

**Northwest Power and Conservation Council
Conservation Resources Advisory Committee
January 26, 2021**

Kevin Smit, NWPCC, began the meeting at 9:00am. Chad Madron, NWPCC, explained Go-to-Webinar best practices.

Jim Lazar, independent, voiced strong concerns about the Go-to-Webinar platform, saying it demotes Advisory Council members from equal partners to spectators who can only speak when recognized. He called this offensive, saying the platform diminishes the value of what he is willing to bring to the process.

Lazar said he will ask the Council to go back to the Go-to-Meeting format as the features of the Go-to-Webinar format are not acceptable to him as a member. Smit thanked him for his comment.

Smit then called for introductions and asked member to review the minutes from December 2020. He reviewed the agenda, pointed to future, monthly CRAC meetings and the upcoming Systems Integration Forum on February 19.

Update on Plan Process and Scenarios

Smit delivered an overview of progress on the Plan Process and Scenarios, noting that Conservation Resource work should be completed by May, with a draft plan tentatively planned for July 2021 and a final plan in October 2021.

Lazar was troubled by seeing “Organized Markets for Energy and Capacity” on [Slide 3.] He referenced an on-going debate on the value of capacity markets, asking if there has been any decision on this topic. Tina Jayaweera, NWPCC, reported that the goal is not to determine if capacity markets were good or bad, but to see how they could change resource strategy. She explained that this was a way to explore the interdependency between the region and the greater WECC.

Lazar stated that California and Texas have an energy-only market and the east has capacity-only markets. He referenced multiple papers that explore their desirability versus their function as a tool in supporting fossil fuel generation. Lazar admitted that this was beyond the scope of the CRAC but was still troubled. Jayaweera stressed that this is just a necessary exploration of their impact.

Madron noted that possible scenarios were discussed in the March 2020 SIF and directed interested parties to a presentation link.

Jeff Harris, NEEA, projected that western market assumptions and energy grid build-out will have a huge impact on the EE build. He asked for help understanding these a priori assumptions, noting that their significant impact on EE. Smit agreed.

Value of Energy Efficiency in the 2021 Plan World

Tina Jayaweera, NWPCC

Jayaweera presented early and draft findings from the baseline conditions, which shows lots of renewables being built, some gas and relatively little, about 500aMW, energy efficiency. Jayaweera walked through the drivers for this, noting early adequacy need and changes in the system since the 7th plan leading to more competition for EE. Jayaweera stressed that baseline conditions are not the Plan. Lastly, Jayaweera walked through the robustness of EE scenario and the various tests of the scenario, providing very early preliminary results out of the scenario.

Craig Patterson, independent, asked why [Slide 2] reflects renewables, and not conservation, as the priority. Jayaweera assured him that will be covered in her presentation. She previewed that conservation is considered a priority as it is given the 10% Act credit but the model is balancing many parameters. Patterson asked if renewables are now cheaper than conservation. Jayaweera said this will be covered.

Harris asked about the different net levelized costs on the X axis on [Slide 5.] Jayaweera said this is how the supply curve was developed, with the Seventh Plan in 2012 dollars and the 2021 Plan in 2016 dollars. She said she could change it but the story would be the same.

Lazar noted that the generating resources on [Slide 7] are central station resources while EE is delivered on the distribution level. He asked if these costs are not comparable for that reason or if the generating resources have something else factored in to make them locationally equal. Jayaweera said the EE is at generator, so it gets the bonus of not having line losses.

Lazar asked about the cost of transmission. Jayaweera said the Seventh Plan included additional T&D costs. Harris said past charts like this were normalized at busbar costs.

Harris wondered how much of the difference on [Slide 10] is from incorporating lighting into the baseline, versus the changes in cost effectiveness for other measures. As example, he asked if ductless heat pumps are more expensive in the 2021 Plan as compared to the Seventh. Lazar piggybacked on the question, asking about building shell improvements that are now incorporated into code.

Jayaweera thought that code was less of a driver but assumed building shell improvements in existing homes are incorporated. She said she didn't have numbers parsed out but offered to look, adding that she thought it was a combination of lighting, updated RTF work, codes and standards and program accomplishments.

Harris was not looking for an answer today, but said it would be helpful to understand the big pieces that drive the change on the graph. Jayaweera agreed, saying new measures are added in every Plan and on the residential side they were quite expensive, as opposed to an inexpensive light bulb.

Deborah Reynolds, WA UTC, asked about weatherization in existing buildings, wondering if code played a role in the change. Jayaweera answered that code does not impact existing buildings unless a commercial building triggers it with a major retrofit. Reynolds asked if that is captured in the potential. Jayaweera answered yes, noting that the RBSA helps look at how existing stock has changed.

