



Tacoma Power IRP Public Workshop #3

Monday, April 27, 2020

Date: April 27, 2020

Time: 12:30-2:30 P.M.

Location: Zoom

Attendees

Frank Boykin Jr., The Black Collective
Roy Buchert, Kaiser Permanente
Elly Claus-McGahan, Citizens Climate Lobby
Annabel Drayton, NWECC
Todd Hay, Sustainable Tacoma Coalition
Bruce Martin, WestRock
Ruth Ann Schonbachler, ratepayer
Andrew Strobel, Puyallup Tribe
Connor Tompkins, Praxair
Graham Vanderschelden, Northwest Seaport Alliance
Lauren Walker Lee, Tacoma Community House
Katie Ware, Renewable NW
Julia Zuckerman, Clearway Energy

Staff

Emma Biggs-Lanier, Tacoma Power
Scott Burns, PRR
Michael Catsi, Tacoma Power
Rachel Clark, Tacoma Power
Keil Drescher, Tacoma Power
Ryan Fullerman, Tacoma Power
Ray Johnson, Tacoma Power
Mila Lassuy, PRR
Ahlmahz Negash, Tacoma Power
Clay Norris, Tacoma Power
Jim Russell, Tacoma Power
Jeremy Stewart, Tacoma Power
Danielle Szigeti, Tacoma Power
Jenny Thacker, PRR

1 Welcome

Jenny Thacker welcomed the group and reviewed the agenda. Attendees and hosts introduced themselves and shared where they were calling from. Scott Burns reviewed Zoom meeting basics and encouraged attendees to ask questions via the chat or over the phone as necessary. Jenny reviewed the meeting purpose and ran an introductory poll to encourage engagement and practice the Zoom polls feature with the group.

2 Scenarios

Ahlmahz Negash, from Tacoma Power's Integrated Resource Planning group, reviewed the scenarios discussed at the second meeting. She reminded the group that scenarios are an alternative future – an educated guess at the set of conditions in the future. Portfolios of various resource combinations are run in each scenario to gauge which resource portfolio should move forward. Tacoma Power examined four scenarios:

- Scenario 1 – High price volatility, high price levels: Carbon Policy Accelerates
- Scenario 2 – Low price volatility, low price levels: Technology Solves Everything
- Scenario 3 – High price volatility, low price levels: Base Case
- Scenario 4 – Low price volatility, high price levels: Reliability Reigns

The Tacoma Power IRP working group discussed the details of each scenario at the March 11 meeting. After a brief re-introduction to the scenarios and an explanation of how they were created, Ahlmahz reviewed key input assumptions used to create the scenarios – demand, storage resources, carbon policy, natural gas prices, capital costs of wind and solar, and coal retirements – and then reviewed key outputs – regional build out of solar, wind and gas, price levels and volatility, and emissions.

The team asked the group to consider and weigh in on whether Tacoma Power is adequately addressing the key changes that might take place in the future. While most attendees felt that key changes were adequately addressed, one attendee expressed a concern that potential restrictions of methane had not been considered explicitly in the scenarios.

Questions:

Does the buildout of gas in Scenario 1 mean that gas is generally cheaper than storage, even with the assumed price on carbon?

- In the assumptions fed into the model, Tacoma Power had to directly specify the amount of storage in each scenario rather than assume a cost of storage and let the model select how much to build because the current version of the modeling tool Aurora runs too slowly when we allow storage to be selected along with other resources. In Scenario 1, storage was limited to 5 gigawatts of short-term storage. In these situations, the fact that we see more gas buildout than we do storage implicitly means that gas is assumed to be cheaper than storage. Note, however, that the buildout of gas was used only to serve peak load, so it is not turning on very often.

I think it would be a lost opportunity if we do not identify any restrictions on methane as a scenario, for classifying or tracking it, if there continues to be changes to storage of methane.

- During this IRP, Tacoma Power developed the scenarios based on how the market would change in these future worlds. In our next IRP, we may be able to build the model based on other identified factors that we want to explore. In this IRP, perhaps a restriction on methane could be encompassed in the "Technology" scenario, since that scenario resulted in far less use of gas. It is important to note that in the details of the buildouts, Washington does not actually build out new gas generation.

I am interested in the cost of storage. Would the analysis need to be more robust to consider the price of storage as an independent variable?

- Yes, it would. This is technically possible, but there are computational modeling limitations within the Aurora capacity expansion model that mean it would take a very long time for the model to converge. We hope that the vendor will improve the storage functionality by the time we conduct the next IRP.

For natural gas prices, why did you show them only going up by \$5/MMBtu, when we know that we've seen more gas volatility, e.g. in Henry Hub prices?

- All of the inputs into the model are in 2012 dollars. In addition to what is presented in the slides, each scenario has five gas price risk runs, where the gas price is allowed to exhibit volatility around the average expected price that we're showing for each scenario.

