

**Northwest Power and Conservation Council**  
**Resource Strategies Advisory Committee**  
**June 5, 2015**

Henry Lorenzen, NPCC, began the meeting at 1:30. Introductions were made. Tom Eckman, NPCC, presented Selected Findings from Scenario Analysis Conducted to Date.

**Slide 4: The Least Cost Strategies for Scenarios 2C, 4C and 4D have Nearly Identical Average Risk**

Lorenzen asked what was meant by “carbon risk.” Eckman answered that there are two distributions: the probability of a carbon cost greater than zero and the probability of what that number is (between \$0-110). Lorenzen asked how the staff prognosticates the future. Eckman answered professional judgment. He continued stating that the intent is to stress the model not to predict the actual level of carbon cost.

Mike Jones, SCL, asked if the first distribution is binomial. Eckman answered yes. Jones then asked if the second distribution is normal. Eckman stated that it is a uniform distribution, not normal. Eckman continued stating that once a value is selected it doesn’t change during that future.

**Slide 5: Similar Distributions of Net System Cost**

John Prescott, DNGC Power, asked why 2012 dollars were used. Eckman replied that everything is computed in constant 2012 dollars. Jones stated concern that the model doesn’t respond to the option to

increase or decrease the rate of acquiring energy efficiency. Eckman replied that the model adapted to constraints on the maximum acquisition ramp rate by selecting to build more expensive efficiency early when the limit was lower and less expensive efficiency when the limit was higher, but that both scenarios ended with the same total conservation acquired by 2035. Lorenzen asked if the assumption about the total amount of energy efficiency over the time might also have an effect. Eckman responded by stating that in the two scenarios tested, only the pace of conservation acquisition was tested, they did not test the impact of constraining the total that could be acquired over the 20-year plan. Eckman also stated that under Scenario 4C, the model has the option to build more efficiency early while under Scenario 4D the model has lower limits on the amount of efficiency it can build in the near term. Given these assumptions, the model doesn't find value in reducing cost or risk by building early. Eckman stated that staff believes that this may be related to the region being long in energy and short in capacity.

**Slide 7: Least Cost Strategies for Scenarios 2C, 4C and 4D Have Very Similar Distributions of Conservation Development through 2020**

Nancy Hirsh, NW Energy Coalition, asked why the model was not choosing energy efficiency early but is building in advance of big resource retirement. Eckman explained that in the Plan's first five years it builds the same amount of efficiency because this level satisfies new resource needs but in the second five year period it ramps up faster, building over 3000 mw of efficiency by 2026 when the second unit of Centralia retires.

Scott Corwin, PPC, asked if this strategy includes codes, standards and momentum. Eckman stated that this is total megawatts. The model does not differentiate how the region might ultimately acquire these savings and the total doesn't include any standards adopted after December 2014. The effects of those existing standards (i.e. adopted as of December 2014) are netted out of the load forecast.

Jones asked if the early conservation acquisitions are driven by low hanging fruit and the rest is driven by changes in capacity balance. Eckman stated the near-term builds for energy efficiency are primarily under \$40 MWh, but in some futures higher priced conservation is also purchased

Ann Gravatt, Climate Solutions, asked if the model knows about the retirement of Boardman and Centralia. Eckman answered yes and they will run a scenario where they are not retired. Rachel Shimshak, Renewable NW, asked why. Eckman said that PPC asked for it. Corwin stated that it would be informative since neither of these resources is relied upon by public power.

**Slide 9: Average Conservation Development Across Scenarios is Very Similar When Carbon Risk is Considered.**

Ralph Cavanagh, NRDC, asked how a faster max energy efficiency ramp yielded a lower number. Eckman answered that they are both essentially the same number within the degree of precision of the model.

Cavanagh restated that the rate that energy efficiency is ramped in appears to look irrelevant on the chart. Eckman stated that energy efficiency is allowed to ramp in faster if the model thinks that it will result in lower costs or risks, or both and there isn't a prescribed rate.

