

Conservation Resources Advisory Committee

Meeting Minutes

August 21, 2013

Meeting Facilitators: Tom Eckman, chair, and Charlie Grist, vice-chair.
Participants list attached.

Tom Eckman called the meeting to order at 9:30 a.m. He welcomed participants and asked for a round of introductions. Eckman said the minutes from the Conservation Resource Advisory Committee (CRAC) meeting November 19, 2012 would be part of the official record of committee proceedings. Ken Canon made a motion to adopt the minutes. Eugene Rosolie seconded the motion, which passed with all votes in favor.

Eckman went on to the meeting agenda and explained each item. He noted that the afternoon will include “a deep dive” into the lessons learned from the Sixth Power Plan and assumptions that drove the answers. We’ll ask your advice about the input assumptions, he said.

Elements of Power Plan Development

Eckman began his presentation with a single slide that represents the portfolio analysis for the regional power plan and the costs and quantities of resources. He explained the slide, noting that the green diamonds represent conservation, which is the lowest cost resource for the first 5,000 average megawatts. Other resource costs start at about \$80, Eckman said.

We end up with conservation in the power plan because it is cheap and low risk; other resources, including gas and renewables, are at the margin, he stated, noting that the first requirement under the Northwest Power Act is to buy the cheapest resource first. This committee doesn’t determine how much conservation goes into the plan; price and availability determine that, Eckman said. Conservation is cheap, available, and low risk, he stated.

Charlie Grist explained a general schematic of the power plan development process, starting with the demand determinants. The role of the CRAC is to advise the Council on conservation elements, which are input into the planning process, he said. Grist listed the other Council advisory committees that give advice on the plan. CRAC is one of eight committees that advise the Council on inputs and “reading the tea leaves” on outputs for the plan, he said.

Grist explained a chart of the steps in the energy efficiency methodology used for the Sixth Power Plan. The steps begin with building supply curves and the schedule of availability, inputs to the Regional Portfolio Model (RPM), and conclude with setting conservation targets and developing an action plan.

The RPM tests multiple plans with combinations of resources against a broad array of possible futures, Grist said. From the RPM, we get a strategy for the least-cost and least-risk power plan, he said. The RPM tests a suite of conservation avoided cost metrics which inform conservation target recommendations, Grist said. All of these things are presented to the Council, which makes the final decision on a plan that includes the conservation targets and recommendations on development of other resources, he said. The power plan is “a very human reading” of the RPM results, Grist added.

Eckman described the CRAC role in the steps on the chart. He said the CRAC is engaged in the following steps 1) Build supply curves 2) Schedule availability 3) Adjust NLO (non-lost opportunity) supply curve for program deployment and 4) Shape savings by season and high/low load hours. In steps 7) Practical considerations and 8) Conservation targets and action plan, the CRAC checks again on whether the results look like a practical limit and a doable target, he said. We test the results with you, Eckman added.

Canon asked if the CRAC would meet more frequently than in the past year to have more robust engagement in the plan. Eckman responded that it would. With the Sixth Power Plan, for example, we had bimonthly meetings at the tail end as we got into the draft plan, he said.

Dave Hewitt asked where the distributed renewables are in the plan. Eckman said there are two types of renewables. One type is the direct application renewables that are largely on the customer side of the meter; we look at those with the eyes of energy efficiency because they are demand reduction, he said. The other type of renewable is more sizeable and is dealt with as a utility-scale resource. If it is on the customer side of the meter, that is our domain, he stated.

Kevin Smit asked if the committee will discuss the RPM. That is a big piece of how decisions are made, he said. Charlie Black said it will be important for each of the advisory committees to know where their part fits into the picture with the RPM, but operation of the RPM is not part of the CRAC agenda. We are going to use the System Analysis Advisory Committee to discuss the plan's analytics, including the RPM, he said. We also have a new Resource Strategies Advisory Committee that will discuss things from a policy perspective, which is an expansion from the Sixth Power Plan, Black said. All of these meetings are open to the public and anyone can participate, he added.

Mary Smith asked how the CRAC will dovetail with the System Analysis Advisory Committee regarding the cost-effectiveness of conservation. The primary determination of how much conservation is cost-effective is made in system analysis, Black said. How much conservation is available will be discussed here in the CRAC, he said.

Generic Process for Estimating Conservation Resource Potential

Eckman continued with the presentation, explaining the steps in a diagram of the Generic Process for Estimating Conservation Resource Potential. He said costs of the conservation measures will be brought up to date for the Seventh Power Plan. We will do a complete database "refresh" on inputs that go into the analysis, Eckman stated.

Grist said the Council is looking for current data for the conservation supply curves. That's where the CRAC members come in, he added.

