

**Northwest Power and Conservation Council
Resource Adequacy Advisory Committee Technical
September 21, 2022**

John Fazio, NWPCC, began the meeting at 9:00am by calling for introductions. Chad Madron, NWPCC, explained how to best interact with the Go-To-Webinar platform.

**Pacific NW Resource Adequacy Assessment
John Fazio, NWPCC**

James Adcock, independent, questioned the statement “You can’t rely on 3000MW because half the time it will be less than that” [Slide 15]. Adcock said he used to worry about a “West wide Contagion” where both CA and the PNW have a simultaneous heat event. He admitted he is less concerned as it appears that when CA is hot the PNW is cooler and vis a versa. Adcock asked if weather patterns were examined.

Fazio said they have examined the PNW weather patterns extensively including using downscaled climate change data. Adcock countered that he is not speaking specifically about the PNW but the entire west. Fazio said they don’t have the same amount of information for the entire West, adding that there are agencies working on providing more downscaled climate change data. Fazio offered to share that data when it becomes available.

Fazio then pointed to other uncertainties, like fuel shortages, pipeline breaks, and transmission outages, that are also not being modeled. He said this lack of information is another reason for limiting imports.

Fred Heutte, NW Energy Coalition, pointed to a recent, two-week-long, record-breaking weather event that did cover the entire west. He called this a big wake-up call as these large, long-duration events are possible.

NWPCC Council Member Doug Grob, asked how an aggressive solar storage build might impact other resources like hydro going into CA to serve their “duck curve” [Slide 16]. John Ollis, NWPCC, said if there’s an excess of resources priced under NW resources the model will broadly import.

Fazio rephrased, asking if the low prices that signals the model to import wouldn’t be there if CA built a lot more storage. Ollis said yes, adding that he has seen this when running scenarios with more storage.

Grob said that means the CA prices might not be that low which might lower the price of exported hydro. Fazio offered to model more out-of-region storage to test the theory. Ollis agreed.

Adcock addressed ramp rate in CA and wondered if the stored energy would be used for ramp rate or peak shaving. Ollis answered that storage is seen more as a ride-through to allow natural gas to ramp up. Ollis added that four-hour storage is not enough to ride through the entire evening ramp. He added that storage and DR are not a substitute for on-call fuels like hydro and gas.

Adcock said he's seen assumptions about local peak shaving but agreed that mitigating the evening ramp is also important. Ollis noted that most stand-alone storage seems to be built to solve transmission issues.

Heutte asked what proportion of negative pricing are due to the Federal tax credits. Ollis answered that the production tax credit is influencing wind prices, but the solar ITC is different. Ollis thought the major driver for negative solar prices is the difficulty in synching an RPS need to load as opposed to the tax credit.

Heutte then addressed the Inflation Reduction Act which might impact the amount of storage throughout the West. He thought this could also significantly influence the market and resource adequacy. Heutte thought surplus solar that might be curtailed could go into CA's 4000MW of batteries or into the "big battery" of the PNW hydro system. Heutte wondered if assessing resource adequacy with LOLP will be sensitive and accurate enough under these new conditions.

Greg Cullen, Energy NW, asked how accurately we're modeling the ability of the NW hydro system to store and ramp up energy. He pointed to a good portion of the system that can flex on a four to five-hour basis but wondered about a longer, eight-hour mid-day period. Fazio said this concern was raised last year leading to an intense review of all the operating constraints on all the hydro projects to check if the modeling reflects real-world operations.

Ollis thanked the owners and operators for helping validate the model inputs, acknowledging the thousands of constraints on the river system. Ollis said there is still work to be done but generally he's seeing a little less flexibility under certain conditions than was illustrated in the Plan. He said more information on this is coming.

BREAK

Scott Levy, Bluefish, pointed to funding for a large (3000mWh) battery build near Bakersfield which doesn't have any transmission issues but does have inexpensive land and a sunny, desert climate. He was surprised to find that only 670mWh are going to PG&E. Levy predicted more investors doing this and suggested running a scenario with a huge storage buildout in CA, thinking that a huge build out may not change prices that much.

Levy also pointed to the physical transfer capability of 8300mW, calling it nowhere near the 2500 in the Plan. He suggested modeling the physical realities of transmissions and a huge storage build.

Fazio thanked him, agreeing that a bigger storage scenario would be interesting but pointed to a time constraint. Fazio also pushed back against modeling the full physical capabilities of the transmission system saying imports are limited because it's impossible to incorporate all the potential uncertainties. Fazio said they are trying to improve this.

Ollis said that even when he ran a scenario with "free" storage it was not all purchased. Ollis thought the limitations around four-hour storage might explain this.

