

**Demand Response Advisory Committee
Northwest Power and Conservation Council
February 20, 2020**

Tina Jayaweera, NWPCCC, began the meeting at 9:30 with a round of introductions and agenda review. Tom Eckhart, UCONS, LLC, asked what T&D Deferral will cover. Jayaweera answered that it will explore how DR and EE can help defer the Transmission and Distribution system investment.

Fred Heutte, NW Energy Coalition, thanked the Council for providing helpful minutes. He reported using them in a recent meeting with BPA.

Melanie Smith, BPA, stated that Bonneville has a position open for a distributed energy resources analyst on the USA Jobs website. Frank Brown, BPA, added that the application closes on February 25, 2020.

Overview of Process

Eckhart asked if the timeline shown on [Slide 3] applies to capacity and Demand Response. John Ollis, NWPCC, replied that the “pencils down” date of March 31 is the same for all resources. Eckhart noted that the models use other regions to baseline DR and asked about regional baseline work. Ollis said there are supply curve experts in the room, adding that PNDRP provided feedback for the Seventh Plan. Eckhart confirmed that there’s no concern about baseline and the supply curves for DR will be similar to the energy supply curves. Jayaweera confirmed.

Joan Wang, Cadmus, asked if draft results will be presented during the next DRAC meeting [Slide 5.] Jayaweera answered no, there will be draft inputs.

DRAFT DR Supply Curves

Heutte noted the price differences on [Slide 3,] stating that equipment for Heat Pumps and resistance water heaters should be similarly priced. Jayaweera pointed to different impacts adding that there are many more electric resistance water heaters, which affects program scaling.

Heutte then asked if program costs are considered separately. Jayaweera answered yes. Heutte then asked about the T&D numbers for DR. Jayaweera said that topic will be covered later but previewed that they will be using the same numbers.

Ahlmaz Negash, Tacoma Power, stated that the presented costs are not net costs before asking why a T&D deferral benefit would be included. Jayaweera explained that she’s presenting net levelized costs without netting out T&D. Ollis added that only some netting will go on in the supply curve and more information will happen in the RPM.

Quentin Nesbitt, Idaho Power, asked if the costs include customer incentives. Jayaweera said a portion of the incentives are included to account for the “hassle factor” of DR. She said this is between 30-50%, depending on the sector.

Nesbit said that explains why the costs on the slide might not mirror actual utility costs per year.

Ted Light, Lighthouse Energy, asked how the potential for electric resistance water heaters and HP water heaters is tallied, given that the potential in each bucket changes over time. Jayaweera stated that topic will be covered later in the presentation before previewing that staff uses what they know today and plan to rely on the RPM’s dynamic interaction factor for each cost bin.

T. Light confirmed that the total presented is based on stock for the beginning of the twenty-year Plan period. Jayaweera answered yes, except for electric vehicles.

Heutte confirmed that, just like EE, if a DR measure has less than a 20-year life there’s a replacement cost. Jayaweera said this is the heart of the afternoon’s discussion, adding that, for DR, the cost is the switch and not the water heater. She said the enablement costs are assumed for the beginning and the discussion will center around the appropriateness of using 20 years.

Gurvinder Singh, PSE, asked about built-in assumptions around event duration and frequency over a season. Jayaweera said most assumptions are five, four-hour events per season, adding that dual season products can have 10 events a year, five events per season. Singh asked if an ELCC value will be added. Ollis said that will be discussed in the afternoon.

Heutte commented that [Slide 5] would benefit from different color choices and suggested switching “incremental achievable” and “cumulative achievable.” Jayaweera agreed that different colors could provide more clarity, but said reversing the presentation would not show the cumulative growth as well.

Singh asked if “Combined” on [Slide 5] means Summer and Winter are added. Jayaweera said no, it’s the maximum potential and the costs are a weighted average between summer and winter.

Elaine Prause, PacifiCorp, asked if the RPM captures all grid services values or if it needs separate credits. Ollis answered that it depends on the model’s perspective, adding that the ASCC works from an adequacy perspective but it doesn’t have good information for an economic value perspective.

Jayaweera asked if the “changing market” scenario would illuminate this. Ollis said probably not, repeating that the RPM is positioned to pick up on the value of DR if there are any adequacy issues.

Wang asked why [Slide 5] shows both heat and cool for non-residential products. Jayaweera answered that some customers may only participate for one season and the slide is meant to cover both seasons.

