Energy Trust Board of Directors Meeting

November 4, 2015

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139th Board Meeting

Wednesday, November 4, 2015
421 SW Oak Street, Suite 300, Portland, Oregon

	Agenda	Tab	Purpose
11:15am	**Executive Session** The board will meet in Executive Session pursuant to bylaws section 3.19.1 to discuss internal personnel matters. **The Executive Session is not open to the public.**		
12:15pm	**Board Meeting—Call to Order** (Debbie Kitchin) • Approve agenda **General Public Comment** The president may defer specific public comment to the appropriate agenda topic.		
	Consent Agenda ..... The consent agenda may be approved by a single motion, second and vote of the board. Any item on the consent agenda will be moved to the regular agenda upon the request from any member of the board. • September 30 Board meeting minutes • Amend Consent Agenda Procedure—R756 • Amend Waste-to-Energy Policy—R757	**1**	Action
12:20pm	**President's Report**		
12:30pm	**Draft 2016 Annual Budget & Draft 2016-2017 Action Plan** (Margie Harris, Peter West, Courtney Wilton)	**Separate Document**	Info
2:00pm	**Break**		
2:10pm	**Energy Programs** • Authorize funds for Ewauna 2 Solar Project—R758 (David McClelland)	**2**	Action
2:30pm	**Committee Reports** • Executive Director Transition Committee (Ken Canon) • Evaluation Committee (Susan Brodahl) ..... • Finance Committee (Dan Enloe) ..... • Policy Committee (Roger Hamilton) ..... o Amend Renewable Energy Certificate Policy—R759 (Jed Jorgensen) ..... • Strategic Planning Committee (Mark Kendall).....	**3** **4** **5** **5** **6**	Info Info Info Action Info
3:30pm	**Staff Report** • Highlights (Margie Harris)		
3:35pm	**Adjourn**		

The next meeting of the Energy Trust Board of Directors will be held
Friday, December 12, 2015 at 12:15 pm
at Energy Trust of Oregon, 421 SW Oak Street, Suite 300, Portland

Table of Contents

Tab 1 Consent Agenda
- September 30 Board meeting minutes
- Amend Consent Agenda Procedure—R756
- Amend Waste-to-Energy Policy—R757

Tab 2 Energy Programs
- Authorize funds for Ewauna 2 Solar Project—R758

Tab 3 Evaluation Committee
- September 28 meeting notes
- Memo: Follow-up Billing Analysis for Nest Thermostat Heat Pump Control Pilot
- Review of Commercial Strategic Energy Management Savings Methods & Staff Response Memo

Tab 4 Finance Committee
- October 27 meeting notes—*notes will be e-mailed prior to board meeting*
- Notes on September 2015 financial statements
- September financials and contract summary report
- Financial glossary

Tab 5 Policy Committee
- October 6 meeting notes
- Amend Renewable Energy Certificate Policy—R759

Tab 6 Strategic Planning Committee
- October 6 meeting notes

Tab 7 Advisory Council Notes
- September 9 RAC meeting notes
- September 9 CAC meeting notes
- October 21 RAC meeting notes—*notes will be e-mailed prior to board meeting*
- October 21 CAC meeting notes—*notes will be e-mailed prior to board meeting*

Tab 8 Glossary of Energy Industry Acronyms and Terminology

Tab 1

Board Meeting Minutes—138th Meeting

September 30, 2015

Board members present: Susan Brodahl, Ken Canon, Melissa Cribbins, Heather Beusse Eberhardt (by phone), Dan Enloe, Roger Hamilton, Mark Kendall, Alan Meyer, John Reynolds, Anne Root, Eddie Sherman, Warren Cook (special advisor, Oregon Department of Energy)

Board members absent: Debbie Kitchin, Lindsey Hardy, John Savage (OPUC *ex officio*)

Staff attending: Margie Harris, Ana Morel, Debbie Menashe, Amber Cole, Steve Lacey, Fred Gordon, Peter West, Courtney Wilton, Scott Clark, Hannah Cruz, Sarah Castor, Dan Rubado, Erika Kociolek, Adam Shick, Mike Bailey, Jed Jorgensen, Thad Roth, Dave Moldal, Betsy Kauffman, Sue Fletcher, Susan Jowaiszas, Susan Jamison, Shelly Carlton, Nicole Brown, Katie Wallace

Others attending: Don Jones, Jr. (PacifiCorp), Elaine Prause (Oregon Public Utility Commission), Tom Eckman (Northwest Power and Conservation Council), Charlie Grist (Northwest Power and Conservation Council), Julia Harper (Northwest Energy Efficiency Alliance), Dave Backen (Evergreen Consulting), BJ Moghadam (Northwest Energy Efficiency Alliance)

Business Meeting

Vice President Ken Canon called the meeting to order at 12:15 p.m. Reminder that consent agenda items can be changed to regular agenda items at any time.

General Public Comments

There were no public comments.

Consent Agenda

The consent agenda may be approved by a single motion, second and vote of the board. Any item on the consent agenda will be moved to the regular agenda upon the request from any member of the board.

MOTION: Approve consent agenda

Consent agenda includes:
1) July 29 Board meeting minutes
2) Amend Authority to Commit Incentives Policy—R752
3) Amend Program Approval Process Policy—R753
4) Amend Above-Market Cost Policy—R754

Moved by: John Reynolds		Seconded by: Dan Enloe
Vote:	In favor: 11	Abstained: 0
	Opposed: 0	

RESOLUTION 752
AMEND POLICY ON COMMITMENT OF INCENTIVE FUNDS FOR PAYMENT OF ENERGY EFFICIENCY PROJECTS IN FURTURE YEARS

4.21.000_Authority to Commit Incentive Funds for Payment of Energy Efficiency Projects in Future Years

WHEREAS:

1. Energy Trust continues to identify improved ways of managing program budgets and maintain accountability.
2. Beginning in 2005, the board approved changes to the annual budget process, program monitoring and reporting of savings and budget expenditures and provided staff the flexibility to shift funds within programs.
3. ~~Staff has proposed an additional improvement to best serve~~The Board later modified the policy to accommodate customers with complex multi-year projects and incentive payment requirements in future years.
4. The Board now wishes to modify the policy to (a) clarify that some of the policy's limitations apply to programs as a whole and others to individual incentive commitments, and (b) allow individual commitments beyond two years if the overall limitation on programs budgets is respected and the commitment is consistent with Energy Trust contracting policies and the OPUC grant agreement

.

It is therefore RESOLVED:

~~1. For~~ Staff may design energy efficiency programs to pay financial incentives over several years, provided that:

1. Staff reviews such programs annually and ensures that not more than
   - ~~Up to~~ 75% of the program's budgeted financial incentive funds are projected to be ~~available~~ committed in the following year~~;~~, and not more than
   - ~~Using these projected program incentive funds as a base line, up to~~ 25% ~~toward projects expected to be available~~ in the ~~third~~ succeeding year.
2. ~~This authority is subject to the following requirements: (a)~~ In addition, any long-term financial incentive commitments made to individuals or individual entities shall be:
   (a) ~~such commitments shall be~~ consistent with milestones or conditions in any reservation, tracking or other systems or requirements applicable to these programs;
   (b) ~~funding commitments and reservation of future financial incentives shall be made for no more than two years~~subject to all Energy Trust contracting requirements and policies, and the Energy Trust-OPUC grant agreement;
   (c) ~~all financial incentive commitments will be~~ tracked and reflected appropriately in forecasting reports; and
   (d) ~~all future financial incentive commitments will be~~ displayed by the program and incorporated into the annual budget process.

RESOLUTION 753
AMEND PROGRAM APPOVAL POLICY

Purpose:

1. ~~Historically~~Initially, the Board has approved programs in resolutions that ~~specify~~ specified projected energy savings and cost/aMW and estimated budget allocations for such items as incentives, marketing, administration and evaluation. Specific terms of program management ~~have typically been~~were addressed in separate resolutions authorizing program management contracts.
2. Experience has ~~shown~~ demonstrated that if staff and contractors adhered to the original terms and conditions identified in Board resolutions authorizing programs, the programs ~~may lose~~lost momentum while staff seeks approval to change program ~~delivery, and considerable Board and staff time are consumed in complex and confusing adjustments~~parameters.
3. ~~Energy Trust has enough experience with these programs to warrant revising~~In 2005, the Board revised this process to make it more efficient.

It is therefore RESOLVED:

1. The Energy Trust of Oregon, Inc., Board of Directors hereby authorizes all existing programs to:
    a. Operate under a not-to-exceed budget cap established by the Board in the annual budget approval process or by special resolution; staff is authorized to manage the program within this budget until the next annual budget review; staff may move budgeted funds from one program to another within the same program sector (residential, commercial, industrial and renewable energy) without board approval.
    b. Be managed to achieve ~~a stretch energy savings and cost/aMW~~annual board-approved goal~~s, recognizing that actual performance may achieve only a more conservative level below which the program would be reevaluated~~.
2. The Board will continue to review and approve program management contract terms.
3. Staff will provide the Board with quarterly status reports based on energy savings by program and sector (not individual contract). Reports would identify issues regarding program performance, such as:
    a. a program's long-term cost-effectiveness is trending in a negative direction.
    b. the program is not expected to achieve significant savings over its life.
    c. a quarterly report shows that a program is trending below ~~the conservative~~its goal, the Board may call for an action plan to address the short-fall.
4. Staff will provide an update to the board on any movement of funds from one program to another at the next board meeting following such movement.
5. The Board retains discretion to modify or discontinue a program if it is not meeting expectations.
6. The Board will use the budget and action plan process to review, modify and adjust program goals and budget caps.

RESOLUTION 754
AMEND ABOVE-MARKET COST POLICY

Procedures for Evaluating the Above-Market Cost of a Renewable Resource Project

WHEREAS:

1. **Ratepayer funds for renewable energy projects may be used for "the above-market costs" of constructing and operating new renewable energy resources.**
2. **In 2002, the board adopted an above-market cost policy specifying a methodology for comparing the cost of a renewable resource with the market price of power, i.e., the price of non-renewable energy on the open market, using levelized present values.**
3. **The methodology identified the maximum amount that Energy Trust would pay toward a project.**
4. **Before 2007, most of Energy Trust's renewable generation came from larger, utility-scale wind projects. These projects were governed by "master agreements" negotiated with PGE and PacifiCorp, which established procedures for identifying projects and negotiating funding agreements. Energy Trust's above-market cost policy described different methodologies for utility-scale projects and smaller projects.**
5. **In 2007, the Oregon legislature limited Energy Trust funding for renewable energy projects to the costs of constructing and operating projects with a nominal generating capacity of 20 megawatts or less. Since then, the methodology for evaluating above-market costs has been the same for all renewable projects, whether utility-sponsored or not.**

6. **In 2012, the board approved changes to the policy to make clear that Energy Trust's focus is on smaller renewable projects. Up for its regular three-year review at this time, staff recommended a slight additional language change to clarify that "net" costs are analyzed in above-market cost evaluation.**

It is therefore RESOLVED that the Energy Trust policy on above-market costs of new renewable resources is amended as shown below to clarify that Energy Trust will use "net" costs in evaluation of project above-market costs.

4.07.000-P Methodology for Evaluating Above-Market Costs of Renewable Resource Projects

The Energy Trust will evaluate medium and small-scale renewable resource projects that are submitted under the Energy Trust programs.

1. **Review Project Proposals:** The Energy Trust will review the costs, net of tax benefits, government incentives and income streams, submitted by project sponsors. Whether through standard processes or RFPs, proposals must provide sufficient information to evaluate the project, including at least technical specifications, resource characteristics, energy delivery, integration, transmission, development timelines, operating plans, financial detail, tax benefits, risks, and personnel. The Energy Trust will evaluate the responses and compare these to the usual and customary net costs and specifications for similar resources. For complex projects, independent consultants may be used to help with this review and due diligence. Information requirements will vary by program.

2. **Definition of Market Cost:** Based on the OAR definition of above-market cost, for projects delivering power to the utilities the Energy Trust will compare the renewable resource costs to the market value that is used by the utility to acquire non-renewable resources, provided the market value was developed using methods consistent with the utility's latest Integrated Resource Plan and the Commission-approved acquisition process. The market value will typically be an updated forward price curve, QF tariff, Commission-approved avoided cost filings, or marginal non-renewable resource selected through a competitive bidding process. The market price will be adjusted to match the expected daily and seasonal delivery schedule of the renewable resource if necessary. In the case of on-site and net metered use, the market cost will be the retail rates for the customer under filed tariffs with the OPUC.

3. **Calculate the above-market cost:** The defined market costs will be compared to the delivered price for the renewable resource for each year of operation. The difference between the two will define the above or below market cost for that year. The net-present value for these costs over the life of the project (or the contract term in the case of a Power Purchase Agreement) will be calculated using industry-standards to determine the maximum above-market payment, if any, from the Energy Trust. The Energy Trust staff will document these assumptions as part of the review and the Energy Trust's approval processes, which will include a review of what was used in the developers bid compared to what is standard in the industry for rates of return and competitive cost of capital. If the net present value is positive, then this amount would define the maximum above-market cost that the Energy Trust could pay. If the net present value is zero or less, then there would be no above-market cost payments.

4. **Payment:** The Energy Trust can pay up to 100% of the above-market cost. The actual amount of the payment is determined on a case-by-case basis after considering the amount of funding available, the funding needed to develop the project, the benefits of the project, and the potential

of the project to reduce renewable resource costs, provide replicable benefits, address a resource with significant potential, or meet other considerations related to achieving the objectives of the Energy Trust Strategic Plan. Payments to applicants for projects generating for own-use may be capped at the calculated net present value when comparing the cost of the project to the proposer's retail rate, if this results in a lower above-market funding from the Energy Trust than provided in step 3 above. Payments may be made up-front or on a periodic basis over time based on production or other factors. Payments made over time may reflect the discounted time-value of those funds.

Standard-Offer Resources: The Energy Trust will have some programs that require a standard offer for all projects of a similar type. Standard offers can be necessary for market development to signal consistency for long range planning and investment, or because projects tend to have uniform costs. In such instances re-calculating the incentive for each project would be a barrier to the market development and unnecessary.
For programs that have been authorized by the board to offer a standard incentive, staff will follow the procedures outlined for mid to small-scale projects. The calculation will be based on the latest available data on average costs for projects in Oregon. This calculation will be updated at least once per year with incentives adjusted, if necessary.

Other Considerations:

1. Implementation of the Above-Market Methodology: The procedures and analyses will determine the above-market cost based on the best information available at the time of the decision; the payment will be fixed based on this information and will not be adjusted for future changes. The Energy Trust will work with the utility and others to include the most current information in the calculation of the above-market costs.

2. Energy Trust Payments: The payment can be made to the developer, investors, lenders, utility or other parties. The Energy Trust may make a one-time payment, establish escrow accounts, or structure other arrangements.

3. Modifications to the Procedures: If the Energy Trust staff determines that these procedures hinder project acquisitions or that it could be in the ratepayers' interest to modify the procedure for evaluating above-market costs, the staff may request that the board make an exception to the procedures. Prior to doing this, Energy Trust staff will consult with the utilities, the Commission staff and, within the constraints of confidentiality and timing, also with the Renewable Advisory Council. The rationale for any case-specific modifications would be documented as part of the evaluation process for board approval.

4. Utility master agreements. Energy Trust has had master agreements with PGE and PacifiCorp for several years. These agreements were negotiated with the above-market cost methodology in mind, and are consistent with this methodology, but have somewhat different procedural requirements. If utilities submit funding requests pursuant to master agreements, those procedural terms will apply.

Committee Reports

Audit Committee, Ken Canon

The committee is preparing for the 2015 financial audit to be conducted by Moss Adams. This year, the Audit Committee requested Moss Adams analyze two areas for potential risks. The first area Moss Adams examined was Energy Trust's incentive payments process, including internal auditing procedures, when incentives are paid to trade allies, and when incentives are paid to both the customer and the contractor. The second area was the billing process and rates for Program Management

Contractors. Moss Adams also reviewed Energy Trust's IT processes related to data flow, the threshold at which extra staff review is required for transactions, user access and system suggestions. Moss Adams reported no exceptions and made only a few suggestions.

An administrative staffing study was completed by Coraggio Group. Based on a recommendation from the 2014 Management Review and comments made by the OPUC during the fall 2014 budget process, Energy Trust engaged Coraggio Group to review administrative and support staff levels and workloads. Coraggio Group surveyed staff spend at least 10% or more time on administrative tasks, representing approximately one-third of the Energy Trust work force. Coraggio Group concluded Energy Trust's administrative staff and workload were adequate and provided three areas of recommendation. First, to continue efficiency improvements through IT automation and other approaches. Next, to use temporary staff during seasonally heavy workload times to complete administrative work, thereby freeing staff to focus on higher-value work. Third, to assess what types of work can be redirected to other staff within the organization to gain further efficiencies.

Executive Director Transition Committee, Ken Canon
The committee is refining the desired list of traits and capabilities for the new executive director and corresponding position description. The committee gathered valuable input through several Energy Trust individual and group stakeholder meetings regarding the capabilities and experience being sought and including a description of the anticipated timeline and process.

Compensation Committee, Dan Enloe
The committee reviewed the Energy Trust benefits plan for next year and decided to continue with the same provider as this year. Costs are increasing slightly. The current offerings in the plan are retained for 2016. A new plan option, a health savings account (HSA) account, was added, which includes a higher deductible. Energy Trust will help contribute to the initial HSA on behalf of those employees who choose this option. Even with the new HSA choice, the plan can be offered largely at no cost to the organization.

The committee reviewed the Energy Trust retirement plan and considered a mutual fund option divested of fossil fuel companies. More work needs to be done by the firm to ensure such an option would still meet our investment guidelines.

Staff is also reviewing prior year merit budgets and focusing on reviewing compensation levels for positions that have been difficult to fill in the local market, which is quite competitive.

Finance Committee, Dan Enloe
The August 2015 financial statement shows year-to-date revenue is very close to the budgeted amount. As planned, the organization is drawing down program reserves. By the end of August, program reserves were 16 percent lower than the same time last year. Incentive spending is up, particularly in the Existing Buildings and Solar programs. The board commented on the overall healthy financials, and looks forward to seeing the draft budget for the next two years at the November board meeting.

Evaluation Committee, Alan Meyer
The committee recently reviewed the gas fireplace market transformation study, New Homes gas fireplace study, 2014 Fast Feedback results, commercial Strategic Energy Management savings methodology and the multifamily Cadet heater billing analysis. The gas fireplace studies indicate there has been more progress in Oregon than the rest of the region for installing energy-efficient fireplaces in existing homes. In new homes, there is opportunity to further engage in ensuring energy-efficient gas fireplaces are installed. The 2014 Fast Feedback results show Energy Trust is meeting or exceeding the OPUC's annual measure for customer satisfaction.

The board asked for clarification on how the Cadet model saves energy. Dan Rubado, Evaluation project manager, responded the Cadet Energy Plus model includes a dual speed fan, onboard thermostat and

other features. The evaluation shows the Cadets produce modest savings but there was too much variability in the results to be conclusive and it would be cost-prohibitive to conduct a larger study.

Policy Committee, Roger Hamilton
Four policies were scheduled for their standard three-year review. Changes to three of the four policies were adopted when the board approved today's consent agenda. No changes were made to the fourth policy, the Biopower Eligible Fuels policy, and it will be reviewed again in three years.

Results from the Pacific Power large solar competitive solicitation were reviewed. The Renewable Energy Advisory Council (RAC) will review the results and staff recommendations for funding at the October committee meeting.

The committee heard updates from staff on changes being considered for the Renewable Energy Certificates (RECs) policy and information on the OPUC large customer funding docket. Staff will keep the committee updated on these topics.

Strategic Planning Committee, Mark Kendall
Energy Trust will be in the second year of the five-year strategic plan at the next Strategic Planning Workshop in 2016. To prepare for the workshop and to assess progress on the plan's goals and strategies, the committee reviewed a staff proposal for measuring results in emerging technology. The metrics include both qualitative and quantitative measures. Sample metrics reviewed included megawatts, stage-gating, whether a technology is ready for integrated resource planning purposes and the capacity of the market to apply the technology. Strategic Planning Workshop dates for May (not the usual June time) in 2016 and for 2016 committee meeting dates were reviewed. At the next meeting, the committee will look at key process areas for continuous improvement and identify and prioritize topics for the retreat.

Groundwork for Budget & Action Planning

Preview of the Draft Seventh Northwest Power Plan,
Tom Eckman, Director of the Power Division of the Northwest Power and Conservation Council and Charlie Grist, Manager of Resource Conservation of the Northwest Power and Conservation Council
Margie introduced the speakers and noted the Pacific Northwest is very fortunate to have the Northwest Power and Conservation Council (Power Council) and these two individuals with their longstanding familiarity with the region and deep expertise. She stated the Council's Electric Power Plans are developed every 5 years and identifies resource requirements, potential, costs and opportunities for the region as a whole. Energy Trust relies upon the Plan as the foundation piece for Integrated Resource Planning work we undertake with each utility. In turn, IRPs lead to the development of annual efficiency savings goals and budgets. Energy Trust also works with the Power Council's Regional Technical Forum, which analyzes conservation measures, technologies, opportunities and costs. The Seventh Power Plan is in development and will be ready in draft form for public review this October. Comments are due in December.

Tom Eckman presented on the history of the Power Council and the current development and use of the Power Plan. The plan is needed to ensure the region has the energy, capacity, integration and storage resources available to serve customers while balancing risk and costs.

As authorized in the Pacific Northwest Electric Power Planning and Conservation Act in 1980, the Power Council was created to develop a fish and wildlife program and develop a regional power plan. The Power Plan is a 20-year look at forecasted electric load with a required review every five years. The plan must take the least-cost resource route to meet forecasted demand. Conservation is a resource designated by federal statute in 1980 just like generation. Conservation has a 10 percent cost advantage

over other resources. There is a ranking order to determining what energy resource to use to meet energy needs, in the priority order of conservation first followed by renewable energy, generating resources utilizing waste heat like co-generation or combined heat and power, and then all other resources. Storage would fall under the all other resources category. The development of each Power Plan includes public involvement.

The Power Council is unique in the U.S.; it is not a regulator, program deliverer or utility. The council's purpose in regards to power planning is to determine when the region will need resources, how much resource, when to build or buy the resource, the projected costs and the risks.

The Power Council uses a resource portfolio supply curve to examine what resources should be acquired first. Looking at the supply curve, the lowest cost and lowest risk resource is conservation, which has a resource potential of approximately 4,000 aMW by 2035. The council then uses scenarios, a combination of resource strategies and future circumstances, to test the cost, amount and timing to acquire the resources. New to the fifth, sixth and seventh Power Plans is the requirement to maintain a resource adequacy standard. In the end, the council's task is to ensure that the benefits of the power plan's resource strategies outweigh its risks.

Tom reviewed the initial findings of the draft Seventh Power Plan. Conservation and demand response can meet nearly all forecasted regional load growth at the least cost and least risk. There is enough cost-effective energy efficiency to keep loads flat for the next 15 years.

For the region, the annual peak is in the winter, and this winter capacity could be supplied by relying on energy efficiency as the largest source and then demand response or supply from external markets depending on availability, reliability and cost. It was noted California typically has a winter surplus. With the three announced coal plant retirements, energy needs can be met through existing natural gas plants and with modest new development of natural gas generation. Compliance with the Environmental Protection Agency's Clean Power Plan can happen at a regional level with existing resource strategies.

Tom clarified capacity is the peak energy demand requirement on a given timeframe, which can be from an hour to multiple days (also called demand). In Oregon, the largest peak is an evening in the winter. The average load demand is 20,000 MW while the peak can reach 35,000 MW.

The board asked how the plan is translated into action if the Power Council is not a regulatory body. Tom responded utilities look at the plan and determine how they measure against it based on their own planning. Regulators also reference the plan.

The Power Council's analysis of adding new renewable energy resources shows there is not much more than 500 aMW of new renewable resource development unless a 35 percent Renewable Portfolio Standard is enacted. If that happens, new renewable energy resource development increases to nearly 3,000 aMW. The scenarios indicate renewable resources available today do not provide winter peak on a reliable basis for the region, and the plan would need to meet the resource adequacy standard by adding natural gas generation.

Tom clarified the summer peak is growing about four-tenths of a percent per year. By 2030, the summer peak is projected to meet or exceed the winter peak for the region as a whole. One of the scenarios tested included what the demand might be with a temperature change in the region, and related effects like hydropower runoff changes and increased air conditioner load due to changing climate.

Tom noted all scenarios show regional carbon reduction amounts will comply with the federal Clean Power Plan. This would not have been possible without 30+ years of conservation programs saving about 5,600 aMW, and the already planned coal plant retirements. Tom clarified 5,600 aMW saved is

more than enough energy to power the state of Oregon. Going forward, energy efficiency is the region's second largest energy resource.

The board took a break from 2:08 p.m. to 2:20 p.m.

Guest Presentation

Northwest Energy Efficiency Alliance Annual Update,
Julia Harper, Director of Market Strategy and Execution for NEEA

Margie introduced Julia and the presentation topic. Energy Trust's five-year strategic period coincides with NEEA's five-year strategic and business plan. Julia helps oversee implementation and business planning.

NEEA is a regional organization working on behalf of 13 million electricity customers in the Pacific Northwest. The nonprofit is voluntarily funded by Energy Trust, Bonneville Power Administration and other utilities. New funders this year are natural gas utilities as NEEA starts to implement its first natural gas market transformation plan.

NEEA coordinates activities and resources for energy efficiency, giving funders greater influence on markets, lowering the overall cost of energy-efficiency acquisition and limiting risk. NEEA has five board committees and seven advisory committees, which include Energy Trust participation. NEEA's strategic goals are to fill the energy-efficiency pipeline with new products, services, practices and approaches, and to create market conditions to accelerate and sustain market adoption of them.

Julia reviewed examples of initiatives led by NEEA, including early initiatives in the late '90s to advance energy-efficiency clothes dryer and compact fluorescent light bulb technology and adoption. The CFL initiative ran 1997-2008 and saved enough energy since then to power 113,000 Northwest homes. A more recent example is the television initiative, launched in 2009, which was one of fastest savings acquisition initiatives for NEEA. NEEA joined California utilities to incentivize the sale of the most energy-efficient televisions at the largest retailers. This work influenced retailers to change their product mix on the shelves, which then influenced manufacturers to build different product mixes than they would have otherwise. Today televisions use 60 percent of the energy of an incandescent light bulb and the initiative led to 142 aMW in total regional savings.

Another NEEA initiative is industrial Strategic Energy Management which Energy Trust now delivers. A barrier to manufacturers reducing industrial energy use was the lack of management systems related to energy. In response, NEEA developed a continuous energy improvement program. In 2008, The Northwest Food Processors Association partnered with NEEA, Energy Trust, the U.S. Department of Energy and others to reduce the industry's energy intensity by 25 percent over 10 years. By the end of 2013, one-third of the food processors started implementing Strategic Energy Management.

Since 1997, NEEA and its funders have saved 1,142 aMW. The 2015-2019 business plan goals are to achieve another 145 aMW in savings. During the last business cycle, NEEA achieved 92 aMW in savings. This included 20 aMW for Energy Trust at a levelized cost of approximately 1.5 cents per kWh.

As part of the business plan, NEEA seeks to fill the emerging technology pipeline with new products. NEEA is currently assessing the potential for savings from secondary window glazing in commercial high-rises, efficient manufactured homes, and commercial new construction to proactively drive net-zero construction through advanced integrated design and code advancement.

Julia noted NEEA influences code changes but does not influence the timing of code cycles across the four-state region. The goal for many NEEA programs is to lock in energy savings codes and standards, creating lasting market effects. In Oregon, NEEA is working with the Home Builders Association on the

residential building code. On standards, NEEA and the Power Council participate regularly in U.S. Department of Energy rulemaking processes. The result is the Pacific Northwest has a strong voice at the table during federal rulemaking.

In August 2015, the NEEA board approved a plan for gas market transformation. Funding is separate from electric market transformation efforts and will be used to scan the market for new technologies, codes and standards, research and evaluation. A natural gas advisory committee includes representation from all funding utilities, including Energy Trust. The budget is $18.4 million over five years. Natural gas initiatives include work on hearth products, gas heat pump water heaters, combined space and water heating, rooftop HVAC systems and natural gas dryers. The 20-year savings are estimated at 280 million annual therms at about 28 cents per therm levelized.

Challenges for NEEA are ensuring regional equity given the diversity in funders, the increasing complexity of energy-efficiency opportunities, more sophisticated technologies, and managing a higher number of concurrent programs with smaller volumes of potential savings in each of them.

Julia clarified NEEA's strategy for exiting a market. NEEA does a lot of upfront planning with a logic model, which outlines market barriers to a particular technology or practice, intervention strategies and expected outcomes. NEEA then sets market progress indicators as the initiative is implemented. Market progress evaluation reports are completed annually to ensure tracking. As NEEA advances and measures market progress, they may hit a tipping point where the market can continue on without intervention or when a new federal code or standard is in place.

The board talked about other opportunities for NEEA to influence technology improvements in existing products, such as water heater pilot lights.

Staff Report

Highlights, Margie Harris

Margie presented on recently completed projects at the Oregon Zoo Elephant Lands exhibit, including space heating that reuses heat from cooling the polar bear pool. The zoo constructed Forest Hall to use natural ventilation, and installed solar electric and solar water heating systems. Elephant Lands earned $107,000 in Energy Trust incentives and was honored with a BetterBricks Commercial Real Estate award for sustainability from the Portland Business Journal.

The Quarter 2 Report was published in mid-August. Quarter 3 closes today and Margie will provide year-end forecasts at the next board meeting. Program activities and results in Quarter 2 included early-year residential outreach that led to increased activity for the sector. The residential sector continued to have strong in-store LED sales, achieved savings through promotions of ductless heat pumps and gas hearths, and launched a gas furnace incentive for single-family housing rentals. In the New Buildings program, the market solutions offering is achieving savings in smaller commercial buildings like restaurants and grocery stores. A new lighting offering for existing small businesses covers 80 percent of LED lighting installation costs, includes a zero-interest financing option and a 5 percent discount for customers who pay upfront. The Existing Buildings program worked with PGE and Pacific Power to reach small business customers with this offer. The industrial sector is seeing more small projects, completing 500 small industrial and agricultural projects through Quarter 2, which is an increase of 20 percent over the same time period last year. Many projects were lighting.

Earlier this month, the Solar program was awarded with an Interstate Renewable Energy Council 3*i* award for the solar soft cost reduction initiative, with strategies to reduce solar installation costs over the long-term. The result will be booking generation at a lower cost to Energy Trust, savings for customers and benefits for the solar industry.

Energy Trust is also working with Multnomah County and the Portland Development Commission on the county's new Commercial Property Assessed Clean Energy Program (CPACE). The program starts with a two-year pilot and is making $3 million available to support 10 commercial buildings in making energy-efficiency upgrades. These buildings can access Energy Trust's incentives and contractor network.

Staff is reviewing the EPA's Clean Power Plan. Oregon is well positioned to meet requirements of the new federal rule. In the coming year, the Oregon Department of Energy, Oregon Public Utility Commission and Department of Environmental Quality will be working on how Oregon will respond and comply with the federal rules.

Margie said there were valuable results in the recent board outreach survey, which indicated a majority of board members are very interested in attending project ribbon cuttings, tours of installed projects, and participating in customer and stakeholder events.

Several important steps are underway for the diversity initiative. The staff and board completed a cultural competency assessment survey, known as the Intercultural Effectiveness Scale (IES). Participation was at a 90 percent response rate. This was the first step toward completing the full assessment providing Energy Trust a baseline from which to understand our attitudes and experience toward differences. Next steps include debrief sessions, focus groups, individual interviews and a more in-depth tailored survey. Once all the information is gathered, the consultant will deliver findings and recommendations on how to proceed with the initiative hopefully by the end of this year. Margie expects to then set goals and identify next stage efforts in early 2016.

Margie completed her report by highlighting Pam's Sunnyside Greenhouse. The Cottage Grove business worked with Energy Trust to improve the gas efficiency in four of ten greenhouses, and is saving more than $10,000 annually.

Feature Presentations

Cyber security, Debbie Menashe and Scott Clark

Cyber security is an area of risk for Energy Trust, as for any business. This presentation is a follow-up to a board request to learn more about Energy Trust's policies and procedures related to cyber security. For any business, it is no longer a matter of whether or if there will be a cyber-security data breach but when.

Energy Trust's approach to mitigating the risk of a cyber-attack is to implement multiple overlapping techniques and tactics to create a web of systems that keep unauthorized users out, and limit exposure if there is an unauthorized user in the system.

IT's approach to security starts with firewalls, which allow only specifically authorized activity into Energy Trust systems. Staff review firewall rules twice a year.IT also keeps servers up-to-date; they were recently upgraded during the Integrated Solution Implementation Project. Energy Trust encrypts all data as it is transmitted between internal and external systems. Another layer of security is controlling access to internal systems using Microsoft Active Directory to create authorized user accounts and groups. IT also requires staff to change passwords on a regular basis. All computers are protected by antivirus software with automatic updates and the email server has malware, spam and antivirus scanning protection. For laptops and mobile phones, there is also security.

Energy Trust engages with third parties to review these security practices and support IT infrastructure staff. This year, two reviews were conducted. Moss Adams reviewed the incentive processing system and process. Anitian, a local firm that specializes in cyber security, reviewed the firewall security and Microsoft SQL Server database security.

The board asked whether there are additional security approaches. Scott clarified the server room is locked and access to the room is logged. Energy Trust also relies on Active Directory accounts for all finance activity. There are daily tape backups of all data, and IT is setting up a disaster recovery site at EasyStreet.

In addition to ongoing systems protections, established policies and procedures help ensure data is protected. IT and Legal staff have ongoing communications with staff on how to treat sensitive data. The participant information policy governs how Energy Trust protects and secures sensitive information, including customer information, utility information and other proprietary business information. Debbie noted Energy Trust will receive more sensitive information as Finance starts to accept Automated Clearing House (ACH) payments. There are varied procedures to implement the policy including ongoing staff and contractor trainings, a mobile device policy, training on how to transmit sensitive data using password protection, and a record retention schedule for paper and electronic files.

Energy Trust faces risk of cyber-attacks and also human error. Such errors have occurred in the past, and Debbie works with the Cheryl Gibson, our compliance manager, to identify where there may be gaps in policies and procedures.

Debbie noted Energy Trust also has a commercial general liability policy to cover injury that may arise from property damage or invasion of privacy, and a special cyber-security policy.

Debbie described a spring 2015 survey of staff to test their knowledge of security issues, policies and procedures. There is also an annual training for staff and contractors on our sensitive data policy.

Debbie clarified the record retention policy and that some documents are permanent files while the majority of files are on a five-year or seven-year destruction schedule, based on state record retention guidelines.

Collaboration and Innovation in Marketing,
Sue Fletcher, Shelly Carlton, Susan Jowaiszas and Susan Jamison

Sue Fletcher gave an overview of Energy Trust external engagement, which includes communications and marketing functions. Today's presentation defines general marketing activities and focuses on program marketing. Communications includes public reporting, internal and external communications, executive director support and other program and organizational support activities. The three functions share channels, including the website, press releases, collateral and email.

The primary focus of marketing is to bring in savings and generation to support achievement of annual and five-year program goals. Marketing strategies and tactics vary by customer sector, geographic region, utility, demographics and other factors.

A variety of marketing approaches are taken. Advertising is one the most visible approaches and includes online, print, radio and television ads. Marketing also connects with customers through events, the website, trade allies who can access cooperative marketing funds from Energy Trust, co-branding or coordinating on utility communications, collateral to aid sales efforts, press releases and targeted emails. The presenters clarified business email campaigns reach out to about 1,500 to 2,000 recipients per email and residential email campaigns could reach up to 50,000 recipients per email.

Customers can approach Energy Trust at a variety of stages in their decision making: awareness, interest, consideration, intent, evaluation and action. Marketing attracts those customers and moves them further toward the action stage. Energy Trust business marketing can stay at the awareness and interest stages, whereas residential marketing more typically reaches to the intent stage. Small business customers are approached through marketing more similarly to residential customers and are guided to a trade ally contractor.

The presenters reviewed current examples of business and residential marketing efforts; of which, advertising can be in the market for multiple years and run as a comprehensive campaign. Business marketing also includes quarterly newsletters geared toward industrial businesses, commercial businesses and multifamily property owners.

Marketing approaches evolve as program and organizational needs change, such as achieving goals and strategies outlined in the Energy Trust five-year strategic plan.

Sue Fletcher clarified development and design of creative materials like television ads is completed by Coates Kokes, Energy Trust's current creative services contracted agency.

The board noted the recent news stories on high school students building Energy Performance Score-rated homes. Susan Jamison noted that while this is not a specific offer and the New Homes program is structured to support such efforts. The program will follow up with the Salem high school cited by the board.

The board asked how utility customer information is used to target unserved customers. It was noted utility customer information has been used for some targeted emails. There is still more opportunity here. One piece of information that will help is the in-progress research by the Planning group on customers yet to be reached and who have participation opportunities. The board mentioned reviewing that research with regional economic data, too.

The presenters noted Program Management Contractors overlay current Energy Trust data with other external data for program targeting. The board encouraged marketing staff to work with other staff to develop mapping tools to aid in marketing efforts.

The board encouraged a similar presentation on Energy Trust communications in the near future.

Adjourn

The meeting adjourned at 4:13 p.m.

The next regular meeting of the Energy Trust Board of Directors will be held Wednesday, November 4, 2015, at 12:15 p.m. at Energy Trust of Oregon, Inc., 421 SW Oak Street, Suite 300, Portland, Oregon.

_____

Alan Meyer, Secretary

Board Decision
Amend Consent Agenda Procedure

November 4, 2015

Discussion and Recommendation

First approved and adopted by the Energy Trust board in 2003, the Consent Agenda Procedure was adopted to provide a streamline process for routine and non-controversial board resolutions. The process has worked well and is flexible. Staff presented some editorial and process clarifications to the Policy Committee on October 6, 2015, and the Policy Committee recommended approval by the full board.

