

Conservation Resources Advisory Council Minutes

October 3, 2014

Northwest Power and Conservation Council

Attendees On-Site

Eugene Rosalie NEEA

Eli Morris, PacifiCorp

Lauren Gage, BPA

George Pohndorf, Snohomish County PUD

Steve Bicker, Tacoma Power

Mary E. Smith, Snohomish County PUD

Craig Smith, Seattle City Light

Kevin Smit, NPCC Staff

Tina Jayaweera, NPCC Staff

Tom Eckman, NPCC Staff

Charlie Gist, NPCC Staff

John Morris, CLEAReault

Nancy Hirsh, NW Energy Coalition

Deborah Reynolds, UTC

Dan Johnson, Avista

Lauren Shapton, PGE

Stan Price, NEEC

Bud Tracy, Unaffiliated

Jess Kincaid, OR Dept. of Energy

Jessica Mitchell, Snohomish County PUD

Jeff Harris, NEEA

Josh Warner, BPA

Danielle Walker, BPA

Hossein Haeri, Cadmus

Shani Taha, UCONS

Wendy Gerlitz, NW Energy Coalition

John McLoy, NW Energy Coalition

Fred Huetten, NW Energy Coalition
Larry Blaufus, Clark Public Utilities
Jennifer Anziano, NPCC Staff
Lakin Garth, Cadmus
Bob Gunn, Energy LLC
Fred Gordon, Energy Trust of Oregon

Attendees via GoToMeeting

Warren Cook, Oregon Dept of Energy
Dave Warren, WA PUD Association
Brian Dekiep, Council staff in Montana
Poppy Storm, Ecotope
Ralph Cavanagh, NRDC
Chuck Murray, Washington State Dept of Commerce
Roger J Spring, Evergreen Consulting
Tom Schumacher, Benton PUD
Christian Douglass, Ptarmigan Research
Travis Walker, Cadmus
Jim Lazar, Consultant
Gurvinder Singh, Puget Sound Energy
Rich Arneson, Tacoma Power
Ryan Firestone, Ptarmigan Research
Lakin Garth, Cadmus
Jeff Harris, NEEA

Welcome and Introduction

Presenters: Tom Eckman, NPCC, Charlie Grist

Tom Eckman welcomes attendees to the CRAC and introductions are made in the room and on the phone via GoToMeeting. The agenda is reviewed and adopted. Eckman calls for comments on the June 6th meetings. These minutes from June 6

are certified and entered. Eckman explains the rules and purpose of the Council and stresses the advisory committee's importance.

Major 7th Plan Development Milestones

Tom Eckman, NPCC

Eckman explains chart 1.7. He stresses several points of interest to the CRAC including a series of financial assumptions, which agrees to use a 4% discount rate with sensitiveness between 3 and 5. Eckman explains the rest of the milestones, including supply curves being set in March. Mary Smith, Snohomish County PUD asks if the supply curve results will be shared in March. Charlie Grist, Council Staff explains that results will be shared for review as they are completed.

Eckman continues, stating that the Resource Portfolio Model (RPM) is under redevelopment explaining that it should be done by the end of February 2015. He continues, stating that in Feb 2015 the Council will put in demand response (DR) supply curves, including load management which will feed into the RPM. The DR side will be part of CRAC's scope. The GRAC will take up generating issues.

The portfolio will be published in August/September, a draft plan will be proposed public comment will close at the end of October. Staff will propose a final draft to be adopted in December of 2015. Eckman calls for questions. There are none.

Supply Curve Development

Goals

Charlie Grist, NPCC

Grist explains the NPCC would like CRAC feedback on the Council's approach to analysis, measure lists, data sources and gaps and emerging policy issues. Lauren Gage, BPA, expresses need for time to provide input on today's presentation.

Eckman states that input will be taken until March and beyond. Grist points to a whiteboard that will handle emerging policy issues that need to be addressed at a later date.

Key Changes from Sixth Plan

Charlie Grist, NPCC

Grist explains changes stressing **New Federal Standards** in place. He points to a report presented by the BPA that about the impact of Federal standards stating that 6000 average megawatts of efficient energy potential was identified and 900 average megawatts will actually be achieved through 2029 from standards, or that 1/6th of the total identified potential has been achieved. Eckman points to a new group of Federal Standards that are on the way.

Grist states that the Council freezes the world as we know it when the plan is done, meaning that only measures adopted by Congress at that time make it into the plan. Federal measures that have been adopted make it into the Council's Load Forecast. Grist mentions that possibly half to 2/3 of the Conservation potential comes from the churn of stock that will be replaced with more efficient models.

Cross-Sector Issues

Grist presents the **Key Questions for CRAC Input Today slide 2.5**

He discusses the fast pace of developments in solid state lighting and what that means for the CRAC. He touches on the 2020 provisions of the EISA general service lighting requirement. He asks about behavior-based measures and which should go into the supply curve and how to account for persistence. He brings up the fast turnover of consumer electronics and finally he asks how to account for federal tax credits.

John Morris, CLEAResult asks why the Council is not addressing 111(d).

Grist says it will be addressed here but we don't know how the Council will deal with it yet as it is out for public comment now.

Solid State Lighting

Grist states that energy efficiency is to be treated as a resource. He reiterates the standards from the Power Act stating that "Energy Efficiency resources must be available and reliable" and like generation resources must be "reliable and available within the time it is needed." He asks how this should be interpreted

and implemented saying that a product or practice must be available, safe, persistent and acceptable to end users. He notes that persistence means if energy efficiency is a resource you must be confident it will stay and produce savings like a power plant and not all energy efficiency can meet this.

Gage wonders if estimating the savings reliably should be part of the definition. Eckman answers that the term “persistent” addresses that. Gage states that you could find something that is “Persistent” that you cannot reliably estimate savings for. Grist points out that this is a good nuance there are things we just don’t know for various reasons. Eckman states that this is a persistence question as well as an uncertainty question about the estimate itself.

Nancy Hirsh, NW Energy Coalition points to availability asking how ubiquitous a new technology has to be before it is included in the Plan and wonders if we can we capture emerging technologies within this definition. She states if a product has to be mass marketed before it’s included we could be short changing ourselves and thinks we should be more inclusive. Grist agrees with the point and as example looks to the Sixth Plan and how they handled the new practice of energy management in industrial facilities. He continues saying that what the Council has typically done was look at the ramp rate of adoption noting that there is an equation for that. These supply curves go into the RPM as potential resources. We put in everything we think could be developed but we don’t decide what is cost effective (within reason) when we put the supply curve together. We let the RPM do its work from there. So we should be inclusive and careful about what we put in realizing that over time it may become less expensive and more available.

Jim Lazar, consultant, expresses concern that this deviates from the statutory direction. If the forecast must be reliable then we need to be forecasting technology and not what is just available today. Eckman answers that that question will come up for the Council about the symmetry of Generating and Energy Efficiency. We’d like to keep them parallel and we’d like your advice on them.

Steve Bicker, Tacoma Power, points out that when we talk about availability, the point is to turn these measures into programs so availability has to be constrained in some way for the program sense. It has to be scalable. Not just available on Amazon. Eckman agrees.

Gurvinder Singh, Puget Sound Energy, asks for clarity on the term availability. He thought availability meant for instance if you installed a CFL it the question would be is it “available when you need it?” not about the actual product being available for purchase. Eckman answers that they would like to look at it both ways, both the shape of the savings and the timing that it is available as a product. There are two meanings. We do take into account load shape that is captured so today’s discussion should concentrate on marketplace availability.

Singh asks, “In making the comparison to generation resource we’re doing a comparison with energy efficiency and supply side as well?” Eckman states yes, we are looking at technology available today and things that might be available in the future.

Hossein Haeri, Cadmus, asks how you separate between truly emerging technologies that are new to end users and ones that are supplanting older technologies. Eckman answers that the Council wants input on that question. Grist brings up that the RPM has some space to test things that happen 10 years from now and other uncertainties.

Eugene Rosalie, NEEA, states that he doesn’t see Solid State Lighting as emerging technology but as evolving technology and would reserve that definition for things like heat pump water heaters or heat pump dryers.

Jeff Harris, NEEA, asks how deep Council wants to go into this question right now. Grist answers that he would like to go into each technology, measure and bundle specificity to mine the CRAC’s knowledge, noting that there is no generic right way. Harris points out that new technology can increase the load and asks if the

Council is planning on looking at that? Eckman says yes we're looking at things like proliferation of screens in general and ultra hi-def.

Solid-State Lighting efficacy trending up while cost trends down

Grist continues stating that efficacy is going up while cost is going down though the Council has historically assumed frozen efficiency. He gives an example, we take cost /per thousand lumens and freeze it. The problems with this is freezing will overstate cost and understate savings even in the near term.

SSL: Proposal

Grist explains that the Council suggests forecasting cost and efficacy changes to 2017 and freezing them there. The forecast would be based on Pacific Northwest Labs' analysis which uses today's costs and trends forward. It would be done by product class and application. Grist asks the room how it feels about the 2017 date. Lazar feels that forecasting to 2017 is probably too conservative. Rosalie feels that 2017 speaks to market penetration rate so he is comfortable with the date. However, he feels the Council should think about market penetration. Eli Morris, Pacificorp, asks how the Council came up with 2017. Grist explains that the DOE charts had solid bands of confidence around that number but they got wider as the years went on. Harris feels that 2017 seems reasonable as the manufacturers have a two-year product cycle. He explains that they are in development on 2017 product now. Beyond that the uncertainty grows for the manufacturer too. It's also the same for consumer electronics.

Mary Smith points out that she doesn't think this is unique to SSL, but asks which numbers become targets and which become utilities programs noting that, "We're imposing targets on utilities that aren't available yet. So we need to see what it means year after year." Eckman states that if you start at 2015 and the cost is going down then the utilities programs might have an easier time. He acknowledges that the risk is it's not and you're stuck.

