

**Northwest Power and Conservation Council
Conservation Resources Advisory Committee
December 4, 2019**

Charlie Grist, NWPCC, began the meeting at 9:00am with introduction and a look at the minutes. Jennifer Light, NWPCC, pointed to upcoming training on Energy Plus models on January 8-10.

2021 Plan: Update on Decisions to Date

Charlie Grist, NWPCC

Wendy Gerlitz, NW Energy Coalition, asked where and when measure-level inputs could be found. Grist said they will come out in stages over the next couple of months.

Agricultural Sector—Ramp Rates

Tina Jayaweera, NWPCC

Jim Lazar, RAP, asked if the current Federal backsliding on lighting standards has the potential to affect the natural replacement rate [Slide 7.] Jayaweera said barn lights are not considered general service so they will most likely not be affected. She added that how other applications may be affected was discussed in the October meeting.

Mark Rehley, NEEA, asked if equipment life is figured into max achievable. Jayaweera answered that lost opportunity measures happen in addition to the ramping. Rehley confirmed that this is not the whole stock. Jayaweera confirmed the point. She added that there is a Max Factor for measures that have a fast turnover to avoid double counting.

Ted Light, EES Consulting, said the ramp rates make sense [Slide 9] and asked about the process to check that the ramp starts at the right point. Jayaweera moved back to [Slide 3] to illustrate where they start, saying they use RPC work for estimates. She acknowledged that there will be a gap as there can't be infinite discreteness.

Danielle Walker, BPA, voice confusion about the total on [Slides 8-9] saying that 20 aMW in 2040 seemed low. Jayaweera offered to double check. Mohit Chhabra, NRDC, was also confused saying it looks cumulative for each measure. Grist said that the resource looks like [Slide 8] to the RPM.

Chhabra asked how re-participation is handled. Jayaweera answered that savings are assumed to be sticky and annuals are cut off if they exceed the max. Chhabra asked about backsliding, adding that other regions have different assumptions for this and there is not good data. Grist explained that there's an assumption that a measure will last 20 years but you may have to buy it again.

Jayaweera said that workbooks will be posted soon and asked for feedback before the end of March 2020.

Eli Morris, AEG, asked if there was an expectation for cumulative potential to decline over time. Jayaweera said it's not declining but flattening out and offered to re-check.

DHP: Segmenting the Market

Tina Jayaweera, NWPCC

Jeff Harris, NEEA, said the smaller HZ2&3 savings are due to alternative fuels [Proposed Permutations] asking if the load forecast reflects any changes in behavior in wood use due to restrictions or aging populations that can no longer use wood. Jennifer Light, NWPCC, clarified that RTF analysis, which included the latest BPA and ETO data, found screening out supplemental fuels still delivered lower savings in HZ2&3.

Jayaweera pointed Harris to the Demand Forecast Advisory Committee for more information on the load forecast.

Walker asked about the expectation for programmatic implementation, saying that this would be a challenging way to implement the program. Jayaweera said the alternative, any DHP, will not be cost effective and not selected by the RPM.

Dave Moody, BPA, agreed that cost effectiveness was an issue but was sure that this dichotomy was the same that he sees. He said a program that asked for a kW screen would be impractical but other screens, like different fuels or cold climate equipment, might deliver a different potential. J. Light said the RTF found a supplemental fuel screen delivered different savings and there was no good data on cold climate equipment. She added that the RTF found that applying the kWh in the evaluation phase for a sample of homes and then true up the realization rate could be a solution.

Walker called this an example of the tension between counting cost-effective savings and getting to the potential. Grist said this is also an example of how much we've achieved in the past and how much more precise our work will have to become.

Harris voiced concern over the difference between the impact evaluation results and the calibrated SEEM model results. He asked if the calibrated SEEM model would be a better representation of DHP potential in the Plan as it doesn't carry program implementation model baggage. J. Light explained the RTF's year-long calibration effort, adding that there was no DHP work as evaluations show there is no reliable way to get savings. She cautioned against relying solely on models.

Chhabra asked why programs can't implement screens. Jack Cullen, ETO, explained the problems saying to get an exception from the PUC the programs had to go through an extensive process. Chhabra asked about applying energy bill-based screens. Cullen explained the difficulties with that approach.

Moody agreed that a consumption-based screen could happen but could bump up against BPA's concern about regional equity. He said this base assumption that feeds into the Power Plan may be very different than what BPA can achieve. Jayaweera noted the comment. Morris agreed that this will not be the only high-cost on a \$/kWh basis measure and asked if this is a one-off or a new way to look at pre-screening. Grist thought there will be more measures in this category where prescreening is required and asked for ideas.

