

**Northwest Power and Conservation Council
Systems Analysis Advisory Committee
June 2, 2020**

John Ollis, NWPCC, began the meeting at 9:30 by reviewing the day's agenda and pointing to the link to the minutes for the May 6 meeting. He then called for introductions.

Modeling Climate Scenario Wind Generation

Dan Hua, NWPCC

Fred Heutte, NW Energy Coalition, noted via chat, that the values on [Slide 14] are pretty consistent with the 2018 LBNL Wind Technologies Market Report. Ben Fitch-Fleischmann, Northwestern Energy, asked if these values account for cold temperature cut outs, when temperatures are so low that output is reduced or blades must be feathered, via chat. Dan Hua, NWPCC, replied no, as no temperatures have been entered. Hua added that he will try that next time. Fitch-Fleischmann thanked him, noting that it's a big concern for Montana wind, given the correlation between low temperatures and peak loads.

Tomás Morrissey, PNUCC, asked if wind generation will continue to be linked to temperature in Council models, via chat [Slide 18.] Ollis answered that wind generation will be linked to load and not temperature, meaning that load, wind and hydro will be aligned. Ollis added that technically, temperature, precipitation and wind data will all be linked. Morrissey thanked Ollis for his response.

Heutte noted an extended discussion of turbine degradation in the 2018 LBNL study [Slide 29] via chat, that finds steady performance until a decline in year ten, possibly because of the cessation of PTCs and a reduction in O&M. He thought the maturation of wind technology may mitigate that in the future and the Council should be aware. Ollis said holding the existing fleet at a ten-year degradation level is not perfect but is the best way to fit the model right now.

Hua added that the time it takes to maintain a turbine is included in the degradation rate.

Nora Xu, PGE, noted that the NREL 2007-2012 plots use historical wind speed while the generation capacity factor is from SAM. She asked if that SAM data is historical. Hua stated that it is, as SAM uses historical wind speed data. Ollis further explained that this is not specific historic data at a specific site but a proxy plant.

Heutte asked if there was any exploration of interannual variability [Slide 35.] Hua answered that he plotted the NREL data from 2007-12 and didn't see much variability [Slide 13-14.] Hua then said he didn't look at monthly data. Heutte thought there would be more variability on a seasonal basis. Hua offered to dig deeper. Ollis noted that there is a fair amount of seasonal variances being captured but right now, on the fuel side, hydro risk is more dominant.

Existing Policies – WECC-wide Clean Energy Targets

Gillian Charles, NWPCC

Morrissey said the concept on [Slide 11] made sense but thought a big portion of the 29% of remaining load was already being served by a carbon-free resource. He asked if and how that would be taken into account. Charles said that right now she is pulling all of the clean energy targets together and not the energy mix. She said aggregating these targets show that they can be met on a regional basis but including starting points skews the targets.

Ollis agreed, adding that this is about what resources can provide RPS and clean attributes, what regional requirement will be reflected in the RPM and what the requirement will be in the whole WECC. Ollis thought this would be a good spot for the SAAC to weigh in on ramp rates.

Morrissey thought modeling the remaining 29% will require nuance. Charles reminded him that these are not the only drivers of resource build out.

Tanya Barham, Community Energy Labs, asked if staff considered incremental targets when calculating the amounts on [Slide 12.] Charles said the existing system is already represented in the model and tagged to meet RPS targets. Charles continued, saying this analysis does not capture local rules, details and nuances because they are too many and too unique but aggregates goals into a regional. WECC-wide target.

Ollis added that many of these rules are not binding and this will be discussed later in the presentation. Heutte sought to discuss 2030 and beyond in Washington State. Heutte said there will be multiple ways to comply and suggested talking to both the WA UTC, Dept of Commerce and thinking deeply about this.

Charles thanked him, noting that rule-making is ongoing and Elizabeth Osborn, NWPC, is following intricacies closely. Charles concluded that once rule-making gets closer to done she will set up discussions with the UTC and other appropriate entities.

Heutte mused that most of the remaining load on [Slide 14] will be public power and wondered if the model will distinguish between investor-owned and public power when checking if a given state is meeting a clean target. Ollis said these policies will be treated as aggregate regional in the RPM and aggregate WECC in AURORA and explained his reasoning.

Heutte asked if load-weighted averages will be used in the RPM. Ollis said yes, pointing to enhancements in the RPM.