Craig Smith, Seattle City Light, states that the farther out we look the more uncertain it becomes but can we look within the 5 years of this plan and see what that looks like. Grist says the Council could generate those numbers and look at that. Smith says that it would be useful as things are moving so rapidly. Fred Gordon, Energy Trust of Oregon explains that he's done the same work differently by handicapped emerging technology instead of hedging and came up with similar results. He restates, "So using a different approach we came up with similar numbers." Gage, states that if our forecast is wrong it's going to be hard around utility programs. She wants a word of caution saying if we freeze it we can track it but if we're wrong it's a problem. That said, Gage feel 2017 is a good year but anything beyond that makes her nervous. Rich Arneson, Tacoma says that he would lean toward what is available right now.

Ralph Cavanagh, NRDC states that there are two distinct questions being put to the Council. He thinks no one should assume innovation will stop, but he thinks utilities are saying let's not embed naturally occurring energy efficiency. Cavanagh feels the Council needs to keep these issues separate. Hirsh states that this forum is not about what we can do today. Nor is it the Council's job to be cautious but think about where we're going in the future. She acknowledges the utility's pain, but states that the Council is supposed to show us a path where we might go. If we have a reliable cost estimates out to 2017 we should use it. She suggests using the cost model on CFLs as a template for SSL cost.

Craig Smith asks how to deal with the uncertainty and the nervousness of the utilities when it comes to target setting and their obligations. He notes that they don't have much patience or tolerance for uncertainty.

Hirsh answers that we all understand that adaptive program management is the expertise of the utilities. The Council is not saying we have to get "this much from this technology"; however, our track record is good even when we are aggressive. Eckman points to an upcoming residential lighting discussion later in the day as a place to discuss this further.

Rosalie wants to remind everyone the Council plan directly affects the I-937 utilities in Washington. They are tied to it.

Grist moves to **Market Penetration of SSL**. He says there are not good numbers available. The options are freeze things at known saturations using CBSA, RBSA or DOE information but that is in the stock not what's flowing through store shelves. He states, "That is what we call penetration; how much of the current bulb change market is taken by SSL. There is Bonneville information and ENERGYSTAR information. We could freeze at forecasted 2015 estimates or forecast economic uptake which means a moving baseline." Eckman says that our staff feels using known stock number is wrong. Eckman notes the proxy called the shelf survey but we don't know how reliable that is. There is limited shipment data available on LED product moving off the shelves. In the past we've frozen at a number or account for improvement in both the load forecast baseline and the assessment baseline

Gurvinder Singh suggests using building stock assessment data and adjusting it for any reported activity to get to the number. Eckman answers that we know what's left in terms of sockets leftover. What we don't know is how many sockets will be filled independent of utility programs and how many products we need to target. If you keep it constant the market potential and targets are larger, if you decrease it the market potential and targets are lower.

Gordon states that "two-year-old information is irrelevant; we've set a baseline with retail sales with caveats. If you have small categories the stock survey is no good but we use it if there are bigger categories. There are lots of foibles to stock survey but it's what we have. We know that sales are greatly outpacing what's in the stock. They are not the same number."

Grist says the baseline we have to measure is the market update, Eckman states we've done both; a frozen and a dynamic baseline. "We know how to do it but we don't have the data to do it well."

Gordon says they don't forecast future baselines using stock because there is a lot of discrepancy in product. Some LED's are better than others and there will be a backlash against the bad stuff. He suggests promoting the better product. He notes that his organization suspects that sales will grow independently of us but acknowledges he don't know to what degree. Eckman asks if they keep the baseline constant. Gordon answers, yes as a share of sales.

Rosalie disagrees with Gordon saying the different markets react differently. He points to the commercial market where the LED experience has been good. He has no study to show it but he feels that it's true. In the commercial market like street lights and retail they see a big uptake in LED because they are a better solution than CFLs. While the Council should take different markets into account Rosalie understands that for the sake of symmetry if you forecast to 2017 for one you must for the other. He suggests putting in a backlash factor and instead of predicting a 10% increase, predicting a 5% increase.

Federal Standards

Tina Jayaweera, Northwest Power and Conservation Council

Jayaweera notes that Federal Standard impacts can be significant. She explains that she pulled data from the DOE site and notes that their process is rigorous.

30 New Federal Efficiency Standards Take Effect this Decade

Jayaweera shows slide 2.14 which lay out 30 different standards that will come on line between 2009 and 2019. She notes that this is much more than in the last decade. Eckman states that the DOE has statutory requirements to review these standards every 6 years and that there was litigation and now the DOE is court-ordered current. As a result these 30 standards are coming and they are big.

How We Account for Standards

Jayaweera states that the Council assumes any final enacted standard will occur at the stated effective date. The DOE generates National Impact Analysis (NIA) workbooks to assess energy savings and costs and determine the level of higher efficiency tiers. Finally the Council will incorporate the impact of the standards

into baseline forecasts as well as a measure list. Eckman adds that the DOE must look at the highest level-- Max Tech--first and then move down.

Standards Example

Jayaweera uses a new standard for microwaves as an example (slide 2.16). The DOE looked at 5 levels and set standard at level 3 for 2016. She concludes by saying this will determine the supply curve for microwaves.

Lighting Under EISA 2007

Jayaweera explains that under the Energy Independence and Security Act (EISA) lighting standards have changed. In 2020 a new standard requires 45 lumens per watt and CFLs is the minimum tech that can reach it. Halogenas cannot meet the 2020 requirement right now. So what do we do for the years between 2016 and 2019?

EPA 111(d) – A Complicating Factor

Jayaweera explains that 111(d) is a proposed state-level carbon dioxide emission guideline for existing generation units. She notes that there are four points to attainment, stressing point four: increase demand-side energy-efficiency. Finally she states that compliance begins in 2020. They are in proposal now and are scheduled to be finalized in June of next year. She states that there is a period between now and 2019 when what you do may not help your compliance for your EPA 111 (d) requirements. This changes the risk and value equations. And it especially affects the lighting standard coming in 2020.

Steve Bicker, Tacoma Power asks if the process will not recognize existing work being done. Eckman answers that the EPA has heard comments about this measure effectively putting the breaks on current energy efficiency programs if they get no credit. But given that understanding, we still have to answer the question of what to do about lighting. Bicker asks, “so you are assuming we will not get credit for early adoption?” Jayaweera says no we are not assuming that but there is that question of what’s the risk, what’s the uncertainty.

Mary Smith states that there is talk that the EPA would recognize any efficiency accomplished beginning the date of the publication of the rule. Measure life is another issue. Lighting is a short measure life so it won't be around in 2020. Others have a longer measure life. Charlie Grist brings up Mary Smith's point saying that the power plan is addressing efficiency as a resource. He states that savings between now and 2020 last for 5 years and after that, the EISA bulbs are in the forecast.

What to do in 2016-2019 for Lighting?

Jayaweera states that it is a balance and asks what do we put in the supply curve and what do we put in load forecast?

Standards: Discussion and Issues

Rosalie asks if the Council is only discussing LED technology at this time. Grist answers that we're talking about whether there is a piece in the supply curve that has conservation potential that we could cost out but would only last between now and 2019? Or do we say that's going to happen on its own so let's look to 2020 only. He continues saying that the Council addressed a similar issue in the Sixth Power Plan when looking at CFLs.

Cavanagh agrees stating that these are cost effective savings on the short term. He notes that there are a lot of sockets with incandescent lamps in them now. However he feels that the Council should not treat 2020 as a certainty noting that it is controversial and contested because of product claims. He continues stressing the inherent confusion that comes with LED lighting noting that the public will have to be educated on factors like warmth and coolness of light. He finishes by saying that he hopes and assumes that a federal standard will come in 2020 but it is not a sure thing noting that there is a potential utility contribution to locking in the standard and stressing the tremendously cost effective savings.

Bicker states that this discussion surprises him as the logic model has been that the utility programs help us ramp up to the new standard and at that point we lock it in. It is common dogma and the way we think about our business.

Mary Smith states that she thinks it depends upon the risk. Will the standard be “undone” or successful? Eckman states that there is the potential of Congress updating the standard. Mary Smith asks if there is some way to parse out the different lighting technologies realizing it would result in a very complex equation. Eckman says the RTF has struggled with this question noting that there is no data on what the consumer is replacing. Mary Smith asks if the manufacturers or distributors might be a source for data. Eckman replies that they (manufacturer and distributors) don’t know either. John Morris adds that he thought RBSA data does address this issue. Eckman explains no, the data doesn’t tell us what the flow is, noting that the consumer may be replacing a CFL or an incandescent. There’s no sales data that tells us. Mary Smith asks if anyone knows how big this resource is. Grist answers that they didn’t look at the quantity. They did do some cost effectiveness analysis and it does look cheap, even at a five-year life. Mary Smith asks what baseline was used. Grist answers halogena.

Gage states that there are factors to encourage including this in the supply curve. She points to the Fleet Average Concept that adds uncertainty adding that there is also uncertainty around R&D for halogena compliance. Finally, she states that it is unknown how EISA will affect specialty lighting.

Harris points to bullet point three in slide 2.20 **What is the value of regulatory compliance?** He predicts there will be a Congressional backlash in 2020 to the EISA standard for general purpose lighting, but wonders what we can do to create market momentum to combat that eventual backlash. He continues saying there will be a risk reduction factor in the PNW and other regions in the country that will make this a non-issue. He restates that if we move the market fast enough there will be no need for incandescent bulbs and when 2020 shows up there will be no need for Congressional intervention. He sums up by asking what role this

Power Plan can play to reduce the risk of that Congressional backlash. Grist answers that that's a risk. Harris agrees that it's a risk.

Rosalie calls for simplification. He says there is good case to go forward and include the resource in this plan on just the basis of cost effectiveness, market transformation and the ability to lock in some standards. He sums up that there is enough here without worrying about Congress in 2020.

Mitchell states that moving the baseline concerns her because: as the amount of savings we can book on a preexisting basis decreases so does our ability to intervene in the market. LEDs are more expensive than CFLs.