Greg Delwiche, BPA, asked if inputs were varied to stress test the model and look at cause and effect. He gave the example of boosting or lowering gas prices as a stress test. Eckman stated that they are working on that now and gave the examples of removing DR, coal and energy efficiency as examples of stresses.

Gregg Carrington, Chelan PUD, asked if the Council will look at gas prices as sensitivity. Eckman answered yes we will do that.

**Slide 10: The Distribution of RPS Resource Development through 2035 is Affected by Conservation Development.**

Shimshak stated that there will not be RECs if you assume additional carbon risk as you can't use a banked REC for that. Eckman stated that there are enough RECs banked in the system to meet existing RPS requirements and will show the Committee a slide explaining it later in the meeting.

**Slide 13: With Carbon Risk Uncertainty Winter Peaking Capacity is Met with Demand Response, Conservation and Limited Thermal Resource Development Scenario 2C – Least Cost Resource Strategy**

Carrington asked how Southern Interties were modeled. Eckman stated that capacity is modeled in the same way as the Resource Adequacy study which finds that on peak in the winter 2500 MW can come from out of region. Eckman called this a market risk constraint and

acknowledged that the inertia has more room on it. Carrington asked if there can be a sensitivity that changes the number. Eckman stated yes.

Gravatt asked if the model is selecting DR because it's cheaper and faster than thermal. Eckman answered yes. Carrington asked if it maxes out at 500 MW. Eckman stated that the 500 MW is within the limits of the lowest cost block of DR, but doesn't use that entire block. He continued that there are four blocks of DR available, but so far the model only selects from the first block. Jones asked if this is because of a price restraint. Eckman answered yes.

Hirsh asked if there is any inclusion of enhanced market capacity in the model like coordination across balancing authorities. Eckman replied that the model already assumes perfect liquidity and fungibility across the region. He called it a limitation of the model.

Cavanaugh asked if the model can show the difference if you move away from optimality. Eckman said the current model cannot.

Cavanaugh asked if you can alert people that there are policy choices that can be made to move you closer or further away. Eckman pointed to studies conducted by the Power Pool that would be better as this is a quarterly model for high level strategic information.

Lorenzen expressed concern with the transactional inertia that may make getting the 500 MW of Demand Response difficult, particularly on the public power part of the system. Eckman said that issue would be an important item for the action plan to address.

Gravatt stated she doesn't disagree with addressing these issues but calls it a sign that the region needs to get started on it. She called the results exciting. Eckman noted that the analysis shows that DR dispatch is small but that DR is an inexpensive way to hold a reserve margin.

Jones asked how responsive the DR is and how long you keep it around for. Eckman answered it has a five year lifespan on the contract. Jones restated the question asking how quickly you get it and how long does it stay available. Eckman answered one hour and held for capacity reserves.

Carrington drew the conversation back to the 2500 MW ceiling on imported energy and asked what the energy assumption is for it. Eckman answered that he can get that information. Carrington stated that the forecasted availability of cheap energy in the middle of the day drove that question.

Hirsh asked if the model differentiates between price driven DR and direct load control. Eckman answered that it is all callable, which means that it's limited to programs that are directly under control of the utility to dispatch. It is not, "price responsive" DR.

Jones asked if the 2500 MW constraint on the intertie is an energy and capacity constraint. Eckman stated it's a capacity constraint and is not sure about the energy. Jones stated that if you could get good low cost power you might make curtailable choices. Eckman agreed. Jones asked if there is any work on a step change on the intertie. Eckman said no, not at this point.

### **Slide 23: Distribution CO2 Emission in 2030 for Resource Subject to EPA's Proposed 111(d) Regulations**

Hirsh stated that our system includes the cost of resources outside the four northwestern states. Eckman answered that we could argue about whether to pay for resources outside our state but in terms of the state boundaries this [Slide 23] is what we are looking at.

