

**Northwest Power & Conservation Council**  
**Conservation Resources/Climate & Weather Advisory Committees**  
**August 21, 2024**

Christian Douglass, NPWCC, began the meeting at 2:00pm. Chad Madron, NWPCC, explained how to best interact with the Zoom Webinar platform. Daniel Hua, NWPCC, called roll.

**Modeling EE with Future Climate Data**

Fred Heutte, NW Energy Coalition, asked if HVAC on [Slide 7] represents the energy used for heating and cooling or if it folds in effective energy efficiency. He clarified that he is asking if the chart talks about load or demand. Douglass clarified that the chart shows aMW of savings.

Heutte asked how EE is treated in this context, wondering specifically about shell measures with HVAC. Douglass said this view of HVAC includes weatherization along with power consuming devices.

Guillaume Mauger, University of WA, asked why scenario A on [Slide 15] has nothing under generation. Douglass answered that this scenario showed more of an average without particularly high or low winter/summer hydro. Mauger asked if that was the same for scenario C's degree days. Hua answered yes.

Mauger wondered if high winter/high summer generation would not be plausible. Hua said they looked, explaining that the scenarios were chosen to represent a category and they did not find one scenario that represented both. Mauger said that made sense from a snowpack perspective.

Mauger wondered about Douglass's comfort level with the 2021 analysis's ability to capture the likely effects of energy efficiency measures [Slide 21]. Douglass said that, while it is not his field of expertise, the Council's capital expansion model did not have an hourly look which meant there was an expected value for EE with an a priori peak demand window. Douglass thought it worked well enough for the tools available at the time, but misses a lot compared to a model with an hourly look. Mauger appreciated the explanation.

Ted Light, Lighthouse Energy, suggested another "gutter" with the FMY approach. Light noted that some measures in the 2021 Plan that were based on program evaluation results and not modeled with weather files. He thought it would make it difficult, if not impossible, to adjust.

Douglass agreed, noting that he expects similar challenges this time as well. He said last time they did some high-level heating degree day adjustments on the energy side which Douglass called reasonable, but wondered how that would affect the hourly side.

Jennifer Light, NWPCC, added that the RTF is working on alternative heat pump measures, calling them a key area of concern. She said this effort to get at peak needs will be modeled and promises to be better than the previous work which had “any” programs.

## **BREAK**

Nicolas Garcia, WPUDA, was struck by [Slide 23]’s BPA transmission bubble, particularly as it pertains to western Montana, southern central Oregon, and the Olympic peninsula. He pointed to the different climates and load characteristics in these regions, asking if there is going to be some way to reflect those differences or if there will be an average.

Douglass stated that they split the BPA BA into three different regions: BPA Oregon, BPA Washington, and BPA Idaho/Montana. Douglass thought this will get at the bulk of the differences, adding that there are different weather stations within the BAs to further refine long-term load forecasting data. Garcia appreciated this response

Garcia called [Slide 29] interesting and illustrative but wondered if heat event shapes shouldn’t be elongated towards later in the day to reflect that it often stays hot until 12:00 or 1:00am. Douglass called this a good point. He said he literally drew the shapes on [Slide 28] in a fashion that Garcia suggested but once they were based on actual, calibrated simulation data they would have wider distributions.

Douglass said the momentum of a building heat wave could also affect the shape. He thought this would be harder to get at, suggesting it would be appropriate for version two of the work.

T. Light recalled that Ben Larson’s work for the Council included discussion on the increasing impacts of the duration of events. T. Light liked the presented approach and did not know how to amend it but called it worth thinking about.

Douglass pointed to the Plan timeline, saying staff will move the ball as much as possible. He said there is logic for what a day would look like if the previous day was also extremely hot but cautioned that it adds more complexity.

Garcia agreed but thought it might be worth exploring with a scenario or some small add on analysis as peak loads will become bigger challenges. He thought exploring how one day effects the next could change the value and importance of conservation in a significant way. Garcia conceded that this would be a lot of work but insisted that extended heat domes and cold snaps would make it challenging to meet loads and efficiency

technologies could provide extended value. Douglass agreed that this is important and said he will look into it.

Heutte observed that there is the actual numerical weather forecast, which is good but not perfect, and expectations of what will happen which might not line up. He also noted a user fatigue aspect that sees people running their heating/cooling systems more during multiple days of extreme weather.

Heutte then pointed to elevated night temperatures during heat events that add to that effect. He said there will be shifts in weather patterns going forward and the climate baseline approach will open up more understanding. Heutte said it's not just the weather that shapes demand but how people respond. Douglas agreed saying the RTF has calibrated to hourly data that bakes user behavior into the models.

Heutte pointed to the approach that looks at five to 10 typical days, stressing that average April days will look different than average July/August days because of cloud patterns. Douglass agreed saying shoulder months might need more day types.

Greg Brunkhorst, Tacoma Power, suggested an emulation approach that applies a machine learning model to the simulated data. Brunkhorst said this binning process looks hard and thought a neural network or boosted tree would save time. Douglas was interested in learning more and offered to connect offline.

T. Light wondered about time zone differences. Douglass was not sure, assuming that staff uses clock time for everything.