Eckman explained the role of the Aurora Model in estimating conservation potential. It provides estimated market costs of energy and capacity by hour, he said. All of the measure costs, measure savings, measure savings shapes, measure lifetime, and Aurora market prices feed into the ProCost model to estimate the levelized cost of savings. The ProCost model also incorporates other factors, like transmission and distribution benefits, financial assumptions such as the discount rates, and the ten percent credit called for in the Act. The Aurora market price estimates used to develop conservation costs in the supply curve only effect the ten percent Regional Act credit component of costs.

Bud Tracy asked if the capacity benefits are limited to winter. Eckman said the analysis for the Seventh Power Plan will incorporate hourly load shapes throughout the year.

This is a big topic for the Seventh Plan since the region is facing capacity issues, Grist said. An issue for the plan will be how we reflect the capacity value of conservation, he said. We think it is a pivotal issue facing the region going forward, Grist added.

Black noted he is hearing a lot of interest from the CRAC about how the Council does its integrated analysis. For the Seventh Power Plan it will be more transparent than in the past and others can actively participate, he said. Black explained that the System Analysis Advisory Committee will bring energy efficiency and generating folks into the same room to discuss issues, but the analysis won't be replicated in the CRAC.

Eckman continued with the presentation, explaining that another factor in the analysis for energy efficiency is how fast the region can deploy efficiency resources and the rules utilities use to acquire those resources. He explained the forecast model and the estimates it provides for the energy efficiency supply curves. The model provides the baseline information we start with for the energy efficiency potential, such as the types of homes, heating systems, square footage, and other information, Eckman said. This potential goes into supply curves for lost opportunity and non-lost opportunity energy efficiency resources, he said. All of this is fed into the RPM and "it chews its way up" the range of possible energy efficiency resource builds, Eckman explained.

The CRAC asked a number of clarifying questions about the use of the models in the process and the development of the supply curves and the inputs that go into them.

Eckman next explained the Demand Forecast and Conservation Interface. He pointed out that there is a process loop that allows for consumer response. It is possible consumers will respond to more efficiency with more consumption in what is called "the rebound effect," Eckman explained. It turns out to be a trivial number in the analysis, he added.

Eckman listed key areas where advice is needed from the CRAC for the Seventh Power Plan. The list includes: performance cost and availability; baselines and remaining potential; development assumptions; energy efficiency development decision rules in RPM modeling; and recommendations for the action plan. We had 20 action plans in the last power plan – some were very directive and others were not – but we won't have so many this time around, he said, adding that the CRAC will help develop the plans.

Draft Timeline for the Seventh Power Plan

Grist went over major steps in a timeline for developing the Seventh Power Plan and noted places where the CRAC will be involved. BPA and Cadmus will soon complete a detailed review of 2010-2011 conservation program results, which will provide knowledge for developing the next plan, he said, and staff will generate information on federal standards and state codes adopted since the Sixth Power Plan. There have been over 20 federal standards adopted since the Sixth plan, which will reduce the available savings, Grist stated. Eckman added that a first step is to figure out how much of what was in the Sixth plan has been done, what remains, and what is its cost.

Nicolas Garcia asked about the committee's process if there are disagreements. How will fundamental disagreements be vetted? he asked.

This is an advisory body and we won't take votes, Eckman responded. We will tell the Council what we heard from the committee, he said, adding that staff will not try "to censor the message." Black said there are a couple of opportunities to air issues. First is in the advisory committee, he said. There will also be opportunities to appear at the Council's Power Committee or at the Council to present concerns, Black said. He added that a new Resource Strategies Advisory Committee could be a place for discussing policy issues. None of the advisory committees are voting entities; they are to gather information and the ultimate policy calls are up to the Council, Black said.

Bruce Folsom asked if staff intends to prepare white papers on issues. Eckman said that is a possibility if there is need for more input on an issue.

Hossein Haeri said the way the role of the committee is defined could help with the question of disagreements. We won't be dealing with policy, we will be dealing with facts, he said. I'm not sure where there might be disagreement, Haeri added.

Smith said one issue, for example, is why utility supply curves don't add up to the Council's curves. Some would ask why the Council can't take the utilities' curves and make them the regional curves, she commented.

That will be an excellent topic for discussion later when we have the supply curves, Eckman responded. We can talk about "where theory meets the road," he said.

Canon said a helpful exercise for the committee would be to discuss how things have fundamentally changed in energy efficiency over the last five years. The difference is stark, and one thing to consider is how much utilities have stepped up and improved their game, he added.

Let's not have any illusions there won't be disagreements on the measures themselves, Rosolie said. He cited costs as another area of potential disagreement. In the end, there will be disagreements, but hopefully, we will have a good honest discussion, Rosolie added.

