Northwest Power & Conservation Council
Conservation Resources Advisory Committee
February 24, 2023

Kevin Smit, NWPCC, began the meeting at 9:00 with a review of the day's agenda. He then called for introductions.

Recap of the NWPCC 2021 Power Plan
Kevin Smit, NWPCC

Angus Duncan, BEF, was bedeviled by talking about resources on one side, load on the other but never talking about linking them up through the transmission system [Slide 6]. He said this has a huge impact on resource choice and reliability and wondered why it wasn't on the presentation slide.

Smit countered that staff talk about and track transmission but don't run a separate scenario in the Plan. He said transmission and grid constraints do play a role in siting potential resources.

Jennifer Light, NWPCC, added that staff did a fairly detailed analysis around transmission capability ahead of the 2021 Plan and found that there is a lot of not-fully-utilized capability on the system even though lines may be fully obligated. She said the region should continue thinking about transmission issues and the Council is exploring a more enhanced, locational analysis approach.

Peter Schaffer, PacifiCorp, said he thought the NERC requirement around contingency reserves is based on a percentage of load, meaning that EE could provide a reserve benefit [Slide 10]. He asked if staff plans to incorporate that as a benefit.

Smit answered that this hasn't been separately quantified as a benefit. Light noted that the Plan includes an analysis of cost-effective reserves and found that EE is one good way to meet regional reserves. She said adding more EE would cost a bit more than just holding reserves back and sending the signal for more thermal or hydro. She said this issue will continue to be investigated.

Duncan asked if the 2021 Plan incorporated Oregon and Washington's requirements to decarbonize [Slide 13]. Smith answered yes, the Plan includes policy that was current at the time it was being made. He said there have been additions since then and some anticipated load forecast assumptions were also included.

Jeff Harris, NEEA, said that, despite seeing this slide many times before, today he learned that the concept of net load is a misnomer. He said it's a metaphor for load minus generating resources. Harris said this slide illustrates the challenge of the 2021 Plan: absent the buildout of

solar, what would be the cost-effective amount of EE needed to reduce loads, which would then reduce the need for new solar.

Harris said he was never clear on the Order of Operations the Plan used but understood the planning process is complicated. He suggested not talking about net load in the future unless they are behind-the-meter resources. Harris said this is more of the confluence of meeting load with generation. Smit understood his point and suggested finding another term.

Nicolas Garcia, WPUDA, said he was always confused that the Plan treats all conservation and all capacity equally despite growing transmission constraints that could give more value to EE in the right location. He wondered if staff agreed and if this treatment will continue. Smit agreed and said staff is working on enhancing the portfolio model to account for more locational capability. Smit agreed that EE and DR could have very different values based on location. Light also agreed but cautioned that analysis is limited by state-level data.

Garcia noted that WA has a lot of new codes and standards and was curious how these policy changes are compared to and differentiated from utility programs when it comes to reaching goals [Slide 16]. Smit said if codes and standards are in place when the Plan is being set up, staff assumes that they are being met. He added that he understood WA's building performance standard is progressive, so will be treated more like a program with a ramp rate.

Light said NEEA and BPA monitor codes, standards, and market changes.

Harris asked about plans for interim assessment and review of the Plan. Light said they are working on scope right now. She thinks the assessment will be completed by late summer 2024. Light added that they are also working on building out a new long-term load forecast model and perhaps do a new long-term load forecast to capture some of these goals. She stressed they will not re-run any scenarios and the Power Committee will be discussing this in the next few weeks.

Resilience Benefits of Energy Efficiency
Noah Lieb, Justin Spencer, Apex Analytics

Harris asked for more information around "grid impacts are captured separately" [Slide 6]. Lieb answered that they didn't value or account for grid-related benefits resulting from EE improvements. He agreed they do exist, but this study and tool does not have an estimate.

Harris noted that this is potentially significant due to the pick-up/rebound load. He asked if staff plan to investigate further. Smit said they are aware of the issue but don't have a plan yet. Smit said he will add it to a list. Harris called it a separate benefit to operators as more flexible loads could have benefit before an event.

Jennifer Finnigan, SCL, asked for clarification around active versus passive measures and if that includes generators. Lieb said active measures require electric input, pre-cooling your home for

instance versus weatherization upgrades that don't need active energy inputs to get benefits. Justin Spencer, Apex Analytics, added that passive measure benefits accrue to any house whether or not they had a backup generator.