J. Light said weatherization may be an example, adding that a lack of good data presents another challenge. Rehley asked how to fill in the gaps on data and when that fill in is used versus the evaluation data. Jayaweera answered that if there is no RTF measure, she scrapes together what she can find. Rehley asked specifically about Manufactured Homes. Jayaweera said she used the RTF data for Single Family adding that there are very few Manufactured Homes where this would apply.

Rehley asked if the RTF looked at electric forced air furnaces. Jayaweera said that's a different measure and is coming soon.

Jayaweera moved to cold climate equipment, saying we might want incorporate the potential as it's past the emerging tech phase but there's still some uncertainty.

Chris Johnson, Benton PUD, spoke about the difficulties of the installation requirements, saying there's some cool applications and there's definite savings but the requirements make it hard. There were nods of agreement in the room.

Rehley asked if electric usage was all in the 20,000-kWh bin [Savings by Consumption.] J. Light explained that the NEEA pilot targeted homes and got higher savings. Grist said savings looked high when this started but there's lots of reasons people put in a DHP that don't align with creating a cost-efficient energy resource

Moody agreed that the DHP market has exploded and again championed an approach that screened out applications or configurations over a kWh consumption screen. He argued that this may skew the results against customers with smaller homes and less means. He reiterated that this approach will affect weatherization and residential HVAC suite. He called this analysis compelling but cautioned against any unintended consequences.

Chhabra said the RTF screen tells you to select homes that use heating energy in a certain way and programs can use that in a practical, flexible way. Grist agreed that they try not to be prescriptive but also don't want to miss real potential or misestimate potential.

Bobbie Wilhelm, Idaho Power, countered that this screen might affect higher income users more than lower as lower income has the higher kWh usage. She encouraged other implementors to overlay Census data with county data and usage data as it might deliver a more equitable measure.

Rehley asked about adoption curves for DHP. He then wondered what DHPs displacing wood heat would do to loads. Jayaweera said she uses a frozen efficiency load forecast that applies across all fuels. Chhabra asked if the question is about fuel switching or potential fuel switching from incentivized DHPs. Rehley said it's about how aggressively you're forecasting the adoption rate. Jayaweera said she hasn't developed the ramp rate yet. Rehley wondered if the total volume of DHPs would feed into an additional load. Chhabra said the per-unit savings include extra consumption as the displacement is netted out. Jayaweera said these are screened so there shouldn't be a lot of that going on.

BREAK

Non-Res Lighting

Charlie Grist, NWPPC

Elaine Miller, NEEA, asked why healthcare is missing from [Slide Lighting Energy 2 to 10 kWh/SF.] Grist answered that the information came from the 2013 CBSA which didn't look at healthcare but information on that sector will be presented later.

Jim Lazar, RAP, noted how far the technology has come for color resolution [2019 Progress Report High-Bay.]

Shani Taha, UCONS, asked about the cost differential between new LED fixtures and today's retail market. Grist didn't know and called for program cost data adding that costs are coming down fast.

Aaron Leatherwood, Evergreen Consultants, asked **if the trend is driven by TLED (couldn't hear in the room or on the recording)** [Slide 21.] Grist said TLED information is coming later, adding that DOE is one year late in releasing its 2018 update.

Aquila Velonis, Cadmus, asked if there is a proposal to peg efficiency on [Slide 24.] Grist answered yes and explained the process. Velonis recalled the Seventh Plan had two different lighting workbooks, one for codes and another for post 2018. He wondered if it is possible to break the work into three points in time to better represent the changing market. Grist said it would not be worth it as there will be another Plan in five years and leveled costs are low. There are head nods of approval in the room.

Walker confirmed that the Seventh Plan had cost and efficacy. Grist confirmed.

Chris Wolgamott, NEEA, thought the upcoming efficacy curves may not be as steep as consumers are looking for more quality light as opposed to more lumens per fixture. Grist agreed

Wolgamott pointed to a shift by some manufacturers to low-cost LED lamps that only last a year or two [Slide 28] adding that ENERGY STAR has dropped its life requirement. Miller offered replacement lamp analysis data on ENERGY STAR/non-ENERGY STAR and DLC/nonDLC.

