RENEWABLE ENERGY ADVISORY COUNCIL
Notes from meeting on June 6, 2012

Attending from the council:
Joe Eberhardt, Portland General Electric
Troy Gagliano, enXco
Thor Hinckley, PGE
Glenn Montgomery, OSEIA
Vijay Satyal, Oregon Department of Energy
Dick Wanderscheid, Bonneville Environmental Foundation
Tashiana Wangler, Pacific Power
Attending from Energy Trust:
Doug Boleyn
Kacia Brockman
Amber Cole
Chris Dearth
Sue Fletcher
Pete Gibson
Fred Gordon
Betsy Kauffman
Dave McClelland
Thad Roth
Lizzie Rubado
Sue Meyer Sample
Peter West
Others attending:
Eric Anderson, PacifiCorp
Bob Proctor, OPUC

1. Welcome and introductions

Betsy Kauffman called the meeting to order at 9:30 a.m. She stated that changes had been made to the April minutes to correct a number and a comment. Minutes were approved.

Betsy passed around a paper that will be used for the board's upcoming strategic retreat. She suggested that council members take a look. The paper can be covered at the next council meeting if it is of interest and we receive feedback from council members.

The agenda, notes and presentation materials are available on Energy Trust's website by clicking here.

2. Lessons learned from the competitive process

Thad Roth presented an update on lessons learned from the competitive process. Energy Trust hasn't undertaken a competitive process in quite a while. The reason behind this process is that we had more demand than incentive funds available in Pacific Power territory.

Thad explained the steps in the process. The first is that we created a standard application for custom projects. Our prior applications focused on capturing information by technology; now we have a single application that standardizes the required documentation for each project. The application also includes appendices that request unique documentation for each technology. A scoring calculator was created to rank projects that met our eligibility requirements. We held a two-step evaluation process. The first phase determined if each individual project met our requirements. If they passed this screen a second phase utilized the scoring calculator to rank projects. We formalized the role of an internal review team. The renewable energy staff conducted a thorough evaluation of each project, made a recommendation for funding, and presented the results to the internal review team made up of key departments including legal, financial and planning representatives. The internal review committee reviewed the individual projects, the proposed funding recommendation and finalized the funding recommendation.

Betsy mentioned that we have always used internal committees, but now it is a more formal, expansive role than we have had in the past.

Thad described the following as lessons learned through the process:

- The team understands the market. No one applied who we didn't expect to apply.
- The timeline was aggressive in terms of receipt of materials and review. If there had been more applications this timeline would have been difficult. Next time we will lengthen the timeline.
- Comparing projects across technologies is always a challenge. Evaluating projects with different capacity factors, risks and incentive costs complicates the fair comparison. This was addressed in our two-step process by assuring that we would be comfortable funding any project meeting our eligibility criteria.
- There are also always opportunities to improve how we communicate the process and expectations.
- This process benefited from an ongoing dialogue during the application and review process. Typically competitive processes do not have ongoing communication. We think it is better to request information when there are gaps. We don't want to get rid of applications because information is missing. The goal was to get as complete an application as possible.
- The two-step evaluation process, to determine project eligibility and rank eligible projects, was an effective tool in our funding decision. In the ranking process, 50 percent of the score was cost per average megawatt. What we did see out of the ranking process was the least expensive projects on an incentive per aMW tended to float to the top. There are some benefits to that.
- At different times our funding requirements might need to focus on different goals. For example, if we wanted to focus only on net-metered projects we would include that specific criterion in our funding announcement.

Vijay: This is for mutual learning. You mentioned that the least expensive projects go to the top. This impacts different technologies. How do you deal with the ones that have higher upfront costs but are good long-term projects?
Thad: I want to be clear that when I say lowest cost per average megawatt I'm describing our incentive per average megawatt. It is not related to the total cost of the project. It reflects how much energy we get for our incentive.

Joe: The competitive process applies to all service territories?
Thad: Just Pacific Power so far.