RESOLUTION 756
AMEND CONSENT AGENDA PROCEDURE

WHEREAS:

1. **1. In 2003, the board established a policy directing staff to identify non-controversial and routine items for inclusion in a consent agenda.**
2. **Staff was directed to err on the side of caution in that determination.**
3. **This policy, up for its regular three year review, was reviewed by the Policy Committee and is recommended for approval by the full Energy Trust board through the consent agenda at its next full board meeting**

It is therefore RESOLVED that the Board of Directors hereby amends the Energy Trust Consent Agenda Procedure as shown in Attachment 1:

ATTACHMENT 1

2.01.001-A Consent Agenda Procedure

History			
Source	Date	Action/Notes	Next Review Date
Board Decision	November 5, 2003	Approved (R221)	11/2006
Policy Committee	October 19, 2006	Reviewed-no changes	11/2009
Policy Committee	October 23, 2012	Reveiwed-no changes	10/2015

That Energy Trust of Oregon, Inc., Board of Directors hereby approves the option of placing board action items on a consent agenda, according to the following guidelines:

- ~~**Action items brought forward through the renewable energy open solicitation program will follow the process approved by the board specifically for that program.**~~
- **Written decision documents on consent agenda items will follow the same format and contain the same information as provided for regular agenda items.**
- **Where appropriate, consent agenda items will meet the following criteria:**
  - **Involve routine and non-controversial matters**
  - **Conform with a previously adopted board policy or implement a project previously approved by the board in a formal resolution**
  - **If an energy efficiency matter, involves a cost-effective action as documented by pertinent financial information, energy savings/production, or other outcomes**
  - **If a renewable energy matter items will follow the process approved by the board specifically for that program**

- **Can be accomplished within the board-approved budget with clearly specified budget authority**
- **No board or public comment is anticipated regarding the proposed action**

- **If the consent agenda item authorizes an increase in expenditures under a previously existing contract, the resolution must include but not be limited to:**
  - **The original amount of the contract**
  - **The number and amount of prior increases**
  - **The amount of the current proposed increase**
  - **The reason for the increase, and**
  - **The resulting total contract amount**
- **The existing conflict of interest rules apply to votes of all items on the consent agenda.**
- **Any item on the consent agenda will be moved to the regular agenda upon request from any board member.**

~~**Moved by: Tom Foley Seconded by: John Klosterman**~~
~~**Vote: 6 in favor 0 opposed 0 abstained**~~
~~**Adopted on November 5, 2003 by Energy Trust of Oregon, Inc., Board of Directors.**~~

CLEAN VERSION

2.01.001-A Consent Agenda Procedure

History			
Source	Date	Action/Notes	Next Review Date
Board Decision	November 5, 2003	Approved (R221)	11/2006
Policy Committee	October 19, 2006	Reviewed-no changes	11/2009
Policy Committee	October 23, 2012	Reveiwed-no changes	10/2015

WHEREAS:

1. **In 2003, the board established a policy directing staff to identify non-controversial and routine items for inclusion in a consent agenda.**
2. **Staff was directed to err on the side of caution in that determination.**
3. **This policy, up for its regular three year review, was reviewed by the Policy Committee and is recommended for approval by the full Energy Trust board through the consent agenda at its next full board meeting.**

BE IT RESOLVED:

That Energy Trust of Oregon, Inc., Board of Directors hereby approves the option of placing board action items on a consent agenda, according to the following guidelines:

- **Action items brought forward through the renewable energy program will follow the process approved by the board specifically for that program.**
- **Written decision documents on consent agenda items will follow the same format and contain the same information as provided for regular agenda items.**
- **Where appropriate, consent agenda items will meet the following criteria:**
  - **Involve routine and non-controversial matters**
  - **Conform with a previously adopted board policy or implement a project previously approved by the board in a formal resolution**
  - **If an energy efficiency matter, involves a cost-effective action as documented by pertinent financial information, energy savings/production, or other outcomes**
  - **Can be accomplished within the board-approved budget with clearly specified budget authority**

  - **No board or public comment is anticipated regarding the proposed action**
- **If the consent agenda item authorizes an increase in expenditures under a previously existing contract, the resolution must include but not be limited to:**
  - **The original amount of the contract**
  - **The number and amount of prior increases**
  - **The amount of the current proposed increase**
  - **The reason for the increase, and**
  - **The resulting total contract amount**
- **The existing conflict of interest rules apply to votes of all items on the consent agenda.**
- **Any item on the consent agenda will be moved to the regular agenda upon request from any board member.**

Moved by: Seconded by:

Vote: In favor: Abstained:

Opposed:

Board Decision
Amend Waste-to-Energy Policy

November 4, 2015

Discussion and Recommendation

First approved and adopted by the Energy Trust board in 2006, the Waste-to Energy Policy was adopted to establish criteria and procedures to guide funding decisions for waste-to-energy projects. While Senate Bill 1149 defines “waste” as an eligible renewable resource, it does not provide additional specific definitional guidance. The Waste-to-Energy Policy provides staff with criteria for funding decisions. Small editorial changes are proposed for the policy to delete reference to the “Biopower” program as that program is now part of the broader “Other Renewables” program. Staff presented these editorial changes to the Policy Committee on October 6, 2015 and the Policy Committee recommended approval by the full board.

RESOLUTION 757
AMEND WASTE-TO-ENERGY POLICY

WHEREAS:

1. **Senate Bill 1149 defines "waste" as an eligible renewable resource.**
2. **In October 2006, Energy Trust established criteria and procedures to guide its decisions regarding funding for waste-to-energy projects, after it was endorsed by the Renewable Advisory Council.**
3. **This policy, up for its regular three year review, was reviewed by the Policy Committee and is recommended for approval by the full Energy Trust board through the consent agenda at its next full board meeting.**

It is therefore RESOLVED that the Board of Directors hereby amends the Energy Trust Waste-to-Energy Policy as shown in Attachment 1:

ATTACHMENT 1

4.24.000-P Waste-to-Energy Policy

History			
Source	**Date**	**Action/Notes**	**Next Review Date**
Board Decision	November 8, 2006	Approved (R411)	November 2009
Policy Committee	November 17, 2009	No change	November 2012
Policy Committee	October 23, 2012	No change	October 2015

1. **Among waste-to-energy projects, Energy Trust will give top funding priority to those projects using organic or biological wastes from human, animal or plant sources.**
2. **Among waste-to-energy projects, Energy Trust will give secondary funding priority to projects using wastes from manufacturing and industrial processes that are otherwise lost to commercial use, and that have no higher-value use than energy production. These projects will be considered as funds allow.**

3. **Eligible projects may use *de minimus* quantities (provisionally, less than 1% of energy content) of petroleum-based materials.**
4. **Energy Trust will prioritize waste-to-energy projects that meet the above criteria and: (a) do not use waste at the expense of a real, current alternative use with a higher social value, such as re-use or recycling; and (b) divert material from landfills, or otherwise avoid environmentally harmful waste disposal options.**
5. **Waste-to-energy projects will be ~~part of the Biopower program, which will fund both waste and biomass projects from a single budget. All Biopower program procedures and policies will apply to waste-to-energy projects. In addition,~~reviewed by RAC ~~review of waste-to-energy projects will be required~~before board action.**

CLEAN VERSION

4.24.000-P Waste-to-Energy Policy

History			
Source	**Date**	**Action/Notes**	**Next Review Date**
Board Decision	November 8, 2006	Approved (R411)	November 2009
Policy Committee	November 17, 2009	No change	November 2012
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2. **Among waste-to-energy projects, Energy Trust will give secondary funding priority to projects using wastes from manufacturing and industrial processes that are otherwise lost to commercial use, and that have no higher-value use than energy production. These projects will be considered as funds allow.**
3. **Eligible projects may use *de minimus* quantities (provisionally, less than 1% of energy content) of petroleum-based materials.**
4. **Energy Trust will prioritize waste-to-energy projects that meet the above criteria and: (a) do not use waste at the expense of a real, current alternative use with a higher social value, such as re-use or recycling; and (b) divert material from landfills, or otherwise avoid environmentally harmful waste disposal options.**
5. **Waste-to-energy projects will be reviewed by RAC before board action.**

Moved by: Seconded by:

Vote: In favor: Abstained:

Opposed:

Tab 2

Board Action
Authorizing Funds for Ewauna Solar 2 Project

November 4, 2015

Summary

Authorize funding of up to $850,000 toward the above-market cost of a 2.90 megawatt (MW_{AC}) ground-mounted solar photovoltaic facility in Klamath Falls, Oregon, developed by OneEnergy Renewables, owned by SolarCity and delivering energy to Pacific Power.

Energy Trust Goals

This project supports the first Renewable Energy sector goal of the 2015-2019 Strategic Plan: to accelerate the rate at which renewable energy resources are acquired, helping to achieve Oregon's 2025 goal of meeting at least eight percent of retail electrical load from small-scale renewable energy projects. The project will also contribute to the sector's five-year goal to support 10 aMW of small-scale renewable energy generation.

The Renewables sector has four priorities and performance benchmarks with the Oregon Public Utility Commission (OPUC), in this order:

1. Project development assistance for custom Renewable projects with an annual report on projects supported.
2. Standard-offer solar incentives with an installation benchmark of 85% of the budget goal.
3. Custom non-solar incentives with a limit on the cost of Renewable Energy Certificates (RECs) acquired.
4. As funding is available, custom and innovative solar projects with an annual report on how projects—if any—were selected.

The sector has more than sufficient Pacific Power funding for the first three priorities in 2015. This project was selected under a competitive solicitation to meet the fourth priority.

Background

- In Q1, 2015, Energy Trust solicited proposals for non-solar Other Renewables projects. None of the projects that applied met funding criteria, leaving $7 Million of Pacific Power funding unallocated. Renewables staff reserved $4 Million for a follow-up Other Renewables solicitation in Q2 to Q3 and reallocated $3 Million for solar projects. Of this, the Solar program reserved $1 Million to backfill demand for standard solar incentives and $2.0 Million for larger, custom solar projects.
- In March, 2015, the Solar program released a solicitation requesting proposals for custom solar projects between 500 kW_{DC} (direct current) the largest size supported by standard incentives, and 10 MW_{AC} (alternating current),the largest size that is eligible for a standard qualifying facility (QF) contract from the utilities. Projects could ask for up to $2 Million.
- Applications were due on May 15. The program received sixteen applications with a total incentive request of $14.6 Million. Fifteen of the proposed projects had received or were seeking qualifying facility contracts from Pacific Power. A sixteenth proposal was for a net-metered project.
- On May 21, 2015, Pacific Power filed a petition with the OPUC requesting that QF contracts be limited to three years (down from 20 years with 15-year firm rates) and that the standard QF contract be limited to wind and solar projects 100 kW_{AC} or smaller (down from 10 MW).
- The OPUC opened docket 1734 to examine Pacific Power's request. The process is expected to take at least eight months. In August, the OPUC granted an interim request

from Pacific Power to limit solar QFs to 3.0 MW_{AC} and made the limitation retroactive to May 21, 2015

- Nine projects were removed from consideration for not meeting readiness criteria, including having a signed power purchase agreement (PPA) and a reasonable interconnection schedule, and providing a complete application with all information requested.
- The program used standardized financial assumption to review above-market cost for the remaining seven projects. These included an 8% target rate of return, a 25-year project life, and a 15-year loan at 5% interest rate. The loan was sized based on an industry-standard debt service coverage ratio of at least 1.35 (a minimum of $1.35 of net revenue for every $1.00 of debt service during the term of the loan).
- Five projects had a signed PPA with a QF rate schedule from 2012. In our financial analysis, staff determined that these projects had no above-market cost or above-market cost that was less than five percent of project cost. These projects were removed from consideration.
- Two project proposals remained under consideration: 1) the 2.9-MW_{AC} Ewauna Solar 2 project that has a signed QF PPA with lower 2014 rates, and 2) a large-scale net-metered project.
- The program scored the final two proposals based on financial and business plan criteria and the Ewauna Solar 2 project was ranked higher by a significant margin. The program is now requesting authorization to proceed with an incentive agreement with the Ewauna project.
- The program is still considering the second project for funding at a later date.

Discussion

- The nameplate capacity of the photovoltaic array will be approximately 3.7 MW_{DC}. This solar project will be capable of generating up to 2.9 MW_{AC} of power measured on the alternating current (AC) side of the system's inverter.
- The Ewauna Solar 2 project will generate 7,246 MWh/yr or 0.83 aMW. This represents 8% of the sector's 2015 -2019 goal to support 10 aMW of new, small-scale renewable energy generation.
- The project site will be located on the south side of Klamath Falls on a leased parcel of 119 acres of low-intensity land presently used for grazing. The property is zoned for industrial use. The developer has secured a conditional use permit for the project from Klamath County.
- Ewauna 2 has a signed 20-year power purchase agreement (PPA) at 2014 Schedule 37 QF rates. The PPA has fifteen years of firm rates with a levelized cost of $64/MWh. The firm rates are a "renewables" QF schedule that include the transfer of RECs to the utility during its deficiency period, starting in 2024. For the last five years of the PPA, the project will receive rates that are indexed to Pacific Power's avoided cost.
- The proposed ground-mounted system will consist of 11,704 Canadian Solar PV modules and 50 Solectria Renewables inverters. The systems will use single-axis trackers to boost generation by about 25% over a fixed-tilt system.
- The project is being developed by OneEnergy Renewables. OneEnergy is also the developer of the Steel Bridge solar project near Willamina. The board approved a $2 Million incentive for the Steel Bridge project in December 2014, and the project is expected to reach commercial operation in Q4 2015.

- The proposed project capital cost is $7,166,375 ($1.95/W_{DC}). This compares favorably to the fixed-tilt Steel Bridge project at $1.98/$W_{DC}$ and is in line with the economies of scale seen on other project proposals.
- Ewauna Solar 2 will take advantage of the 30% Federal Investment Tax Credit and accelerated depreciation. The project will apply for a $250,000 Renewable Energy Development (RED) grant from Oregon Department of Energy.
- Based on our standardized financial assumptions, the project can support a loan of 20% of project cost and has a rate of return of 5.5% without an incentive. With 20% debt, the state and federal incentives and the 2014 *non-renewable* QF rate schedule, the project has above-market cost of approximately $1,921,000.
- Pacific Power is contributing approximately $506,000 to project revenue with its above-market *renewable* QF rate schedule. In return, the project will provide RECs to the utility during its Portfolio Standard deficiency period. This deficiency period starts in 2024 and lasts for the remainder of the project's 15-year fixed rate schedule. This represents about 28% of the RECs during the project lifetime.
- After the utility's above-market contribution, there is remaining above-market cost of $1,415,000.
- OneEnergy requested an incentive of $850,000 ($0.23/W_{DC}). Based on the remaining above-market cost, staff propose providing the full amount requested. The incentive will cover 45% of the full above-market cost.
- In return, Energy Trust will receive about 12 years of RECs from the project—more than 45% of the RECs during the 25-year project life. In total, utility customers are covering 71% of project's above-market cost and will receive at least 81% of the RECs from the project.
- The developer plans to cover additional above-market cost with REC sales during the first five years.
- The Renewable Energy Advisory Council (RAC) supports the Ewauna 2 project.

Recommendation

Authorize the executive director or her designee to sign a contract authorizing expenditure of up to $850,000 to provide above-market support for the Ewauna 2 project, contingent on successful contract negotiation consistent with the resolution below.

RESOLUTION 758
AUTHORIZING FUNDS FOR EWAUNA 2 SOLAR PROJECT

WHEREAS:

1. **Consistent with Energy Trust's 2015-2019 Strategic Plan, Energy Trust supports all eligible renewable energy technologies using competitive approaches to identify and fund new projects and market solutions for those projects receiving non-standard incentives.**
2. **In addition, the Oregon Public Utility Commission's (OPUC's) fourth funding priority for renewables for Energy Trust to support the above-market costs associated with innovative and custom solar projects, "as funds are available."**
3. **In early-2015, Staff identified $2,000,000 in available funds for innovative and custom solar projects in Pacific Power territory, funds unallocated after a 2015 "Other Renewables" RFP process and support of standard solar projects.**

4. **In March, 2015, Energy Trust released a Request for Proposals for innovative and custom solar projects in Pacific Power territory, and sixteen applications were received and reviewed.**
5. **Evaluating the proposed projects for readiness and above-market cost, Energy Trust staff recommends moving forward with Ewauna 2 Solar: a 2.9 MW_{AC} project, ground mounted, with single-axis trackers to boost generation approximately 25% over a fixed tilt system. The project will be located on the south side of Klamath Falls, in Oregon on leased land zoned for industrial use and currently used for grazing. This project proposal demonstrated many strengths.**
6. **This project has a solid business plan, executed 26-year lease, experienced developer, construction contractor, and owner, and executed power purchase agreement (PPA) and interconnection agreement.**
7. **Total project cost is estimated to be approximately $7,166,000, which Energy Trust staff considers reasonable for a project of this size and design, at $1.95/ W_{DC}, comparing favorably to the recent Steel Bridge Solar project at $1.98/$W_{DC}$.**
8. **Netting out Pacific Power's contribution towards the above-market cost of the project through its above-market QF rate pursuant to the project's executed PPA, the remaining above-market cost on a net-present value basis over 20 years is estimated at 1,415,000.**
9. **Based on its analysis of above-market cost and available incentive funding for projects of this type, staff recommends an Energy Trust incentive of up to $850,000.**
10. **In consideration for its incentive funding contribution, Energy Trust will require that the project owner assign up to 48 percent of the Renewable Energy Certificates (RECs) for the project to Pacific Power for compliance with Oregon's solar mandate and renewable energy requirements.**

It is therefore RESOLVED that the board of directors of Energy Trust of Oregon, Inc. authorizes:

1. **An incentive of up to $850,000, payable in not less than two increments, for the Ewauna 2 ground-mounted solar project in Klamath Falls, Oregon with minimum capacity of 2.9 MW_{AC} and expected generation of 7,246 MWh/year (0.83 aMW).**
2. **Energy Trust to require the project owner to deliver up to 48% of all RECs from this project to Pacific Power for the benefit of its ratepayers and for compliance with Pacific Power's renewable energy generation and solar capacity obligations to the state, recognizing that through the project's PPA, the project is also providing additional RECs directly to Pacific Power such that Pacific Power will be receiving a total of approximately 78% of the RECs from the project.**
3. **The executive director or her designee to negotiate and sign an agreement consistent with this resolution.**

Moved by: Seconded by:
Vote: In favor: Abstained:
Opposed:

Tab 3

Evaluation Committee Meeting

September 28, 2015 12:00 pm-3:00 pm

Attendees

Evaluation Committee Members
Alan Meyer, Board Member, Committee Chair
Susan Brodahl, Board Member
Anne Root, Board Member (phone)
Heather Beusse-Eberhardt, Board Member

Energy Trust Staff
Steve Lacey, Director of Operations
Fred Gordon, Director of Planning and Evaluation
Sarah Castor, Evaluation Sr. Project Manager
Dan Rubado, Evaluation Project Manager
Erika Kociolek, Evaluation Project Manager
Andy Eiden, Data Analyst
JP Batmale, Planning Manager
Andy Hudson, Planning Project Manager
Mike Bailey, Engineering Manager, Planning
Jackie Goss, Planning Engineer
Sue Fletcher, Senior Manager, Communications and Customer Service
Shelly Carlton, Strategic Marketing Manager
Peter West, Director of Energy Programs
Oliver Kesting, Commercial Sector Lead
Sam Walker, Sr. Project Manager, Commercial
Thad Roth, Residential Sector Lead
Marshall Johnson, Sr. Program Manager, Residential
Kim Crossman, Industry and Agriculture Sector Lead
Betsy Kauffman, Renewables Sector Lead
Dave McClelland, Program Manager, Solar
Lizzie Rubado, Sr. Project Manager, Solar
Jeni Hall, Project Manager, Solar
Susan Jowaiszas, Sr. Marketing Manager, Commercial and Industrial
Nicole Brown, Marketing Coordinator, Commercial and Industrial

1. Existing Homes Air Sealing Pilot Evaluation

Presented by Dan Rubado

Background: The Existing Homes program ran a pilot spanning 2014 and 2015, focused on a prescriptive air sealing measure in attics. In 2014, it looked like all gas air sealing measures would go away due to cost-effectiveness challenges; this pilot was a last-ditch effort to maintain an air sealing offering in the Existing Homes program. Combining air sealing with attic insulation was an attempt to lower the cost of doing air sealing since a contractor is already onsite and in the attic to install attic insulation.

Andy H. asked if this was limited to the attic, or if other areas of the home received air sealing. Dan responded that this was only focused on air sealing in attics.

Pilot Goals: The goals for the pilot were to try to reimagine air sealing and design a cost-effective measure. Also, there have been issues over the years with the air sealing paradigm; namely, there has been the potential to manipulate the incentive with blower door testing. A goal of the pilot was to design a measure that would be difficult to manipulate. Other goals were to simplify the quality assurance (QA) process, and achieve cost savings. On the topic of costs, the thought was that if the measure could be prescriptive, with a checklist of areas to be sealed, the program could do away with the blower door test requirements, which can be expensive.

The program's goal was to test the measure in 100 homes, and do blower door testing during the installation process to determine the impact on air infiltration. Susan B. asked what a blower door test involves. Dan responded that a device is inserted into the doorway of a home – it's essentially a big fan – and it depressurizes the home, and measures how long it takes for air to infiltrate into the home through cracks and gaps. It's a quantitative measurement of the leakiness of the home. There are standardized protocols, such as closing all the windows and blocking off vents; for the pilot, the program ensured that the contractors all did this the same way. Also, all of the blower door equipment was calibrated, so it would get the same readings in the same scenarios.

Evaluation Goals: The primary goal of the evaluation was to estimate savings. Other goals were to determine the cost of the measure when installed with insulation, determine if a combo measure (air sealing and attic insulation) is viable and cost-effective, and determine how well contractors handle measure – that is, if they liked it, whether or not it was something they would do, and how the incentive structure would work for them.

Evaluation Tasks: Energy Trust hired Research Into Action and SBW as a team to do interviews with staff and contractors, review and analyze pilot data (primarily the blower door testing results), and estimate savings.

Pilot Implementation: The program recruited the six most active insulation trade allies to participate in the pilot. They received an orientation to the pilot, which covered the incentives, administration, expectations, logistics, and recruiting. Trade allies were responsible for recruiting qualified customers into the pilot. To participate, homes had to be gas-heated, single family homes, and the contractor had to be doing an attic insulation project at the home. Initially, the qualifications were limited to homes doing only attic insulation; this turned out to be a problem because the volume of attic insulation-only projects was low.

Alan asked, why was attic insulation a critical part of air sealing? Dan responded that the program wanted the contractors to be working in the attic to begin with. Fred added that the measure did not get an exception from the Oregon Public Utilities Commission, so the program was looking for ways to make it cheaper and easier. When testing of homes was done to see where air leakage occurs, the majority is from the ceiling; this strategy aligns with contractors already working on attic insulation, and had the potential to be less expensive.

This was supposed to be a prescriptive measure – air sealing activities were categorized in the following ways:

- chases (gaps around chimneys or conduit and vent pipes)
- drywall penetrations (can lights, or heating vents)
- top plate

Blower door testing was done by students from Portland State University (PSU) and program staff before, during, and after installation. A lot of testing was done coincident with the work; the idea was to isolate the air sealing component and then within that, isolate the impact of air sealing certain areas. Some of the blower door testing work was done by students, and some was done by program staff; ultimately, program staff took that over later in the pilot. Contractors were paid a $400 incentive, and there was no cost to customers - it was intended to be a free service.

The pilot ended up having 45 homes, which was much lower than original goal of 100. This was primarily due to lack of participation from two high-volume trade allies. Marshall commented that the pilot's value proposition was just not good enough for those two trade allies to participate. Dan added that for the purposes of the pilot, we required blower door testing during the job. This made jobs take longer, which meant contractors couldn't do as many jobs. So, it hurt their profitability to be involved in the pilot, and the $400 incentive didn't make it worth it to them.

Twenty-five of the pilot homes were located in Portland; 18 were in the greater Portland Metro area, and two were in Salem. The pilot began slowly in Summer 2014, then about two-thirds of the projects were completed between September and December 2014. There was a push into 2015 to get more projects, but volume trailed off and we decided to end the pilot and evaluate with the homes and data we had.

Staff Interviews: Program staff thought the pilot ran smoothly and that communication was good. They were hopeful that combining air sealing with attic insulation would be cost-effective. There was lower than anticipated trade ally participation, a more limited number of homes in the pilot, and the pilot took twice as long as planned. Staff were uncertain about market acceptance, and cited lack of interest from customers and contractors, decreased demand for all gas home weatherization measures, and less certain savings from air sealing relative to other measures. Staff reported that the PSU students were not effective in conducting blower door tests and collecting data without supervision, so program staff took on that responsibility. Some potential barriers identified were the difficulty of doing QA without blower door tests (this pilot didn't test or come up with a definite alternative QA approach) and getting trade allies and customers interested in doing air sealing during attic insulation projects.

Trade Ally Interviews: Trade allies reported only positive interactions with program staff. Alan asked if this was Energy Trust staff. Dan clarified that it was staff at the Existing Homes program's program management contract (PMC), CLEAResult. Trade allies thought that the approach was a viable strategy. They reported that they completed between 100 and 1,300 attic insulation jobs per year, and roughly a third or a half of those would be good candidates for air sealing. Costs to do air sealing ranged from $300-$1,000 per project, although this depended on home size and the details of the job (for example, having an uninterrupted workflow and clear access in the attic were primary cost considerations). Some trade allies actively promoted the pilot while others only approached good candidates. The initial restrictions (that is, only doing attic insulation) made the pilot less appealing to contractors and more difficult to find eligible customers.

Trade allies reported that the time required to accommodate blower testing limited the number of projects that could be completed per day. Also, trade allies fixated on the pilot requirements, and did not differentiate between the pilot and a future measure. Two firms reported using different crews for specialized tasks like air sealing, so scheduling was more difficult. Not all trade ally employees were trained to do the pilot because of the uncertainty that the measure would continue, and trade ally companies didn't want to train people to do something that

wouldn't stick around. There were some small accounting problems caused by the pilot incentive structure that caused frustration among a few contractors (related to the incentive being paid to the contractor). All contractors said the $400 incentive would be required to do air sealing if it becomes a regular offering. Trade allies provided mixed feedback on how easily it would be to do verification without blower door testing (e.g., a checklist, photos).

Housing Characteristics: The average home in the pilot was built in 1953 (most of the homes were built between 1940 and 1980). The average size was 1,800 square feet, and most homes were one-story (20% had two floors). The average gas furnace efficiency was 85%, and these units were, on average, 11 years old. A slight majority of homes had crawl spaces (instead of basements). The existing condition of attic insulation was three inches, and the average air infiltration was 0.67 air changes per hour (ACH).

Blower Door Data: Blower door data was collected by CLEAResult, compiled, and provided to SBW. SBW reviewed the data for consistency, and looked for outliers. Two homes were dropped from the analysis because of data quality issues. The blower door tests were done to assess changes in tightness; the resulting measurements, ACH and CFM50 (cubic feet per minute, a measure of airflow), were input into Simplified Energy Enthalpy Model (SEEM) modeling software to evaluate energy savings.

Air sealing results – change in air leakage

	PRE PILOT ACH	POST AIR SEALING ACH	AIR SEALING ΔACH	POST INSULATION ACH	TOTAL ΔACH
Mean	0.668	0.588	0.079	0.564	0.104
Standard deviation	0.25	0.21	0.10	0.21	0.10

The table above shows a modest, small change in ACH. The change in ACH after air sealing is 0.08, on average, and then after insulation, the total change in ACH is 0.1, so some of the toal was obtained through insulation anyway. So the takeaway here is that air sealing gives a modest amount of air infiltration reduction that may be obtained from attic insulation anyway.

Thad asked if a variety of insulation techniques and materials were used, and if so, would that play into these results. Dan responded that he thought it was mostly blown-in insulation. Mike asked if air sealing is part of the standard attic insulation procedures. Dan responded that air sealing is something that contractors would not normally do as part of an attic insulation job.

There was a fair amount of variability from house to house. Fred asked if the amount of change is associated with the initial amount of leakage. Dan responded that that is a good hypothesis, but doesn't know exactly.

These numbers were translated into CFM, which is correlated with home square footage; with bigger homes, there is more air leaking out because the homes are larger. This information was put into SEEM modeling software, and normalized for square footage, so every house was on a level playing field.

Savings Estimation: The best way to have done savings estimation would be doing custom runs in SEEM modeling software for every individual home, and calculating the average energy savings. However, this is quite expensive to do, and we didn't have enough data from each

home to provide all the inputs that SEEM requires. The next best thing was to take Regional Technical Forum (RTF) prototype homes (which characterize certain housing types – e.g., certain home vintages, configurations, and sizes), enter the prototype home characteristics in SEEM, and get the right mix of prototype homes that represent the sample of homes in the pilot. Then, the ACH observed in the pilot would be applied to the homes in the modeling software to get an estimate of energy savings. The goal is to apply ACH data to some representative homes and figure out what energy savings would be for those homes. There are a bunch of assumptions built into the RTF prototype homes, and we decided to stick with those assumptions, rather than change them. The RTF has already built workbooks used to estimate savings for different measures based on SEEM modeling runs from prototype homes, so most of the work was done already – SBW then calculated it out into savings per CFM. So, we used the results from the RTF, applied the distribution of housing types that we had to the results in the RTF's standard workbook, and then, using the change in CFM data, calculated savings for the air sealing measure. We relied heavily on the RTF's work because it was much cheaper to do that. To see if it made a difference, we did have SBW do some custom SEEM runs – the results were almost identical.

Marshall asked if SBW took the gas savings directly from the RTF workbooks. Dan responded that most of the RTF's work is based on electric homes; SBW converted electric savings to gas savings based on furnace efficiency. Marshall asked if we could have taken the RTF's measure for prescriptive air sealing and done an engineering analysis. Dan responded that we didn't know what the ACH reduction was going to be, so we took that input and then did an engineering analysis. Fred commented that if the number of homes in the pilot had been larger, we could have looked at savings through billing analysis, as another check on the savings.

Results: As shown in the table below, heating zone 1 has the lowest savings potential. The RTF workbook method compared to the custom SEEM runs is fairly similar – 11-12 therms. This is a fairly small amount of savings for the cost.

Air sealing savings

MEASURE	MEAN THERM SAVINGS (RTF WORKBOOK)	MEAN THERM SAVINGS (SEEM RUNS)
Attic Air Sealing, Heating Zone 1	11	12
Attic Air Sealing, Heating Zone 2	12	--
Attic Air Sealing, Heating Zone 3	12	--

Mike commented that some of the savings would probably come from insulation anyway. Dan responded that the pilot sequenced blower door testing, but didn't look at air infiltration reductions from insulation-only jobs, so we don't know how much we would have gotten from insulation alone.

Conclusions: There were some implementation challenges with recruiting, scheduling, and costs. Also, reaction to the pilot was lukewarm, but trade allies were receptive to a full-fledged combined attic insulation and air sealing measure as long as an incentive persisted. There were

limited savings – if this was rolled out as a measure, it would require efficient and effective monitoring and QC, with a minimal incentive to be cost-effective, and this might not be enough money to motivate trade allies or customers to do it.

Recommendations: The evaluator recommended determining what incentive amount would motivate trade allies, and, if moving forward, trade allies need to be re-engaged and informed of reduced requirements for the measure.

Energy Trust Take: The small amount of gas savings estimated are unlikely to be cost-effective, and large cost reductions from combining air sealing with attic insulation were not demonstrated. Removing the blower door testing lowers cost, but a viable QA alternative is still required (and wasn't developed as part of this pilot). Trade allies and customers appeared to be lukewarm about attic air sealing. And finally, according to trade allies, less than half of their attic insulation projects would be good candidates for air sealing.

Alan asked if these results mean the program is planning to not move forward with a measure. Marshall confirmed that the program strategies are transitioning away from measure with high touches and that involve field work (like this one) to preserve delivery dollars for strategies that can contribute to measures with higher savings. This pilot was a last-ditch effort to appease trade ally stakeholders to keep measures that don't meet our metric for cost-effectiveness. Alan commented that there are savings, so it seems that it is just a tradeoff in terms of how many dollars we need to put into getting the savings. Dan commented this is a good example of why Energy Trust does pilots. We thought there was promise, and believed that we could implement strategies to lower the cost (and get higher savings), and decided it was worth testing. Given the results, it's a good thing we did not roll out an offering. Mike commented that the challenge is, technically, yes, leaky houses use more energy, but there is not one sole cause of leaks.

Susan B. asked if there is a cost that gas could get to where this measure could be cost-effective, or is it just that the savings are so small that it's unlikely to ever be cost-effective? Dan responded that it's some of both. At the current level of savings, the measure would have to cost a quarter of what it does currently in order for it to be cost-effective or gas prices would have to quadruple. Fred added that it's not just that current gas prices would have to increase, but current and future prices would need to increase significantly.

Thad asked, how do the results from this pilot (in terms of ACH) compare to new construction residential homes? Dan responded that EPS homes have less than half the ACH compared to tightly sealed existing homes.

Before the start of the next presentation, Alan asked about the next two presentations, since they aren't typical evaluation projects - what is the context? Erika responded that these aren't typical evaluation projects, but we periodically bring other projects to the committee when those project involve evaluation staff (who will sometimes assist with projects being driven by other groups or entities) and/or when the results of a project will be used to make program decisions or be made publically available. Fred added that we look to the committee for guidance on what should and should not be presented at the evaluation committee meetings.

2. Solar Soft Costs

Presented by Jeni Hall

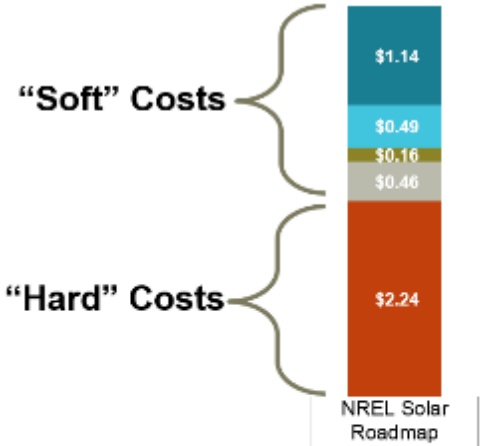
Background: The US Department of Energy (DOE) launched the SunShot initiative in 2011, and set an audacious goal to decrease solar costs by 75% between 2010 and 2020 – this translates to a target of $1.50 per watt for residential solar, and $1.25 per watt for commercial solar. The goal is to make solar cost-competitive with conventional forms of electricity. The National Renewable Energy Labs, NREL, operationalized this goal by breaking solar into five categories, and outlined how to get to that 2020 goal.

The five categories of solar are:

- Hardware costs (modules, inverter, racking, electrical components)
- Installation and labor
- Permitting, inspection, interconnection, and incentive (PII+I), which is where Energy Trust fits in
- Customer acquisition (sales and marketing up to the point where the contract is signed)
- Other soft costs (installer profit, overhead, transaction costs, supply chain costs, sales tax – this also includes unplanned expenses, rework, inefficiencies, and cost overruns)

The chart below shows NREL's 2014 target for solar installed costs, disaggregated into the five categories of costs that were just mentioned.

Breakdown of NREL's 2014 target for solar installed costs



	NREL Solar Roadmap 2014 Forecast
Other Soft Costs ($/W)	$1.14
Customer Acquisition ($/W)	$0.49
PII+I ($/W)	$0.16
Installation labor ($/W)	$0.46
Hardware Costs ($/W)	$2.24
Installed Cost ($/W)	$4.49

Survey: We sent out a survey to trade ally installers, which was modeled after surveys done by NREL. The survey was fielded in Q3 2014 and asked about solar installations and costs for Q1 and Q2 2014; 15 contractors total participated. We got good representation from contractors across the state.

We used NREL's blended labor rates, and made adjustments for some categories. Susan B. asked, what was the rationale for including labor in soft costs (as it is typically included in hard costs)? Jeni responded that installation labor is relative to the cost of modules; the intent behind working on decreasing soft costs is the fact that module costs used to be decreasing each year, and we'd expect the cost of solar to follow that trend. The technology plateaued, the cost plateaued, and the industry looked to find savings elsewhere. Sarah commented that getting the costs down could involve using different labor (a non-electrician vs. an electrician) or getting the installation time down. Jeni added that when we talk with installers, they are concerned that labor rates are part of soft costs, and so is profit. But a lot of it could be efficiencies – making it easier and faster to install solar. Alan commented that a better term might be hardware costs and non-hardware costs. Fred commented that the module cost is globally determined, but the rest of these, we may be able to bring down.

Jeni continued, noting that as part of this survey, we asked contractors to provide information on the numbers of hours they spent per task for an average system size, which we then used to calculate a cost per watt.

Customer Acquisition Costs: The table below shows marketing, advertising, and other customer acquisition costs. Other costs varied between $118 and $4,000 per project.

Customer acquisition costs

	Residential Cost ($/W)	Commercial Cost ($/W)
Marketing & Advertising	$0.03	$0.07
Other Customer Acquisition	$0.29	$0.14
Total	**$0.32/watt**	**$0.19/watt**

Hardware Costs: There was a wide range of costs for modules, inverters, and other hardware and materials, and these seemed to be higher than what we know to be the industry average. Since Energy Trust collects information on the cost of modules and inverters for all projects for which we pay an incentive, we adjusted the self-reported module and inverter costs using this data. The table below shows the reported and adjusted hardware costs.

