

**Oregon Geothermal Working Group 5<sup>th</sup> Meeting  
Information Workshop  
Renewable Energy Production Payments  
Salem, OR, April 5, 2006  
Minutes, Discussion and Recommendations  
By  
Carel DeWinkel  
ODOE's Renewable Energy Division.  
April 11, 2006.**

**Minutes**

Approximately 50 people attended this workshop. Attendees represented a wide variety of stakeholders. The Agenda of this workshop is shown on the last page.

Following is a brief summary of the main presentations, followed by a synopsis of the discussion and a comparison chart of the critical aspects of an Advanced Renewable Tariff (ART) and a Public Purpose Charge program. Finally, a set of recommendation is included.

Carel DeWinkel, Renewable Energy Division of the Oregon Department of Energy (ODOE), opened the workshop with a brief introduction to explain the policy context of this workshop. The Governor's Renewable Energy Action plan includes the provision to

- Assess the feasibility and effectiveness of production-based incentives for electricity generated by small to medium scale renewable resource facilities.
- Assess the feasibility of a state Renewable Portfolio Standard and compare it with production-based incentives as to its effectiveness to encourage renewable energy development.

He explained that the goal of this workshop was to understand the critical design features of putting in place effective and efficient production-based payment policy, with a focus on small to medium sized projects.

Next, Ted Bernhard, Stoel Rives Corporate and Securities Attorney in Portland, gave a business perspective on community based energy development. Ted's current law practice focused on equity finance issues with clean energy businesses. He used community wind as his main example but his general conclusions are valid for other renewable technologies as well. Ted summarized his presentation with the following points as necessary conditions for a successful community based energy development:

- Provide a stable, long-term market demand for renewable resources by providing reasonable tariffs with long term contracts for projects so that investors get a fair return on investment.
- Make sure that the market is transparent with reliable and easily available data on performance, and costs of equipment, installation and O&M, etc.
- Do good projects and make sure that investors are aware of them.
- Don't discourage early stage investors/developers' enthusiasm by stacking the odds against them.
- Use early successes to build a large and growing pool of qualified investors.

Next, Christopher Dymond, Renewable Energy Division of the Oregon Department of Energy (ODOE), explained existing production based incentives for PV in the US and overseas. He showed the rapid growth in PV particularly in Japan and Germany due to their production based payments. He also provided a brief overview of the new production based incentive in the state of Washington for solar, wind and biomass digesters. The utilities pay the generator owner once a year and receive a reduction in their state taxes that equals that payment. Christopher's presentation is posted on the REWG website.

Next, our main speaker, Paul Gipe, author and renewable energy advocate, gave a series of presentations on the successes and failures of production-based payment policies (often referred to as a Feed-in Law, or Advanced Renewable Tariffs (ART)) in Europe and North America. Principal aspects of an ART are:

- Prices set by a political process, while market forces determine the installed capacity. This is the reverse of the RPS process.
- Tariff must be sufficiently high to drive development by making the return on investment attractive to equity investors (while avoiding windfall profits).
- Long term contracts with minimum prices (often with an initial period of higher prices, followed by a period of lower prices after the loan has been paid off)
- ART are rate based, no state taxes are included.

With numerous examples, Paul showed that a well designed ART

- Promotes the development of distributed renewable resources by small companies, "investment" coops (LLCs), public entities and individual citizens (Denmark, Germany), although large corporations can also use an ART for development (Spain).
- Builds a strong constituency in favor of renewable energy developments, thereby avoiding or at least reducing the NIMBY effect of people supporting energy projects so long as they don't have to be near them.
- Promotes renewables in geographical areas where the resource is lower than the most optimal sites.
- Supports a diversified portfolio of renewable energy technologies.

For example for Germany, a country about 30 percent larger in size than Oregon with a population of 80 million people:

- Renewables 9% of Supply (~11%, 2005)
- Renewables are generating about 50,000,000 MWh/yr. (for comparison, total electricity sales in Oregon were about 45,000,000 MWh in 2005)
  - 200,000 PV Installations
  - 2,000 Biomass Plants
  - 550 MW Farm Biogas, 10 TWh/yr
  - 6,000 Hydro Plants
  - 18,000 Wind Turbines

- Total of 235,000 Generators
- Jobs
  - 45,000 Employed in Wind Industry (predicted 110,000 jobs in 2010)
  - 30,000 Employed in PV Industry
  - Total of 150,000 Employed in Renewables

As to costs, these results have been achieved with a surcharge of 0.5 eurocent/kWh or about 1.50 euros per month for an average household that uses 3,500 kWh per year. This is a 3% surcharge. Large, electricity intensive industries pay a lower surcharge. This surcharge is expected to increase until the year 2017 because of a push to increase solar power, which is more expensive than the other resources. After 2017, the surcharge is expected to decline and **“primarily only especially innovative and young renewable energy technologies will remain dependent on this special support”**. (quote from “Renewable Energy Sources Act– EEG“ by the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety). Another useful publication from the same Ministry is “What electricity from Renewable Energies Costs, February 2006). Both publications are available on the REWG website.

