Northwest Power and Conservation Council
Resource Adequacy Advisory Committee-- Technical
February 27, 2019

John Fazio, NWPCC, opened the meeting at 10:00 with introductions and a review of the agenda.

2024 Pacific Northwest Resource Adequacy Assessment Resource Updates
John Fazio, NWPCC

Tomás Morrissey, PNUCC, noted that the base case sustained peaking curves seem higher than the flex case in March on [Slide 4] and asked if it's an artifact. Fazio thought it might be a typo and said he would look into it.

[After reviewing the data, Fazio found that the base case had no bypass spill in March whereas the Flex spill case did, thus the lower sustained peaking curves in March. For other months, the peak period spill (at least through spring) is generally lower that the required spill in the base case, which leads to generally higher sustained peaking curves for those periods.]

Rob Diffely, BPA presented [Slide 12.] Dave Tomlinson, UniEnergy Technologies, asked why 10-hour batteries were not explored, noting new technology that allow 8-10-hour dispatch. Fazio stated that he didn't model any batteries because of lack of information regarding existing or planned batteries for the PNW. He stated that the Resource Adequacy standard for modeling generation is either that the resources are existing or are sited and licensed. He said he could model 10-hour batteries if there were information and if the resource was expected to be online by 2024.

The duration for dispatch of demand response measures, Diffely said that generally programs operate over a two to six-hour window, so he took a middle approach of four hours. He stated that he was open to changing that if there was more information. Tomlinson offered to share more information.

Morrissey was unsure if the newly proposed PGE battery should be included. He described it as a 30 MW, 4-hour battery that is part of the Wheatridge Renewable Energy Facility. Tomlinson noted that Wheatridge's wind and solar are not included on the slide.

Fazio then displayed a couple of spreadsheets with data on individual generating resources, including thermal, wind solar and small hydro. Fazio said that the small hydro in the spreadsheets represents very small hydro that is not a part of the hydro logic in GENESYS. Fazio said there were three levels of hydro plants, major hydro plants whose operation is simulated explicitly, independent hydro plants whose aggregate monthly generation is fed into the model and finally the small hydro plants not modeled in the GENESYS hydro logic. Diffely agreed that there are three levels of hydro [Spreadsheet.]

Load Forecast

Phillip Popoff, PSE, asked if the intention is to use the hourly regression back to the 1920s [Comparison of Hourly Loads.] Fazio reiterated some of the discussion from past RAAC meetings on this subject. Popoff noted that cutting off the first 20 years of historic temperatures could make the regional need go up because those early 20 years were mild. Fazio said he will post the load data files for comparison and feedback.

Fazio added that a similar argument could be made about stream flow records. He said that when the water record was 70 historic years, the critical year was one in seventy. Now with 80 water years, the critical period is one in eighty. Fazio asked whether we really believe that the likelihood of a critical hydro year changed because we added 10 more years of data. He said probably not but for the time being we give each historic water condition the same likelihood of occurring.

[Fazio looked into the question of whether using a shorter temperature range would affect adequacy. He found that when he ran an 89-year study vs a 69-year study the LOLP changed from about 10 percent to about 12 percent. This supports Phillip's concern that cutting off some of the historic temperature years would affect the results. However, Fazio also discovered in an offline conversation with Massoud Jourabchi, that if we choose to use a shorter historic temperature period, the "normal" temperature must be reassessed prior to running the load forecast model. Thus, Fazio's 69-year study was flawed in that sense and it is yet undetermined how using a shorter record might affect the adequacy assessment.]

James Gall, Avista, noted the shorter record length for hourly regression loads and asked if looking at daily highs and lows from 1929-1948 could be used to create simulated hourly temperatures for that period. Fazio answered no and was not sure whether that type of work could be done. Fazio asked if AVISTA has done any of that work. Gall answered yes, noting that summer is pretty easy while winter is more challenging. Fazio wasn't sure if there is much to be gained by doing that but said he would bring it up for further discussion, if appropriate, at a later date.

Morrissey asked about the seasonal LOLP split [Slide 8] Fazio said he will put a monthly metrics spreadsheet in the uploaded data folder but that overall, the region is still mostly a winter peaking system, with more winter resource need than summer resource need.

Recommendations

Tyler Llewellyn, BPA, asked for the data source for the EE budget. Fazio said he would find out and post it with other RAAC meeting material.

Discussion of Recent COI Trends
Tomás Morrissey, PNUCC

Llewellyn asked if [Slide 3] represents the COI and PDCI combined. Morrissey answered yes.

Llewellyn emphasized the comment on the bottom of [Slide 5] that says that there are BPA loads and resources not included and the data are for the BPA BA.

Tomlinson confirmed that the events on [Slide 3] are atypical. Morrissey answered that the shape is still seen when solar comes up and moved to [Slide 6] to illustrate. Howarth asked how the 3000MW of imports compare to other times when there are imports. Morrissey said this is pretty close to the deepest he's seen, even going back to 2009, but was not sure about the 2001 power crisis. Howarth asked about the spring when there is runoff. Morrissey answered that the NW typically exports in the spring but in recent years there is a strong solar shape in CA [Slide 3.] Howarth asked if they stay positive during cold weather events. Morrissey answered that it typically stays positive but as more solar is developing in CA it dips lower and lower.

