

Northwest Power & Conservation Council
RAAC Technical & Steering
November 8, 2022

John Fazio, NWPCC, began the Technical portion of the RAAC meeting at 1:00. Chad Madron, NWPCC, explained how to best interact with both the Go-to-Webinar and Box platforms. After calling for introductions, Fazio asked attendees to check the [minutes](#) from the September 21, 2022 meeting for accuracy and for any comments/corrections be emailed to him.

Before launching into the meeting, Fazio alerted the committee that study results for the preliminary RA assessment are not available for this meeting because model runs were still in progress.

Resource Adequacy Technical Advisory Committee

John Fazio, NWPCC

John Ollis, NWPCC

Fred Heutte, NW Energy Coalition, questioned the Cost of New Entry (CONE) estimate of \$50,000/MW per year on [Slide 12] saying it's usually a KW/year measure. Fazio explained that the CONE is an amortized (or leveled annual) value for all capital and fixed costs but excluding operating costs. Heutte said he's seen CONE reported by PJM at \$140 per KW/year and was puzzled by the MW. [Note: the PJM estimate of \$140/KW per year converts to \$140,000/MW per year.]

Fazio answered that all estimates for CONE that he has seen have been in units of \$/MW per year. But Heutte was still puzzled as to what the \$50,000/MW year equates to and stated that he was more concerned with the order of magnitude than with precision. Fazio acknowledged that past estimates for CONE were in the range of \$100,000/MW per year or more, which is consistent with the PJM assumption. As another example, Fazio noted that the U.K.'s assumption for CONE has also been in the range of \$100,000/MW per year. However, downward trends in resource capital costs have led to lower overall estimates for CONE.

Heutte then moved to the Value of Lost Load (VOLL), asking how values are determined along with the pros and cons around the metric. Fazio stated that customer surveys are often used to estimate the VOLL, but answers vary by customer class. Fazio added that an alternative approach for estimating the VOLL is to compare the relationship between GNP and energy consumption. Fazio said that although VOLL estimates vary widely, values in the range of \$25,000 to \$35,000/MW-hour are not uncommon. He noted that the U.K., for example, has used an estimated VOLL of about \$33,000/MW-hour and the Council's rough estimate (based on past analysis) is about \$26,000/MW-hour.

Heutte cautioned that using VOLL to set an adequacy standard is problematic because it can vary so widely across customer classes. Fazio agreed but reminded the committee that the

proposed new standard will have multiple components and will not be based solely on CONE and VOLL. He admitted that it will be challenging to set adequacy limits using CONE and VOLL.

Brittany Andrus, WECC, pointed to the coming evolution of the standard and hoped there will be a work plan to define specifics and experiment with the data before running an actual assessment. Fazio noted that the Council has been reporting many of the proposed metrics in its annual adequacy assessments for the past 15-20 years. He said this year's Resource Adequacy Assessment will be based on the current 5% LOLP standard, but that other metrics will again be reported for perspective. Fazio stated that the Council could agree on a set of adequacy metrics to define its new standard, with the understanding that final (binding) limits for those metrics would be determined later after much testing and stakeholder feedback. He added that there is no precise timetable for this work yet.

Andrus thanked him, adding that she recalled distribution system planning work that was similar.

Scott Levy, Bluefish, asked how many additional reserves were needed in the 2021 Plan [Slide 21]. Ollis said the up (incremental) reserves, which are important for maintaining adequacy, totaled 6,000 MW in the baseline scenario, that is, an additional 3100 MW over the previous assumption of 2900 MW.

Levy confirmed that the 2021 Power Plan found a need for increasing reserves. He asked if the 6000 MW in the baseline scenario represented the magnitude of reserves actually being held or whether it would be an increase over current operations. Ollis said staff doesn't have exact insight into the numbers yet and it's still an open question. Ollis added that the need for 6000 MW of up reserves for conservative regional operations was derived from model runs.

Fazio stated that [Slide 21] is for the year 2027 and not the entire 20-year span of the Plan.