Another comment was to have the committee consider how to instill the ethic of conservation in the region. Eckman said there are many behavior-based programs that are finding their way into mix. These haven't been incorporated in past plans, but that will be an issue in the Seventh Power Plan, he said. Do we include them in the plan? Do they meet the statutory mandates of the Northwest Power Act? Eckman asked.

Black noted that the schedule for the Seventh Power Plan has been delayed. The delay is related to the Council extending the amendment process for its Fish and Wildlife Program, he explained. In addition, the RPM needs to be reworked so we are building more time into the schedule, Black said. He said the issue Smith raised about the supply curves is a fertile topic for investigation. He also suggested work could be done to compare what is in the power plan with what is happening with utilities.

Lauren Gage said the schedule delay has implications for BPA's energy efficiency program and meeting the conservation targets in the region. We need to have a conversation about that, she said. Eckman agreed and said Peter Cogswell also brought the issue to the Council's attention.

There was more discussion about the schedule for the Seventh Power Plan and implications for programs in the region. Grist completed his timeline presentation outlining the points at which

input will be needed from the CRAC. The committee will be asked to help develop the Action Plan for the Seventh Power Plan, he concluded.

Eli Morris asked how research projects that are under way dovetail with the schedule. Grist said there should be new information from the projects to incorporate into the supply curves.

Susan Hermanet reported that the Northwest Energy Efficiency Alliance (NEEA) is on schedule to complete surveys that will feed into the plan. As a result of the Residential Building Stock Assessment and the Commercial Building Stock Assessment, we will have better information than we have ever had for those sectors, Eckman stated. From a technical standpoint, it will likely be a better foundation for the plan, he said.

Rosolie asked when a draft load forecast would be available and Grist said it would be in mid 2014. We'll get a better fix on a final as things evolve, he said.

Work Plan Items

Grist summarized the following points to be added to the staff's work plan for developing the Seventh Power Plan and/or the agendas for future CRAC meetings:

- Be open to vetting disagreements that arise in the CRAC.
- Explore implications of a delay in the schedule for the Seventh Power Plan.
- Discuss changes in the region's energy efficiency context since the last plan.
- Compare the Council's supply curve with those developed by utilities.

Lessons Learned from the Sixth Power Plan

Eckman presented a high-level summary of what was learned from the Sixth Power Plan. This is looking at history to inform what we are doing with the Seventh Plan, he added.

Eckman began by listing factors that affect conservation resource development, including cost and amount of energy efficiency, wholesale market prices, carbon cost and risk, and load growth. He said the last factor on the list, acquisition ramp-rate assumptions, reflects how fast resource development can happen. Eckman said staff did sensitivity analyses that provided insights into the question of resource development; we did an uncertainty analysis around gas prices, generation prices, and also the cost and performance of energy efficiency. We gained insights from that analysis to address issues such as what if we didn't make the conservation target and what would be the backstop, he said. Decision rules, such as the market price adder for conservation cost-effectiveness, are another factor in the analysis, Eckman said.

With regard to the size and shape of conservation supply curves, it's important to understand there is "a lot of cheap stuff" out there and in aggregate, the megawatts are large, he continued. At \$60 to \$70 per average megawatt (MWa), conservation begins to have diminishing returns; what happens in the higher price ranges matters a lot, Eckman stated. At that higher price, the curve starts meeting up with new generation resources, he said. Eckman said there are 5,800 MWa of conservation in the Sixth Power Plan and that most of that was below \$60 to \$70 per average megawatt.

He said there is a lot of remaining conservation potential if the market price is low and the combined-cycle combustion turbine is your option. "It takes a Draconian view of the world" not to develop conservation, he said in explaining the supply curve.

Utilities will need combustion turbines to deal with integrating wind, Garcia said. The marginal cost is the right metric not the levelized cost, he said. However, if you are building for integrating renewables, you might build a single-cycle gas plant, Ralph Cavanagh commented.

Eckman said the RPM is used to see how the energy efficiency analysis changes in the different resource cost scenarios. The RPM approach tests for what is the best metric for conservation cost effectiveness. There is “a lot of cheap stuff” in the supply curves and the RPM helps to sort that out, he indicated.

Phil Welker asked where the “order of march” for various resources is addressed. Black said those would be topics for the System Analysis and Resource Strategies advisory committees.

Eckman continued the presentation, noting there are diminishing returns for energy efficiency starting around \$80 per MWh. It is important to understand that if the shape of the supply curve changes, the results are not the same, he said. Additional slides illustrated the ramp rate for conservation and the availability of lost-opportunity and retrofit conservation.