After lunch, Paul presented information on the details of proper tariff design. He used examples from Germany and France. Because the Germans have such a well-developed transparent market with performance and cost data that are easily accessible to all, the simpler French profitability index approach may very well be better suited to the Oregon situation. This resembles the type of economic analysis ODOE and the Energy Trust of Oregon already perform with at least one important refinement. The French model has basically two periods over the life of the contract. The first period has a tariff that is set relatively high and it lasts about 5 years. The second period has a lower tariff. The resource at the specific site location is evaluated after 5 years. The tariff during the remaining period is reduced but the initial agreed upon ROI is maintained. Thus, the reduction in the tariff is dependent upon the resource level. This has two important benefits. First, windfall profits can be avoided. But secondly, it gives the investor assurance that the ROI will be maintained even if the initial estimate of the resource was a bit too high (a site that used a drastically overestimated resource would not obtain the required ROI). This is particularly important for wind energy developers.

For more detailed information on tariff design, please review Paul Gipe’s presentations on the REWG website.

## Discussion

Following Paul Gipe’s presentation, a lively discussion took place. This discussion can broadly be divided into five topics<sup>1</sup>:

- Whether an ART can be an effective tool to promote renewables
- ART’s costs

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<sup>1</sup> I have elaborated on the discussions in an attempt to help clarify the issues.

- A comparison of how an ART differs from the Public Purpose Charge framework in which the Trust has to operate
- Concern how a push for an ART could negatively impact Oregon's current Public Purpose Charge and the role of the Energy Trust of Oregon
- Cheapest cost of power versus using renewable energy development as part of rural economic development

Is a well-designed ART an effective tool to promote renewable energy development?

Based on the feed back received from the attendees, there was general agreement that the answer is affirmative. The material presented at the workshop showed a rapid growth in many countries where this policy tool is being used and the number of countries that are adopting ART is growing throughout the world.

What is the order of magnitude of an ART program for Oregon?

Although a hard number cannot be given at this time, a ballpark figure can be derived at with some assumptions. We discussed the following numbers, with a few more details given here for clarification.

Please refer to **Table 1** with the copy of the spreadsheet that was given as a handout at the workshop. The top part shows the electricity sales for the years 2015 and 2025, assuming an annual growth rate of 1 percent. The lower part shows cost estimates of a very simple ART. Please focus on the column for the year 2015. Then, assuming that

- 20% of the goal of 517 aMW by 2015 will be met with distributed development, and
- an ART of 2 cent/kWh average additional payment above the avoided cost would be sufficient to drive development.

Then, the total cost for the investor-owned utilities (IOUs) would *ramp up* to about \$14 million in the year **2015**. In comparison, the current annual renewable budget for the Energy Trust of Oregon is about \$10 million, so the difference is less than a factor of two. And there is a 9-year time difference here.

Of course, the question is whether a 2 cents payment above the utilities avoided cost is sufficient to drive the development of new renewable resources. If one assumes that

- the Commissioners of the OPUC order the utilities to re-submit avoided costs figures based on realistic natural gas forecasts, and
- that they order a long term escalation of avoided cost that is flat in REAL terms.

Then, indications are that an average of 2 cents/kWh will make many community wind, small hydro and biomass projects happen<sup>2</sup>. Obviously, more work needs to be done on this, but it's a ballpark figure.

We briefly discussed the comparison with the current budget of the Energy Trust of Oregon along the following outline. Let's assume that the large wind farms don't need

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<sup>2</sup> We are leaving PV to the side for now as that currently has different incentives and to a large extent a different market.

funds from the Trust (either because of rising market prices - no above-market cost like Klondike II - or a change in the "charter" of the ETO to focus on smaller scale (10 MW or less) projects only). Then, the ETO's current budget appears to be sufficient for an Advanced Renewable Tariff *in the near term*.