Jeff Harris, NEEA, appreciated the work on [Slide 32] saying it will separate out the heat pumps the region needs versus the ones we currently get. He asked about dual fuel heat pumps, with a gas furnace/heat pump baseline or gas furnace/central ac baseline. He wondered how this transformation will be modeled.

Douglass had not thought about this yet. He assumed this would be captured in the load forecast which will assume some level of electrification. J. Light agreed that fitting this into the definition of the Power Act's definition of energy efficiency and the Council's long-standing policy of fuel switching/fuel choice will require more thought.

Harris suggested this could be part of an electrification scenario. He pointed to a NEEA demonstration project that will show how to use this equipment as flexible load. J. Light said the load forecast will account for building electrification, adding that there will be a range of forecasts.

Rich Arneson, Tacoma Power, thought the best practices was a combination of best class heat pump choice, installation practices, and user behavior. He said if any of these factors is not right it will underperform. Arneson voiced concern about using a gas furnace as an

auxiliary source if the electric utility is paying a heat pump incentive as his utility's measures include a greenhouse gas emissions component. He called this a problem, particularly when the gas furnace has to be replaced, and the user is stuck with an underperforming heat pump, forcing them to add electric resistance. Douglass took note of Arneson's concerns.

Garcia stated that some people install ductless heat pumps in homes that already have a ducted heat pump to better focus heating/cooling to a specific part of the house. He wasn't sure if this was a good or bad thing but called it interesting.

Douglass said that is more of a zonal configuration but is usually found with just ductless systems. He said he could look into it.

T. Light thought that Harris's point about a heat pump with gas backup intersects with heating systems classified in the RBSA. He thought this would require caution when grouping primary heating system information.

T. Light then talked about Douglass's work at the Efficiency Exchange with Arneson and Jim White, Chelan County PUD, on a potential retro commissioning heat pump measure. T. Light thought that this shape would have some interdependencies with that work. Douglass agreed, saying the RTF modelers are looking at it along with other things.

Spencer Moersfelder, Energy Trust of Oregon, asked how the evolving savings shapes will impact the Council's selection of load shapes [Slide 37]. Douglass said all Council work is public and will be available and usable. He said they might not get used in RTF work.

Moersfelder was interested if these will be used in measure development as Energy Trust uses the Council's load shapes to quantify capacity benefits and carbon impacts. Douglass said this will be determined probably after the Plan.

Harris said along with the HEMS data there is also the residential metering study. He said this 10-year-old work is an hourly data set that provides load shapes and end uses. Harris admitted that this may be a bit dated but might be worth checking into. Douglass was aware of the data and pointed the Council's load forecaster to it along with the RBSA metering study, which Douglass called easily one of the best sources available.

Douglas asked about the availability of NEEA's CEMS data. Harris thought it would be tight but there may be some partial data available which could be helpful.

Harris appreciated that staff was digging into addressing his perceived shortcomings of the 2021 Plan approach, particularly the disconnects between energy efficiency/cost effectiveness work and other data sets used for resource planning/capital expansion. He called the load shape work a good approach. Douglass appreciated Harris's comment.

Douglass thanked the room and asked for further comments as staff wants to create a strong analysis. He ended the meeting at 4:00pm.

### **Attendees via Zoom Webinar**

Christian Douglass	NWPCC	Amanda Welch	ODOE
Kevin Smit	NWPCC	Nicolas Garcia	WPUDA
Jennifer Light	NWPCC	Brian Dekiep	NWPCC
Daniel Hua	NWPCC	Dan Adams	Avista
Chad Madron	NWPCC	Verene Martin	SCL
Christina Steinhoff	NEEA	Jeff Harris	NEEA
Frank Brown	BPA	Chris Johnson	Benton PUD
Emily Gilroy	WA UTC	Annika Roberts	NPWCC
Landon Snyder	Snohomish PUD	Michael Coe	Snohomish PUD
Sophia Spencer	Nauvoo Solution	Billie McWinn	Idaho Power
Brian Dombeck	BPA	Jonathan Belais	NEEA
Jennifer Snyder	WA UTC	Konstantine Geranois	WA UTC
Craig Patterson	independent	Ronda Strauch	SCL
Mark Lenssen	PSE	Debbie DePetris	Clark PUD
Nick Gemperle	PSE	Kasey Curtis	PSE
Mary Kulas	independent	Ted Light	Lighthouse Energy
Sofya Atitsogbe	WA UTC	Brad Westmoreland	PNGC Power
Lorin Molander	PSE	Jennifer Finnigan	SCL
Peter Kernan	OR PUC	Greg Brunkhorst	Tacoma Power
Brandy Neff	PNGC Power	Aquila Velonis	Cadmus Group
Spencer Moersfelder	Energy Trust of OR	Fred Heutte	NW Energy Coalition
Mike Hermanson	Avista	Angus Duncan	NRDC
Alize Seelig	PNUCC	Leann Bleakney	NWPCC
Jeanne Currie	Clean Energy Transition	Guillaume Mauger	University of WA
Andy Cameron	ODOE	Rich Arneson	Tacoma Power