Duncan said [Slide 9] is missing the difference between a house that is gas heated versus electric resistance heated versus HP heated. He said he assumed the example home is electrically heated and asked if the reference case has the same base value for resistance heat and HPs. Spencer answered that the study focuses on electrically heated homes but notes that values will be different for different heating options.

Jim Lazar, RAP, said he was troubled by the first bullet on the slide, asking if the avoided cost of energy is a GNT measure or if a distribution capacity value is reflected here. Spencer answered that this is a third kind of impact: the avoided cost of building resilience energy. Lazar's next comment was garbled. Spencer said this could be added as an additional impact.

Gurvinder Singh, PSE, addressed [Slide: Step 1] saying EE is not a dispatchable resource and asked if these events are no longer events because of past EE or just outage events. Spencer answered that they are just looking at outage events and this will be clearer when they get to Step 3.

Garcia called the approach on [Slide 14] interesting but proposed that not everyone will respond this way. He asked if there was an intermediate step for people not willing to pay for a large generator but might buy a medium sized one. Spencer said they came up with a method that could work but other systems could work too. Lieb added that the tool is flexible enough to allow the input of a different reference system.

Rich Arneson, Tacoma Power, said this shows a weatherization retrofit where the existing furnace stays the same. He said changing the generator doesn't change the load and wondered where the benefit comes from. Spencer said this is looking at a continuous situation not a discreet situation. He agreed you wouldn't change the strip size, but maybe you would optimize the strips.

Anna Kim, OR PUC, appreciated this work but noted that customers react differently, and experience outages differently. As example she said rural areas get service at different times and may have longer power outages.

Lazar noted that he uses his EV battery as a backup system. He said there will be a lot of creative responses to outages as appliances and vehicles change over time but didn't think that a 20 kW Diesel generator was a rational response to this magnitude of need. Spencer said the 14 kWh is the expected average value, but you will need 200 kWh once in 20 years. He added that the heating system also plays a role.

Harris asked if the system is running to avoid freezing inside the house [Slide 18]. Spencer answered they are trying to close the gap and avoid freezing. Harris called that unrealistic, and

the generator would probably run to keep the house at 50° or 60°. Spencer said you could use that approach and pick a set point of 50° Harris called that a better way to capture the health benefit. He suggested picking a set point that is a minimum for health (55°) and have both houses try to achieve that.

Finnigan said she expected to see more benefits in the summer [Slide 20] considering the excess deaths due to the heat dome. Spencer said the critical assumption they made was benefits during an outage. He acknowledged that they looked into the heat dome and found big cooling benefits, but these homes were pulled from the study as they never had an outage.

Finnigan called this a good first step but wondered what would happen in Seattle if the power went out during another heat event or if power is turned off during wildfire season. Spencer said they used the avoided cost approach, but kWh saved during a heat dome event might be worth a whole lot more in terms of saving lives. He called this an area that would benefit from further refinement.

Duncan said a damages approach would give a different perspective on costs and benefits during extreme events. He then asked about the impacts for the extended/rolling events. Spencer explained that illustrates their assumption about when rolling blackouts (bulk system power failures) would occur. He said it's correlated with extreme cold within a dry year. Duncan was still confused about the non-linearity of the graph. Spencer said it's in all three, but the annual frequency is different.

Singh said he was still stuck on [Slide 25] that showed savings going down once you apply probability to these events. He then addressed the feasibility of customers finding value in this approach. Singh said a vast swath of customers don't think about power loss as outages are usually short lived.

Spencer said it's hard to estimate the value to the customer adding that most people buy generators after going through a long-duration event. He didn't think the range—one to three cents—is in the high-end noting that in TX real time wholesale pricing is pegged at $9/kWh.

Lieb appreciated the input, saying the framework is flexible and other approaches had deeper, darker rabbit holes.

Smit called this a great first step adding that the RTF also provided input. He was excited about the starting framework and promised the tool will be discussed again.

Break

Low-GWP Refrigerant Impact on Energy Efficiency
Olav Hegland, DNV
Duncan asked about refrigerated trucking [Slide 17] and wondered if this will look at the impact, functionality, efficiency, and performance of EV passenger car AC and refrigerated

trucking. Hegland admitted this should be investigated but was not part of the scope of this study. Smit agreed that this is something that should be included in future EV forecasting.

