Study Results: The Referent Price of Renewable Energy Credits in the Pacific Northwest

Presented to the Energy Trust of Oregon

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I. Executive Summary

The Energy Trust of Oregon, Inc. (Energy Trust) is seeking to establish a method by which it can determine the market value for the renewable energy certificates (RECs) it obtains from the projects it supports. Setting a referent price will yield several benefits over the current practice of offering a REC price to developers on a project-by-project basis. These benefits include fairness and transparency, financial predictability for developers, and reduced administrative tasks and costs.

To determine the referent price, the Energy Trust enlisted Think Energy, Inc. (Think Energy) to 1) conduct a survey of REC vendors, brokers, and utilities; and 2) analyze the renewable portfolio standards (RPS) enacted in Oregon, Washington, and California, all of which could potentially impact REC prices in the Pacific Northwest.

The survey yielded results indicating that REC prices for several resources, including utility-scale wind, small wind, hydro, wood waste, landfill gas, and digester gas, are expected to rise through 2010, but only modestly. Prices in 2007 currently range from $2.50/MWh for hydro to $5.00 for utility-scale wind projects.

The review of the renewable portfolio standards focused on five considerations:

- Renewable Energy Goal and Timeline
- Geographic Area Covered
- Permissibility of Using RECs to Fulfill Requirements
- Exclusions and Exemptions to Meeting Requirements
- Penalties for Non-Compliance

The results of the RPS analyses in Oregon and Washington indicate that they are not likely to impact the price of RECs in the coming years. The requirements and timelines, in combination with the exclusion and exemption clauses and compliance payments, will have minimal effects. In light of the more ambitious California targets for adopting renewable energy, it is possible that the outcome of the implementation and regulatory process could impact the referent price for RECs, though this also seems unlikely in the near term.

It is recommended that the Energy Trust carry out the added task of selling and purchasing RECs from renewable energy sources in the Pacific Northwest. This would provide the necessary information about what the market is willing to pay and accept for RECs from specific renewable energy generation assets, further assisting the Energy Trust in setting fair and accurate REC prices. It is also recommended that the Energy Trust continue to survey REC brokers, vendors, and utilities to obtain further data points as the market develops. Lastly, the Energy Trust should continue to monitor renewable portfolio standards, particularly as legislation in California may change in the near future.

II. Introduction

The Energy Trust of Oregon is a private, non-profit corporation dedicated to helping Oregon meet its energy needs through clean energy sources. The Energy Trust began operation in March of 2002 and receives its funds from a "public purposes charge," created as part of a 1999 energy restructuring law, Senate Bill 1149. This charge is collected from both natural gas (1 % to 1.2% gas bill charge) and electric utility customers (2.4% electric bill charge) in the state.[1] The revenue, which amounts to approximately $52 million each year, is used to support energy conservation and renewable energy development.[2]

The Energy Trust is considering developing and implementing a method to determine market value for the renewable energy certificates (RECs) it obtains from the projects it supports. Currently, the Energy Trust offers a price for RECs to developers on a project-by-project basis.

Implementing a method to determine market value for RECs on a regular basis will have several benefits. First, renewable energy project developers will know that the Energy Trust is offering a fair price for RECs. This will reduce the likelihood that developers will dispute the price with the Energy Trust. By eliminating the need and the opportunity to negotiate this price for each project, the Energy Trust will streamline the process for funding new development.

Second, the publication of transparent referent prices for RECs will favorably impact the availability of finance capital. Financial institutions will know that developers can count on a firm revenue stream for the RECs it sells to the Energy Trust. This certainty will help developers obtain the financing they need to invest in new renewable energy projects.

Third, the Energy Trust will reduce the administrative burden associated with processing funding requests. Instead of re-establishing the price of RECs for each project, the Energy Trust will be able to refer to a current list of market prices for RECs generated from a suite of renewable resources. By investing a small amount of time and money upfront, the Energy Trust will reduce the time necessary to evaluate individual projects.

To determine the referent price, the Energy Trust enlisted Think Energy to conduct a survey of REC vendors, brokers, and utilities. To complement the survey, the Energy Trust also asked Think Energy to review renewable portfolio standards in Oregon, Washington, and California to determine their potential impact in the Pacific Northwest. An overview and results of both the survey and the RPS analyses are presented in this report.