Isn't the availability of lost-opportunity related to the construction cycle? a participant asked. Eckman responded that it is. He explained a graph of the available retrofit conservation. We “front loaded the retrofit” and made it available early on in the Sixth plan, Eckman said. We could have exceeded the 160 MWa, the RPM-modeled maximum annual pace, if we had gotten ahead of schedule on retrofits, he noted. As a result of the front-loading, fewer retrofits will be available going forward with the plan, Eckman said.

Rosolie asked about the reference to “a calculator” to determine lost-opportunity targets. What calculator are you referring to? he asked. The Council developed a calculator for use with Washington's I-937 legislation, Eckman responded. Rosolie asked if the calculator addresses specific efficiency measures, and Eckman said it did not, just megawatts.

Grist said the Council's plan has a target of 1,200 MW over five years. The target “was built up from a granular level” of what we thought was available and buildable in that period, he said. It informed what the Council chose in the power plan, Grist added.

Cavanagh noted the region is half way to the target ahead of schedule. In each of the first two years, we were 20 MW above the target, Eckman said.

Grist explained the derivation of the shape of the savings. The big inputs to the RPM are cost and pace of energy efficiency acquisition, as well as the shape of savings. We develop the shape by looking at what is available in the high and low load hours, he said, referring to a graph that indicates relatively more savings occur in the winter than summer. This shape drives the capacity value of conservation in the RPM, Grist stated.

Eckman described the “Goldilocks” problem faced by resource planners. They don't want to build too much or too little, they want to build what is just right, he clarified. In Lesson 1, Eckman explained that the region experienced overbuilding of resources in the 1970s with thermal plant construction. There was a significant error and it was and continues to be very costly, he stated. Eckman pointed out the impact on retail electricity rates.

In Lesson 2, he said the region has also experienced underbuilding, explaining the situation in 2000, when the wholesale power market rose to over \$700 per MWh. As a consequence of the

exposure to a very costly short-term market, retail electricity rates went up, Eckman said. PGE's industrial rate went up by 50 percent, he added.

We found if we buy more conservation, we can hedge against these overbuilding and underbuilding periods, Eckman stated. It is the cheapest insurance we can buy against these situations, and Lesson 3 is that acquiring additional energy efficiency reduces both cost and risk, he said. Reserve margins matter, Eckman continued, explaining Lesson 4. Energy efficiency keeps utilities out of the market because their loads are lower, he said. If loads do not grow fast, market prices stay more stable; there is less pressure on prices, Eckman said. Energy efficiency is a way to avoid being in the market for power purchases when prices are extreme, he said. With energy efficiency, you also get to avoid making mistakes, Eckman continued. It is a risk mitigation strategy in that you don't have to decide to build something that is irreversible, he stated.

Lesson 5 tells us that both least cost and least risk resource portfolios rely heavily on energy efficiency, Eckman said. You get the same answer in both cases, he added.

In terms of flexibility, there will be a need for new resources, Garcia stated. What sort of difference will that make in the analysis? Some utilities have to build resources to meet flexibility needs, he said. We may no longer be able to defer what has been deferred capital, Garcia pointed out.

We have a different world with regard to capacity in the Seventh Power Plan, Eckman responded.

Eckman went on to Lessons 6 and 7. The pace of energy efficiency development does not vary significantly between least cost and least risk portfolios, and carbon price didn't have a lot of impact on efficiency resource development, he said. When you look at a single future, there is not a lot of difference at \$20 or \$100 carbon, Eckman said.

Lessons from the Uncertainty Analysis

Grist explained the lessons learned from an uncertainty analysis done after the Sixth Power Plan was adopted to test uncertain cost and price. Increasing the uncertainty bounds around cost and availability of conservation resulted in optioning additional wind generation, he said.

Black explained limitations in the RPM's capability to model wind. It treats wind generation as a block of power and doesn't reflect the intermittency, he said. Other resources are needed to address the intermittency, which wasn't captured in the Sixth Power Plan; it will be in the Seventh Plan, Black said.

There are uncertainties with efficiency, Gage stated. Is it on the table to look at the sensitivities around the supply curves? she asked. We can do that analysis this time, Eckman responded. The totals can change and the slope of the supply curves change, he said. Grist said more thought should be given to different ways to model conservation uncertainty. This is a question that applies to handling uncertainties for all resources, he said.

Eckman moved on to the topic of the cost-effectiveness findings from the Sixth plan with regard to establishing a premium over market price. We do not give the RPM a cost-effectiveness limit for efficiency, it finds the level, he explained, by testing the premium in increments of 10, i.e., plus \$10, plus \$20. In the Sixth plan, we tested up to a premium of \$200 per MW, Eckman said.

We are starting to look out at those prices, so the Seventh plan may need to look at retrofits over \$200 per MW, he added.