Fitch-Fleischmann noted that Missoula City is unclear about its targets [Slide 16] and felt that this was a lot of analytical gymnastics for a small amount of MWs. He thought there might be a simpler, clearer way to approach this issue. Charles countered that this doesn't always mean physical compliance and Missoula is not unique in their position. Ollis added that this is an attempt to apply a consistent method across the region.

Fitch-Fleischmann understood. He then said that assumptions about Northwestern Energy create a lot of noise and suggested a future discussion about including all of Northwestern's

territory and excluding all of Montana-Dakota Utilities. **“Sold!” exclaimed Charles “No takebacks!”** Ollis welcomed the comment and asked for more stakeholder ideas on how to simplify the work. Fitch-Fleischmann suggested connecting offline. Tom Kaiserski, State of Montana Dept of Commerce, cautioned that the BPA footprint extends 75 miles east of the continental divide and includes the cities of Helena and Bozeman. Charles agreed, noting both cities have clean energy targets but was unsure if they were in the BPA footprint. She suggested Kaiserski join the offline discussion.

Heutte offered to check in with Northwest Energy Coalition’s Montana staff and suggested checking in with BPA. He then voiced appreciation of Council staff’s consistency and thoroughness, calling the work an authoritative catalog for the region.

Heutte noted that WECC looked at policies from non-Northwest states and asked if Charles explored that work [Slide 18.] Charles noted that the author of that study, Tom Carr, WEIB, recently presented to the Council and she will reach out to him.

Heutte stated that 23 local governments have adopted 100% clean energy policies in Utah and offered to share information [Slide 24.] Charles said she has some information and welcomed more. Heutte noted that Rocky Mountain Power and PacifiCorp are working with these local governments and the information is folded into the PAC IRP.

Emerging Tech Reference Plant **Gillian Charles, NWPCC**

LUNCH

Proposed Setup for External Electricity Price Forecast Scenarios in AURORA **John Ollis, NWPCC**

Heutte noted that Tom Carr’s study looked at a more-flexible and less-flexible overall scenario that bundled transmission constraints, market availability and development along with policy [Slide 5.] He said this combo approach resembles the Path to Decarbonization scenario, asking Ollis to discuss further. Ollis said he is aware of the WEIB scenario and have collaborated with WEIB on some of the data and set ups already. Ollis then explained his reasoning around the expanded usage of AURORA to better understand flexibility requirements.

Heutte thought this approach made sense, adding that he’s not advocating a replication of this study but thought it was a good way to get at policy affects, particularly after 2030. Ollis agreed that the study was valuable and this Plan’s scenarios are more focused on policy than model runs. Ollis thought there was a place for a more formalized set of questions and offered to dig deeper with Heutte offline.

Scott Levy, Bluefish, asked if carbon sequestration, particularly from the removal of dams, will be included in emission numbers [Slide 11.] Ollis said they need data to look at this and there

are questions around a variable or budget number. Ollis thought this information could go into AURORA but might be more efficiently done after the fact, while different resource options might be better explored in the RPM.

Levy said the CRSO draft has an objective of minimizing CO₂-equivalent emissions from the NW power grid but its limited scope doesn't allow a look at carbon sequestration benefits of a recovered salmon population in Idaho. Levy offered to send his calculations for review. Ollis thanked him and thought the Pathways to Decarbonization scenario might be a good place to consider this information.

Rob Diffely, BPA, asked if there is any limit to solar in California or if it's just wind [Slide 16] via chat. Ollis said he has no limits on solar aside what is already in AURORA's default. Heutte agreed that there is no real limit on CA solar but wind is heavily constrained. Heutte then said offshore wind could be very important in the future and suggested further discussion. Ollis thought offshore wind might be best addressed in the narrative in the 2021 Plan.

Heutte agreed that the good northern California/southern Oregon offshore wind source is far from transmission and will take a while to build out but then pointed to Imperial Valley geothermal. Ollis agreed, saying AURORA showed a geothermal build in California. Heutte then noted a strong increase in hybrids in the state. Ollis again agreed, saying he will show some results about this later in the presentation.