III. Description of Methods

To identify the referent price of renewable energy credits, two tasks were carried out. The first was a survey of REC vendors, brokers, and utilities to obtain current market and future pricing of RECs. The second was a review of renewable portfolio standards expected to influence the REC market in the Pacific Northwest.

A. Survey of REC Brokers, Vendors, and Utilities

To obtain REC price estimates, Think Energy surveyed a number of brokers, vendors, and utilities. Think Energy created a separate survey for each category and distributed the surveys via email to 50 of these

market participants. The surveys were structured to obtain REC prices (in $/MWh) for utility-scale wind, small-scale wind, solar, hydro, wood waste, landfill gas, and digester gas from 2007-2010. For brokers and vendors, the surveys also asked if forecasting reports were available and if so, if they could be provided to the Energy Trust. Copies of the surveys can be found in the Appendix. Following email distribution of the surveys, several rounds of calls were made to elicit responses.

B. Review of Renewable Portfolio Standards

The review of renewable portfolio standards in Oregon, Washington, and California was designed with the aim of identifying the likelihood that each RPS would drive up the referent price for RECs generated by projects funded by the Energy Trust. The following five key considerations were taken into account:

1. **Renewable Energy Goal and Timeline**. The goals and timeline of each of the three states' RPS were examined to identify how ambitious the programs are. Some states had lower goals set farther into the future, where other states hoped to achieve much more on an accelerated timeline.
2. **Geographic Area**. Some states have restrictions on where renewable energy power can be generated to fulfill RPS requirements.
3. **Renewable Energy Certificates**. Renewable Energy Certificates can be used in some states to meet RPS requirements. However, in other states, all power must be bundled if applied to an RPS.
4. **Exclusions and Exceptions**. Provisions exist in each RPS that limit or eliminate the need for a utility to comply with the standard. These provisions were explored to determine what the impact on REC prices may be as well as what loopholes are created as a result of the provisions.
5. **Compliance Penalties**. Compliance penalties play a significant role in a state's renewable portfolio. Most states offer utilities the option of making an alternative compliance payment (ACP) if they are unable to meet the requirements through increased renewable energy generation or REC purchases. A high ACP can drive up REC prices.

IV. Results

A. Survey of REC Brokers, Vendors, and Utilities

The response rate from the survey was approximately 25%. This rate includes responses from companies that are no longer active in the REC market or were not willing to disclose price information; only two companies submitted REC price estimates. These price estimates are presented in the tables below.

Company 1 Survey Response				
Technology	**2007 Price ($/MWh)**	**2008 Price ($/MWh)**	**2009 Price ($/MWh)**	**2010 Price ($/MWh)**
Wind (Utility-Scale)	$5.00	$5.25	$5.50	$5.75
Wind (Small-Scale)	$4.75	$5.00	$5.25	$5.50
Solar	-	-	-	-
Hydro	$2.75	$3.00	$3.25	$3.50
Wood Waste	$3.00	$3.25	$3.50	$3.75
Landfill Gas	$2.75	$3.00	$3.25	$3.50
Digester Gas	$2.75	$3.00	$3.25	$3.50

Company 1 provided 2007 price estimates that began at $2.75 for digester gas and increased up to $5.00 for utility-scale wind. Company 1 did not provide any insight as to why prices for small-scale wind differ from prices of utility-scale wind. For each year, Company 1 forecasted that prices for each category would rise by $0.25. Company 1 did not offer any price estimates for solar.

Company 2 Survey Response				
Technology	2007 Price ($/MWh)	2008 Price ($/MWh)	2009 Price ($/MWh)	2010 Price ($/MWh)
Wind (Utility-Scale)	$4.00	$5.00	-	-
Wind (Small-Scale)	$4.00	$5.00	-	-
Solar	-	-	-	-
Hydro	$2.50	$2.50	-	-
Wood Waste	$2.75	$3.00	-	-
Landfill Gas	$3.00	$3.25	-	-
Digester Gas	-	-	-	-

Company 2 provided 2007 price estimates that began at $2.50 for hydro and increased up to $4.00 for utility and small-scale wind. Company 2 only provided a forecast for 2008, with wind prices rising by $1.00 and wood waste and landfill gas rising by $0.25. Company 2 expects hydro to remain at $2.50 for 2008. Price estimates were not provided for solar or digester gas.