3 Resource need

Rachel Clark reviewed Tacoma Power's resource need, including what the need will be when the existing contracts with Columbia Basin Hydro (CBH) and Bonneville Power Administration (BPA) expire.

Across all the simulations, Tacoma Power is aiming for:

- No more than 2.4 hours of shortfalls per year (Loss of load hours – LOLH)
- Shortfalls equivalent to no more than 0.001% of our load per year (Normalized, expected unserved energy - NEUE)
- No more than 2 days of shortfall every ten years (which we express as 0.2 days per year) (Loss of load expectation - LOLE)

While Tacoma Power could still meet resource needs after the CBH contracts expire, without BPA there is a year-round need for power and Tacoma Power will need to add resources to fill that gap.

Questions:

How would the Normalized Expected Unserved Energy metric consider interruptible power agreements with customers?

- It would come up in the modeling of our system rather than in the metric. Right now, it would depend on how we model it. We would most likely model it as a resource, and it would just serve to cover part of the shortfall we might otherwise see.

4 Draft Portfolio Resources:

Rachel Clark reviewed the draft portfolio options to be run in the various scenarios. She began by reviewing the types of resources that will be modeled to see if they make sense to include in the preferred portfolio.

- The CBH contract
 - Renew/don't renew
- The BPA contract
 - Renew with same product (Slice/Block)
 - Slice – approximately 3% of the output from the federal system that we can use at any time during the day, with some limitations. Because there is a lot of variability in how much the federal system generates in a given year, this sometimes results in a surplus that we sell on the market
 - Block – a flat amount of energy that ensure we have enough under critical water conditions
 - Renew with different product

- Block with shaping – a flat amount that changes each month but allows some flexibility across the day which would likely not result in a surplus of energy
 - Don't renew
- Non-hydro renewables
 - Solar
 - Eastern WA wind
 - Gorge wind
- Adding to existing hydro projects
 - Add generator to Cowlitz project
 - There is room for a third generator, but doing so would be very expensive
 - Add pumped storage to Cowlitz project.
 - This would be in lieu of just adding a generator, so this option and adding a generator are mutually exclusive.
- Resources to back up renewables to make them more feasible
 - Small modular nuclear which would run 24/7
 - Simple cycle natural gas which can be turned on and off when needed

Rachel explained that conservation is another important resource, which is included as a reduction to demand in our load forecast in this IRP.

The team asked meeting participants to weigh in on the list of resources. Participants took part in a poll inquiring if any resources were missing or if any resources were on the list that should not be included.

Some participants expressed concerns about not including the following resources: demand response, hydrogen energy storage, renewable hydrogen, energy conservation, and cryogenic energy sources. The team shared that demand response is not something that Tacoma Power has modelled in this IRP, primarily because it means various things and Tacoma Power needs to define what they mean by demand response and determine how they will go about modeling it. Rachel reiterated that Tacoma Power does include conservation in these models by taking the output from the conservation potential assessment, which is then included in the load, but that the goal is to include conservation directly as a resource in future IRPs.

Some resources that were mentioned but are not yet modeled will be considered for modeling in the next IRP.

Update: Since the meeting, the IRP team discussed how we might go about modeling demand response in time to include in this IRP, and we established that we can include a very simple demand response product in this IRP. This product will essentially serve to carry reserve for the system but will never actually be called upon. We do not necessarily believe that we are modeling all types of demand response options appropriately with this basic DR resource, but it is a step.

Questions:

Does cryogenic energy storage fall into the same status as Demand Response?

- Yes, sometimes, but it can also be seen as a supply-side resource (as opposed to a demand-side resource like demand response). Some utilities have already started putting it into their IRPs as a supply-side resource.

What kind of duration of storage is needed for Tacoma's portfolio if we didn't renew BPA?

- We don't know without modeling it. Tacoma Power's current hydro projects provide long-duration storage but not enough to cover all of the wind and solar we would have to add if we were to try to replace BPA with only those resources.

What are the limitations on building out resources for the model?

- There is a human resource limitation to making immediate additions. Because we are using an in-house model, resource logic, code, and integration need to be built and tested from scratch every time we create a new resource to add to the portfolio. This takes considerable time.

When talking about natural gas, have you considered the policy issue and public opinion on fracking, along with carbon methane issues?

- We have direction to model natural gas. We understand there are concerns about natural gas and will bring those concerns up to our leadership. In the model, natural gas is used only in portfolios where Tacoma Power does not renew any BPA contract.
- It is also important to remember that modeling the resource does not necessarily mean that Tacoma Power will choose it. Even if a resource is found to be the most economical and meet resource adequacy metrics, there may be other reasons why Tacoma Power would choose not to use it in a preferred, recommended portfolio. The results of the IRP inform policy decisions, which happen outside of the IRP process.
- When designing a portfolio that would include natural gas, Tacoma Power also looks at whether or not the portfolio is compliant with CETA and whether it emits more than allowed. If so, the natural gas would be tuned back until it is CETA-compliant.