Hardware costs

	Residential		Commercial	
	Reported Cost ($/W)	Adjusted Cost ($/W)	*Reported Cost ($/W)*	Adjusted Cost ($/W)
Module	*$1.68*	**$1.10**	*$1.40*	**$0.99**
Inverter	*$0.67*	**$0.43**	*$0.68*	**$0.29**
Other	*$0.34*	**$0.34**	*$0.54*	**$0.54**
Total	*$2.69/watt*	**$1.87/watt**	*$2.62/watt*	**$1.82/watt**

Heather asked if contractors are putting their margins in the reported costs. Jeni responded that it could be the margin, and it could be the way that the information is being reported by the contractor. They may not know the average cost of hardware. We have flagged this as an area that should be revised before we do any subsequent surveys. Fred asked if we have any reason to believe that the self-reported estimates for the other categories are better than these estimates. Jeni noted that the estimates in the other categories more closely mirror NREL's

numbers, and we asked for different information in other categories, and this may have been easier to answer (for example, number of hours spent on a task rather than an average cost).

The table below shows a comparison of residential and commercial costs, broken down by the five cost categories, as compared with the 2014 roadmap target.

Oregon and NREL cost comparison

	Residential		Commercial	
	Oregon 2014	Roadmap 2014 Target	Oregon 2014	Roadmap 2014 Target
Customer Acquisition ($/W)	$0.32	$0.49	$0.19	$0.13
Installation Labor ($/W)	$0.48	$0.46	$0.33	$0.30
Permitting, Inspection, Interconnection and Incentives ($/W)	$0.16	$0.16	$0.07	$1.36
Other Soft Costs ($/W)	$1.42	$1.14	$1.31	
Total Soft Costs ($/W)	$2.38	$2.25	$1.90	$1.76
Hardware Costs ($/W)	$1.87	$2.24	$1.82	$1.88
Total System Costs ($/W)	**$4.25/watt**	**$4.49/watt**	**$3.72/watt**	**$3.64/watt**

What stood out to the solar team is that soft costs are more than half of the installed price. Oregon residential costs are slightly lower than the national target, and commercial is slightly higher. The costs associated with permitting, inspection, interconnection, and incentives is right in line with the national roadmap, which is interesting given that Oregon has one of the more strict regulatory environments (we put solar installations through a lot of paperwork), but things like the number of days it takes to get back permits and incentive applications, and project delays don't seem to show up in these numbers.

Mike asked, what is typically the biggest delay? Jeni responded that it depends on the contractor, location, and utility. A delay for a city permit, utility hookup, etc. could easily be weeks.

Customer acquisition costs were slightly lower than the roadmap target, which is in direct opposition to what we hear from trade allies. However, there were wide ranges there, which means the number may not be very accurate. Hardware cost are slightly lower than the roadmap target, which is true across the country, as hardware costs have decreased more significantly than anticipated. The "other soft cost" category is higher than the national target. It's important to remember that this category is anything that is left over after subtracting all of the other categories from the total installed cost. So anything that is under- or over-estimated in the first three categories plus hardware costs gets lumped into the "other" category, making it a hard category to nail down.

Mike asked if Oregon's lack of a sales tax plays into these results at all. Jeni responded that most places waive at least some sales tax for solar installs, so the numbers should be fairly comparable to the national numbers.

Takeaways: The first takeaway is that Oregon installers are in the ballpark. Another is, as we have been discussing, soft costs are not well-tracked or understood.

Heather commented that the Q2 2015 Greentech Media (GTM) research report on solar market insights had, on page 51, national system pricing. The highest pricing was for Massachusetts at $4.94 and Oregon, at $4.53. That's higher than what is being reported here. Dave responded that we provide data to GTM, as do utilities for feed-in-tariff projects. This may be an error. The other factor is that third-party owned systems don't have a point-of-sale, so they are allowed to report the fair market value, and sometimes those numbers seem to be inflated.

Next Steps: The solar program plans to revise the survey based on learnings from this initial survey, and repeat in 2016 (gathering information about 2015).

Alan commented that if you lump profit into soft costs, it obscures what you want to learn. For example, assume the market bears a price of $100, and hardware cost is $50. If you lower hardware costs, you won't lower the price since you're still able to sell at $100. All you're doing is changing the ratio of hardware cost to soft costs, which obscures the actual soft costs. All you're doing is changing the ratio of profit to cost. Jeni responded that we see a range of installation costs within Oregon with a swing of ±$2 and there are a variety of reasons for that range. This is one reason that focusing purely on averages is a challenge and it makes a national solar roadmap a difficult target to use. Regarding the piece about profit, we are not in the business of lowering profit margins. There is significant downward pressure on the market, and Energy Trust incentives play a part in that since we track the average cost of solar through the state to set the incentive. This pressure is not unique to Oregon. Dave commented that Energy Trust sets a price based on above market cost analysis and cost information, then ratchets down. This year, the PGE residential incentive has dropped by $0.10 per watt three times. We are putting our downward pressure on the market, and, at the same time, continued to see costs come down.

Mike asked, how many projects are competitively bid? Do people usually get one bid, or do people shop it around? Jeni responded that we see a range, but the market is very competitive right now. We recommend that customers get at least two bids. We also do what we can to provide cost information to customers.

Jeni continued, noting that other next steps include continuing to do internal process improvements and external stakeholder engagement. These are the roles we see ourselves playing in soft cost reduction. Additional, the program seeks to understand challenges and market barriers that individual trade allies face, and will assess opportunities to address those barriers.

Fred asked for clarity on how this information will be used – is it to track on soft cost over time and measure progress? Jeni responded that the program was planning to use it as a benchmark, but given the wide range of costs we saw, it's going to be used for tracking and we hope to get better numbers in the future. Dave commented that a lot of the regional efforts are focused on structural changes to make the permitting, inspection, installation and incentive costs go down, but we found here that it's a pretty small piece of the puzzle, so what else can we do to make progress? It seems to be pointing to looking at the customer acquisition and other soft costs.

Customer acquisition costs appear lower than national target which would indicate it is easier to find customers in Oregon - a surprising conclusion considering what we hear from installers. Energy Trust does do some blanket advertising and is doing more solar-specific advertising recently but would not account for a large decrease in customer acquisition costs. More likely reasons are that Oregon installers receive a large percentage of leads from referrals than other

more costly methods or that installers are not fully attributing the cost of customer acquisition. After the survey was complete, we talked with installers, and they had some surprising opinions about what they felt should be counted; there was one installer who was adamant that sales commissions are not customer acquisition costs.

The last takeaway is that the program is considering the applicability of the national targets to Oregon, and discussing whether more Oregon-specific targets would be more appropriate.

Heather commented that the federal Investment Tax Credit is expected to sunset in 2016 and reduce from 30% to 10%, making it less of a tax equity market, more of a debt-based market. That should mean that the financing piece of the soft costs will decrease, which may cause overall costs to decrease as a result. Dave responded that the lower costs get, the less impact the removal of the tax credit will have, and the more resilient the Oregon industry will be.

3. Commercial and Industrial Qualitative Market Research Studies

Presented by Susan Jowaiszas

Susan J. will be presenting two studies that we completed for the commercial and industrial programs this year: a commercial-focused qualitative study, and an industrial-focused qualitative study.

- Commercial Qualitative Market Research Study

Background: The commercial programs are seeing more small projects, and are expecting more savings from trade ally-delivered tracks in the future. The goal of this study was to investigate the nature and structure of contractor and customer interactions - specifically, probing about the value of the trade ally network, and opportunities for Energy Trust to insert ourselves (in a productive way) to make more jobs happen.

Methodology: We completed one-on-one interviews with 20 contractors (a mix of lighting and non-lighting, and trade ally and non-trade ally contractors). We also talked with 41 customers. This was a matched design, so we tried to talk to several customers of the contractors that were interviewed. The timing of this research coincided with designing the My Business campaign, which included a trade ally co-operative marketing component; this research informed us of contractors' need and appetite for co-operative marketing, and provided insight into how to build that out.

Findings: An interesting finding was that of the nine non-allies we spoke with, six thought they were trade allies. Customers didn't report seeking out Energy Trust-affiliated trade allies, and don't ask contractors if they are a trade ally. They are more interested in whether their contractors have the information and forms needed to receive incentives. In their minds, anyone with an incentive form is a trade ally. Unsurprisingly, affiliated trade allies value their trade ally status more highly than contractors who believe they are (but actually are not) trade allies.

One of the most helpful elements of qualitative research is that we get to hear the words people use to describe the interaction and the meaning behind the words.

In general, customers reported looking for knowledgeable contractors. Many found contractors via word of mouth. There isn't as much aggressive marketing (as we see on the residential side)

– fewer contractors on the commercial side take advantage of co-operative marketing. Customers reported valuing contractors' reputation and experience over price.

Contractors who reported cold calling as part of their normal business model sell energy savings more than contractors going back to repeat customers or to referrals. Both customers and contractors reported that most projects happen for non-energy reasons – energy savings are a byproduct of something they needed.

We asked about financing, and contractors reported that there is low uptake and low interest in financing among customers. Both customers and contractors supported Energy Trust increasing sales, marketing, and outreach efforts. Not many customers interacted directly with Energy Trust staff, but of those who did, they were positive about those interactions.

When asked what would be helpful to drive more projects and savings, contractors mentioned technical support, marketing support, more incentives, incenting high-performing trade allies, offering different incentives for small businesses (which are harder to move), and not getting in the middle of their relationships with their customers. Customers mentioned working with business associations, marketing to customers directly, and showing the connection between Energy Trust and trade allies.

Conclusions and Next Steps: Through the My Business campaign, we increased the amount for which we reimburse trade allies for co-operative marketing. A small number of trade allies took us up on that, but a larger number did the standard co-operative marketing. The program will continue to promote sales training opportunities for trade allies, and is working to recruit active non-trade allies into the network. We are continuing to look for ways to make ally status more evident to customers and create outreach that promotes trade allies.

Alan asked if in our advertising, there are links that take customers directly to trade allies. Susan J. commented that we have the trade ally directory on Energy Trust's website, and, as part of My Business, the call to action for customers was not to call Energy Trust, but to call a trade ally. When looking at web traffic, once visitors landed on the site, most were going to the trade ally directory, which is what we wanted – to make the path to trade allies shorter. Fred asked about the paradox between customers saying they want to hear from Energy Trust, but don't have any time. Susan commented that this is a continual challenge. Dan asked if there was any "policing" of trade ally status – that is, checking to see if contractors who have listed themselves as trade allies on their website actually are trade allies. Sue commented that Energy Trust is not actively checking, but that the image files with the trade ally logos are not freely available, so it would be difficult for non-allies to procure.

- Small Manufacturer Qualitative Market Research

Background: Now, we turn to discussing research on industrial customers. This presentation is similar to the one that was given at the American Council for an Energy Efficient Economy (ACEEE)'s Summer Study on Energy Efficiency in Industry. About six months ago, there was a New York Times op-ed about "big data" and "small data." The article shared that many large companies, such as Facebook and Amazon, have anthropologists and sociologists studying customers in a qualitative fashion (that is, gathering "small data") to help inform them about what's missing in their quantitative, or "big," data. Qualitative data is helpful for marketing because it helps find out the "how," not just the "what."

In 2012, we did the first qualitative study focused on industrial customers, and we completed a second study this year. These being qualitative studies, we collected small data – listening to the words people use, how they describe their interactions, and how they describe their business. In addition to providing value to marketers, this information provides valuable information that can be used to design programs.

The 2012 study involved 37 customers of varying sizes – most of them were large, since the program was primarily serving large customers. The 2015 study was focused on small manufacturers. Interviews were conducted with 30 customers; 17 in the Portland Metro area and 13 outside of the Portland Metro area. The folks we talked with were mostly plant managers, owners, or operations managers.

For the 2012 study, the research question was, what about market segmentation? We wanted to see if decision-making about energy was similar among companies in the same vertical market sectors. We discovered that vertical market sectors were not significant. We did see that overall energy use, company size and health, organization culture, location, and whether or not the company was in light/heavy industry affected the extent to which they embraced energy efficiency.

The key research question for the 2015 study was, are smaller manufactures fundamentally different in how they approach energy management than larger manufacturers? The context for this is that the industrial program changed its delivery model to provide custom services to manufacturers of all sizes, not just larger ones. “Small” manufacturers were defined as having annual energy use of under 500,000 kWh. The research focused on customer awareness of Energy Trust, how their firm approaches energy, how they keep up on energy-related topics, how energy is prioritized in their business, engagement with vendors, and then how they like to be contacted.

Themes: One theme that emerged is mixed signals. Across the 30 customers, many wanted Energy Trust to come out to their site and give them ideas, but don’t want to be called or e-mailed. They appreciate their vendors, and have deep relationships with them, but want to hear about emerging technologies and Energy Trust’s program from us. They characterize themselves as conservative and careful, but also make decisions in a streamlined way.

With regards to the key research question (are big and small manufactures different in the way they approach energy management?) we found that there were not dramatic differences in manufacturers’ approaches, although the way they get in there and make it happen is different, and scaled to size of their company and their ranges of responsibility. Overall, energy is not a big thing they worry about. The big thing they worry about is workforce, and this was consistent across companies of all sizes. Manufacturers were consistently interested in incentives and looking at payback.

The customers we spoke with were driven to improve their businesses, had pride in proprietary processes, and had a desire to keep up and have their businesses grow and thrive. They reported not having enough time to be up on everything, and wanted help in sorting things out. When thinking about energy, the 30 customers interviewed fell into one of four categories: high focus on energy, proactive, opportunistic, and low/no. Only a few were in the high category. Seven were categorized as proactive, nine were opportunistic, and ten were in the low/no category. In terms of keeping up to date on energy, they look to their vendors and Energy Trust.

These customers also tend to be entrepreneurs – they are survivors, and have an appetite for risk. In the 2012 study, we heard that folks only proposed energy projects they knew would be approved. These smaller manufacturers make decisions based on similar factors to larger manufacturers, but are much less formal. Mike asked if they look at payback. Susan said that yes, this was consistent across the large and small manufactures. Heather asked about how long of a payback was considered "good." Susan responded that in general, a three-year payback; some large businesses had shorter paybacks of 1.5 years.

Another theme that came out of this research is that money talks; incentives and payback matter. Customers are looking to Energy Trust and vendors for this information.

Customers reported that they felt they had done everything they can do. To address this, the program is offering enhanced scoping studies to identify savings opportunities, and is continuing to develop case studies to show other businesses doing energy projects.

Vendors are important to these customers. They have been their primary point of contact before the program started offering custom services to manufacturers of all sizes. They have long-standing relationships with vendors, and count on them to be familiar with incentives and look to them for deep knowledge of technology. Vendors can only provide ideas on what they sell, and since we recently expanded the program design to include this group of small manufacturers, there's a communication opportunity to let people know about the services and clarify the difference between program delivery contractors (PDCs) and vendors.

When we talked to larger customers in 2012, many said we should focus on telling other people about this program. This is likely due to how they interact with the program, which is mostly on a one-on-one basis. Smaller customers assumed everybody knew about Energy Trust because they heard about Energy Trust from vendors. Shelly asked if this might be due to small customers being more collaborative than the bigger guys. Susan responded that this is certainly possible.

What did we learn? Overall, the program design is sound, and the existing communications and marketing channels are working. Opportunities for improvement exist; the program is continuing to evolve the quarterly industrial newsletter and we are looking for ways to encourage business-oriented trade allies to do marketing. The program is also mining data we have to help us find key intervals at which businesses are likely making decisions (e.g., seasonal windows, or capital budget periods).

Alan asked, where do utility reps fit in? Susan commented that these customers most likely do not have a utility account manager. However, we did not ask this specifically.

Andy H. commented on the mismatch between companies wanting assistance but not having the time – is there anything we can do to help them self-service? Susan responded that the program worked to redesign the industrial section of the website – this is where smaller customers go for information. We tried to make the prescriptive incentive information (for lighting, irrigation, and compressed air) front and center. We look forward to figuring out how to build the website to help smaller customers.

4. Short Take: Efficiency Sales Training

Presented by Erika Kociolek

Phil is out right now so Erika is presenting in his stead. This presentation is just a quick take on a training that was held in February 2014.

Background: Energy Trust contracted with Bobbi Tannenbaum of Btan Consulting for this evaluation project. The study period was February 2014 to April 2015. As a bit of background, Energy Trust sponsored the Efficiency Sales Professional™ (ESP) training, which was led by Mark Jewell. This five-day training had 64 participants. A snow storm truncated two of the training days, so that some people could only be there for three of the days. The trainer tried to make up some lost time with online content, but unfortunately some people could not do that.

Participants included contractors, vendors, and engineers working for companies that provide energy products or services (50%), staff providing energy program delivery (20%) and utility, Energy Trust, or Energy Trust PMC staff (30%).

Evaluation Methods: Basically there were three parts to the study: a survey immediately after the training, a survey three months after the training, and in-depth interviews one year after the training.

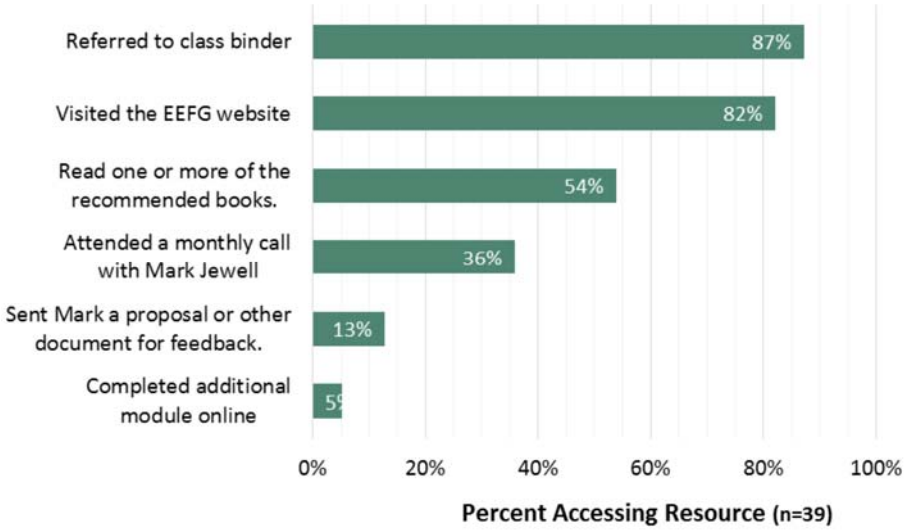
- A survey was fielded with 59 participants immediately after the training to assess participant satisfaction with the training and intentions to make changes as a result of the training. This part was trying to get quick feedback, and capture what participants wanted to do right after the training.
- Three months after the training, a web survey was fielded with 39 participants to identify participants' on-going learning activities, changes implemented, and likely future changes, as well as effects on sales.
- Finally, one year after the training, in-depth interviews were conducted with 19 participants to identify and potentially quantify the impacts of the training on the sales of energy efficiency equipment and services, one year after the workshop.

The overall goal was to find out what participants got out of the training, what they did after the training, and what was the impact on sales (if any).

Survey Findings: Over two-thirds of the respondents reported that the training surpassed their expectations for quality, content, applicability, and amount of new information. Overall, people thought the training was really good. All of the respondents rated the workshop either a 4 or a 5 out of 5. Additionally, 91% of respondents said that they would likely modify their presentations made to customers and promotional materials as a result of the training.

Three-Month Follow-Up Survey: All respondents said they accessed at least one of the provided resources post-training. The graph below shows which resources were accessed after the training.

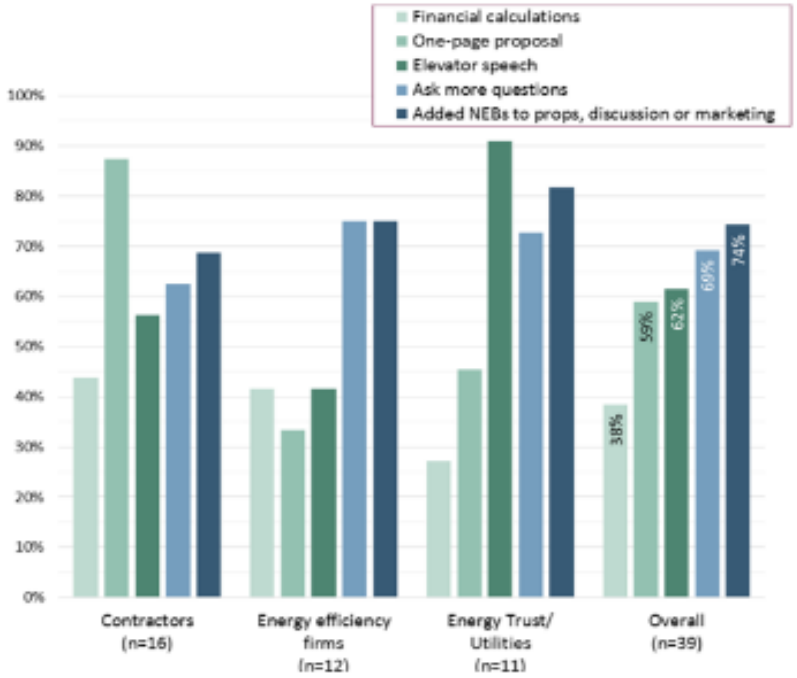
Resources access post-training



In particular, 87% referred to their class binder, and 82% visited the training organization's website. Ninety-two percent reported subscribing to some sort of content (e.g., e-mails, blog updates, app).

As shown in the graph below, nearly all (97%) of the respondents made some type of change to their marketing or sales approach as a result of the training. Most asked customers more questions, and added or highlighted non-energy benefits (NEBs) in their discussions, proposals, or marketing materials.

Changes made to marketing and sales approach post-training



JP asked what the difference is between a contractor and energy efficiency firm. Erika said she wasn't sure, but would double-check. [Follow-Up: Contractors are defined as market providers of energy efficiency services and products, while energy efficiency firms are Energy Trust contractors and energy-efficiency firms (such as PMCs or PDCs).]

One of the key questions was, what's the impact of the training on sales? We asked respondents if they thought the training had positive impacts on their sales. Most respondents (72%) reported seeing positive effects on their customers' willingness to purchase energy-efficiency equipment or services.

In-Depth Interviews: The interviews sought to understand the changes participants actually made and what barriers they faced one year after the training. Most respondents reported making changes to their sales approach as a result of the training, including developing a one-page proposal, including financial metrics, listening more to customers, doing more preparation for customer meetings, and targeting customers in new ways.

Some respondents reported that their organization's sales approach has changed as a result of the training. The most common organizational change is the adoption of the one-page proposal.

Respondents identified several organizational barriers to making changes, including requirements from Energy Trust and others about templates, lacking authority to make changes, and lack of time.

Most respondents reported higher sales volume over the past year, but were hesitant to attribute this fully to the sales training. All respondents thought very highly of the training and found Mark Jewell to be an excellent instructor. Almost everyone said that they would send or would recommend sending other people in their organization to the training.

One suggestion for future trainings was to reduce the amount of content and shorten the training. Some respondents thought the training length (five days) could be reduced. Another suggestion was to market and keep training targeted at specific sectors and types of attendees.

Recommendations: The evaluator had several recommendations. First, Energy Trust should continue to support sales training and make sales trainings shorter and more focused (e.g., have sector- and role-specific trainings). Also, it would be helpful to align Energy Trust program operations and templates with best practices identified in the training. Since the trainer was not local, the evaluator recommended developing local resources to deliver effective sales training. Finally, the evaluator recommended working with trainers in advance of classes to assure that the curriculum will meet participant needs.

Peter asked what the difference is between the last recommendation and the second one. Erika responded that from her perspective, the second recommendation is around creating content for certain generic groups of people, and the last one is suggesting the trainer work to tailor training to what individuals in a given training course want to cover.

Kim commented that the attendees from the industrial sector were not as interested in the content as those from commercial. From industrial's perspective, we need to know more about the intended audience for the training, because we make a lot of decisions about whether or not to send people to this training. For example, is this just a training for commercial real estate?

Erika asked for clarification about Kim's question, and Kim asked, why do you think that residential and industrial participants are not finding it useful? This was mentioned very briefly in the evaluation report. Is this something that is just geared towards commercial? If it is a complex financial sector approach that is not applicable to my sector, then I need to know that.

Sam commented that Mark Jewell has extensive experience in the commercial sector, and that is his background, so it's not surprising that the training was focused on commercial.

Peter asked for more details about the recommendation to align program operations and templates with best practices identified in the training. Erika replied that the survey responses were not specific and unfortunately we just don't have much in the way of specifics from survey respondents and from interviewees.

Kim commented it seemed that the most important aspect was the sales training component. This is something that is very replicable and it seemed that attendees had not had that type of training before. It was surprising because having been in both the commercial and industrial sectors, it's an important aspect of the work in those sectors.

Sam added that this was his impression from having attended in person. There were tradespeople there and they came away feeling better about sales. Alan added that from just reading the report it seemed like this was a general sales training, and that some of the attendees were people who might be in sales but not know it.

Andy H. asked if there was any specific recommendation to align Energy Trust's processes or operations with the training. Erika reiterated that it was not clear from the surveys what people meant by "program templates and documents" – this could mean a lot of different things. Oliver commented that staff from some of the Program Management Contractors attended the training

and took the lessons learned back to their daily jobs, but as of right now, there have been no changes to actual program materials or workbooks.

Kim commented that the question of best practices is a bit loose. We just heard about the market research for small manufacturers and how it is distinctly different. So the best practices will be different based on sector. The small manufacturers care mostly about the simple payback. We don't have their discount rate and we don't pretend to because they just care about that simple figure. We can take what we have learned from our market research and combine with what Mark Jewell is recommending. But it is often that people make decisions based on much simpler information than we think they do. Erika mentioned that this gets back to the idea of having more targeted trainings, which was one of the evaluator's recommendations.

Mike added that some of the recommendations may be harder to do in practice. For example, coming up with a neat one-pager with all of the relevant information on it requires more prep-time because now you can't rely on a ten page proposal while making the sale.

Wrap-Up & Next Steps

We are thinking about scheduling another evaluation committee meeting in November. Alan and several others are not available the first week in November; we will send out a Doodle poll to see what days work the best for folks.

Alan commented that it was really helpful to hear about three related studies today. It would be nice to do that more often, as it really helps.

September 2, 2015

MEMO

FROM: Dan Rubado, Evaluation Project Manager, Energy Trust of Oregon;
Phil Degens, Evaluation Manager, Energy Trust of Oregon

TO: Marshall Johnson, Sr. Program Manager, Energy Trust of Oregon;
Paul Sklar, Planning Engineer, Energy Trust of Oregon;
Fred Gordon, Director of Planning & Evaluation, Energy Trust of Oregon

CC: Existing Homes program, CLEAResult

SUBJECT: Follow-up Billing Analysis for the Nest Thermostat Heat Pump Control Pilot

BACKGROUND

In 2013, Energy Trust's Existing Homes program implemented a pilot to test the Nest thermostat as an advanced heat pump control device in single family homes with central, air source heat pumps with electric resistance backup. This pilot was evaluated by Apex Analytics in 2014. The resulting electricity savings were established through billing analysis conducted by Energy Trust and reviewed by Apex, using a partial year of follow-up data. The plan at that time was to provide a preliminary savings estimate for Nest thermostats in heat pump homes and return to the analysis after a full year of data was available to establish a more definitive savings estimate. The pilot ended with 177 successful Nest thermostat installations and a comparison group of 299 similar heat pump homes. The 2014 analysis estimated that the annual electric savings attributable to Nest were 781 kWh (90% CI: 316, 1246), or 4.7% of annual electric use and roughly 12% of the average heating load. The 2014 evaluation report can be found on Energy Trust's website at: http://energytrust.org/library/reports/Nest_Pilot_Study_Evaluation_wSR.pdf. Once a full year of post-installation electric use data were available, we went back and re-analyzed the annual electric savings for pilot homes.

METHODS

Housing and occupant characteristics for pilot participant and comparison homes were retrieved from Energy Trust's project tracking database and from ancillary data collected during the pilot and evaluation project. Monthly electric utility billing data for each home were retrieved from Energy Trust's utility database. Homes that could not be matched to utility data were dropped from the analysis. We computed the raw daily average electric usage for each billing period for each home. Daily usage was the primary unit for the analysis. Weather data from nearby weather stations were retrieved from the

National Climatic Data Center. Daily average temperature was used to calculate heating degree-days (HDDs) and cooling degree-days (CDDs) for each billing period for each home. The HDD and CDD variables were computed for reference temperatures for every degree ranging from 45 to 85 °F. The HDD and CDD values were then divided by the number of days in each billing period to obtain average daily HDD and CDD variables, which could be directly compared with the average daily electric use.

The pre-pilot period of the study was defined as June 2012 through July 2013. Thermostat installations were conducted from August through December 2013, so this period was excluded from the analysis. The post-installation period was defined as January 2014 through February 2015. Monthly electric use readings from each study period were identified and flagged in the analysis dataset.

Using similar methods to the 2014 analysis, we re-ran our analysis of the pilot homes to determine the energy savings attributable to the Nest thermostat in heat pump homes. Participant and comparison homes were screened for potential issues with their billing data, outliers in annual electric usage, large swings in electric usage, solar PV systems, and other Energy Trust-funded efficiency measures. The sample attrition is described in more detail in the results section. We used two analysis methods to compute electricity savings. We first used a very similar multilevel model specification to the 2014 analysis, with the addition of cooling terms. Then, we used a PRISM-like analysis to weather normalize annual usage and computed savings as the difference-in-differences.

Multilevel Model

The first approach was to compare the pre-to-post change in electric use between the study groups using the multilevel mixed effects model. Average daily electric use was modeled as a function of average daily HDDs and CDDs, a study period (pre- vs. post-installation) flag, study group (participant vs. comparison) flag, home square footage, and year built. Interaction terms between the study period flag, study group flag, and HDD and CDD variables were added to model the impact of the Nest thermostat, depending on weather conditions. Additional terms were added to model the relationship between HDDs and CDDs and electric use separately for each home in the sample, which makes this method analogous to the PRISM method. The advantages to this type of model are that it accounts for repeated observations over time within each home and simultaneously computes the effect and variance of the study group and study period. The primary drawback is that it applies the same HDD and CDD reference temperatures to all homes. The following formula describes the resulting linear mixed effects model:

$$Usage_{ij} = \beta_0 + \beta_1 HDD_{ij} + \beta_2 CDD_{ij} + \beta_3 Group_{ij} + \beta_4 Post_{ij} + \beta_5 SqFt_{ij} + \beta_6 YearBuilt_{ij} + \beta_7 Group_{ij} * Post_{ij} + \beta_8 Group_{ij} * HDD_{ij} + \beta_9 Post_{ij} * HDD_{ij} + \beta_{10} Group_{ij} * Post_{ij} * HDD_{ij} + \beta_{11} Group_{ij} * CDD_{ij} + \beta_{12} Post_{ij} * CDD_{ij} + \beta_{13} Group_{ij} * Post_{ij} * CDD_{ij} + u_{0i} + u_{1i} HDD_{ij} + u_{2i} CDD_{ij} + \epsilon_{ij}$$

Where:

$Usage_{ij}$ = the average daily electric usage for home i during billing month j ,

β = the coefficients for each variable in the model,

β_0 = the fixed intercept for all homes,

HDD_{ij} = Heating Degree-Days for home *i* during month *j*,
CDD_{ij} = Cooling Degree-Days for home *i* during month *j*,
$Group_{ij}$ $\{0,1\}$ = dummy variable where 1 indicates that home *i* is part of the participant study group, which is static across all *j* billing months,
$Post_{ij}$ $\{0,1\}$ = dummy variable where 1 indicates that home *i* during billing month *j* is in the post-installation study period,
$SqFt_{ij}$ = square footage of home *i*, which is static across all *j* billing months,
$YearBuilt_{ij}$ = year of construction of home *i*, which is static across all *j* billing months,
u_{0i} = random intercept for home *i* which is independent from ϵ_{ij},
u_{1i} = random slope coefficient of HDD for home *i* which is independent from ϵ_{ij},
u_{2i} = random slope coefficient of CDD for home *i* which is independent from ϵ_{ij}, and,
ϵ_{ij} = model error for home *i* during billing month *j*.

As noted above, HDD and CDD variables with different reference temperatures were tested in the model using all possible combinations from 45 to 85°F. The reference temperatures that resulted in the model with the best fit was selected as the final model, based on the fit statistics (AIC and BIC). A HDD reference temperature of 55°F and CDD reference temperature of 70 °F proved to have the best fit for this sample of homes.

The model provided three key parameter estimates for computing energy savings: the interaction coefficients β_7, β_{10} and β_{13}. Together, these coefficients describe the difference between participant and comparison group homes change in pre- to post-installation average daily usage for a given number of HDDs and CDDs. The model factors out the influence of any differences in square footage or year built between homes on the interaction coefficients. So, the sum of these coefficients is the average daily electric savings. A linear combination of these three coefficients was computed to estimate the weather normalized annual electric savings in kWh per home, as described below. We also computed the pre-pilot average annual electric use and heating usage for the treatment group from the parameter estimates in kWh per home, so that we could calculate energy savings as a percent of annual electric and annual heating loads.

Average Annual Savings = $365 * \beta_7 + LRHDD * \beta_{10} + LRCDD * \beta_{13}$
Average Annual Usage = $365 * (\beta_0 + \beta_3 + AvgSqFt * \beta_5 + AvgYearBuilt * \beta_6) + LRHDD * (\beta_1 + \beta_8) + LRCDD * (\beta_2 + \beta_{11})$
Average Annual Heating Usage = $LRHDD * (\beta_1 + \beta_8)$
Average Annual Cooling Usage = $LRCDD * (\beta_2 + \beta_{11})$

Where:
AvgSqFt = average square feet across all homes in the sample,
AvgYearBuilt = average year of construction across all homes in the sample,
LRHDD = long-run average annual HDDs for each weather station, averaged across the homes in the sample, derived from the Typical Meteorological Year 3 (TMY3) dataset, and,

LRCDD = long-run average annual CDDs for each weather station, averaged across the homes in the sample.

PRISM-like Analysis

Next, we used a PRISM-like (PRInceton Score-keeping Method[1]) weather normalized annual usage, differences-in-differences approach. We fitted separate weather regression models for each home for both the pre- and post-installation study periods, using HDD and CDD variables. All combinations of HDD and CDD reference temperatures were run for all home-level regression models, from 45° to 85°F. The model results with the highest R-squared for each home and study period were selected to calculate the weather normalized annual usage, using the TMY3 long-run HDDs and CDDs. However, if the model R-squared was less than 0.5 or the HDD coefficient was negative, then we assumed the home was insensitive to weather and used the raw annual usage for the analysis. The primary advantage of this method is that the models are specified for each individual home so the reference temperatures that best fit the data are used. Unfortunately, since the weather normalization is not done simultaneously with the difference-in-differences computation, the error terms are not carried through from the regression models to the savings estimate. Thus, this method tends to understate the statistical significance of the results. The model specifications for weather normalization were:

$$\text{Average daily usage}_i = \beta_0 + \beta_1 HDD_i(\tau_h) + \beta_2 CDD_i(\tau_c) + \varepsilon_i$$
$$\text{Normalized annual usage}_i = 365*\beta_0 + \beta_1 LRHDD_i(\tau_h) + \beta_2 LRCDD_i(\tau_c)$$
$$\text{Normalized heating usage}_i = \beta_1 LRHDD_i(\tau_h)$$

Where:
i = home indicator,
β_0 = Estimated average daily "base load" usage for home i,
β_1 = Model predicted heating slope,
$HDD_i(\tau_h)$ = Average daily HDDs at reference temperature τ_h,
β_2 = Model predicted cooling slope,
$CDD_i(\tau_c)$ = Average daily CDDs at reference temperature τ_c,
ε_i = Unexplained error term,
$LRHDD_i(\tau_h)$ = Long-run average annual HDDs at reference temperature τ_h, and,
$LRCDD_i(\tau_c)$= Long-run average annual CDDs at reference temperature τ_c.

Next, the difference was taken between the pre- and post-pilot normalized annual electric usage for each home. To determine electric savings while controlling for square footage and year built, we created another regression model where study group predicted the delta in annual usage. The coefficient of the study group variable was the annual electric savings.

[1] Fels, M. (1986). PRISM: An Introduction. Energy and Buildings, 9, 5-18. Retrieved from http://www.marean.mycpanel.princeton.edu/~marean/images/prism_intro.pdf

RESULTS

Pilot homes were removed from the analysis sample for a variety of reasons, including: not matching to billing data, insufficient billing data for analysis (less than six months of billing records in either study period), missing or invalid information on square footage or year built, known solar PV systems funded by Energy Trust, other Energy Trust-funded efficiency measures, outliers in annual electric use (<5,000 kWh/year or >40,000 kWh/year), homes with large swings in annual electric use (more than 100% increase or 50% decrease in kWh/year), and participant homes where Nest thermostats were known to have been uninstalled mid-pilot. After the attrition steps, 60% of participants homes and 67% of comparison homes remained for analysis. Compared to the 2014 evaluation, there was some additional attrition in this analysis. **Table 1** summarizes the sample attrition.

Table 1: Attrition analysis for Nest heat pump control pilot participant and comparison homes.

	Participant Group				Comparison Group			
Phase of Analysis	N Removed	N Homes	% Homes	2012 kWh Usage	N Removed	N Homes	% Homes	2012 kWh Usage
All Nest pilot homes	0	177	100%	--	0	299	100%	--
Homes matched to billing data	-13	164	93%	17,315	-40	259	87%	16,583
Homes removed with solar PV	-5	159	90%	17,379	-3	256	86%	16,677
Homes with sufficient valid billing data	-8	151	85%	17,557	-24	232	78%	16,477
Homes removed with Energy Trust projects	-35	116	66%	17,362	-20	212	71%	16,290
Homes with valid sq.ft. and year built	-5	111	63%	17,316	-5	207	69%	16,294
Outliers removed with low annual usage	-1	110	62%	17,476	-1	206	69%	16,373
Outliers removed with high annual usage	-1	109	62%	17,246	-4	202	68%	15,642
Outliers removed with large changes in annual usage	0	109	62%	17,246	-3	199	67%	15,653
Homes removed where Nest uninstalled	-3	106	60%	17,150	0	199	67%	15,653
Total homes available for analysis		**106**	**60%**	**17,150**		**199**	**67%**	**15,653**

The basic characteristics of the pilot homes in the final sample are summarized in **Table 2** and the geographic distribution of homes is summarize in **Table 3**. The participant and comparison group homes are clearly very similar on all of the dimensions analyzed here. The mean square footage and year of

construction are nearly identical between the groups. The percent of site built versus manufactured homes and the geographic distribution were also similar for participant and comparison homes.

