

**Northwest Power and Conservation Council
Resource Adequacy Advisory (Steering) Committee
June 23, 2020**

Richard Devlin, NWPCC, began the meeting at 1:00pm by welcoming the group and introducing co-chair Rob Petty, BPA. Petty spoke about the importance of the RAAC and looked forward to working with the group.

Chad Madron, NWPCC, discussed details and features of the Go-to-Webinar platform. He attempted a role call but was thwarted by technical difficulties.

John Fazio, NWPCC, presented the meeting agenda and a short explanation of the RAAC's work before beginning the presentation.

Nicholas Garcia, WPUDA, said past work used modified historic flow data to account for changes in dam operating regimes [Slide: Concerns regarding the use of CC data.] Garcia pointed to fairly new spill regimes and wondered if and how they are being accounted for. Fazio said operating constraints are not part of the climate change data obtained from the RMJOC and emphasized that the flow data represents unregulated flows, without operating constraints. Fazio added that dam operations are separate inputs.

Fazio then said he will be asking the RAAC for their opinions on non-power constraints and operating guidelines to be used to assess the adequacy of any future year in question.

Phillip Popoff, Puget Sound Energy, voiced concern, via the Questions feature, over the lack of variability in temperature patterns between simulations. Popoff wrote that in earlier work, the hourly temperatures for simulations were the same as the simulations, explaining that there was no consideration of how hot or cold spells can occur during different periods. He felt that this should be examined by the Technical Committee before the Steering Committee forms an opinion.

Fazio said a wide variation of future temperatures will be covered, adding that he will present charts showing that past work would hit a particular day with 69 different potential temperatures while the climate change work will hit the same day with 30 different potential temperatures.

Fred Heutte, NW Energy Coalition, confirmed that the orange bar on [Slide 11] represents the combined envelope for all three climate models. Fazio answered yes, explaining that each month has 10 average modified flows for each of the three climate change scenarios equaling 30 different numbers while the historic record holds 80. Heutte summarized that this represents the range of the three models across 10 years at a given month or point and is not a distribution of frequency.

Jimmy Lindsay, PGE, said the historical data captures natural weather variability while the climate models are a fundamental forecast and do not attempt to capture this [Slide: Climate Change Trends in Flows.] He asked if we're assuming these three climate change models reflect the natural variability associated with weather. Fazio answered yes, absolutely.

Lindsay then asked if an individual climate model is intentionally trying to simulate natural variability or if an individual climate model represents a fundamental average forecast. Fazio said the RMJOC report would best answer that, summarizing that there were 19 different climate change scenarios that used different downscaling methods and staff chose three that best represent the full range of potential changes.

Dan Hua, NWPC, confirmed that the question is, "does the General Circulation Model represent weather?" before answering that it does. Hua said each model does it a bit differently but all represent the amount of atmospheric warming to expect by 2100.

Fazio added that the RMJOC did a bias correction to replicate historical conditions. Hua confirmed this.

Tomás Morrissey, PNUCC, asked, via the Questions feature, if any statistical test was conducted to determine significance. Fazio said no, moving to [Slide: Climate Change Trends Continue in the Future] to illustrate that there is no high end. Fazio asked for ideas on how to do that and Morrissey offered to speak more offline.

Garcia noted that some climate models indicate warmer winters with little summer change and asked if that possibility is represented here [Slide: Range of Variation in Temperature.] Fazio said yes, explaining how the Council looked at seasonality when narrowing down the 19 forecasts. Fazio added that the goal was to capture the smallest and biggest changes in temperature and precipitation for both winter and summer to ensure that the full range of future possibilities was captured. Fazio offered to show past work and discuss in further detail offline.

Aliza Seelig, Seattle City Light, pointed to two major policy issues the Steering Committee must contemplate [Slide: Concerns regarding the use of CC data.] She asked if LOLP will continue to be the selected metric for the 2021 Power Plan and how frequency, duration and magnitude will be considered. She then asked about how to think about risks beyond market risk.

Fazio addressed LOLP, saying the 5% LOLP has been the standard for a while, even as the Council and RAAC explore other metrics. Fazio said pursuing other metrics did not make sense until the GENESYS model was upgraded and fully vetted. He said once that work was done, staff will start exploring new metrics like a Loss of Load Event.

Rachel Clark, Tacoma Power, asked, via the Questions feature, if staff will be sharing the results of the analysis to check for bias. Fazio said absolutely, adding he will share everything when there are results to share.

Spencer Gray, NIPPC, asked, via the Questions feature, if the Council evaluated the analysis CAISO completed a few weeks ago on NWPP imports (south) into CAISO and if staff considered producing its own similar analysis of south-to-north flows [Slide: In-Region Market Supply.] Fazio wasn't sure but noted seeing their past work. John Ollis, NWPC, said he had not yet seen this analysis. Gray offered to send a copy.

