Northwest Power & Conservation Council
Resource Adequacy Advisory Technical Committee
June 27, 2024

Dor Hirsh Bar Gai, NWPCC, began the meeting at 9:00 by calling for introductions. Chad Madron, NWPCC, explained how to best interact with the Go-to-Webinar platform.

Aliza Seelig, PNUCC, confirmed that [Slide 12-13] extrapolate to 2029. Hirsh Bar Gai confirmed that the slides represent the buildouts from the Plan. Seelig asked where the baseline is found. Hirsh Bar Gai said it is close to the orange line.

Jennifer Light, NWPCC, suggested not focusing too hard on the baseline as the Council's 2021 Plan strategy is not tied to the baseline. Seelig asked if the strategy is some combination of these and how it's extrapolated. John Ollis, NWPCC, confirmed that the baseline runs through the middle and agreed with Light's assessment. He said any interpretation should look to see what number of renewables the Plan was getting in a number of scenarios.

Seelig understood that it's an amalgamation of all the drafts that picks a number for the Plan, recalling that EE went from 750 MW to 1000 MW in 2027 which now extrapolates to 1300 MW. Light said the EE is derived through supply curves while the target looks at a cost-effective amount of EE. She said the 2027 assessment used the top range (1000MW) as the test. Light agreed that none of this is perfect, but said staff is trying to get at the high end of the target with renewables consistent to where a lot of lines on the slide were falling.

Seelig then moved to [Slide 15] asking how significant all the transmission is, adding that it's coming online slowly with delays already having an impact. She wondered what level of confidence the room should have in these builds given the amount of concern PNUCC members are voicing.

Hirsh Bar Gai said this is the difference between an adequacy assessment with a five-year outlook versus deeper Power Plan questions. He said Boardman to Hemmingway will have the most impact for this assessment, but staff do model the entire WECC. Hirsh Bar Gai said as the Council is using a market reliance limit, having more WECC transmission is good for WECC dynamics, but he cautioned that it might be too soon to say what is the impact for the region as staff knows there is already transfer capability beyond that limit.

Ollis agreed, saying this five-year snapshot deliberately avoided other transmission to allow for a buffer period in case of delays. He said most of the effect will be mitigated by the Council's market reliance limit.

Scott Levy, Bluefish, noted the import limit wondering if current Council members are aware of that constraint. He suggested a scenario that used physical limits, calling it a

more accurate model. Hirsh Bar Gai assured Levy the Council members are aware of the limit. Ollis said the RAAC could revisit this limit for the Plan.

Seelig confirmed that the average on [Slide 25] is the average across simulations for energy and one-hour peak. She asked if the model captures the difference between coincident and non-coincident peak. Hirsh Bar Gai agreed with the first part of Seelig's comment but did not recall focusing analysis on coincident versus non-coincident peak.

Ollis added that, on a high level, staff can look at hourly loads and resources and how things flow but tend to wrap it into a regional look. He said as far as coincident versus non-coincident, all of the peaks in the model are from a coincident perspective.

Seelig said PNUCC uses a bottom-up, non-coincident approach and was curious what staff thought the difference might be. She thought this information would have value for the region and wondered if staff could provide that look. Ollis thought it was possible, referencing the new load forecast model that will be used for the 9th Plan.

Frank Brown, BPA, asked how batteries/storage is treated. Ollis answered that there are not a lot in the model right now, but they can be modeled in detail. Brown noted that they are not listed in the existing resources table. Ollis called that an oversight, assuring him they are accounted for in the existing resources.

Levy asked if the 97.5 VaR on [Slide 33] changes based on run scenarios or is a fixed reference case. Hirsh Bar Gai said the threshold value is fixed. Levy asked if there will always be 2.5% of cases with a shortfall in every scenario and this chart illustrates how big that is. John Ollis added a clarification that a scenario doesn't always have to have 2.5% of shortfalls past the threshold, it is simply a matter of the results of each study and it is possible to have no shortfalls as well.