Table 2: Summary of Nest pilot home characteristics.

Group	N	Mean Square Footage	Mean Year Built	% Site Built
Participants	106	1,681	1978	80%
Comparison	199	1,666	1978	74%
Total	305	1,672	1978	76%

Table 3: Geographic distribution of Nest pilot homes.

	Portland Metro		Willamette Valley		Southern Oregon	
Group	N	% of Homes	N	% of Homes	N	% of Homes
Participants	104	59%	28	16%	45	25%
Comparison	150	50%	48	16%	101	34%
Total	**254**	**53%**	**76**	**16%**	**146**	**31%**

Multilevel Model

We specified multilevel mixed effects models with all combinations of HDD and CDD reference temperatures, with CDD reference temperatures greater than or equal to HDD, between 45°F and 80°F. The model we selected with the best fit had the same reference temperatures as in the 2014 analysis: 55°F for HDD and 70°F for CDD.

The annual electric savings estimate was 645 kWh (**Table 4**), or 3.8% of annual electric use and 14% of heating usage (**Table 5**). This savings estimate is slightly but not significantly lower than the preliminary savings estimate calculated in the 2014 analysis of 781 kWh (which was itself lower than the original savings estimate for heat pump advanced controls), yielding a realization rate of 83%. The savings percentages were based on the participant group's pre-pilot normalized annual electric use of 16,935 kWh and annual heating usage of 4,542 kWh (27% of annual usage), as computed from the model coefficients. We also calculated that normalized annual cooling usage in pilot homes from the model coefficients and found that it was very low, on average, at an estimated 200 kWh per year. As a result, there were no detectable cooling savings.

Table 4: Multilevel model annual electric savings for the Nest thermostat in heat pump homes.

Annual kWh Savings	Std. Err.	90% Conf. Interval	p-value
645	152	376, 914	<0.001*

* Highly statistically significant at the 90% confidence level.

Table 5: Multilevel model annual electric savings for the Nest thermostat in heat pump homes, as percentages of total electric use and heating usage.

% Savings	% Heating Savings	Annual kWh Usage	Annual Heating kWh Usage	% Heating Usage
3.8%	14%	16,935	4,542	27%

PRISM-like Analysis

The annual electric savings estimate using the PRISM-like method was 544 kWh (**Table 6**), or 3.2% of annual electric use and 11% of heating usage (**Table 7**). **Figure 1** displays the average pre- and post-pilot weather normalized annual electric use for each study group to illustrate how the savings were computed as the difference-in-differences. The savings were substantially lower than those estimated from the 2014 analysis, yielding a realization rate of 70%. As noted above, the error of the savings estimate is overstated and the statistical significance is understated due to the two-stage nature of the method. The savings percentages were based on the participant group's pre-pilot normalized annual electric use of 16,876 kWh and heating usage of 5,127 kWh (30% of annual usage), as computed from the model coefficients. These usage estimates are similar to the usage estimates from the multilevel model. The average best fit HDD reference temperatures used for the pre- and post-installation regression models were, 56 and 55°F, respectively, essentially the same as the multilevel model. The average CDD reference temperatures used were 68 and 67°F, respectively, close to the 70°F temperature used in the multilevel model.

Table 6: PRISM-like analysis annual electric savings for the Nest thermostat in heat pump homes.

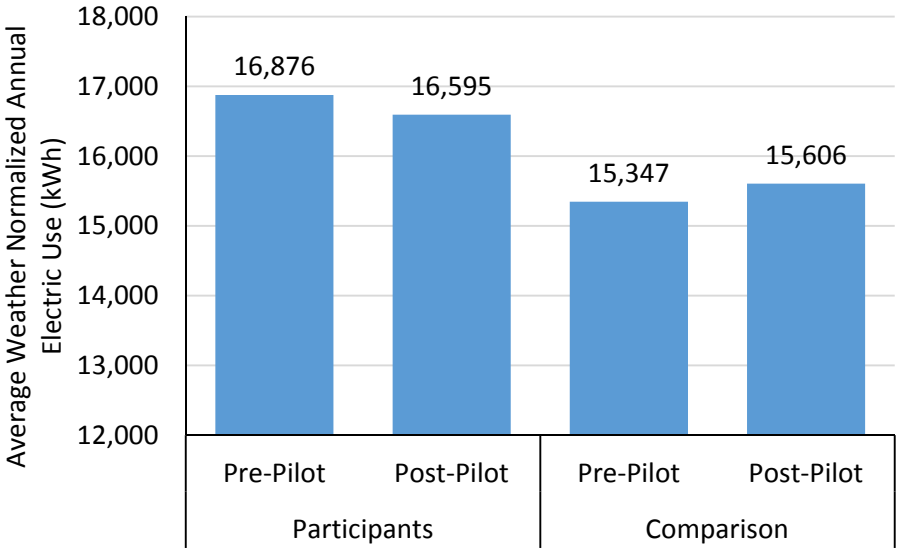
Annual kWh Savings	Std. Err.	90% Conf. Interval	p-value
544	384	-91, 1178	0.158*

* Borderline statistically significant at the 90% confidence level. However, this method tends to understate statistical significance.

Table 7: PRISM-like analysis annual electric savings for the Nest thermostat in heat pump homes, as percentages of total electric use and heating usage.

% Savings	% Heating Savings	Annual kWh Usage	Annual Heating kWh Usage	% Heating Usage
3.2%	11%	16,876	5,127	30%

Figure 1: Average normalized annual electric use for participant and comparison homes in the pre- and post-pilot study periods.



We created graphs of the changes in weather normalized annual usage from the pre-to-post installation periods for individual homes to illustrate the distributions used to compute the average savings. **Figure 2** shows the distribution of changes in usage with the kernel density. **Figure 3** shows a scatter plot of the changes in usage as a function of the pre-period annual usage. The large amount of scatter and substantial overlap between the distributions of the participant and comparison homes demonstrates that there is a large amount of variability in the results for individual homes. However, there were significant electric savings on average.

Figure 2: Distribution of changes in normalized annual electric use per dwelling unit, by study group.

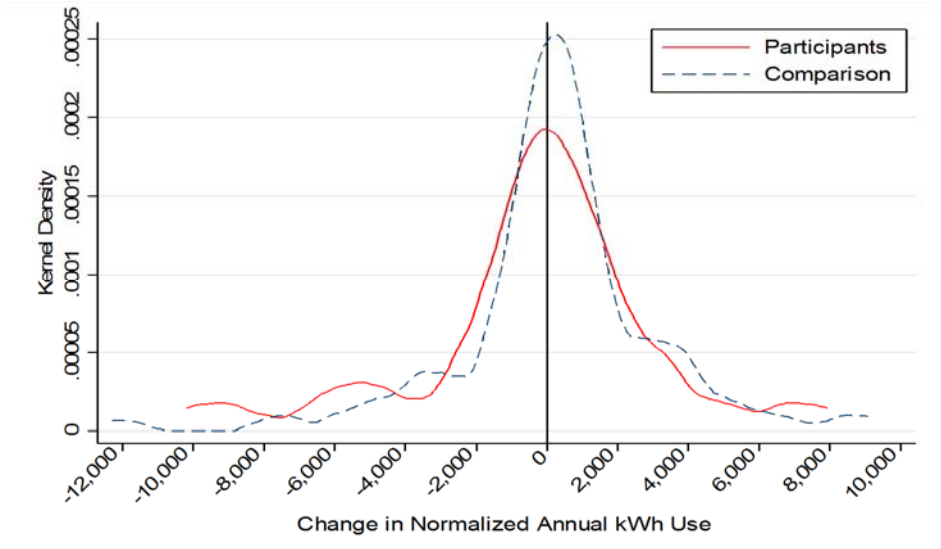
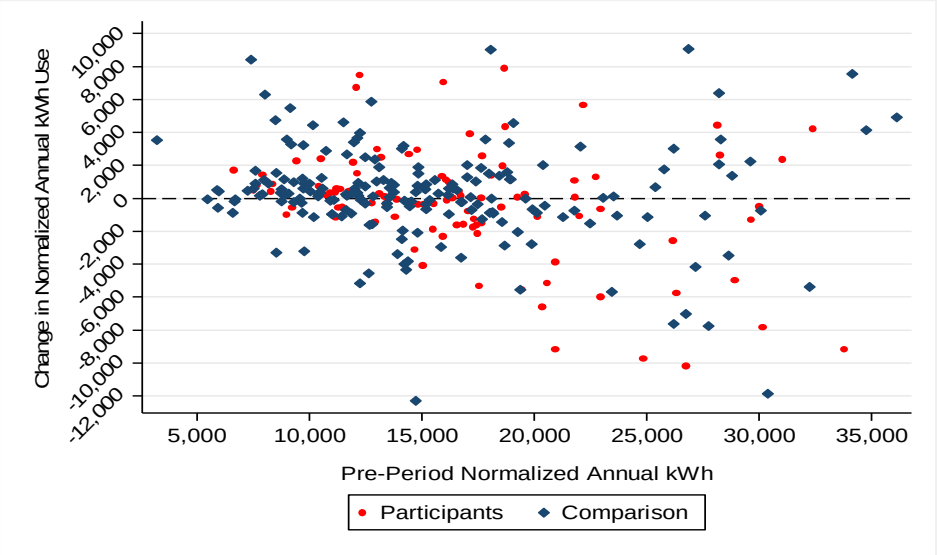


Figure 3: Scatterplot of changes in normalized annual electric use per dwelling unit versus pre-installation normalized annual electric use, by study group.



CONCLUSIONS & RECOMMENDATIONS

This billing analysis is a follow-up to Energy Trust's preliminary savings results for the Nest thermostat in homes with central heat pump systems, presented in a 2014 evaluation report. Using a full year of post-pilot electricity billing data, we were able to re-analyze pilot homes to update the electric savings estimate. Unfortunately, after a year elapsed, there was 40% attrition of Nest participant homes (compared to 36% in the original analysis), reducing the final sample for the analysis. Most of these homes were removed from the analysis because they received Energy Trust incentives for additional electric efficiency measures in the follow-up period. Since more participant homes were removed than comparison homes (40% versus 33%), this source of attrition could bias the results. The differential attrition combined with high variability in the results and a participant group that may not represent typical smart thermostat customers means that the generalizability of this study may be limited. As a result, the savings estimate may be subject to additional changes in the future, given additional participants and data to analyze. Ideally, to nail down the electric savings for Nest thermostats in heat pump homes, we would need a larger sample of participants who purchased their thermostats through typical market channels. However, this pilot provides the only data we currently have to assess savings for the Nest thermostat in heat pump homes.

The estimated annual electric savings for the Nest thermostat differed somewhat, depending on the analysis method used. The multilevel model approach yielded a savings estimate of 645 kWh per year and the PRISM-like approach resulted in an estimate of 544 kWh per year. These two approaches were equally valid and the model outputs and results are similar. We believe the average of the two results provides a reasonable estimate of savings for Nest. Thus, the average annual electric savings due to the Nest thermostat in heat pump homes was 594 kWh per year, which is equivalent to 3.5% of annual electric use and 12% of heating usage (**Table 8**). This represents a 24% decrease from the preliminary savings estimate of 781 kWh per year from the 2014 analysis (realization rate of 76%), although the

difference was not statistically significant. The updated savings estimate is based on a full year of post-installation data and should replace the preliminary estimate as the electric savings claimed by Energy Trust for Nest thermostats installed in heat pump homes.

Table 8: Final annual electric savings for the Nest thermostat in heat pump homes.

Annual kWh Savings	% Savings	% Heating Savings
594	3.5%	12%

June 10, 2015

From: Philippus Willems, Ryan Kroll

To: Dan Rubado, Evaluation Project Manager, Energy Trust of Oregon

Re: Review of Commercial SEM Savings Methods

The purpose of this memo is to present the results of the PWP/Michaels Energy team's review of methods used to calculate and report savings from the Commercial SEM program and develop recommendation to help standardize that process.

Background

The evaluation team completed interviews with Energy Trust program staff as well as with both of the program delivery contractors (PDCs) currently delivering Commercial Strategic Energy Management (SEM) – Strategic Energy Group (SEG) and CLEAResult (formerly Triple Point Energy). From discussions with both groups, we obtained feedback regarding current methods, potential changes, and the impact of recommendations made in the second SEM evaluation report, which was published in December 2014 and can be found at:
http://assets.energytrust.org/api/assets/reports/141202_SEMReport.pdf

There is a solid basis for using regression to estimate savings using billing data, and the technique is called out in International Performance measurement and Verification Protocol (IPMVP) as Option C: Whole Building Analysis. However, IPMVP notes that for Option C "billing analysis is appropriate when:

- Savings are above noise—that is, the estimated energy savings are greater than at least 10% to 20% of the monthly utility bill being analyzed.
- There is a high degree of interaction between multiple measures at a single site.
- The energy conservation measure (ECM) improves or replaces the building energy management or control system.
- The ECM involves improvements to the building shell or other measures that primarily affect the building load (e.g., thermal insulation, low-e windows).
- The measurement of individual component savings is not relevant.
- Other approaches are too expensive."

While SEM meets several of the above criteria, expected savings from SEM fall far below the 10-20% threshold noted, which suggests that caveats in applying regression analysis must be scrupulously adhered to, with any deviations thoroughly documented. That fact underlies several of our recommendations for standardizing the application of this approach to Commercial SEM. In addition, it is important for the analysis technique to be applied as transparently as possible, so that participants, Energy Trust staff, and program evaluators can readily see how savings were calculated and what assumptions were made.

For this research, we examined the following aspects of the savings estimation and reporting process:

- Selection of the baseline period

- Specification of the model
- Selection of measurement period and extrapolation of results
- Linking of results to specific SEM actions
- Reporting of savings to participants and to Energy Trust

Findings are presented below. It should be noted that recommended approaches include some that are current practice in some cases; however, the goal of the recommendations is to standardize impact assessment methods so that best practices are used, with any deviations thoroughly explained and documented.

Baseline period

Recommendations:

1. The baseline period should cover at least 12 months immediately before participation
2. If a different baseline period is selected, the reasons should be thoroughly documented

Discussion:

The baseline period is meant to capture the relationship between weather and usage under standard operating procedures before a customer becomes involved in SEM. Ideally, this would cover about 24 months of billing data that reflect a time period when there were relatively few external factors affecting usage, such as equipment retrofits or significant changes in building use or occupancy. Unfortunately, the more months of data are included, the more likely the influence of external factors. Even if more than 12 months of data are available, they should not be used unless there are at least 24 months, to ensure that no time period is overrepresented.

We recommend that the baseline period for the savings analysis cover either the 12 or 24 months immediately preceding participation, with participation defined as the time when initial actions to assess and address savings opportunities are undertaken. In other words, merely signing the paperwork to enroll in the program would not mean that practice would be expected to change and savings observed, so if a participant enrolls in October and attends a kickoff event in November, both October and November could reasonably be considered part of the baseline period. This should mean a greater likelihood that the "participation" billing data will actually reflect program savings.

There have been instances where a PDC chose to use a period other than the 12 months immediately preceding participation because another 12 month period appeared to provide a clearer relationship between weather and energy usage. However, we believe that any exclusion of a period of time within what would normally be the baseline period requires a detailed explanation. If several months of data are not reflective of true "baseline" usage, that should be called out and explained. If a regression using the 12 months prior to participation yields inferior results to those for an alternate baseline period, both sets of results should be presented; e.g., the 12 months prior to participation could not be made to yield better than an R^2 of 0.65 and t = 1.9, while an alternate baseline ending 6 months earlier yielded a regression with an R^2 of 0.9 and t = 2.15. Simply stating that the alternate baseline provides a "better" fit is not sufficient.

In addition, if there are reasons why the 12 months immediately prior to participation are not representative of typical operations, those reasons (i.e., the anomalies in operations) must be discussed in detail to show why the post-participation period would not also be affected.

It should be noted that while a high R^2 is desirable as an indication that the model strongly reflects the operation of the building, the selection of the baseline period based on the R^2 value can result in periods being selected that are consistent, but may not be representative of the operation immediately prior to the SEM actions.

In some cases, deviation from the consistent operation may be an indicator of changes to variables not included in the analysis that need to be incorporated to increase accuracy. For example, a building at 50% occupancy may have very predictable energy usage based on heating degree days and cooling degree days only. However, if the occupancy level increases or decreases, the energy consumption predicted by the original analysis will no longer be correct and will not be the correct basis of comparison for going forward.

Specification of the model

Recommendations:

1. Use the minimum number of variables needed to obtain a good fit, including variables that reflect the influence of heating and cooling, as well as other relevant variables (e.g., occupancy, schedule) that vary over the baseline period.
2. Use analytical tools such as stepwise regression or Lasso to ensure that the most powerful explanatory variables are entered first and error is minimized.
3. Variables should be defined so that the causal relationship between the independent (weather and other) variables and energy usage is clear to the participant and can be used to calculate savings in the future
4. Pooled models and standardized building type models are not recommended at this time.
5. Interval data should be used only for customers with the resources to interpret and update models developed with such data.

Discussion:

There are a number of documents[1] that specify good practice in the use of regression models to estimate energy savings, and we do not make specific recommendations that differ from the general guidelines those documents offer.

In general, the model selection procedure should be simple to apply and produce consistent, repeatable results. Selecting the "best" model can be done depending on the goodness of fit as measured by the R^2, coefficient of variation of the normalized annual consumption (i.e., CV(NAC)) or coefficient of variation of the root mean squared error (i.e., CV(RMSE)). We do not specifically recommend any one of these measures, but do encourage PDCs to use several of these criteria when evaluating alternative models.

[1] See, for example, Annex D to "ASHRAE Guideline 14-2002, Measuring Energy and Demand Savings"

More importantly, the final model should "make sense" to customers; that is, the variables should be defined so that the causal relationship between the independent (weather and other) variables and energy usage is clear. Similarly, while the use of interval data can help provide a more refined model, it is important that the final specification employs data that customers have access to so that they can continue to update the savings Cumulative Sum (CUSUM) results after the engagement ends. The independent variables should be readily available to individual customers and their sources (e.g., US Weather Service data from PDX) identified in the write-ups provided to customers and Energy Trust with the model results.

The use of pooled models or standardized building type models does have some potential advantage for simplifying the analysis in some cases. However, both of these approaches removed the ability to easily identify causality between SEM actions and capital projects and the resulting savings on the usage for the specific building, which is a fundamental goal of SEM programs. Therefore, neither of these approaches is recommended at this time.

In some cases, the use of interval data can show the effects of SEM activities more quickly and reliably than the use of monthly billed data. By increasing the number of data points, this approach can increase the number of unique variables that can be incorporated in the model, which can significantly increase model accuracy. However, the use of interval data can greatly increase the time required for analysis and can increase the work required to collect the data to include each variable, which would make customers less likely to perform the consistent updating of all model variables. Additionally, not all variables may be available on as granular of a level, and estimation may be required, which would add uncertainty to the analysis. Therefore, the use of interval data is not recommended except for customers who thoroughly understand the analysis, have access to the required data, and are willing and able to update the model regularly.

Selection of measurement period and extrapolation of results

Recommendations:

1. Eliminate the current practice of extrapolating partial-year results to an annual savings estimate and replace it with a calculation of cumulative, measured savings at the end of the first 12 months of participation.
2. If Energy Trust decides it wants to claim annual savings, use a rule of thumb, such as the result of a linear extrapolation of monthly savings, divided by 2 (e.g., 4 months of savings would be multiplied by 1.5).

Discussion:

One of the most challenging aspects of calculating savings by PDCs has been the extrapolation of savings for a few months to an annual estimate. In most cases, there are three or at most four months of post-participation usage data available to reflect SEM actions taken by program participants; moreover, those months typically fall during the summer (cooling) period, and may not be typical of overall operation over the course of a year. PDC analysts do their best to adjust the limited savings data to reflect non-cooling months by extrapolating using typical meteorological year (TMY) data and professional

judgment, but there is clearly no way to accurately predict heating season usage based on cooling usage data.

We recommend that the current approach for the annualizing of savings, described in the evaluation report referenced above, be discontinued. Instead, we would recommend that the measurement period used to determine the claimed savings for the program be the 12 month period following the initiation of SEM activities. The claimed first-year savings are then savings calculated using the CUSUM analysis for the first full year after SEM activities are initiated. Similarly, billing data for the next 12 months would be used to calculate second year savings from additional SEM actions taken after the initial engagement ends. This approach eliminates any extrapolation of savings and the uncertainty associated with current annual savings estimates. Because many participants have as few as three months of post-SEM bill history and rarely have more than six months of data at the time savings are currently estimated, extrapolation of these data is inherently inaccurate, as discussed above.

We recognize that deferring calculation of annual savings poses challenges from a programmatic standpoint. Specifically, this approach will provide a one-year disconnect between the costs associated with SEM and the resulting savings. If the savings must be claimed in the same year as costs for program cost-effectiveness or other factors, then we recommend a rule of thumb approach like that described in recommendation 2, above. This would still free PDC analysts from the time consuming task of annualizing savings and may allow more time to be spent on other activities.

Linking of results to specific SEM actions

Recommendations:

1. To enhance the value of the savings analysis to participants, link reductions in billed usage to SEM activity through enhanced communication with the participant.
2. Work with participants to develop proactive project strategies and timelines
3. Incorporate both operational and behavioral activities in the variance log or other record of actions

The most challenging aspect of linking energy savings to SEM actions has been the lack of consistent tracking of SEM activities completed at participant sites. For many participants, activity tracking is not occurring until the CUSUM analysis identifies savings, which causes the participant and the PDC to go back through maintenance records or discuss what has happened at the facility to try to append the actions to the result. This retroactive tracking of actions is even more difficult when the participant has multiple buildings or multiple maintenance or other staff involved in the SEM process. Each person will often act independent of the other staff and have a different threshold or idea of what activities should or should not be entered into the variance log or otherwise tracked.

To reduce this, several strategies are recommended. First, we suggest that the participant should be contacted frequently, especially early in the SEM participation period, to provide guidance on how SEM-related operational changes should be documented.

Second, we would recommend that during those frequent check-ins there should be more discussion of identified needs or upcoming potential activities. By discussing these activities prior to completion, the

PDC can cement in the participant's minds which activities are SEM related and need to be recorded to help create an appropriate feedback loop linking activities to savings.

Finally, customers should be encouraged to report not just adjustment and changes to building operations (e.g., schedules, setpoints), but also education/information campaigns that seek to influence occupant behavior. Meetings of energy management teams that are formed or active during most SEM engagements are often used to discuss or promote such activities, and the minutes of team meetings could serve as a useful source of input on non-operational changes that could be linked to the savings analysis.

Reporting of savings to participants and to Energy Trust

Recommendations:

1. Improve reporting to participants to include alternate ways of presenting savings that are more recognizable to the participant.
2. Differentiate the reporting of savings from non-SEM capital projects between participants and Energy Trust to minimize participant confusion, and provide participants with a detailed explanation when SEM savings are reduced by these capital projects.

The most significant challenge in reporting savings to participants has been the difficulty for customers to understand and quickly interpret the CUSUM graphs. Specifically, PDCs said that some customers find it hard to interpret that the expected savings for SEM activities are represented by changes in slope in the CUSUM graph.

Customers generally seem to find it easier to understand savings when these are presented in charts comparing actual usage to modeled baseline usage, and we recommended that such alternate graphs be included in the customer reports. We note, however, that this graph does not present cumulative savings, so the CUSUM graph should not be eliminated. However, it should clearly present the cumulative savings as the area under the curve and not require interpretation based on the differences in slopes.

The reporting process is also complicated by participants who have completed capital projects during the SEM baseline or analysis periods. Especially for custom calculated projects, there can be a significant disconnect between the savings claimed for the projects and the savings seen on the bills. If claimed savings for capital projects are greater than those observed in the billing data, the SEM savings analysis can lead to negative savings attributed to the SEM program.

While claimed savings from capital projects clearly need to be netted out of the SEM savings analysis to ensure consistency for reporting for Energy Trust, providing the total combined savings for both projects is important to provide the positive feedback loop that SEM seeks to provide. In addition, the analysis could present the realization rate associated with that specific type of capital project and explain how that would affect the "residual" SEM savings. Presenting negative SEM savings out of context may give the customer an incorrect assessment of the impacts of their actions, and could lead them to take incorrect actions as a result. For calculating program incentives, the SEM savings as reduced by savings associated with capital projects will still need to be presented; however, both in the savings report to the participant and in subsequent discussions, the PDCs can make sure that they discuss the interactions between the savings claims for the two programs.

MEMO

Date: October 5, 2015

To: Energy Trust of Oregon Board of Directors

From: Kathleen Belkhayat, Commercial Sector Project Manager

Subject: Staff Response to the Review of Commercial Strategic Energy Management Savings Methods

The purpose of this memo is to document next steps for savings recommendations made by PWP/Michaels Energy team in their review of methods used to calculate and report savings from the Commercial Strategic Energy Management program. For each of the areas covered, Energy Trust will take the following actions.

- Baseline period and model specification: Recommendations will be taken and documented for program delivery contractors in a Commercial SEM modeling guidelines document.
- Savings measurement period: Energy Trust will move from projecting annual savings, based on a few months of measured savings, to directly measuring savings for each complete year, without doing any projections.
- Identifying and documenting SEM actions: Energy Trust will work with the SEM program delivery contractors to continue to find ways to encourage documentation of SEM activities and make documentation easier for participants.
- Reporting savings to participants: Energy Trust will work with the SEM program delivery contractors and SEM curriculum developers to streamline tools and provide any additional tools to make savings more well-defined for the participant and easier to present to their stakeholders.

Tab 4

Notes on September 2015 Financial Statements

October 21, 2015

Revenue

Year-to-Date revenue is very close to budgeted amounts. Most of the shortage in NWN is because WA funds were paid in October rather than September as budgeted (about $750K).

Sep-15	YTD Actual	YTD Budget	YTD Var	YTD %	PY
PGE	60,786,616	59,409,847	1,376,769	2.3%	66,697,735
PAC	36,983,398	36,336,808	646,590	1.8%	40,971,663
NWN	13,699,887	14,968,099	(1,268,212)	-8.5%	17,877,890
CNG	995,458	1,320,459	(325,001)	-24.6%	2,152,814
Investment Income	463,812	216,000	247,812	114.7%	173,876
Total	112,929,172	112,251,213	677,959	0.6%	127,873,979

Reserves

Program reserves dropped slightly in September and are now 17% lower than where we were at this time last year. They will most likely continue to drop through the end of the year.

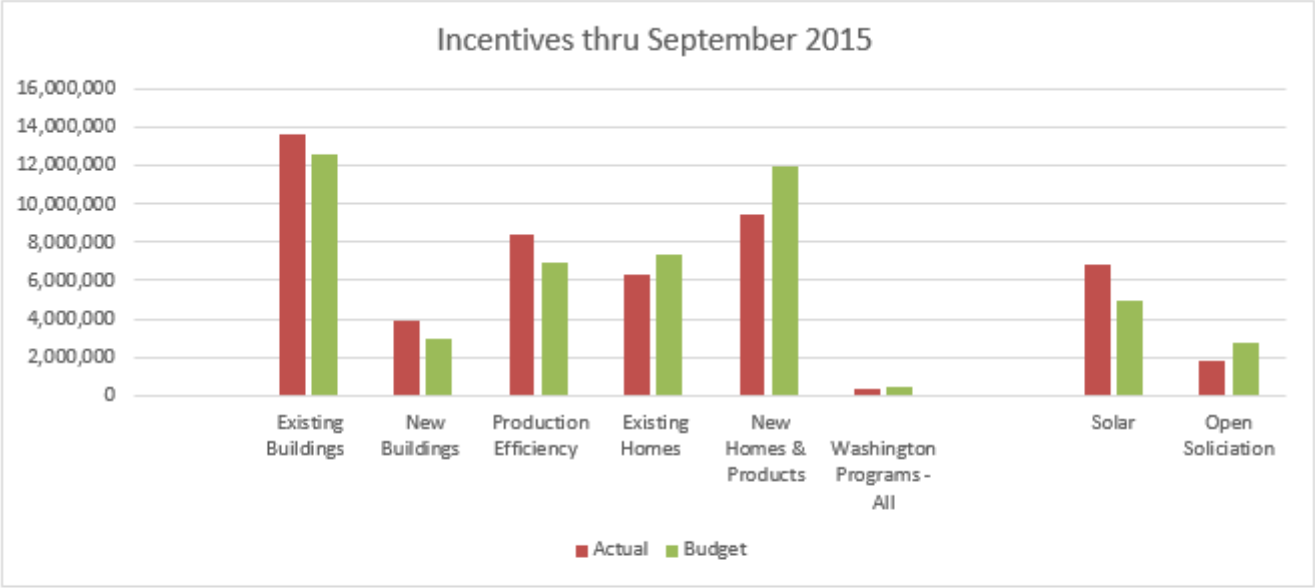
Reserves

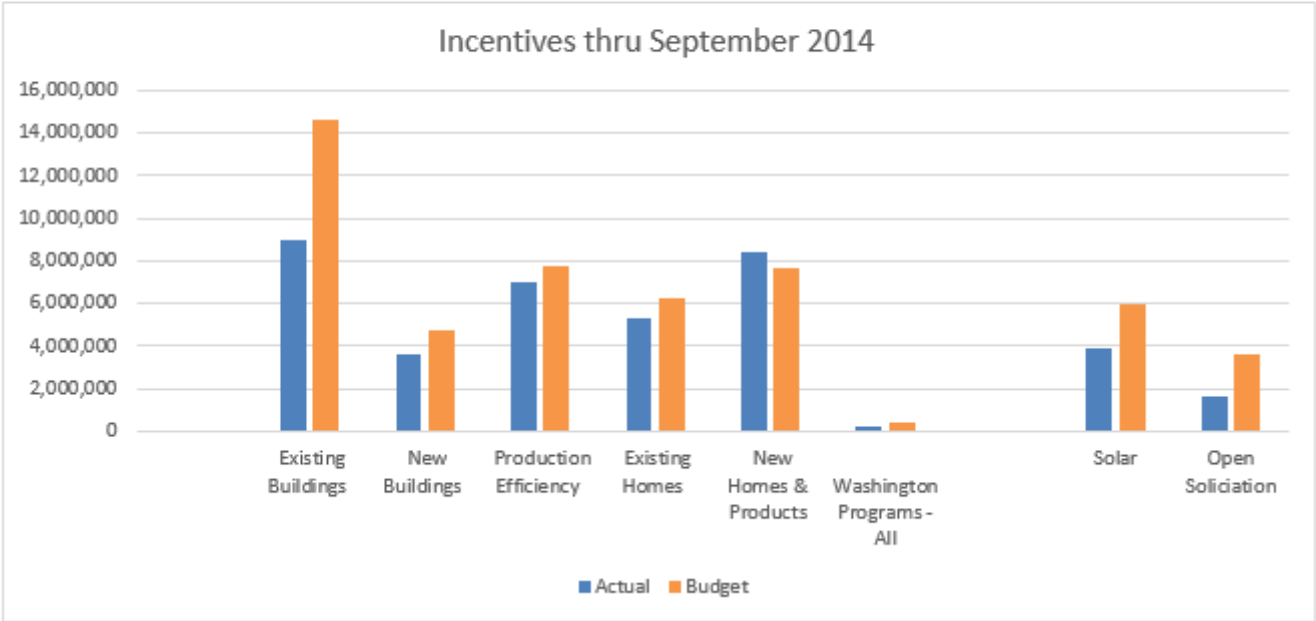
	Actual 09/30/15 Amount	Actual 12/31/14 Amount	YTD % Change	Actual 09/30/14 Amount	12 month % Change
PGE	34,565,007	27,816,061	24%	42,497,581	-19%
PacifiCorp	16,840,593	15,090,308	12%	22,836,009	-26%
NW Natural	10,129,985	9,503,289	7%	13,015,882	-22%
Cascade	940,576	1,156,900	-19%	1,522,748	-38%
NWN Industrial	1,466,705	580,920	152%	1,131,673	30%
NWN Washington	63,422	217,848	-71%	265,084	-76%
PGE Renewables	12,598,912	13,736,997	-8%	14,747,417	-15%
PAC Renewables	11,908,890	10,937,994	9%	12,695,066	-6%
Program Reserves	88,514,090	79,040,317	12%	108,711,460	-19%
Contingency Reserve	5,000,000	5,000,000	0%	5,000,000	0%
Contingency Available	3,651,666	3,186,804	15%	3,180,986	15%
Total	97,165,750	87,227,121	11%	116,892,447	-17%

Incentive Expenses

Total expenses for September were $1.5 million below budget, largely due to incentive spending. Spending for the year is now $2.5 million below budget - a 2% variance. Spending vs. last year is $14 million (16% higher).

Incentives for the month came in 13% below budget ($0.9 million). Results by program are comparable to last month. A comparison with last year's incentive status is below. It shows the dramatic increase in incentive spending for all programs. We have spent $11.5 million more on incentives this year than last year.





Total Incentives
Year-to-Date 2015

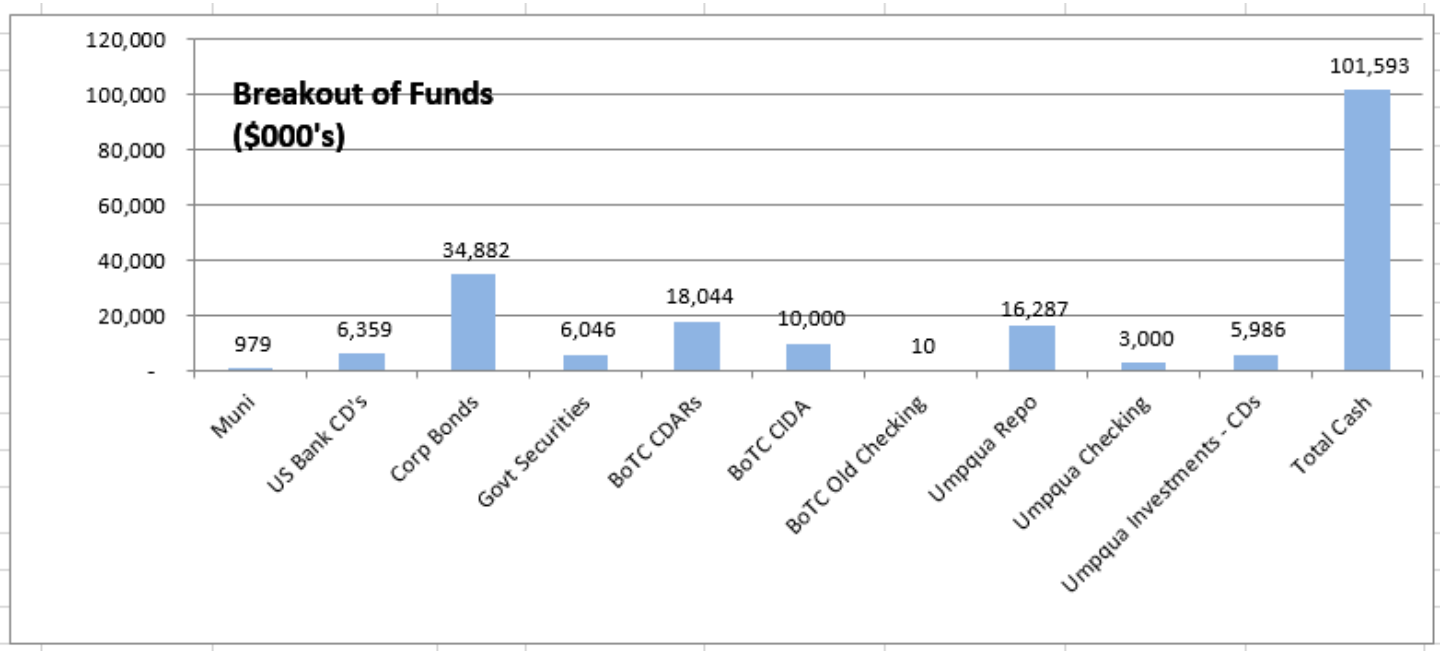
Incentives thru September 2015	Actual	Budget	Variance	Var %
Existing Buildings	13,587,204	12,542,235	(1,044,969)	-8%
New Buildings	3,876,872	2,938,909	(937,964)	-32%
Production Efficiency	8,410,398	6,984,225	(1,426,173)	-20%
Existing Homes	6,331,486	7,367,203	1,035,717	14%
New Homes & Products	9,463,490	11,960,829	2,497,340	21%
Washington Programs - All	303,430	404,625	101,195	25%
Solar	6,800,172	4,979,450	(1,820,722)	-37%
Open Soliciation	1,823,941	2,727,939	903,998	33%
Total Incentives	50,596,993	49,905,416	(691,578)	-1%
Energy Efficiency Only	**41,972,880**	**42,198,027**	**225,147**	**1%**
Act Incent to Annual Budget	**44%**	**94,486,648**		

Total Incentives
Year-to-Year Comparison

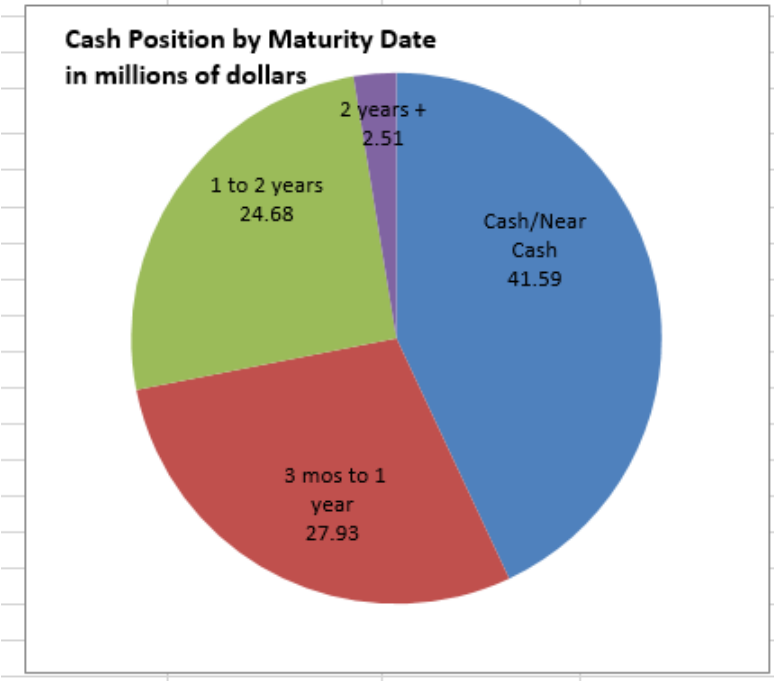
Sept 2015 vs. Sept 2014	Current Year	Prior Year	Variance	Var %
Existing Buildings	13,587,204	9,027,211	(4,559,993)	-51%
New Buildings	3,876,872	3,630,018	(246,854)	-7%
Production Efficiency	8,410,398	6,963,013	(1,447,385)	-21%
Existing Homes	6,331,486	5,309,251	(1,022,235)	-19%
New Homes & Products	9,463,490	8,405,921	(1,057,569)	-13%
Washington Programs - All	303,430	247,326	(56,104)	-23%
Solar	6,800,172	3,863,361	(2,936,812)	-76%
Open Solicitation	1,823,941	1,644,053	(179,888)	-11%
Total Incentives	50,596,993	39,090,154	(11,506,844)	-29%
Energy Efficiency Only	**41,972,880**	**33,582,740**	**(8,390,140)**	-25%

Investment Status

The graphs below show the type of investments we hold and the locations where our funds are held at the end of September (including cash). The average liquidity for all assets held at 9/30/15 was 192 days. Because of year end cash demands and next year's planned budget, we are planning to maintain relatively short term liquidity going forward.