Carrington wondered if regulations would address this if the region adopts the first jurisdictional deliverer like California. He continued stating that it assumes the power coming into the northwest would be clean. Hirsh answered that it would be a change in accounting. Shimshak called it a favorable look. Eckman stated this is what it looks like if you impose 111(d) on existing policy. He reminded the group that it may not even be possible as it assumes perfect fungibility of resources, including energy efficiency, across all four states.

Cavanaugh asked if the plan sheds light on the value of regional compliance approaches. Eckman answered that this analysis is essentially a regional approach. If you can't get a state-by-state approach that achieves comparable emission levels for this cost, then the differential of what you expect to do and spend at the state level and the cost and emissions from this outcome would show the benefit of a regional solution.

Travis Kavulla, Montana PSC, stated that the counterfactual is not modeled so you can't state any conclusion. Eckman said that it can't be modeled because no one knows what the states are going to do.

Kavulla agreed that it doesn't make sense to model at the state level but that's how the Clean Air Act regulations work. Kavulla then suggested polling the states to find out what they are inclined to do. Kavulla said that 111(d) compliance will probably not be about overlaying carbon costs on the region but a collection of log rolling at the state level. He concluded by saying that this analysis doesn't get at the political economy of how regulation like this works. Eckman agreed saying that this analysis finds what it would take to get a resource portfolio in compliance but not how it is achieved.

### **Slide 25 and 26: Thermal Resource Dispatch with and without Carbon Risk**

Kavulla noted that there seems to be less renewables in **Slide 26: Thermal Resource Dispatch With Carbon Risk**. Eckman explained that with carbon risk conservation comes in at a higher level and reduces loads, which lowers RPS requirements. Kavulla commented that the political administrations of certain states will want to supplant coal with renewable resources. He called it a paradoxical result. Eckman stated that the model found a cheaper way to achieve the carbon reduction goals at the region level. That might not be consistent with state goals.

Hirsh asked to return to slide 23. She asked if scenario 1b shows a higher probability of getting to higher emissions reduction. Eckman clarified that it shows higher emissions not reductions.

Tom Karier, NPCC, stated that it's too early for lessons learned but on average business as usual would meet EPA requirement about 60% of the time. He stated that if all states adopt a carbon price we could

comply more often. Karier stated that when we have a Power Plan with resource targets we can say that if we meet the targets we should be close to meeting a regional carbon emissions requirement in most futures. Eckman concluded by saying that what the RPM has identified is the least cost portfolio that achieves a particular distributions of carbon emissions, it does not answer the question of how the states and region can best achieve this resource mix

**Slide 28: Common Elements of Least Cost Resource Strategies Across Scenarios Analyzed to Date (cont)**

Jason Eisdorfer, Oregon PUC, asked about banked RECs and 111(d) and why we don't see more renewable sooner. Eckman answered that we are not seeing renewable builds in the near term because of the state regulations that allow banking of RECs for various periods of time. In particular, Oregon regulations allow RECs to have an infinite lifetime. That is, they can be held indefinitely for future use.

Delwiche reiterated that the region appears flush with energy but limited winter capacity. He then asked if the model buys conservation ahead of DR because of the supply curve. Eckman stated that it's cheaper--under \$40/MWh, so the model sees a way to build capacity and get subsidized though reductions in energy cost.

Shimshak stated that efficiency is cheap and we know how to do it and have confidence in it. She then said that DR is also cheap but we don't have experience with it. She asked if there are tests to find out what happens if we don't get it. Eckman stated that they are testing what happens if they remove DR and doesn't have an answer yet.

Shimshak asked about DR's flexibility. Eckman stated that it gives us capacity only. Shimshak asked if the model looks at flexibility. Eckman said no.

### **Slide 33: Renewable Resources**

Doug Howell, Sierra Club, asked if the solar shown on the slide is in region. Eckman answered yes stating that it's mostly from Southern Idaho with some in southeast Oregon. Shimshak stated that solar and Montana wind came out as high performers in the Generating Resources Advisory Committee. Eckman said that we don't get them because we have other resources that are cheaper.