Deborah Reynolds, UTC, brings up RBSA data stating that 1/3 of the bulbs being replaced are CFLs. Eckman explains that 1/3 are not yet EISA compliant and 1/3 are not yet covered by EISA because they are specialty lamps. Reynolds states that the Council needs to be careful when calculating cost effectiveness. She hopes there will be a way to gather data on what LEDs are replacing especially in this four year period. She continues stating that she is working on 111(d) comments for the state and they are asking if there is some additional compliance being imposed by these standards. They are looking at tools and programs already in place and ways to augment them. For Washington it's all cost effective conservation that's available, reliable and feasible. She stresses that 111(d) doesn't change it going forward. Lazar adds that in the short term LEDs will replace CFLs so in effect the LED is replacing a lower efficacy lamp.

Eckman summarizes the group's general opinion that it's not whether we are going to see the savings and pay the cost and reap the benefits of them. Instead it's a question of whether we have rate payer-funded activity to make them happen. What he hears is the consensus that we will have rate payer-funded activity to make them happen, even if they would have happened otherwise because the risk of not doing so is too high. And it ought to be in the supply curves and not in the load forecast.

Mary Smith disagrees that there is consensus stressing that there is risk that the utilities will take a financial penalty for an after-the-fact evaluation that shows that LEDs didn't go where they were supposed to. To solve the problem we need flexibility and recognition in the target and penalty mechanism to recognize the utility's intent. We do agree with the risk on the adoption of the standard but we can't take on the financial risk. Bicker agrees with Mary Smith pointing out that for many of us that do their own CPAs there is a risk mitigating opportunity every couple of years. So we can make adjustments if the stock isn't what we originally thought. But it does make sense to have the option to have them in the supply curve. Eckman interjects that from a total resource cost perspective it doesn't matter. We will pay the same price. It's just a question of who pays what part of it in the region. We get the same benefit and the cost is the same. It's not a political issue for the Council from that perspective. Mary Smith says who pays matters. Eckman agrees but states, "It matters a lot more to you than it does to us."

Harris says analytically from a power planning standpoint this is a hedging strategy. Yes it's in the EISA standard to take effect in 2020 but there's some risk around that along with near-term value on the way to reducing risk of a 2020 failure. He then asks how this gets treated analytically compared to other resources that are not subject to a standard. Eckman answers that there is presently no modeling capability to separate that out. We will test uncertainties about getting levels of efficiency but the narrowest level we can test right now is if it under performs or over performs compared to our expectations, just like any other resource. Harris adds that it seems like a good test case for a new tool set.

Grist stresses that if between now and 2020 if LEDs are applied to EISA compliance bulbs they look cheap, if they replace CFLs they look expensive and you wouldn't buy them as a resource in the short term. Deborah Reynolds asks what the tipping point is. Eckman replies that the Council can figure that out.

Gordon asks the Council to not "nerd out" on the tools. Get some threshold tests, if the CFLs are cost effective you know the risk is low and if it's a 20% chance or an 80% chance that EISA fails it doesn't matter. Detailed modeling is important when

you have marginal propositions. Save robust analysis to something closer to the margin. This isn't it. Eckman answers that they can do a calculation to see what wattage differential needs to be there and what saturation of CFL replacement would create a baseline that would be a problem. Tina Jayaweera brings up LED or CFLs that have a TRC of 2,3, or 4 at 12+ year EUL. When we are dealing with the short term we don't have a 12+ year EUL, we have a four-year EUL and that makes the answer less obvious. Eckman says that's over the tipping point. Jayaweera agrees.

Behavior-based Programs

Grist explains the levels of behavior based programs which include providing information, training, feedback and funds. The Seventh Plan programs will include Agriculture and Scientific Irrigation Scheduling (SIS), Industrial, Commercial which includes emerging work in Strategic Energy Management (SEM) and Residential. Grist then asks do these measures meet the Act requirements of being reliable and available. He also defines Conservation stressing that there needs to be an "electric power consumption" reduction to meet the definition. Eckman adds that there also must be an "increase in efficiency" or it doesn't count. Eckman stresses that both must be present

Grist then asks how the Council accounts for the persistence (or lack thereof) of these savings. He asks if there is data to quantify the savings and what are we missing.

Grist then presents the Council's proposal (slide 2.24) and asks for input.

Lazar asks to back up to the previous slide (2.23). He asks about "increasing the efficiency of energy use." Does efficiency mean lumen hour per kilowatt hour or "utils" per kilowatt hour? He explains that everyone agrees turning off the light when you leave the room is a good idea but it doesn't change the lumen per kilowatt hour but it does change the number of utils in terms of wellbeing. So how does the Council define the word efficiency of energy use? Eckman answers that we are taking input on that. Grist asks Lazar to explain an "util" Lazar says a

“util” is an economic measurement of consumer wellbeing, how much satisfaction you get from what you consume.

Eckman give some background on the issue saying that historically they’ve defined energy efficiency as a productivity improvement meaning we are getting the same or more output from the same or reduced kilowatt hour input. So it’s per unit of output. Therefore, the consumer could see the same utility function they had before but we reduced the amount of kilowatt hours to produce it. As example, Eckman points to controls that turn off lights automatically, noting that they would be acceptable efficiency because there is no loss of utility function even though there is not an increase in lumens per kilowatt hour.

Lazar says that conversely turning down your thermostat so you’re cold in order to keep your report in line with your neighbor does involve a sacrifice of well-being.

Hirsh says that commercial, ag and industrial behavioral programs have been in place. They focus on training, skill development and education. In essence that is what we are talking about, training and educating residential customers to operate their home more efficiently. She sees them as equal in value and should be included in the plan. She points out that on the commercial/industrial side there is persistence in O&M and Recommissioning. She admits that there is some drop off but you assume some persistence of savings in those programs. She feels that the same could be true on the residential side so she doesn’t want to bias on the notion that residential customers will not behave like corporate customers.

Hossein Haeri adds a comment about the definition of behavior-based programs. He points to past Power Plan questions about SIS and says to solve it they put out criteria that clarified it for everyone. He wonders if we are “there yet” with residential behavior-based programs. Do we have a concrete definition standard for them? Eckman states that evaluations have attempted to determine what was behind the occupants change in consumption. And what of that might be persistent? Haeri asks will we count behavior-based programs as a resource if

they show savings over one year or three consecutive years. Eckman answers that the proposal will ask for an ongoing check to see if it's still there. Haeri then asks once it is included in the Resource Portfolio what do you do in the second year? Eckman explains that it is an annual savings like the O&M, so if it doesn't persist it doesn't accumulate. For instance if it's 1% of load one year it would have to be 2% the following year to accumulate. Haeri asks if this would create problems for resource and system planning. Eckman answers, yes every year that it's on the potential side they have to try to get it again.

Gordon asks, how do we know what is an util for people? We shouldn't go into it unless someone is doing it to them; for example, a landlord turning the heat down on a tenant. Eckman states that the proposal steps back from Nanny-ing and asks "is it persistent?" So we measure persistence. Gordon answers that he likes the proposal. Gage asks Gordon, how are you handling residential? Gordon answers, "A lot like the Council is proposing. We are not assuming a very long life for programs; we're coming up with a persistence curve based on data from around the country. We are trying to model the resource over time. We don't assume it's there forever unless we re-intervene and re-intervene. The point is we are dealing with it as a resource with a finite life."

Kincaid states that the reason she wants to draw a distinction between the O&M and the C&I stuff is that residential consumers are not logical market actors. And there are often not enough good numbers to do effective calculations. So it's hard to figure out the occupancy of a house or if they get a new plasma screen TV and to try to come up with an appropriate algorithm to manage that over the service territory. It is challenging. Is there enough information for the RTF to give us a measure that we could turn to rather than have to do these calculations over and over?

Mary Smith asks if smart thermostats would fit in the supply curve as a behavioral or as a measure. Eckman asks what she suggests. Smith speculates that the Nest Thermostat will know data like room temperature and if you are watching TV.

Rosalie says he doesn't know of any in-home devices that have proven to save anything. "I think they are beneficial but as far as including them as a resource in the Plan that's the wrong direction. Also Home Energy Reports exclude many utilities especially smaller utilities because they don't have enough participants for evaluations." Rosalie continues saying that in the Industrial Sector he knows of no way to measure the effects of training. He also questions whether you can measure persistence in the Industrial and Commercial sectors. He points to the Strategic Energy Management Programs put out by the BPA that show a change in management or direction can put programs on hold. People are trying to solve this problem to measure and ensure persistence but he thinks we need to be careful how far we go down the line.

Harris goes back to slide 2.24. He states that it is a viable method to ensure persistence. He notes that in the Commercial and Industrial Sectors there is a built-in profit motive and strategic energy management that can align with built-in business drivers. He says these create a system that doesn't require utility re-investment. Harris then asks is the Tracking and reporting mechanism to us, us being the efficiency community or is it an internal feedback? Grist answers both, noting that's why Strategic Energy Management made it into the Sixth Plan. Harris replies that he thinks that's fundamentally different than consumer behavior, where reinforcing mechanisms are obtuse and harder to say they will be available forever.

Gage says that her work shows that industrial savings seem to be there, but persistence remains a question. She would like to raise caution on the commercial side. On the industrial side savings are big so they can be measured. Eckman asks will the commercial side be "too fuzzy?" Gage says yes, too heterogeneous, you can't do it building by building and you can't pool it either. We can get estimates on the industrial and residential side but she would be really cautious about overestimating the ability to hit that market.

Price comments that he feels positive about being as inclusive as possible in relation to including behavior measures. So much of what we do is built around

uncertainty. When we get to behavior measures there are two certain aspects; we are going to let people in buildings and they are going to influence use based on their behaviors. When we look comparatively there are problems with this just like there are problems with everything we've talked about today. He says the "squishiness around the edges" is not unique to this resource but unique to everything we do. Based on that he doesn't agree we should set the measure life conservatively.

Haeri states that the "fuzziness" relates to definition and program design. Energy management programs cover a wide spectrum of activities and functions. They range from a program that says you have to have an energy manager on site all the way to programs that require on-going measurement, calculation and tracking. It's not clear to me that these programs constitute the same measures.