LUNCH

IRA Home Energy Rebates Program
Danielle Walker, US Dept of Energy

Smit asked if the Weatherization Assistance Program is new money [Slide 5: Programs Coming Out of SCEP]. Walker answered that the $3.5 Billion is a big increase but was not sure by how much.

Smith asked if there is a cap on the efficiency side [Slide 8]. Walker answered no but there is on the electrification side.

Harris happily greeted Walker back to the CRAC. He said NEEA has been thinking about income verification and POS. He reveled that there are commercial entities that do this for credit purchases. Harris thought consumers might like that more than an IRS tool. He then said commercial vendors have built-in fraud departments, which would remove the need for self-attestation.

Schaffer said that PacifiCorp provides an Oregon low-income application for customers to self-certify for bill discounts. He called this useful for reaching out to customers with different EE offers. Schaffer agreed that his organization is also concerned with fraud, and when customers sign up, they agree to possibly being sampled for income verification. Schaffer said they can also monitor bills and a spike in usage will be flagged for investigation.

Walker asked about uptake. Schaffer said they saw quite a bit of uptake at first, pointing to community outreach efforts.

Lazar referenced an example of a 100-year-old Seattle house that has been retrofitted so it can be 100% heated with a HPWH [Slide 13]. He thought very deep retrofits like this could be useful tools to address energy, capacity, resilience, and DR. Lazar wondered if this and other sources could fund these houses of the future. Walker said the DOE is all about leveraging and integrating to allow bundling. Lazar thought some of these actions may not be cost effective, but utilities could handle the cost-effective measures while DOE funds could go to the rest.

Walker reminded that room that there are no cost effectiveness constraints on this funding, leading to a lot of opportunity.

Kim said the OR PUC asked ETO for ways to go beyond complimenting this funding but also looking for gaps. She thought this may require more back and forth to fit these funds together and maximize benefits.

Harris reminded the room about NEEA's work on consumer rebates for appliances. He said the ESRPP platform has the major retailers involved and would like this work to flow together. Walker asked who NEEA is working with at EPA. Harris did not know but would find out.

Schaffer leveraged PacifiCorp's unique position of serving six different states, saying key themes tend to be "who's operating the centralized function of coalescing different groups and coming up with a unified strategy and vision." He said people are identifying important stakeholders and PacifiCorp is taking on the supporting role of identifying tribes and finding a single point of contact.

Schaffer noted that there are small utilizes in every state and wondered how they are being brought into the conversation. He would like to see more co-ops and small public utilities into this space.

Walker asked if there is a wide range progress in figuring this out among the six states PacifiCorp serves. Schaffer admitted that it's hard to say because of their different stakes in each state. He did say there is movement in nearly every state but WY.

Debbie DePetris, Clark PUD, warmly greeted Walker before reinterring that reporting requirements are based on BPA. She worried that softer requirements might lead to fly-by-night HVAC contractors and people that want to participate in programs that don't help with utility savings. She thought that PTCS going away and meeting I937 targets add complexity. DePetris said Clark has a robust contractor network today and wondered what this will mean in the future.

Walker asked if Clark is talking to WA about these questions. DePetris said Clark is not currently but might have opportunity in the future.

Finnigan pointed to HB 1391 in WA that creates a way to coordinate federal money. She said the idea is to have the Dept of Commerce coordinate and create a statewide building energy upgrade navigator program. Walker called that awesome!

Smit encouraged CRAC members to submit comments to the RFI to make it easier to access these federal funds and give the region a boost.

Smit ended the meeting at 2:00.

Miscellaneous Questions and Answers from the Questions Panel.

Angus Duncan, BEF
Q: Jennifer: I think you're right for maybe the next 5 years. But led times for significant Tx additions are ten years or longer, so work has to commence today to enable substantial E-W and offshore wind in the 2030s. Tx is a "limiting condition" which will influence price and supply of both supply and demand-side resources including EE.

A: Thanks Angus. Yes, we are definitely continuing to improve our modeling and understanding of the transmission capability. For EE (and DR) we do also account for transmission and distribution deferral benefits in the analysis, that we will want to revisit going forward. Transmission is definitely a big piece of the puzzle we will be thinking through.

Q: This chart invites the question whether climate change is driving this range wider -- e.g., extended cold weather event in Texas; heat dome in Portland.

