RENEWABLE ENERGY ADVISORY COUNCIL
Notes from meeting on April 18, 2012

Attending from the council:
Megan Decker, Renewable Northwest Project
Troy Gagliano, enXco
Robert Grott, Northwest Environmental Business Council
Thor Hinckley, Portland General Electric
Juliet Johnson, Oregon Public Utility Commission
Glenn Montgomery, OSEIA
Frank Vignola, University of Oregon
Vijay Satyal, Oregon Department of Energy
Dick Wanderscheid, Bonneville Environmental Foundation
Tashiana Wangler, Pacific Power

Attending from Energy Trust:
Doug Boleyn
Kacia Brockman
Shelly Carlton
Sue Fletcher
Pete Gibson
Betsy Kauffman
David McClelland
Elaine Prause
Thad Roth
Lizzie Rubado
Peter West

Others attending:
Erik Anderson, PacifiCorp
Joe Eberhardt, Portland General Electric
Evan Elias, Oregon Department of Energy
Matt Hale, Oregon Department of Energy
Matt Hall, Columbia Biogas
Gia Schneider, Natel Energy (phone)
John Reynolds, Energy Trust Board, University of Oregon

1. Welcome and introductions

Betsy Kauffman called the meeting to order at 9:30 a.m. and announced that the presentations are available by webinar for attendees joining by phone. The February Renewable Energy Advisory Council minutes were approved.

Betsy mentioned the upcoming Future Energy Conference and NW Energy Expo next week and recommended that council members attend. Robert Grott recommended registering early. Governor Kitzhaber is scheduled to make an energy policy address. There will be a workshop on the Governor's 10-year energy plan and policy workshops at the end of the conference on renewable energy and energy efficiency. The SolarWorld president is speaking, and ACEEE will be there.

Thad Roth said that there will also be a Friday Northwest Biogas workshop presented by the Biogas Working Group, representing work over the last 24 months.

Glenn Montgomery said there will be a clean energy industry buyer and seller's forum for those looking to get into the supply chain, and pre- and post-conference workshops for trades people.

Betsy said Energy Trust, the Oregon Small Wind Energy Association and Northwest Environmental Business Council will provide a week-long training on siting and estimating production for small wind turbines. Energy Trust would like trade allies to attend, but this training will not make someone a trade ally. Energy Trust is offering a 50 percent tuition reimbursement for Oregon residents—$400 of the $795 cost. People can also pay $50 and attend only the first day of the training.

2. Update on competitive process

Betsy presented an update on the competitive process that Energy Trust instituted for custom renewable energy projects in Pacific Power territory. It opened mid-January and closed at the end of February. Projects were required to begin construction by the end of the year. There was $2 million in incentive funds available. Applications asked for project development schedule, financing, permitting and ownership structure, among other things. There was a two-level staff review. Energy Trust needed to make sure project energy projections made sense according to the fuel supply, and looked at the cost compared to other projects.

Four applications were received, but two were deemed ineligible. The internal review group was multidisciplinary, and all four projects were presented to this group. This group reviewed the applications and the entire process.

Dick Wanderscheid: Were the two projects that didn't meet eligibility requirements grossly under the bar?
Thad: We are still working with these projects and see them as very strong applicants. They aren't ready to go right now; there is still work to be done on their part and our part to move forward.

Vijay Satyal: Is this production-based costing or is capacity considered?
Thad: It is based on average megawatts.

Vijay: Can you give an example of a risk-mitigating measure?
Thad: EPC or fixed price O&M contracts are examples of risk-mitigation.

Dick: The two projects that didn't meet eligibility, had they been in touch with you before the competitive process?
Thad: Yes, they were known projects.

Robert: Were you surprised by only four applicants?
Betsy: No, we had a good sense of the market and got the applicants we were expecting. We reached out to more than 50 organizations and agencies.

Robert: You knew the marketplace
Thad: We went pretty wide.