Company 2 stated that, due to anticipated carbon regulation, many REC sellers are unwilling to sell past 2008 as they wanted the option of selling at higher prices in the future should circumstances change between now and 2009. They also advised that the numbers provided in their table, while indicative, are probably a bit high. The company suggested that a firm buying interest would probably result in final offers anywhere from 25 to 50 cents below the offers shown in the table above.

Think Energy also consulted with Ed Holt of Ed Holt & Associates, Inc., an independent expert in the field, regarding the REC market in the Pacific Northwest. Although he had no information pertaining specifically to the Pacific Northwest, Mr. Holt noted that REC prices nationally were generally in the $4.00-$5.00 range per megawatt-hour, which is consistent with the figures provided above.

B. Review of Renewable Portfolio Standards

STATE OF OREGON

The RPS legislation in Oregon, the Oregon Renewable Energy Act, was signed into law earlier this year. The Public Utilities Commission (PUC) is directed to set forth all supporting regulation by July 1, 2009.

1. **Renewable Power Goal and Timeline.** The ultimate goal is 25% by 2025, with interim goals of 5% by 2011, 15% by 2015, and 20% by 2020. According to their 2007 Integrated Resource Plans, Portland General Electric and PacifiCorp expect their system-wide RPS-eligible renewable resource percentages to be 4%[3] and 3.6%[4], respectively, by the end of this year. Based on these estimates, the table below illustrates utilities' progress towards the first interim goal.

Utility or Electricity Service Supplier	Total Retail Sale, 2005 (MWh)	2007 Est. Renewable Sales (MWh)	2001 RPS Goal (MWh)	Est. Percent Achieved
Portland General Electric Company	17,540,047	701,602	877,002	80%
PacifiCorp	13,206,589	475,437	660,329	72%
Eugene Water and Electric Board	2,663,174	N/A	133,159	N/A
Central Lincoln PUD	1,292,369	N/A	64,618	N/A

2. **Geographic Area.** Bundled power can be generated in the United States portion of the Western Electricity Coordinating Council (WECC) region, while unbundled RECs can by supplied from anywhere in the WECC region. This region encompasses British Columbia and Alberta in Canada; a small part of Mexico; and the states of Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Utah, Arizona, New Mexico, Colorado, and part of South Dakota.

3. **Renewable Energy Certificates.** Utilities can use RECs to comply with up to 20% of their requirements.[5] The table below shows the maximum amount of RECs that each of the four largest utilities could acquire. Smaller consumer-owned utilities can use RECs for up to 50% of their compliance requirements.[6]

Utility or Electricity Service Supplier	Total Retail Sale, 2005 (MWh)	RPS Goal (MWh)			
		2011 (5%)	2015 (15%)	2020 (20%)	2025 (25%)
Portland General Electric Company	17,540,047	877,002	2,631,007	3,508,009	4,385,012
RPS REC Limit (20%)		175,400	526,201	701,602	877,002
PacifiCorp	13,206,589	660,329	1,980,988	2,641,318	3,301,647
RPS REC Limit (20%)		132,066	396,198	528,264	660,329
Eugene Water and Electric Board	2,663,174	133,159	399,476	532,635	665,794
RPS REC Limit (20%)		26,632	79,895	106,527	133,159
Central Lincoln PUD	1,292,369	64,618	193,855	258,474	323,092
RPS REC Limit (20%)		12,924	38,771	51,695	64,618

4. **Exclusions and Exceptions.** There are three conditions under which the RPS goals would not be applicable:

   - "Electric utilities are not required to comply with a renewable portfolio standard during a compliance year to the extent that the incremental cost of compliance, the cost of unbundled renewable energy certificates and the cost of alternative compliance payments… exceeds four percent of the utility's annual revenue requirement for the compliance year."[7]