Singh asked about the \$55 cost for residential electric resistance water heaters. Jayaweera moved to the spreadsheet and explained that the levelized cost workbooks will soon be available for review. Singh looked forward to seeing those workbooks, calling the \$55, “a little light.”

Heutte re-affirmed his distaste for pie charts [Slide 6.]

BREAK

Binning

T. Light agreed that minimizing price variance was a good strategy [Slide 11] but suggested splitting bins to increase resolution. Jayaweera said there are still unknowns until the model runs but thought it was possible to reconfigure the bins if results deem it necessary.

Heutte asked what the bin boundaries are. Jayaweera answered the first bin is \$25, the second \$50, the third \$100 and the fourth is anything above.

Heutte noted that the resistance water heater is in the second bin while the grid-enabled technology is in the third. He asked why the resource is split between two bins. Jayaweera agreed that it's something to think about, and thought putting both in bin three was the best option. Heutte thought it was best to keep them together and being in the higher bin wouldn't matter that much.

Program Life Assumptions

Eckhart noted that utilities and industrial clients look at cost components differently [Slide 2.] While he understood that this is a regional approach, Eckhart wondered if there was any value in reflecting industrial versus utility costs. Jayaweera clarified that these costs are utility costs, and include some incentives to represent customer inconvenience. She said this follows the California protocol.

Eckhart noted that some utilities have a tremendous number of industrial customers while others don't. Jayaweera said she incorporated input from the Industrial Customers of NW Utilities, Zeecha Van Hoose at Clark PUD and Energy NW.

Nesbitt thought it would be helpful to specifically note that the incentive on [Slide 2] is just the portion that covers the customers' costs. Jayaweera changed the slide and said she would clarify that point in other parts of the presentation.

Heutte asked Jayaweera to point out on the [Res DLC Water heating Spreadsheet] where the costs go back after 10 years. Jayaweera answered that equipment, marketing and any one-time

incentive would be reinvested. Heutte asked if setup costs would be repeated as well. Jayaweera answered no.

Heutte was confused by the term “planning” on [Slide 3.] Jayaweera changed it to “setup” and changed “startup” to “equipment, marketing and one-time incentive” along with other corrections on the slide. Heutte noted that managing DR’s active equipment can be costly, agreeing that it makes sense to try to accommodate the process. Ollis said the methodology is similar to what was done in the Seventh Plan, but with more granularity.

T. Light asked about interaction between a ten-year life and attrition that might amount to a penalty or if set-up is modeled to recur after 10 years and program participation continues. Jayaweera said there is an attrition assumption and the program will add participants to make up for that. Wang confirmed that this is the approach.

Heutte thought this approach might create spikes in year 1 and year 11. Jayaweera assured him that the costs are leveled.

Brown voiced preference for this approach over the Seventh Plan’s tactic of reinvesting costs every five years. Brown stated that this made DR products more expensive than they really are. He then argued that 10 years is still a penalty, noting other utilities around the country that operate DR and haven’t had a replacement cost in 20-30 years. He offered to do some benchmarking that would prove a 20-year life is reasonable.

Nesbitt spoke about his residential AC program that started in 2003 with three different devices. He said they eventually landed on an AMI device in 2012, adding that it still needs maintenance and he has replaced a lot of switches. Nesbitt said irrigation measures need even more maintenance. Because of this, he agreed that a 10-year life is reasonable.

Jayaweera asked if a switch is easily transferable to a new water heater. Nesbitt said he doesn’t have water heater experience but noted issues with AC programs where HVAC dealers leave switches disconnected, actively encourage participants not to use them or just take them away with the old equipment. Nesbitt also pointed to the need to accommodate back end software upgrades from the manufacturer.

Brown stated that he now agrees a 10-year life is appropriate.

Jayaweera asked for comment on the 20-year life for price-based DR. Both Nesbitt and Brown supported it.

Kyle Frankiewich, WA UTC, pointed to Washington State reimplementing PURPA and thought that anything under \$40 would be cost effective in all circumstances [Slide 10.] Ollis thought that was a good metric in the past, but using the leveled cost of capacity may not work for a Plan heavily driven by policy. Ollis added that the Associated System Capacity Contribution (ASCC) will also strongly influence values.

Eckhart asked about DR options going into rate base. Jayaweera said this is a barrier to DR and could potentially make a good action item.