Tashiana Wangler: Is this process a change from how you evaluated projects in the past?
Betsy: We were looking at mostly the same criteria, but we created a more formalized way of weighting because of the competitive process. We've been evaluating projects for a long time using similar criteria. One thing we did do was create a single application. They were separate before. This made it apples to apples.
Thad: Some things were different. In the past, we typically did not have deadlines for when construction would begin. Additionally, previously we could afford to support a project early in the development process. Now we are looking for projects that are ready to go. We have less flexibility now because of the demand for our resources and available dollars. Total demand was $5 million and we only had $2 million available in incentives.

Vijay: Did you feel during the process that any criteria were counterintuitive? Were you looking for something that is proven or are you testing new technologies?
Thad: There were opportunities for projects to benefit from scoring additional points that were not cost-related.
Betsy: That was one of the challenges. But that's the nature of having a portfolio of projects. We tried to create a range of projects.

Glenn: Can you describe the range of technologies that applied?
Betsy: We have decided to present just the proposals that are moving forward and not provide information on the applicants that aren't moving forward at this time. There was a mix of technologies, however.

Vijay: A question was raised in February about this. Will the two ineligible projects have a leg up on new incentive funds?
Thad: The better we understand them, the more likely they are to be successful. We haven't closed the door on anyone yet. We'll work with all potential eligible projects.

Tashiana: What is your assessment of this new process?
Thad: We thought about including "lessons learned" in our presentation today, but we haven't completed the process. Before making a decision about how we move ahead, we want to finish the current process. Our role changed in this process, in the ready-to-go aspect. Our view was colored by that, and our expectations higher. The challenge is "what does this mean for those who were unsuccessful in this round?" We're not sure how that plays out with projects that are moving ahead. We'd like to see them happen, with or without us.
Betsy: From a process standpoint, despite the compressed timeline, it worked well from a staff perspective. There was a lot of conversation and support. The internal review was an effective meeting. We were able to meet the timeline of customers who wanted a quick answer. Overall, it has been a positive process so far.

Peter: This process generated a similar number of applicants as past processes. Four to six projects seem to be standard for the number of projects that can apply and meet a year deadline. We have yet to evaluate whether this process results in more projects that have a better completion rate. We won't know that for awhile. In general, the process was worth the effort.

3. Completed dairy biogas project (added to agenda during course of meeting)
Thad presented an "off agenda" item.

He provided photos and description of the first dairy biogas project that Energy Trust funded. This is the first of six projects Revolution Energy Solutions will receive incentives from Energy Trust. The site shown has 1,100 cows and is an organic dairy. The project has two 800,000 gallon tanks. This was a project sited in Pacific Power territory. A German company created the engine skid. The gas cleaning portion removes moisture. It is a qualifying facility, and is also scheduled to provide energy for its own needs.

Robert: Is it continuous flow?
Thad: No, it's a sequencing-batch process. One tank is filled for 3 ½ days, mixed and then produces gas while the other is filled. All effluent goes on the field.

4. Farm Power Misty Meadows biogas project
Thad presented this topic. [See slides in meeting packet.]

Thad said one of Energy Trust's strategic initiatives is to support third-party ownership of agricultural biogas. Farm Power is the second developer that has successfully implemented this model in Oregon. The developer builds, owns and operates the biogas plant though a long-term lease with the dairy. Revenues and other outputs are shared between the developer and the dairy. Energy Trust thinks the opportunity here is about 45 MW. The project needs more than

dairy manure to get there. If it all completes at the end of 2012, manure from 30 percent of Oregon's dairy cows will be used in these plants.

Thad said Farm Power proposes to build and operate a 750 kW project located at Misty Meadows Dairy in Tillamook County. Energy Trust proposes to provide $1,000,000 in funding paid in four uniform payments. The first would be at commercial operation, and then there would be three additional payments as the project hits its annual generation targets.

Farm Power is presently operating three similar projects, two in Washington and one in Oregon. Farm Power will use the same development team to build Farm Power Misty Meadows that has successfully developed those first three projects. GHD, the process designer, has more than 60 dairy biogas plants operating in the U.S. Andgar, the construction company, has built seven GHD projects in the Pacific Northwest including all Farm Power projects. They have a strong working relationship with two regional financial entities that have funded their other projects. They have demonstrated that they can build and successfully operate these projects, which gives us a fair degree of confidence in their ability to execute. They have also provided invoices from an operating project, Rexville, which is the same size, and they've hit the generation targets in the forecast.