Barham noted via chat that even though there is no prohibition against it a gas plant in Oxnard, CA was recently shut [Slide 18.] Brian Neff, CEC, also stated via chat that there are no new gas plants actively being sited by the CEC at this time. Ollis suggested modeling this in the same way as the most recent wholesale electricity price forecast, countering that Alberta, Canada builds a lot of gas if we don't limit it.

Morrissey noted that the slide shows 6000MW of gas coming on line in the first three years, asking if these are units that were already coming on line or if they are units AURORA decided to build. Ollis answered that they are units AURORA is building with the caveat that he is not counting coal to gas conversions and other things in the queue. Morrissey asked if AURORA builds them right away or if there will be a lag. Ollis said they have a first available date of 2020, so it's tricky in the beginning.

Barham voiced confusion over the single-Axis Solar growth on [Slide 20.] Ollis said the big story on limiting gas is the region builds more of everything else except for solar. Ollis said the reason why Single-Axis Solar looks different is because wind took its place.

Xu asked via chat if the described limitations on build used in all the scenarios referenced earlier. She also asked if additional scenarios have additional limitations. Ollis said for the most part it's for the baseline and other scenarios but it could be really ramped up in the Pathways to Deep Decarbonization scenario.

Xu then asked if there is a static peak contribution when looking at capacity expansion. Ollis said staff used a dynamic peak credit with some tuning for better results.

Heutte added that Oregon, Washington and California can build but it's very unlikely. He noted that states with a lot of coal could see some replacement but there are clean options there as well. Heutte applauded this approach, saying it's on the right track but cautioned that as of yet there are no legal restrictions against building new gas on the west coast. Ollis asked the SAAC to email more comments and suggestions to him.

Fitch-Fleischmann asked if there were limitations put on Montana gas builds [Slide 19.] Ollis answered yes, they had to be built before 2026 to recoup capital costs.

Kathi Scanlan, WA UTC, asked via chat if the second bullet on [Slide Climate Change Data in AURORA] are medium loads net EE and inclusive of line loss. Ollis answered that line losses are accounted for explicitly in AURORA and are net of existing EE but future EE is not built out in AURORA.

Parameters Updates in AURORA for Different Scenarios

John Ollis, NWPCC

Xu asked via chat if carbon prices in Oregon or Washington was assumed in the future [Slide AURORA Modeling Strategy (Scenarios Part 2.)] Ollis said no, it was backed out of AURORA's default.

RPM Futures Methodology (Part 2)

John Ollis, NWPCC

Parameters for Weather-Normalized Loads

Dan Hua, NWPCC

Morrissey asked to see more results and a load review in future meetings [Slide 44.] Ollis answered yes, pointing to past discussion around the load forecast and new learnings that need internal discussion before presentation. Ollis said it will be covered in the next SAAC meeting.

Ollis thanked the group before ending the meeting at 3:40.

Attendees via Webinar

Adam Schultz	ODOE
Alyssa Tavares	independent
Barbara Miller	Army Corp of Engineers
Ben Fitch-Fleischmann	Northwestern Energy
Bryan Neff	CEC
Christopher Allen	Cowlitz PUD
Dan Hua	NWPCC
Elizabeth Osborne	NWPCC

Frank Brown	BPA
Fred Heutte	NW Energy Coalition
Garrison Marr	Snohomish PUD
Gillian Charles	NWPCC
Eric Graessley	BPA
Greg Cullen	Energy Northwest
Hazel Aragon	CEC
Ian Bledsoe	Clatskanie PUD
Jim Litchfield	independent
John Lyons	Avista
John Ollis	NWPCC
Kathi Scanlan	WA UTC
Larry Becker	Northwest Power Consulting?
Mark Gendron	Idaho Falls Power?
Massoud Jourabchi	NWPCC
Ian McGetrick	Idaho Power
Mike Hoffman	PNNL
Nora Xu	PGE
Paul Nissley	Seattle City Light
Rebecca Smith	ODOE
Rob Diffely	BPA
Sanjaya De Zoysa	BC Hydro
Scott Levy	Bluefish
Selisa Rollins	BPA
Shauna McReynolds	PNUCC
Shirley Lindstrom	NWPCC
Steve Johnson	WA UTC
Tanya Barham	Community Energy Labs
Tom Kaiserski	Montana
Tomás Morrissey	PNUCC
Tyler Tobin	PSE
Villamor Gamponia	SCL
Brian Dekiep	NWPCC
Zhi Chen	PSE