Fazio referenced information sent by Fred Heutte, NW Energy Coalition, that addresses this topic.

Scot Levy, Bluefish, suggested getting a better handle on imports from CA, calling the data dated. He noted that the CRSO process is neither transparent or final, but pointed to the good likelihood of the retirement of the Lower Snake River dams.

LUNCH

Fazio explained that the apparent discrepancy in the sustained peaking curves that Morrisey found earlier in the day was not so because the base case had no spill in March. Llewellyn suggested checking the Council spill data against the language in the spill agreement, which is available on the BPA website. Fazio said that all spill data used in these analyses came from BPA but would like the opportunity to review that data with respect to the language in the spill agreement. Pat Byrne, BPA, suggested that she, Fazio and Llewellyn talk about this further offline.

Resource Adequacy Study in the Northwest under Climate Change in the 2030s
Dan Hua, NWPCC
Morrissey asked if there is an increase or decrease in extreme temperature events [Slide 16.] Hua said that that information will be covered in upcoming slides.

Morrissey asked if the same adjustment was made to every year in the 88-year record and if it was necessary to add more climate effect to the earlier years [Slide 31.] Hua answered that weather pattern is assumed to be independent of climate, so every year gets the same addition of the [$\triangle$T] cc.

Tomlinson confirmed that the results on [Slide 33] were due to winter heating and summer cooling. Hua agreed.

Conclusion

Morrissey asked if the Council is going to re-run its climate change studies to see how different load expectations and DR effect results. Fazio answered yes and no, explaining that the current work is based on a resampling method that uses past water conditions to mimic the effect of climate change. He said this method is only an approximation and can only be used for 2 of the 10 climate scenarios. He said that he is expecting the modified flow data (along with appropriate rule curves) for all 10 scenarios by fall of 2019 (from the RMJOC). He said that data will be used for future climate change studies and for analysis to be used in developing the next power plan.

Fazio said the next Power Plan will include some form of climate change future in its base case. However, how that will be done is still under discussion. Of course, he added that one of the many alternative scenarios to be studies will also likely be a no-climate change case.

Briefing on the Redeveloped GENESYS Model
John Ollis, NWPCC
Dan Hua, NWPCC

Ollis opened the model to preview.

Morrissey asked if the supply blocks are linked to resource characteristics. Ollis answered no, but linked to a particular shape and available capacity. Ollis added that an hourly shape can be added on.

Morrissey asked how out of region load is represented. Ollis answered that each buss has an hourly associated load with sub-hourly reserves.

Garret LaBove, PSE, asked about constraints and how to apply custom constraints. Ollis suggested taking the conversation offline as it's heading into the weeds but said the model is better with soft constraints.

Fazio pointed to four different files of hydro constraints in HYDSIM with two pages of a hard, semi-hard and soft constraints that are not yet built into the new GENESYS. He wasn't sure every constraint could, or should, be included and explained his work around. Ollis reminded the room that this model is still in development and the goal is to not loose functionality.

Llewellyn asked if there is a set of monthly/weekly constraints and another set of hourly or one overarching set of constraints. Ollis said GENESYS was set to weekly to better match HYDSIM adding that the constraint must match the fidelity of the implemented stage. Fazio said that the intent is to put in something like bypass spill by hour of day and more constraints will be included. Ollis confirmed that the model's fidelity of constraints goes down to the hourly level.

Morrissey asked how long it will take the model to crank through 7000 simulations. Ollis did not know for sure but said the cloud allows to run the model quickly—for a price. Fazio added that it can be run locally for testing purposes.

Fazio asked if there's a way to look at the output of a particular hydro project. Ollis pointed to a temporary problem with the graphic interface but looked at Grand Coulee Dam overlaid by McNary and Big Eight.

Fazio confirmed that there will be a dynamic allocation of balancing reserves, hour-, day- and week-ahead unit commitments and forecast error on load and renewable resources. Ollis confirmed.

LaBove asked if the Resource Adequacy plan is to include output from both GENESYS models this time. Fazio said yes, adding that this is why the report is expected in September.

Howarth noted the move towards more realistic import limits and asked if that information will only be imported into the new model or both. Fazio said the hope is the new GENESYS will give insights into what to assume for the classic model adding that AURORA and other sources will be used as well. He anticipated running both models for a couple of years until there is full confidence in the new version.

Fazio ended the meeting at 3:15.

Attendees

Dan Hua	NWPCC
John Ollis	NWPCC
Selisa Rollins	BPA
Dave Tomlinson	UniEnergy Technologies
Pat Byrne	BPA
Tyler Llewellyn	BPA
Tomás Morrissey	PNUCC

Attendees via Webinar

Aaron Bush	Public Power Council
Adam Schultz	Oregon DOE
Andrea G	NWPCC
Brandon Charles	MRW & Associates
David Howarth	MRW & Associates
Elizabeth Osborne	NWPCC
Frank Brown	BPA
Glenn Blackmon	WA Dept of Commerce
James Gall	Avista
John Fazio	NWPCC
Garrison Marr	Snohomish PUD

Garret LaBove	PSE
Phillip Popoff	PSE
Rob Diffely	BPA
Scot Levy	Bluefish
Steve Knudsen	Energy Consultant
Villamor Gamponia	SCL
Will Price	EWEB