Tacoma Power 2022 IRP Workshop #2
Wednesday, March 2, 2022

OBJECTIVE |

- Share how Tacoma Power's forecasted load affected IRP Model outputs
- Share results of several stress tests on Tacoma Power's load
- Receive feedback on assumptions made

PARTICIPANTS |

Name	Representing	Name	Representing
Kristin Lynette	City of Tacoma	Rachel Clark	TPU – Meeting Lead
Chrissy Cooley	TPU Board Member	Haley Saul	TPU – Facilitator
Annabel Drayton	NW Energy Coalition	Ahlmahz Negash	TPU – Project Team
Jim Averkamp	Joint Base Lewis-McChord	Danielle Szigeti	TPU – Project Team (Presenter)
Paul Munz	BPA	Michael Catsi	TPU (Presenter)
Bruce Martin	West Rock	Ryan Fulleman	TPU (Presenter)
Mia Navarro	Office of Equity & Human Rights	Bryce Wang	TPU (Presenter)
Patrick Babbit	City of Tacoma	Christina Leinneweber	TPU
		Gertie Joiner	TPU
		Dave Rosholm	TPU
		Kyle Frankiewich	TPU
		Ray Johnson	TPU
		Keil Drescher	TPU
		Lisa Rennie	TPU

AGENDA

TIME	ITEM	LEAD
10:00 A.M.	**Welcome**	Rachel Clark
10:05 A.M.	**Objective & Agenda Review**	Haley/Travis
10:10 A.M.	**Ice Breaker**	Haley/Travis
10:15 A.M.	**Base Case Load Forecast** Tacoma Power's load forecast, or forecast of energy consumption, is a critical input into the IRP. We use it as our assumption for how energy consumption will grow in our base case scenario and even use it as a reference point for what we assume growth will be in other scenarios (for example, we assume in our low growth scenario that loads are 25% lower than our base case by the end of the study period). Our load forecast is	Bryce Wang/ Christina Leinneweber

produced by our Rates Planning & Analysis group. We will use our most recent (2021) load forecast in the 2022 IRP.

See PowerPoint for detailed coverage

QUESTION | How are the peaks of the "normal" derived? If it was an average, I'd anticipate a much smoother black line – Kyle, Tacoma Power

- We do not use an average on purpose because it would smooth the line too much and not reflect normal peaks and troughs

| 10:35 A.M. | **Tacoma Power Load in IRP Model** | Danielle Szigeti |

The load forecast provides us with a projection of the long-term trajectory of consumption under normal weather conditions. But consumption can vary a lot based on how cold or hot it is, and we want to make sure we're planning for the full range of temperature conditions we might see. So we take the load forecast and then re-introduce weather variability. This presentation gave us a picture of the weather-variable load that will actually be put into the 2022 IRP.

See PowerPoint for detailed coverage

QUESTION | On system peak model results – the median seems to have some kind of tiered steps. Any guesses on what causes that? – Kyle, Tacoma Power

- This is likely because we do not have thousands of observations for weather. We consider 58 historical weather years. While that is a lot of weather conditions, we will not see every possible temperature appear in our data. As a result, there will be some lumpiness in temperatures and loads.

QUESTION | Can you explain why [load is] lower modelled in the future? – Kristin, Tacoma Sustainability

- This is because our load forecast projects a slight decline in consumption over time (see previous presentation). We use the load forecast to determine the trajectory of loads over time.

QUESTION | With trend away from hydrocarbon energy, wouldn't you anticipate more electrical heat demand and increased EV demand? – James Averkamp

In addition to this question, we received several additional comments that the baseline load forecast not being what stakeholders think the future will look like

- Yes, we think this is very likely. We address this possibility in two ways. First, we run our analysis for three additional scenarios, two of which assume higher load growth than our base case. Second, we are beginning to directly explore the potential impacts of electrification through a stress test/sensitivity analysis in the 2022 IRP. This stress test is not necessarily a forecast of what we

think will happen but rather a way to see how well our preferred resource portfolio would handle large load increases from electrification. We plan to continue this work and include a more nuanced and realistic projection of potential load growth from electrification in our 2024 IRP.

