Tacoma Power IRP Public Workshop #2

Wednesday, March 11, 2020

Date: **March 11, 2020**
Time: **12:30-4:00 P.M.**
Location: **Tacoma Public Utilities Building l 3628 South 35th Street l ABS-B1**

Attendees	Staff
Glen Booth, Bonneville Power Administration	Rick Applegate, Tacoma Power
Frank Boykin Jr., Retiree and Ratepayer	Melissa Buchler, Tacoma Power
Annabelle Drayton, NW Energy Coalition	Michael Catsi, Tacoma Power
Javier Figueroa, City of University Place	Rachel Clark, Tacoma Power
Elizabeth Osborne, NW Power and Conservation Council	Ray Johnson, Tacoma Power
Bruce Martin, WestRock	Ahlmahz Negash, Tacoma Power
Ruth Ann Schonbachler, Ratepayer	Jeff Stafford, Tacoma Power
Jon Shields, U.S. Oil and Refining Company	Danielle Szigeti, Tacoma Power
Rebecca Sliger, Tacoma Community College	Mila Lassuy, PRR
Connor Tomkins, PraxAir	Jenny Thacker, PRR
Graham VanderSchelden, Port of Tacoma	
Katie Ware, Renewable Northwest	
Kirsten Watts, Bonneville Power Administration	

1 Welcome

Jenny Thacker welcomed the group and reviewed the agenda. Attendees and hosts introduced themselves and shared where they were calling from. Jenny reviewed GoToMeeting basics, and encouraged attendees to ask questions via the chat or over the phone as necessary.

2 Metrics

Rachel Clark from Tacoma Power's Integrated Resource Planning group reviewed the IRP process for the group and discussed the metrics against which the portfolios are evaluated. There are two categories of metrics.

First, the "pass/fail" set of metrics:

- Does it meet resource adequacy requirements?
  Resource adequacy means that the agency has enough resources to serve the demand, also known as load. The portfolio being evaluated must meet load requirements in the scenarios.

- Does it comply with the Clean Energy Transformation Act (CETA)?

To comply with CETA, 80% or more of the load must be served by carbon-free power. Currently, Tacoma Power's portfolio surpasses this threshold.

If portfolios pass both "pass/fail" metrics, we use the following criteria to compare them to each other:

- Cost
  Tacoma Power evaluates portfolios on the cost of the resources they use. This includes the social cost of carbon and the potential for any cost offset from surplus power sales.

- Financial risk
  Tacoma Power evaluates portfolios on their financial risk. The questions we ask ourselves is how bad is it when bad things happen? To determine that, we look at the average cost across the top 5% to 10% highest-cost simulations.

- Ability to change course
  Tacoma Power evaluates portfolios on how well they could adjust to a changing world. Demand-side resources such as conservation can be implemented piecemeal rather than all at once and receive a better rating on this dimension, and any large resources that Tacoma Power would own are least flexible. For two portfolios of similar cost and risk, Tacoma Power would prefer the more flexible one.

- Carbon emissions
  Finally, Tacoma Power evaluates portfolios on their expected carbon emissions, with lower-carbon portfolios scoring higher in this category.

Questions:

Could you provide an example of a "high cost, high risk" portfolio?

Not right now. All we have at this point are theoretical data points. When we run the portfolios, we will have actual data, so we will know which portfolios are high-risk and high cost and will share that with the group.

Do you account for risks other than financial risks?

The other risk we account for the risk of not having enough power in the Resource Adequacy metric.

3 Tacoma Power's Current Portfolio:

Rick Applegate reviewed Tacoma Power's current portfolio. This includes four categories.

- Resources Tacoma Power owns:
  Tacoma Power owns four hydroelectric projects. Three of these dams include a "mutli-dam" configuration, which means they have two dams with a reservoir in between, providing flexibility. The largest of these, the Cowlitz Project, provides the majority of the power in Tacoma Power-owned resources. It does not operate at full capacity because of concern about how the spillway would perform in a seismic event. Those interested can find additional information at this link: **www.mytpu.org/about-tpu/services/power/about-tacoma-power/dams-power-sources/cowlitz-river-project/mossyrock-dam/#pattern_2**

- Resources from the Bonneville Power Administration (BPA):
  The current contract with BPA runs through September 2028 and includes both a "block product" – a steady and constant amount of energy, and a "slice product" – a percentage of BPA's generating capability. The amount of energy received from the slice product varies from year to year.

- Other resources Tacoma power purchases through long-term power purchase agreements:
  Tacoma Power purchases some power from Columbia Basin Hydro and Grant County, though the majority comes from resources Tacoma Power owns and power bought from BPA.

- Conservation is Tacoma Power's other major resource. To date, conservation has saved the amount of power equivalent to the power generated by Mayfield Dam.