Patterson asked for a re-evaluation of weak links and skewed analysis in the conservation effort. He acknowledged great strides in lighting but noted that lighting only accounts for 2-3% of an energy bill while windows are more effective at saving. He recognized that replacing windows can be costly and might only give a small benefit. Patterson argued that insulated shutters can give better results at lower cost, but, "we can't go there because of the idiot factor."

Jayaweera answered that utilities have looked at low-e storm windows which are less expensive, easy to install and working well in manufactured homes. She thought a program person could better respond to this question adding that her

work is to identify cost-effective measures and urge acquiring all of their potential. Jayaweera concluded by saying lighting has been an easy, inexpensive measure that has made a significant difference in the region's energy load.

Nicolas Garcia, WPUDA, agreed with everything on [Slide 12] but said market prices become more variable over time with very high and very low prices. He asked about EE's ability to potentially clip the high prices. Jayaweera agreed that EE can clip high prices but said it potentially loses money during low price periods and there has to be a balance. She said the model values the ability to turn a resource off during low prices and on during high.

Garcia said the real question is what types of efficiency are well suited to meet this world.

Lazar recalled adding distribution costs and recognizing the load factor of residential retrofit in early RTF work. He said this almost doubled the cost effectiveness of residential retrofit [Slide 15.] Lazar argued that he does not see the distribution side as an adder to the value of EE or as a cost for central generation. Jayaweera countered that she is not showing all of the details and everything is taken up to the busbar.

Harris asked if [Slide 16] represents solar without storage. Jayaweera answered yes, saying solar plus storage is around \$80. Harris said this slide illustrates the reality that energy efficiency has become more expensive while other resources have come down in price. He added that comparing these resources is complicated and getting more complicated over time, pointing to wind overlapping with the spring runoff as an example.

Lazar noted other complicating factors like the improved efficiency of gas generation and greater output from improved wind turbine technology. Harris said in some ways this is a success story for the NW power system even if it's not so great for efficiency.

Jayaweera agreed, saying replacing old thermal generation with new, more efficient thermals is a quick way to cut carbon.

James Vanden Bos, BPA, said he thought the simple cycle was the Generating Resources reference plant. Jayaweera explained that all resources are modeled but the Seventh Plan used the simple cycle for the alternate capacity resource. She said she didn't know what the narrative would be for the 2021 Plan.

Patterson asked if that is the caveat around efficiency or if the economy is causing the decrease in energy use. He reported that 10% of residential Lane Electric customers are using pay ahead, calling the decision economically driven as opposed to conservation. He asked how this impacts evaluations. Jayaweera said much RTF time and effort is dedicated to teasing that information out. She said a range of loads is used in determining resource acquisition but the evaluation community tries to get to the heart of savings. Jayaweera admitted that pay-as-you-go (pay ahead) is challenging as some may be curtailment.

Mohit Chhabra, NRDC, asked for a comparison of the total clean energy builds between the Seventh Plan and the baseline run with EE plus renewables [Slide 17.] He then asked how much of Bullet Three: EE as an incremental build resource is less desirable than an immediate build generation resource, is driven by energy needs due to coal retirements. Jayaweera said the Seventh Plan was almost entirely EE, 1400aMW in the Action Plan period while the draft baseline is 4000aMW of renewables.

Dave Hewitt, New Buildings Institute, asked if any value has been placed on carbon emissions, methane or other greenhouse gasses. Jayaweera answered yes, saying the social cost of carbon will be included in the analysis. She said they are also including methane, upstream methane, NOx and SOx.

Rich Arneson, Tacoma Power, moved to [Slide 16] asking if resource costs do not include the impact of tax breaks/production credits for solar and wind. Jayaweera concurred, saying the 10% tax credit is captured in the RPM and these costs are from MicroFin.

Heather Nicholson, independent, asked if methane from hydro storage will be evaluated. Jayaweera said it was examined in the past and remains undetermined. She offered to follow up.

Harris confirmed that [Slide 2] says the model is grabbing carbon-free solar and wind to make up for coal plant retirements. He summarized that EE is building out slower because there is little need in the first six years. Jayaweera said yes. Harris noted the starting set of assumptions that replaces coal is policy driven noting that this is a different paradigm than the Seventh Plan.

Garcia stated that methane from hydro reservoirs tend to occur when the water is warm, slow and nutrient rich. He added that our water is cold and fast with less nutrients so there would be little to no methane.