QUESTION | What about weather projections (not historic patters), we know this is changing also? [in terms of load forecast] – Kristin, Tacoma Sustainability

- For the load forecast, we use the most recent 10 years of weather to construct the weather-normal in the "business-as-usual" load forecast. We used to use 30-year historical period but changed it because climate change was making the larger dataset less useful for forecasting.

- For the IRP, we still use 58 years of historical weather (1950 to 2007) to look at load variability resulting from weather. However, we also examine the impacts of climate change directly in a sensitivity analysis. Currently, we run it as a sensitivity analysis because we are working on figuring out how best to incorporate the projections into our modeling. We have a lot of great data to project what climate change will do to temperatures and inflows at our hydro projects, but there is so much data that we are still working on figuring out the best and most efficient way to incorporate it to get projections of future weather that are as accurate as possible.

QUESTION | How are other utilities doing it? – Kristin, Tacoma Sustainability

- There is currently no standard "best practice" for incorporating climate change modeling into integrated resource planning. Utilities are using a variety of different approaches to account for climate change in their modeling.

QUESTION | How different is this model input (and outputs) from the 2020 IRP?

- A reminder that the 2022 is just an update to the 2020 IRP so only minor changes are made. Full scale changes will be made in 2024.

10:50 A.M.	BREAK!!	
10:55 A.M.	**Electro fuel Load**	Michael Catsi

We've received quite a bit of internal and external interest in understanding how our system will handle specific additions to our projected loads, so we will also run a series of "stress tests" in addition to our core portfolios. The two discussed (Electrofuel and Electrification) both have a theme of trying to understand what our resource

needs might be under a decarbonized economy. This presentation was an overview of what electrofuels are and what Tacoma Power has done so far to support their development.

See PowerPoint for detailed coverage

QUESTION | Are any customers actively using this new rate?

- Not yet. It's not a matter of if it will be used, but when.

QUESTION | How far out do you think it's likely to see your first customer on the rate?

- 2 – 3 years. For projects to start moving, about 18 months. The low carbon fuel standard next year, other state legislation next year, might accelerate projects moving forward.

QUESTION | With that [timeframe for new electro fuel customers] in mind, and still relative uncertainty, about how much new load would be included in IRP?

- The projects I've met with, from 1 MW to 300 MW and a range of projects in between. It depends on their ability to find industrial land to meet these larger loads in production.

- Exact amount is up in the air. We've looked at whether we could handle a load around the 65MW limit in our current electrofuel rate. For the IRP, we will likely look at how we would handle a larger load, around a 100 MW load.

- Note that the IRP analysis is just an initial step. As actual prospects come up, a whole lot of people start doing a lot of additional analysis to understand the full impacts of a load like this.

| 11:15 A.M. | **Electrification Stress Test** | Ryan Fulleman |

The second stress test we added to our 2022 IRP analysis will look at what a large-scale switch to electric end uses from natural gas and gasoline might mean for our resource needs. This presentation is our draft analysis of what the load impacts might be under some simplified assumptions about how widespread that switch to electric energy might be. We want to make clear two things as we go through this:

First is that, for this 2022 IRP, we're NOT coming up with a prediction or forecast and what we think is likely to happen. Rather, we're just trying to get a sense of how big the impacts could be. We have a broader effort going on at Tacoma Power to come up with a set of projections of how we might see vehicle and building electrification

roll out over time. And that work is what we plan to incorporate into our 2024 IRP.

Second, these are draft results. If you have suggestions or concerns, please share them.

See PowerPoint for detailed coverage

QUESTION | What about industrial load switching? Industry is a high energy user.

- We don't have any information on industrial load switching, unfortunately (part of the caveats). This is, however, something that we will consider in the 2024 electrification study.

SUGGESTION | Provide clarification on definition of medium duty vehicle.

11:45 P.M.	**Next Steps**	Rachel Clark