4 Conservation Potential Assessment (CPA)

Rich Arneson reviewed the CPA, including its role in planning, history, what impacts CPA results, and recent CPA results.

The CPA is used in planning to model conservation impacts on load forecasts. It identifies conservation measures that have a net benefit to the service area. The CPA looks at the Technical Potential and the Achievable Technical Potential of various conservation measures, and the IRP process looks at the Achievable Economic Potential of measures that meet the Achievable Technical Potential.

- Technical potential: Is it technically feasible to install this measure?
- Achievable technical potential: Are there market barriers to making this measure successful?
- Achievable economic potential: Is the measure cost effective? Is the cost lower than the forecasted value of energy saved?

The factors that affect potential include:

- End-use saturation and efficiency levels
- Baselines – codes, standards, and markets
- Recent accomplishments
- New technology
- Avoided price forecasts
- Assumptions about each measure

Rich reviewed active programs in place to drive conservation, and shared current potential numbers for each of the major Tacoma Power customer sectors with the group.

- Residential: 84,029 MWh
- Commercial: 171,549 MWh
- Industrial: 94,397 MWh
- JBLM Commercial: 21,569 MWh
- On/Off street lighting: 5,649 MWh

Questions:

Do the conservation numbers shared at this meeting include distributed sources like solar?

No. Customer-generated resourced are not included in the CPA.

5 Base Case Load Forecast:

Melisa Buchler discussed the existing base case load forecast. She reviewed load forecasting in general, including broad trends in load forecasting and what affects load. Load forecasting looks at the expected demand for power.

Long-term load forecasts are important for long term infrastructure and resource planning. Infrastructure like power plants take many years to design and build, and long-term load forecasting informs power companies of future needs in time to meet those needs. Melissa reminded the group that while forecasts will be incorrect, based on the nature of guessing the future, they can be helpful in developing models that allow for informed planning.

Historically, demand for electricity developed hand in hand with economic growth, which made predictions relatively straightforward. Around 20 years ago, however, this relationship changed. Likely because of increased energy efficient technologies, increased energy efficiency programs and standards, and broad cultural shifts such as smaller living spaces, demand for energy no longer relates directly to economic growth, and this makes it more difficult to predict.

Tacoma Power creates load forecasts based on a number of factors.

- Weather

  Tacoma Power purchases historical weather data from an independent firm specializing in weather and environmental information. This allows the team to create a "weather normal" load that adjusts for the fact that every year has different weather conditions. Currently, Tacoma Power uses the last 10 years of historical weather data to create the "weather normal" load.

- Economy

  Tacoma Power purchases economic and demographic data from an independent firm specializing in long-term county-level economic and demographic data series. This dataset does not anticipate business cycles or large economic shocks.

- Demography of service area

  Similar to above, the demographic data purchased allows Tacoma Power to create an educated guess for population changes such as residential growth. This includes a metric called "residence adjustment," which notes whether people live in the county and commute out for work or vice versa.

Melissa next discussed how system load forecasts are derived. Tacoma Power's system load forecasts is the sum of the non-industrial and industrial forecasts. Each of these smaller forecasts are made up of additional subsystem forecasts like conservation and codes and standards, which are provided by Tacoma power's Conservation Potential Assessment. Conservation and codes and standards are accounted for in the industrial and non-industrial forecasts. Currently, when industrial and non-industrial forecasts are considered and adjusted for conservation and codes and standards, system load is projected to decline slightly - 0.4% compound annual rate over 20 years once conservation is accounted for.

Questions:

How did Tacoma Power come up with 10-year cut off for historical weather?

Melissa looked at number of different bases, including 10, 15, 20, 25, and 30 years, and reviewed how they had performed historically when predicting loads. The 10-year dataset performed the best in reflecting more recent variability.

Do you purchase weather data rather than use public data so it can be more tailored?

Tacoma Power purchases weather data to look at data from multiple weather stations in an economical way. The data that is publicly available is a little messy and has some holes. The firm Tacoma Power buys data from cleans it up and fills in those holes.

How are you accounting for the load that will accompany a rise in electric vehicles?

This forecast is in the "business as usual" case and does not take into account future regulations which might lead to a rise in the number of electric vehicles. At this point, electric vehicles are a very low draw on the current load. Either the miles driven or the demand would need to increase significantly to have much of an impact. But if something changes, we can include it.

Would you include Port electrification in this load forecasting process?

Yes. This is a substantial part of the current load, and Tacoma Power would want to include it as soon as we know for sure it is going to happen. We would rely on the Port's estimate for load need as well as information from other electrified ports to make sure our forecast is as accurate as possible.

How do you address datasets that have embedded conservation or codes and standards?