If you get deep savings in buildings, you reposition them in the marketplace, Hewitt said. If you reposition a building, you can increase the asset value, he added. Even if a system is expensive, the asset value to the owner can be much greater, Hewitt pointed out, adding that we need to start looking at who gets the benefit.

We don't know the speed with which we can replicate these results, Fred Gordon stated. If we want to get into the upper end of the curve, we have to deal with uncertainty; we may need to talk about things we think are worth it, but can't prove, he said.

As the proportion of non-energy benefits begins to swamp the energy benefits, it becomes more problematic for utilities to target and pay for that portion of savings, Smith said. Eckman said that issue might be addressed by considering measure achievability.

Eckman resumed his presentation, explaining that the RPM approach to establishing a premium over market price is meant to mimic utility decisions. As prices get high in the market, people think they need to build, he said. We now have 12 years of sustained investment in energy efficiency and we need to take a look at this rule, Eckman said: does market price have anything to do with the pace of conservation development any more?

Next, Eckman addressed the topic of planning for uncertainty in an integrated resource plan. Costs are uncertain for all resources, he said, using as illustration the uncertainty around a combined cycle combustion turbine.

Eckman said in the Sixth plan, the energy efficiency cost premium was market price plus \$50 per MWh for lost-opportunity conservation and \$80 per MWh for non-lost opportunity conservation, which was modified to market price plus \$30 per MWh. The premium works in conjunction with the shape of the supply curve, he said. It causes more efficiency to be built when market prices are low and limits overbuilding energy efficiency when prices are high, Eckman explained. Setting a cost-effectiveness limit above the short-term market prices acquires more efficiency and reduces both the system cost and risk, he said.

Grist explained the impact of the cost effectiveness premium. When the market price is low, you don't roll back acquisition of efficiency so much, he said. If you do, you end up with a higher cost system overall, Grist said.

Development of Decision Rules

Grist presented the energy efficiency development decision rules in the RPM. He said the overarching aim is to reflect how things happen in the real world and how decisions are made at utilities. Grist listed several rules that are important areas for CRAC advice: apparent market price, ramp rates, maximum rate limits, and the buy "up to" behavior. In the Sixth Power Plan we came to the conclusion we couldn't develop more than 160 MWA in a year, which we set as the maximum rate limit, he said. Grist explained the buy "up to" behavior. In practice, a utility can not buy up the supply curve in the logical order; the model mimics the real world by buying some resources at other places on the curve, he said. How we incorporate the Northwest Power Act credit is another decision rule, Grist explained.

We are looking for whether these are the right rules and whether there are additional ones, he said. And do they mimic reality? Grist asked.

Canon suggested calling the “maximum rate limit” the “maximum acquisition level” to avoid confusion.

If you are trying to model utility decision making, you need a maximum retail rate limit, Smith stated. It is part of utility decision making, and it bears on how we pay for efficiency, she said.

The RPM is a regional model so how do we do that? Cavanagh asked. We should talk about how we implement that and how we could have a proxy, Eckman said. We are trying to minimize overall revenue requirements, he said.

The Council is always driven by the statutory obligation to minimize the revenue requirement, Cavanagh said. If you want the Council to insert retail rate impacts, you are asking them to do something other than that, he said.

A utility’s appetite for spending money is limited, Garcia commented. If something doubles retail rates, utilities will resist it, he said. Utilities worry about the rate impact any expenditure will cause for their customers, Garcia stated.

We are also dealing with short-term versus long-term effects, Smith added.

Let’s figure out first what is cost-effective regionally and then talk about the effects of that, Black suggested. When a utility acquires a major new generating resource, there is a rate impact, he said, and it is a big impact compared to building 10 percent of a plant over 10 years.

Grist explained the derivation of the “apparent market price.” The apparent market price proxy in any quarter is the rolling average market price for the past 20 quarters, he said.

Rosolie asked about the reasoning behind choosing 20 quarters or five years. It is a carryover from the Fourth Power Plan, Eckman said. In the Fifth Plan, we looked at lengthening or shortening that time, so it is open for discussion, he said.

Gordon suggested making the question experimental to ask whether following market price gives any long-term benefit. We could put that on the table to see if it is a testable question, Eckman responded.

The premium used is static, Black stated. How safe is that assumption given the dynamic with market prices changing? he asked. It is not intuitive to me that the premium would flex based on the circumstances, Black said, adding that the appetite for energy efficiency does vary depending on economic circumstances.

We are trying to come up with something that serves as a guidepost through the ups and downs in the market, Michael Schilmoeller responded. “This is all fair game to look at,” he said. I think the averaging period has less effect than you might think, Schilmoeller said. But these are interesting questions and perfectly fair, he added.

What is the relationship of the apparent market price to the load forecast the Council makes? Garcia asked.