They have an executed power purchase agreement with Pacific Power, use of facility agreements and the balancing area authority is beginning to be finalized with Bonneville Power Administration. The interconnection agreement with Tillamook PUD is finalized.

They have secured a number of grants to make this project successful, including a Business Energy Tax Credit and a Biomass Producer Collector Tax credit worth $150,000 a year. Manure energy is eligible for a $5 per green ton tax credit. The project will share half of that with the dairy. That's good through 2017 and represents about $150,000 a year. The project also received a loan guarantee through the U.S. Department of Agriculture. Additional revenue includes a USDA grant. There will be fiber sales, shared with dairy. Thad explained that fiber is a bedding option. The Medford project of this type had lower costs because they didn't have to build a digester. One of the reasons to accelerate this project was to deal with projects that needed to know if we could help them before the Business Energy Tax Credit expired. This project should also reduce odor impact.

Thad described the financial summary, which shows the above-market cost after tax adjustment as $1.3 million. The incentive per average megawatt is $1.29 million per aMW. The project competes very well compared with other biomass projects. There are a number of additional benefits with this project including use of a third-party strategy, leverage a project with a Business Energy Tax Credit and job creation. This project would go to the board on the May 23. 2012.

Thor Hinckley: Is there a different incentive in Washington? Lower?
Thad: Puget Sound Energy is giving them a bundle price for energy and Renewable Energy Certificates.

Thor: Is there a premium attached?
Thad: Yes.

Dick: They get a double REC credit on that?
Thad: Yes.

Audience member: What are the interconnection costs and does this project wheel?

Thad – Yes, it's wheeling, which brings extra cost. We think about interconnection as the physical connection and the wheeling cost and cost of BPA as part of lifecycle cost. PUDs have significantly lower interconnection costs. When you add wheeling costs, it comes out in the same range as PGE or Pacific Power. There are always outliers, but we consider all costs. Wheeling added probably $75,000 in cost over the life of this project.

Vijay: The issue we had with dairy companies in the past was separation. What risks are you expecting?
Thad: The real risk is the dairy, which is responsible for the manure supply. We know that energy companies will be around for 15 years, but we're not sure the diary will be. Their approach to mitigate the supply risk is the availability of manure from surrounding dairies. But there are about 14,000 cows in Tillamook County, and only 5,000 of them are spoken for. If this dairy goes away, there are a lot of other cows to take their place.
Vijay: But it's not a mobile operation.
Thad: Presently manure only comes from the host dairy but it could access nearby dairies. Not the ideal option.

Juliet Johnson: What do dairies do that don't have these?
Thad: All combined animal feeding operations have water quality permits to manage the nutrients in manure. They store the manure in a lagoon for 10 months, then apply to the land for two months. Methane production happens in the lagoon and is released. This project eliminates that methane and is endorsed as best practice in industry.

Frank Vignola: Is there any value given for the fact that they're managing it better?
Thad: No. Those are added benefits. We do give a value to the fiber. We acknowledge that the investment is including these revenue streams. We see our investment as providing the leverage to realize societal benefits, such as less odor.

Dick: Is it safe to assume, under Schedule 37, that the value of the power purchase agreement will be half what it is now?
Thad*:* They'll get the old avoided cost rates. The new rates are 25 percent lower over a 20-year period. The first two years are about half, but they go back up. In the first few years, you're only getting energy, not energy capacity.

Tashiana: I must say that we hope these will be in our territory moving forward.
Thad: We hope that is the case. There are a number of small dairies in PGE and Pacific Power territory. They are smaller, but this design works with these smaller dairies.

Tashiana: I have a question about REC ownership fees. Is the 65 to 35 split typical?
Thad: For most projects that are smaller, the allocation is based on net present value of the incentive over NPV of above-market cost. That actually turns out to be 61 percent in this case, and it's usually a range of 65 percent to 75 percent. It's usually in this range but an individual project can vary.