Heutte agreed that a \$/KW-y is a useful, but limited, metric and approved of the model's look at performance along with costs. He argued that it is time to move away from the "reference plant" concept and look at system value instead. Ollis agreed, saying coming up with an avoided capacity cost metric is tricky and might not be appropriate for every utility.

Prause wondered if binning by cost loses some critical details [Slide 10.] Jayaweera said the RPM will know winter versus summer availability. Ollis added that binning by season or other attributes increases variability within the bins. He added that seasonality is becoming less of an issue and segmenting by cost bin is probably the right answer.

Brown suggested dropping the high-cost, low MW products in bin four and dividing the remaining products into the four bins. Jayaweera said that could be an option for some scenarios but bin four might be chosen in the deep decarbonization scenario. Ollis agreed that limiting bins for some scenarios may make sense.

Brown reiterated that it was not the cost of products in bin four but their lack of MW that prompted the suggestion. Eckhart agreed the high-cost bin wouldn't drive results but might have policy implications. Ollis thought it would be good to show a wide variety of DR products as some utilities might have a niche need for them.

Heutte approved of running a deep decarbonization scenario but said accomplishing a deep decarb in reality would require a different resource mix. He called the proposed scenario a corner case for the overall plan. Jayaweera said the deep decarb scenario will have a lot of moving parts to it. She then answered a chat question about CTA2045 compliant water heaters, saying the natural turnover of water heaters means it will be an important, but slow, build.

LUNCH

RPM Review and Enhancements

Smith said [Slide 8] highlights Brown's earlier point about getting rid of bin four. Ollis said he was willing to modify bins if it turns out to be an issue but thought overall cost would prove more of a driver.

Eckhart said this has an impact on reserves and asked for more clarity. Ollis said this is about trying to reduce the peak load by a percentage factor. He likened the obligation of peak MW to load plus reserves from an adequacy perspective. Eckhart asked if Ollis sees a ceiling on peak demand linked to reserves. Ollis said the ARM and ASCC come from the hourly GENESYS model which contemplates reserves and energy needs and allows a 5% LOLP.

Heutte stated that, from a whole house perspective, an electric resistance water heater that's using less energy because of EE still has the full DR potential. He wondered how this translates to the system level. Ollis said these numbers could be marked at zero. Heutte then asked about the multiplier. Ollis answered that the multiplier is a way for the RPM to understand the dynamic link between EE and DR.

Heutte asked if this is a curve-fitting exercise. Jayaweera said the EE perspective looks at the difference in load profiles between Heat Pump and electric resistance water heaters to get the savings profile. Heutte wondered if a given bin with only Heat Pump water heaters will have one multiplier but that multiplier might be different if there's a mix of water heaters. Jayaweera explained as more heat pump water heaters come on line there are fewer available electric resistance water heaters, which increases the DR potential for heat pump water heaters but decreases the DR potential for electric resistance.

Heutte summarized that some DR measures have an EE component and some do not and the multiplier quantifies what is current within a given bin. Ollis and Jayaweera both said yes. Heutte was still confused but happy.

T. Light asked if a multiplier of zero means no DR/EE interaction. Ollis said yes. T. Light wondered about a negative multiplier for cases like switching from an electric resistance to a heat pump water heater. Ollis said that could be true and offered to check.

Heutte confirmed that the ASCC [ASCC as an array] is a way to endogenously retire thermal. Ollis said yes, it's a way to account for the adequacy part.

Smith asked for a definition of "near" hours of need [Slide 13.] Ollis explained, using the example of a 6 to 8:00 pm summer peak and a DR product that runs from 7 to 10:00 pm to illustrate his point. He said DR is good for a one-hour problem but does not provide a capacity contribution for a bigger event.

Smith said there are products and buckets that could handle a bigger event and asked how they will be accounted for. Ollis said there could be a weighted constraint within the bin, adding that the RPM is not a good model for this and asked that the topic be tabled for now.

Heutte said the slide highlights that "near" might be different for different DR. Ollis said this approach is a project management tool to avoid a lot of "guess and check."

Smith cautioned that when tools and models are released people believe they are accurate, which is a reason to get as close as possible [Slide 14.] Ollis strongly agreed adding that, once tuned, the array concept will be close.

Distribution Efficiency Status Update
Charlie Grist, NWPCC

Heutte asked what “utility heating and cooling” is on [Slide 6.] Grist wasn’t sure. T. Light said the baseline was customized based on climate zone.