The reason for the “stress testing” is that we believe we can’t forecast the future, Schilmoeller responded. We want a robust future that can meet what happens, he said. We test the premium on 750 market price futures, Grist explained. We are stress-testing excursions from the average, Eckman said.

Black explained how the Council will address the question of how closely the Aurora price forecast tracks with apparent market price in the Seventh Power Plan. If our Aurora forecast has the market at \$30 MWh and the average of 20 futures is \$75 MWh, we have introduced systemic bias, he said.

Canon asked if staff will develop a list of questions/issues for the CRAC to respond to, and Eckman said it would.

If through this process we are looking for regional support for this resource, why talk only about wholesale market price and not the effect on utilities, Bud Tracy said. If we don’t think about the effect, we will get pushback, he said. How do we answer that issue and is there a plan for asking that question? Tracy asked.

Eckman said the effect on utilities tempers “what we should do.” Black pointed out that BPA has prepared a business case for conservation. Gage elaborated, reporting that BPA has written and published a business case for conservation and developed a tool that utilities can customize to analyze their specific situation. Steve Weiss said the tool for utilities is being tested and is not yet available. The business case is posted on the BPA website, he said.

Grist went on to explain how the Council develops the ramp rate for lost opportunity and non-lost opportunity. We develop the availability and limit on what can be developed, he said. Grist listed the factors used to determine what the penetration rates might be and the calculation done to come up with the ramp rates.

Do you have decision rules for each of those things? Canon asked.

Grist said staff made proposals for what the rules might look like, and Eckman said the advisory committee was asked if they were right.

Do you compare the actual penetration rates to the curves? Tracy asked. Yes, Grist responded. We hope the Cadmus and BPA work will provide that data for us, Eckman added.

The ramp rates have to be reasonable, Gordon commented. They won’t be accurate for each measure, but it is important to think about them individually and collectively, he said.

Grist explained the lost-opportunity penetration rates. We came up with a suite of curves that reflected the potential penetration rates by measure and summed them up across measures to get the total achievable conservation by year. Individual measure penetration rates go up to 85 percent, he said.

Is 85 percent accurate? Tom Schumacher asked. We did a paper on it and concluded that 85 percent was reasonable, Grist said. He said staff would circulate the paper.

There is also a suite of curves for retrofit, Grist said, and went on to explain how they are developed. He noted that retrofit opportunities, once deployed can’t be deployed again. Programs mix high and low cost measures so we can’t buy only the cheap conservation first,

Grist said. Instead, the analysis samples a range of measures on the discretionary supply curve; it is not a linear process, he stated.

Gordon commented on the graph of retrofit penetration rates. We don't flat line in the later years, the penetration just occurs more slowly, he said. There is a slowdown and at some point, the conservation is harder to get, Gordon said. Grist addressed why the availability curves flatten out, explaining that the analysis is careful not to consume more units than there are of a measure.

The committee discussed how to account for lost opportunity resources that later become retrofit opportunities. I like "having the model run wild" with lost opportunity, Gordon said. You want to test cost and benefit with the planning tools to inform pragmatic choices year to year, he said.

Grist went on to explain the sensitivity analysis of what happens "if we go faster or slower" with retrofits. In the slower case, we limited it to 100 MW per year and with the fast case, it was 220 MW per year, and we came up with system cost and risk values, he said. In summary, going slower increased the cost and increased the risk, Grist stated.

You are reducing the risk of an unlikely case, Garcia commented. This drives toward resources with low marginal costs, he said.

You are trying to mitigate against high cost outcomes, Schilmoeller responded. You are looking at what costs will be if the high-cost outcome doesn't manifest or if something disadvantageous to the plan occurs, he said. The model is coming up with plans of options that reduce exposure to high-costs irrespective of the outcome, Schilmoeller said. When it is making recommendations, "it is trying to protect you from blunders," he added.

Part of the Energy Trust mission is to build a sustainable industry in the sustainable industries, Gordon said. Part of the concern is to set a pace we can sustain and not "boom and crash," he said. We don't want to overheat the market and then crash, Gordon stated.

If there is another decision rule we could use to address this, we should take a look at it, Grist said. There was some discussion of risk, and Schilmoeller said Appendix P in the Sixth Power Plan discusses the options for analyzing risk.

Grist went on to a list of findings from the Sixth Power Plan related to the acquisition rate for conservation. We learned in the last plan that the pace of acquisition matters and that we could do better or worse "depending on the governor we use," Eckman stated.

Northwest Power Act Credit

Grist explained how the Northwest Power Act credit for conservation is calculated. The Act says energy efficiency is cost-effective at 110 percent of generation, and the credit is calculated as 10 percent of the power system value, he said. Grist listed other factors in the calculation and said the credit is subtracted from the levelized cost of energy in the conservation supply curves.