Levy referenced the difference between BPA's data center study and the Council's [Slide 35]. He asked if it is because the Council is not assuming any resources besides what is already scheduled while Bonneville assumes utilities will create resources to accommodate centers.

Ollis was not sure which BPA study Levy was referencing but explained that staff assumes existing resources plus whatever is needed to get to the planned resource strategy. He said the Plan contemplated a higher data center range, but it was not enough of a hedge to accommodate this much early growth. Light added that the March update to the Council had four trajectories, and the baseline was lower than what may be seen in other studies. She said the next Plan will examine this further.

Seelig touched on the red and purple boxes on [Slide 36], asking if incident 4 is a simulation year. Hirsh Bar Gai said "4" is just a tracking construct and G_33 is the climate/condition

simulation. Seelig confirmed that that one, four-hour event lost 3,368 MW/h. Hirsh Bar Gai confirmed, explaining the event in further detail.

Seelig tried to extrapolate the graph to the January 2024 cold weather event where imports were above the limit for a long duration. She asked to see those January numbers represented in a similar way. Hirsh Bar Gai said they can qualitatively compare similar conditions, but it will never be apples to apples because of market limitations.

Ollis added that the 3,368 is a MWh, akin to a volume. He said the 960 MW is more comparable. Ollis added that this scenario is comparable to the January event as there was market available over and above the 2500 but staff choose not to rely on that so it's seen as a shortfall. Seelig countered that it was close as energy emergency alerts came through and event 5-7 were consecutive day events.

Hirsh Bar Gai explained that while they might have happened on consecutive days, they were not 24-hour events, but one-hour shortfalls that occurred in consecutive days. Seeling asked if staff would call this a type 1 emergency resources. Hirsh Bar Gai said the model does not designate if the emergency measure needed to mitigate these shortfalls are type 1 or type 2, but from observing the January 2024 winter event, it can be assumed that higher market imports are likely, hence type 1, that event as they can be mitigated with higher market imports.

James Adcock, independent, did not feel the current market limitations were well motivated and wished there was a better way to represent them, perhaps with price distributions or thresholds. Hirsh Bar Gai said this could be revisited, pointing to the model's flexibility to accommodate changes.

Seelig added that expanding limits would require a critical re-look at all the WECC assumptions. Ollis agreed.

BREAK

Adcock expressed concern over making the Council's metrics more complicated than the accuracies and limitations of the available modeling [Slide 51]. He was worried that more sophisticated metrics will be taken too seriously without taking a closer look at model limitations.

Elizabeth Hossner, PSE, moved back to assessment fundamentals, confirming that the reference portfolio starts with the total resource from the 2021 Plan. Hirsh Bar Gai said it's an approximation. She asked to see what would happen if that plan were not achieved, using just existing resources plus what is currently under construction. She then said she would like to see how much resource is needed to achieve adequacy.

Hirsh Bar Gai said the 2027 assessment tested a no resource strategy scenario and found it inadequate. He said this assessment did not test the strategy as the assumption was it would also be inadequate.

Hossner asked if that will be done again, wondering what the LOLP percentage is based on No Resource Strategy, and then how many MW of resources would be needed to achieve adequacy.

Hirsh Bar Gai explained that the adequacy assessment determines whether or not the region is adequate and not what is needed to achieve adequacy. He said the past LOLP would say how much capacity was needed for mitigation, but that is not what we are doing with these with four metrics. Hirsh Bar Gai said staff are currently working on OptGen to get at the relationship between the output of metrics and what is needed to meet adequacy.

Light added more context, saying the adequacy is one piece information, but staff is also tracking utility plans. She said the reference case is testing 660MW of renewables by 2029 but tracking shows double the number of planned renewables. She added that EE is tracking closer to the higher end of the range. Light said there is a bright line between the adequacy assessment and the Power Plan. Hossner said she will follow up later.

