results.

We intend the model to be agnostic with respect to the timing of market purchases, and we model effects of adjusting market prices with sensitivities. Adding day-ahead versus real-time dynamics, or BPA's forward marketing activity and capabilities is far more speculative, especially as markets undergo potentially major changes. Without specific estimates of how much capacity will add to the marginal cost of a market purchase, we are being conservative on cost but not allowing the modeled to purchase to meet a capacity need. If and when we have more data or better estimates of the costs and availability, we will include these as options.

Comment 8: While I understand there is a "dummy resource" that allows for problem solving or trouble shooting when the model cannot return a solution, I do not see where system reliability is questioned during this analysis. If the model does not solve, there is cause for concern about whether the resources necessary for a reliable system are being considered or that they are valued correctly.

We appreciate and share the concerns regarding system reliability. It and when the dummy resource is selected, it shows that BPA cannot meet its obligations without additional resource options. If the dummy resource is selected in a period, we will view

that as a reliability risk and it will identify the need for BPA to have appropriate tools and resources available to address that risk.

Comment 9: The model assumes that at some high enough price, there always is energy available. Clearly, this is incorrect and is a major flaw. Resource availability during extreme weather events is never guaranteed. Think about the Texas freeze and the availability of their natural gas fleet. This is literally a dangerous assumption and will drive incorrect solutions when the system just will not solve and should not solve without the addition of some other resource with different capacity attributes.

We appreciate your concern regarding market availability. We have imposed limits on available energy from the market to address this concern. These limits are based on the results of the market assessment. Details on the market reliance limits from the RP24 market assessment for the Base scenario can be found on slide 76 of the June 10th 2024 Resource Program workshop, with materials available at <https://www.bpa.gov/-/media/Aep/power/resource-program/20240610-resource-program-workshop.pdf>. The dummy resource also serves to demonstrate the potential for a reliability concern if the model will not solve and must call upon the dummy resource.

Comments 10-12 focus on the integration of natural gas in RP24. While natural gas is not directly included in the model due to technical considerations, we will be evaluating natural gas outside of the model. We are confident that the approach we are taking to that evaluation will indicate whether natural gas would be chosen as a resource solution in sensitivities. As you point out, depending on need, natural gas may be important to future system reliability. We anticipate that our modeling approach will identify any potential future role for natural gas in BPA's resource acquisition.

We very much appreciate your continued engagement and your feedback. While we are unable to address all your comments and recommendations in the Resource Program today, your thoughtful comments continue to push us to reexamine approaches and help inform our planning for RP26.

Sincerely,

Allison Mace

Allison Mace
Manager, Market Analysis and Policy