I've heard the critique that we are mixing apples and oranges, i.e., mixing levelized with non-levelized costs, Black commented. Grist said the calculation is apples to apples.

Why is it appropriate to net out the non-energy costs and benefits? Gage asked. You are using a benefit here as a cost, Gordon said, adding that it is a result of the process versus being a sensible thing to do. Eckman said the statute requires the consideration of the ten percent credits when comparing resources, in addition to estimating environmental costs.

Grist explained the results of the decision rules in calculating a Mean Build Out for conservation.

When we get up to a cost of \$100 MWh, is the RPM picking resources other than conservation? Rosolie asked. Grist said it is.

Garcia asked if the analysis in the Sixth Power Plan assumes escalations or de-escalations for other resources. Grist said there are lots of factors that change, such as capital costs and fuel costs. Each resource has its own set of factors that impact costs, he said.

Dave Warren asked if staff has tested the 2010-2012 actuals against the \$160 per MWh cap. That was done, Eckman said.

CRAC discussed why the model is buying high-priced conservation at the tail end of the 20-year period.

Grist explained the lost-opportunity conservation distribution in the build-out futures. There is a spread of futures, he said. In the first five years, there is not much difference, he said. Part of the differential between the top and bottom of the curve is load growth; toward the top, these are high load-growth futures, Eckman said.

Wendy Gerlitz said while the analysis didn't test above the \$160 per MWh energy efficiency, there would be value in knowing what would happen if the model could go above that "somewhat arbitrary" limit. We didn't test above that cost, but we tested at acquiring 220 MWh per year and it showed a positive benefit, Grist said. It was better and "you chose the suboptimal outcome," Cavanagh commented.

Eckman went through the remaining slides, a summary set of tables which illustrate conservation build-out results for a series of comparative cases with and without the market price adders, carbon penalties, and stochastic variability. He presented results from Table J-2 in the Sixth Power Plan. Eckman laid out how much the market price adders and carbon penalties change the amount of conservation acquired between cases for both deterministic and stochastic approaches.

Which scenario goes into the calculator? Haeri asked. The stochastic results, Eckman said.

Haeri asked how market adders relate to the Northwest Power Act. Is there a provision in the Act that allows for including these adders? he asked. The market adders are a way to reflect what we should buy to protect against cost and risk excursions, Eckman responded. It is an analytical framework for getting at the problem of risk, he said. It is part of the modeling solution to address the problem that we don't know the future, Eckman added. He said the result of the adders is to "buy a little more insurance" to hedge the risk, he said.

What does this tell you about what people should do? What do all of these adders do in the short run? Gordon asked. He went on to say that the real impact of the adders in the short run is to add flexibility to innovate without identifying costs as pure innovation. I don't know if that is a planning/modeling impact, but that is what happens, Gordon said.

The CRAC discussed the market adders and conservation costs. We anticipate seeing utility costs go up over time, Eckman said. Grist said it would help to look at actual program costs over the last few years to inform the supply curve development for the Seventh Plan.

Eckman explained the thinking behind determining the present value benefits of energy efficiency, saying it is valued at market price. When we buy energy efficiency up to these levels, we are saying the net-present value benefit is positive, even though we are buying something more expensive than market, and it is better compared to a generating resource, he said.

Black asked Gordon to elaborate on his statement about how the adders allow innovation. There are measures we are not doing now because of their cost, but they might get better later, Gordon responded. We are helping the industry learn how to grow, he said. If contractors are learning how to add things and improve processes, there is a different skill set being developed, Gordon said. You either have a program that entails a set of static things or you can “procedurize innovation,” he said.

Did we talk about that in the Sixth Plan? Black asked. Eckman said it informed some discussion, but it was not addressed directly.

Welker noted there has been an evolution into different kinds of measures, but there hasn't been a transition into a different paradigm that makes sense for utilities in terms of cost-effectiveness and annual accountability for costs. Those are the implementation issues that need to be addressed or you get to a place where you have run out of measures, he said.

I have heard this before, that we are running out of measures, Black said. I see this as a significant topic and an important nexus between what we do in planning and the real-world implementation issues that we keep hearing about, he said. I'd like to flag this as an important topic, Black said.

Eckman went on to explain the cost-effectiveness premium and its role in risk mitigation. Historically, the pace of utility efficiency development has been tied to short-term market conditions, he said. Eckman presented the graph he referred to as “Mr. Toad's wild ride.” This is the RPM acquisitions with no cost-effectiveness premium, he said, referring to the up and down curve. The cost-effectiveness premium smoothes out the ride, he said. “The adders result in a better outcome, he stated.

Eckman listed issues to queue up for the CRAC work plan and he asked for help in determining the order of march for the issues. If there are other issues, let us know, he said.