Seelig countered Adcock's early comment, saying it is important to report the metrics and all the assumptions. She thought the Council and others recommend multi-metric standards. She then thought that running a study without resources would be help in the near term for better model testing. Seelig called for anything that would better help understand the model saying it would be valuable for regional support of the work.

Seelig then said understanding new resource builds is more complicated than looking at IRPs. She said there are also uncommitted, out-of-region resources and committed, in-region resources to consider and asked staff to comment.

Ollis agreed that the model doesn't reflect all the challenges that come with acquiring a resource, noting that modeling contractual limitation and sharing of power is not the RAAC's goal. He called the model an adequacy model that understands market fundamentals.

Ollis said they modeled a scenario without builds in the past that showed an inadequate system and suspected it would be inadequate today. Pointing to Hossner's concern of understanding the deficit, Ollis said this could be seen a bit in existing work.

Ollis said if the region wants to see more details on this going forward it can be done but cautioned that models are expensive and time consuming to run. Because of this, he suggested squeezing as much out of the existing analytics as possible.

Adcock asked if staff model the loss of a major natural gas pipeline [Slide 52]. Hirsh Bar Gai said staff modeled that in the WECC in previous assessments. He added that staff looked at how an event like this effects imports, adding that the next Plan will investigate this further.

Tyler Tobin from PSE, asked about the different multi metrics, referencing the capacity and energy. He said these two cover duration and adding a duration metric feels redundant. He asked how a duration metric would provide value. Hirsh Bar Gai said there can be a 10,000 MW single loss in one hour or a 10,000 MW loss over multiple hours and that can make a big difference. Hirsh Bar Gai said renewables add increased risk and more questions. He then said, from a supply side, this metric illustrates the very bad events that the region wants to avoid.

Levy wrote: To that point of John Ollis right now, putting back the two scenarios of the 7th Power Plan (planned and unplanned loss of a major resource) could be a simulation of losing a gas line, nuke, LSR hydropower, etc., if that 7th scenario does not upfront state "a non-GHG resource". Repeating that scenario would be informative, and the 8th Plan avoidance of that scenario was not helpful for those wishing to be well-informed, in the chat.

Seelig wrote: For duration, should we be considering multi day risk. I remember that being a keep up at night…, in the chat. She wondered if there could be another duration metric beside 8-hour. Hirsh Bar Gai said it goes back to what the region wants to protect against. He said the model still captures and reveals very long events.

Seelig asked about a six-hour, day-after-day event, or two six-hour events in one day. She wondered if eight hours was too big and asked about some combination to capture the kind of consecutiveness that was seen in January 2024. Seelig was concerned about becoming too dependent on four-hour batteries.

Hirsh Bar Gai rephrased the questions as, should we have a metric for multiple events per day. He said the statistics would capture this and the metrics would send the right signal in aggregate. Hirsh Bar Gai said they are working on further translations, but as of now are event-focused as opposed to day-focused.

Seelig said she's bringing this up because the multi-day cold snap kept people up at night, so she felt it was worth revisiting. She wondered if the RAAC should be resurveyed about what worries people most.

Hirsh Bar Gai said they've discussed renewable droughts in the past and can queue up the topic again.

Adcock asked if staff is confident the model can handle the region's historically typical one-in-20-year winter drought. Hirsh Bar Gai said there is a diverse range of climate models

that captures wide-ranging conditions. He pointed Adcock to the newly formed Climate and Weather Advisory Committee (CWAC) for a deeper look.

Adcock voiced a preference for a lower threshold than what is depicted on [Slide 53].

Seelig thought it might be helpful to think about resources utilities have firmly acquired [Slide 54] versus what might be out there because of uncertainty. She said PNUCC tries to track firm acquisitions because during extreme events others will try to acquire those resources. Hirsh Bar Gai said it's a possibility, cautioning that there might not be a "heat dome" or "cold snap" scenario, but the existing scenario distributions do show them.