   - "Electric utilities are not required to comply with the renewable portfolio standards… to the extent that compliance with the standard would require the utility to acquire electricity in excess of the utility's projected load requirements in any calendar year."[8]

   - "Electric utilities are not required to comply with the renewable portfolio standards… to the extent that acquiring the additional electricity would require the utility to substitute qualifying electricity for electricity derived from an energy source other than coal, natural gas or petroleum."[9]

5. **Compliance Penalties.** The Public Utilities Commission (PUC) has been directed to set an Alternative Compliance Payment (ACP) by July 1, 2009. Furthermore, the PUC has the right to impose additional penalties at its discretion.[10]

STATE OF WASHINGTON

Washington's Clean Energy Initiative (I-937) has been signed into law, and final regulations for its implementation are due by the end of calendar year 2007. There are two bodies that are responsible for implementation: the Washington State Utilities and Transportation Commission (WUTC) and the Washington Department of Community, Trade, and Economic Development (CTED).

1. **Renewable Power Goal and Timeline.** The overall goal is 15% by 2020, with interim goals of 3% by 2012 and 9% by 2016. According to Washington CTED's state utility fuel mix report, the 2006 percentage of non-hydro renewables is approximately 2%.[11] Based on this assumption, the table below illustrates the current progress utilities have achieved in reaching the first interim goal.

Utility or Electricity Service Supplier	Total Retail Sales, 2005 (MWh)	2007 Est. Renewable Sales (MWh)	2012 RPS Goal (MWh)	Est. Percent Achieved
Puget Sound Energy Inc	20,465,557	409,311	613,967	67%
City of Seattle	9,161,466	183,229	274,844	67%
Snohomish County PUD No 1	6,305,176	126,104	189,155	67%
Avista Corp	5,232,594	104,652	156,978	67%

2. **Geographic Area.** Renewable power generated in the Pacific Northwest can be used for compliance. The Pacific Northwest is defined by the law to be Washington, Oregon, Idaho, and western Montana.

3. **Renewable Energy Certificates.** Utilities may meet up to 100% of their requirements with RECs. The table below shows the maximum amount of RECs that each of the four largest utilities could acquire.

Utility or Electricity Service Supplier	Total Retail Sale, 2005 (MWh)	RPS Goal (MWh)		
		2012 (3%)	2016 (9%)	2020 (15%)
Puget Sound Energy Inc	20,465,557	613,967	1,841,900	3,069,834
RPS REC Limit (100%)		613,967	1,841,900	3,069,834
City of Seattle	9,161,466	274,844	824,532	1,374,220
RPS REC Limit (100%)		274,844	824,532	1,374,220
Snohomish County PUD No 1	6,305,176	189,155	567,466	945,776
RPS REC Limit (100%)		189,155	567,466	945,776
Avista Corp	5,232,594	156,978	470,933	784,889
RPS REC Limit (100%)		156,978	470,933	784,889

4. **Exclusions and Exceptions.** There are four conditions under which the total RPS goals would not be applicable:

   - "A qualifying utility shall be considered in compliance with an annual target… for a given year if the utility invested four percent of its total annual retail revenue requirement on the incremental costs of eligible renewable resources, the cost of renewable energy credits, or a combination of both, but a utility may elect to invest more than this amount."[12]

- "A qualifying utility shall be considered in compliance with an annual target… if the utility's weather-adjusted load for the previous three years on average did not increase over that time period."[13]

- "A qualifying utility shall be considered in compliance with an annual target… if after the effective date of this section, the utility did not commence or renew ownership or incremental purchases of electricity from resources other than renewable resources other than on a daily spot price basis and the electricity is not offset by equivalent renewable energy credits."[14]

- "A qualifying utility shall be considered in compliance with an annual target… if the utility invested at least one percent of its total annual retail revenue requirement that year on eligible renewable resources, renewable energy credits, or a combination of both."[15]

5. **Compliance Penalties.** The compliance payment in Washington is set at $50/MWh.[16]

STATE OF CALIFORNIA

California Senate Bill (SB) 107 updated an earlier RPS that was established in 2002 by SB-67. There are two legislative bodies responsible for implementation: the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC). Rather than fulfilling the RPS requirement by investing in renewable energy or obtaining RECs, California requires that utilities execute contracts to purchase power from renewable energy facilities.