Haeri asked about the “achievable fraction” issue. Do you mean something other than avoided costs, here? Does it include other constraining factors like rate impacts? he asked.

Where we are in 2013 and 2014 is that the energy efficiency activity in the region could be sustained at the current level and the revenue requirement would not increase, Eckman stated. But if we go to 400 MWa per year as the achievable fraction, it could, he said.

Work Plan Items Wrap-up

Grist listed issues that were raised in the discussion that will need further attention and/or to be addressed in future work plans. The items are:

- Look at how things have fundamentally changed in the energy efficiency context.
- Re-label the “maximum rate limit” as the “maximum acquisition level.”
- Consider what happens to conservation avoided costs if the region needs to build capacity for reasons other than energy.
- Revisit conservation uncertainty modeling for the Seventh Power Plan.
- Compare utility targets versus the Power Plan targets.
- Consider implications in the delay of the schedule for the Seventh Power Plan.
- Look at supply curves more carefully in the high-cost realm. Consider a probability analysis for the high end of the supply curve.
- Consider the value of retrofit in repositioning buildings in the marketplace.
- Consider the utility perspective when non-energy benefits are high. Address how NEBs are treated in supply curve development.
- Look at the shape of supply curves over time in the last few plans and how the top-end changes.
- Look at retail rate impacts of conservation in decision rules.
- Consider the premium in the context of changing market prices.
- Circulate the staff paper on maximum conservation penetration rates.
- Model the decreasing rate of acquisition over time in the supply curves.
- Look at the value of a sustainable pace of conservation deployment.
- Test how much to spend on innovation to inform program efforts.
- Incorporate market intervention strategies and customer-relationship model versus a measure-based perspective.
- Develop a list of questions/issues for CRAC response and a CRAC work plan to address issues.

Eckman said the CRAC will likely meet later in the fall, probably in November.

Rosolie asked where the policy discussion about energy efficiency fits. It shouldn't be left to the end and would be better discussed sooner rather than later.

Eckman said CRAC could pick up discussing policy issues that bear on technical issues as they arise.

Eckman announced that the Council has posted a job opening for an energy efficiency staff person and he encouraged committee members to read it.

The meeting adjourned at 3:47 p.m.

Conservation Resources Advisory Committee Meeting August 21, 2013

Participants List (In Person and By Phone)

Lauren Gage	BPA	By Phone:
Phil Welker	PECI	
Bud Tracy	Ratepayer	Steve Weiss
Ken Canon		Ken Baker
Lauren Shapton	PGE	Brian DeKiep
Ken Eklund	WSU Energy Program	Marty Stipe
Dick Adams	PNUCC	Deb Young
Kevin Smit	EES Consulting	Kathy Hadley
Stan Price	NEEC	Stacey Donohue
Chuck Murray	WA State Energy Office	Rebecca Nelson
Charlie Black	NPCC	Van Ashton
Bruce Folsom	Avista	Shirley Lindstrom
Ralph Cavanagh	NRDC	Ryan Firestone
Nicolas Garcia	Tacoma Power	Tom Schumacher
Eli Morris	PacifiCorp	Tom Eckhart
Hossein Haeri	Cadmus	Glenn Atwood
Susan Hermenet	NEEA	Rob Currier
Eugene Rosolie	Cowlitz PUD	Linda Esparza
Doug Brawley	PNGC	Tina Jayaweera
David Nightingale	WUTC	Chad Madron
Mary E. Smith	Snohomish Co. PUD	Erik Holman
David Hewitt	New Buildings Institute	Rich Arneson
Fred Gordon	Energy Trust	Kathy Moore
Danielle Gidding	BPA	Gurvinder Singh
Wendy Gerlitz	NW Energy Coalition	Don Jones, Jr.
Justin Holzgrove	Mason County PUD 3	Kevin White
Bob Gunn	Seinergy LLC	Patrick Keegan
Jill Steiner	Cadmus	
Erin Rowe	Cadmus	
Steve Bicker	Tacoma Power	
Tomás Morrissey	PNUCC	
Will Price	EWEB	
Mike McClenahan	Grant County PUD	
Jason Klotz	NEEA	
Pamela Sporborg	NRU	
Cory Read	Idaho Power	
Jess Kincaid	OR DOE	
Christian Douglass	RTF Contract Staff	
Mohit Singh-Chhabra	RTF Contract Staff	
Michael Schilmoeller	NPCC	
John Morris	Fluid Market Strategies	
Josh Rushton	RTF Contract Staff	
Howard Schwartz	NPCC-Washington	
Julie Amos	WA Auditor's Office	
Bo Downen	PPC	
Larry Blaufus	Clark Public Utilities	
Therese Hampton	Public Generating Pool	