Levy referenced the 2024 winter event, suggesting digging into what happened and why. He suggested it might have been a transmission problem adding that BPA has not been forthcoming with him. Hirsh Bar Gai admitted that it is very difficult to have an apples-to-apples comparison and offered to follow up.

Adcock explained his concerns around import limits, saying overbuilding ensures other regions at a cost to us and vice versa. He suggested trying to keep those inter-region relationships on a play fair basis.

Seelig said she is not hearing concerns about adequacy in the near term [Slide 57]. She was thinking about extrapolating analysis, noting that loads are up. Seelig asked for a staff perspective if there is a role to weigh in on this, saying PNUCC members are working hard to add resources and are concerned about market being available when needed. Seelig pointed to the difference between feeling, reality, and modeling and wondered how this will be conveyed.

Ollis said his impression is this assessment is five years out, which give a buffer to find resources. He said this looks like a long-term red flag if the data center loads are higher than what was shown in the Plan. Ollis said the EE piece is also important.

Ollis said his own personal concern is more about getting the WRAP off the ground, and he thinks there could be a lot of challenges closer term.

Hirsh Bar Gai shared Ollis's near term concerns, pointing to changes in the system. He addressed timing, saying he will keep the body posted for Q4 meetings and further work. Seelig thought it important to convey how the region is feeling and concerning events to Council members. She referenced a recent meeting with E3 where they said California's Plan only includes "in construction data centers." This gave her the impression that California thinks data centers are a bigger deal and we have to prepare a system that takes a long time to build for a hard-to-predict reality.

Seelig called for more Council feedback as the region is experiencing a tighter market than they had in recent decades.

Hirsh Bar Gai moved to [Slide 60] to address data centers, saying staff is taking the risk very seriously. Ollis added that the higher data center forecast is inadequate, which sends a very clear message.

Blake Scherer, Benton PUD, asked what the grey on [Slide 60] represents. Hirsh Bar Gai said that represents the full spread of data center growth. Tomás Morrissey, NWPCC, confirmed.

Hirsh Bar Gai ended the meeting at 12:00pm.

Attendees via Go-to-Webinar

Dan Hua	NWPCC	Blake Scherer	Benton PUD
Dor Hirsh Bar Gai	NWPCC	Aliza Seelig	PNUCC
Jennifer Light	NWPCC	Joni Sliger	ODOE
John Ollis	NWPCC	Tyler Tobin	PSE
Steve Simmons	NWPCC	Hannah Wahl	PSE
Tomás Morrissey	NWPCC	Christina Wyatt	BBEC
Chad Madron	NWPCC	Glenn Blackmon	WA Dept of Com
James Adcock	independent	Greg Brunkhorst	Tacoma Power
Brittany Andrus	WECC	Katie Chamberlain	Renewable NW
Paul Barrager	WA UTC	Mike Hermanson	Avista Corp
Edith Bayer	ODOE	Arlene Sherrett	independent
Peggy Beltrone	Cat Creek Energy	Landon Snyder	Snohomish PUD
Frank Brown	BPA		
Kym Buzdygon	NWPCC		
Daniel Catchpole	NewsData		
Nathaniel Clayville	NWPCC		
Jeanne Currie	Clean Energy Transition		
Joshua Dennis	WA UTC		
Rob Diffely	BPA		
Brian Dombeck	BPA		
Bryon Domgaard	WECC		
Ryan Egerdahl	BPA		
Karma Hara	BPA		
Doug Hart	PSE		
Joshua Haver	Idaho PUC		
Fred Heutte	NW Energy Coalition		
Michael Hill	Tacoma Power		
Elizabeth Hossner	PSE		
Peter Jensen	NWPCC		
Sanjeev Joshi	Critfc		
Mary Kulas	Consultant PPC		
Scott Levy	Bluefish		
Bryan Neff	CEC		
Heather Nicholson	Orcas P&L		
Joel Nightingale	WA UTC		
Phil Ritter	Sonic		
Annika Roberts	NWPCC		
Will Rosquist	Montana		