Robert: Part of the evaluative criteria was replicable business model. Can we keep doing these projects without the Business Energy Tax Credit?
Thad: Yes. The replicable business model is third-party ownership. With low avoided cost rates, developers are looking at turning biogas into compressed natural gas, which has more attractive revenues. Now that we've got seven to eight of these projects in the pipeline, we need to demonstrate they can work. Having other energy off-takers (like compressed natural gas) just gives the projects more flexibility.

Vijay: Have you thought of working with the farm bureau or dairy association? It's a smart business model for lower acquisition cost.
Thad: Darigold, or the Northwest Dairy Association, has been working on this. We've worked with them. We've helped fund a technical outreach position for the last three years with the Oregon Dairy Farmers Association. The goal is to get 10 projects built. The marketing co-op is an even better approach.
Vijay: One factor that made this happen quickly was the Business Energy Tax Credit. Co-ops have access to surprising financing. Consumer-owned utilities have a lot of financing available to them.

5. Monroe Drop hydropower project

Betsy presented this topic. [See slides in meeting packet.] Gia Schneider was on the phone from Natel Energy to help with any questions.

Betsy said this hydropower project is sited at an existing drop structure. It's very compact compared to others of this kind. It's a demonstration of new low-head technology developed by Natel. Energy Trust proposed an incentive of $0.25 per kWh, $450,000 total. The project would be owned by Monroe Drop, LLC using technology developed by Natel. Project ownership reverts to North Unit Irrigation District after 20-25 years. There is a secured site and a lease agreement. The timing is tight but Energy Trust confidence is high.

Betsy said Natel is a new hydro equipment manufacturer that is looking to demonstrate success while learning ways to drive down costs. The team is sophisticated and capable. Owners are Massachusetts Institute of Technology-trained, have one project in the ground and have proven themselves capable of completing projects. Natel won a grant from the U.S. Department of Energy's water power program to test this technology at ultra low-head sites. Energy Trust is very interested in the low-head market because there are many low-head sites on irrigation districts that cannot be cost-effectively developed with conventional turbines. This has not been available to us in the past, and this technology could change that.

Engine components can be easily fabricated and maintained. A smaller turbine was installed in Buckeye, Arizona. There is no strong performance data from initial installation. It ran only at 14 percent of expected levels, and the company's explanation was that there was a defective gate on the bypass channel. However, Betsy said that doesn't account for all of the low production. Performance is the biggest risk from Energy Trust's perspective. Energy Trust will mitigate that risk by paying incentives based on the amount of energy produced. On the other side, Energy Trust feels it's a strong team that is supportive of commercializing this technology.

Hydropower is a factor of head, or drop, and flow, or water, available. Monroe Drop has 12 feet of head, which makes this an ultra-low head site that would not be served well by traditional technology. Data from North Unit Irrigation District from the years 2003-2010 indicate available flows exceed the turbine's flow rating 80 percent of the time. It should be able to operate 95 percent of the time during irrigation season. Energy Trust does not expect water shortages to be a problem, only one reduction has happened since 1997. The project is expected to generate at least 822 MWh per year, except the first year when Natel intends to perform a substantial amount of testing on the turbine, which is expected to significantly reduce production. In later years, chances are that there could be more flow through the turbine, which could increase production beyond 822 MWh.

Betsy said the project is well along, but the timeline is tight. This project will have an April 2013 completion date and be operational by October 2013. There is a signed power purchase agreement with Pacific Power. By the end of April 2012 they will know whether they can

proceed straight to an interconnection agreement or whether they will need to do a system impact study and a facilities study. Interconnection costs can't be fully known until needed studies are complete. If interconnection is delayed, it does not affect plans. Operational testing can be done without the interconnection in place. The project needs a water right and Federal Energy Regulatory Commission license, which should be a smooth process because they have already gone through an environmental impact review with the U.S. DOE. Natel's team has substantial experience in permitting.