Bud Tracy, points to his experience with smaller utilities and suggests when looking at efficiency you should follow the money. Success from a philosophical standpoint is hard to measure from a historical perspective. He then points to Rosalie's questions suggesting looking at a firm resource like persistence which is a capacity measurement and not an energy measurement. Finally he suggests that if you want to make a residential sector program work you should educate the women of the house.

Rosalie thinks that we should look at these programs more as infrastructure rather than widgets. He points to the Home Energy Reports, noting the value of having constant touch with the end user. The same with training if you train people you have an infrastructure; maybe you can't measure it but it has value. Sometimes we worry too much about how we're going to measure the kilowatt hours. He states that for the plan we have to but for the rest of us it's having the infrastructure in place, having trained, and willing people in place that want to do energy efficiency. He also notes that tracking and reporting tools are important too. He sums up by saying behavior gets to infrastructure. Steve Bicker agrees with Rosalie saying that just talking about Net Market Effects and Non-Programmatic savings is testimony to the fact that we all believe on some level

that we're putting something in place that will have a sustained and expanding impact.

Hirsh then asks Rosalie if he would include these in the plan or not. She agrees that they are important infrastructure that the Council shouldn't ignore. But we need to include these comprehensively. Do we need a different set of metrics for how we measure behavioral programs in their entirety? It might be a different formula, a different methodology. Rosalie agrees saying it is a different formula and methodology and it's getting away from counting the kilowatt hours as the golden ring. "We have to value the infrastructure."

Kincaid adds that that's how the RTF could help us, if they put a value to it then we could add it to the plan in a meaningful way instead of trying to figure out individual consumers' purchases. Grist says that's what the RTF is trying to do. Kincaid says the RTF could do it once and then we quantify it into the plan. Otherwise it's a burdensome calculation.

Craig Smith states that there is variability in the results. He questions what everyone gets in their Home Energy Reports. Rosalie says they get 1% Craig Smith reports that he's seen everything from 0.75% to 3.5% and says they are up at 3% over a several year period. He continues saying trying to glean anything from that will be difficult.

Singh says this discussion has been about whether this resource is reliable. He notes the uncertainties with some of the aspects of the measures. However he asserts that we haven't got the data and he doesn't think that RTF has reliable data on the confidence of savings as per residential behavior programs. He notes that it's challenging. When a Utility has to make decision on purchasing supply side resources and you ask if the residential programs will produce 100 megawatts in 5 years it becomes an issue of confidence building. So anyone who has to make decisions from Plan this is critical. So having more data and certainty is important and he's not sure if this is the plan where the behavioral programs make it.

Eckman breaks for lunch

Consumer Electronics

Grist talks about Consumer Electronics noting that in the Sixth Power Plan televisions, computers, monitors and network control of PC in offices and set-top boxes were included. He mentions that these technologies change quickly with lots of rapid product turnover leading to short term savings. Both the TVs and the Set-top boxes have been transformed to efficient options. He poses the question; do we include computers, monitors and network PC control in the Seventh Plan?

Consumer Electronics: Modeling Approach

Grist points out that there are no Federal Standards on these but there is ENERGYSTAR specifications. The Baseline forecast accounts for changes like desktop computers being replaced by laptops and tablets. The proposed approach for the Seventh Plan includes using ENERGYSTAR calculators as an estimate of savings for desktops and monitors. Grist also reports they plan to use RTF UES for network PC management and freeze savings assumptions. Grist reiterates that the plan will probably not include TVs or set top boxes.

Gage asks for clarification about set-top boxes. Eckman explains that set-top boxes are being covered by a voluntary agreement between major manufacturers and users, i.e. Comcast, Time Warner Cable, etc. The agreement is overseen by a board to ensure that efficiency of set top boxes meets ENERGYSTAR 5. The next round should bring them to ENERGYSTAR 6 specs. So the players are committed to having all of their replacement stock meet ENERGYSTAR levels on a fixed time frame. Also they will annually produce what their kilowatt hour consumption is per customer. That is a 6-year negotiating agreement of renewable. They are still in negotiation about being able to tighten the standard. Right now there is not a “deep sleep” mode covered in the product but that is a next nugget to get to. This is in lieu of Federal standards.

Harris comments on TVs stating that we are trying to get the Council data on forecast of shipments of ultra-high def TVs as a rapidly emerging trend. These screens are a different product than the standard high def. They currently consume between 2x and 4x of the energy at a given screen size of a standard high def TV. There is a range of two-to-one in efficiency for these TVs. We think this is a live topic for ENERGYSTAR. We think this product is going to replace standard def TVs in a short amount of time. So we will send you shipment data and weighted average usage for you to consider. Grist says that will be helpful. Harris continues saying that there is new technology in glass that will allow for a 100 inch panel that's the same cost as a 60 inch panel. So those two trends will shove sales to much larger units. Someone asks for clarification of the 2-4 times energy consumption. Harris explains that the units have 4 times as many pixels so depending on how they are built they will be much more energy intensive.

Someone asks what we assume the rotation will be for set-top boxes, Eckman answers a three to four year rotation. Eckman states that there is a trend to single box to multiple clients in the house and that is driven by the manufacturer and distributor because it gives more consumer benefits. And these will be replaced by Smart TVs that don't need a set-top box. It's integrated into the TV. Grist adds that that was one of the factors that drove us to leaving TVs out for now. Eckman says that all of the major TV manufacturers are offering this now. Grist calls for more comments noting that there are many trends to consider including television watching on smart phones.

Federal Tax Incentives

Grist explains the slide mentioning the three efficiency measures that benefit from federal tax benefits: Customer side PV, solar water heaters, Ground-source heat pumps. Grist notes that 30% of cost expires December 31, 2016. He asks the Council if we should account for this credit in the cost-effectiveness analysis. He stresses the difference between Federal tax incentives vs state incentives noting that Federal dollars often do not make it back to the Federal tax payer in the same pace they paid it.

Grist explains that the Council always uses a “total resource cost” approach to meet the requirements of the Regional Act and says it may make sense to include the Federal Tax incentives. Jim Lazar asks if this includes all the resource related benefits no matter who receives them. Eckman answers yes.

John Morris, ClearResult, asks for clarification about “assure economic for the power systems and the region as a whole.” Eckman explains that if it’s good for the system then it’s good for the region as a whole. Eugene Rosalie asks why bother? Eckman replies that that is a good question considering the magnitude; it’s a one-year, component measure. Rosalie states that solar pv, solar water heaters and ground-source heat pumps never come out as cost effective even without adding the 30%. Eckman states that in some of our high futures we see them coming to that level, but not many. It’s a symmetry question with generating resources because we have included them in the past so should we include them at the customer scale. Rosalie votes, “why bother”. Eckman acknowledges this and states that on the Generating side it’s a one or two year benefit as well. So they are limited in duration and uncertain in the future. Grist adds that you have to forecast these things and the Feds change things all the time. Singh seconds it because on the supply side you’re probably not going to build anything the first year.

Summary of Issues and Data Needs: Cross-Sector

Grist discusses that he has touched on this. The rest of the day’s agenda is set.

Residential and Agriculture

Residential Sector – Approach, Methods and Measures.

Jayaweera begins the presentation stating that much of the content has been covered earlier. She plans however to go deeper into Federal Standards and discuss the available data. She will talk about methodology and updates from the Sixth Plan. She will talk about changes to the measure list and data gaps as well.

Scope of Residential Analysis

Jayaweera notes that there are 17 measure bundles and 638 measure permutations.

Source of Data

Jayaweera touches on the many sources of data from the NIA workbooks, which she calls a “treasure trove”, to RBSA which the Council will enrich with sales data and market trend analysis. She also says the Regional Technical Forum (RTF) is a source of data for savings along with program tracking data and evaluation reports.

New Federal Efficiency Standards (Residential Only)

Jayaweera presents the Federal standards. She notes that many new standards come on in 2015.

Potential New Standards

Jayaweera discusses standards that are in the works. She draws the Council’s attention to two standards that may come on line next year: Dishwashers and Ranges & ovens hoping to harvest early data.

Residential Building Stock Assessment (RBSA) and Metering

Jayaweera expects to get good data about saturations from these sources as opposed to what was done earlier. In the Sixth Plan and earlier, approximations were made based on vintage cohort and current code. For the Seventh Plan the Council is using consumption data and RBSA metering to develop and update load shapes. These load shapes will enable us to value both the energy and capacity.

RTF Work

Jayaweera explains the Regional Technical Forum work. She says that the Seventh Plan will tap heavily into this work. She says that the RTF has made internal advancements in how it estimates savings. This includes updating the modeling approach from SEEM to SEEM96. She states that SEEM’s updates allows a better look at heating loads.

Methodology (Units)

Jayaweera discusses the fact that to do an assessment you need cost & savings and number of units. The Council is working on forecasts on the number of homes by state and by building type in the region both new and existing and square foot information. She notes that we tie the turnover potential to those load forecasts. She points out a difference for this Plan is the splitting of multi-family into two segments: low-rise Multifamily and high-rise Multifamily. For the high-rise the residential side is mostly concerned about widgets, i.e. appliances, while the multifamily on the commercial side we are more concerned about the building shell and common HVAC and lighting systems.

Rosalie notes that in Portland the trend is to demolish existing homes to build a larger structure. How is that being accounted for? Eckman answers that a demolition factor is in the load forecast that removes existing stock over time at the per-unit level. He also notes that new units coming in are scaled larger. Rosalie brings up the trend in Portland and Seattle of leaving one existing piece intact, building a much larger structure and calling it a “remodel.” Rosalie wonders how the model would capture this. Grist calls this phenomenon an “economic demolition” and says the old model would not capture it. Eckman says the demolition rates were calibrated to census data. He admits that if that has accelerated we are going to miss it. Jayaweera calls for better data to inform this. Eckman says that they will look to 2020 data. Bicker states that if the homes are being replaced at a rate that is greater than the demolition you won’t see it in the data but it will be more energy intensive if they are bigger. Eckman answers that the appliance stock is counted separately so it’s mostly the conditioning units that come into play. Rosalie agrees.