Redeveloped GENESYS—Regional Import/Export Dynamics

John Ollis, NWPC

Kate von Reis Baron, PGE, asked, via the Questions feature, if the price blocks for external resources are based on external, "normal" conditions [Slide 2.] Ollis answered yes, to some extent adding that conditions can be changed, modified and re-defined as seen fit. Ollis then explained future graphs that will illustrate this.

Lindsay thought it important to encumber external price blocks with non-normal demand needs. He used a summer heat wave that affects the Northwest, California and the desert SW as example. Ollis called that a good point, noting that hourly demand is represented and limits could be placed on the supply side. Ollis called for data to represent those extreme conditions, especially for the desert SW.

Gray asked if the price blocks are tied to types of resources at the market nodes, or if they are a blend of all available resources at the nodes, via the Questions feature. Ollis said the blocks are built from regular resources but he could just dispatch every resource in the WECC instead.

Fazio addressed Lindsay's question, saying it would be great to analyze the out-of-region resources and loads stochastically but is held back by missing data and the amount of time the process would take. Ollis said the model is set up to do this but missing data is the key.

Garcia asked if the 3400MW on [Slide 3] represents the traditional metrics for transmission planning, i.e. N-1 or if it represents all availability. Fazio said it's the former based on adverse conditions and one line down.

Lindsay asked if the 11,400MW of physical transmission capability is based on a path rating or firm capacity. Ollis explained that it's a mix of art and science and explained the logic behind it.

Morrissey asked if the same weather pattern effects the entire WECC [Slide 8,] for example if the NW has 1950 temperatures does the rest of the WECC, especially BC, experience 1950 conditions. Ollis said no, this is perturbing regional loads without a look at the rest of the WECC. Ollis then explained ways he limited supply but not load. Morrissey confirmed that this doesn't pick up high demand in BC but uses a supply constraint. Ollis said BC has high demand on an expected basis but there isn't enough supply to get there. Ollis added that ideally all demands would line up.

Gray asked for a source around the 3400MW number. Fazio offered to send it.

Scott Levy, Bluefish, asked if the 3400MW Market Reliance would replace the current “2500MW Winter Market/OMW Summer Market” limit in GENESYS. Fazio answered no, the 3400MW is a transmission limit on either of those two.

David Tomlinson, Solar Horizon, asked about the transmission capacity resolution and if it is daily averages or ideally, hourly or multi-hour blocks, via the Questions feature. Ollis answered that multi-hour blocks or daily can be used. He said right now the transmission capacity is monthly but can go to a higher granularity.

Tomlinson pointed to peak, time-of-day issues, saying it would be valuable to look at critical points of higher load during the day. He asked if transmission can be looked at in three to four-hour blocks. Ollis asked if this is for supply or transmission constraint. Tomlinson answered that he’s interested in a transmission constraint forced on an hourly block. Ollis offered to follow up.

Fazio thanked the RAAC for their engagement, noting that the Technical Committee will meet in July to further explore these issues. Madron reiterated that a recording of today’s presentation is available on request. Fazio ended the meeting at 3:00pm.

Attendees via Go-to-Webinar

Rich Arneson	Tacoma Power
Tanya Barham	Community Energy Labs
Steve Bellcoff	BPA
Leann Bleakney	NWPCC
Jeff Blend	Montana
Frank Brown	BPA
Aaron Bush	PPC
Pat Byrne	BPA
Rachel Clark	Tacoma Power
Jordan Cumming	Fortis BC
Ben Fitch-Fleischmann	Northwestern
Villamor Gamponia	Seattle City Light
Nicolas Garcia	WPUDA
Wendy Gerlitz	NW Energy Coalition
Spencer Gray	NIPPC
Tom Haymaker	Clark PUD
Fred Heutte	NW Energy Coalition
Nancy Kelly	Western Resources
Scott Levy	Bluefish
Jimmy Lindsay	PGE
Shirley Lindstrom	NWPCC
Douglas Logan	
Shauna McReynolds	PNUCC
Tomás Morrissey	PNUCC

Elizabeth Osborne	NWPCC
Phillip Popoff	Puget Sound Energy
Selisa Rollins	BPA
Sashwat Roy	Renewable NW
Paul Schulz	Montana
David Tomlinson	Solar Horizon
Ben Ulrich	EWEB
Cindy Wright	Seattle City Light
James Yost	NWPCC
Joni Zenger	Utah
Will Price	EWEB
Aliza Seelig	Seattle City Light
Kate von Reis Baron	PGE
Mike Dalton	Montana
Barclay Gibbs	
Steve Johnson	WA UTC
Dan Hua	NWPCC
John Ollis	NWPCC