Delwiche asked what the assumption is for rooftop solar. Eckman answered about 250-300 aMW (approximately 2500 – 3000 MW of nameplate capacity) are incorporated over time which lowered the load forecast. Eckman pointed to Scenario 3B which will consider emerging technology could assume higher solar contributions (2500 - 3000 aMW) but that scenario is not in today's presentation.

Jones asked if you are assuming current state programs are extended for non-utility solar. Eckman stated that they are assuming no state credits and only the federal 10 percent investment tax credit beyond 2016 and only for solar.

Shimshak asked if the 250-300 aMW of distributed solar would be in addition to the solar available today. Eckman answered yes it would be on top of it.

### **Slide 36: Sensitivity Studies**

Carrington asked how long it takes to run sensitivity tests. Eckman answered 12 hours with two days for analysis. Terry Morlan, Contractor to NPCC, noted that sensitivities mentioned so far in the meeting include testing perfect market assumptions and intertie capacity constraints. Carrington mentioned testing gas prices. Eckman asked if gas price's upper range should be constrained to a lower area.

Carrington stated most people are looking at lower gas prices. Jones stated he is more concerned with the average. Eckman said that reducing the upper end of the range would also reduce the average.

Cavanaugh asked if any utilities in the region hedged their gas price risk. Kavulla stated that Montana has acquired gas production fields which are a physical, on system, hedge. Cavanaugh called that relevant in thinking about the range of price risk.

Dave Nightingale, WUTC, asked for clarification on "Test alternative EE Winter Capacity. Eckman explained that the shape is from old data and that the group might want to test a number lower than 1.5 or 2.

Nightingale called it an interesting sensitivity to try. He noted that it's wise to be conservative but if there's a big advantage we would never know it unless we test it.

Morlan stated that the constraints on the intertie came from the Resource Adequacy Forum. He noted that, in contrast to the model's perfect market assumption, actual markets might be stickier and slower which is why they picked a lower number for intertie reliance.

Nightingale stated that a pipeline might be fully subscribed and he is

interested on what's really on the line. Eckman stated that the Council is looking at actual transmission line loadings, not contracts.

Gravatt asked which scenario looks at all of the region's coal going away. Eckman answered Scenario 3A.

Shimshak asked to test higher average gas prices. Eckman stated they could look at both directions but they are not seeing economic builds now. Karier stated that to make a difference they would have to drive out conservation and it would be surprising for them to get that low.

Delwiche asked that given winter peak capacity is the limiting factor have you made the assumption that utilities will have to carry the balancing reserves they currently carry. Eckman answered that the reserves currently carried are manifest through the Loss of Load Probability held as a region. Eckman said they will do some flexibility and balancing analysis which will look at it closer.

Stan Price, NEEC, asked there was a way to understand the capacity benefit from conservation at the utility level instead of the regional level. Eckman called it idiosyncratic to the service territory and said it is a limitation of modeling at the regional level.

Price asked how we do something with the information learned here. Eckman said for the DR program we know that at the regional level we need to target what's on at 6 pm in the winter. That information could inform entities interested in developing DR because they would know what end uses or businesses to target.

Cavanaugh stated that the broader lesson is that energy efficiency gives you more peak than energy savings. Eckman said yes the ratio of peak savings to energy savings is greater than one. Cavanaugh called that a remarkable insight.

Lorenzen stated that this has significant implications on how the region goes about acquiring energy efficiency. Eckman stated that energy efficiency's low cost drives it more than anything.

Eisdorfer asked if scenario 2A may not be modeled because of what has been previously found. Eckman said, staff is proposing not to run it because we have a good idea of what the portfolio would have to be to get in the range of proposed 111(d) carbon reductions.