Hirsh agrees with the Council’s decision to split multi-family into low-rise and high-rise stating that this is a bigger factor on load considering the expansion of urban redevelopment. Eckman agrees stating that high-rise look very different than low-rise. He goes on stating that in RBSA we have the data. He also notes that the phenomenon is limited to Seattle and Portland.

Methodology (Costs & Savings)

Jayaweera states that the method is a bottom-up approach. The equation for achievable savings potential is number of units * kWh savings per unit * achievable penetration.

Change in Calculation Approach

Jayaweera reports that the residential supply curve workbooks look more like the Sixth Plan's commercial workbook. This means the Council will look at an annual stock turnover e.g. washing machines. This is a change from the old Plan's method of looking back from the 20th year. She hopes that this will achieve some consistency.

Eckman adds that the methodology will not change for 1937.

Gage asks about the measure interaction (Option 3)? Charlie Grist answers that the Council is proposing using the RTF work.

Key Measures from the Sixth Plan

Jayaweera discusses what is changing in the new plan. She notes that residential lighting is changing as discussed earlier in the day. Jayaweera moves to shower heads stating that we have much better saturation data on low flow units. She continues saying that the number is much higher because of program activity. Reynolds asks about the number of electric water heaters. Eckman and Jayaweera answer that the number hasn't changed much.

Key Measures, Continued

Jayaweera continues by discussing weatherization and ductless heat pump activity. She points to better data for both.

Measures to Drop

Jayaweera tells the group that the Council is considering dropping three measures: efficient electric water heater tanks, TVs although she points out that the coming of Ultra-Hi-Def may change that, and Set-top boxes.

Potential New Measures/ Measure Data Gaps

Jayaweera points to the new measures to be considered noting that some have RTF savings associated with them. She draws attention to four: Behavioral, lighting controls, home automation and VDS for well pumps noting that there are significant gaps with them and calls for data. Gage brings up controls asking if the Council is seeing technologies for this. Gage notes that there is already security controls but wonders about efficiency controls that focus on consumption reduction. Jayaweera brings up the Hue Lighting System by Phillips comparing it to the Nest. Deborah Reynolds asks if this is like day lighting controls. Jayaweera answers perhaps, noting that there are a lot of questions around it. Eckman notes that all LEDs are chips which means they have an IP address and can be controlled from anywhere by anything. He also notes the trickle charge to keep the IP address alive, noting that it's a lot to keep track of.

Jayaweera brings up home automation calling it a catch phrase noting that there are many questions about it including what does it mean and how much does it save.

Summary of Issues and Data Needs: Residential

Jayaweera sums up the Residential issues and data needs. She calls for input. Eckman broadens the call asking for emerging technologies that might be included in this plan. Gordon brings up lighting controls and whole home systems including remotes. He states that the cost of a dimmer with LEDs has dropped significantly.

Harris brings up media servers noting that the wireless network equipment has grown in size. In anticipation of "the internet of things" server manufacturers are making them the size of a cereal box. Their energy consumption is also growing proportionately. There is also the idea that wireless router will be hung off of

them. This is not a huge thing at this moment but there may be a constant load of 50 watts. Eckman states that this perhaps should go in the Load Forecast.

John Morris asks if home automation includes home energy management systems. Jayaweera answers that it could.

Kincaid asks about demand/response supply curves. She wonders at the RTF level, particularly in the residential sector if there is consideration of the effect of direct load control response on the effectiveness of highly-efficient devices. Eckman answer that there is on-going research on heat pump water heaters and direct load control. Lazar adds that in valuing these measures he notes that it's important to not count capacity savings twice. Eckman agrees. Grist address Kincaid's original question stating that the RTF has not taken the issue up.

Jayaweera follows up by noting that the CRAC website will include the measure list

Agricultural Sector

Key Measures from the Sixth Plan

Jayaweera discusses key measures from the Sixth plan, noting that there will be RTF updates. She points to Scientific Irrigation Scheduling (SIS) noting that it is big. She addresses CRAC members who are also on the RTF stating that there is much discussion about SIS's savings and baseline. She notes that this is not what today's discussion will be. The question for today will be the water spreading issue.

The Water-Spreading Issue

Jayaweera explains that in some regions of the Northwest the water savings applies only to that crop. The water they save will be applied to another use and therefore the saved energy will be used elsewhere. She then poses the questions "Should irrigation measures that result in water spreading be considered conservation?"

Conservation or Non-Energy Benefit

She states that there are two ways to look at the issue; as a conservation resource or as a non-energy benefit. She discusses slide 3.21 which breaks down the two options.

Sixth Plan

Jayaweera points to the Sixth plan and notes that it only considered irrigated acreage in the Columbia Basin Ground Water Management Area (CB GWMA). She notes that the Council suspects that SIS is going on outside of the CB GWMA. The question she poses is “What do we do about that?”

Should Supply Curves Include Irrigation Savings for Ares Where Water Spreading is Likely?

Eckman states that this could be a cost effective measure that does not reduce load so then it's not a supply-side resource. Lazar states that unless that new load is irrigation. He says this is a utils question stating that if the same amount of water can grow twice as much crop with the same amount of electricity then that is an improvement in efficiency of energy use. Eckman interjects if we knew why loads were growing and if it was because of new irrigated acreage than it would be an easy equation to complete. Grist states that if you can demonstrate that the additional load would happen if you didn't improve efficiency. Lazar points to downstream benefits to water being left in the river or macro-economic benefits to that water being put to beneficial use.

Cavanagh notes that if the water stays in the river then there is additional hydropower. He asks if that has been counted. Eckman answers yes it is half the benefit of SIS savings. Cavanagh asks if that is valued at the wholesale rate. Eckman answers yes that as we value all of our savings it's at the avoided cost of market purchases plus market premium plus risk analysis plus everything else that goes into the resource portfolio model. So the short answer is risk-adjusted value.

Rosalie states that he agrees with Jim and Ralph but brings up that just doing it on 7 million acres is not right because it depends on the crop. He admits that he

doesn't know how to do that. Eckman states that there are estimates in the existing system on how much water individual crops take. Rosalie states that you have to know how often the crops are being planted. Eckman says yes and that we have little new information on that. Jayaweera reiterates that there are estimates of what crops there are in the region.

Rosalie then brings up the addition of AgriMet weather stations in Southern Idaho that would bring the potential of SIS to that area because there would be more access to the data. Therefore he thinks we should not just consider SIS in the Columbia Basin but more broadly in the region.

Gordon makes the analogy that if "the water is the factory and we can produce more crop with that water" he can stretch his mind around it. But he brings up places where Reverse Spreading doesn't work because it's one big hardpan and if you put less water in one spot they have to put more water on the neighboring farm because the water table goes down. Therefore it still doesn't apply everywhere. Eckman states that there is a calculation that deals with water that is not used that stays in the river and water that is used getting back to the river. This is important in WA where there are return flows that come back two dams down so we miss some of the hydro potential. But we don't have this information for the Klamath area because there is no resource below it. Eckman continues stating that in Idaho it's common to under-irrigate because they don't have enough water at present. Therefore if they adapted SIS it would increase water usage rather than decrease it. They would grow better crops but they don't have enough water to grow the crops they have now as productively as they could. It has to assume that any new acreage that they put in would have gone in anyway.

Grist adds that on the flip side if you're a resource planner for a utility and you are deciding on entering a new contract or buying a generator you can't count on this with regard to offsetting that need for new generation.

Rosalie suggests looking to experts on the ground like consultants and the BPA with a special session.

Haeri brings up the SIS working group. He points to the old study that says taking all of the acreage would be overstating. He notes that in high irrigation season the pumps run 24 hours a day and this is not because the crops require it. He says there are other reasons like stabilizing soils and etc. so that needs to be discounted. Eckman adds that the baseline level of SIS and the acreage includes this.

Grist reminds the group that in the Sixth Plan we only used this in the Columbia basin so if we expand it there is a whole lot more efficiency potential than we thought. Eckman brings up the one-year measure life.

Tracy expands on Haeri's statement saying that SIS is limited by the two sources of water: river and ground. He thinks for the most part users will apply more water to existing acres and not expand. At the same time, he also thinks there will be some expansion.

Data Gaps

Jayaweera points to important data gaps stating that the number of units is based on national data instead of regional. She also notes that there is no recent stock assessment to gauge baseline saturation. She calls for data from the group.

Hirsh asks where under new measures does the Washington cannabis crop fit in. She asks is the water, HVAC and lighting load included under commercial or ag? Grist poses the question to the group, "what meters are they on? Industrial, commercial or Ag?" John Morris answers that in Colorado they are commercial. Eckman says the predominate one is lighting and there might be vsd's on the pumping system and the HVAC is significant as well. Tracy brings up the morality of supplying an illegal crop. Hirsh states that in Washington it's legal and we want it to be as efficient as possible. Grist notes that it would be tough for the utilities to have program activity in that area due to Federal laws. He continues stating that only IOU service territories would get conservation targets.

Commercial Sector

Scope of Commercial Analysis

Kevin Smit states that most of the heavy issues have been covered earlier. He speaks about the 50 measure bundles. He also notes the many permutations of the measure bundles.

Methodology

Smit discusses the methodology noting that units are driven by building segment floor space. These include a load forecast model that provides square footage by year and segment and states that square footage is driven by employment. He explains which measure bundles are population driven.

Data Sources

Smit points to data sources stating that the new CBSA will provide better data than was previously available. He notes that equipment regulated by federal standards provides data as well as equipment of process driven data from the EPA, State Agencies and so on.

Commercial Building Stock Assessment (CBSA)

Grist explains that NEEA is sponsoring this assessment and analysts are still in the field. He stresses that for the first time it is a random sample which is great. He notes that there are 850 sites in the sample with 464 site-level data points. This makes it rich and there is much detail in lighting which will aid the conservation potential assessment for lighting particularly for Solid State. He also notes that there is good data on HVAC. Grist says the characteristics data is due the end of October. He asks the CRAC members for billing data. The goal was to have monthly billing data for all 850 sites and as of now there is barely 40%. He says it will take work from utilities, Bonneville and others to get access to that data. Without that data we would have to go back to our previous version which was not a random sample and is old.