Rob Diffely, BPA, asked how many games are being run for each scenario [Slide 19]. Fazio explained that they ran 5000-6000 games for LOLP, adding that the variables were not connected. He said correlating river flows to temperature and using climate change data allows them to run just 180 games. Fazio added that turning on stochastic forced outages or more wind and solar patterns would require more games.

Diffely confirmed that you can get stable results with just 180 games at this time Fazio agreed.

Sashwat Roy, Renewable NW, asked if the stochastic force outages for thermals correlated to weather. Fazio said no, adding that the topic was under discussion in many areas around the country. Fazio stressed that stochastic forced outages are not correlated to temperature in the classic model.

Adcock said the question isn't how many runs but how many errors or incomplete aspects of the model would affect how meaningful these new standards are. Fazio answered that no model is perfect and there are utility contingency operations that can't be modeled. He stated that the LOLP doesn't predict actual curtailments but the likelihood that some emergency action will need to be taken.

Adcock stressed that he thinks some aspect of the modeling is in error or inadequate. Fazio thanked him and asked for specifics offline.

Rachel Clark, Tacoma Power, generally approved of this direction around a new RA standard [Slide 40]. She then asked how emergency peak and energy capabilities will be estimated. Fazio said they could ask but didn't know if the utilities would share that information or even how well-defined the answer would be.

Fazio said another tactic would be looking market conditions to approximate the size of emergency purchases the whole region could make. He suggested a third option to get at ranges: performing a regression analysis on systems deemed to be adequate using the 5% LOLP metric. Fazio added that they could also opt to do all three and then use professional judgement.

Heutte approved of this project. He noted that a multi-metric standard is looking to emerge as the preferred choice among other bodies and appreciated the Council looking into it. Heutte admitted the importance of adequate energy is growing, saying a four-part multi-metric approach could potentially draw a bright line between an adequate versus an inadequate system. Heutte thought this could provide real clarity as opposed to the spectrum an LOLP renders. He wondered if anything would be lost by giving up that spectrum and mused on the possibility of just a two-part metric.

Fazio agreed that a four-part metric would draw a narrower line but said there would be time for fine tuning and confidence building. Heutte said he will have some experts provide input. Fazio appreciated the input into this new approach.

Adcock pointed to the limitations of models and how much they effect results. He also said results must be communicated very carefully to customers to avoid false expectations.

Adcock then took the customer perspective, saying resource inadequacy and competent management will lead to rolling blackouts. He, as a customer, said there are already power outages due to other reason but if they are 10 times larger it says my utility is working on the wrong things and should we be increasing delivery reliability.

Fazio stressed that this is looking at the bulk system and not distribution. Fazio agreed that no model is perfect, and output should always come with a caveat. He stressed that experience and professional judgement, along with model runs, always go into making the Power Plan.

Adcock said he still disagrees with the capabilities of the model and then clarified that he is particularly concerned with the VOLL metric, saying it is not ready yet. Fazio thanked him, adding that even though there are countries and utilities around the world that use VOLL as their sole metric, the Council could reject the idea.

Roy agreed with Heutte about the benefits of a multi-metric RA standard particularly with the amount of renewables and storage coming onto the system. He addressed supply-side inputs, asking how Associate System Capacity Contributions were used in the last RA assessment and how that will be impacted in the future.

Fazio said there should be no effect as he doesn't use ASCCs or ELCCs in simulations.

Roy stressed his earlier comment about the importance of modeling forced outages correlating with weather and sharing the results. Fazio agreed.

Heutte pointed to other forced outage/system condition analysis using GADS data that didn't find a correlation. He then said that there is increased evidence that there could be a correlation particularly under high temperature conditions.

Heutte wondered how this will all relate to the Western Resource Adequacy Program approach. He said there were some recent seasonal analysis reveals but nothing is complete yet. Heutte wondered how the WRAP approach will relate to the Council's.

Fazio said he sees the two as complementary and not at odds with each other, noting the differences between WRAP and Council work. He said the real value of the WRAP is facilitating the sharing of existing resources. Fazio said the two approaches meet at the planning reserve margin. He explained that the WRAP uses a one-event day for 10 years and while the Council's standard is more complex it can be converted to a planning reserve margin for comparison.

Heutte thanked him for the explanation, reiterating that the WRAP is more operations while the Council is more for planning. He called the planning reserve margin interesting saying NW hydro doesn't usually use it because of interannual variation. Heutte then said the WRAP presently just focuses on average conditions for load and hydro while the Council takes a wider range into account.