1. **Renewable Power Goal and Timeline.** The goal is to achieve 20% of electricity generation from renewables by 2010. For each year until that goal, utilities are required to increase their percentage of renewable power by at least 1%. The 2007 RPS requirements for the three main utilities, Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric are 11.9%, 16.0%, and 5.3%, respectively.[17] In 2005, the three utilities had actual deliveries of 11.8%, 17.7%, and 5.2%, respectively.[18] Based on these estimates, the table below illustrates the current progress that utilities have made in reaching the RPS target.

Utility or Electricity Service Supplier	Total Retail Sales, 2005 (MWh)	2005 Est. Renewable Sale (MWh)	2010 RPS Goal (MWh)	Est. Percent Achieved
Southern California Edison Co	75,301,581	13,328,380	15,060,316	89%
Pacific Gas & Electric Co	72,727,705	8,581,869	14,545,541	59%
Los Angeles City of	23,400,472	N/A	4,680,094	N/A
San Diego Gas & Electric Co	16,001,482	832,077	3,200,296	26%

2. **Geographic Area.** Facilities have to either be located in California and in operation after September 26, 1996, or have had begun selling electricity to a California electrical corporation prior to September 26, 1996. Out-of-state generation facilities may be eligible for California's RPS if they meet specific requirements as set forth by the legislation; in particular the facilities must be connected to the WECC transmission system. Out-of-state generation facilities not connected to the WECC transmission system are not eligible for California's RPS. Other requirements include good environmental protection and delivery to an in-state market hub.[19]

3. **Renewable Energy Certificates.** Currently, RECs are not eligible for California's RPS; however, this may change in the near future. One significant step is that the Western Region Electricity Generation Information System (WREGIS) has recently become operational. WREGIS is an independent renewable energy database that covers the WECC region. RECs are created for all renewable energy generation units that are registered in the database. In April of 2006, the CPUC published a white paper on RECs and California's RPS. As recently as September 2007, the CPUC was hosting workshops to develop understanding of how RECs could be used in California, should the Commission decide to allow RECs to satisfy the RPS.[20]

Utility or Electricity Service Supplier	Total Retail Sale, 2005 (MWh)	RPS Goal (MWh)
		2010 (20%)
Southern California Edison Co	75,301,581	15,060,316
RPS REC Limit (0%)		0
Pacific Gas & Electric Co	72,727,705	14,545,541
RPS REC Limit (0%)		0
Los Angeles City of	23,400,472	4,680,094
RPS REC Limit (0%)		0
San Diego Gas & Electric Co	16,001,482	3,200,296
RPS REC Limit (0%)		0

4. **Exclusions and Exceptions.** California's structure places some of the burden of compliance on the Public Utilities Commission, which is responsible for certifying the power purchase contracts that the utilities bid out. There are several types of exemptions to meeting targets:

   - "The commission shall not require an electrical corporation to conduct procurement to fulfill the renewables portfolio standard until the commission determines either of the following: (i) The electrical corporation has attained an investment grade credit rating as determined by at least two major rating agencies. (ii) The electrical corporation is able to procure eligible renewable energy resources on reasonable terms, those resources can be financed if necessary, and the procurement will not impair the restoration of an electrical corporation's creditworthiness."[21]
   - "The Energy Commission shall provide supplemental energy payments from funds in the New Renewable Resources Account in the Renewable Resource Trust Fund to eligible renewable energy resources pursuant to Chapter 8.6 (commencing with Section 25740) of Division 15 of the Public Resources Code, consistent with this article, for above-market costs."[22]
   - "An electric corporation shall not be required to enter into long-term contracts with eligible renewable energy resources that exceed the market prices established pursuant to subdivision (c) of this section."[23]
   - "Flexible rules for compliance including, but not limited to, permitting electrical corporations to apply excess procurement in one year to subsequent years or inadequate procurement in one year to no more than the following three years."[24]

5. **Compliance Penalties.** The PUC can issue to retailers penalties of 5 cents per kWh of shortfall, with an annual cap of $25 million per utility.[25] This cap translates to 500,000 MWh of potential shortfall.