*In other words, if these first-cut cost estimates of the needed ART are close to being correct, then there will NOT be an immediate additional rate impact with such a new approach to stimulate renewables.*

#### A comparison of how an ART differs from the Public Purpose Charge framework in which the Trust has to operate

Questions were raised as to how an ART differs from how the Energy Trust of Oregon currently operates. After all, if the budget would not increase dramatically, why do some favor an ART? One of the main differences is that an ART gives certainty to the renewables energy industry and investors that Oregon offers a long-term market for its products. That's what an ART policy tool has shown over and over again in many countries. A PPC cannot do that (at least in its current form). In contrast, the Trust can basically only work with the equivalent of some kind of escrow mechanism to spread the payments out over a 10 year period. After some further discussions among ODOE staff and Peter West, Director of Renewable Energy of the Energy Trust of Oregon, we thought that **table 2** would be helpful in further explaining the differences between an ART and the way the Trust has to operate in within its current framework. As you will see, the only area, albeit a very important one, that the Trust can offer more than an ART is in the area of early market development.

#### Concern how a push for an ART could negatively impact Oregon's current Public Purpose Charge and the role of the Energy Trust of Oregon

A concern was expressed by some that a push for an ART could jeopardize the existence of the Trust and the Public Purpose Charge. They argued that the push for an ART might pose political risks for the ETO. However, others pointed out that because of the history behind SB 1149 *both* a RPS and on ART could pose a risk once a legislative session is in progress.

#### Cheapest cost of power versus using renewable energy development as part of rural economic development.

This debate centered on the role of distributed renewable energy development as part of rural economic development. Some participants argued that this is a very important link, while others are looking more at trying to get as much renewable capacity for the least amount of funds possible, i.e. large wind farms. The former participants believe that an ART for distributed generation is the best tool because of its emphasis on market development while the latter participants appear to favor more traditional RPS policy approach that doesn't emphasize economic development.

## **Conclusions and Recommendations:**

1. An Advanced Renewable Tariff is an effective tool for the development of distributed renewable generation projects and local renewable energy markets.
2. A workshop to develop tariff designs for biomass, hydro and wind (all 10 MW or less) should be held in the near future to build on this workshop. Such a second workshop should also result in a rough estimate of costs of an ART.
3. Both the RPS and the ART policy tools can be effective, although each emphasize different kinds of market development. An effort should be made to find ways to come up with a hybrid model that can take advantage of the best attributes of both approaches.
4. Different stakeholders have dramatically different views on the role of economic development in the state's renewable energy policy. Disagreements in this area threaten to derail progress in developing consensus on the design of a RPS.
5. A more detailed discussion of an ART and the framework of the Public Purpose Charge should take place.

Table 1

Oregon's Renewable Energy Action Plan's (REAP) goals and the cost of Renewable Energy Production Payments (REPPs)					
		(in aMW)	(in MWh)		
Total sales to ultimate customers in 2004		5,118	44,833,617		
Total sales in 2004, IOUs only (70.4% of total) *		3603	31,562,866		
Total sales in 2004, COUs only (29.6% of total) *		1515	13,270,751		
Annual growth rate <i>after</i> conservation (%)		1			
Oregon's Renewable Energy Action Plan's (REAP) Goals: IOUs AND COUs					
End of		year 2015		year 2025	
		(in aMW)	(in MWh)	(in aMW)	(in MWh)
Total sales (aMW)		5710	50,019,447	6307	55,252,588
Total sales growth since end of 2004 (aMW)		592	5,185,830	1189	10,418,971
Renewable Action Plan's Goal: 10% renewables by 2015		571	5,001,945		
which means for the IOUs		408	3,571,389		
which means for the COUs		163	1,430,556		
Renewable Action Plan's Goal: 25% renewables by 2025				1577	13,813,147
which means for the IOUs				1126	9,862,587
which means for the COUs				451	3,950,560
Cost of a REPP program to meet a fraction (see row 29) of the REAP Goals					
REPPs are an extra payment per kWh above the "avoided cost" based rate					
Average extra payment to the <i>producer</i> (\$/kWh) **		\$ 0.02			
		year 2015		year 2025	
Fraction of total renewables receiving the REPP ***		0.2		0.2	
Annual cost of the REPP payments					
paid by the IOUs		\$	14,285,554	\$	39,450,348
paid by the COUs		\$	5,722,225	\$	15,802,240
Rate payers' cost per kWh when REPP is paid by all customers of both the IOUs and COUs		\$	0.0004	\$	0.0010
Rate payers' cost in percent of residential rate if the rate is about 7 cents per kWh			0.6%		1.4%
Rate payers' annual cost for a rate payer who					
uses 10,000 kWh per year		\$	4.00	\$	10.00
uses 16,000 kWh per year		\$	6.40	\$	16.00
<b>The yellow cells are the independent variables</b>					
* note that all these numbers are sales, which equals generation minus losses					
** the actual payments may be different for different technologies					
*** this assumes that "large" (to be defined) renewable energy facilities are NOT eligible for REPPs					