A: Yes, it does. Those two events you mention are a couple of the primary drivers for doing this study and trying to attribute a value to EE

Q: Agree with Jeff that it would be worth continuing to refine the analysis, then integrating it with (a) impacts on distribution system, pro and con; (b) assuming homes and transportation continue to electrify, is there a sensitivity case that looks at resilience of such homes, with backup power from your EV? In the second case, what additional system value can be captured by the grid from linked, dispatchable homes/businesses and microgrids?

Q: Good, thanks. Good to add heat pumps to the analysis also, and the heating/cooling fluids charging these units. Heat pumps and EV's should be assumed to be the future (until something better comes along).

Jim Lazar, RAP
Q: Seems like there is a huge value in pipes not freezing, even if the occupants can go elsewhere to avoid freezing to death. And even discomfort carries a cost.

Q: I think there are three likely different behavior: maintain traditional comfort level (the wealthy person), maintain minimal comfort level (most of us on this call), and avoid freezing pipes, which has an entirely different set of values.

A: Thanks Jim. Good clarifications. I will pass this along.

Q: The 20 kW diesel generator meets (1), the inverter on the EV plus propane fireplace or wood stove meets (2), and the propane fireplace alone meets (3). Even a Kerosun heater ($300) can meet (3) and avoid tens of thousands of dollars of pipe freeze damage. I just helped someone with loaning my propane shop heater when their furnace failed. We heated their office building with propane to prevent freeze, and nobody came into the office until it could be fixed.

A: Thanks Jim. I'll forward this so all can read it.

Quentin Nesbitt, Idaho Power
Q: I appreciate methodology and really like the approach on avoided cost and like the differential cost approach on the generator, but I do think you need to look at lower cost for generation I have bought and installed a generator with a manual interconnect switch for 4 kW

for only $3,000 and the incremental amount for larger just would not have been very much at all. So, I think your $3800 + is very high.

A: Thanks Quentin. We heard a lot of similar feedback from the RTF. We will definitely be investigating the best assumptions to use in this methodology and tool.

Craig Patterson, independent
Q: What about the economic effects of high bills and poor customers? How are you addressing the 20% of customers who have a hard time paying their bills? Can you address the needs of these customers?

Attendees via Go-to-Webinar

Kevin Smit	NWPCC	Dan Adams	Avista Corp
Rich Arneson	Tacoma Power	Leann Bleakney	NWPCC
Juan Carlos Blacker	BPA	Frank Brown	BPA
Michael Coe	Snohomish PUD	Andy Cameron	ODOE
Debbie DePetris	Clark PUD	Angus Duncan	BEF
Andy Eiden	PGN	Jennifer Finnigan	SCL
Robert Frost	Benton PUD	Ryan Fulleman	Tacoma Power
Nicolas Garcia	WPUDA	Andrew Grant	Cadmus Group
Lee Hall	BPA	Chad Ihrig	Franklin Energy
Mark Jerome	CLEAResult	Elena Kazarov	BPA
Peter Kernan	OR PUC	Anna Kim	OR PUC
Jim Lazar	RAP	Hanna Lee	BPA
Ted Light	Lighthouse Energy	Kerry Meade	NEEC
Kari Montrichard	BC Hydro	Dave Moody	BPA
Quentin Nesbitt	Idaho Power	Elizabeth Osborne	NWPCC
Chris Johnson	Benton PUD	Peter Schaffer	PacifiCorp
McKenna Schmitt	Boise State	Aliza Seelig	PNNUC
Juan Serpa Muñoz	EWEB	Melanie Smith	BPA
Jennifer Snyder	WA UTC	Kimberly Sullivan	Boise State
Jason Talford	Idaho PUC	Taylor Thomas	Idaho PUC
Aquila Velonis	Cadmus Group	Bonnie Watson	BPA
Joan Wang	BPA	Josh Warner	BPA
Brian Dekiep	NWPCC	Izzy Jones	Boise State
Craig Paterson	independent	Gurvinder Singh	PSE
Tamara Anderson	NEEA	James Clark	Energy Hub
Dylan D'Souza	NWPCC	Misty Gao	PGN
Ann E Gravatt	NWPCC	Amber Gschwend	GDS Assoc
Lori Hermanson	Avista Corp	David Hewitt	NBI
Avery Martin	Independent	Heather Nicholson	Independent

Kathi Scanlan	WA UTC	Nihit Shah	PGE
Molly Siebers	EPA	Justin Spencer	Apex Analytics
Danielle Walker	US DOE	Kitty Wang	Energy Solution
Danie Williams	Northwestern		