Joe: Is your process a duplication of the competitive processes undertaken with the utility?
Thad: We should examine to see if there is redundancy. We could look at timing of funding announcements to leverage the utility process.
Joe: At the utility, we ask them to apply without consideration of an Energy Trust incentive. The Energy Trust process would then need to fit into that utility review process and timing.
Thad: We need to learn more about how your process works and the size of projects.

Bob: The result of the scoring calculation didn't necessary result in the project that was funded, correct?
Thad: This was the result of our two-stage process. Some don't make it through the first round. Only those that make it through the first round go to the scoring calculator.

Bob: You were not saying that there was a post processing of the scores, correct?
Thad: Correct.

Bob: How did you go about integrating quantitative and qualitative factors?
Thad: The scoring had a mathematical calculation that was compared to other factors, such as experience of the developer, an innovative application or a model that can be replicated, for example. It is a bit artful but you either got the score or you didn't get the score. You are building these other factors onto the financial performance of the projects.

Bob: Did you have any experience where a project scored well on quantitative factors but not on qualitative?
Thad: One of the big issues is risk. We dealt with that in the first stage. If we didn't have confidence in the project, it didn't make it to the next level.
Fred: There is a balancing act between funding conventional projects and innovative projects that may be more expensive that we didn't really have to address in this round but we will have to in the future.
Thad: There are a couple of approaches, and there are ways to adjust the scoring system to provide additional points. In this case we were fortunate enough to end up getting an innovative project. The process allowed that project to move forward.

Vijay: Is Energy Trust considering a policy decision about net-metered projects only?
Thad: That was just an example. We have limited resources and might need to narrow the range of projects in the future.

Thad described that this process will likely be extended to both utilities. Pacific Power will have annual funding announcements. Staff may expand development assistance because of need, moving earlier in the process and providing more assistance. Funding limitations will also be a factor.

Dick: Are you extending this process to PGE because you are short funds or you like the process?
Thad: We think we will be short but there are some equity advantages as well.

3. Update on the Solar market

Dave McClelland presented. He said the council has talked about a couple of larger projects and staff thought it would be nice to show some recent photos of these installations. The first is an enXco 2.84-MW project that was operational last December. This was a Nanosolar thin film project, demonstrating innovative technology. The other project is 1.75-MW array and it is the Oregon Department of Energy Baldock rest area. We recently received some new aerial photos.

Dave said the presentation is about solar electric market trends, but staff also wanted to show the Bud Clark Commons water heating system. There are approximately 100 collectors at this site. It is the equivalent of a 120-kW solar electric system. This is the largest rooftop system in Energy Trust's area. The Energy Trust incentive for this project came from the energy efficiency side of the house.

Dick: How did the costs compare to solar electric?

Dave: It is $2 to $2.50 a watt.

Dave continued: We wanted to look back a little bit and look at cost trends. We have supported 4,500 systems to date, since 2002, in commercial and residential. The projects spiked in 2008 in commercial and have since leveled off. There has been more action in recent years in residential installations. There are also feed-in tariff programs run by the utilities. Installations on those started in 2010. Some of the activity in the region has shifted to the feed-in tariff.

Dave explained the residential sector is where the majority of action has been in the last few years: Things really started picking up in 2009 and 2010, with a doubling of number of systems installed. Drivers were the cost of the systems and bulk purchase models. About half of the 2010 projects came through bulk purchase models. There are more options for customers in terms of incentives and purchase models. The big thing for us this year was third-party owned systems, with a higher percentage of third-party systems this year.

Troy: Can you explain the difference between bulk purchase and third-party models?
Dave: With the bulk model a community puts out an RFP and selects a contractor, or contractors, to install, driving down the cost of systems. The third-party owner model is when there is a single system owner for the life of system, and that owner provides the system as a service to the homeowner.

Glenn: Are the numbers correct for third-party systems?
Dave: I will check the numbers, one may just include commercial.

Joe: Have you peeled away the mandates to understand Energy Trust's leverage, and how much of the market are you driving, versus Oregon Department of Energy and feed-in tariff?
Dave: No. It is a great question. We can look at the proportion that is coming from Energy Trust.