The financial review shows that the above-market cost after tax adjustment is $450,000. Energy Trust is proposing an incentive up to $450,000, a net present value of approximately $360,000, to be paid quarterly on production at a rate of $0.25 cents per kWh. The Energy Trust incentive will cover 80 percent of the above-market cost and Energy Trust is proposing to take title to the project's first 15,000 RECs, which is 91 percent of what staff expects to be generated at the stated annual generation estimate. The project is expected to break even in year 10, sooner if production is higher. It would be at the high end of the range for Energy Trust hydro incentives on a dollar per aMW basis, but staff thinks that there are great learning and application possibilities.

John Reynolds: Do we have an inventory of lower-head hydro opportunities?
Gia: There is a report available, and Jed is aware of it. The report is not anywhere near complete. It shows 40 MW of potential. We have specific information related to the canals impacted by this project, as well.
John: This would be a good thing to ask Jed to report on at the next council meeting.

Dick: Is this under the old Schedule 37 rates?
Betsy: Yes, it is under the old schedule.

Vijay: There are two significant risks, yet your scoring was based 50 percent on costs.
Betsy: The metric used was dollars per average megawatt. Paying an incentive on production is a way to mitigate the risk. The other way is to pay a lump sum with payback provisions in the contract. This will pay out over three years. Demonstration projects are important to us and part of our portfolio.

Matt Hall: Was the ranking unnecessary for the ineligible projects?
Betsy: Projects that didn't pass the eligibility screen were not moved forward into the next phase.
Thad: The two projects that passed didn't need it.

Frank: This seems to be a high cost, but I think this is new technology and you want to test it. That's the basis. What are the prospects for costs coming down?
Gia: The big picture and one of the reasons we chose this site as a demonstration project is because this structure is very representative of many irrigation canals across the Pacific Northwest. We cannot anticipate a cookie cutter approach, but one of the very strong focuses of this effort is to come up with some standards in design for civil works. This will allow for cost reduction. Cost reductions on equipment are already happening, but it will take us through this project cycle to get there. The goal is under $700 per kW on the equipment, then $0.05 per kW. This goal will take several years to realize.

Evan Elias: You've identified an amount for the incentive. The only variable is how quickly it's paid out.

Betsy: There may be an upper limit to the amount of time that we can pay the incentive. That will be worked out in contracting. It is okay if it is paid out more quickly, but if it takes a long time to pay out, there is a problem there.

Juliet: Can you confirm the incentive as a percent of above-market cost?
Betsy: The net present value of the incentive is about $360,000, covering 80 percent of the project's above-market cost.

Tashiana: In the contract, is there a limit on the years when the incentive will be paid out?
Betsy: It hasn't been worked out, but the expectation is three, and there will be a cap in the contract.
Thad: We have endpoint limits on many of the contracts of this type. We'll have an "out" for Energy Trust if they aren't meeting certain criteria. Specific terms have not yet been worked out.

Tashiana: Jed presented on state permitting in February. Does that apply here?
Betsy: It does apply but is not an issue in this case.

Robert: I'm excited about the $0.05 goal. What about higher head projects? Are those still part of the portfolio?
Betsy: We are still continuing to build the pipeline by doing feasibility studies, but without a Business Energy Tax Credit, projects are going to be slow to develop over the next several years. We will see some slowing of that but we see this as being cyclical. We think that those projects will come back.

Tashiana: Aren't the rules that the board has to vote on projects above $500,000?
Betsy: Because these are demonstration projects, we interpret it as still needing to go to the board.

No objections were expressed at moving both projects to board review and approval.

6. Solar budget update

Kacia Brockman presented this topic. The renewable energy programs have allocated funds that had been carried forward from previous budget years, so the funding available for new solar projects in 2012 and 2013 is much less than in 2010 and 2011. Staff knew that 2012 would be a transition year, so it planned to lower incentives to stretch and manage the dollars. Energy Trust instituted a stepped incentive structure for projects in Pacific Power and PGE territory, and incentives are in the process of being stepped down. Staff has imposed other controls, as well, to ensure the funds are distributed broadly. Energy Trust is not providing incentives to Business Energy Tax Credit beneficiaries, even those with the 35 percent grant, because they have insignificant above-market costs. Energy Trust is limiting the number of projects per contractor, and has lowered the cap on commercial projects.