**Table 2: Comparison between a mature Advanced Renewable Tariffs (ART) and the current Public Purpose Charge (PPC) policy tools**

Specific Aspect	Mature Advanced Renewable Tariffs	Current Public Purpose Charge	Comments
Sufficient funds	Yes	<b>No</b>	Budget caps result in funding spread among multiple resources and applications
Rate based	Yes	Yes	While both are rate mechanisms, the ART is not typically capped
Payment Term	15 to 20 years	1-7 years (15-20 contracts with payback provisions)	Payments from PPC are generally more up-front and based on NPV analyses and formal escrow accounts.
Price setting	By committee of stakeholders (such as industry, academics, etc.)	Price discovery via RFP, open application and collected project data.	ART typically reviews and adjusts prices every two to three years. Both will adjust for follow-on projects (see degression, below).
Price adjustment within contract period	Yes	<b>No</b>	ETO uses a one-time, above-market calculation to set maximum payment
Inflation adjustment	Yes	Yes	See above, the rate is forecast
Differentiation of price by size, type of resource, resource intensity	Yes	Yes	
Degression (next year projects start at a lower price level)	Yes	Yes	
Project size restriction	Proposed 10 MW or less	<b>No</b>	Currently not with ETO
Attractive to create equity investor pools for smaller projects	Yes	<b>No</b>	Limited, less predictable funds with PPC are a problem for project developers and new equity entrants
Support for early market development	<b>No</b>	Yes	E.g. training, feasibility studies, resource assessments, etc.
Transparent market	Yes	Yes	Both provide public data. The ART's long-term, predictable prices allow the market to plan. Public Purpose Charges can be set and predictable, but limited budget cycles generally mean less dependability.
Coordination with OPUC regulations	Yes	Yes	Necessary conditions for ART are standard interconnection and contracting
Flexibility with BETC, SELP, Farm bill	Yes	Yes	



**Agenda - Information Workshop  
Renewable Energy Production Payments  
Salem, OR, April 5, 2006<sup>3</sup>**

This workshop will focus on production based payments (or renewable energy tariffs) for renewable energy systems. These tariffs have been used in promoting renewable energy in European countries, wind energy projects in Minnesota, and more recently, a tariff was passed in the state of Washington for photovoltaic systems, small wind and anaerobic digesters. Policy context: Our Governor's Renewable Energy Action Plan (REAP) has two action items that read:

- Assess the feasibility and effectiveness of production-based incentives for electricity generated by small to medium scale renewable resource facilities.
- Assess the feasibility of a state Renewable Portfolio Standard and compare it with production-based incentives as to its effectiveness to encourage renewable energy development.

The goal of this workshop is to understand the critical design features of putting in place effective and efficient production based payment policies, with a focus on small to medium sized projects. In addition, this workshop will help evaluate this policy tool as the Renewable Energy Working Group implements the REAP.

**The workshop is applicable to all renewables**

When: Wednesday, April 5, 9:00 AM to 4:00 PM  
Where: The Salem Public Library, 585 Liberty Street SE, Salem

\*\* Agenda \*\*

- 09:00 – 09:10 Welcome – Carel DeWinkel, Oregon Department of Energy (ODOE)  
09:10 – 09:30 The REAP and Community Based Energy Development, Carel DeWinkel  
09:30 – 09:45 Equity Investor and Business Perspective on Community Based Energy Development, Ted Bernhard, Stoel Rives  
09:45 – 10:00 Renewable Energy Tariffs in the state of Washington, Christopher Dymond, ODOE  
10:00 – 10:45 Advanced Renewable Energy Tariffs in Europe and North America: An Overview—Success and Failures, Paul Gipe, author and renewable energy advocate  
10:45 – 11:00 Break  
11:00 – 12:00 Advanced Renewable Energy Tariffs, continued, Paul Gipe  
12:00 – 01:30 Lunch (own expense)  
01:30 – 03:15 Tariff design, Paul Gipe
- Key conditions to succeed (fair price, fixed period, differentiation by technology and region, predictability, etc.)
  - Specific examples in detail
  - Wind and Solar tariffs in Germany and France
  - Wind, Solar, Biomass and Hydro tariffs in Ontario, Canada
- 03:15 – 03:45 Scenarios for Oregon: ball park numbers for discussion  
03:45 – 04:00 Next Steps – Report to the Governor's Renewable Energy Working Group

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<sup>3</sup> Will also serve as the Oregon Wind Working Group's (OWWG) Eleventh Meeting and the Oregon Geothermal Working Group's (OGWG) Fifth meeting