Ollis added that the WRAP looks a much bigger footprint. Fazio agreed, adding that the WRAP has a higher cost of noncompliance which might deter some utilities from joining.

Levy thought that the big CA storage build was interesting, calling it the economic future. He then addressed the ELCC for the storage, asking for the E3 study's curve for southern CA vs in the region. Ollis said Aurora allows the battery capacity contribution value to be determined by a dynamic peak calculation, meaning the ELCC is not required. Levy appreciated and approved of this approach.

Fazio encouraged the group to reach out with more feedback to take to the Council. He said the numbers will be presented in future meetings.

Fazio ended the meeting at 12:00.

James Adcock emailed the following comments after the meeting:

Why I think complicated models of inadequacy don't make sense:

- There are three climate models, one of which doesn't agree at all with the others, which means at least one of them is very wrong.
- There is something wrong with the regional downscaling based on their temperature distribution.
- The hourly re-interpolation from daily tMin tMax has problems at least in terms of ramp rate, based on the distribution of their first differences. Ramp rate [Duck Curve] being a big deal.

- The assumptions about limits of imports, I think, are set too low.
- And the resulting Overbuild by our region simply leads to higher costs and higher emissions while leading other regions -- read California's -- continued underbuilding and over-reliance on our region.
- So, I think Current modeling efforts may be good enough to provide some qualitative feedback about adequacy, but nothing beyond that.

Jim Adcock

- jimad@msn.com

Fazio replied: Thanks very much for your comments. They are greatly appreciated and will be added to the minutes as after-meeting feedback. I think folks sometimes do depend too heavily on analytical models when the data that drives them is not as robust as it could be. But thank you in particular for the specific examples of where you believe the modeling deficiencies are. We are always striving to improve our models and the input data but hope that even with their limitations (which should be noted) they do provide some valuable information. Thanks again.

Brittany Andrus, WECC, clarified that storage is a stand-alone battery and not pumped storage or solar + storage in the question pane. It was confirmed.

Craig Patterson made the following comments throughout the presentation:

Patterson: How do you get 3500 aWH in conservation savings from these numbers?

Clarifications please.

- Response: I don't know what you are referring to. But the 2021 Plan Conservation was developed based on other analysis. This is a new look with some updated information specifically to inform our adequacy assessment which will test the plan strategy.

Patterson: Can you talk about what happened in Texas 2 winters ago and how shortfalls can have draconian effects on rates. Can you share how you're addressing a Texas like possibility in the event of shortfalls? Thanks

- Response: John is explaining how we think about shortfalls. The adequacy assessment (topic of discussion today) isn't focused on rates. It is focused on an early warning about the adequacy of the system with a goal of avoiding big events.

Patterson: I understand it's not the focus, yet how can you not address the pervasive implications?

- Response: This call is focused on our adequacy assessment and exploring a new adequacy metric. The goal of this work is to provide an early warning for the system.

Theoretically, avoiding expensive events keeps costs down and should impact rates, but that is not the focus of this study and not a topic for today.

Patterson: Thanks for the clarification. When will rate implications be discussed? Thanks

- Response: We have no planned discussions on rates.

Patterson: Is there a precedent in this country for paying customers for lost load? When and where did it happen and what are the 'take aways'?

- There was no response.

Attendees via Go-to-Webinar

John Fazio	NWPCC
James Adcock	
Brittany Andrus	WECC
Leann Bleakney	NWPCC
Frank Brown	BPA
Pat Byrne	BPA
Rachel Clark	Tacoma Power
Greg Cullen	Energy NW
Renchang Dai	PSE
Rob Diffely	BPA
Ted Drennan	OR PUC
Mike Frantz	GC PUD
Ryan Fulleman	Tacoma Power
Doug Grob	NWPCC
Doug Hart	PSE
Fred Heutte	NW Energy Coalition
Massoud Jourabchi	NWPCC
Tyler King	Clallam PUD
Scot Levy	Bluefish
Jennifer Light	NWPCC
Douglas Logan	
Heather Nicholson	independent
Joel Nightingale	WA UTC
Elizabeth Osborne	NWPCC
Craig Patterson	
Selisa Rollins	BPA
Sashwat Roy	Renewable NW
Blake Scherer	Benton PUD
Aliza Seelig	PNUCC
Landon Snyder	Snohomish PUD
Jaime Stamatson	Montana
Lisa Stites	GC PUD

Glenn Traeger	
Saul Villarreal	Seattle City Light
Hannah Wahl	PSE
Jim Yost	NWPCC
Brian Dekiep	NWPCC
Ahlmahz Negash	Tacoma Power
Ian Mcgetrick	Idaho Power
Tyler Tobin	PSE