Average Days to Maturity:	192
Average Portfolio Yield:	0.50%



Energy Trust of Oregon
BALANCE SHEET
September 30, 2015
(Unaudited)

	September 2015	August 2015	Dec 2014	September 2014	Change from one month ago	Change from Beg. of Year	Change from one year ago
Current Assets							
Cash & Cash Equivalents	34,300,080	36,770,275	51,411,367	68,193,921	(2,470,196)	(17,111,287)	(33,893,841)
Investments	67,132,386	66,153,365	64,490,244	54,364,342	979,021	2,642,142	12,768,044
Receivables	269,258	358,376	323,531	193,214	(89,118)	(54,273)	76,044
Prepaid Expenses	494,000	447,890	405,430	582,006	46,110	88,571	(88,006)
Advances to Vendors	2,164,517	847,012	1,482,149	2,452,757	1,317,505	682,368	(288,240)
Current Portion Note Receivable			0	10,000	0	0	(10,000)
Total Current Assets	**104,360,241**	**104,576,918**	**118,112,720**	**125,796,241**	**(216,677)**	**(13,752,479)**	**(21,436,000)**
Fixed Assets							
Computer Hardware and Software	3,481,079	3,481,079	1,653,762	1,634,233	0	1,827,317	1,846,845
Software Development in Progress	133,154	123,293	1025908.62	549063.12	9,862	(892,754)	(415,909)
Leasehold Improvements	318,964	318,964	318,964	313,333	-	-	5,631
Office Equipment and Furniture	698,874	698,874	679,343	600,662	-	19,530.75	98,212
Total Fixed Assets	**4,632,071**	**4,622,210**	**3,677,978**	**3,097,292**	**9,862**	**954,093**	**1,534,780**
Less Depreciation	(2,443,554)	(2,360,728)	(1,831,551)	(1,718,690)	(82,826)	(612,003)	(724,864)
Net Fixed Assets	**2,188,518**	**2,261,482**	**1,846,428**	**1,378,602**	**(72,965)**	**342,090**	**809,916**
Other Assets							
Deposits	132,340	132,340	135,340	64,461	0	(3,000)	67,879
Deferred Compensation Asset	707,711	699,461	630,176	564,334	8,250	77,535	143,377
Note Receivable, net of allowance	86,789	86,789	86,789	90000	-	-	(3,211)
Total Other Assets	**926,840**	**918,590**	**852,305**	**718,795**	**8,250**	**74,535**	**208,045**
Total Assets	**107,475,599**	**107,756,991**	**120,811,454**	**127,893,638**	**(281,392)**	**(13,335,855)**	**(20,418,039)**
Current Liabilities							
Accounts Payable and Accruals	8,517,590	8,474,295	31,924,631	9,379,251	43,295	(23,407,041)	(861,662)
Salaries, Taxes, & Benefits Payable	753,231	721,697	671,849	691,885	31,534	81,382	61,346
Total Current Liabilities	**9,270,820**	**9,195,992**	**32,596,480**	**10,071,136**	**74,829**	**(23,325,659)**	**(800,316)**
Long Term Liabilities							
Deferred Rent	324,686	327,465	349,692	354,611	(2,778)	(25,005)	(29,924)
Deferred Compensation Payable	707,711	699,461	632,976	567,134	8,250	74,735	140,577
Other Long-Term Liabilities	6,630	5,420	5,185	8,308	1,210.00	1,445	(1,678)
Total Long-Term Liabilities	**1,039,027**	**1,032,345**	**987,852**	**930,052**	**6,682**	**51,175**	**108,975**
Total Liabilities	**10,309,847**	**10,228,337**	**33,584,332**	**11,001,189**	**81,510**	**(23,274,485)**	**(691,341)**
Net Assets							
Unrestricted Net Assets	97,165,752	97,528,654	87,227,121	116,892,449	(362,902)	9,938,630	(19,726,698)
Total Net Assets	**97,165,752**	**97,528,654**	**87,227,121**	**116,892,449**	**(362,902)**	**9,938,630**	**(19,726,698)**
Total Liabilities and Net Assets	**107,475,599**	**107,756,991**	**120,811,454**	**127,893,638**	**(281,392)**	**(13,335,855)**	**(20,418,039)**

Energy Trust of Oregon
Cash Flow Statement-Indirect Method
Monthly 2015

	January	February	March	April	May	June	July	August	September	Year to Date
Operating Activities:										
Revenue less Expenses	8,620,993	6,726,499	1,531,158	715,318	(2,736,736)	(4,113,196)	(1,391,665)	949,161	(362,902)	$ 9,938,628
Non-cash items:										
Depreciation	40,242	41,284	64,566	71,460	73,396	75,252	81,000	81,976	82,826	612,002
Change in Reserve on Long Term Note	-	-	-							-
Loss on disposal of assets										
Receivables	5,800	11,583	-	(7,684)	-	(10,698)	5,001		20,580	24,582
Interest Receivable	4,268	(50,180)	58,204	8,452	(43,458)	9,862	8,932	(34,926)	68,538	29,692
Advances to Vendors	543,337	465,160	(1,177,147)	228,917	594,462	(1,000,894)	451,715	529,587	(1,317,505)	(682,368)
Prepaid expenses and other costs	14,982	47,842	(254,416)	68,730	7,275	95,511	(101,812)	79,428	(46,110)	(88,570)
Accounts payable	(20,265,729)	(2,448,214)	(352,009)	212,675	(972,984)	457,462	(90,250)	8,713	43,295	(23,407,041)
Payroll and related accruals	17,794	52,944	96,210	(24,170)	24,831	10,229	(25,607)	(35,898)	39,784	156,117
Deferred rent and other	(11,515)	(11,028)	(10,673)	(8,029)	(13,988)	(11,029)	(10,948)	(11,068)	(9,819)	(98,097)
Cash rec'd from / (used in) Operating Activities	(11,029,828)	4,835,890	(44,107)	1,265,669	(3,067,202)	(4,487,501)	(1,073,634)	1,566,973	(1,481,313)	$ (13,515,053)
Investing Activities:										
Investment Activity (1)	(2,475,092)	(5,431,428)	(1,217,888)	2,835,537	3,803,928	(2,582,238)	(1,185,464)	4,589,524	(979,021)	(2,642,142)
(Acquisition)/Disposal of Capital Assets	(132,268)	(142,396)	(143,192)	(151,901)	(98,053)	(128,592)	(100,776)	(47,053)	(9,862)	(954,093)
Cash rec'd from / (used in) Investing Activities	(2,607,360)	(5,573,824)	(1,361,080)	2,683,636	3,705,875	(2,710,830)	(1,286,240)	4,542,471	(988,883)	$ (3,596,235)
Cash at beginning of Period	51,411,367	37,774,180	37,036,243	35,631,058	39,580,364	40,219,037	33,020,705	30,660,832	36,770,273	51,411,367
Increase/(Decrease) in Cash	(13,637,187)	(737,934)	(1,405,187)	3,949,305	638,673	(7,198,331)	(2,359,874)	6,109,444	(2,470,195)	(17,111,287)
Cash at end of period	$ 37,774,180	$ 37,036,243	$ 35,631,058	$ 39,580,364	$ 40,219,037	$ 33,020,705	$ 30,660,832	$ 36,770,275	$ 34,300,080	$ 34,300,080

(1) As investments mature, they are rolled into the Repo account.
Investments that are made during the month reduce available cash.

Energy Trust of Oregon
Cash Flow Projection
January 2015 - December 2016

	Actual									2015 R3 Forecast		
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Cash In:												
Public purpose and Incr funding	15,740,912	15,125,779	12,539,730	13,204,663	10,891,616	10,343,345	11,275,486	11,838,796	11,505,033	11,480,046	11,051,149	13,383,226
From other sources	5,800	11,583	-	(7,684)	700	(10,698)	5,351	-	20,581	-	-	-
Investment Income	110,630	(27,478)	123,371	70,057	8,631	12,301	48,465	(14,203)	161,730	-	-	-
Total cash in	15,857,342	15,109,884	12,663,101	13,267,036	10,900,947	10,344,948	11,329,302	11,824,593	11,687,344	11,480,046	11,051,149	13,383,226
Cash Out:	29,494,530	15,847,819	14,068,288	9,317,730	10,262,273	17,543,282	13,689,174	5,715,147	14,157,540	13,470,891	11,163,901	20,572,629
Net cash flow for the month	(13,637,188)	(737,935)	(1,405,187)	3,949,306	638,674	(7,198,334)	(2,359,872)	6,109,446	(2,470,196)	(1,990,845)	(112,752)	(7,189,403)
Beginning Balance: Cash & MM	51,411,367	37,774,180	37,036,248	35,631,058	39,580,364	40,219,037	33,020,705	30,660,832	36,770,275	34,300,080	32,309,235	32,196,484
Ending cash & MM	**37,774,180**	**37,036,243**	**35,631,058**	**39,580,364**	**40,219,037**	**33,020,705**	**30,660,832**	**36,770,275**	**34,300,080**	**32,309,235**	**32,196,484**	**25,007,081**

Future Commitments

Renewable Incentives	17,600,000	17,500,000	17,000,000	16,900,000	16,600,000	14,600,000	14,400,000	14,200,000	16,000,000	15,600,000	14,500,000	12,300,000
Efficiency Incentives	48,400,000	47,100,000	63,000,000	60,400,000	58,500,000	62,200,000	58,900,000	58,800,000	70,700,000	70,800,000	85,100,000	76,700,000
Emergency Contingency Pool	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Total Commitments	71,000,000	69,600,000	85,000,000	82,300,000	80,100,000	81,800,000	78,300,000	78,000,000	91,700,000	91,400,000	104,600,000	94,000,000

(1) Included in "Ending cash & MM" above

Dedicated funds adjustment: reduction in available cash for commitments to Renewable program projects with board approval, or when board approval not required, with signed agreements
Committed funds adjustment: reduction in available cash for commitments to Efficiency program projects with signed agreements
Cash reserve: reduction in available cash to cover cashflow variability and winter revenue risk
Escrow: dedicated funds set aside in separate bank accounts

Energy Trust of Oregon
Cash Flow Projection
January 2015 - December 2016

	2016 R1 Budgeted Amounts											
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Cash In:												
Public purpose and Incr funding	16,500,000	15,800,000	13,100,000	13,800,000	11,300,000	10,800,000	11,600,000	12,300,000	11,700,000	11,800,000	11,600,000	14,000,000
From other sources												
Investment Income	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Total cash in	16,525,000	15,825,000	13,125,000	13,825,000	11,325,000	10,825,000	11,625,000	12,325,000	11,725,000	11,825,000	11,625,000	14,025,000
Cash Out:	33,600,000	10,000,000	12,400,000	11,600,000	13,300,000	16,000,000	12,300,000	12,600,000	15,500,000	13,700,000	16,000,000	18,000,000
Net cash flow for the month	(17,075,000)	5,825,000	725,000	2,225,000	(1,975,000)	(5,175,000)	(675,000)	(275,000)	(3,775,000)	(1,875,000)	(4,375,000)	(3,975,000)
Beginning Balance: Cash & MM	25,007,081	7,932,081	13,757,081	14,482,081	16,707,081	14,732,081	9,557,081	8,882,081	8,607,081	4,832,081	2,957,081	(1,417,919)
Ending cash & MM	**7,932,081**	**13,757,081**	**14,482,081**	**16,707,081**	**14,732,081**	**9,557,081**	**8,882,081**	**8,607,081**	**4,832,081**	**2,957,081**	**(1,417,919)**	**(5,392,919)**
Future Commitments												
Renewable Incentives	11,900,000	13,000,000	13,900,000	16,300,000	16,100,000	16,400,000	16,900,000	17,500,000	17,500,000	17,500,000	17,500,000	17,500,000
Efficiency Incentives	74,000,000	74,400,000	71,800,000	71,300,000	73,500,000	72,800,000	73,600,000	75,900,000	75,900,000	75,900,000	75,900,000	75,900,000
Emergency Contingency Pool	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Total Commitments	90,900,000	92,400,000	90,700,000	92,600,000	94,600,000	94,200,000	95,500,000	98,400,000	98,400,000	98,400,000	98,400,000	98,400,000

(1) Included in "Ending cash & MM" above

Dedicated funds adjustment: reduction in available cash for commitments to Renewable program projects with board approval, or when board approval not required, with signed agreements
Committed funds adjustment: reduction in available cash for commitments to Efficiency program projects with signed agreements
Cash reserve: reduction in available cash to cover cashflow variability and winter revenue risk
Escrow: dedicated funds set aside in separate bank accounts

Energy Trust of Oregon
Income Statement - Actual and Prior Yr Comparison
For the Month Ending September 30, 2015
(Unaudited)

	September				YTD			
	Actual	Actual Prior Year	Prior Year Variance	Variance %	Actual	Actual Prior Year	Prior Year Variance	Variance %
REVENUES								
Public Purpose Funds-PGE	3,267,882	3,173,789	94,094	3%	28,306,675	28,410,584	(103,908)	0%
Public Purpose Funds-PacifiCorp	2,365,998	2,330,726	35,272	2%	20,704,588	20,924,787	(220,199)	-1%
Public Purpose Funds-NW Natural	403,070	555,297	(152,227)	-27%	10,969,207	15,302,011	(4,332,804)	-28%
Public Purpose Funds-Cascade	31,232	37,816	(6,584)	-17%	995,458	2,152,814	(1,157,356)	-54%
Total Public Purpose Funds	**6,068,183**	**6,097,628**	**(29,445)**	**0%**	**60,975,928**	**66,790,195**	**(5,814,267)**	**-9%**
Incremental Funds - PGE	3,645,930	3,936,826	(290,896)	-7%	32,479,941	38,287,151	(5,807,210)	-15%
Incremental Funds - PacifiCorp	1,790,921	2,109,874	(318,953)	-15%	16,278,810	20,046,875	(3,768,065)	-19%
NW Natural - Industrial DSM			0		2,052,288	2,048,702	3,586	0%
NW Natural - Washington			0		678,392	527,177	151,215	29%
Contributions			0		1,050	13,400	(12,350)	-92%
Revenue from Investments	93,193	28,133	65,060	231%	463,812	173,876	289,937	167%
TOTAL REVENUE	**11,598,226**	**12,172,460**	**(574,234)**	**-5%**	**112,930,222**	**127,887,377**	**(14,957,154)**	**-12%**
EXPENSES								
Program Subcontracts	4,180,889	4,510,941	330,052	7%	37,593,105	35,301,502	(2,291,603)	-6%
Incentives	6,102,107	4,971,470	(1,130,637)	-23%	50,596,993	39,090,154	(11,506,840)	-29%
Salaries and Related Expenses	1,004,415	897,048	(107,367)	-12%	8,002,073	7,821,031	(181,042)	-2%
Professional Services	442,332	624,085	181,752	29%	4,778,311	4,968,813	190,501	4%
Supplies	2,217	2,548	331	13%	25,806	26,357	551	2%
Telephone	4,956	4,835	(120)	-2%	43,968	41,567	(2,402)	-6%
Postage and Shipping Expenses	64	572	508	89%	9,656	9,716	60	1%
Occupancy Expenses	52,403	55,516	3,113	6%	482,346	485,190	2,844	1%
Noncapitalized Equip. & Depr.	114,220	27,551	(86,670)	-315%	903,332	514,263	(389,069)	-76%
Call Center	12,136	12,107	(29)	0%	112,856	111,947	(908)	-1%
Printing and Publications	614	13,932	13,318	96%	52,506	93,518	41,012	44%
Travel	18,719	10,037	(8,682)	-87%	115,296	109,855	(5,441)	-5%
Conference, Training & Mtng Exp	12,838	23,713	10,875	46%	114,199	156,455	42,256	27%
Interest Expense and Bank Fees			0		1,774	2,000	226	11%
Insurance	8,486	8,339	(147)	-2%	78,404	76,183	(2,221)	-3%
Miscellaneous Expenses	228	300	72		453.16	3,316	2,863	
Dues, Licenses and Fees	4,503	9,268	4,766	51%	80,514	113,633	33,120	29%
TOTAL EXPENSES	**11,961,128**	**11,172,263**	**(788,866)**	**-7%**	**102,991,592**	**88,925,499**	**(14,066,093)**	**-16%**
TOTAL REVENUE LESS EXPENSES	**(362,902)**	**1,000,198**	**(1,363,100)**	**136%**	**9,938,630**	**38,961,877**	**(29,023,247)**	**-74%**

Energy Trust of Oregon
Income Statement - Actual and YTD Budget Comparison
For the Month Ending September 30, 2015
(Unaudited)

	September				YTD			
	Actual	**Budget**	**Budget Variance**	**Variance %**	**Actual**	**Budget**	**Budget Variance**	**Variance %**
REVENUES								
Public Purpose Funds-PGE	3,267,882	3,158,643	109,240	3%	28,306,675	28,274,575	32,100	0%
Public Purpose Funds-PacifiCorp	2,365,998	2,124,815	241,183	11%	20,704,588	20,930,617	(226,029)	-1%
Public Purpose Funds-NW Natural	403,070	419,447	(16,377)	-4%	10,969,207	11,558,466	(589,260)	-5%
Public Purpose Funds-Cascade	31,232	57,411	(26,180)	-46%	995,458	1,320,459	(325,001)	-25%
Total Public Purpose Funds	**6,068,183**	**5,760,316**	**307,867**	**5%**	**60,975,928**	**62,084,118**	**(1,108,190)**	**-2%**
Incremental Funds - PGE	3,645,930	3,201,443	444,486	14%	32,479,941	31,135,272	1,344,670	4%
Incremental Funds - PacifiCorp	1,790,921	1,521,220	269,701	18%	16,278,810	15,406,191	872,619	6%
NW Natural - Industrial DSM			0		2,052,288	1,998,281	54,007	3%
NW Natural - Washington		705,676	(705,676)	-100%	678,392	1,411,352	(732,960)	-52%
Contributions			0		1,050		1,050	
Revenue from Investments	93,193	24,000	69,193	288%	463,812	216,000	247,812	115%
TOTAL REVENUE	**11,598,226**	**11,212,655**	**385,571**	**3%**	**112,930,222**	**112,251,214**	**679,009**	**1%**
EXPENSES								
Program Subcontracts	4,180,889	4,381,191	200,302	5%	37,593,105	38,132,451	539,346	1%
Incentives	6,102,107	7,040,885	938,778	13%	50,596,993	49,905,416	(691,578)	-1%
Salaries and Related Expenses	1,004,415	971,072	(33,343)	-3%	8,002,073	8,836,969	834,896	9%
Professional Services	442,332	786,696	344,364	44%	4,778,311	6,291,760	1,513,448	24%
Supplies	2,217	3,650	1,433	39%	25,806	32,850	7,044	21%
Telephone	4,956	5,583	628	11%	43,968	49,500	5,532	11%
Postage and Shipping Expenses	64	1,100	1,036	94%	9,656	9,900	244	2%
Occupancy Expenses	52,403	61,519	9,116	15%	482,346	553,669	71,323	13%
Noncapitalized Equip. & Depr.	114,220	116,807	2,586	2%	903,332	855,856	(47,476)	-6%
Call Center	12,136	13,000	864	7%	112,856	117,000	4,144	4%
Printing and Publications	614	10,946	10,331	94%	52,506	98,513	46,007	47%
Travel	18,719	22,508	3,789	17%	115,296	154,575	39,279	25%
Conference, Training & Mtng Exp	12,838	27,212	14,373	53%	114,199	245,005	130,806	53%
Interest Expense and Bank Fees		208	208	100%	1,774	1,875	101	5%
Insurance	8,486	9,167	680	7%	78,404	82,500	4,096	5%
Miscellaneous Expenses	228		(228)		453.16		-453.16	
Dues, Licenses and Fees	4,503	8,735	4,233	48%	80,514	102,819	22,305	22%
TOTAL EXPENSES	**11,961,128**	**13,460,280**	**1,499,151**	**11%**	**102,991,592**	**105,470,658**	**2,479,066**	**2%**
TOTAL REVENUE LESS EXPENSES	**(362,902)**	**(2,247,624)**	**1,884,722**	**84%**	**9,938,630**	**6,780,555**	**3,158,075**	**47%**

Energy Trust of Oregon
Statement of Functional Expenses
For the Nine Months Ending September 30, 2015
(Unaudited)

	Energy Efficiency	Renewable Energy	Total Program Expenses	Management & General	Communications & Customer Service	Total Admin Expenses	Total	Budget	Variance	% Var
Program Expenses										
Incentives/ Program Management & Deliver	$79,276,835	$ 8,913,264	$ 88,190,099				$ 88,190,099	$88,037,867	$ (152,232)	0%
Payroll and Related Expenses	2,258,457	688,740	2,947,196	1,536,006	902,197	2,438,203	5,385,400	5,844,180	458,780	8%
Outsourced Services	3,054,462	620,730	3,675,192	176,359	737,033	913,392	4,588,584	5,867,135	1,278,551	22%
Planning and Evaluation	1,474,498	49,012	1,523,510	1,089		1,089	1,524,599	1,794,699	270,100	15%
Customer Service Management	435,548	32,619	468,167				468,167	406,843	(61,324)	-15%
Trade Allies Network	233,871	15,917	249,788				249,788	301,152	51,364	17%
Total Program Expenses	**86,733,671**	**10,320,281**	**97,053,952**	**1,713,454**	**1,639,230**	**3,352,684**	**100,406,637**	**102,251,875**	**1,845,238**	**2%**
Program Support Costs										
Supplies	6,352	2,634	8,986	6,908	3,124	10,031	19,017	23,363	4,346	19%
Postage and Shipping Expenses	1,646	2,463	4,110	2,529	690	3,219	7,329	6,080	(1,249)	-21%
Telephone	1,902	636	2,538	1,164	917	2,081	4,619	7,480	2,861	38%
Printing and Publications	42,326	1,527	43,853	3,164	4,112	7,277	51,130	95,377	44,247	46%
Occupancy Expenses	138,113	46,213	184,326	84,527	57,919	142,446	326,772	367,897	41,125	11%
Insurance	22,450	7,512	29,962	13,740	9,415	23,154	53,116	54,819	1,703	3%
Equipment	5,366	57,663	63,029	3,284	2,250	5,534	68,563	101,087	32,524	32%
Travel	23,020	11,923	34,943	18,988	33,535	52,523	87,466	120,600	33,134	27%
Meetings, Trainings & Conferences	20,088	10,239	30,328	39,935	11,066	51,001	81,328	198,177	116,849	59%
Interest Expense and Bank Fees				1,774		1,774	1,774	1,875	101	5%
Depreciation & Amortization	37,431	12,525	49,956	22,909	15,697	38,606	88,562	77,755	(10,807)	-14%
Dues, Licenses and Fees	41,970	7,170	49,140	(6,034)	14,231	8,197	57,337		(57,337)	
Miscellaneous Expenses	375	10	386	19	13	32	418	69,656	69,238	
IT Services	1,149,355	151,618	1,300,974	258,570	177,982	436,553	1,737,526	2,094,616	357,090	17%
Total Program Support Costs	**1,490,394**	**312,134**	**1,802,528**	**451,476**	**330,952**	**782,428**	**2,584,956**	**3,218,782**	**633,826**	**20%**
TOTAL EXPENSES	**88,224,065**	**10,632,415**	**98,856,480**	**2,164,931**	**1,970,180**	**4,135,110**	**102,991,592**	**105,470,657**	**2,479,066**	**2%**
OPUC Measure vs. 8%	**5.3%**									

ENERGY TRUST OF OREGON
Year to Date by Program/Service Territory
For the Eight Months Ending September 30, 2015
Unaudited

	ENERGY EFFICIENCY								
	PGE	PacifiCorp	Total	NWN Industrial	NW Natural	Cascade	Oregon Total	NWN WA	ETO Total
REVENUES									
Public Purpose Funding	$21,937,820	$16,163,470	$38,101,291	$0	$10,969,207	$995,458	$50,065,955	$0	$50,065,955
Incremental Funding	32,479,941	16,278,810	48,758,752	2,052,288			50,811,040	678,392	51,489,432
Contributions									
Revenue from Investments									
TOTAL PROGRAM REVENUE	**41,890,353**	**25,042,110**	**66,932,463**	**2,052,288**	**10,139,415**	**927,925**	**80,052,092**	**678,392**	**80,730,484**
EXPENSES									
Program Management (Note 3)	2,003,779	1,308,324	3,312,103	103,133	499,292	77,250	3,991,778	87,337	4,079,115
Program Delivery	16,954,826	11,448,825	28,403,652	572,843	3,168,050	455,692	32,600,235	267,416	32,867,652
Incentives	22,256,273	13,613,019	35,869,291	373,292	4,917,737	509,128	41,669,450	303,431	41,972,881
Program Eval & Planning Svcs.	1,455,879	979,081	2,434,960	25,063	313,721	31,502	2,805,247	31,567	2,836,814
Program Marketing/Outreach	1,730,503	1,176,111	2,906,612	17,281	595,281	49,546	3,568,722	41,824	3,610,546
Program Quality Assurance	13,828	10,610	24,439	0	7,832	539	32,809	0	32,809
Outsourced Services	344,910	221,110	566,021	11,040	78,435	8,895	664,391	0	664,391
Trade Allies & Cust. Svc. Mgmt.	286,353	215,596	501,949	2,481	131,880	9,859	646,168	23,251	669,419
IT Services	537,412	378,963	916,374	9,015	181,166	16,394	1,122,948	26,407	1,149,355
Other Program Expenses - all	171,151	108,074	279,226	5,521	33,866	4,325	322,938	18,148	341,086
TOTAL PROGRAM EXPENSES	**45,754,914**	**29,459,713**	**75,214,627**	**1,119,669**	**9,927,260**	**1,163,130**	**87,424,686**	**799,381**	**88,224,065**
ADMINISTRATIVE COSTS									
Management & General (Notes 1&2)	1,002,019	645,161	1,647,180	24,520	217,404	25,471	1,914,576	17,506	1,932,082
Communications & Customer Svc (Notes 1&2)	911,883	587,122	1,499,005	22,314	197,847	23,181	1,742,350	15,931	1,758,280
Total Administrative Costs	**1,913,902**	**1,232,283**	**3,146,185**	**46,834**	**415,251**	**48,652**	**3,656,926**	**33,437**	**3,690,362**
TOTAL PROG & ADMIN EXPENSES	**47,668,816**	**30,691,996**	**78,360,812**	**1,166,503**	**10,342,511**	**1,211,782**	**91,081,612**	**832,818**	**91,914,430**
TOTAL REVENUE LESS EXPENSES	**6,748,946**	**1,750,285**	**8,499,230**	**885,785**	**626,696**	**(216,324)**	**9,795,383**	**(154,426)**	**9,640,957**
NET ASSETS - RESERVES									
Cumulative Carryover at 12/31/14	27,816,061	15,090,308	42,906,369	580,920	9,503,289	1,156,900	54,147,478	217,848	54,365,326
Change in net assets this year	6,748,946	1,750,285	8,499,230	885,785	626,696	(216,324)	9,795,383	(154,426)	9,640,957
Ending Net Assets - Reserves	**34,565,007**	**16,840,593**	**51,405,599**	**1,466,705**	**10,129,985**	**940,576**	**63,942,861**	**63,422**	**64,006,283**
Ending Reserve by Category									
Program Reserves (Efficiency and Renewables)	34,565,007	16,840,593	51,405,599	1,466,705	10,129,985	940,576	63,942,861	63,422	64,006,283
Operational Contingency Pool									
Emergency Contingency Pool									
TOTAL NET ASSETS CUMULATIVE	34,565,007	16,840,593	51,405,599	1,466,705	10,129,985	940,576	63,942,861	63,422	64,006,283

Note 1) Management & General and Communications & Customer Service Expenses (Admin) have been allocated based on total expenses.
Note 2) Admin costs are allocated for mgmt reporting only. GAAP for Not for Profits does not allow allocation of admin costs to program expenses.
Note 3) Program Management costs include both outsourced and internal staff.

ENERGY TRUST OF OREGON
Year to Date by Program/Service Territory
For the Eight Months Ending September 30, 2015
Unaudited

	RENEWABLE ENERGY				TOTAL			
	PGE	PacifiCorp	Total	Other	All Programs	Approved budget	Change	% Change
REVENUES								
Public Purpose Funding	$6,368,855	$4,541,118	$10,909,973	0	$60,975,928	$62,084,118	($1,108,190)	-2%
Incremental Funding					51,489,432	49,951,096	1,538,336	3%
Contributions				1,050	1,050		1,050	
Revenue from Investments				463,812	463,812	216,000	247,812	115%
TOTAL PROGRAM REVENUE	**4,894,062**	**3,496,985**	**8,391,047**	**464,862**	**112,930,222**	**112,251,214**	**679,008**	**1%**
EXPENSES								
Program Management (Note 3)	464,378	239,347	703,724		4,782,839	5,257,600	474,761	9%
Program Delivery	170,921	103,229	274,150		33,141,802	33,357,936	216,134	1%
Incentives	6,040,930	2,583,183	8,624,113		50,596,994	49,905,415	(691,579)	-1%
Program Eval & Planning Svcs.	32,773	17,317	50,091		2,886,905	3,697,093	810,188	22%
Program Marketing/Outreach	107,242	70,259	177,500		3,788,046	4,141,063	353,017	9%
Program Quality Assurance	0	0	0		32,809	75,000	42,191	56%
Outsourced Services	149,676	292,475	442,151		1,106,542	1,414,423	307,881	22%
Trade Allies & Cust. Svc. Mgmt.	33,826	14,711	48,536		717,955	707,996	(9,959)	-1%
IT Services	100,115	51,502	151,619		1,300,974	1,568,346	267,372	17%
Other Program Expenses - all	105,676	54,855	160,532		501,618	705,268	203,650	29%
TOTAL PROGRAM EXPENSES	**7,205,537**	**3,426,878**	**10,632,415**	**-**	**98,856,480**	**100,830,140**	**1,973,660**	**2%**
ADMINISTRATIVE COSTS								
Management & General (Notes 1&2)	157,799	75,047	232,847		2,164,931	2,491,029	326,098	13%
Communications & Customer Svc (Notes 1&2)	143,604	68,297	211,901		1,970,180	2,149,498	179,318	8%
Total Administrative Costs	**301,403**	**143,344**	**444,748**		**4,135,110**	**4,640,527**	**505,417**	**11%**
TOTAL PROG & ADMIN EXPENSES	**7,506,940**	**3,570,222**	**11,077,164**		**102,991,592**	**105,470,667**	**2,479,066**	**2%**
TOTAL REVENUE LESS EXPENSES	**(1,138,085)**	**970,896**	**(167,191)**	**464,862**	**9,938,630**	**6,780,547**	**3,158,084**	**47%**
NET ASSETS - RESERVES								
Cumulative Carryover at 12/31/14	13,736,997	10,937,994	24,674,991	8,186,804	87,227,121	88,912,387	(1,685,266)	-2%
Change in net assets this year	(1,138,085)	970,896	(167,191)	464,862	9,938,630	6,780,547	3,158,084	47%
Ending Net Assets - Reserves	**12,598,912**	**11,908,890**	**24,507,800**	**8,651,666**	**97,165,752**	**95,692,934**	**1,472,818**	**2%**
Ending Reserve by Category								
Program Reserves (Efficiency and Renewables)	12,598,912	11,908,890	24,507,800		92,165,752			
Operational Contingency Pool				3,651,666				
Emergency Contingency Pool				5,000,000	5,000,000			
TOTAL NET ASSETS CUMULATIVE	12,598,912	11,908,890	24,507,800	8,651,666	97,165,752	95,692,934	1,472,818	2%

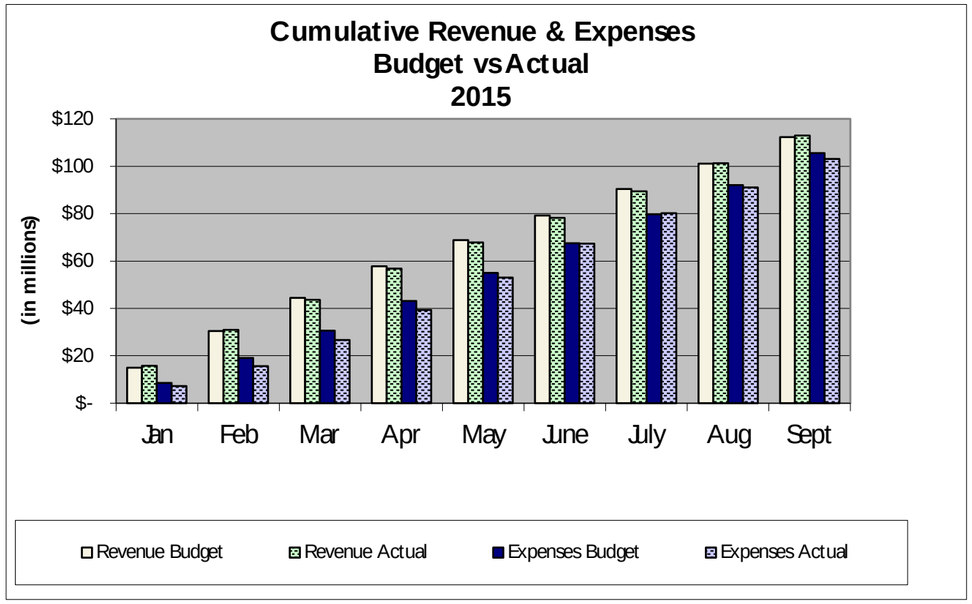
Energy Trust of Oregon
Program Expense by Service Territory
For the Nine Months Ending September 30, 2015
(Unaudited)