Cavanaugh stated a critical policy issue would be to make it easier and cheaper to integrate loads across a broader area. He asked if the intertie questions are about total capacity. Eckman answered that it's about how much we can rely on them. Cavanaugh said it would be good to have a better sense of it. He said it matters to have easier and cheaper ways to integrate loads. Eckman agreed but stated that we don't have the capability to model that.

Karier reminded the group that the EIM discussion is about flexibility which is not addressed in this model. He said it could be thought about when adding flexibility resources. He also pointed to looking at other studies that look the benefits of EIM. Eckman said there is a discussion on flexibility and balancing in other places that staff is trying to find.

Cavanaugh called attention to the area's tradition to looking at the potential benefits of acting like a region instead of atomized utility systems. He said this strikes him as fitting in that category.

Kavulla stated that the Northwest power pool quantified the sum total of diversity benefits and thought it was public information. Eckman said he didn't know. Jones stated that he thinks Seattle has a copy of the information so it's public.

Shawna McReynolds, PNUCC, asked if there is any study or discussion about what happens if the region doesn't accomplish the 6000 out of 8000 MW of capacity reduction from efficiency. Eckman stated they haven't tested a scenario where we pay for it and don't get it. McReynolds pointed to the amount of blue (representing the winter peak capacity benefit from conservation) on the chart and said it makes her want to flag it.

Cavanaugh stated the region has 30 years of evidence that shows that we always under forecast efficiency. Eckman explained that the research the Council did following the Fifth Plan was to look at the share of efficiency that was assumed to be achievable over a 20-year period compared to what was accomplished, they did not look at whether individual measures saved more or less than expected. McReynolds suggested putting a sensitivity test on the list that would assess the impact of getting fewer saving than assumed for our investments, but said it is not a high priority.

Karier brought attention to next steps and asked how everyone keeps track of information and when the group will meet again. Eckman said they assume one more meeting before the draft plan. Corwin asked what the target date for the plan is. Eckman said hopefully September.

Howell asked if the 60-day comment period will hold. Eckman said yes as chief council says that is the minimum. Howell asked about the follow-up public hearings and meetings. Eckman said that there are typically two public hearings per state and these will probably be in October and November.

Karier said presentations will be available on line. Eckman said invitations to the Council webinars will be sent to the Committee as well. Morlan asked if his summary letters of these meetings are useful. The room agreed they are.

Eckman ended the meeting at 3:30.

### **Attendees on Site**

Mike Jones	Seattle City Light
Tom DeBoer	Puget Sound Energy
Rachel Shimshak	Renewable NW
Mike Paoli	Energy NW
Greg Delwiche	BPA
Doug Howell	Sierra Club
John Prescott	DNGC Power
Anne Spangler	Snohomish PUD

Shawna McReynolds	PNUCC
Ann Gravatt	Climate Solutions
Nancy Hirsh	NW Energy Coalition
Tom Karier	NPCC
Terry Morlan	Contractor to NPCC
Tom Eckman	NPCC
Henry Lorenzen	NPCC
Gregg Carrington	Chelan PUD
Jason Eisdorfer	Oregon PUC
Tomas Morrissey	PNUCC
Leann Breaking	OR PUC
Ruchi Sadhir	OR PUC
Fred Huette	NOW Energy Coalition
Danielle Walker	BPA
Robert Petty	BPA
Peter Cogswell	BPA
Steve Crow	NPCC
Rebecca O'Neil	PNNL
Mike Hoffman	PNNL
Dave Nightingale	WUTC
Scott Corwin	PPC
Stan Price	NEEC

**Attendees via Go-to-Meeting**

Brian Dekiep	NPCC
Robert Diffely	BPA
Elizabeth Osborne	NPCC
Jess Kincaid	OR Dept of Energy

Jim Manion

Travis Kavulla

Pat Smith

Ralph Cavanagh

Chris Robinson

Shirley Lindstrom

Therese Hampton

WS Power

Montana PSC

NPCC

NRDC

Tacoma Power

NPCC

Public Generation Pool