Smith asked if [Slide 8] makes the broad assumption that a utility wouldn’t do DVR unless they were also interested in CVR because of equipment. Grist said yes, equipment is the issue. Smith said she’s heard many times from utilities interested in doing DVR but not CVR. Grist said CVR looks strong and offers demand reduction. Smith countered people want what people want.

Ollis said CVR is going to look better from an RPM perspective. Smith asked if this reflects reality, noting the BPA’s DR Potential Assessment didn’t just look at how much was available but how willing people were to take it up. She thought the same metric should be used for CVR.

Grist said staff is looking at how much is available and how much it costs. Smith called that technical potential and wanted to know more about achievable potential. Jayaweera said achievable is incorporated through the adoption curve and max achievability factor.

Smith thought this method might bump out something with a higher adoption rate. Ollis said he knew there would be some concern with this proposal and contemplated letting CVR and DVR fight it out in the model. He went with this proposal because DVR would skew the cost bin down and CVR looks better for the region as a whole because EE fits better with hydro.

Smith called this disappointing, as DVR is the lowest-cost DR product. Brown said this is a way to cut DR off at the knees, pointing to 20 years of implementing DVR in a variety of ways. He said there are utilities interested in DVR that would never consider CVR and called the Council’s CVR potential number ridiculous. He was okay with reducing DVR by the number of implemented CVR, but said he would fight eliminating BPA’s best DR product all the way to November.

Ollis assured the room that this is a straw proposal for simplifying the model and asked the DRAC to offer recommendations. Smith called Brown’s proposal to look at adopted CVR sound. Brown said this matches the reality of his experience.

Grist thought DVR and CVR only compete on ECM 1 [Slide 6.] Smith said just because you have DVR equipment doesn’t mean you want to implement CVR. Brown pointed to utilities with AMI in ECM3 that do DVR with no interested in doing CVR. Grist asked why. Brown said DVR reduces costs while CVR reduces revenue.

Van Hoose wrote on Chat that Clark does CVR on some feeders and is not interested in DVR. Ollis said there might be a patchwork of opinions on this and utilities should do what’s right for them. Ollis then read another Chat that said CRV is mandated in Washington when cost effective.

Ollis stressed that this is an attempt to streamline modeling. He agreed that DVR looks great for a DR resource but conservation at that price will still look better. Smith argued that these

numbers do not represent CRV's real, achievable potential and disagreed with using it to knock out easily-achievable DVR.

Ollis pointed to a model enhancement that reduces DR availability based on conservation. Jayaweera noted staff struggles with this, adding that the Plan is a way to push the region to a least-cost approach and DVR is not the least-cost approach compared to CVR.

T. Light offered tiering the product or assigning market shares as a solution. Jayaweera thought it might work.

Negash asked if the proposed first bin would have been completely taken up in the Seventh Plan. Ollis answered yes, adding that the first bin in the Seventh Plan was \$26 and was bought a lot. Negash said this most likely means that DVR will still get selected. Ollis thought DVR's value would be de-rated over time as CVR is taken up. He added that EE's, and CVR's, better ASCC means it will be taken up more.

Ollis offered options to the DRAC:

- Model CVR with a narrative about DVR
- Model a CVR and DVR "cage match" which will still need a DVR narrative
- Blend in Market Share information

Smith asked how to stress "achievable potential." Jayaweera explained how she would limit the resource. Ollis said both would probably get bought with this method, which would also require a narrative.

Grist reminded the room that the Power Plan asks that staff assess regional costs, risks and reliability which is different than utility revenue impacts.

Smith likened this situation to asking ten chickens for ten eggs, without realizing that two of the chickens are older and no longer laying. Brown re-iterated that he advocated hard for CVR for over 15 years and had some success with Snohomish PUD. He then pointed to past Plans with large, unmet CVR targets.

Brown did not see the sense in distorting the model and moving away from the reality on the ground. He predicted another Power Plan with large, unmet CVR targets and lamented throwing away the best, most marketable DR product in the name of modeling and policy purity.

T. Light thought this was similar to a conversation about incrementalism held in the January CRAC meeting.

Grist asked if DVR is temporary while CVR doesn't go away. Smith answered that if CVR is working there's no space for DVR, so if DVR isn't on the table and if a utility doesn't want to do CVR then nothing is accomplished.