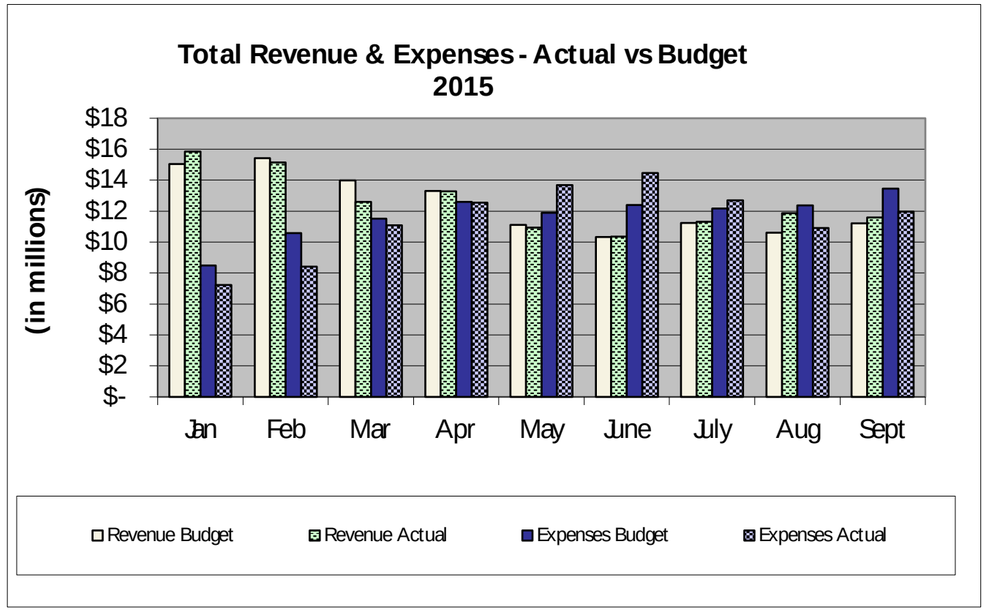
	PGE	Pacific Power	Subtotal Elec.	NWN Industrial	NW Natural Gas	Cascade	Subtotal Gas	Oregon Total	NWN WA	ETO Total	YTD Budget	Variance	% Var
Energy Efficiency													
Commercial													
Existing Buildings	$ 15,478,073	$ 10,073,360	$ 25,551,433	$ 512,659	$ 1,913,810	$ 305,810	$ 2,732,280	$ 28,283,713	$ 249,193	$ 28,532,906	$ 28,070,471	$ (462,435)	-2%
New Buildings	4,848,679	2,715,247	7,563,926	26,215	714,643	161,941	902,800	8,466,726		8,466,726	8,040,847	(425,879)	-5%
NEEA	992,387	703,634	1,696,020		61,743	6,281	68,024	1,764,045	5,115	1,769,160	2,143,576	374,416	17%
Total Commercial	**21,319,138**	**13,492,242**	**34,811,380**	**538,874**	**2,690,197**	**474,033**	**3,703,104**	**38,514,484**	**254,308**	**38,768,792**	**38,254,894**	**(513,898)**	**-1%**
Industrial													
Production Efficiency	10,850,641	6,449,153	17,299,793	627,628	497,161	192,058	1,316,847	18,616,640		18,616,640	17,421,671	(1,194,969)	-7%
NEEA	211,906	150,757	362,663					362,663		362,663	119,090	(243,573)	-205%
Total Industrial	**11,062,546**	**6,599,910**	**17,662,456**	**627,628**	**497,161**	**192,058**	**1,316,847**	**18,979,303**	**-**	**18,979,303**	**17,540,761**	**(1,438,542)**	**-8%**
Residential													
Existing Homes	4,969,217	5,255,349	10,224,566	-	3,789,881	191,156	3,981,037	14,205,603	288,861	14,494,464	16,196,518	1,702,054	11%
New Homes/Products	8,681,332	4,186,740	12,868,071	-	3,244,429	341,918	3,586,347	16,454,418	278,117	16,732,535	20,102,195	3,369,660	17%
NEEA	1,636,582	1,157,758	2,794,340		120,846	12,617	133,463	2,927,802	11,530	2,939,332	3,146,449	207,117	7%
Total Residential	**15,287,130**	**10,599,846**	**25,886,977**	**-**	**7,155,156**	**545,690**	**7,700,846**	**33,587,823**	**578,508**	**34,166,331**	**39,445,162**	**5,278,831**	**13%**
Energy Efficiency Costs	**47,668,816**	**30,691,996**	**78,360,812**	**1,166,503**	**10,342,511**	**1,211,782**	**12,720,797**	**91,081,612**	**832,818**	**91,914,430**	**95,240,817**	**3,326,391**	**3%**
Renewables													
Solar Electric (Photovoltaic)	5,852,540	2,520,794	8,373,334					8,373,334		8,373,334	6,591,537	(1,781,797)	-27%
Other Renewable	1,654,399	1,049,430	2,703,829					2,703,829		2,703,829	3,638,304	934,475	26%
Renewables Costs	**7,506,940**	**3,570,222**	**11,077,164**	**-**	**-**	**-**	**-**	**11,077,164**	**-**	**11,077,164**	**10,229,841**	**(847,322)**	**-8%**
Cost Grand Total	**55,175,756**	**34,262,218**	**89,437,976**	**1,166,503**	**10,342,511**	**1,211,782**	**12,720,797**	**102,158,776**	**832,818**	**102,991,592**	**105,470,658**	**2,479,066**	**2%**

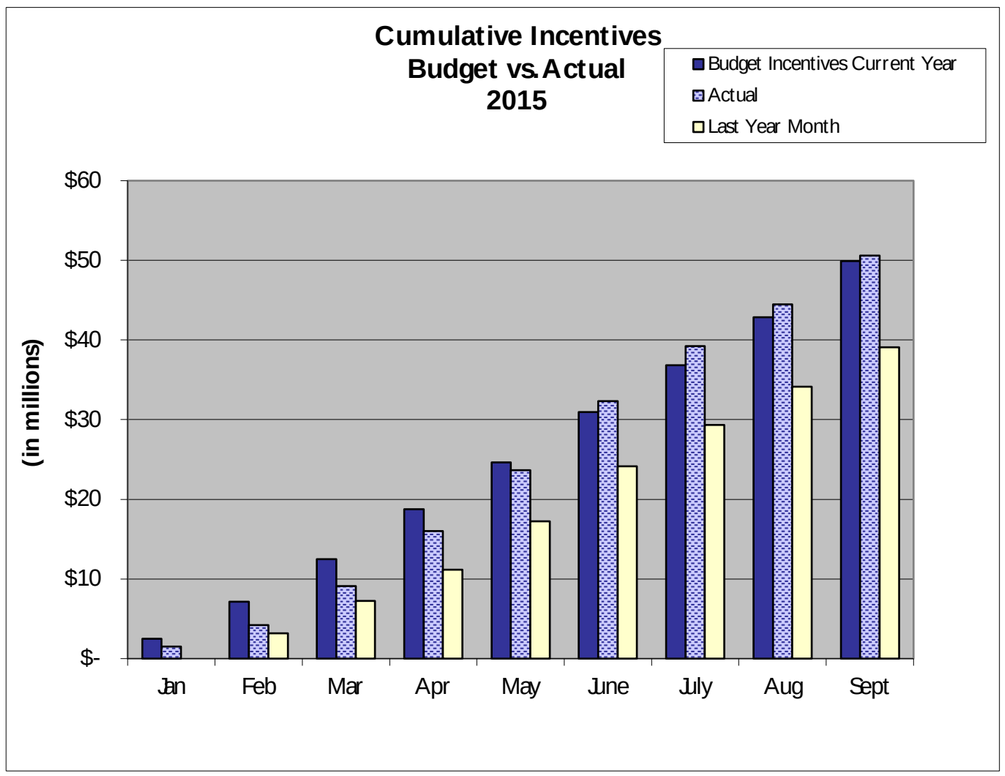
Energy Trust of Oregon
Administrative Expenses
For the 3rd Quarter and Nine Months Ending September 30, 2015
(Unaudited)

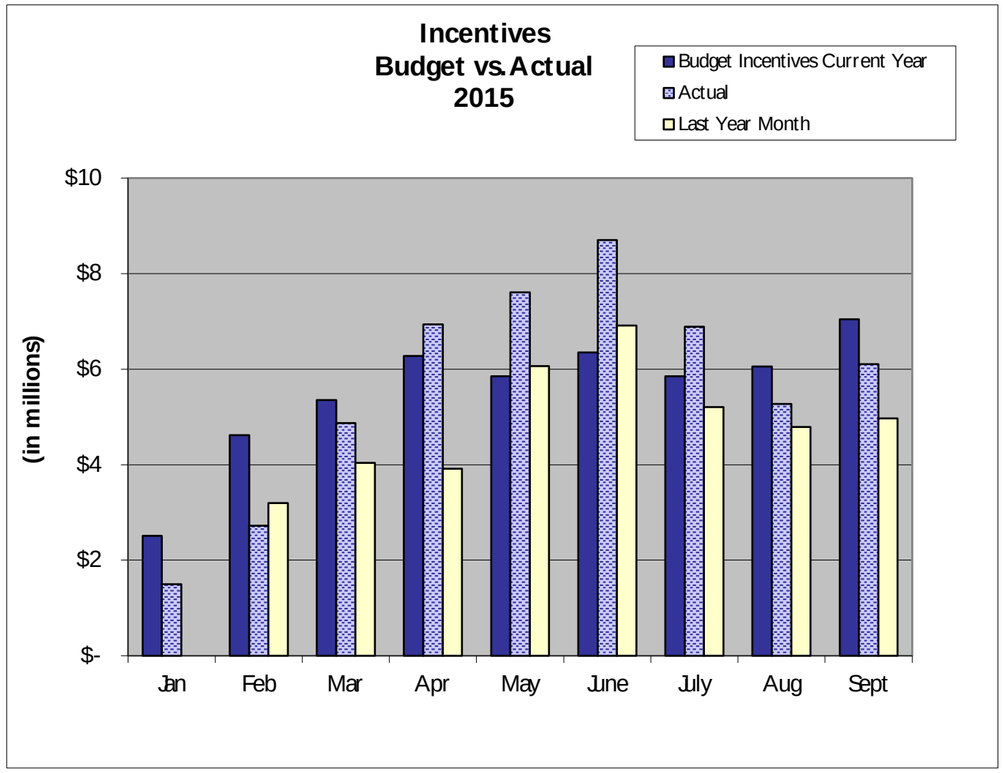
	MANAGEMENT & GENERAL						COMMUNICATIONS & CUSTOMER SERVICE					
	QUARTER			YTD			QUARTER			YTD		
	ACTUAL	BUDGET	REMAINING	ACTUAL	BUDGET	VARIANCE	ACTUAL	BUDGET	REMAINING	ACTUAL	BUDGET	VARIANCE
EXPENSES												
Outsourced Services	$43,612	$80,922	$37,310	$161,346	$301,766	$140,420	$266,426	$336,775	$70,349	$737,033	$801,100	$64,067
Legal Services	248	6,750	6,503	15,013	20,250	5,237						
Salaries and Related Expenses	522,574	530,459	7,885	1,535,978	1,572,297	36,320	296,187	332,886	36,699	902,177	998,657	96,480
Supplies	1,779	1,075	(704)	3,220	3,225	5	110	250	140	597	750	153
Telephone							80		(80)	120		(120)
Postage and Shipping Expenses	256		(256)	1,522		(1,522)						
Printing and Publications	1,133	88	(1,046)	2,680	263	(2,417)	2,376	1,250	(1,126)	3,780	3,750	(30)
Travel	4,676	12,387	7,712	18,988	37,162	18,175	18,211	6,250	(11,961)	33,535	18,750	(14,785)
Conference, Training & Mtngs	13,445	36,672	23,227	39,716	98,617	58,901	5,355	3,500	(1,855)	10,915	10,500	(416)
Interest Expense and Bank Fees		625	625	1,774	1,875	101						
Dues, Licenses and Fees	4,125	1,419	(2,706)	(6,034)	4,486	10,520	4,260	2,125	(2,135)	14,231	6,375	(7,856)
Shared Allocation (Note 1)	42,115	46,031	3,916	131,069	138,094	7,025	28,509	31,685	3,176	89,810	95,054	5,244
IT Service Allocation (Note 2)	103,049	114,276	11,228	258,570	311,711	53,140	70,932	78,660	7,728	177,982	214,561	36,578
Planning & Eval	395	423	28	1,089	1,282	193						
TOTAL EXPENSES	**737,407**	**831,127**	**93,722**	**2,164,931**	**2,491,028**	**326,098**	**692,446**	**793,381**	**100,935**	**1,970,180**	**2,149,497**	**179,315**

Note 1) Represents allocation of Shared (General Office Management) Costs
Note 2) Represents allocation of Shared IT Costs


Cumulative Revenue & Expenses
Budget vs Actual
2015
(in millions)
$120
$100
$80
$60
$40
$20
$-
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Revenue Budget
Revenue Actual
Expenses Budget
Expenses Actual


Total Revenue & Expenses - Actual vs Budget
2015
(in millions)
$18
$16
$14
$12
$10
$8
$6
$4
$2
$-
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Revenue Budget
Revenue Actual
Expenses Budget
Expenses Actual


Cumulative Incentives
Budget vs. Actual
2015
Budget Incentives Current Year
Actual
Last Year Month
(in millions)
$60
$50
$40
$30
$20
$10
$-
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept


Incentives
Budget vs. Actual
2015
Budget Incentives Current Year
Actual
Last Year Month
(in millions)
$10
$8
$6
$4
$2
$-
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept

CONTRACTOR	Description	City	EST COST	Actual TTD	Remaining	Start	End
Administration							
		Administration Total:	**6,667,521**	**3,342,188**	**3,325,333**		
Communications							
		Communications Total:	**3,968,641**	**3,042,163**	**926,478**		
Energy Efficiency							
Northwest Energy Efficiency Alliance	Regional EE Initiative Agmt	Portland	33,662,505	6,559,500	27,103,005	1/1/2015	7/1/2020
ICF Resources, LLC	2015 BE PMC	Fairfax	9,361,147	7,261,814	2,099,333	1/1/2015	12/31/2015
CLEAResult Consulting Inc	2015 HES PMC	Austin	6,831,251	4,813,010	2,018,241	1/1/2015	12/31/2015
Northwest Energy Efficiency Alliance	Regional Gas EE Initiative	Portland	6,200,354	305,667	5,894,687	1/1/2015	7/1/2020
CLEAResult Consulting Inc	2015 NBE PMC	Austin	4,986,181	3,112,959	1,873,222	1/1/2015	12/31/2015
Lockheed Martin Services, Inc.	2015 MF PMC	Cherry Hill	4,158,899	2,947,455	1,211,445	1/1/2015	12/31/2015
Ecova Inc	2015 Products PMC	Spokane	3,601,890	2,557,255	1,044,635	1/1/2015	1/31/2016
CLEAResult Consulting Inc	2015 NH PMC	Austin	2,772,252	1,963,590	808,662	1/1/2015	12/31/2015
Energy 350 Inc	PDC - PE 2015	Portland	2,388,150	1,664,271	723,879	1/1/2015	12/31/2015
Portland General Electric	PDC - PE 2015	Portland	2,211,000	1,637,307	573,693	1/1/2015	12/31/2015
Oregon State University	CHP Project - OSU	Corvallis	2,024,263	1,982,682	41,581	12/20/2010	1/31/2016
Northwest Power & Conservation Council	RTF Funding Agreement		1,825,000	321,766	1,503,234	2/25/2015	12/31/2019
Cascade Energy, Inc.	PDC - PE 2015 Small Industrial	Walla Walla	1,497,000	1,138,395	358,605	1/1/2015	12/31/2015
NEXANT, INC.	PDC - PE 2015	San Francisco	1,344,550	1,191,964	152,586	1/1/2015	12/31/2015
Evergreen Consulting Group, LLC	PE Lighting PDC 2015	Tigard	1,296,000	900,968	395,032	1/1/2015	12/31/2015
RHT Energy Inc.	PDC - PE 2015	Medford	1,126,440	781,082	345,358	1/1/2015	12/31/2015
HST&V, LLC	PDC - SEM 2015	Portland	1,041,740	676,237	365,503	1/1/2015	12/31/2015
CLEAResult Consulting Inc	PDC - SEM 2015	Austin	695,500	403,958	291,542	1/1/2015	12/31/2015
EnergySavvy Inc.	EnergySavvy Online Audit Tool	Seattle	587,500	513,469	74,031	1/1/2012	12/31/2015
Clean Energy Works, Inc.	EE Incentive & Services Agmt	Portland	497,340	340,540	156,800	7/1/2014	12/31/2015
Cascade Energy, Inc.	SEM Curriculum	Walla Walla	404,080	404,080	0	5/1/2014	4/30/2016
The Cadmus Group Inc.	PE Impact Eval 2012	Watertown	345,000	256,996	88,004	4/15/2014	2/29/2016
Energy Market Innovations, Inc.	Lighting Controls Savings Est	Seattle	315,000	314,537	463	10/1/2014	1/31/2016
Craft3	SWR Loan Origination/Loss Fund	Portland	305,000	8,850	296,150	6/1/2014	12/31/2016
EnerNoc, Inc.	Commercial SEM curriculum	Boston	300,915	255,179	45,736	6/27/2014	5/30/2016
Craft3	Loan Agreement	Portland	300,000	100,000	200,000	6/1/2014	6/20/2025
CLEAResult Consulting Inc	2015 HES WA PMC	Austin	277,600	200,275	77,325	1/1/2015	12/31/2015
Home Performance Contractors Guild of Oregon	Existing Homes Program Support	Portland	248,750	212,731	36,019	1/1/2012	12/31/2015

KEMA Incorporated	Commercial SEM Impact Eval	Oakland	205,000	0	205,000	9/1/2015	6/30/2016
ICF Resources, LLC	2015 BE NWN WA PMC	Fairfax	196,984	128,836	68,148	1/1/2015	12/31/2015
The Cadmus Group Inc.	PE SEM Impact Evaluation	Watertown	177,000	58,475	118,525	5/1/2015	12/31/2015
Northwest Energy Efficiency Alliance	Product Funding Agreement	Portland	171,851	171,851	0	6/5/2014	12/31/2015
Navigant Consulting Inc	CORE Improvement Pilot Eval	Boulder	140,000	140,000	0	9/1/2012	12/31/2015
ICF Resources, LLC	2015 BE DSM PMC	Fairfax	119,627	58,628	60,999	1/1/2015	12/31/2015
Abt SRBI Inc.	Fast Feedback Surveys	New York	118,000	97,986	20,014	1/31/2014	2/29/2016
ICF Resources, LLC	OSU CHP Performance Monitoring	Fairfax	100,000	54,458	45,543	7/1/2013	6/30/2016
1000 Broadway Building L.P.	Pay-for-Performance Pilot	Portland	88,125	0	88,125	10/17/2014	11/1/2018
Research Into Action, Inc.	SWR OnBill Repmt Pilot Eval	Portland	73,000	51,240	21,761	11/1/2014	6/30/2016
KEMA Incorporated	Impact Evaluation NBE '11 -'14	Oakland	70,000	40,676	29,324	3/2/2015	12/31/2015
SBW Consulting, Inc.	Path to Net Zero Impact Eval	Bellevue	70,000	31,897	38,103	3/19/2015	3/31/2016
Pivotal Energy Solutions LLC	EPS New Home dbase construct	Gilbert	68,750	34,000	34,750	7/1/2014	6/30/2016
Pivotal Energy Solutions LLC	License Agreement	Gilbert	64,500	46,732	17,768	3/1/2014	12/31/2015
Earth Advantage, Inc.	New Homes Code Change Analysis	Portland	54,110	32,516	21,594	1/1/2015	11/30/2015
Balanced Energy Solutions LLC	New Homes QA Inspections	Portland	54,000	15,060	38,940	4/27/2015	12/31/2015
Evergreen Economics	New Homes Process Evaluation	Portland	50,000	19,895	30,105	6/1/2015	12/31/2015
PWP, Inc.	EB SBES Process Evaluation	Gaithersburg	50,000	2,755	47,245	9/14/2015	5/31/2016
MetaResource Group	Intel DX1 Mod 1&2 Megaproject	Portland	45,000	3,093	41,907	4/1/2015	5/1/2017
NEXANT, INC.	Products Process Evaluation'15	San Francisco	43,000	43,000	0	4/15/2015	10/15/2015
Evergreen Economics	Gas Hearth Mrkt Transformation	Portland	42,840	42,830	10	1/1/2015	11/30/2015
Research Into Action, Inc.	LED Street Lighting Assessment	Portland	39,000	38,999	1	5/1/2015	10/31/2015
KEMA Incorporated	Billing Analysis Review	Oakland	35,000	0	35,000	3/15/2015	12/31/2016
Apex Analytics LLC	Gas Thermostat	Boulder	30,000	29,080	920	10/20/2014	12/31/2015
Research Into Action, Inc.	MPower Pilot Evaluation	Portland	30,000	19,976	10,024	2/1/2015	6/30/2016
WegoWise Inc	benchmarking license 2015	Boston	30,000	10,312	19,688	6/15/2014	12/31/2016
Energy Center of Wisconsin	Billing Analysis Review	Madison	25,000	0	25,000	3/15/2015	12/31/2016
Evergreen Economics	Air Sealing Pilot Evaluation	Portland	25,000	1,155	23,845	10/15/2014	12/31/2015
Northwest Food Processors Association	NW Industrial EE Summit 2015	Portland	25,000	17,965	7,035	11/30/2014	12/31/2015
Portland General Electric	2015 Workshop Sponsorship	Portland	25,000	25,000	0	1/1/2015	12/31/2015
CLEAResult Consulting Inc	Professional Services/Trans	Austin	22,588	19,539	3,049	10/15/2014	10/15/2016
MetaResource Group	Pay-for-Performance Pilot Eval	Portland	20,000	3,075	16,925	7/1/2015	5/30/2016
MetaResource Group	Pay-for-Performance Pilot Eval	Portland	20,000	2,250	17,750	8/5/2014	12/31/2015
Consortium for Energy Efficiency	Membership Dues - 2015		18,736	18,736	0	1/1/2015	12/31/2015

Energy 350 Inc	Professional Services	Portland	14,920	14,920	0	12/10/2014	12/10/2016
MetaResource Group	Mosier Well Energy Eff Study	Portland	13,500	4,523	8,977	7/1/2015	12/15/2015
Cascade Energy, Inc.	C/E & C/A Calculator Revisions	Walla Walla	12,100	12,100	0	5/21/2015	10/31/2015
American Council for and Energy Efficient Economy	Low-Income HH Sponsorship		10,000	10,000	0	7/22/2015	12/31/2015
American Council for and Energy Efficient Economy	Intelligent Effncy Sponsorship		10,000	10,000	0	7/22/2015	12/31/2015
American Council for and Energy Efficient Economy	EE Measures Sponsorship		10,000	10,000	0	7/22/2015	12/31/2015
Research Into Action, Inc.	Professional Services	Portland	9,590	9,570	20	9/1/2014	8/31/2016
Bridgetown Printing Company	January 2015 Bill Insert	Portland	9,517	9,517	0	1/1/2015	12/31/2015
City of Portland Bureau of Planning & Sustainability	Sponsorships - 2015	Portland	8,000	8,000	0	1/1/2015	12/31/2015
Northwest Energy Efficiency Council	BOC 2015 Sponsorship	Seattle	7,900	6,000	1,900	1/1/2015	12/31/2015
Northwest Environmental Business Council	Future Energy Conference 2015	Portland	7,650	7,650	0	3/25/2015	12/31/2015
Earth Advantage, Inc.	2015 Functional Sponsorship	Portland	7,500	7,500	0	3/1/2015	2/29/2016
LightTracker, Inc.	CREED Data	Boulder	7,300	0	7,300	8/5/2015	8/4/2016
Apose Pty Ltd	Aspose.NET Words Software Lice	Lane Cove	5,045	5,040	5	12/3/2014	12/3/2015
Social Enterprises Inc.	GoGreen Sponsorship - 2015	Portland	5,000	5,000	0	5/12/2015	12/31/2015
Sustainable Northwest	2015 Sponsorship	Portland	5,000	5,000	0	9/1/2015	9/1/2016
	Energy Efficiency Total:		**93,095,439**	**44,211,367**	**48,884,073**		

Joint Programs

Portland State University	Technology Forecasting		120,132	99,493	20,639	11/7/2011	12/31/2015
E Source Companies LLC	E Source Service Agreement	Boulder	74,900	74,900	0	2/1/2014	1/31/2016
The Cadmus Group Inc.	Evaluation Consultant	Watertown	39,045	38,960	85	6/20/2013	2/28/2016
Navigant Consulting Inc	P&E Consultant Services	Boulder	37,530	22,530	15,000	1/15/2014	12/30/2015
CoStar Realty Information Inc	Property Data	Baltimore	33,620	26,708	6,912	6/1/2011	5/31/2016
Research Into Action, Inc.	EH Attic Air Sealing Pilot Eva	Portland	30,000	30,000	0	10/8/2014	9/30/2016
American Council for and Energy Efficient Economy	ACEEE Sponsorship - 2015		12,500	12,500	0	1/1/2015	12/31/2015
	Joint Programs Total:		**347,727**	**305,091**	**42,636**		

Renewable Energy

Clean Water Services	Project Funding Agreement		3,000,000	1,000,000	2,000,000	11/25/2014	11/25/2039
JC-Biomethane LLC	Biogas Plant Project Funding	Eugene	2,000,000	1,000,000	1,000,000	10/18/2012	10/18/2032
Steel Bridge Solar, LLC	Project Funding Agreement	Seattle	2,000,000	0	2,000,000	3/27/2015	12/15/2040
Oregon Institute of Technology	Geothermal Resource Funding	Klamath Falls	1,550,000	1,550,000	0	9/11/2012	9/11/2032
Farm Power Misty Meadows LLC	Misty Meadows Biogas Facility	Mount Vernon	1,000,000	750,000	250,000	10/25/2012	10/25/2027
Three Sisters Irrigation District	TSID Hydro	Sisters	1,000,000	700,000	300,000	4/25/2012	9/30/2032
Farmers Irrigation District	FID - Plant 2 Hydro	Hood River	900,000	0	900,000	4/1/2014	4/1/2034

Tioga Solar VI, LLC	Photovoltaic Project Agreement	San Mateo	570,760	570,760	0	2/1/2009	2/1/2030
Old Mill Solar, LLC	Project Funding Agmt Bly, OR	Lake Oswego	490,000	0	490,000	5/29/2015	5/28/2030
City of Medford	750kW Combined Heat & Power	Medford	450,000	450,000	0	10/20/2011	10/20/2031
City of Pendleton	Pendleton Microturbines	Pendleton	450,000	150,000	300,000	4/20/2012	4/20/2032
RES - Ag FGO LLC	Biogas Manure Digester Project	Washington	441,660	441,660	0	10/27/2010	10/27/2025
RES - Ag FGO LLC	Biogas Manure Digester - FGO	Washington	441,660	217,830	223,830	10/27/2010	10/27/2025
SunE Solar XVI Lessor, LLC	BVT Sexton Mtn PV	Bethesda	355,412	0	355,412	5/15/2014	12/31/2034
CIty of Gresham	City of Gresham Cogen 2		330,000	165,000	165,000	4/9/2014	7/9/2034
Farmers Conservation Alliance	Irrigation Collaboration Initi	Hood River	312,876	206,804	106,072	1/2/2015	12/31/2016
Clean Power Research, LLC	PowerClerk License	Napa	231,253	228,583	2,670	7/1/2014	6/30/2016
K2A Properties, LLC	Doerfler Wind Farm Project	Aumsville	230,000	230,000	0	5/20/2010	5/20/2030
Confederated Tribes of the Umatilla Indian Reservation	Small Wind Project Funding	Pendleton	170,992	170,992	0	7/25/2013	12/31/2028
Henley KBG, LLC	Henley Proj Dev Assistance	Reno	150,000	43,683	106,318	4/10/2014	12/31/2015
City of Astoria	Bear Creek Funding Agreement	Astoria	143,000	143,000	0	3/24/2014	3/24/2034
Klamath Basin Geopower Inc	Poe Valley Proj Dev Assistance	Reno	112,874	63,000	49,874	4/10/2014	12/31/2015
Gary Higbee DBA WindStream Solar	Solar Verifier Services	Eugene	100,000	55,197	44,803	8/1/2014	7/31/2016
Wallowa Resources Community Solutions, Inc.	Upfront Hydroelectric Project		100,000	26,433	73,568	10/1/2011	10/1/2016
Mapdwell LLC	Mapdwell Account	Boston	64,595	64,595	0	3/17/2014	11/30/2015
SPS of Oregon Inc	Project Funding Agreement	Wallowa	60,000	0	60,000	10/15/2015	10/31/2036
Solar Oregon	2015 Outreach Agreement	Portland	43,800	21,400	22,400	1/1/2015	2/29/2016
State of Oregon Dept of Geology & Mineral Industries	Lidar Data	Portland	40,000	16,000	24,000	11/7/2014	12/1/2015
Clean Energy States Alliance	CESA Membership		39,500	39,500	0	7/1/2015	6/30/2016
Glenna R Wiseman	Solar Marketing Curriculum	Redlands	32,000	0	32,000	10/20/2015	6/30/2016
Kendrick Business Services LLC	Solar TA Business Consulting	Albany	30,000	0	30,000	10/8/2015	3/31/2016
University of Oregon	UO SRML Contribution - 2015	Eugene	24,999	24,999	0	2/11/2015	3/8/2016
Robert Migliori	42kW wind energy system	Newberg	24,125	17,037	7,088	4/11/2007	1/31/2024
Solar Oregon	Education & Outreach Services	Portland	24,000	24,000	0	1/1/2014	12/31/2015
Solar Oregon	Website Upgrade Grant	Portland	20,000	8,000	12,000	12/8/2014	12/31/2015
Oregon Clean Power Cooperative	Grant Agreement	Corvallis	17,000	10,000	7,000	6/15/2015	6/30/2016
Warren Griffin	Griffin Wind Project	Salem	13,150	9,255	3,895	10/1/2005	10/1/2020
Future Resource Stragtegies, LLC	Brewery Biopower Anaerobic Dig	Salem	8,000	0	8,000	8/11/2015	10/31/2015
OSEIA-Oregon Solar Energy Industries Assoc	OSEIA 2015 Conf Sponsorship		7,500	7,500	0	1/1/2015	12/31/2015
Clean Energy States Alliance	CESA ITAC Sponsorship		5,000	5,000	0	1/1/2015	12/31/2015
		Renewable Energy Total:	**16,984,156**	**8,410,227**	**8,573,929**		

Grand Total:	**121,063,485**	**59,311,036**	**61,752,449**

Financial Glossary

(for internal use) - updated April 16, 2014

Administrative Costs

Costs that, by nonprofit accounting standards, have general objectives which enable an organization's programs to function. The organization's programs in turn provide direct services to the organization's constituents and fulfill the mission of the organization.
i.e. management and general and general communication and outreach expenses

I. **Management and General**
- Includes governance/board activities, interest/financing costs, accounting, payroll, human resources, general legal support, and other general organizational management costs.
- Receives an allocated share of indirect costs.

II. **General Communications and Outreach**
- Expenditures of a general nature, conveying the nonprofit mission of the organization and general public awareness.
- Receives an allocated share of indirect costs.

Allocation
- A way of grouping costs together and applying them to a program as one pool based upon an allocation base that most closely represents the activity driver of the costs in the pool.
- Used as an alternative to charging programs on an invoice–by–invoice basis for accounting efficiency purposes.
- An example would be accumulating all of the costs associated with customer management (call center operations, Energy Trust customer service personnel, complaint tracking, etc). The accumulated costs are then spread to the programs that benefited by using the ratio of calls into the call center by program (i.e. the allocation base).

Allocation Cost Pools
- Employee benefits and taxes.
- Office operations. Includes rent, telephone, utilities, supplies, etc.
- Information Technology (IT) services.
- Planning and evaluation general costs.
- Customer service and trade ally support costs.
- General communications and outreach costs.
- Management and general costs.
- Shared costs for electric utilities.
- Shared costs for gas utilities.
- Shared costs for all utilities.

Auditor's Opinion
- An accountant's or auditor's opinion is a report by an independent CPA presented to the board of directors describing the scope of the examination of the organization's books, and certifying that the financial statements meet the AICPA (American Institute of Certified Public Accountants) requirements of GAAP (generally accepted accounting principles).

- Depending on the audit findings, the opinion can be unqualified or qualified regarding specific items. Energy Trust strives for and has achieved in all its years an unqualified opinion.
- An unqualified opinion indicates agreement by the auditors that the financial statements present an accurate assessment of the organization's financial results.
- The OPUC Grant Agreement requires an unqualified opinion regarding Energy Trust's financial records.
- Failure to follow generally accepted accounting principles (GAAP) can result in a qualified opinion.

Board-approved Annual Budget

- Funds approved by the board for *expenditures* during the budget year (subject to board approved program funding caps and associated policy) for the stated functions.
- Funds approved for *capital* asset expenditures.
- Approval of the general allocation of funds including commitments and cash outlays.
- Approval of expenditures is based on assumed revenues from utilities as forecasted in their annual projections of public purpose collections and/or contracted revenues.

Reserves

- In any one year, the amount by which revenues exceed expenses for that year in a designated category that will be added to the cumulative balance and brought forward for expenditure to the next budget year.
- In any one year, if expenditures exceed revenues, the negative difference is applied against the cumulative carryover balance.
- Does not equal the cash on hand due to noncash expense items such as depreciation.
- Tracked by major utility funder and at high level program area--by EE vs RE, not tracked by program.

Committed Funds

- Represents funds obligated to identified efficiency program participants in the form of signed applications or agreements and tracked in the project forecasting system**.**
- If the project is not demonstrably proceeding within agreed upon time frame, committed funds return to incentive pool. Reapplication would then be required.
- Funds are expensed when the project is completed.
- Funds may be held in the operating cash account, or in escrow accounts.

Contract obligations

- A signed contract for goods or services that creates a legal obligation.
- Reported in the monthly Contract Status Summary Report.

Cost-Effectiveness Calculation

- Programs and measures are evaluated for cost-effectiveness.
- The cost of program savings must be lower than the cost to produce the energy from both a utility and societal perspective.
- Expressed as a ratio of energy savings cost divided by the presumed avoided utility and societal cost of energy.
- Program cost-effectiveness evaluation is "fully allocated," i.e. includes all of the program costs plus a portion of Energy Trust administrative costs.

Dedicated Funds

- Represents funds obligated to identified renewable program participants in the form of signed applications or agreements and tracked in the project forecasting system.

- May include commitments, escrows, contracts, board designations, master agreements.
- Methodology utilized to develop renewable energy activity-based budgets amounts.

Direct Program Costs

- Can be directly linked to and reflect a causal relationship to one individual program/project; or can easily be allocated to two or more programs based upon usage, cause, or benefit.

Direct Program Evaluation & Planning Services

- Evaluation services for a specific program rather than for a group of programs.
- Costs incurred in evaluating programs and projects and included in determining total program funding caps.
- Planning services for a specific program rather than for a group of programs.
- Costs incurred in planning programs and projects and are included in determining program funding expenditures and caps.
- Evaluation and planning services attributable to a number of programs are recorded in a cost pool and are subsequently allocated to individual programs.

Escrowed Program (Incentive) Funds

- Cash deposited into a separate bank account that will be paid out pursuant to a contractual obligation requiring a certain event or result to occur. Funds can be returned to Energy Trust if such event or result does not occur. Therefore, the funds are still "owned" by Energy Trust and will remain on the balance sheet.
- The funds are within the control of the bank in accordance with the terms of the escrow agreement.
- When the event or result occurs, the funds are considered "earned" and are transferred out of the escrow account ("paid out") and then are reflected as an expense on the income statement for the current period.

Expenditures/Expenses

- Amounts for which there is an obligation for payment of goods and/or services that have been received or earned within the month or year.

FastTrack Projects Forecasting

Module developed in FastTrack to provide information about the timing of future incentive payments, with the following definitions**:**

- Estimated-Project data may be inaccurate or incomplete. Rough estimate of energy savings, incentives and completion date by project and by service territory.
- Proposed-Project that has received a written incentive offer but no agreement or application has been signed. Energy savings, incentives and completion date to be documented by programs using this phase. For Renewable projects-project that has received Board approval.
- Accepted-Used for renewable energy projects in 2nd round of application; projects that have reached a stage where approval process can begin.
- Committed-Project that has a signed agreement or application reserving incentive dollars until project completion. Energy savings/generations, incentives and completion date by project and by service territory must be documented in project records and in FastTrack. If project not demonstrably proceeding within agreed upon time frame, committed funds return to incentive pool. Reapplication would then be required.
- Dedicated-Renewable project that has been committed, has a signed agreement, and if required, has been approved by the board of directors.

Incentives

I. **Residential Incentives**

- Incentives paid to a residential program participant (party responsible for payment for utility service in particular dwelling unit) exclusively for energy efficiency and renewable energy measures in the homes or apartments of such residential customers.

II. **Business Incentives**

- Incentives paid to a participant other than a residential program participant as defined above following the installation of an energy efficiency or renewable energy measure.
- Above market cost for a particular renewable energy project.

III. **Service Incentives**

- Incentives paid to an installation contractor which serves as a reduction in the final cost to the participant for the installation of an energy efficiency or renewable energy measure.
- Payment for services delivered to participants by contractors such as home reviews and technical analysis studies.
- End-user training, enhancing participant technical knowledge or energy efficiency practices proficiency such as “how to” sessions on insulation, weatherization, or high efficiency lighting.
- CFL online home review fulfillment and PMC direct installations.
- Technical trade ally training to enhance program knowledge.
- Incentives for equipment purchases by trade allies to garner improvements of services and diagnostics delivered to end-users, such as duct sealing, HVAC diagnosis, air filtration, etc.

Indirect Costs

- Shared costs that are “allocated” for accounting purposes rather than assigning individual charges to programs.
- Allocated to all programs and administration functions based on a standard basis such as hours worked, square footage, customer phone calls, etc.
- Examples include rent/facilities, supplies, computer equipment and support, and depreciation.

IT Support Services

- Information technology costs incurred as a result of supporting all programs.
- Includes FastTrack energy savings and incentive tracking software, data tracking support of PMCs and for the program evaluation functions.
- Includes technical architecture design and physical infrastructure.
- Receives an allocation of indirect shared costs.
- Total costs subsequently allocated to programs and administrative units.

Outsourced Services

- Miscellaneous professional services contracted to third parties rather than performed by internal staff.
- Can be incurred for program or administrative reasons and will be identified as such.

Program Costs

- Expenditures made to fulfill the purposes or mission for which the organization exists and are authorized through the program approval process.
- Includes program management, incentives, program staff salaries, planning, evaluation, quality assurance, program-specific marketing and other costs incurred solely for program purposes.
- Can be direct or indirect (i.e. allocated based on program usage.)

Program Delivery Expense

- This will include all PMC labor and direct costs associated with: incentive processing, program coordination, program support, trade ally communications, and program delivery contractors.
- Includes contract payments to NEEA for market transformation efforts.
- Includes performance compensation incentives paid to program management contractors under contract agreement if certain incentive goals are met.
- Includes professional services for items such as solar inspections, anemometer maintenance and general renewable energy consulting.

Program Legal Services

- External legal expenditures and internal legal services utilized in the development of a program-specific contract.

Program Management Expense

- PMC billings associated with program contract oversight, program support, staff management, etc.
- ETO program management staff salaries, taxes and benefits.

Program Marketing/Outreach

- PMC labor and direct costs associated with marketing/outreach/awareness efforts to communicate program opportunities and benefits to rate payers/program participants.
- Awareness campaigns and outreach efforts designed to reach participants of individual programs.
- Co-op advertising with trade allies and vendors to promote a particular program benefit to the public.

Program Quality Assurance

- Independent in-house or outsourced services for the quality assurance efforts of a particular program (distinguished from program quality control).