Aren't there cost risks associated with small modular nuclear?

- For small modular nuclear, there are both cost and political risks. We model the cost risks by using a range of cost estimates.
- Additionally, there is a risk of it not being available by 2028.
- Because nuclear is expensive, it is difficult to imagine that it would end up in the lowest cost portfolio.

Have you considered small, distributed projects like small-scale digestors?

- Tacoma Power's energy research and development group is constantly keeping an eye on new technologies for Tacoma Power to support. If new technologies that would potentially meet the resource need become more widely available, it would be something that Tacoma Power could model.
- Generally, for the IRP, resources need to be of a significant magnitude that is reliably available and large enough to impact our portfolio. Small-scale digestors might be large enough in the aggregate, just like conservation and demand response. Currently that is difficult to model, but we can work on how to do that better between now and the next IRP.

5 Draft Portfolio options

Rachel Clark shared Tacoma Power’s current list of draft portfolios – combinations of the resources shared in the previous section. All portfolio options include Tacoma Power’s hydro power.

Draft Portfolio List

Renew BPA Slice/Block

- Tacoma Power Hydro + BPA Slice + renew CBH (*continue current portfolio*)
- Tacoma Power Hydro + BPA Slice
- Tacoma Power Hydro + BPA Slice + 2023 Solar
- Tacoma Power Hydro + BPA Slice + 2028 Solar
- Tacoma Power Hydro + BPA Slice + WA Wind
- Tacoma Power Hydro + BPA Slice + Gorge Wind
- Tacoma Power Hydro + BPA Slice + Pumped Storage at Cowlitz
- Tacoma Power Hydro + BPA Slice + 3rd Generator at Cowlitz

Renew BPA with Shapeable Block

- Tacoma Power Hydro + BPA Block
- Tacoma Power Hydro + BPA Block + 2023 Solar
- Tacoma Power Hydro + BPA Block + 2028 Solar
- Tacoma Power Hydro + BPA Block + WA Wind
- Tacoma Power Hydro + BPA Block + Gorge Wind
- Tacoma Power Hydro + BPA Block + Pumped storage at Cowlitz
- Tacoma Power Hydro + BPA Block + 3rd Generator at Cowlitz

No BPA Renewal

- Tacoma Power Hydro + WA Wind + Gorge Wind + 2028 Solar
- Tacoma Power Hydro + WA Wind + Gorge Wind + 2028 Solar + Pumped storage at Cowlitz
- Tacoma Power Hydro + WA Wind + Gorge Wind + 2028 Solar + 3rd Generator at Cowlitz
- Tacoma Power Hydro + WA Wind + Gorge Wind + 2028 Solar + Limited Natural Gas
- Tacoma Power Hydro + WA Wind + Gorge Wind + 2028 Solar + Small Modular Nuclear

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Questions:

For the No BPA Renewal portfolios, how much is that short on the resource adequacy side? I'm a little surprised to not see a battery storage proposal included here with wind/solar when we seem to be seeing very low costs for such storage.

- Much of the current batteries are for short duration storage. One of the challenges that Tacoma Power faces is that a longer duration storage than what is currently available is needed to replace the need for something like BPA or a gas plant. Ideally, we would like to model a battery storage in our system model, but we are not sure if we will have enough human resource to do it in time for this IRP.

What are the costs of renewing the BPA contract?

- In general, the price of power Tacoma Power receives from BPA is quite reasonable. That said, Tacoma Power often gets surplus energy, and cannot get the same price on the market for which it was purchased. BPA provides Tacoma Power both energy and capacity, which cannot necessarily be compared to direct market price. BPA price is based not on the power market, but on cost of service, similarly to how Tacoma Power charges its customers.

- A long-term concern for the BPA contract could be that there may be increasing costs related to fish mitigation, which will be a factor in portfolio decisions.

Are there any permitting/ licensing limitations with expanding the Cowlitz resource?

- Yes, there are licensing implications with expanding Cowlitz resource. If Tacoma Power found that one of the preferred portfolios included a change to our Cowlitz project, there would still be a lot more work to do to understand all the licensing implications. In general, the license could be amended to expand our Cowlitz resource, but it would be quite an undertaking and might lead to some real challenges. It might not be feasible to finish it by 2028.

Lauren Walker Lee from Tacoma Community House commented that it does seem that we are beholden to BPA's cost increases as Tacoma Power considers cost impacts to Tacoma customers.

- Thank you for this comment.

6 Next Steps

Rachel Clark reviewed the plan for the fourth and final workshop, and invited participants to reach out with thoughts on anything they would like to see included.

The action items are listed below.

Tacoma Power will:

- Provide meeting notes to all attendees by Wednesday, May 6
- Post updated meeting materials and link to recording from this workshop to the Tacoma Power **Integrated Resource Plan website**
- Post meeting materials for the fourth meeting one week before the meeting

Attendees will:

- Email Rachel or another member of the project team with any thoughts on what needs to be discussed at the fourth and final meeting.