Heutte asked why so much thermal generating capability [Slide 26] is going unused. Ollis explained that some thermal capability is used as a reserve to cover forecast error (in demand and in renewable resource generation). As more renewable resources are added, the magnitude of forecast error increases, meaning that more reserves (and fuel for those reserves) are required. Roughly half the time, thermal units holding reserves will not have to be dispatched (when observed demand and solar and wind generation are less than forecasted). The availability of inexpensive market supplies will also lead to unused generating capability because more expensive thermal generation will be displaced, or because market prices make thermal units uneconomical (and therefore uncommitted).

Heutte called 8500 MW of reserves huge and expensive and asked if the model considers storage and DR for reserves. Ollis answered yes adding that they only assign units as reserves if they are actually used as reserves.

Heutte then said there is a lot of real word action that can affect this, pointing to CAISO's work that found a software glitch that dispatched battery storage earlier than would be beneficial. He said this means there should be more fine tuning around the concept as reserves are getting trickier.

Ollis said the existing DR is not currently available as reserves as that's not how utilities are using them. He felt this conservative approach was appropriate but could change as the DR portfolio grows.

Heutte countered that PGE is starting to use their DR in a new way and getting small, but good results. He felt Ollis's approach was good for now but needs to evolve. Ollis said the model has the capability to do that.

Levy speculated that most events happen during the afternoon ramp. Ollis answered mostly but mornings are challenging as well. Levy recalled how surprised Council member Devlin was that the analysis did not show more batteries and wondered if it was because of the high cost of reference plant. Levy wondered if those costs would change for the new assessment.

Levy then asked about meeting the needed increase in reserves with batteries.

Ollis said they are trying to stick with the interpretation of the resource strategy for the Adequacy assessment. He said if they are not adequate it will bring up more questions. Ollis added that batteries are different in the NW because of the hydro system. Levy approved of the method.

Heutte noted Council metrics for counting resources and then pointed to several thousands of megawatts of new resources in NW IRPs, with active RFPs, and hoped that a "likely to be built" tier would be added [Slide 27]. Ollis took his point and offered to investigate as many proxy renewables are turning into real renewables.

Heutte thought [Slide 29] was an important topic to come back to, adding that the import limit is primary driven by weather conditions across the entire West.

Resource Adequacy Steering Advisory Committee

John Fazio, NWPCC

John Ollis, NWPCC

KC Golden, NWPCC

Rob Petty, BPA

Rob Petty, BPA, thanked the technical team for working on this complex issue. He then thanked Council staff for being so open and transparent as they revise the GENESYS model.

KC Golden, NWPCC, pointed to the rapidly evolving nature of this work, noting that Washington State passed another code change for electrification along with a national bill that may change

incentives. He was glad that work to deliver a more useable set of metrics was happening now and was intrigued to see more.

Golden asked about the broad-brush term of emergency measures [Slide 35]. He asked about the gray area between emergency measures and DR initiatives wondering if they are treated differently. Fazio stated that emergency measures are not simulated in the model and if they were to model DR operations, they would move out of the emergency measure list. Fazio said quantifying these measures would be difficult and require further discussion.

Heutte asked about the process timeline for the Council's new RA standard. Fazio said they would take stakeholder feedback for the new standard to the Council and get their approval to test. He said they would work to define binding limits for the adequacy metrics over the next six months after further model review and analysis. Fazio noted that it may take a while before the new standard is in its final form. For example, he added that the Council started using LOLP in 1999 but it wasn't formally adopted as the Council's standard until 2011.

Heutte asked what role the Advisory Committee would play. Fazio said the RAAC would provide feedback on material to be considered but does not "approve" or "vote" on the matter.

Heutte agreed with this approach as he felt the LOLP was no longer adequate as a stand-alone metric and a more multi-dimensional view of the system was more appropriate. He asked if this new, multi-metric approach would be something a non-energy expert could interpret and understand. Heutte also wondered how to compare this kind of RA assessment with other methods.

Fazio said his objective is to make the process as transparent as possible but admitted that the challenge is in setting adequacy metric limits. He then proposed two ways to compare Council findings to WRAP findings, 1) via a planning reserve margin (PRM) or 2) by extracting the relevant adequacy metric value from Council studies. The WRAP adequacy standard is based on limiting "event days" to no more than one per 10 years. The Council's adequacy standard can be compared directly to the WRAP's standard by extracting the number of event days per 10 years from a study that exactly meets the Council's new standard. With respect to the multi-metric nature of the new standard, Fazio thought that potentially one of the metrics may eventually reveal itself as the one that most often is binding. But he added that other metrics also provide very useful information and so they will also be calculated and recorded.