For large utilities such as Southern California Edison and Pacific Gas and Electric, this amount represents less than 1% of their annual retail generation.

V. Analysis

A. Survey of REC Brokers, Vendors and Utilities

The survey of REC market participants reveals an expectation that REC prices will rise, but slowly and steadily.

The survey results, however, suffer from two limitations. The first of these is the low response rate; only two companies offered concrete price forecasts. There were several reasons why companies were not able or willing to provide useful data:

- Concern over disclosure of proprietary information
- Market uncertainty/unavailable information
- Geographic scope of survey

Companies were unable or unwilling to provide the needed data because the survey was seeking proprietary information, and many of the contacts were hesitant to reveal such information. Those surveyed expressed concern that disclosure of such information would put their company at a disadvantage in the market.

Another reason the response rate was low is that many of the companies contacted were reluctant to offer long-term forecasts. Uncertainty about both the future of a regional or national carbon cap and trade system and the growth or decline in demand for RECs make these forecasts both difficult for REC vendors and brokers to determine.

The geographic scope of the survey also impacted response rates. While many of the contacts had robust national REC prices and forecasts, they did not have adequate information or experience relating specifically to generation sources in the Pacific Northwest.

A second limitation concerning the survey results is that vendors often build in significant margin when setting prices in long-term contracts. This is done to cover any risk from price fluctuations that may occur as a result of RPS impacts, national carbon legislation, changes in demand in the voluntary market, and future supply uncertainty. As mentioned in the results section, a firm buying interest will likely result in a final price 25 to 50 cents below the originally stated value.

The difficulty in obtaining responses indicates 1) that this market is not well developed; and 2) that there is not enough liquidity in the market to establish definitive referent prices from this study.

B. Review of Renewable Portfolio Standards

The review of the RPS legislation that has been enacted in Oregon, Washington and California complements the survey results. The survey results reflect an expectation of predictability in REC prices over the next few years. Similarly, the RPS analyses indicate that, despite new goals and regulations,

electricity market prices are likely to remain stable. Only a few provisions in any of the bills have the potential to disrupt the REC market and drive up prices.

The results of the RPS analyses in Oregon and Washington indicate that they are not likely to impact the price of RECs in the coming years. The requirements and timelines, in combination with the exclusion and exemption clauses and compliance payments, will have minimal effects. California's more ambitious targets for adopting renewable energy, the prospective change regarding the use of RECs to meet the RPS requirements, and the ongoing implementation of the regulatory regime all have the potential to impact the referent price for RECs, but this is not likely.

Such results are to be expected from renewable portfolio standards – bills would be unlikely to pass state legislatures if they threatened to create either a sense of uncertainty or fluctuation in the electricity market. The result is that in each state there are several provisions that limit the impact of the RPS: either the goal regarding how much of the state's electricity should come from renewable resources is not ambitious, or there are exclusions or exceptions allowing noncompliance.

The most important type of condition allowing exemptions, and one that is common to the legislation in all three states, is that utilities will not be required to meet their goals if compliance becomes too costly. In Washington and Oregon, there are limits placed on the level of investment required to meet the RPS goals which diminishes the impact of the measures. In California, this exemption works differently. If funds from the New Renewable Resources Account of the Renewable Resource Trust Fund are insufficient to cover the above-market costs for new renewable energy resources, retail sellers will not be required to meet compliance goals.

There are also several other provisions that favor stability, predictability and minimal disruption.

- In Oregon, the first goal of 5% in four years is very weak. This RPS will likely not have significant impact until 2015, when the goal is 15%. In addition, if renewables displace a non fossil-fuel resource, compliance is waived. Thus Bonneville Power Administration's hydropower, as part of their Federal Base System, is especially well-protected, and the obligations of utilities are limited.

- In Washington, the goal for 2012 is 3%, which only slightly above the current proportion of electricity provided from non-hydro renewable generation. The first significant hurdle will not occur until 2016, when 9% is required. In addition, the ACP in the state is $50/MWh, which is fairly low, and not likely to impact REC prices.

