Northwest Power & Conservation Council
Generating Resources Advisory Committee
March 26, 2024

Annika Roberts, NWPCC, opened the meeting at 9:30am. She welcomed GRAC members and discussed the best way to interact with the Go-to-Webinar interface. She then called for introductions.

Reference Plant Updates for the Annual Adequacy Assessment: Renewables & Storage Focus

Fred Heutte, NW Energy Coalition, asked about the timeline for the costs outlined on [Slide 18] adding there are different costs for the IRP, execution, and when the resources is generating. Roberts answered that she thinks these are at contract execution, which includes a two-year development period, but offered to double check.

Mark Gendron, UAMPS, wondered why costs are represented in 2016 dollars. Roberts answered that it because the 2021 Power Plan, and all of its modeling, is in 2016 dollars. She expected the next Plan will have updated dollars.

Chase Morgan, IF Power, asked if downward cost projections on the forward cost curve are still being observed. Roberts answered that the forward cost curve numbers are based on ENRAL's moderate forecast. She said that might change for the Ninth Plan.

Rick Williams, PSU, asked if there could be a sensitivity comparing competing solar designs [Slide 41]. Dylan D'Souza, NWPCC, answered yes, pointing to additional studies. He added that many of those designs look similar to pump storage, and this is trying to capture long, muti-day storage.

Eric Graessley, BPA, asked if the 300 MW cap on 100-hr storage is per year over the planning horizon or if 300 is the max cumulative build, in the chat. D'Souza answered that that is per year.

Gendron called adding the long-duration storage exciting and he was pleased to see the technology approaching commercial availability. He again addressed using 2016 dollars, saying staff should highlight that the table on [Slide 42] is in 2023 dollars. D'Souza apologized, saying the figures are actually in 2016 dollars.

Kevin Smit, NWPCC, asked that people working on IRPs share their data so staff can double check work. Alexandrea Karpoff, PSE, wrote that Puget Sound's numbers look pretty similar.

Karpoff wrote: Regarding ITCs/PTCs - Bob Williams is our financial expert on the IRP team, and says we will be modeling these like this:

PTCs are applied to production of renewable output. ITCs are applied to storage at 30% as tax benefit to investment. Feel free to reach out to either of us (robert.williams@pse.com) if you're interested in further details, in the chat [Slide 45].

Graessley wrote: we're planning on giving representative resources base credits, PTC for solar and wind. ITC for all other resources. this was based off numerous studies, in the chat.

Ben Ulrich, EWEB, asked if Geothermal will be included as a reference plant, in the chat. Roberts said it was a reference plant in the 2021 Plan and will be again, but no updates are planned because there is not a lot of building going on. She said this might change as they get closer to the Ninth Plan.

Smit asked that feedback on how tax credits are being treated be sent along.

BREAK

Preparing for the Council's Ninth Plan
Williams appreciated the timeline discussed and suggested considering the Columbia River Treaty as a separate scenario [Slide 8]. He noted that flood risk management is changing and wondered what that would do to hydro costs and flexibility. Williams wondered how this super scenario would be analyzed.

Jennifer Light, NWPCC, said she has heard this concern before, and staff plan to reflect hydro operations as best they can. She said scoping out the range before modeling would be helpful and called for written ideas on how to best leverage the idea.

GRAC Preparation for the 9th Plan
Williams called the work on [Slide 9] a wonderful initiative. He proposed looking at the effects of anti-islanding code on the solar reference plant during scenarios that are not business as usual. Williams also suggested looking at the benefits of hybrid plants as these plants can reverse the effects of inverter instability.

Smit asked if anyone is including these projects in their IRPs. Karpoff said PSE is and are also trying to figure out the optimal storage to generation capacity ratio. She said they are looking at 50% or less which is in line with the presentation.

Robert Del Mar, Oregon DOE, called the information on [Slide 11] very useful. He asked about the efficiency for the electrolyzer and the round-trip efficiency on the turbine. He wondered if the total overall system efficiency considered both of these factors and if they came to 32% or if the 50% includes generating the hydrogen and then sending it back to the turbine to create the electricity.

D'Souza confirmed that the general system efficiency was right but planned to calculate them both separately. He asked if the recommendation is to do them together. Del Mar answered no, saying he was asking a clarifying question. He confirmed that the overall grid power back to grid power is closer to 33% round trip efficiency. D'Souza answered yes.

Del Mar asked if hydrogen has long-term or seasonal storage attributes. D'Souza said that is a question staff is looking at and asked the GRAC for input.

Karpoff asked if the slide illustrates running 100% hydrogen in the turbines. D'Souza stated that the numbers are based on M25 which is the 574MW turbine that runs 100% hydrogen and not mixes.

Karpoff then asked where the information about ammonia-burning turbines came from. D'Souza answered that ammonia is a mixed fuel that is used in Japan. He said there are fewer firm details, but Mitsubishi and GE are planning on building turbines for the fuel.

Smit asked if there is a variable O&M cost for the electrolyzer. D'Souza answered yes adding that there is not a lot of data available yet.

Smit added that there are plans to expand the ability to analyze behind the meter resources [Slide 12]. He said they are looking at residential, commercial, and industrial rooftop solar as resources and asked for input on methods.

Williams called reliability an important factor and constraint when considering emerging technologies [Slide 13]. He suggested considering resilient scenarios where the infrastructure is disrupted and distributed renewable resources could help with community survivability. Williams also suggested exploring the DOE's PacWave facility at the University of Oregon and Orcas Island's look at tidal energy. Because of these different project he suggested changing the name of Wave Energy to Marine Renewable Energy to encompass all the work. He also talked about fuel cells as a DER.

Roberts ended the meeting at 11:30.

Attendees in person and via Go-to-Webinar

Annika Roberts	NWPCC	Rob Del Mar	Oregon DOE
Dylan D'Souza	NWPCC	Rob Diffely	BPA
Kevin Smit	NWPCC	Sean Ford	Portland PPC
Tomás Morrissey	NWPCC	Mark Gendron	UAMPS
Jennifer Light	NWPCC	Eric Graessley	BPA
Rick Williams	PSU	Nora Hawkins	WA Dept of Commerce
Michael Boyles	BPA	Fred Heutte	NW Energy Coalition
Frank Brown	BPA	Dor Hirsh Bar Gai	NWPCC
Laura Burford	BPA	Peter Jensen	NWPCC
Katie Chamberlain	Renewables NW	Alexandra Karpoff	Puget Sound Energy
Nathan Critchfield	Puget Sound Energy	Mary Kulas	independent

John Lyons	Avista Corp
Ian McGetrick	Idaho Power
Chase Morgan	IF Power
Bryan Neff	CEC
Kaitryn Olson	Puget Sound Energy
Elizabeth Osborne	NWPCC
Aliza Seelig	PNUCC
Andrea Talty	PSE
Tyler Tobin	PSE
Terry Toland	Clark PUD
Ben Ulrich	EWEB
Craig Patterson	independent
Stephanie Price	PSE
Kristin Raja	independent
Landon Snyder	Snohomish PUD
Brian Dombeck	BPA