Grist points to the slide's last bullet "higher estimate of floor area" he scratches it out noting that consultants found duplicates and other adjustments.

Lighting Standard Updates

Smit shows the slide pointing to three standards that will come on line this year, General Service Fluorescent Lamps, Incandescent Reflector Lamps and Incandescent Reflector Lamps noting that they hope to gather data from the Technical Service Documents. Grist points out that the General Service Fluorescent Lamp proposal is up to 93 lumens a watt for the standard - the high-performance T-8 tube.

Other Standards Updates

Smit shows other standards updates that may come on line, noting that they may or may not have data on them but we still need to be aware of them. He notes that 2015 and 2016 will see a lot of activity.

Hirsh brings up "lag time" She notes that you are assuming these standards in the baseline but we know in reality it will take five years at least for these to transform in the market place because of stock and turnover and people being stubborn. She admits that she may be wrong on the time frame but we may want to build in time. Grist states they are thinking about using the DOE model for how these standards deploy and there is a lag function in there to accommodate existing stock of light bulbs. He continues stating that the lag time is short, a year or less. Eckman clarifies that these are manufacturing standards and after a certain date they cannot produce or import anything that doesn't comply.

Bicker states that that doesn't mean you are getting the savings right away noting that we are going to be switching out T-12s for a long time to come. Grist states that we are assuming that the T-12s will die on their own so they are not in the baseline anymore. Bicker adds that we get the savings sooner if we switch them out. In reality the diffusion of these new technologies in the market place takes a

lot longer than it would seem to. Grist says distributor surveys indicate that say they are down to less than 5% of the sales for T-12s. They are not in warehouses, they are not at distributors, and they are not available for purchase anymore. We use this data for the stock turnover portion of our model.

Arneson states that he's heard this conversation about T-12s before and would like to observe that the CBSA identified a significant share, 18%, of T-12s. He suggests we observe that manufactures have created a T-12 compliant lamp that meets EISA 2007. Therefore the ballasts will continue to be made so they will be maintainable into the future. Add this to the customers that have not participated because they can't afford to change out. They will continue to maintain what they have rather than change out to a T-8 or another more efficient system. Grist says we will look for data to firm that out, noting that the data we've seen so far doesn't show that, stressing that the data they have includes the EISA compliant T-12s.

Arneson continues stating that the NEEA/CBSA study says that there are bulbs and lamps. Grist calls for input on this piece, noting that there is a difference between the stock of light bulbs in the ceiling and the flow of light bulbs into those sockets. We measure sales data on flow. That's the picture of what's going into those sockets, not what is in the ceiling right now. So our proposed approach is to model these underlying sales flow data to represent what will be in the ceiling. Grist continues, noting these lamps last four to six years. That is the proposal for the maintenance market. Arneson agrees that this is a great point but observes that the lamp sales data is affected by the utility retrofit programs that put in those T-8's. Eckman notes that the current penetration is effected not only by what you do but by what everyone else is doing.

Rosalie comments that he would be cautious on going too far out in assumptions on this market as we are seeing four-foot LEDs replacing T-8s. So it's possible that someone will make LEDs for T-12s. Rosalie concludes by saying he thinks you are okay where you are.

John Morris brings up how these technologies are adopted. He wonders if there was a way to look at different subsets within markets and if we can find and identify market factors or industry sectors that are more or less likely to adopt newer technologies.

Gordon points to long term and short term resource issues. For the long term you have the standard you turn over the equipment and it's gone. For the short term we use logic that factors in how long it will take for the standard equipment to be in the stores and then we look at half a ballast life. Then you shorten your savings from the retrofit as you go forward because the ballasts are getting older. Then you hit a threshold where it's not economical to retrofit anymore because the equipment is old. So it's a resource but it's a short-term resource. Grist replies that it's the same on EISA 2020, stating that if it's a short-term resource it may be valuable so how do you analyze it? Eckman notes that we have to make sure that it doesn't persist past its actual lifetime so you don't count it as a debit against load or in this case, load growth.

Key Measures for the Sixth Plan – All Being Updated.

Smit notes that lighting has been discussed earlier. He notes that in the Seventh Plan there will be CBSA data to rely on along with codes and standards to be worked into the baseline. He notes that there is still a lot of discussion that needs to happen about Solid State lighting. He calls for comments today and beyond.

Sixth Plan Key Measures, Continued

Smit says the Council will rely on CBSA data for HVAC. He calls for more data particularly end-use data for heat, cooling and ventilation loads. Smit says that the billing data that Grist mentioned earlier will help but that doesn't go to the end use level. He asks if there are utilities that have been metering buildings or systems to please share their data.

Sixth Plan Key Measures, Continued

Smit moves to slide 4.12 calling for more data on wastewater treatment and water supply. He notes that the main driver is the kilowatt hour per flow rate as that's what's missing. He continues saying that there is data on saving but he doesn't know how that relates to reduction in the flow rate. Eckman reiterates that they are looking for project data or meter data for a baseline. Grist states that the other thing they are looking for is what's been done so far. We're not sure our data captures the efficiency improvements that have been made since the last estimate. Those come out of the potential so it's one of the other pieces we're looking for. Eckman adds that the last baseline assessment was done by BacGen in 2004-2005.

Sixth Plan Key Measures, Continued

Smit points to slide 4.13 touching on refrigeration. Smit brings up integrated building design noting that it is for new construction only. He asks if they should also include renovation. Gage says that her team flagged this as a potential issue and asking what are the technologies and savings present. Grist says yes, that's why it's on the board. We've had a recommendation that it needs to be in. Are you expressing concern about it being a trackable market? Gage calls for Jeff. Grist says that he will be calling but he's the one who suggested that it needs to be applied to the renovation market. He wants input on that because he doesn't know how to estimate that market. How big is it? And what can we get from the synergies that come from designing it better.

Gordon states that he did some work on estimating the size of the potential market noting that it is cautionary.

Measure Expansion or Expanded Savings

Smit discusses Solid State Lighting noting that it has been well covered. However he draws attention to freezing costs and efficacy improvements at projected 2017. He also points to lighting controls, noting that it is a potentially big area of savings. He calls for better data on savings across applications. Rosalie comments to what John Morris raised earlier noting that he didn't see mention on LEDs and case lighting. He asks how that gets counted. Grist states that typically they identify how many stores don't have it and that goes into the potential pile. So we

look at the CBSA which did track that and a random sample of grocery stores. That would form our basis for how many are already done and the remainder is the potential. If there's no data it's a tougher estimate to make. Rosalie brings up the ENERGYSMART grocer program assuming that the BPA has significant data. He then asks if that data will be used. Grist answers yes.

Price asks to go back to thinking of getting out of lighting and on to the thermal side in commercial, noting that it gives him a déjà vu moment when thinking about HVAC opportunities and asking for the data. Are we at a point where we can conclude that we are never going to get the data? The data doesn't exist and it can't exist because of the variability in relationship to what the commercial building stock looks like. So there's no homogeneous way to think about this. So rather than abandoning it because we don't have access to the data maybe in the future we can come up with a different way to get to the dimension of that resource. Grist says that right now there are whole building programs that have been doing a variety of measures. The Sixth Plan included O&M on HVAC retro commissioning data and at savings across that bundle knowing that there were 40-50 measures in that bundle. Looking at a program accomplishment bundle if they were measured through billing data for example and the cost is one way to get at an aggregate from our optimization program.

Hirsh states that this is a problem that mandatory benchmarking of commercial buildings might solve. Eckman notes that they would need the cost equation for changes which is what we're interested in as well as usage. He continues saying that benchmarking for buildings that underwent improvement and what was the cost energy efficiency relationship so we can get to the load forecast for those buildings. Hirsh asks if there are other sources of data besides utilities.

New Measures: Commercial

New or Expanded Applications

Smit notes that embedded data centers are new. Compressed Air Systems are also new for Commercial buildings. He notes that there are developments in Chiller Retrofits and Advanced Roof Top HVAC. Grist brings up Bonneville's

success with a roof top package program that converts units to a variable speed fan. They got some good savings but noted that there are issues. If “as found” conditions were under ventilating, the program fix may cause energy use to go up. Is that a productivity gain or do we say that fix to the system would have happened anyway?

Lazar points to technologies that lend themselves to thermal energy storage which is a valuable capacity and a renewable integration resource. Thermal storage may allow making cold at night when heat rejection is better. Lazar continues, saying he doesn’t want to miss the connection of these efficiency measures and their companion demand response measures.

Hirsh goes back to measure 5 saying it’s similar to low-income weatherization stating that sometimes energy use increases because non-energy benefits like comfort go up. Eckman says that in the end what we do in efficiency has to offset the need for new resources. If it doesn’t, he can’t put it in the supply curve even if it’s a great and cost effective thing.

Bicker says this is one reason why we need to educate our own governmental agencies about the separation of the Council and RTF’s function and what we are charged to do. There can be a presumption that everything is welded together but there are different drivers. Bicker states that some of our legislation that drives our programs are written for other reasons beside load resource balance. We have to recognize both.

Smit moves on to the rest of the proposed measures. He notes that some information comes from the emerging technology collaborative. He points to number 9 and 10 that went through the RTF. Grist points out that none of these are big game changers. Grist then takes time to thank Hirsh and friends in Hawaii for the water cooler measure. He points to a water cooler that makes hot water noting that it used 800 kilowatt hours a year in standby losses. The people in Hawaii put a timer on them which turns it off at night and saves electricity. This is

done through the leasing agent. It looks like there are between 20 and 40 megawatts of these in the region.