Program Reserves

- Negotiated with utilities annually, with a goal of providing a cushion of approximately 5% above funds needed to fulfill annual budgeted costs. Management may access up to 50% of annual program reserve without prior board approval (resolution 633, 2012).

Program Support Costs

- Source of information is contained in statement of functional expense report.
- Portion of costs in OPUC performance measure for program administration and support costs.
    - Includes expenses incurred directly by the program.
    - Includes allocation of shared and indirect costs incurred in the following categories: supplies; postage and shipping; telephone; printing and publications; occupancy expenses; insurance; equipment; travel; business meetings; conferences and training; depreciation and amortization; dues, licenses,

subscriptions and fees; miscellaneous expense; and an allocation of information technology department cost.

Project Specific Costs (for Renewable Energy)

- Expenses directly related to identified projects or identified customers to assist them in constructing or operating renewable projects. Includes services to prospective as well as current customers.
- Must involve direct contact with the project or customer, individually or in groups, and provide a service the customer would otherwise incur at their own expense.
- Does not include general program costs to reach a broad (unidentified) audience such as websites, advertising, program development, or program management.
- Project-Specific costs may be in the categories of; Incentives, Staff salaries, Program delivery, Legal services, Public relations, Creative services, Professional services, Travel, Business meetings, Telephone, or Escrow account bank fees.

Savings Types

- **Working Savings/Generation:** the estimate of savings/generation that is used for data entry by program personnel as they approve individual projects. They are based on deemed savings/generation for prescriptive measures, and engineering calculations for custom measures. They do not incorporate any evaluation or transmission and distribution factors.
- **Reportable Savings/Generation:** the estimate of savings/generation that will be used for public reporting of Energy Trust results. This includes transmission and distribution factors, evaluation factors, and any other corrections required to the original working values. These values are updated annually, and are subject to revision each year during the "true-up" as a result of new information or identified errors.
- **Contract Savings**: the estimate of savings that will be used to compare against annual contract goals. These savings figures are generally the same as the reportable savings at the time that the contract year started. For purposes of adjusting working savings to arrive at this number, a single adjustment percentage (a SRAF, as defined below) is agreed to at the beginning of the contract year and is applied to all program measures. This is based on the sum of the adjustments between working and reportable numbers in the forecast developed for the program year.
- **Savings Realization Adjustment Factors (SRAF):** are savings realization adjustment factors applied to electric and gas working savings measures in order to reflect more accurate savings information through the benefit of evaluation and other studies. These factors are determined by the Energy Trust and used for annual contract amendments. The factors are determined based on the best available information from:
  - Program evaluations and/or other research that account for free riders, spill-over effects and measure impacts to date; and
  - Published transmission and distribution line loss information resulting from electric measure savings.

Total Program and Admin Expenses (line item on income statement)

- Used only for cost effectiveness calculations, levelized cost calculations and in management reports used to track funds spent/remaining by service territory.
- Includes all costs of the organization--direct, indirect, and an allocation of administration costs to programs.
- Should not be used for external financial reporting (not GAAP).

Total Program Expenses (line item on income statement)

- All indirect costs have been allocated to program costs with the exception of administration (management and general costs and communications & outreach).
- Per the requirements of Generally Accepted Accounting Principles (GAAP) for nonprofits, administrative costs should not be allocated to programs.
- There is no causal relationship—costs would not go away if the program did not exist.

Trade Ally Programs & Customer Service Management

- Costs associated with Energy Trust sponsorship of training and development of a trade ally network for a variety of programs.
- Trade Ally costs are tracked and allocated to programs based on the number of allies associated with that program.
- Costs in support of assisting customers which benefit all Energy Trust programs such as call center operations, customer service manager, complaint handling, etc.
- Customer service costs are tracked and allocated based on # of calls into the call center per month.

True Up

- True-up is a once-a-year process where we take everything we've learned about how much energy programs actually save or generate, and update our reports of historic performance and our software tools for forecasting and analyzing future savings.
- Information incorporated includes improved engineering models of savings (new data factor), anticipated results of future evaluations based on what prior evaluations of similar programs have shown (anticipated evaluation factor), and results from actual evaluations of the program and the year of activity in question (evaluation factor).
- Results are incorporated in the Annual Report (for the year just past) and the True-up Report (for prior years).
- Sometimes the best data on program savings or generation is not available for 2-3 years, especially for market transformation programs. So for some programs, the savings are updated through the annual true-up 2 or 3 times

Tab 5

Policy Committee Meeting

October 6, 2015, 3:30–5:00 pm

Attending by teleconference

Roger Hamilton, Ken Canon, Alan Meyer, John Reynolds

Attending at Energy Trust offices

Amber Cole, Fred Gordon, Margie Harris, Jed Jorgensen, Betsy Kauffman, Steve Lacey, Debbie Menashe, John Volkman, Peter West

Policies for Review

Staff presented three policies for review: Renewable Energy Certificate (REC) Policy, Consent Agenda Policy, and Waste-to-Energy Policy.

REC Policy

A revised REC Policy, which had been under review for some time, was presented to the committee for consideration. As proposed, the policy would be amended in three general areas:

- To allow Energy Trust not to register RECs in the Western Renewable Energy Generation Information System (WREGIS) where the board, acting after an annual presentation by staff compiled in consultation with the utilities and the Oregon Public Utility Commission, concludes the effort and expense are disproportionate to REC market value;
- To permit coordination of the policy with utility green-power programs and rate processes by reducing Energy Trust's share of RECs to the extent that a utility retains RECs; and
- To make minor changes clarifying the mechanics of the policy.

The committee discussed the proposed changes, and suggested that in the analysis of the value of RECs as compared to the cost and effort of WREGIS registration, Energy Trust should consider all aspects of value including their value to the utility system and not just "market value." As a result of this discussion, staff will revise the proposal to eliminate the word "market" as a qualifier to the word "value" in the Principles section of the policy. Determining value under the policy, as revised, would require an annual presentation to the board to determine whether the cost and effort of registering certain RECs in WREGIS is disproportionate to the value of such RECs. In this annual presentation, staff will provide information on market and *other* values. Margie also asked that the proposed policy be revised to be more explicit and describe that if the board determines that the cost and effort of registering certain RECs outweighs the value of such RECs, they will authorize staff not to register such RECs in a formal board resolution.

The committee expressed support for the revised REC policy with the changes discussed at the meeting and recommends its approval by the full board. Because of the complexity of the policy and because of board and Renewable Energy Advisory Council (RAC) involvement development of the proposed changes, the committee recommended that the policy be placed on the regular agenda for review by the full board.

Staff then asked for, and the committee agreed to, time to preview for the committee a possible implementation plan for the coming year if the policy, as revised, were to be fully approved by the board at its next full board meeting. As background, Jed Jorgensen, renewables program manager, informed the committee about utility and OPUC information regarding REC value. In addition, Jed reported that efforts to promote a form of deemed generation estimates for WREGIS registration of RECs generated by residential rooftop solar projects have been suspended. In the course of reviewing such a proposal, significant and unanticipated opposition emerged because of the possible

dilutive effect that such a strategy could have on the California and other Renewable Portfolio Standard (RPS) policies. As a result of the arguments opposing this strategy, no proposal will move forward with WREGIS. That information, along with an update of REC market value as described in the Bonneville Environmental Foundation REC report completed earlier in 2015, suggests that the cost and effort of REC registration outweighs current REC value for residential rooftop solar projects funded with assistance from Energy Trust. A similar conclusion was presented with respect to small Other Renewables projects where neither the project owner nor the utility is interested in registering the project's RECs. The committee agreed that staff will present a full report and proposal for both categories of RECs to the full board if the full board approves the revised REC policy at its next meeting.

Consent Agenda Policy

The Consent Agenda Procedure Policy was up for its regular three year review. Editorial changes only were proposed, primarily to reflect the changed project approval process for "Other Renewables" projects. Committee members suggested that the bullet regarding the procedure for renewables projects approval be moved into the second section of the policy. With that change, the revised policy was approved by the committee and recommended for approval by the full board in the consent agenda portion of the next full board meeting.

Waste-to-Energy Policy

The Waste-to-Energy Policy was also up for its regular three year review. Editorial changes only are proposed, primarily to reflect that inclusion of the Biopower Program into the Other Renewables Program. The committee recommended no additional changes and recommended the revised policy for approval by the full board in the consent agenda portion of the next full board meeting.

Consent to Appointment of Member to the Conservation Advisory Committee (CAC)

In accordance with CAC and board rules, Policy Committee consent is required for formal membership on Energy Trust's advisory committees. Policy Committee consent was requested for appointment of Tyler Pepple to represent the Industrial Customers of Northwest Utilities (ICNU) on the CAC. ICNU has had representation on the CAC in prior years and wishes to have representation again. Staff indicated strong support of this recommended appointment. ICNU is an important voice on energy issues in the region, representing a large block of utility customers and Energy Trust program participants.

ICNU recommended, and staff supported, the appointment of Tyler Pepple. Tyler is a partner in the law firm of Davison Van Cleve, P.C. which has represented ICNU for many years. Tyler serves as ICNU's primary representative on most energy efficiency issues in which it is involved. He drafted and sponsored ICNU's comments in the Oregon Public Utility Commission's investigation into large customer energy efficiency limitations and continues to represent ICNU in the legislative work group that has grown out of this investigation. Tyler also serves as ICNU's representative on the Puget Sound Energy's Conservation Resource Advisory Group. Tyler is knowledgeable about the issues and will bring valuable perspective to the CAC.

The committee unanimously supported the appointment of Tyler Pepple to the CAC.

Brief Updates

Margie provided a brief update to the committee on the status of the stakeholder conversations regarding the structure of the public purpose charges that have emerged in the context of the large customer docket. Debbie provided a brief update to the committee regarding Energy Trust's involvement in discussions about Oregon compliance with the Environmental Protection Agency's recently released Clean Power Plan guidelines. Energy Trust will continue to work with the three state agencies steering the state response and plan, DEQ, ODOE, and the OPUC, and will keep the committee informed.

The meeting adjourned shortly before 5:00 pm. The next meeting of the Policy Committee is scheduled for November 17, 2015.

Board Decision
Amending Energy Trust Renewable Energy Certificate Policy

November 4, 2015

Summary

Amend the Energy Trust renewable energy certificate (REC) policy as shown in Attachment 1:

(1) Allow Energy Trust not to register RECs in the Western Renewable Energy Generation Information System (WREGIS) where the board, in consultation with the utilities and the Oregon Public Utility Commission, concludes the effort and expense are disproportionate to REC market value;
(2) Coordinate policy with utility green-power programs and rate processes by reducing Energy Trust's share of RECs to the extent that a utility retains RECs; and
(3) Make minor changes clarifying the mechanics of the policy.

Background

- Although the public-purpose law does not mention RECs, Energy Trust decided early on to claim RECs in exchange for project incentives, recognizing that RECs are a value associated with these projects that should be protected for ratepayers.
- Initially, Energy Trust decided that the value of RECs was nominal or unascertainable and, because incentives invariably exceeded any value, Energy Trust should take title to *all* RECs if it provides *any* incentive.
- In 2004, after discussions with the Renewable Energy Advisory Council (RAC) and the OPUC, Energy Trust established a written policy under which Energy Trust's REC share was based on how much of a project's above-market costs Energy Trust pays, *pro rata*.
- In 2007, Oregon and other states enacted renewable portfolio standards (RPSs) and REC "compliance markets" emerged. Some project owners argued that future REC values could be much higher than Energy Trust's incentive. The board amended its REC policy to account for market values.
- Under the amended policy, Energy Trust will:
    - survey REC markets in consultation with the utilities and the Oregon Public Utility Commission
    - calculate the incentive's pro rata contribution to above-market costs
    - compare the value of the pro rata share of RECs to their market value
    - If the pro rata value is less than the market value, negotiate a lower share but at least as many RECs as the incentive would buy on the market
    - If the pro rata value is more than the market value, take the full pro rata share.

Discussion

- The first amendment, in section 1 of Attachment 1, would establish a procedure by which the board could in the future allow us not to register RECs in WREGIS if the cost of doing so is disproportionate to REC value.
- Under this amendment, staff would consult with the utilities and the Oregon Public Utility Commission and then report REC market prices to the board and RAC annually, along with the cost and effort involved in securing and registering them. Where the cost and effort exceed REC market value, staff may seek board permission not to register RECs. If the board concludes that the cost and effort are disproportionate to the REC value, it may exempt the RECs from WREGIS registration.

- The proposal was prompted by experience with small, net-metered solar projects. Energy Trust has more than 7,000 such projects, currently about 25% of annual REC production from incentivized projects, and the number is growing. To count these RECs toward the Oregon RPS, they must be registered in WREGIS. WREGIS currently requires the output of each project to be metered and reported by a Qualified Reporting Entity (QRE). However, the cost of metering and arranging QREs so far exceeds the market value of the RECs as to be prohibitive.
- For more than five years, staff has looked for ways to reduce these costs, without success. A proposal to allow Energy Trust to upload estimated, rather than metered, generation from net-metered solar projects into WREGIS to then count toward the RPS is not able to move forward.
- The pros and cons of this amendment:
    - Pros:
        - Makes the REC policy more flexible when REC registration is impractical
        - Reduces project metering and QRE costs
        - Reduces complexity in small project transactions, a barrier to development
        - Frees up staff time for project work
    - Cons:
        - RECs could not be used for compliance with RPS; however, utilities expect REC surpluses through early 2020s, and Energy Trust's REC holdings are a very small percentage of RPS requirements.
- <u>The second amendment</u>, in Attachment 1, section 2, last bullet:
- In 2014, PGE and Pacific Power began filing with the OPUC new avoided cost rates for renewable energy projects. Under the new rates, the utilities take RECs from projects under certain circumstances. With Energy Trust's REC policy, the utilities and Energy Trust would together take more than 100% of project RECs. This situation can also occur for some projects that receive grants from Pacific Power's Blue Sky program.
- The proposed amendment would reduce Energy Trust's share of RECs to the extent that a utility retains RECs for the benefit of its ratepayers via a green power grant program or power purchase agreement.
- The pros and cons: The amendment would align the policy with utility programs, avoiding over-allocation of RECs, and remove a source of complexity in project transactions. We are unaware of any disadvantages.
- <u>A third amendment was originally proposed but has been withdrawn.</u> That amendment would have accommodated certain project owners aiming to satisfy independently-established environmental or "green" goals, not owners seeking to profit from REC trading strategies, by permitting such project owners to provide eligible replacement RECs to Energy Trust.
- Pacific Power and PGE strongly opposed this third amendment proposal on grounds that it results in RECs from ratepayer investment that may not provide compliance under either regulatory or RPS or fuel mix requirements. While Energy Trust staff believes this proposal would support additional projects, the number of projects and generation at issue may not be significant enough to warrant further engagement with the utilities. Staff has, therefore, withdrawn its proposal for this third amendment.
- <u>An option staff explored but does not recommend</u>: Staff discussed with the policy committee the possibility of changing the basis for calculating Energy Trust's share of RECs from above-market cost to total project cost. Such a shift would facilitate project negotiations.
- Some members of the policy committee had reservations about the option because it would produce significantly fewer RECs for Energy Trust and ratepayers. OPUC staff were concerned

that it would not be wise if greenhouse gas reduction regulations are adopted. For these reasons, staff did not advance it.

Recommendation

Amend the Energy Trust REC policy as shown in the attachment:

1. Allow Energy Trust not to register RECs in the Western Renewable Energy Generation Information System (WREGIS) where the board concludes the effort and expense are disproportionate to the REC market value based on market value analysis presented by Energy Trust staff after consultation with the utilities and the OPUC;
2. Coordinate policy with utility green-power programs and rate processes by reducing Energy Trust's share of RECs to the extent that a utility retains RECs for the benefit of its ratepayers via a green power granting program or power purchase agreement; and
3. Adopt minor changes, primarily in section 2 "Ownership," clarifying policy mechanics.

RESOLUTION 759
AMEND ENERGY TRUST RENEWABLE ENERGY CERTIFICATE POLICY

WHEREAS:

1. **RECs represent renewable energy values that should be protected for ratepayers in Energy Trust programs.**
2. **In protecting this value, Energy Trust recognizes that: (a) there may be circumstances in which the cost of registering RECs in WREGIS is prohibitive; (b) Energy Trust's REC share should be coordinated with utility green-power programs and rate processes; and (c) owners of custom projects may keep RECs to meet environmental or "green" goals if the owner provides substitute RECs meeting certain requirements aimed at protecting ratepayers represented by Energy Trust.**
3. **These principles should be incorporated in Energy Trust policy.**
4. **This policy, up for its regular three year review, was reviewed by the Policy Committee and is recommended for approval by the full Energy Trust board through the consent agenda at its next fully board meeting.**

It is therefore RESOLVED that the Board of Directors hereby amends the Energy Trust REC policy as shown in Attachment 1, to:

1. **Allow Energy Trust not to register RECs in the Western Renewable Energy Generation Information System (WREGIS) where the board concludes the effort and expense are disproportionate to the REC market value;**
2. **Coordinate policy with utility green-power programs and rate processes by reducing Energy Trust's share of RECs to the extent that a utility retains RECs for the benefit of its ratepayers via a green power granting program or power purchase agreement; and,**
3. **Adopt minor changes, primarily in section 2 "Ownership," clarifying policy mechanics.**

ATTACHMENT 1

4.15.000-P Renewable Energy Certificate (REC) Policy

History			
Source	Date	Action/Notes	Next Review Date
Board Decision	March 3, 2004	Approved (R256)	February 2005
Board Decision	February 16, 2005 (residential tags)	Amended (R313)	
Board Decision	April 6, 2005	Rescind R313	February 2008
Board Decision	March 28, 2007	Amended R433	February 2010
Policy Committee	October 12, 2010	Reviewed, no changes	October 2013
Board Decision	May 4, 2011	Amended R584	May 2014

PRINCIPLES

The following principles should guide Energy Trust's ownership of renewable energy certificates (RECs) generated by renewable resources:

- **RECs generated by renewable energy are one of the multiple values for Oregonians provided through investing in renewable resources.**
- **Energy Trust RECs should be used for the long-term benefit of customers of Pacific Power and Portland General Electric, as long as the effort and expense associated with registering them is not disproportionate to their value.**
- **The disposition (retention, transfer) of RECs will coordinate with and further the goals of Energy Trust, state policies and regulatory requirements.**
- **Where Energy Trust takes ownership of RECs, its ownership should reflect both the REC value and the support provided by Energy Trust.**
- **Energy Trust should coordinate its REC policy with utility green power programs and rate processes.**
- **Energy Trust ownership of RECs and the mode of delivery of RECs to Energy Trust should be flexible over time, while reinforcing incentives for long-term project performance.**

POLICY

1. **Annual Board Review**
   - **Energy Trust will ascertain market values and forward price curves for relevant types of RECs and update them periodically.**
   - **In order to ascertain market values and forward prices curves for relevant types of RECs, Energy Trust will consult with PGE, Pacific Power and the OPUC staff and will give consideration to federal and state policies that may affect such values and forward price curves.**
   - **Energy Trust will track the cost and effort involved in registering RECs and report it to the RAC and the board at least annually, and where the market value of any given REC category is less than the cost of registering them, recommend whether to continue to register them in WREGIS.**
   - **Where the board determines, after RAC review, that the cost and effort entailed in registering RECs of a given type is disproportionate to the market and other values associated with RECs, the board may authorize staff to take title to the RECs without registering them in WREGIS and shall effectuate such authority by board resolution.**

2. Ownership

- **Where the board determines that Energy Trust should secure RECs for the benefit of ratepayers, the quantity of RECs for which Energy Trust will take ownership rights will be based on the ratio between Energy Trust's incentive and above-market cost, with an adjustment in cases where the REC market value exceeds the per-REC value of the incentive, determined as follows:**
  - **Step 1: Multiply the number of RECs that would be generated by a project over the term of the funding agreement with Energy Trust by the percentage of the above-market cost represented by Energy Trust's incentive.**
  - **Step 2: Divide the incentive amount by the quantity of RECs calculated in Step 1.**
  - **Step 3: Compare the per-REC value of Energy Trust's incentive to the REC market value ascertained in Section 1 of this policy.**
  - **Step 4: If the per-REC value of the incentive exceeds the per-REC market value, Energy Trust will take the full amount of RECs calculated in Step 1. If, however, the per-REC market value exceeds the per-REC incentive value, Energy Trust will reduce its REC ownership so that the per-REC incentive value is equivalent to the per-REC market value.**
- **Energy Trust will reduce its ownership of RECs to the extent that a utility retains RECs for the benefit of its ratepayers pursuant to the utility's green power program or power purchase agreements.**

3. Delivery of RECs

- **Unless the Energy Trust board determines under Section 1 that a type of REC need not be registered in WREGIS, RECs should be delivered to a utility WREGIS account specified by Energy Trust.**
- **Energy Trust may agree to up-front retention of RECs by a developer or project owner if there are contractual assurances that future RECs will revert to Energy Trust.**

Moved by: Seconded by:

Vote: In favor: Abstained:

Opposed:

Tab 6

Strategic Planning Committee Meeting

October 6, 2015, 2:00–3:30 pm

Attending at Energy Trust offices
JP Batmale, Fred Gordon, Margie Harris, Steve Lacey, Debbie Menashe, John Volkman, Warren Cook

Attending by teleconference
Mark Kendall, Susan Brodahl, Ken Canon, John Reynolds, Elaine Prause

Update on Establishing Metrics for Key Process Areas
Staff presented an update on its activities related to establishing operational improvement metrics for four key operations processes to be addressed for efficiency improvements: Procurement, Incentive Payment Processing, Customer Information and Customer Service, and Energy Project Tracking. Staff reported that in September, Energy Trust engaged Coraggio Group to develop progress metrics for these operations processes and two categories of metrics have been selected: Payment Accuracy % and Process Time and/or Cycle Time. Finance staff is currently working to develop appropriate baselines in these areas, based on Coraggio training. Once baselines are set, staff will be able to report and track on progress for the Procurement process.

Coraggio is working across the operations group to train how to establish metrics for projects as they start. Coraggio is also working on the next specific process area for metric development: improvement in incentive payment processing, a process changed through the ISI project. Unlike the Procurement process, the Incentive Payment Processing process will require looking backward to measure improvements from previous processing systems to the new.

The committee expressed interest in speaking directly with Holly Valkama at Coraggio to learn best practices for board-level identification and use of metrics for operations processes. Mark Kendall will contact Holly directly.

Emerging Tech Metric Proposal
Following discussion at the committee's last meeting, staff has revised its proposal for an Emerging Tech Metrics for electric technologies. Based on the earlier discussion, staff revised its proposal such that the committee track Energy Trust's progress towards supporting emerging technologies to replenish the electric energy efficiency resource in two ways: 1) by a quantitative metric for NEEA-identified "ready for scale-up" resources (35 aMw) and 2) through progress indicators for Energy Trust's own emerging technology development activities. Staff proposed progress indicators for the Energy Trust efforts, and committee members suggested some revised language. The progress indicators also reference a report out on pilot projects underway, and committee members expressed strong interest in such a report because it provides specific examples of Energy Trust's approach to replenishing energy efficiency resource. Energy Trust is preparing a pilot report for the OPUC and will provide the same information to the Strategic Planning Committee. A revised proposal for emerging tech metrics, reflecting the committee discussion, will be circulated to committee members and used for ongoing reporting.

The committee then discussed whether the "emerging tech" label was broad enough to describe the full array of options used by Energy Trust to replenish the energy efficiency resource. The committee concluded that a better label is "Emerging Efficiency Resource" which more clearly describes not only technologies, but behavioral and other innovative approaches aimed at increasing the available

energy efficiency for planning. Staff will incorporate this revised label and title into the proposal to be recirculated to committee members.

Update on Baseline for Expanding Participation

Staff updated the committee on its progress towards establishing a baseline for the Expand Participation strategy. Staff's initial focus and review has been on the residential participation rates. Initial review indicated a pronounced lower level of participation in Energy Trust residential program offerings outside of the tri-county area. The initial analysis compared participation rates by census tract. That analysis gave consideration to variables such as income, ethnicity, and single versus multifamily, because census data provides that information. Energy Trust-wide, this analysis showed that participation rates were close to average or higher for lower income customers, non-whites, and multifamily, but that customers outside the tri-county area (metro Portland) appeared to participate at a much lower rate. A second analysis, currently underway, will use data on individual participants instead of census tracts to better understand the tri-county/rest of the state differences by fuel type and program. Staff reported to the committee on the preliminary results of this review. In the preliminary analysis, staff has not been able to factor in retail lighting programs and NEEA. Initial indicators in other offerings are that participation rates for the electric efficiency programs are on average higher outside the tri-county area. Participation rates for gas programs, however, are lower than average outside the tri-county area. Furthermore, this difference for gas may be largely present in the Products program and not in the Existing Homes program. Further analysis is required to confirm this conclusion.

This is important and useful information for program design around the entire service territories. Committee members discussed the initial report. Staff will provide a full report on research efforts and a proposed baseline at the next committee meeting.

Brainstorming Strategic Planning Retreat Topics

The 2016 Board Strategic Planning Retreat is scheduled for May 19-20, 2016. At the next committee meeting in February, staff will present a draft agenda for the retreat. The retreat agenda will include time for reporting and discussion on implementation progress with respect to the 2015-2019 Strategic Plan. Committee and staff discussed additional potential agenda topics that are of interest to committee members. The possible topics are numerous and a small set of examples of possible topics includes EPA's Clean Power Plan and implications for Energy Trust, behavioral strategies for efficiency and renewables project efforts, Energy Trust's role in distributed energy system optimization, change and transition management, the Power Council's Seventh Plan, storage for renewable energy, and the considerations in anticipation of the public purpose charge 2026 sunset date. Staff will begin working on a draft retreat agenda and continue planning for the retreat itself, including meeting with Nick Viele who has agreed to facilitate the retreat.

The meeting adjourned at 3:30 pm.

The next meeting of the Strategic Planning Committee is scheduled for February 2, 2016.

Tab 7

Renewable Energy Advisory Council Meeting Notes

September 9, 2015

Attending from the council:
Diane Broad, Oregon Department of Energy
Jason Busch, Oregon Wave Energy Trust
Shaun Foster, Portland General Electric
Kari Greer, Pacific Power
Robert Grott, Northwest Environmental Business Council
Suzanne Leta-Liou, Atkins
Matt Mylet, Beneficial State Bank
Michael O'Brien, Renewable Northwest
Elaine Prause, Oregon Public Utility Commission
Frank Vignola, Solar Monitoring, University of Oregon
Dick Wanderscheid, Bonneville Environmental Foundation
Peter Weisberg, The Climate Trust

Attending from Energy Trust:
Susan Badger-Jones
Amber Cole
Hannah Cruz
Sue Fletcher
Matt Getchell
Jeni Hall
Jed Jorgensen
Betsy Kauffman
David McClelland
Dave Moldal
Gayle Roughton
Lizzie Rubado
Peter West

Others attending:
Kyle Diesner, City of Portland
Cindy Dolezel, Oregon Public Utility Commission
Alisa Dunlap, Pacific Power
Kendra Hubbard, Oregon Solar Energy Industries Association
Mitt Jones, Home Performance Guild of Oregon
Pooja Kishore, Pacific Power
Lisa Logie, Solar Oregon
Brendan McCarthy, Portland General Electric
Alan Meyer, Energy Trust board
Sara Parsons, Iberdrola Renewables
John Reynolds, Energy Trust board
Matt Shane, Oregonians for Renewable Energy Progress
Ann Siqveland, OneEnergy Renewables

1. Welcome and introductions

Betsy Kauffman convened the meeting at 9:30 a.m. The agenda, notes and presentation materials are available on Energy Trust's website at: www.energytrust.org/About/public-meetings/REACouncil.aspx.

2. Budget themes

Staff presented the themes and activities that will be reflected in the 2016 budget for the Solar and Other Renewables programs.

Betsy commented on current market trends including falling solar prices, the investment tax credit expiration, fewer state incentives and potential limits for projects at qualifying facilities. The renewable energy sector will continue into 2016 with a portfolio of technologies focusing primarily on solar installations, and will continue building a pipeline of hydropower and biopower projects.

Dave McClelland presented the 2015 solar pipeline and the 2016 solar budget themes.

Dave McClelland: The 2015 solar pipeline is currently 11 MWdc in commercial project reservations, and the residential program has had its strongest year to date with 1,000 completed projects, a 40 percent growth over last year.

Alan Meyer: What does it mean when reservations are in a prior year?
Dave McClelland: Reservations reflect dollars and energy that are still in the pipeline, not completed projects. Some projects take a year or longer to complete installation due to their reliance on other funding sources with long grant cycles. Energy Trust has offered extensions for some projects in the commercial program facing these challenges. Additionally, the pipeline graph shows projects by application submittal date, meaning solely project activity, not installed MW to date. It's not uncommon for a project application to be submitted the year prior to its installation.

Betsy: There will be a budgeting 101 segment in the October Renewable Energy Advisory Council meeting when we'll detail the fund reservation process.

Suzanne Leta-Liou: Are pipeline trends in the residential market consistent with those of the commercial market?
Dave McClelland: Yes, assuming the investment tax credit is not extended. The commercial market has longer project time frames. We'll see a strong pipeline through the beginning of next year, which will taper off toward year-end when the focus shifts to installations.

> Energy Trust operates on a stepped incentive structure. Making small reductions in our incentives allows us to support more projects and enables us to offer continuous funding to customers throughout the year.
>
> In 2015, the Portland General Electric residential incentive started at $1.00/watt. There have been four reductions this year, or a 30 percent decrease. Despite this drop in incentives, there has been no reduction in demand. The residential incentive for Pacific Power has had a 10 percent reduction, and the incentive is expected to remain stable for the remainder of the year.

Alan: Is the decrease a result of falling prices or sensitivity of the market?
Dave McClelland: A combination of falling prices and demand, driven by a sense of urgency in regards to the investment tax credit expiration.

Jason Busch: Does the investment tax credit apply to residential projects?
Dave McClelland: Yes, the residential investment tax credit goes away completely and the commercial tax credit drops from 30 to 10 percent at the end of 2016.

Jason: In regards to the stepped incentive structure, does the incentive rate reset at the start of each year?
Dave McClelland: There's not usually a reset, although the end of 2016 will be unique. We might announce a change in the 2017 incentive rate early next year to create some certainty and stability in the market.

Jason: Is the volume of incentives always lower for Pacific Power?
Dave McClelland: Traditionally yes, though 2016 is likely to be more balanced as we'll have a more even amount of funding for both utilities.

Peter Weisberg: Why are the Pacific Power numbers lower, both in installed projects and in budget allowance?
Dave McClelland: We typically have less Pacific Power funding, and there are more options for solar than for other renewables projects in PGE territory. Pacific Power territory holds more opportunity for other renewable technologies.
Betsy: It's also worth noting that some funding has moved into the solar PGE budget this year. There were challenges bringing in non-solar projects. In response to the expiration of the investment tax credit, we allowed some more PGE funding to be made available for solar projects.

Shaun Foster: Have you noticed contractors considering funding allowance when determining their service areas?
Dave McClelland: Somewhat. Larger-scale third-party developers have focused on the Portland area where funding is readily available. In Pacific Power territory, we tend to see smaller developers doing direct sales.

Suzanne: Is it possible there will be an increase in Pacific Power incentives to drive the market?
Dave McClelland: We're somewhat restrained by above-market costs, though there is potential that we lowered the incentive too quickly this year. It's something we're still considering.

> Soft cost strategies are underway for 2015, and the draft benchmarking survey is complete. Key findings indicate a need for customer acquisition and defining other soft costs. In response to these findings, the program is focusing on business development efforts, such as small business mentoring to help contractors understand and manage cost drivers. The program is also focusing on customer acquisition efforts, such as a bid request form that generates leads for trade allies. In 2016, the soft costs survey will be repeated, refocusing on the outreach and other cost definitions and a roadmap.

Jason: Are there policies regarding smart inverters, such as allowing blackout startup and incentivizing off-grid capability and resilience?
Dave McClelland: The east coast is ahead of us on resiliency because of Hurricane Sandy aftermath. We're interested in doing more in this area. Energy Trust has a part to play on smart inverters, but can't be leading this effort. It should be led by the Oregon Public Utility Commission and the utilities. Oregon is most likely to succeed here if we watch and follow the technical standards being developed in California.

Suzanne: A lot of the market in the Portland metro area consists of third-party contractors. Is there a difference between their knowledge base and the knowledge base of other types of contractors?
Jeni Hall: Third-party contractors had more defined responses because they report similar information directly to their investors. While they had more information, it didn't change where the costs are located. We're not as focused on helping third parties but will also report findings.

Jason: In your review of soft costs, do some developers have a better understanding than others?
Dave McClelland: There's a variety of understanding of soft costs, and also a large range of installation costs, which has made comparison difficult.

Matt Mylet: Is there any interest in a centralized tool for lead generation?
Dave McClelland: We've sent about 950 solar leads directly to contractors since we launched our bid request form, and so far contractors have had very positive feedback. For next year, we're looking at opportunities to increase the value of this service by better qualifying leads.

Kendra Hubbard: How many of the leads distributed have turned to installations?
Dave McClelland: We're still working on that number. We need to make some improvements to our conversion tracking and reporting.

Suzanne: Is the contractor bid information being collected?
Dave McClelland: No, the lead generation agreement is separate and its focus is to set trade ally response terms in the interest of the customer.
Suzanne: If this is something that you can require, the information will help with soft costs analysis.

John Meyer: Is Mapdwell® still an option?
Dave McClelland: Mapdwell is happening separately to lead generation, and we're evaluating both of those options.

Jason: This effort is described as a soft cost reduction. If Energy Trust is helping specific developers instead of helping the market, how is that goal achieved?
Dave McClelland: One outcome of our survey was that soft costs are as unique as the contractors, and we're limited in what costs we can address at the market level. The business mentoring that we're proposing is targeted at contractors that are active and successful in the market, and also are smaller businesses that want to grow. Costs need to be in parallel with the value of the energy to achieve our long-term goal of creating a market that can thrive without incentives.

Several members discussed direct assistance provided to solar installers in comparison to trainings provided by Advanced Energy for efficiency contractors. Betsy will add this topic to a future advisory council meeting.

Jed Jorgensen presented the Other Renewables 2015 pipeline, advocating for use of the term forecasts instead of program goals, as it implies a more realistic outcome. Jed also went over 2016 budget themes for Other Renewable technologies.

Jed: By year-end, we expect to have 2 aMW installed, consisting of two biogas projects and two hydropower projects. Between this year and last, both the hydropower and biopower pipelines have doubled, while geothermal and wind have continued to be more reactive markets. Overall, this year has been focused on building the pipeline by providing project development assistance. We have not yet selected any projects submitted through competitive solicitations, as they all needed more development.

> In 2016, we'll continue with our current technology portfolio, focusing on hydropower and biopower pipeline development. Outreach efforts will also play a large role. We will coordinate workshops for owners to learn from one another's system operations, and to tour each other's facilities. The expected outcome is that owners will learn about each other's operation and maintenance techniques, share best practices and provide a general forum for owners to reflect on similar challenges.

Elaine Prause: There's currently a large amount of project development in the pipeline. Does that indicate that there will be a shift to project incentives in 2017 and 2018?
Jed: It's hard to say. A lot of projects applied this year. If they move forward with development assistance, they'll likely be ready for installation next year. However, it's likely that the hydropower projects will take longer, especially those involved in irrigation, as they're very large system improvement projects.

Frank Vignola: Is there one key problem that keeps projects moving slowly?
Jed: Complexity. They're all custom projects and have a lot of moving parts, such as permitting, land ownership, large costs, etc.
Betsy: A great analogy is that a solar project is like buying a fridge, and a biopower project is like remodeling a kitchen or building a whole new house.

3. Executive director recruiting
John Reynolds and Amber Cole presented the timeline for the Energy Trust executive director transition and requested feedback on a list of capabilities and traits.

Suzanne: There's a strong connection between efficiency and renewable efforts. It would behoove the person chosen to fully understand their interaction and have the ability to push forward with leadership in this area.
John: It is important, though the line here is often blurred between what Energy Trust can do and what is considered the responsibility of the utilities.

Jason: I'd like to see strong familiarity with Oregon's political system, and the ability to be proactive in regards to legislation. Currently, resiliency is a big concern in the state, and the next leader should position Energy Trust to add value there. Someone who can remain as apolitical as possible while knowing where and when to be involved. At the very least, they should be extremely comfortable working in the political environment.
John: It's difficult to add this as a requirement, as open lobbying is not allowed.

Matt Mylet: Energy Trust already has a lot of industry knowledge in its staff. I would like to see the person chosen for this position be held in high esteem for their management skills. While it is very important to find someone that has a certain level of experience in the sector, it is ultimately their strong leadership and management skills that will allow them to succeed and be able focus on the non-energy related challenges that Energy Trust faces.

Kendra: What is the level of involvement of stakeholders?
John: Engagement varies. There are individual conversations and also group conversations.

Dick Wanderscheid: The utility world is going to change in the next few years, and Energy Trust's role may change considerably. It will be more important for the new director to think outside the box, redirect the company to new levels and new roles, and empower staff to innovate and work in new ways.

Suzanne: What does Energy Trust culture mean?
Amber Cole: The culture evolves constantly and consistently. We have a culture of change and inclusion. Staff are included in generating new ideas, strategic planning and forward management, and it was made clear by both Ken Canon and Mark Kendall that this should remain the case. Additionally, we're not looking for someone to fix the company, but rather to sustain and continue to build it.
Suzanne: I would suggest defining the aspects of the culture that you'd like to retain and anything new that you're looking for, and explicitly calling those out in the announcement.

Frank: Make sure to search for a longer-term candidate, not just someone interested in a stepping stone.

Matt Mylet: Strategic thinking, planning and execution are most important. Staying relevant to the industry while being dynamic and moving along with the sector will be a primary role of the executive director. Once incentives burn off, this will be key to keeping the ball rolling.