Scott Levy, Bluefish, agreed that was the summary of past Council findings but posted a link to other work. He said the lower Snake is warmer, slower and contained more nutrients. He posted a link for more information and encouraged more funding into this exploratory work. Jayaweera thanked him and said that might be a topic for the Generating Resources side.

Ted Light, Lighthouse Energy, confirmed that RPM results are run through GENESYS to determine resource adequacy on an hourly basis [Slide 18.] Jayaweera confirmed, explaining the process. T. Light pointed to modeling hiccups and asked if these results have gone through the GENESYS model. Jayaweera said staff was still in the process of refining the Adequacy Resource Margin (ARM) and the ASCC so they are not yet determined. She added that staff is now close to the Adequacy Reserve Margin.

T. Light then asked what kind of measures the RPM is selecting, specifically questioning low cost and high capacity. Jayaweera said the first years are seeing some higher cost bins acquired but very low-cost bins in later years.

Harris thought it useful to pursue the Robustness of EE scenario [Slide 20.] He pointed to large-scale experiments around how fast you could deploy EE if the need is great. Harris thought the CRAC could be helpful in creating a scenario that explores how rapidly EE could be deployed if needed.

Lazar called the ability to accelerate acquisition [Slide 21] overwhelmingly due to retrofits and not new construction or lost opportunity. He called this surprising, given the regional efforts to ban natural gas in new construction. Lazar pointed to a WA code study showing it is no longer cost effective to install gas heat.

Jayaweera clarified that electrification will be discussed later. She then pointed to ramp rates on top of lost opportunity measures that translates to lots of lost opportunity in the supply curves. Smit said industrial has 40-50% which is a change from the past.

Jessica Aiona, BPA, asked for an explanation of how the ramp rates were changed. Jayaweera explained her process.

Harris said 600-700MW a year is an ambitious target. He then asked about the set of assumptions driving this, wondering if a baseline assumption embedding a policy mandate of continuing EE would increase or reduce total system costs. Jayaweera thought the Council could consider that and costs would increase. She thought they could still get necessary insights without doing this particular action.

Harris referenced complex interactions between resource adequacy and the timing of resource availability. He said mandated EE in the baseline would change load requirements and might change the renewable buildout in unanticipated ways. Jayaweera said this effect is already being seen and offered to talk more offline.

Hewitt confirmed that baseload is being replaced with variable generation and asked if there are transmission or distribution constraints that will become more relevant. For instance, he pointed to the possibility of more geographically-targeted solutions or a push for something specific like controllable, heat pump water heaters or electric vehicles. Hewitt said this approach will bring up equity issues.

Jayaweera noted that solar and wind are already broken out by location [Slide 15.] Hewitt thought these numbers could be more refined, pointing to a difference between community and utility-scale solar and the importance of demand control.

BREAK

**EE in the Pathways to Decarbonization Scenario
Kevin Smit, NWPCC and Tina Jayaweera, NWPCC**

Smit provided an overview of the purpose of the scenario and stressed the difference between efficiency and electrification and how the Conservation Resources staff works with it. Smit ran down the EE adjustments for the scenario.

Lazar called the 38% share of multi-family gas in water heating versus a 12% space heating for multi-family odd and asked why [Slide 5.] Jayaweera explained that she was focusing on in-unit and most high-rise multi-family have large-volume water heaters. Lazar asked if high-rise is a big percentage of the market. Jayaweera said there are more low-rise buildings but the unit numbers are comparable.

Harris asked for more context around “General approach – count efficiency from more electric units at current practice efficiency.” Jayaweera explained how the load forecast looks at replacement at today’s current practice/market average efficiency mix.

Harris poked at market average efficiency mix, saying it is not clear that we would end up in the same place from a current practice standpoint under an electrification scenario. He wondered if it should optimize under first cost instead. Jayaweera said it comes down to capturing the effect in the baseline/load or the energy efficiency potential and this seemed like the most reasonable approach.

Jennifer Light, NWPCC, said the RTF and PAC spent a lot of time on this and the approach is consistent with Council direction.

Lazar pointed to a decade of planned code improvements that will improve efficiency, an electrification movement driven by policy, homes that use such small amounts of gas that it doesn’t cover the cost of extending the gas line, and improved efficiency of electric appliances. He thought all of these will affect the baseline. Jayaweera stressed that efficiency may be acquired through programs, codes and standards, or the natural market adoption and the supply curves don’t specify.

Lazar argued that codes and standards will acquire 80-90% of this whether we need it or not.