Energy Trust had a big year-end 2012 spike in commercial solar electric applications that was not anticipated; the spike was driven largely by stimulus dollars in Pacific Power territory and projects with Business Energy Tax Credit pre-certifications in PGE territory. Staff typically reports a slower Quarter 1 but had four times the activity this quarter over a year ago. Global markets and local competition are driving costs down and community-led efforts continue to drive demand.

The board approved a budget increase in March in response to this unanticipated Quarter 4 to Quarter 1 activity.

Incentive reductions for Pacific Power customers began in December 2011. Most of the funds in the first two steps went to commercial projects. Now there are separate steps for residential and commercial projects. Residential incentives have dropped by half from 2011, and staff is now only entertaining very small, $15,000 cap, commercial projects in Pacific Power territory.

Kacia said staff revisited PGE incentives in Quarter 1. Projects started with a $0.50 per watt drop to residential incentives right off the bat. PGE rates are slightly higher than Pacific Power. The commercial incentive cap for PGE customers shrunk from $500,000 to $75,000, but remains large enough to support third-party ownership that may work without Business Energy Tax Credits. If there is another run on the money, staff may need to make the funds unavailable for a period.

Troy: For residential, is it individual homeowners or Solarize driving demand?
Kacia: The Solarize efforts are a big driver but it is separate applications for each homeowner.

Troy: Are you seeing quality control issues?
Kacia: I feel like quality control is the strongest part of our program. A sun chart is required and must meet 75 percent solar resource. Micro inverters allow you to qualify each panel individually. They don't have to be perfectly unshaded, but they have to meet our requirements. We do verify onsite. Some contractors are on a periodic inspection schedule but they had to demonstrate past quality to reach this status.

Peter: The feed-in tariff is driving projects, too; they are not all ours that you see. Under this tariff, customers are taking on the risk if they choose systems that are more shaded. The other part is that the standards have been raised over time. Our focus has been on longevity of systems.

Vijay: I want to commend the Solar program. This is a moving target and thank you for providing detailed updates. It helps us.

Robert: Glenn, what is the state of the installer community?
Glenn: The commercial sector is struggling, but the residential sector is solid. However, there are some installers in the residential sector whose business models are not aligned well with where the market is going.
Frank: Commercial folks are moving into residential. They have some advantages because of bulk cost rates.

Tashiana: I recognize this is a tough budget cycle and there is a lot of demand, but moving forward, it would be our hope that there would be larger-scale incentives available in Pacific Power territory.
Frank: What size are you talking about?
Tashiana: 500 kW to 500 MW; that is our mandate so we would like to see those projects considered.
Dick: Could those plug into the competitive process?
Thad: The funding for the competitive process came from the biogas and hydro programs. But we could consider this possibility in the future. We've notified the board, and we've asked the council for feedback in the past, and what has come back is a desire to pursue smaller projects. There's tension between those two, larger and smaller projects.

Vijay: Cost or capacity-based programs is a topic of an Oregon State University study that will compare business models on risk and payback for Energy Trust of Oregon, the Residential

Energy Tax Credit, Energy Trust of Oregon and the Residential Energy Tax Credit, and others over the next five months. We would like to have it viewed at the council in future.

7. Public comment

There was no public comment.

Evan Elias was asked to provide an update from the Oregon Department of Energy.

Evan said that after operating the Business Energy Tax Credit for 30 years, the state legislature ended it and replaced it with new, smaller, more containable programs. The renewable energy development funds act as grants, and are allocated through a competitive grant process, similar to Energy Trust's process. It closed on April 2, 2012. The Oregon Department of Energy received seven applications for renewable energy projects. They fell into two groups, solar electric and biogas, and represented $2 million in projects. The aggregate incentive request was $710,000, and there is $450,000 available. The department has evaluated only through the completeness review, and six of seven projects made it through that. These will go through a criteria-based review, then a technical review.

Frank: Will it be a mix of technologies?
Evan: We have various criteria; cost being one, diversity being another. The announcements lay out the criteria. It's modeled after the tiered process.

8. Meeting adjournment

Betsy thanked all council members for their participation and adjourned the meeting at 11:55 a.m. The next full council meeting is June 6, 2012.