New Measures: Commercial

New Technology or Practice

Smit goes through the slide. He notes that Strategic Energy Management may be a big thing for commercial. Rosalie brings up the heat pump for clothes dryers asking if it's for Laundromats or hotels. Grist answers that it is both. The new CBSA shows that 60% of commercial clothes dryers are electric and are in hotels, motels, schools, universities and all over the place. Some are big and coin operated and some are in residential care facilities. So way more are electric than we thought. Grist continues saying I'm not sure if we have a measure that works in that sector, but quick calculations showed that they were bigger than anticipated so that's why it's on there. Eckman adds that it will influence the commercial clothes washer as well. The presumption before was we had 10-15% electric drying but that's not true.

Smit presents the rest of the slides and asks for questions, comments and/or data to be sent in. He notes that measures in grey (numbers 6-9) don't have as much information as the others and may be dropped. Eckman says if you have information for others that aren't on here to please let us know. Smit agrees using the water cooler measure as an example.

High Priority New/Update

Smit talks about glazing noting a new technology that sounds promising. It is installed from the inside of the building into the existing frame.

Lower Priority New/Update

Smit notes that much on the slide had been discussed earlier. A question is asked about the sub contract on data centers (slide 4.17) Grist explains that they hired The Cadmus Group to produce an estimate of what the load is on these embedded centers as well as produce a first cut energy efficiency potential assessment.

Hirsh asks about moving High-Rise Multi-Family (slide 4.19) to low priority. Grist noted that most of the potential here is in appliances in the units which are covered in other measures. There may be some on common areas like ventilation and lighting. But we would like input.

Cavanagh asks to go back to data closets. NRDC is doing lots of work on the savings associated with moving them to the cloud and wants to know if that is a legitimate energy efficiency measure, not just tweaking the closets but supplanting them completely. Grist asks “do you?” Cavanagh answers yes stating that we are likely to become robust advocates for the obsolescence of every small office having its own data closet. In terms of security and energy use it’s worth a careful look. It is something that utilities might want to give a boost to. Grist states that the Demand Forecasting Team is looking at that to create an integrated forecast on embedded data servers and the move to the cloud. We are trying to build a model to test the sensitivity of those functions; what’s moving to the cloud, what efficiencies you gain from the move. We can build a tool but it’s anybody’s guess on how that market unfolds. Cavanagh says that there’s an opportunity to influence how that market unfolds and wants to flag that as a potential utilities program. He suggests the Demand Forecasting Team connect with his colleague Pierre DelForge as an expert.

Gordon says that from a load forecasting point of view these are important questions. He states that he normally doesn’t start with the resource and the program question at the same time, but we should look at programs. He asks, “Do you think that anyone making decisions will listen to anyone in the utility?” Gordon continues, noting that energy use is not a high concern for these people and asks can program providers really influence where people will put their data?

Cavanagh says that utilities can give people a nudge and it passes the laugh test and his group is going to do all it can to help it pass that test. Rosalie notes that the cloud doesn’t come free. Cavanagh admits that and poses this question to the group: Does the cloud give you significant security and efficiency? And if it does

shouldn't we move people in that direction. I'm talking about nudges not mandates.

Bicker says that there are legal concerns about data security that utilities care about and we need to practice what we preach. Cavanagh agrees stating that you are more credible than you realize particularly with smaller customers who aren't very sophisticated. Reynolds adds that there are cyber security aspects that you wouldn't want to ignore.

Measures to Drop

Smit talks about measures that are planned to drop. Price asks about incorporating commissioning and controls into commercial SEM noting that there are successful examples in the Puget Sound region on controls optimization. He says that the thought that in order to get there you have to go through SEM might artificially truncate the opportunity. Grist makes a note. Smit says that a layered approach might be best. The top layer is SEM with other pieces in between.

Industrial Sector

What was in the Sixth Plan?

Smit reviews the slide noting that potential doubled compared to the Fifth Plan. He states that the same top-down methodology will be used in the Seventh Plan.

Sixth Plan Savings Potential by Measure

Smit explains the slide noting that much was achieved. He predicts that it will be smaller for the Seventh Plan

Seventh Plan Approach, Same Measures, Update End Use

Smit notes that we hope to tap the Industrial Facility Site Assessment (IFSA). There is a draft and some data but not enough. Grist adds that IFSA study has been slow. We are targeting 120 sites and we got about 80. So the coverage is not as good as we hoped. We will get survey based data that is probably better than what we used before in some industries but it won't be complete coverage of all the industries here. Grist points to some of the big industries like pulp and paper

where we only have a few plants. As a result we are proposing going back to our Sixth Plan data for those if we don't have enough new information to go forward. Smit resumes saying they net out accomplishments as per regional reports. He notes that they have achieved 130 MW as of 2012 which is a big chunk of the 800.

Next Federal Efficiency Standards (Industrial)

Smit states that there's not a lot of standards for industrial but he points to Pump standards maybe coming on line in 2015.

Industrial Facility Site Assessment (IFSA)

Smit discusses what the IFSA set out to do. He notes it's in draft form and working on getting more data. Smit notes that it is the first of its kind and is hopeful it will provide needed data.

Key Measure & Practices

Smit says these are the ones from Plan Six and a more complete list is available on the web.

Proposed Measure Changes for the Seventh Plan

Smit notes that transformers will be dropped and that another round of standards are due in 2022. Industrial Energy Management may be revised. Refrigeration potential and ramp rates will be reviewed and lighting baselines updated.

Industrial Energy Management

Harris states that his organization is working on Strategic Energy Management for a framework called the Capability Maturity Matrix. Harris says this is another way to look at it vs. the three levels described in the Sixth Plan. We are trying to populate that matrix with energy intensity savings data to see if there's a way to link proven efficiency to each of these levels. He offers this as a way to take the SEM and categorize it.

Rosalie states that he encourages and supports aligning with the SEM Collaborative stating that he thinks it's important that the region is on the same page, noting that the SEM Collaborative has done good work. Smit agrees.

New Measures: Industrial

Smit reviews the new measures for the industrial sector. For CO2 heat pumps Smit admits he is not sure about the data. Grist states that the problem with CO2 heat pumps in the residential sector is that they are not UL approved. But they are in industrial and commercial as they are different class of equipment and they may become more widely available.

Mitchell asks if the microwave sterilization/pasteurization technologies are approved by the FDA and if that is part of the consideration. Grist answers it should be but it hasn't been explored.

Summary of Issues and Data Needs: Industrial

Smit says most has been covered and calls for missing data and information.

Distribution System

Grist notes that the Sixth Plan had 400 megawatts of energy efficiency potential mostly from Conservation Voltage Reduction. It reduces losses from the power plant outward. He notes that voltage was kept in favorable ranges in the homes as well.

Methodology

Grist notes that much has been covered earlier in the day. He draws attention to the NEEA Distribution System Efficiency Initiative 2008 describing the initiative noting that the savings are measured and solid.

Updating Distribution Efficiency

Grist states that there has been mixed results on uptake. He states that there is a mix of barriers to getting the savings but is not convinced it's not there. He notes that he has information of 70 utilities around the country using this and are bagging big savings.

Grist continues acknowledging some institutional barriers to doing it. He says for the Seventh Plan the idea is to subtract out reported accomplishments from potential estimates and revisit ramp rates and physical limitations.

Arneson asks about the Distribution Efficiency Assumptions stating when the study was done there was a different make up of end uses, i.e. high saturations incandescent light bulbs and other systems. He asks if the potential could be revised to account for different saturations. Grist answers we could look into how much the end use has shaped over the season. Eckman adds, they found different CVR factors by feeder based on the type of equipment that was on that feeder.

Arneson continues stating that he understands some end uses like newer TVs have a constant power requirement so if you change the voltage they will still increase to maintain their consumption, for example. Eckman says, within the ANSI standards, yes. Eckman then points to a SmartGrid study where they did end-of-line voltage using SmartGrid meters and it allowed you to do this with less cost. So there may be infrastructure in place that wasn't there before that we can tap. That might be an easier proposition.

Tracy comments that he is encouraged by this but he is confused by why, as stated in Smit's earlier presentation, you would drop the transformer. Eckman explains that the dropped transformers were new transformers above the efficiency standards. Grist states that one of the biggest contributors to the 900 average megawatts of standard savings was transformer standards.

Tracy continues stating the data they are looking for would only be on replacements or new construction. The conductor size should be considered. Eckman states that it is.

Eckman calls for questions or experiences that could update analysis.

Inputs for Cost of Saved Energy

Eckman explains the question put to the Council. What is the mix and the cost of money for Conserving Resources?

Approach

Grist explains the approach (slide 5.3) noting that is similar to the Sixth Plan with updated values. He identifies top issues for feedback including Share of Cost paid by consumer, program administration costs and approach to financing costs.

Financial Parameter

Grist explains the slide. He notes that they use different financing parameters by sector. He notes that the impacts of financial parameters are a subtle change on TRC of supply curves.

Financing Terms for EE

Grist reads through the slide noting that measure costs will be borne by the customer, BPA and Utility. Tracy asks for clarity stating that there is a difference in the customer, BPA and Utility in the case of investor owned but there is no difference in consumer owned utility, the consumer pays for it all anyway. Grist notes that it's a good point stating that they are trying to get cost impact on the systems identified correctly.

Share of Costs by Sponsor

Grist explains the proposal which calls for 35% to be borne by the customer, 20% to the BPA, 5% to POU Direct, and 41% to IOUs. He notes the numbers come from 2008-2012 data.

Mary Smith asks which BPA conservation costs are being capitalized. Grist states it's from their Red Book, only the portion capitalized. Smith asks why are we not including all of their costs. Eckman answers that we are considering all the BPA costs. A portion is capitalized and a portion is expensed. We are proposing using the 2008-2012 portions for the forecast. The capitalized portion is what they reported as direct funded expenditures out of the Red Book.

Lazar asks if the customer in this case is the consumer. Grist responds yes.

Eckman clarifies that this includes measure costs and acquisition costs. So the 181 and the 104 were capital and expense in those years. They don't include staffing

costs. Mary Smith adds or measurement or evaluation? Eckman says yes. Mary Smith states that it doesn't include market research or marketing or... Eckman says we are trying to determine how much of the measure costs are paid for by capitalizing. Grist continues saying they want to include the interest cost in the cost of the measure.