Lazar pointed to some employee productivity non-energy benefits for the products on [Slide 32] including improved glare and thought it could be included in the analysis. Grist called for data. J. Light said they cannot consider that in the costs/benefits according to the Plan's framework.

Wolgamott stated that Idaho may be going to a lower LPD [Slide 33.] Gurvinder Singh, PSE, confirmed that the weighting is small. Grist confirmed but thought it would help. Lazar asked what IECC 2021 may be. Grist didn't know adding that IECC lags ASHREA when it comes to lighting. Singh asked about the CBSA. Grist said it only includes about a dozen new buildings.

Tom Osborn, BPA, asked if the **LPD** includes credit for advanced controls [Slide 35.] Grist answered no saying it will have to be taken up separately, calling it tricky to do.

Leatherwood recalled trying to implement a DLC premium program and found product quality was often worse than DLC standard [Slide 36.] He also said he often used an exception process to accept lights below DLC standard as they were well controlled and had superior light. Grist asked if he recommends just using DLC standard. Leatherwood answered yes.

Wolgamott added that DLC is making a major shift towards a quality metric with a glare, flicker and other factors playing more of a role than lumens per watt. Ryan LeBaron, BPA, agreed that DLC standard, or a blend, was a better option.

Jessica Aiona, BPA, confirmed that efficiency shares will be frozen at the beginning of the Plan period but the efficacy and cost will be frozen at the mid-point [Slide 38.] Grist confirmed. Lazar asked if there is any change to the heating and cooling interaction. Grist pointed to a new suite of building models that they may run interactions through if there is time, adding that the interactions have been updated by the RTF since the Seventh Plan.

Wolgamott spoke about the differences between networked and luminaire-level controls, saying that luminaire-level is more granular as there is a sensor at every general fixture [Slide 42.] He added that high-end trim adds to savings in multiple ways including deterring turning off controls.

Chhabra asked if all control types, like dimmer or daylighting, is connected. Wolgamott said connected controls are set up to have everything networked which may force a new look at the sector. He recalled that lighting and controls were always viewed separately but now controls, particularly luminaire-level, are integrated into one piece of equipment. Leatherwood said this will impact program design methodology.

Chhabra asked why the individual savings percentages are sometimes higher than they are in the multi column. Grist said it has to do with how the controls work together. Wolgamott agreed.

Wolgamott pointed to lower life expectancy with earlier LEDs which may lead to LED to LED programs that still bring efficiency gains [Slide 44.] Grist said this sounded like a retrofit approach.

[Issues for Feedback (1)]

Wolgamott said IACC 2018 has an optional path for luminaire-level lighting controls that WA already has in place. He thought these optional paths may shift codes in the future. Grist said this will eat away at remaining potential.

Aiona stated that turnover varies by building type/segment, like industrial which doesn't turn over much. She asked that that be considered when setting the maximum. Grist agreed that the high-bay application is tough. Aiona said it's more by business type, particularly industrial which can't disrupt production to change lights.

[Issues for Feedback (2)]

Chhabra asked if cost for controls will be frozen over time. Grist said they will be frozen at some point. Chhabra asked if the lighting code plans for larger retrofit. Grist said yes and it adds complexity to the issue as people do not want to trigger codes. Leatherwood agreed that he's seeing a lack of code enforcement in the market. Grist asked if there's any data on that. Rehley said NEEA has a new construction study. Grist said there wasn't much control data there.

Leatherwood asked about the 10%.....(trails off.) Grist asked if he shouldn't assume so much. Rehley pointed to upcoming lighting/HVAC control testing but wasn't sure how that would be dealt with in the supply curves.

LUNCH ½ hour

Distribution Efficiency

Mike Starrett, NWPCC

T. Light asked about DVR [Slide 4.] Jayaweera said there will be some DVR potential but EE comes first so it will decrease as CVR increases. T. Light said that made sense adding that there may be some existing DVR in place that may limit CVR applicability. Grist asked if the CVR goes away if you do DVR. Starrett said once you've done CVR you can't push it down further likening CVR to permanent DVR. T. Light said some utilities have the potential to do both but DVR is more attractive for some reason.

Starrett said on the distribution engineering side there's not much motivation to lower the voltage. Singh said lowering voltage is required by WA law. Jennifer Snyder, WA UTC, said they're working on this. Singh said EIA says you must do all cost-effective operations on your distribution system, adding that there are limiting factors like needing an AMI infrastructure.

Starrett countered that you don't need AMI infrastructure and explained methods.