These analyses do not, however, suggest that a change in REC prices is impossible. There are a few outstanding regulatory terms that have yet to be determined in Oregon and California; these terms will impact implementation, and possibly the price of RECs. In Oregon the PUC has the right to impose noncompliance penalties at its discretion. This represents a significant question as to the efficacy of the legislation. A high ACP could drive up the referent price of RECs in Oregon, while a low ACP would have the opposite effect.

In California, there are several steps that have to be taken and regulations that have to be implemented by the California Energy Commission and the PUC. Therefore, much hinges on the implementation and regulatory process in California, which could impact the referent price for RECs in the region. These processes will be important to track.

In addition, there is currently less certainty in California about the impacts of the RPS on renewable generation, and therefore REC prices. The goal of reaching 20% renewable generation by 2010 is very ambitious. Moreover, as utilities are required to add at least 1% per year until this time, they cannot wait to install or purchase generation at the last possible moment, maintaining momentum for the renewable energy market.

The renewable portfolio standards are certainly already having a positive impact on the development of renewable energy. There is currently renewable power plant development and purchasing by utilities to comply with the standards, but this activity falls short of fully meeting all of the stated goals. This modest development is not expected to impact market prices for RECs.

VI. Recommendations

The survey and the RPS analyses provide an assessment of the likely trends involving REC prices in the Pacific Northwest. However, concerns about the potential impacts of RPS legislation, as well as anticipation of a national carbon trading or regulatory regime can impact forecasting estimates. Therefore, taking additional steps to monitor market developments and establish market REC pricing is warranted. To this end, it is recommended that the Energy Trust (or a proxy) sell and purchase RECs. Obtaining market data from completed REC transactions offers a highly accurate means of pinpointing a referent price. It provides valuable information about both the "buy" and "sell" positions, clarifying willingness to buy and willingness to pay for RECs from specific renewable energy generation assets. These steps should be taken annually for three years, as there is the need to continually monitor market trends and reassess prices. During this time, the Energy Trust should continue to conduct a survey similar to that performed for this report. As the REC market grows and develops, the results from such a survey will improve.

Utilities in Oregon are already participating in the REC market, both to supply their customers with green power offerings and to begin compliance with the RPS. If cooperation between the utilities and the Energy Trust is not prohibited by the PUC, then the Energy Trust should pursue this relationship. Obtaining REC pricing information from the utilities would be the most efficient and least-cost method.

If the Energy Trust is not able to work with the utilities to obtain REC market information, then Think Energy recommends that the Energy Trust sell, on a periodic basis, a small amount of the RECs it holds. Following is a description of the recommended strategy.

- In the first year the Energy Trust would offer for sale to the highest bidder 100 megawatt-hours per year (MWh/yr) for three years of RECs from utility-scale wind, along with 10 MWh/yr for three years from both small wind and hydro projects.
- In the second year, after additional projects have been added to the Energy Trust portfolio, the Energy Trust would offer the same suite of RECs for sale, along with 10 MWh/yr for three years from solar.
- In the third year, the offer would also include 10 MWh/yr for three years from biomass generation.

Concurrently, the Energy Trust would purchase RECs generated in the Pacific Northwest from each energy source for which it is interested in obtaining pricing information.

- In the first year, this purchase would be for 100 MWh/yr for three years of utility-scale wind RECs and 50 MWh/yr for three years of all other REC types.
- In the second and third years, the Energy Trust would purchase 50 MWh/yr for three years of RECs generated from renewable energy sources not included in the Energy Trust auction of RECs described above.

It is estimated that, to get detailed information, the Energy Trust would have to purchase 2,100 MWh of RECs. If RECs are obtained at prices that reflect the prices gleaned through the survey described in this report, the purchase would cost approximately $10,000 over three years. However, if REC prices in the Pacific Northwest are closer to the national average, this could cost Energy Trust anywhere from $20,000 to $25,000.