A: Tacoma Power maintains historical series with no adjustments. Tacoma Power does a reduction to the forecasted value - those are incremental conservation measures, i.e. in addition to what has been achieved in the past.

How is Tacoma Power thinking about demand response as a resource? Is this incorporated in the load forecast?

The load forecast is intended to be business as usual, so we don't include demand response as a resource. If we were asked to, we would estimate on an energy basis and on a demand basis and run forecasts based on both of those.

6 Western Electric Coordinating Council (WECC) Base Case Buildout and Prices

Ahlmahz Nagash discussed the WECC base case scenario. She reviewed what WECC is and the two Aurora models that inform WECC forecasts.

The capacity expansion model sorts resources according to their value. It runs simulations with various combinations of resource additions and retirements until the net present value of the electric system is stable and as high as it can get. The final combination chosen by the model represents the optimum set of resources. The buildout through 2045 includes 170 gigawatts of added generation capacity – 135 gigawatts from renewable sources and 35 from gas sources.

The price forecast model looks at how much generation capacity is available in various portfolios and how much they will cost. Resources are sorted by their cost per megawatt hour. Historically, the average price per megawatt hour was around US $50 2019 per megawatt hour, with a standard deviation of $35. The forecasted average price is $35 per megawatt hour, with a standard deviation of $107. This indicates a lower price, but higher volatility. This is due to increased presence of renewables – which are less reliable but produce low to no cost energy – and the lack of storage currently in place to balance that energy.

Questions:

How do transmission resources compare with expected peak loads? Is it more likely for generation or transmission to be a constraint for meeting future loads?

The answer depends on the area. We can go in to this further at our next meeting and show constraints area by area.

7 Preliminary Scenarios

Rachel Clark shared the scenarios developed for this IRP with the group. The scenarios were created with feedback from the group and Tacoma Power employees. The team ultimately created scenarios around two critical uncertainties, market price levels, which can be high or low, and market price volatility, which can also be high or low. We created scenarios to fit into four quadrants: high-high, high-low, low-high, and low-low quadrants.

- "Cruise Control" (base case)
  - Low price levels, high market volatility scenario
  - Business as usual
  - This uses the standard forecasts
- "Carbon Policy Accelerates"
  - High price levels, high market volatility scenario
  - In this scenario, the world gets serious about decarbonization and plows forward with policies, even though it may not be achievable at low cost.
- "Reliability Reigns"
  - High price levels, low market volatility scenario
  - In this scenario, there is higher demand and due to bad management of infrastructure, there is not always the capacity in place to meet that demand, so rolling blackouts and price extremes lead policy makers to prioritize reliability over using renewable sources of energy, and we see a roll back of clean energy policies around 2030.
- "Technology Solves Everything"
  - Low price levels, low market volatility scenario
  - In this scenario, there is strong demand-side management, enhanced renewable technology, the infrastructure to store and manage energy from renewables, and stable prices. People use a lot of renewables because of their low cost, making carbon policies irrelevant. Energy market prices are stable and low.

Other factors, or "sensitivities," that will be addressed separately from these scenarios are:

- Climate change: will the preferred portfolio work if there is a massive change (e.g. drought) caused by climate change?

- New large load: will the preferred portfolio work is there is a large load increase (e.g. massive server farm)? If not, how much additional power would be needed and at what times of year would it be needed?

Rachel then went through the Tacoma Power staff and IRP Working Group survey results.

- There is general agreement that population growth in the Tacoma Power service area is likely.
- There is some agreement that vehicle and port electrification policies and a price on carbon are likely.
- Both staff and participants came up with several possible scenarios, most of which can be put into one of the four scenarios that this process will consider.

Questions:

As you choose preferred portfolio, are you thinking about your ability to influence our existing world? Are you driving change towards a preferred portfolio?

Tacoma Power won't choose a portfolio assuming we have the power to influence the world to this extent. The role of the IRP is not to recommend policy direction, but to make sure we have the resources necessary to meet demand. Also, Tacoma Power alone cannot change the price of, for example, storage at the regional and national level. Tacoma Power does look for opportunities to encourage the development of new technologies to support decarbonization and has programs to support such efforts, but these are separate from the IRP, which focuses on what portfolio will best meet customers' needs into the future.

8 Next Steps

Tacoma Power will:

- Provide meeting notes to all attendees 10 days after the meeting
- Post updated meeting materials and presentation link from this meeting to the Tacoma Power Integrated Resource Plan website
    - **https://www.mytpu.org/about-tpu/services/power/integrated-resource-plan**
- Update participants on meeting location (webinar or in person) at least one week before the meeting
- Post meeting materials for the second meeting one week before the meeting
- Send a satisfaction/check in survey to participants

Attendees will:

- Take the survey on IRP planning process satisfaction