Singh asked if Starrett examined savings load shapes particularly during peak. Starrett said this was done with MW hour with shape. Grist said the shape profile was developed from work in the RW Beck study. Singh asked if the percentage savings changes. Grist answered yes, saying it shapes 1aMW into months and high/low periods. Singh asked if CVR delivers 2% winter peak savings. Grist didn't know. Starrett wasn't sure about the shape but said in general the heavier the line load delivered bigger net savings. He added that he wasn't sure about winter savings due to thermostatic loads.

Grist stated that when Adam Hadley, Hadley Energy, did the analysis he used proxy shapes and thought it might be time to re-examine it. Singh wondered how much the mix of load during peak would influence voltage. Grist said all of the measures use a marginal line loss calculation for all of the savings. Starrett offered to investigate further.

Grist asked if data about air conditioning saturation or LEDs were taken into account. Starrett said he first looked at older published work on the relationship between voltage power and end use but struggled with incorporating it. He said he was more comfortable using recent utility studies.

Grist asked about ramp rates. Starrett said he's hearing that, once implemented, utilities like PacifiCorp are getting 1/10th of what they were anticipating, but Idaho Power and PGE are getting more. He added that software packages generally have a CVR component and may change the picture in five years.

Snyder said adoption rate is expected to go up among the WA IOUs.

Chhabra asked about the legal requirement to do this. Singh explained that the Energy Independence Act says to get all cost-effective efficiency on your system, including the distribution system. Singh thought that implementation is happening but wasn't sure about ramp rates.

Starrett added that substations should be able to do line drop compensation without any upgrades but AMI will allow deeper, faster savings.

Inputs for Cost of Saved Energy

Charlie Grist, NWPCC

Bud Tracy, Consultant for Idaho, stressed that the end-use customer pays for everything eventually [Slide 2.] Grist said this will be discussed more but most utilities expense their conservation and do not have financing costs but the customer will. Tracy stressed that it's always the customers' money in the end adding that unregulated utilities will pay for this with either their rates or equity reserve.

Morris asked if utility program data revealed incremental costs [Slide 6.] Grist said he didn't remember if he had total incremental costs. Jayaweera said they did for some.

Morris then asked how NEEA, codes and standards play in. Grist said that would be in the utility component, adding that the lower chart includes data from the RCP and should include NEEA.

Chhabra asked if cost buckets are treated differently. Grist answered yes, explaining that it only makes a difference if something is financed.

Gerlitz asked how IOU finance costs are calculated now that BPA doesn't finance. Grist said the assumption is all IOUs are expensing. Gerlitz asked what is assumed for the customer. Grist answered 4.2%.

Jayaweera moved back to Morris's question about NEEA influencing the 35%. Grist explained that it came from broad thinking about programs, incentive levels and how much money it will take to influence customers.

Walker said BPA paid 60% incentive on average adding that that was just a straight average and not weighted by savings. Chhabra asked if that included low income programs. Walker answered yes.

Gerlitz asked if it would be better to look across different sectors. Johnson agreed, saying that residential is super expensive. Walker said that got complicated quickly.

T. Light thought Energy Trust might have data on that. Cullen said they do and offered to look.

Johnson asked why do this if everyone is expensing. Grist said the 35% is small but there, agreeing that they should not invest too much time and effort in gathering data.

Commercial Fans and Refrigeration (and a few other questions)

Kevin Smit, NWPCC

Jamie Anthony, BPA, voiced concern with excluding measures on [Slide 7] as it may unfairly exclude them for retrofit applications. Chhabra asked if the code covers systems or end-use equipment as equipment will have to be code. Smit agreed, saying this is more about early replacement still getting savings. Smit continued, saying this is covered with the standard and won't show up as a separate measure.

Anthony countered that the RTF had plans to develop the floating heads measure as a retrofit and code wouldn't apply. J. Light confirmed that the RTF does retrofit measures but the Plan does not. Anthony said this should be revisited when we get to the preliminary results slide.

Anthony cautioned that refrigeration systems in the building types on [Slide 9] may not be similar to grocery systems.

Anthony wondered why the measures from [Slide 7] were included in the baseline analysis on [Slide 10] when they should be available for retrofit measures. He cautioned that the 176MW

seemed high and was confused as he heard the Council doesn't consider retrofits. Smit clarified that there are a lot of retrofits but some are excluded.

Paul Sklar, RTF CAT, discussed why doors were considered [Slide 13] and other changes.