VII. Conclusion

The Energy Trust of Oregon is seeking a reliable method for determining the referent price of RECs for projects it supports. The survey of REC vendors, brokers and utilities and the analyses of RPS legislation in Oregon, Washington, and California have provided results that will assist the Energy Trust in achieving this goal. The survey results suggest that REC prices are expected to rise through 2010, but only modestly, for renewable resources such as utility-scale wind, small wind, hydro, wood waste, landfill gas, and digester gas. The analyses of RPS legislation in Oregon, Washington and California indicate that these statutes are not likely to impact the price of RECs in the coming years. The Energy Trust should continue to survey those active in the REC market as results are likely to improve as the market grows. RPS legislation, particularly from California, should also be monitored closely.

It is also recommended that the Energy Trust continue to assess the REC market by purchasing and selling RECs over a three year period. This will further assist in the establishment of an accurate referent price. At the time when such a price is set, the Energy Trust will be better able to reach its objectives of offering fairness, transparency and financial predictability to renewable energy project developers, while providing a diminished administrative burden and reduced costs for the Energy Trust.

Appendix I: Renewable Energy Credit Surveys

Broker

Think Energy is a renewable energy consulting firm conducting work on behalf of the Energy Trust of Oregon. We are currently surveying buyers and sellers of Renewable Energy Certificates (RECs) in Oregon and other states in the Pacific Northwest to determine a referent price. Please refer to the attached letter from Peter West of the Energy Trust of Oregon for additional background and confidentiality information.

Given your company's experience with RECs, please address the following questions:

1. Please fill in the table below as much as possible.

Technology	2007 Price ($/MWh)	2008 Price ($/MWh)	2009 Price ($/MWh)	2010 Price ($/MWh)	Notes
Wind (Utility-Scale)					
Wind (Small-Scale)					
Solar					
Hydro					
Wood Waste					
Landfill Gas					
Digester Gas					

2. Could we obtain a sample of your current pricing and forecasting to share with our client?

Your feedback will help Energy Trust of Oregon continue to efficiently and effectively disperse funding to the renewable energy sector. Due to the time-sensitive nature of this survey, someone from Think Energy will call you later this week to ensure you received this and see if you can provide answers. Thank you in advance for your support.

Vendor

Think Energy is a renewable energy consulting firm conducting work on behalf of the Energy Trust of Oregon. We are currently surveying buyers and sellers of Renewable Energy Certificates (RECs) in Oregon and other states in the Pacific Northwest to determine a referent price. Please refer to the attached letter from Peter West of the Energy Trust of Oregon for additional background and confidentiality information.

Given your company's experience with RECs, please address the following questions:

1. Please fill in the table below as much as possible.

Technology	2007 Price ($/MWh)	2008 Price ($/MWh)	2009 Price ($/MWh)	2010 Price ($/MWh)	Notes
Wind (Utility-Scale)					
Wind (Small-Scale)					
Solar					
Hydro					
Wood Waste					

Landfill Gas					
Digester Gas					

2. Could we obtain a sample of your current pricing and forecasting to share with our client?

Your feedback will help Energy Trust of Oregon continue to efficiently and effectively disperse funding to the renewable energy sector. Due to the time-sensitive nature of this survey, someone from Think Energy will call you later this week to ensure you received this and see if you can provide answers. Thank you in advance for your support.

Utility

Think Energy is a renewable energy consulting firm conducting work on behalf of the Energy Trust of Oregon. We are currently surveying buyers and sellers of Renewable Energy Certificates (RECs) in Oregon and other states in the Pacific Northwest to determine a referent price. Given your utility's experience with RECs, please answer the following questions:

1. What is the current price for RECs of the following technologies: utility-scale wind, small-scale wind, solar, hydro, wood waste, landfill gas, and digester gas?

2. What is your one-year and/or five-year forecast of these prices? How do you determine these future prices?

Your feedback will help Energy Trust of Oregon continue to efficiently and effectively disperse funding to the renewable energy sector. Due to the time-sensitive nature of this survey, someone from Think Energy will call you later this week to ensure you received this and see if you can provide answers. Thank you in advance for your support.

2. Could we obtain a sample of your purchasing history to share with our client?

Your feedback will help Energy Trust of Oregon continue to efficiently and effectively disperse funding to the renewable energy sector. Due to the time-sensitive nature of this survey, someone from Think Energy will call you later this week to ensure you received this and see if you can provide answers. Thank you in advance for your support.

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