Ollis offered to show both in the modeling in the name of fairness, but cautioned that staff thinks the results will be the same. He then said a Power Plan produces many things that might not actually happen, but shows the region how to operate in a least-cost fashion.

Smith agreed with Ollis's point and asked that "achievable" potential be changed to "technical" potential. Brown said realistic achievable increments of CVR should be subtracted from the DVR supply curve, calling the proposed number "silly" considering the lack of interest.

Jayaweera said this issue and DRAC feedback will be brought up at the next Council meeting and she will email results of that discussion to the group.

BREAK

Applying T&D Deferral to DR

Heutte asked what the weighted average values were in the Seventh Plan [Background.] Jayaweera answered about \$30 each. Heutte called this a huge reduction, asking how many utilities provided data, if it is written up anywhere and if this will appear in the Plan narrative. Jayaweera answered about five or six provided information and the approach is available in presentation slides, adding that it will likely get some space in the Plan narrative.

Heutte questioned why the reduction is so huge. Jayaweera said using Sixth Plan numbers for the Seventh proved to be part of the issue. She said a more important issue is the way utilities calculated these numbers in the past compared to this method which recognizes that not all investment is deferrable and some expenditures are purely O&M.

Heutte called this method a way to move to a pure marginal cost. Ollis said he sent Heutte the presentation that lays out methodology. Jayaweera reminded him that these are regional, peanut buttered, planning estimates used for locations that have 0 value as opposed to locational hot spots.

Brown stated that he roughly monitors non-wires projects across the US every four months or so and finds that 90% of deferrals are pilots or commission-approved projects and use DR or DR plus batteries [How to Apply for DR?] He said it's rare to find a transmission deferral and thought both the T and the D credit should apply to DR.

Negash clarified that T&D is coming in at \$3 and \$7, before asking what the Seventh Plan numbers were. Ollis answered that they were \$26 and \$31. Negash agreed that using both now would still be significantly lower than just using the Seventh's Plan \$26 for transmission.

Heutte recalled his discomfort with excluding the Distribution deferral in the Seventh Plan and agreed with Brown's point that the Distribution side will be a big utility operations driver. He then called it shocking that the value would fall 90% over one Plan cycle.

T. Light thought that a local distribution system that doesn't align to system peak would still find value in this approach.

Van Hoose asked if there was any value in having T&D be cumulative, noting that DR is often used to address a single transmission or distribution bottleneck and couldn't see how DR could get credit on both sides. Jayaweera said this goes back to past conversations about DR being used for either T or D.

Ollis called Van Hoose's point valid, but countered that people buy EE for various reasons too. He said different BA's have different costs for different resources and this is peanut buttering can be hard for some utilities without hot spots. Ollis said that getting this picky about T&D might mean that it's appropriate to reexamine every resource.

Ollis suggested handling the issue in the narrative and perhaps punting on the modeling side.

Negash asked if there will ever be a Plan with resources priced by location. Ollis said he would if the information was available and he had a different model.

Heutte agreed with the averaging approach, saying that locational value is real but would bog down analysis. Ollis added that the modeling does capture east side and west side.

Public Input

Heutte asked to be alerted when the spreadsheets become available. Jayaweera said yes, adding that there are two workbooks if a product has both summer and winter impacts.

Wang noted that the load forecast was still being finalized and asked if that will have an impact on the global workbooks. Jayaweera said she didn't plan to wait because of time constraints but didn't expect a lot of adjustments.

Jayaweera adjourned the meeting at 3:30 pm.

Attendees

Tina Jayaweera	NWPCC
John Ollis	NWPCC
Elaine Prause	PacifiCorp
Tom Eckhart	UCONS
Melanie Smith	BPA
Joan Wang	Cadmus
Ted Light	Lighthouse Energy
Fred Heutte	NW Energy Coalition
Ahlmahz Negash	Tacoma Power

Attendees via Webinar

Aaron Busch	PPC
Adam Schultz	ODOE
Cindy Wright	SCL
Clint Gerkenmeyer	Energy Northwest
Frank Brown	BPA
Jennifer Snyder	WA UTC
Kerry Meade	Smart Buildings Center
Kyle Frankiewich	WA UTC
Malcolm Ainspan	NRG
Quentin Nesbitt	Idaho Power
Sarah Vorpahl	WA dept of Commerce
Gurvinder Singh	Puget Sound Energy
Suzanne Frew	Snohomish PUD
Zeecha Van Hoose	Clark PUD