Grist asked how to estimate how many freezers don't have doors [Slide 11.] Anthony said BPA found a regional technical potential of 15aMW. Sklar said it would be good to recheck explaining that he used CBSA data to determine this. Smit agreed that in some places the CBSA data was thin but more is coming.

Gerlitz asked why an 85% max was used for all measures. Smit explained that there has been a long-standing big program that has done a lot but not all. Gerlitz asked if there is any data that informs this or is it based on casual conversations. Smit said it was casual conversations. Gerlitz called for more rigor behind what is being used. Smit agreed, saying he plans a measure-by-measure look going forward.

Walker offered to look at ESG analysis. Gerlitz said that would be interesting to see.

Chhabra asked about the broad rules around max achievable. Smit said there weren't rules but they came up with three levels. Grist said they might be higher if a standard or code comes through. Smit said that logic will apply here and more will be revealed when he looks at each measure.

Anthony wondered if the measure on [Slide 20] was for new construction only or included retrofits. J. Light said this will be mid-stream and for any natural replacement. Anthony asked about a HP range. Nate Baker, Cadeo Group, said the measure covers up to 50HP.

Singh said savings per HP which would allow finer tuning. J. Light said the RTF measure will be more granular. Baker said these values are weighted based on likelihood that a particular fan configuration (type, application and size) will be installed in the field.

Anthony asked how the numbers on [Slide 24] overlap with custom projects. Baker said the measures developed for the RTF were capped at 50HP to limit overlap. Grist said expanding that might help pick up industrial applications.

Grist asked Baker if the ability to right size equipment with integrated systems will boost savings [Slide 20.] Baker agreed.

T. Light thought there would be lots of opportunity with fans over 50HP. Smit agreed

Anthony said BPA would be interested in expanding commercial infiltration reduction by building types [Slide 27.] Smit said more window options were coming along with more insulation measures. Anthony hoped the insulation measures for small commercial included

roofs and floors and walls in various configurations. J. Light said RTF work on that will come after the supply curves but window options will be expanded on time.

Anthony suggested exploring Agriculture options for engine block heaters [Slide 30.] Jayaweera said there are circulation block heaters for Ag but offered to explore further. Osborn explained that many farms with multiple tractors are plugged in at the shop so it's not a huge potential.

Smit recalled that Avista has a program like this for school busses but residential light duty is a hard market. Osborn agreed, especially if the equipment was installed after market. Smit clarified that the measure controls a pre-installed unit. Anthony said BPA is keen on this measure and suggested contacting technology expert T.J. Sharkey at BPA for more.

Public Comment

Lazar said there will be a RAP webinar on December 5 about the EPA's report on the health benefits of energy efficiency and renewables.

Chhabra said that better measure targeting will become more important even though it is less convenient. He urged that we, as a community, have to get better at that and looked forward to Council guidance.

Grist ended the meeting at 2:30.

Attendees

Charlie Grist	NWPCC
Tina Jayaweera	NWPCC
Kevin Smit	NWPCC
Mike Starrett	NWPCC
Jessica Aiona	BPA
Eli Morris	AEG
Chris Johnson	Benton PUD
Aaron Leatherwood	Evergreen Consultants
Shani Taha	UCONS, LLC
Mark Rehley	NEEA
Bud Tracy	Consultant for Idaho
Jennifer Snyder	WA UTC
Jack Cullen	Energy Trust
Wendy Gerlitz	NW Energy Coalition
Mohit Chhabra	NRDC
Aquila Velonis	Cadmus
Ted Light	EES Consulting
Danielle Walker	BPA
Gurvinder Singh	Puget Sound Energy
Chris Wolgamott	NEEA

Attendees via Webinar

Aaron Bush	PPC
Tod Amundson	BPA
Bobby Wilhelm	Idaho Power
Brandy Neff	PNGC Power
Michael Coe	Snohomish PUD
Dave Hewitt	independent
David Moody	independent
Elaine Miller	NEEA
Jamie Anthony	BPA
Jeff Harris	NEEA
Jim Lazar	RAP
Kathryn Bae	NEEA
Kerry Meade	Smart Buildings Center
Leann Bleakney	NWPCC
Megan Stratman	NRU NW
Nate Baker	Cadeo Group
Quentin Nesbitt	Idaho Power
Paul Sklar	RTF CAT
Robert Weber	BPA
Ryan Brown	NEEA
Ryan LeBaron	BPA
Shirley Lindstrom	NWPCC
Tom Osborn	BPA
Torsten Kieper	BPA
Brian Dekiep	NWPCC