Arneson noted that Washington's HB1050 talks about efficient electrification but does not define "efficient." Jayaweera pointed to the second bullet on [Slide 4] saying some of this is a question of putting it in the load forecast versus efficiency. She added that one assumption is that the converted units are not subject to any ramp rate. Smit added that some of this is clarifying the modeling approach and this is consistent with other modeling work.

David Siddiqui, Oracle, noted studies that look at the modulating impact of EE on clean generation projections and the importance of maximizing the amount of EE to keep clean energy procurement costs down. He asked how much of that modulating factor had been built into the work. Jayaweera said that was covered in the earlier presentation, but summarized that they were expecting more EE but the low cost of renewables, the NW's immediate need and low future prices played a role in the outcome.

Siddiqui asked if there is any assumption to increase renewables due to lower efficiency and if that impacts the cost of clean energy generation. Jayaweera thought the Robustness of EE Scenario could get some insight into that question.

Lazar asked if the electric column on [Slide 10] was calculated at 3413 BTUs per KWh or some other acceptable conversion factor. Smit said yes.

Harris thought petroleum industry numbers could be higher. Smit offered to check. Lazar added that refineries use tremendous amounts of pipeline natural gas along with refinery gas.

Jennifer Finnigan, SCL, appreciated the slide and asked for more information on sources. Smit said he is writing up the details and offered to share. Finnigan then asked for a rough estimate of people he spoke to. Smit said he spoke to three or four companies with multiple sources in each company. He stressed that he is happy to make adjustments if needed.

Harris confirmed that staff doesn't have any interactions between this scenario and other carbon-free resource buildout to make judgements [Slide 14.] Smit confirmed saying they are still building up the inputs and will run it in late April.

Harris asked about the interactivity between the Pathways to Decarbonization and the Robustness of EE [Slide 15.] He said if you know you're headed for electrification you might want to look at changes in ramp rates that better reflect the robustness of EE to avoid overbuilding.

Lazar noted that there are two different parts to electrification: higher market share of efficient new buildings and the fact that 70% of buildings that will be here in 2050 are already here now and will need electrification. He said these old structures are not efficient or capable of being efficient. He thought the first group could get to 100% but it will be harder for the second group. Because of this he suggested separating new construction from retrofit.

Smit ended the meeting at 12:00.

Attendees via Go-to-Webinar

Kevin Smit	NWPCC
Tina Jayaweera	NWPCC
Jennifer Light	NWPCC
Jessica Aiona	BPA
Rich Arneson	Tacoma Power
Leann Bleakney	NWPCC
Frank Brown	BPA
Morgan Brummund	Idaho OER
Aaron Bush	PPC
Dan Catchpole	News Data
Mohit Chhabra	NRDC
Michael Coe	Snohomish PUD
Warren Cook	ODOE
Debbie DePetris	Clark PUD
Andy Eiden	PGE
Jennifer Finnigan	SCL
Ryan Fullerman	Tacoma Power
Lakin Garth	Cadmus Group
Nicolas Garcia	WPUDA
Andrea Goodwin	NWPCC
Greg Harr	Evergreen Efficiency
Jeff Harris	NEEA

Fred Heutte	NW Energy
David Hewitt	New Buildings Institute
Mihana Ho	Boise State
Chad Ihrig	Franklin Energy
Stefanie Johnson	Seattle City Light
Scott Kenaston	Evergreen Efficiency
Torsten Kieper	BPA
Anna Kim	Oregon
Jim Lazar	independent
Scott Levy	Bluefish
Ted Light	Lighthouse Energy
Kerry Meade	NEEC
Eli Morris	Applied Energy Group
Tomás Morrissey	PNUCC
Brandy Neff	PNGC Power
Quentin Nesbitt	Idaho Power
Heather Nickolson	independent
Dave Nightingale	WA UTC
Amber Nyquist	GD Associates
Elizabeth Osborne	NWPCC
Patrick Oshie	NWPCC
Craig Patterson	independent
Katie Pegan	Idaho OER
Elain Prause	PacifiCorp
Deborah Reynolds	WA UTC
David Siddiqui	Oracle
Gurvinder Singh	PSE
Christina Steinhoff	NEEA
James Swain	Boise State
Shani Taha	UCONS
Taylor Thomas	Idaho PUC
James Vanden Bos	BPA
Aquila Velonis	Cadmus Group
Joshua Weber	DVC Law
Amy Wheelless	NW Energy Coalition
Cindy Wright	Seattle City Light
Brian Dekiep	NWPCC

Tanya Barham
Hailey Stevens

Community Energy Labs
Boise State