Vijay: You have some of this information from previous presentations where you forecasted demand.

Dave presented data on commercial solar electric average costs, which went up in the first years of the Energy Trust program, and then dropped after 2007. Residential solar electric average costs show similar trends with peaks in 2008.

Dick: Is the average cost about the same for Energy Trust for residential and commercial?
Dave: They are similar. But that is because we are serving a different segment of the commercial market, like very small systems that are almost residential scale.

Dave showed data that looked at the top module brands. It showed that SolarWorld is the dominant module. That data was then compared to the top brands and their system costs over time. All appear to be converging in costs.

Vijay: Based on this data, I wonder why we have a tariff complaint.

Troy: What is meant by system costs?
Dave: That is all costs.

Vijay: Why did SolarWorld have a big drop then jump?
Dave: There were a lot of bulk purchase projects that contribute to these trends. This data reflect a number of contractors that have their own cost structure, not just pure system costs.

There are a lot of factors contributing to the ups and downs. In 2010 residential prices plateaud. Now they are dropping again.

Joe: Does this include the Baldock project?
Dave: It does but only one data point. It is a relatively small piece. If that project was removed SolarWorld would still be the dominant provider.

Dave discussed the stepped incentive structure which will likely be shifting down again today in PGE territory. Staff does see an impact on the residential market with the step decrease. The commercial market has had less of an impact.

Joe: You are capping project size, right? Is that impacting the system designers for commercial in terms of space, particularly if they want to use the full rooftop?
Dave: Right now the cap is $75,000 but the average size is about half of that. The cap doesn't seem to be a factor.
Doug: In recent visits that I have had with developers, the projects they are pursuing are all under the $100,000 development line.
Dave: There is a dollar cap not a capacity cap.

Dave: A similar price decline has occurred in Pacific Power territory. We have a stepped incentive design. We tell the market the amount, then we track when funds are exhausted at that level.

Bill: I don't see quantities provided with this data. If you had quantities, then you could play with the supply curve.
Kacia: We use this information to determine how much of our resources go into residential or commercial tracks, and incentive rates.

Dave reported that the program hasn't received any Pacific Power commercial applications in the last two and one-half months.

Eric: Have there been thoughts about adjusting the cap? How long with no projects before making changes?
Dave: We have discussed this. We have been watching the residential market and there are some bulk purchase models about to kick off. We are waiting to see if those take off.

Dave: In 2012, the average size of commercial projects has been about 22 kW. Contractors are finding that it is easier for them to make a residential sale in this market.

Troy: It was decided to spread incentives around so more can take part. Have you looked at these numbers compared to the contributions made to utility scale sites?
Dave: Approximately one-third of our funds in PGE territory are going to utility scale sites this year.
Kacia: We will continue to evaluate those costs.

Kacia: Doug Boleyn has been with Energy Trust for three years, and working in solar for 40 years. July 6 he is retiring and we thank him for his long-time commitment to solar.

4. Changes to the Small Wind initiative
Chris Dearth presented this topic and provided context to the wind initiative and the challenges staff faces.

Energy Trust has been modestly successful placing over three dozen turbines in the past five years. We expect that this year our numbers will be down. Most of the turbines are very small, less than 3 kW. The estimated total annual production jumped last year but it is mostly due to one large turbine in Silverton. Production estimates were often high in previous years. We are working to try to get better estimates.

There are relatively few turbine companies currently represented in Oregon. Some that we have on our approved list aren't active in Oregon. However, we have seen renewed interested in Oregon and increased sales efforts.

Some recent studies conducted by Energy Trust have been helpful. One showed that we were overestimating production by as much as 19 percent. We also looked at internal practices, and revised our incentive structure based on an estimated annual energy output model currently used by the New York State Energy Research and Development Authority. The incentives will be more generous as a result.

Some of the challenges that we faced in the past included fixed incentives based on nameplate capacity. Now incentives will be based on average energy output. This will be based on a wind energy report, performed by Wind Analytics. Our previous estimates were based on an outdated wind map. The data from Wind Analytics will be more accurate and determined for a particular turbine at a precise site. We will then base our incentive on that precise data and the resulting average energy ouput.