Mary Smith asks how expense costs are treated. Eckman answers it gets treated as expense because there is no interest on it. This is about determining what share of the total costs has interest associated with it. Right now we are assuming that no one other than Bonneville borrows money to do energy efficiency. Grist says that Bonneville's other costs are represented in the costs. Eckman add, "in the rate."

Rosalie clarifies that for the public, or consumer owned utilities, for the regional share the 20% is that interest. And for the direct? Grist answers that is an expense. Eckman explains that for the POU 5% and the IOU 41% is expense. The 35% portion of that is capitalized expense.

Tracy states that there is a cost to that money. Grist answers, "That's why we want to include it here." Tracy continues stating someone has to pay so he applauds it noting that there is a cost of money. Eckman states that there is an opportunity cost.

Reynolds says that what we've done at the Washington Commission is we've allowed the energy efficiency programs to be forward looking. We've allowed them to include forward expense in current rates. She admits that this is anathema. But it does eliminate the cost of money to the company.

Gordon states that when the utility does a forward expense it goes directly to the customer and the customer's cost of capital is what's relevant right? Eckman states yes. Gordon continues saying they are the ones paying so it's an opportunity cost. So it's their cost of capital you're applying whenever it's

expensed? Eckman answers that for a portion of the share they have there's and interest payment directly. We are not using their opportunity cost.

Gordon asks about the IOU costs which are all expensed. Do you look at the consumer costs because they are the ones that are paying immediately? Grist answers that what we are proposing is the IOUs cost is expensed so there is no interest cost associated with it. Eckman states that they are in current rates continuing that we don't know if individual consumers finance payment of their energy bill. Eckman admits that there is an opportunity cost in the grand scheme of things but we are not measuring that at this time.

Mary Smith suggests adding two more columns to the chart on slide 5.6 where you show the break out of capital and expense. Lazar states that this issue has been with us for a long time and wonders if anything is changing. Eckman answers that they are doing the same thing they did in the Sixth Plan but with different values.

Mary Smith states that it's in the interest of better education to those who are investigating this report. Grist notes that there is a workbook that goes along with this work that includes all of the pieces. Grist summarizes that what he's hearing, particularly from Tracy and Gordon is that in the end game the consumers are paying all of these costs. Gordon states that there is a cost of money to the consumer and I'm not sure why you are not factoring that in. Grist replies, we are. To explain he jumps to slide 5.11.

Proposed Cost of Capital for Residential Consumers

Grist explains that many of the energy efficiency measures we deploy now deploy more than once in the 20 year period. What the calculation shows is that for the first installation of the measure the utility picks up a portion of the first installation cost. In the second installation of the measure the utility picks up none of that cost. In the third it picks up none. The customer bears a portion in the first install and 100% in the following installs. So for any measure that installs more than once most of the cost is borne by the customer.

Grist then asks, “What is the rate we are using for the consumer cost?” He states that he is using DOE methods that employ a mix of 12 types of equity. He further illustrates the slide. He concludes stating that the average weighted cost of capital is 4.3%.

Rosalie asks if they are going to update this to reflect a shift. Grist states that this is the most recent update from recent rulemaking in the federal standards. Rosalie wonders why it only goes out to 2007. Grist says yes Eckman states that he thinks they had 2010 data. Grist states that it is the best they can lay their hands on.

Proposed Cost of Capital for Business Consumers

Grist states that there are different cost of capital numbers for commercial, industrial and agriculture customers. He then points to the commercial property number of 7.6%. He notes that not all commercial property is privately held stating that 30% of commercial floor area is publically owned. So a local government rate was used for those.

Cavanagh states that you are building in an inherent anti-efficiency bias here. He states that efficiency is paid for by the customer which reduces costs to the utility system but there is no such opportunity on the generation side as generation is financed solely by the utility system. Therefore generation is going to look artificially cheaper because it has access to the entire utility bill where energy efficiency has access to a portion of it.

Eckman answers that when we sized the resource we assume that anything that is cost effective can be paid for entirely by the utility rate revenues. Therefore we need an analysis based on that assumption.

Cavanagh insists he doesn't want to re-open that issue. He asks for insurance that the efficiency resource is judged in the first instance on terms identical to generation resource.

Lazar echoes Cavanagh's point by saying if some of the consumer sectors have a higher cost of capital than the utility sector then these measures would be cost effectively delivered if financed by the utility sector. Eckman agrees stating that we can presume that utilities finance all.

Cavanagh clarifies that he thinks it's appropriate for the customers to share in the costs, but likes Lazar's notion of removing the implicit bias in the accounting. He reminds everyone that there is one test that uses comparable assumptions of utility financing for all resources and picks the best buys first. He states that most people think that's what the Council is doing. He knows that the Council thinks that is what they are doing despite the introduction of these alternative financing perspectives. But if these alternatives are cutting back on the amount of cost effective conservation then Lazar is offering an alternative.

Grist affirms that the portion financed by commercial and industrial customers does increase the cost to the efficiency measure relative to utility financing in those sectors. Eckman continues stating the issue of the reinstall costs is to ensure persistence. He also notes that the utility is made up of customers that have these costs of capital. So for Generating resources it's only the utility's cost of capital unless you back up by saying the utilities have rate payers that have this same cost of capital and the same capital structure so it doesn't matter what the utility cost of capital is anyway.

Cavanagh states that in the end it's the customers that pay for everything. So you don't want to introduce an artificial bias by giving generating resources the appearance of a lower financing cost when everything has the same financing cost.

Tracy states that this might have been addressed in the drafting noting that conservation had a 10% benefit over any other resource.

Hirsh asks if the way Lazar and Cavanagh described it is the way it was done in previous plans. Grist and Eckman answer no. Grist states we've been doing it this way since he's been here. Cavanagh states that they have been discriminating against conservation for 30 years. Eckman states that they have still got a lot done. Grist states that this is on the Council's agenda and we will take to the power committee that there is a difference of opinion among the CRAC members if this is a fair treatment of the cost of the resource.

Eckman reiterates how meaningful the work is pointing to the weighted capital cost to all sectors is around 4.5-5%. The weighted cost for IOUs is about the same.

Lazar states that he suggests to the Council adopt a single cost of capital for all purposes.

Haeri states that in a couple of jurisdictions the issue has come up that when residential customer programs are evaluated they use the utilities discount rate which is around 8% for most utilities. Eckman calls that number nominal. Haeri agrees. He continues saying the cost of borrowing is lower than 8% calling it the other side of the coin. Eckman expands stating that one of the issues going forward is analysts are looking at the future cost of money and inflation and they see an increase going forward. So some numbers look high compared to current interest rates. They triple from today's mortgage rates.

Eckman poses to the group the question of, per Lazar, a single cost of capital? Lazar feels Eckman will pose the question fairly.

Summary Sponsor Financial Parameters for EE

Charlie Grist explains the slide (5.14) He asks will Bonneville forever finance its capital costs for conservation? Eckman re-asks at least through this rate period and plan? The room nods in agreement.

Grist continues to narrate the slide noting how the admin costs are distributed.

Eckman points to the 20% admin costs asking if that number is correct or should it be bigger.

Mary Smith states that she doesn't understand the sponsor share of admin costs. Grist explains how he got to the number. Eckman adds to the explanation.

Rosalie offers more data saying that for 1937 we had to report admin costs in dollars. Eckman says we will contact the state auditor to find out what the aggregate is. Grist states that he did get a number on the customer share of costs from Avista of 37%.

Grist summarizing stating that what he hears is a plea for a more equitable or apples to apples way to think about the cost of financing. Eckman states that he hears a plea for symmetrical treatment. Grist asks how that fits with re-install costs. Eckman states that the customer pays for all of it in the end. He continues stating that that is not the way generation projects get financed today. From the generating project side the IOUs have a cost of money and they do finance their projects at that cost of money. It's the same for the IPPs. So when you go out for a PPA you have to pay what it costs to make it happen. The interest charges are there and it doesn't matter that the customer ultimately pays it off. It's the same for 0% interest loans for customers. Some customers get that rate and others pay for them.

Bicker states that it comes down to whether the transaction costs are being treated equitably with each other. Eckman states that our approach represents the reality of how things get paid for the first round. It does present a bias which way isn't clear.

Mitchell agrees that the reality is different than the planning stating that we've had a loan program for decades and the uptake on that is small in residential.

Eckman ends saying they will take forward what we've heard. He notes that they will report any decisions back and he thanks the Council for input.

Seventh Plan Supply Curve Development Schedule

Supply Curve Development Schedule Overview

Grist narrates slide 7.2 talking about the three waves of CRAC agendas going forward. He explains that the dates are subject to change depending on the arrival of data. He notes that pieces may be missing when they are posted. He says they will be posted for review when they are ready. He explains what the workbooks will look like.

Grist notes that they are looking for review of the Excel workbooks as the information is complex. He calls for help from spreadsheet experts.

He notes that in January they will call for review of the RPM decision rules. He also explains that the ramp rates are up for discussion.

He notes that all work will be on the Council's website for review.

Jayaweera notes that in the November wave they plan to present a workbook structure overview.

A question of Supply Curve Junkies II is proposed and Eckman responds that it will happen. Grist proposes making the second half of CRAC meetings Supply Curve Junkie meetings

Reynolds says that it is helpful to dive into the weeds for emerging technologies. It helps in getting better comments.

Eckman states that they had two supply curve junkies meetings last time for the “spreadsheet types” and they were well attended. So we can arrange that it might be later in the process.

Grist asks that since much of the policy items were touched on today the other meetings could be more technical? The room doesn’t agree. Eckman states that there is a mix of issues that come up each time. Hirsh says it’s hard to separate out when policy issues emerge. Bicker said you can’t have good policy unless you can talk about the details.

Eckman states that we appreciate the level of interest in the issues noting that it’s gratifying and the whole purpose of the act.

Hirsh brings up the Northwest Energy Coalition’s conference on Nov 7 inviting people to attend.

Eckman adjourns until the next meeting.