Heutte summarized his input, saying it is appropriate for the Council to green light testing. He also thought it important to do some user review at the RAAC and beyond saying ESIG and other entities have been working on this. Fazio added that this will be presented to the IEEE RA work group, the NERC probabilistic analysis working group, and other places in the country and around the world. Fazio noted that, to the best of his knowledge, this proposed hybrid approach is unique.

Golden said the Council will approve the use of the proposed adequacy metrics but allow time to fine tune the limits for those metrics.

Heutte raised concern over a future with more than one organized, day-ahead market in the west. He thought this would create a different, hard seam barrier to imports and exports across the NERC market boundary [Slide 45]. He wondered if a hard seam could reduce capability to provide imports into the NW.

Ollis thought GENESYS might have the functionality to explore this issue, admitting that it would require a fair amount of lead time.

Fazio stopped at [Slide 47] to explain that there are no numbers in the chart because of long model run time. He suggested a short future meeting to discuss findings.

Golden asked if people can give feedback about import limits in the future. Ollis said yes, cautioning that numbers should be received by Friday, Nov 11. Fazio noted that assumptions about import limits have been debated by the RAAC going back to 2001.

Golden agreed with getting rid of the scenarios in the blue boxes and was eager to have another meeting in a few weeks. Fazio laid out a timeline for the work.

Golden asked if the green scenarios are reference cases with no manipulating of dials. Ollis said yes, adding that these scenarios iterate on the Plan strategy. Golden confirmed that planned resources in the reference cases are 750 to 1000 aMW of EE and a minimum of 3500MW of renewables. Ollis said we could land anywhere with those numbers.

Fazio added that scenarios in the green boxes will not include the plan's minimum resource builds, but rather an appropriate interpretation of the Plan strategy that yields the needed resources for adequacy. He emphasized that the plan strategy is just that, a strategy and not a blueprint for resource builds. Ollis said this is an interpretive approach. Fazio said the system will not be adequate with existing resources, and he hopes it will be adequate when the plan resources are added. The final set of plan resources interpreted from the plan strategy will be used for all scenarios with the exception of the high load scenario. Golden understood the approach.

Golden thanked Fazio and Ollis for their good presentation and hoped committee members would continue to provide feedback. Petty agreed, saying the hour was a lot to absorb and was looking forward to seeing results at the next meeting.

Fazio ended the meeting at 4:05.

From the Go-to-Webinar question pane

Craig Patterson: How do you incorporate non-linear events like the heat dome or 100-degree temps in the artic?

Answer: We incorporate climate change informed temperatures and stream flows in the adequacy analysis which has a wide range of weather events including heat domes.

Attendees via Go-to-Webinar

Name	Organization	Name	Organization
John Fazio	NWPCC	John Ollis	NWPCC
Malcolm Ainspan	NRG	Brittany Andrus	WECC
Leann Bleakney	NWPCC	Juan Bedoya	PNNL
Pat Byrne	BPA	Russ Cazier	Utah
Rachel Clark	Tacoma Power	Robert Diffely	BPA
Curtis Diouhy	OR PUC	Ted Drennan	OR PUC
Angus Duncan	independent	Ryan Egerdahl	BPA
Fred Heutte	NW Energy Coalition	Massoud Jourabchi	NWPCC
Rebecca Klein	SCL	Scott Levy	Bluefish
Jennifer Light	NWPCC	Ian Mcgetrick	Idaho Power
Heather Nicholson	Orcas P&L	Joel Nightingale	WA UTC
Paul Nissley	SCL	Elizabeth Osborne	NWPCC
Aliza Seelig	PNUCC	Steven Simmons	NWPCC
David Williams	Utah	Joni Zenger	Utah
Brian Dekiep	NWPCC	Craig Patterson	independent
Ian Bledsoe	Clatskanie PUD	Frank Brown	BPA
Dan Catchpole	News Data	Yousu Chen	PNNL
Verene Martin	SCL	Dave Robertson	independent
Blake Scherer	Benton PUD	Landon Snyder	Snohomish PUD
Kathryn Walter	Avista	Rick Williams	PSU