Another challenge we faced was that the wind map on our website was misleading. We have removed the map and now we require an initial consultation and a report from Wind Analytics. We will have a new web portal to provide more accurate information on our website in the next few months.

Our service territory and the high wind areas don't always align. We don't cover many of the best wind areas like the coast, gorge and southeast Oregon. This makes it hard for contractors to find good customers.

We also found that some turbines were untested and unreliable. Turbine companies were also unproven from a business standpoint. As a member of the Interstate Turbine Advisory Council, Energy Trust will share resources, expertise and increase market influence. ITAC will list the best turbines and the strongest companies.

Another challenge was that turbines were not always sited at the best location on the site. We will now request two potential sites are evaluated in the Wind Analytics report.

Tashiana: I assume that there are city codes limiting heights.
Chris: Most sites are in county planning jurisdictions and often require variances. Some counties do very well with planning provisions which accommodate small wind turbines, others do not.

Tashiana: The optimal customer would be a farmer with land in a rural area, correct?
Chris: We usually require at least an acre. The more space the better.

Eric: We see significant dissatisfaction with output. Are you going to be looking at true performance and basing your incentive on that performance? Are you going to look at the real data? PGE faces the complaints because the customers assume the less-than-expected production output is the result of the connection.

Chris: That is what we want to address. We are looking at working with one company, Jacobs, to give customers real-time online data and we can then analyze that data. We can compare performance to the Wind Analytics report that we received upfront. We are trying to move to science from art.
Betsy: The initial numbers look like they are quite conservative. We think that is good.

Bob: So in the future the incentive will be based on forecast. What are the capacity factors?
Chris: Capacity factors are unknown, not enough data.

Vijay: Based on research that we are seeing they are very low, 9 percent to 12 percent or 14 percent. There is seasonality to it.

Lizzie: The challenges with estimating haven't just been a challenge with Energy Trust. We are not unique. The multi-state collaboration is pooling information and grappling with this problem. There are not that many systems installed. There are not a lot of data points.

Vijay: We were getting calls regarding production. We were concerned it could have become a Department of Justice issue.

Fred: Part of this is about siting and height. It will be interesting to see if good advice will impact capacity factor.

Chris: Hopefully better data will allow them to make good choices.

Eric: Does performance impact incentive?
Chris: Yes, incentives are higher for higher estimated performance.

Eric: You mentioned that some of the turbine manufacturers are building in monitoring equipment. Is this an industry standard?
Chris: It is not a requirement yet, but when it is available across the board, we will require it.

Vijay: I am excited that you are working with this company and wonder if you would like the Oregon Department of Energy to be a part of this effort.
Chris: We would love to work with you on this.

Dick: Are you capping the incentive?
Chris: 60 percent of project cost, not a hard dollar cost.

Dick: Are they net metered?
Chris: Most are.

Dick: Typically they are sited away from the dwellings so are there extra costs to connect to the grid?
Chris: Usually they are near outbuildings or even the house. Connection costs are not that high in terms of a percentage of the project. We require that they are within 1,500 feet of the connection. Farms have unique needs that we need to factor in. We are looking for farmers that have some sort of farm connection load.

5. Public comment
Troy: I liked the pictures of the solar presentation. It was great to work with PGE on this project and enXco was happy with the sites. Energy Trust was also great to work with. Issues that came up were resolved. It has been up and running for six months and we are getting great

feedback from neighbors and the county. It has also generated calls from various land owners. I'm happy to take folks out to see the project.

Dave corrected data in his presentation; there were 593 feed-in tariff projects.

The briefing paper for the board retreat was handed out.

Vijay mentioned that the Governor's 10-Year Energy Plan is out for 60 days for public comment.

6. Meeting adjournment

Betsy thanked all council members for their participation and adjourned the meeting at 11:25 a.m. The next full council meeting is July 25, 2012.