Dick: Bear in mind this is a complex process. Wordsmithing can only help keep you in line to a certain extent. Be conscious of the fact that the applications will be highly reflective of the hiring process, and interviews will change your perceptions.

There was consensus among Renewable Energy Advisory Council members that the transition period should be as short as possible, and the salary range should be an open discussion point. Council members should send candidate suggestions to Ken Canon.

4. Draft changes to the Renewable Energy Certificate policy

Energy Trust is proposing changes to the Renewable Energy Certificate, REC, policy, and the utilities provided feedback that can be found in the REC policies document. Renewable Energy Advisory Council members discussed details of the proposed changes.

Jason: What benefit does this have to the generator? What value does the claim of green energy have?
Jed: We're trying to meet a customer need. For example, the City of Gresham is trying to meet specific green energy goals, and the RECs are claimed towards its municipal goal. To be Federal Trade Commission compliant, project owners are contractually required to own the RECs to claim that they are using the green power generated at the site.

Brendan McCarthy: PGE is concerned that the proposed policy revision encourages REC shuffling. For example, in Colorado, utilities get the offtake from the community solar project and are allowing shareholders to buy in by purchasing RECs that come from projects in Texas. Customers aren't purchasing RECs originating from the Colorado community solar initiative, and are essentially receiving "greened up" RECs associated with projects in Texas.
Suzanne: The same issue of null power and REC shuffling between states has come up before. This is not a new issue, and it is a valid concern in terms of REC viability.

Pooja Kishore: Pacific Power agrees with the issue of bundling RECs. Substitutes are not fair, as all RECs are not created equal. There's no control over the RECs to ensure that they're not being sold, and it's not clear how much this has been vetted.
Brandon: Yes, additionally, REC shuffling is not a policy we'd like to encourage because there's enough room in the market for people to start trading RECs as a business.

Dick: Are there projects that didn't go forward as a result of the REC agreement?
Jed: Yes.

Elaine: Option three is something that may be rarely used, but it's on the list because it provides a certain level of solution. Do you see this issue in the project pipeline?
Jed: Yes and no. This conversation hasn't started with a lot of the projects that are receiving project development assistance. It's a good question about whether or not it's worth providing assistance if the project will eventually ask for a share of the RECs. There may be more potential for REC problems among biopower projects than among hydropower projects.

Dick: If we see projects not being built because of the REC policy, it's up to the board to decide whether or not the projects are more valuable than the costs to the customers of implementing option three.

Diane Broad: There's nothing about the proposed changes that violate statues or rules. The Renewable Portfolio Standards law would not be evaded by turning toward qualifying facilities projects. This is a board decision.

Michael O'Brien: When will the board make a decision? Can we gather written responses?
Betsy: Yes, there is time.

5. Public comment
Suzanne has accepted a global market strategy position at SunPower.

6. Meeting adjournment
The meeting adjourned at 11:58 a.m. The next Renewable Energy Advisory Council meeting is scheduled on October 21.

Conservation Advisory Council Meeting Notes

September 9, 2015

Attending from the council:
Warren Cook, Oregon Department of Energy
Charlie Grist, Northwest Power and Conservation Council
Julia Harper, Northwest Energy Efficiency Alliance
Garrett Harris, Portland General Electric
Don Jones, Jr., Pacific Power
Don MacOdrum, Home Performance Guild of Oregon
Holly Meyer, NW Natural
Elaine Prause, Oregon Public Utility Commission

Attending from Energy Trust:
Susan Badger-Jones
Mike Bailey
Amber Cole
Kim Crossman
Sue Fletcher
Jackie Goss
Fred Gordon
Marshall Johnson
Erika Kociolek
Steve Lacey
Ana Morel
Thad Roth
Erin Rowland
Adam Shick
Julianne Thacher
Katie Wallace
Mark Wyman

Others attending:
Dave Backen, Evergreen Consulting
Susan Brodahl, Energy Trust board
John Frankel, NW Natural
Sara Fredrickson, CLEAResult
Chris Smith, Energy 350
Cameron Gallagher, Nexant
Mitt Jones, Home Performance Guild of Oregon
Alan Meyer, Energy Trust board
Tim Miller, Clean Energy Works
Greg Stiles, Ecova

1. Welcome and introductions

Kim Crossman convened the meeting at 1:30 p.m. and reviewed the agenda. The agenda, notes and presentation materials are available on Energy Trust's website at: www.energytrust.org/About/public-meetings/CACMeetings.aspx.

2. Old business

The council approved July meeting notes without comments or changes.

3. Executive director hire and transition

Susan Brodahl, a member of the board's Executive Director Transition Committee, presented plans for recruiting, hiring and transitioning to a new executive director. Energy Trust's current executive director, Margie Harris, will retire at the end of 2016.

Susan Brodahl: Based on discussions with the board, the Executive Director Transition Committee proposed a list of desired traits and capabilities of a new executive director: strategic thinking, planning and execution; executive level management; effective communications; belief in mission; sustaining Energy Trust's culture; and in-depth industry and subject matter knowledge. The committee is reaching out to stakeholders for input, and is seeking input and new ideas today from council members.

Susan Brodahl: What current and future opportunities and challenges should the board have in mind when selecting an executive director?

Julia Harper: Implications of the Environmental Protection Agency's Clean Power Plan.

Don Jones, Jr.: Flat or declining utility loads.

Marshall Johnson: Climate refugees.

Greg Stiles: 2020 federal lighting standards

Marshall: Opportunities related to carbon markets.

Garrett Harris: Challenges regarding cost-effective energy-efficiency measures given low costs of natural gas, changing code standards and market saturation of energy-efficiency measures.

Holly Meyer: Strategic thinking to position Energy Trust to solve the next challenges, such as how Energy Trust can fit into carbon reduction efforts. I also want to stress the challenge of finding cost-effective gas-saving measures.

Julia: Opportunities and needs to combine energy-efficiency with water conservation efforts.

Steve Lacey: Political acumen is missing from the list of desired traits.

John Frankel, NW Natural: Increased housing density in the Portland market and increased multifamily building construction.

Marshall: An urban planning background may be helpful.

Warren Cook: The current and future state of the public purpose charge and SB 838 funding.

Don Jones, Jr.: Energy policy chops, especially at the state level.
Don MacOdrum: I agree that the new executive director needs solid policy experience and legislative savvy.

Tim Miller, Clean Energy Works: A background in innovation, such as folding in other publicly funded objectives like resilience. Innovation in looking at new marketing channels, such as through partnerships.

Susan Brodahl: What capabilities and traits are most and least important to you?
Don MacOdrum: A new executive director needs all of those traits. We should be talking about the depth of expertise they need to have in each category. What is the minimum level of expertise or skill needed?

Susan: What's the least important trait? What can we train for?
Don MacOdrum: You can train for Energy Trust culture. In fact, less exposure to Energy Trust's history and culture may facilitate more innovation and opportunities to forge new relationships.
Don Jones, Jr.: I agree that culture is something you can train for.

Garrett: I don't think it's a bad thing for the new executive director to challenge Energy Trust's culture. I would tweak the language from "sustain" to "sustain and enhance." I think industry

knowledge is critical, but the incumbent does not necessarily need deep subject matter knowledge.
Holly: I agree that deep subject matter knowledge is not critical. I suggest breaking out industry and subject matter knowledge into two bullets. Communications skills are extremely critical.

Garrett: I suggest adding collaboration to the communications bullet.

Julia: The top qualities are strategic thinking, management and communications. Industry and subject matter knowledge are secondary to those core management and leadership skills. Finding someone who believes in the mission should be easy.

Don Jones, Jr.: Some industry and subject matter knowledge is important, though it doesn't need to be the candidate's top strength.

Don MacOdrum: You could combine the culture and mission bullets, and create a new policy bullet.

Susan Brodahl: Is it important for the person to be from the Pacific Northwest?
Council members agreed that it's an advantage but not critical.
Warren: The Pacific Northwest has unique energy issues that a candidate must understand.

Marshall: Innovation. Creativity. Change management. IT systems expertise.

Julia: Integrity is an important trait to add. It's important to preserve the integrity of the organization.

Susan Brodahl: What is most important about this hiring and transition process?
Don Jones, Jr: Hire the right person. Founder and successor transitions are very difficult.
Susan Brodahl: The committee is not just focused on selection, but also transition. We will be involved in the incumbent's first 18 months.

Don Jones, Jr.: Will the new executive director be an at-will or contracted employee?
Susan: Likely at-will, but I will need to refer that question to Human Resources.

Don MacOdrum: Continuity of leadership is important. We need systems in place that allow for the executive director to be innovative and creative.

Susan Brodahl: Send additional questions or comments to Ken Canon, Executive Director Transition Committee chair. Your feedback will be consolidated by the committee and presented to the full board.

Greg Stiles: I want to note what I learned in another stakeholder session, which is the committee will not use a headhunter.
Susan Brodahl: Energy Trust has a strong network and reputation, and we're not sure it's needed.
Don Jones: It could be helpful for a headhunter to find and encourage as many qualified applicants as possible.
Susan Brodahl: There is room in our timeline to engage a headhunter after we receive a first round of applications, if needed.

Holly: I feel strongly that the candidate should embrace the role of natural gas in our clean energy future, and not just focus on electric efficiency opportunities.

4. Gas fireplace market transformation studies

Mark Wyman, New Homes and Products manager, and Adam Shick, Planning project manager, presented the results of several recently completed studies on the market for direct-vent gas fireplaces and implications of these findings on future program design. Currently, Energy Trust provides incentives only for fireplaces in existing, not new, homes.

Adam: There are two components of fireplace efficiency: FE and ignition systems. Fireplace efficiency, or FE, is an estimate of the efficiency of gas fireplaces, also called thermal efficiency. Higher is better. Standing pilot lights are on constantly. With intermittent pilot ignition, IPI, the pilot is ignited first and then is used to turn on the main burner. When you turn the fireplace off, the pilot light turns off immediately. In this presentation, IPI and electronic ignition are used interchangeably.

> Energy Trust began offering incentives for gas fireplaces through a pilot in 2009. The offering was intended to get consumers to purchase fireplaces with higher FE ratings and move the market away from standing pilot lights and toward efficient ignition systems. In 2009, a survey of Oregon hearth vendors was undertaken to estimate the market baseline FE and prevalence of IPI. That study found that just under 40 percent of fireplaces had IPI and the average FE was 61 percent.
>
> The survey was replicated in 2013 when the program received anecdotal feedback that the fireplace market in Oregon had changed rapidly since the 2009 survey. The 2013 survey observed a large increase in average FE, from an average of 61 percent to an average of 68 percent, and a very large jump in the proportion of fireplaces with IPI, from 40 percent to 76 percent.
>
> To understand if these large changes were driven by Energy Trust, interviews with three market actors were undertaken in 2014. The outcome of the interviews was inconclusive. This led Energy Trust to undertake a more comprehensive study of the fireplace market, which is being presented today.
>
> In 2014, we conducted a market transformation study, asking manufacturers and distributors to forecast gas fireplace sales in Oregon and a comparison region consisting of Eastern Washington, Idaho and Montana through 2020. Idaho and Montana lack fireplace incentive programs. We looked for changes over time and differences between regions. We learned that the proportion of direct-vent gas fireplace sales with IPI were much higher in Oregon than in comparison regions. The proportion of high FE fireplaces was also higher in Oregon than in comparison regions. FE differences between regions are relatively consistent, and FE levels are not expected to change significantly by 2020.

Don Jones, Jr.: Are all gas fireplaces sold through distributors?
Mark: We have more to learn about the distribution model.
Don Jones, Jr.: In my experience, distributors have an accurate understanding of their markets.

Julia: Do any distributors cover Oregon and other states?
Adam: Yes, two of the three distributors we interviewed work in both regions.

Warren: Do rural differences account for differences in fuel sources?
Adam: No.

Susan Badger-Jones: How do you define rural?

Adam: The researchers advised us that the comparison regions were more rural than Oregon.

Adam: To learn about gas fireplace prevalence in new homes, we also conducted a survey of people living in homes whose builders received incentives through Energy Trust's New Homes program. We found that gas fireplaces are prevalent in new homes, and average FE and IPI prevalence appears to be lower than what we see in the Existing Homes market. We interviewed new home buyers to learn how much fireplaces are used in new homes, and found that they are used much less than fireplaces installed by residents of existing homes—an average of eight hours per week in new homes compared to 15 hours in existing homes. We concluded that the best opportunities for new home fireplace efficiency is in IPI.

John Frankel: The New Homes study is based on self-reported data from a warmer-than-average year and the Existing Homes study is based on metered data during a colder-than-average year. How can you compare these two studies?
Adam: For Existing Homes, we surveyed residents in addition to metering energy use. We calculated the difference between surveyed and metered results and applied that factor to the New Homes data.

Don Jones, Jr.: Builders of new homes install gas fireplaces for aesthetics, not for primary use as a heat source.
Mark: Fireplaces in new homes are not generally used as a secondary heat source. Additionally, new homes have more efficient mechanicals and shells, resulting in a lower baseload of heating to be displaced.

John Frankel: For new homes, awareness by builders about FE were low. FE is not posted on fireplaces, so it makes sense that awareness is lower.

Mark: The program is working on including fireplaces in Energy Trust's EPS™ model for rating the energy efficiency of new homes. Based on these studies, if Energy Trust were to offer incentives for fireplaces in new homes, the incentives would differ significantly from incentives for fireplaces in existing homes. This could result in market confusion.

Holly: I thought new homes incentives were based on packages, not individual incentives.
Mark: Yes, this is true for homes rated with EPS. We also offer incentives for individual products. We are collaborating with Northwest Energy Efficiency Alliance to develop a protocol for a standard performance-based new construction program. One limitation is the modelling software.

Mark: Objectives in 2016 include maintaining momentum on the prevalence of IPI. Research indicated that we have accomplished a lot of progress in the market, and we want to achieve 100 percent IPI. Two-thirds of gas fireplaces are installed in the new construction market. We want to continue momentum through the retail channel. We need more sales data to determine if we can achieve market transformation.

> In 2016, we will continue downstream incentives for FE and develop new mid-stream distributor incentives for IPI. The mid-stream incentives will help us make inroads into the new homes market. Thermal efficiency is not a viable resource in the new homes market. Electronic ignition savings are cost-effective in both markets.

Don Jones, Jr.: What are key efficiency features that determine the FE score of a fireplace?

Mark: It's like an Annual Fuel Utilization Efficiency, AFUE, rating. It's hard to isolate the cost of efficiency because the units have a lot of aesthetic features. More energy-efficient units can have lower costs in some cases
John Frankel: Everything about the fireplace determines the FE rating score, including glass, box type, log type and how the unit is sealed.

Fred: It's difficult to decide if we should do more research, which can be very expensive. Our research is well ahead of everyone else in the country.

Mark: The proposed 2016 Existing Homes downstream thermal efficiency offer is a $150 incentive for units with 70-74 percent FE and $250 for units with 75 percent FE or higher. Incentives today are $250 and $350, respectively. IPI would be required for all units to receive incentives.
Marshall: Units cost around $2,000.

Holly: What is the incremental cost between efficient and non-efficient units?
Mark: There is not consensus.
Warren: Current tax credits are $350 and $500.

Mark: The 2016 proposed residential midstream electronic ignition offer is $30. This is a distributor-facing offer. Savings are discounted. The goal is to hold the line on prevalence of electronic ignition in 2016 as incentives are transitioned upstream.

John Frankel: How do you define distributors?
Mark: Distributors are defined as anyone who buys from a manufacturer.

Mark: 2016 will be a transitional year. The limited upstream approach will provide a framework to forecast savings, allow time to build new business relationships and provide opportunities to establish distributor level baselines to transition to performance-based goals. This will give us a foothold to launching a mid-stream offer.

Holly: How do you know if $30 is enough to motivate distributors to fill out the paperwork?
Marshall: Distributors would install a quantity of fireplaces so that the $30 would add up to significant benefit.

Holly: Why are overall incentives going down?
Mark: We now better understand our impact on the market, and are working to finalize a determination as to the rate of influence our incentive has had. This influence rate will be applied as a net to gross ratio, discounting the amount of savings we claim on each IPI to reflect the degree to which we believe our incentive is responsible for the current market-wide prevalence of IPIs.

John Frankel: Regarding reducing FE incentives, on the HVAC slide, you have a better understanding of what the market looks like because you survey distributors. How do we know a customer will choose a more efficient unit when we drop incentives? I am concerned that we will lose ground by reducing incentives.
Mark: We can pull back from this offer if we feel like we are losing ground. We believe there is enough momentum in the market that this offer will be successful.

Elaine: With 91 percent of the market having IPI, distributors will get $30 for most of their sales.

Warren: Energy Trust shouldn't give up on serving the new homes market with gas fireplace offerings.

Fred: The challenge is how to identify new home buyers who will actually use their fireplaces.
Holly: Even if the first homebuyer doesn't use the fireplace, subsequent homeowners may.

John Frankel: Furnaces installed in new homes are two-thirds of the market and have a very low average efficiency level. Given our study took place during a very warm winter, we need to take another look at gas fireplace opportunities in new homes.

5. Turning on a dime: Efficacy of incentive bonuses in Production Efficiency
Jackie Goss, Planning engineer, presented an analysis on how bonus incentives influence project completion rates or enrollment patterns. Using project-level data from the Production Efficiency program, staff studied the effects of five distinct bonus design structures on participant attrition, energy savings and completion timeliness.

Jackie: Bonus incentives allow us to respond to changes in the market, encourage quick action, increase participation and test program design ideas. We've offered five bonuses since 2010. Each bonus was a response to a unique situation and we analyzed them each a bit differently.

> In 2011, the Oregon Department of Energy Business Energy Tax Credit was eliminated, resulting in fewer projects in the pipeline. The Production Efficiency program offered a 20 percent bonus to new custom lighting and streamlined projects that completed before year-end. The bonus accounted for a 13 percent increase in project volume and a 3.6 percent increase in electric savings, indicating that many small projects participated in the bonus.

Julia: How did the savings increase compare to the cost increase?
Kim: Cost increase was not analyzed. All bonus incentives remained cost-effective.

Charlie Grist: Do you think the bonus attracted smaller projects?
Jackie: Only small projects could complete during that time period.

Jackie: In 2012, the program offered a 20 percent bonus for new custom, lighting and streamlined projects if capital equipment was purchased within 90 days. The bonus was successful in increasing new project enrollments early in the year. Of those enrollments, 87 percent of bonus recipients completed projects in 2012, which is a typical completion rate.

> In 2014, the program offered a year-end bonus to encourage projects to complete in 2014. The bonus was a 20 percent additional incentive for custom capital projects completed by October 15, 2015. The goal was to reduce attrition. Four percent fewer projects than usual were abandoned, with 2.7 percent fewer projects delayed and 8.5 percent more projects advanced, which means they closed in Q4 2014 instead of Q1 2015.

Julia: Do bonuses take activity away from future quarters?
Jackie: I don't think this is a big concern. Industrial customers do multiple projects. The sooner they complete one project, the sooner they will move onto the next project, and the sooner society reaps the benefits of using less energy.
Kim: Bonuses give project champions a tool to move projects forward within their organizations.

Susan Brodahl: Does this create a workload burden during an already busy time of year?

Kim: Yes. When projects increase 13 percent, so does paperwork.

Jackie: In 2010, during an economic slump, the Production Efficiency program launched a 90x90 bonus, with an incentive cap of 90 percent of project cost for projects completed within 90 days. We raised the incentive cap instead of the incentive rate. The bonus was for operations and maintenance projects, which tend to be quick and low cost. In 2010, there was a huge increase in completed projects. This was repeated in 2011. After two years, it became a standard offering. However, more people took advantage of 90x90 when it was a limited-time offering. An additional goal of 90x90 was to get projects to complete on time. Average project time to complete dropped from 12 months in 2009 to four months in 2010.

> The last bonus, in 2014, was a Program Delivery Contractor, PDC, performance compensation bonus. Typically, most projects close in the last two months of the year. To encourage projects to complete earlier in the year and help the program evaluate achievement of goals earlier in the year, the program launched a PDC performance bonus. As a result, projects completed in Q2 increased and projects completed in Q3 and Q4 slightly decreased.

Kim: The hockey stick may be driven not by the market but by Energy Trust's contracting structures.

Garrett: Can self-directing customers take advantage of bonuses?
Kim: Yes, but we don't notice a difference between self-direct and non-self-direct customers taking advantage of bonuses. Self-directing customers are eligible for 50 percent of incentives.

Holly: Did you also have more projects in 2014?
Kim: Yes, that's the general trend.

Don Jones, Jr.: It is the contractors' behavior making the hockey stick. One year my company switched our programs and contracts from a calendar year to a fiscal year, and the hockey stick just moved forward to the end of the fiscal year.
Charlie: Is the shift to Q2 statistically significant?
Jackie: I'm not certain.

Chris Smith, Energy 350: From a PDC perspective, achieving the mid-year goal is an important measure of our success.
Kim: The mid-year PDC bonuses give us a big impact for a relatively small dollar amount. This is an example of applying an internal intervention for an internal problem.

Jackie: We need to balance the benefits of bonuses with disrupting the market.
Kim: The industrial sector is unique because when you pull savings forward, you get more savings in the long run. We're not just pulling forward a limited energy-efficiency resource. The capacity of staff at the facility to implement projects is one of the main limiters to efficiency, and when they get a project done earlier than planned, that creates room to do others sooner. The manufacturers and measures are changing so fast that there are always additional energy-saving opportunities.

Jackie: Bonuses can also impact customer expectations. Limited-time offers create urgency to start, accelerate or revive projects. Savvy customers are like savvy shoppers. They may wait for a deal. We want to mitigate the risk that customers will expect bonuses and wait for a bonus to do a project. This is one reason why we vary bonuses from year to year.
Kim: That is why we are not running any bonuses this year.

Jackie: In summary, bonuses that reward projects for completing by a date are best for achieving same-year savings. Enrollment bonuses generate volume, but may not reduce delays. Quick-turn projects are often small projects. Mid-year deadlines and bonuses improve the program's ability to forecast.

Don Jones, Jr.: Kim, what are your takeaways?
Kim: I would like to explore more interventions like the mid-year PDC bonus strategy. On what to avoid, the fall bonus had a significant impact on increasing staff workload at year-end.

6. Public comment
There were no additional comments.

7. Meeting adjournment
The meeting adjourned at 4:00 p.m.

The next scheduled meeting of the Conservation Advisory Council will be on October 21, 2015, from 1:30 p.m. – 5:00 p.m.

Tab 8

Glossary of Terms Related to Energy Trust of Oregon's Work

Glossary provided to the Energy Trust Board of Directors for general use. Definitions and acronyms are compiled from a variety of resources. Energy Trust policies on topics related to any definitions listed below should be referenced for the most current and comprehensive information. Last updated July 2015.

Above-Market Costs of New Renewable Energy Resources
The portion of the net present value cost of producing power (including fixed and operating costs, delivery, overhead and profit) from a new renewable energy resource that exceeds the market value of an equivalent quantity and distribution (across peak and off-peak periods and seasonally) of power from a nondifferentiated source, with the same term of contract. Energy Trust board policy specifies the methodology for calculating above-market costs. *Reference the Board Cost-Effectiveness Policy and General Methodology*

Aggregate
Combining retail electricity consumers into a buying group for the purchase of electricity and related services. "Aggregator" is an entity that aggregates.

Air Sealing (Infiltration Control)
Conservation measures, such as caulking, efficient windows and weatherstripping, which reduce the amount of cold air entering or warm air escaping a building.

Ampere (Amp)
The unit of measure that tells how much electricity flows through a conductor. It is like using cubic feet per second to measure the flow of water. For example, a 1,200 watt, 120-volt hair dryer pulls 10 amperes of electric current (watts divided by volts).

Anaerobic Digestion
A biochemical process by which organic matter is decomposed by bacteria in the absence of oxygen, producing methane and other byproducts.

Average Megawatt (aMW)
One megawatt of capacity produced continuously over a period of one year. 1 aMW equals 1 megawatt multiplied by the 8,760 hours in a year. 1 aMW equals 8,760 MWh or 8,760,000 kWh.

Avoided Cost
(Regulatory) The amount of money that an electric utility would need to spend for the next increment of electric generation they would need to either produce or purchase if not for the reduction in demand due to energy-efficiency savings or the energy that a co-generator or small-power producer provides. Federal law establishes broad guidelines for determining how much a qualifying facility (QF) gets paid for power sold to the utility.

Base Load
The minimum amount of electric power delivered or required over a given period of time at a steady rate.

Benefit/Cost Ratios
By law, Oregon public purpose funds may be invested only in cost-effective energy-efficiency measures—that is, efficiency measures must cost less than acquiring the energy from conventional sources, unless exempted by the OPUC.

Energy Trust calculates benefit/cost ratios (BCR) on a prospective and retrospective basis. Looking forward, all prescriptive measures and custom projects must have a total resource cost test BCR > 1.0 unless the OPUC has approved an exception. As required in the OPUC grant agreement, Energy Trust reports annually how cost-effective programs were by comparing total costs to benefits, which also need to exceed 1.0.

Biomass
Solid organic wastes from wood, forest or field residues which can be heated to produce energy to power an electric generator.

Biomass Gas
A medium Btu gas containing methane and carbon dioxide, resulting from the action of microorganisms on organic materials such as a landfill.

Blower Door
Home Performance test conducted by a contractor (or energy auditor) to evaluate a home's air tightness. During this test a powerful fan mounts into the frame of an exterior door and pulls air out of the house to lower the inside air pressure. While the fan operates, the contractor can determine the house's air infiltration rate and better identify specific leaks around the house.

British Thermal Unit (Btu)
The standard measure of heat energy. The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

Cogeneration (Combined Heat and Power, CHP)
The sequential production of electricity and useful thermal energy, often by the recovery of reject heat from an electric generating plant for use in industrial processes, space or water heating applications. Conversely, may occur by using reject heat from industrial processes to power an electricity generator. *Reference the Board Combined Heat and Power Policy*

Compact Fluorescent Light Bulbs (CFL)
CFLs combine the efficiency of fluorescent lighting with the convenience of a standard incandescent bulb. There are many styles of compact fluorescent, including exit light fixtures and floodlights (lamps containing reflectors). CFLs are designed for residential uses; they are also used in table lamps, wall sconces, and hall and ceiling fixtures of hotels, motels, hospitals and other types of commercial buildings with residential-type applications.

Conservation
While not specifically defined in the law or OPUC rules on direct access regulation, "conservation" is defined in the OPUC rule 860-027-0310(1)(a) as follows: Conservation means any reduction in electric power or natural gas consumption as the result of increases in efficiency of energy use, production or distribution. Conservation also includes cost-effective fuel switching.

Although fuel switching is part of the definition, this aspect of the rule has not been operationalized as of March 2013.

Cost Effective
Not specifically defined in SB 1149. The OPUC has a definition which refers to a definition from ORS 469.631 (4) stating that an energy resource, facility or conservation measure during its life cycle results in delivered power costs to the ultimate consumer no greater than the comparable incremental cost of the least-cost alternative new energy resource, facility or conservation measure. Cost comparison under this definition shall include but not be limited to: (a) cost escalations and future availability of fuels; (b) waste disposal and decommissioning cost; (c) transmission and distribution costs; (d) geographic, climatic and other differences in the state; and (e) environmental impact. ORS 757.612 (4) (SB 1149) exempts utilities from the requirements of ORS 469.631 to 469.645 when the public purpose charge is implemented.

By law, Oregon public purpose funds may be invested only in cost-effective energy-efficiency measures—that is, efficiency measures must cost less than acquiring the energy from conventional sources, unless exempted by the OPUC. *Reference the Board Cost-Effectiveness Policy and General Methodology*

Cumulative Savings
Sum of the total annual energy savings over a certain time frame while accounting for measure savings "lives." (For example, if a measure is installed for each of two years, the cumulative savings would be the sum of the measure installed in the first year, plus the incremental savings from the savings installed in the second year plus the savings in the second year from the measure installed in the first year.)

Decoupling
A rate provision which reduces or eliminates the degree to which utility profits are driven by the volume of electricity or gas sold. Decoupling is thought by its proponents to reduce utility disincentives to support efficiency. There are many specific variants employed in different states and with different utilities.

Direct Access
The ability of a retail electricity consumer to purchase electricity and certain ancillary services from an entity other than the distribution utility.

Economizer Air
A ducting arrangement and automatic control system that allows a heating, ventilation and air conditioning (HVAC) system to supply up to 100 percent outside air to satisfy cooling demands, even if additional mechanical cooling is required.

Energy Management System (EMS)
A system designed to monitor and control building equipment. An EMS can often be used to monitor energy use in a facility, track the performance of various building systems and control the operations of equipment.

ENERGY STAR®
ENERGY STAR is a joint Environmental Protection Agency and Department of Energy program that encourages energy conservation by improving the energy efficiency of a wide range of consumer and commercial products, enhancing energy efficiency in buildings and promoting energy management planning for businesses and other organizations.

Energy Use Intensity (EUI)
A metric that describes a building's energy use relative to its size. It is the total annual energy consumption (kBtu) divided by the total floor space of the building. EUI varies significantly by building type and by the efficiency of the building.

Enthalpy
Enthalpy is the useful energy or total heat content of a fluid. Ideally, the total enthalpy of a substance is the amount of useful work that substance can do. Enthalpy is used in fluid dynamics and thermodynamics when calculating properties of fluids as they change temperature, pressure and phase (e.g. liquid to liquid-vapor mixture). In HVAC, refrigeration and power cycle processes, enthalpy is used extensively in calculating properties of the refrigerant or working fluid. Additionally, in HVAC applications, enthalpy is used in calculations relating to humidity. An enthalpy economizer is a piece of HVAC equipment that modulates the amount of outdoor air entering into a ventilation system based on outdoor temperature and humidity.

Environmental Protection Agency (EPA)
Founded in 1970, this independent agency was designed to "protect human health and safeguard the natural environment." It regulates a variety of different types of emissions, including greenhouse gases emitted in energy use. It runs several national end-use programs, like ENERGY STAR, SmartWay, Smart Growth programs and green communities programs.

Evaluation
After-the-fact analysis of the effectiveness and results of programs. *Process and Market Evaluations* study the markets to be addressed and the effectiveness of the program strategy, design and implementation. They are used primarily to improve programs. *Impact evaluations* use post-installation data to improve estimates of energy savings and renewable energy generated.

Feed-in Tariff
A renewable energy policy that typically offers a guarantee of payments to project owners for the total amount of renewable electricity they produce, access to the grid and stable, long-term contracts. In Oregon, the pilot program was called the Volumetric Incentive Rate program and each investor-owned utility in the state ran separate programs. Solar systems receiving a feed-in tariff rate were not eligible for Energy Trust incentives or a state tax credit.

Footcandle
A unit of illuminance on a surface that is one foot from a uniform point source of light of one candle and is equal to one lumen per square foot

Free Rider
This evaluation term describes energy efficiency program participants who would have taken the recommended actions on their own, even if the program did not exist. Process evaluations include participant survey questions, which lead to the quantification of the level of free rider impacts on programs that is applied as a discounting factor to Energy Trust reported results.

Geothermal
Useful energy derived from the natural heat of the earth as manifested by hot rocks, hot water, hot brines or steam.

Green Tags (Renewable Energy Certificates or RECs)
See the Renewable Energy Certificates entry.

Gross Savings
Savings that are unadjusted for evaluation factors of free riders, spillover and savings realization rates. Energy Trust reports all savings in net terms, not gross terms, unless otherwise stated in the publication.

Heat Pump
An HVAC system that works as a two-way air conditioner, moving heat outside in the summer and reusing heat from the cold outdoors with an electrical system in the winter. Most systems use forced warm-air delivery systems to move heated air throughout the house.

Heating, Ventilation and Air Conditioning (HVAC)
Mechanical systems that provide thermal comfort and air quality in an indoor space. They are often grouped together because they are generally interconnected. HVAC systems include central air conditioners, heat pumps, furnaces, boilers, rooftop units, chillers and packaged systems.

Hydroelectric Power (Hydropower)
The generation of electricity using falling water to turn turbo-electric generators.

Incremental Annual Savings
Energy savings in one year corresponding to the energy-efficiency measures implemented in that same year.

Incremental Cost
The difference in cost relative to a base case, including equipment and labor cost.

Instant-savings Measure (ISM)
Inexpensive energy-efficiency products installed at no charge, such as CFLs, low-flow showerheads and high-performance faucet aerators. Predominately used by the Existing Homes program and multifamily track to provide homeowners and renters with easy-to-install, energy-saving products.

Integrated Resources Planning (Least-Cost Planning)
A power-planning strategy that takes into account all available and reliable resources to meet current and future loads. This strategy is employed by each of the utilities served by Energy Trust, and for the region's electric system by the Northwest Power and Conservation Council. The term "least-cost" refers to all costs, including capital, labor, fuel, maintenance, decommissioning, known environmental impacts and difficult to quantify ramifications of selecting one resource over another.

Interconnection
For all distributed generation—solar, wind, CHP, fuel cells, etc.—interconnection with the local electric grid provides back-up power and an opportunity to participate in net-metering and sell-back schemes when they are available. It's important to most distributed generation projects to be interconnected with the grid, but adding small generators at spots along an electric grid can produce a number of safety concerns and other operational issues for a utility. Utilities, then, generally work with their state-level regulatory bodies to develop interconnection standards that clearly delineate the manner in which distributed generation systems may be interconnected.

Joule
A unit of work or energy equal to the amount of work done when the point of application of force of 1 newton is displaced 1 meter in the direction of the force. It takes 1,055 joules to equal a Btu. It takes about 1 million joules to make a pot of coffee.

Kilowatt
One thousand (1,000) watts. A unit of measure of the amount of electricity needed to operate given equipment.

Large Customers (with reference to SB 838)
Customers using more than 1 aMW of electricity a year are not required to pay electric conservation charges under SB 838. Additionally, Energy Trust may not provide them with services funded under SB 838 provisions.

Least Cost
The term “least-cost” refers to all costs, including capital, labor, fuel, maintenance, decommissioning, known environmental impacts and difficult to quantify ramifications of selecting one resource over another.

Levelized Cost
The level of payment necessary each year to recover the total investment and interest payments (at a specified interest rate) over the life of the measure.

Local Energy Conservation
Conservation measures, projects or programs that are installed or implemented within the service territory of an electric company.

Low-income Weatherization
Repairs, weatherization and installation of energy-efficient appliances and fixtures for low-income residences for the purpose of enhancing energy efficiency. In Oregon, SB 1149 directs a portion of public purpose funds to Oregon Housing and Community Services to serve low-income customers. Energy Trust coordinates with low-income agencies and refers eligible customers.

Lumen
A measure of the amount of light available from a light source equivalent to the light emitted by one candle.

Lumens/Watt
A measure of the efficacy of a light fixture; the number of lumens output per watt of power consumed.

Market Transformation
Lasting structural or behavioral change in the marketplace and/or changes to energy codes and equipment standards that increases the adoption of energy-efficient technologies and practices. Market transformation is defined in the Oregon Administrative Rules.

Megawatt
The electrical unit of power that equals one million watts (1,000 kW).

Megawatt Hour
One thousand kilowatt hours, or an amount of electrical energy that would power approximately one typical PGE or Pacific Power household for one month. (Based on an average of 11,300 kWh consumed per household per year.)

Methane
A light hydrocarbon that is the main component of natural gas and marsh gas. It is the product of the anaerobic decomposition of organic matter, enteric fermentation in animals and a greenhouse gas.

Monitoring, Targeting and Reporting (MT&R)
A systematic approach to measure and track energy consumption data by establishing a baseline in order to establish reduction targets, identify opportunities for energy savings and report results.

Municipal Solid Waste
Refuse offering the potential for energy recovery. Technically, residential, institutional and commercial discards. Does not include combustible wood by-products included in the term “mill residue.”

Net Metering
An electricity policy for consumers who own (generally small) renewable energy facilities (such as wind, solar power or home fuel cells). "Net," in this context, is used in the sense of meaning "what remains after deductions.” In this case, the deduction of any energy outflows from metered energy inflows. Under net metering, a system owner receives retail credit for at least a portion of the electricity they generate.

Net-to-Gross
Net-to-gross ratios are important in determining the actual energy savings attributable to a particular program, as distinct from energy efficiency occurring naturally (in the absence of a program). The net-to-gross ratio equals the net program load impact divided by the gross program load impact. This factor is applied to gross program savings to determine the program's net impact.

Net Savings
Savings that are adjusted for evaluation factors of free riders, spillover and savings realization rates. Energy Trust reports all savings in net terms, not gross terms, unless otherwise stated in the publication.

Nondifferentiated Source (Undifferentiated Source)
Power available from the wholesale market or delivered to retail customers.

Non-energy Benefit (NEB)
The additional benefits created by an energy-efficiency or renewable energy project beyond the energy savings or production of the project. Non-energy benefits often include water and sewer savings (e.g. clothes washers, dishwashers), improved comfort (e.g. air sealing, windows), sound deadening (e.g. insulation, windows), property value increase (e.g. windows, solar electric), improved health and productivity and enhanced brand.

Oregon Public Utility Commission (OPUC)
Energy Trust operates under a grant agreement with the OPUC and reports quarterly and annually to the state agency. Reports include quarterly presentations to the commission and an annual update on progress to OPUC minimum annual performance measures.

Path to Net Zero (PTNZ)
The Path to Net Zero pilot was launched in 2009 by the New Buildings program to provide increased design, technical assistance, construction, and measurement and reporting incentives to commercial building projects that aimed to achieve exceptional energy performance. The offer demonstrates that a wide range of buildings can achieve aggressive energy goals using currently available construction methods and technology, as well as by testing innovative design strategies.

Photovoltaic
Direct conversion of sunlight to electric energy through the effects of solar radiation on semi-conductor materials. Photovoltaic systems are one type of solar system eligible for Energy Trust incentives.

Program Management Contractor (PMC)
Company Energy Trust contracts with to deliver and implement a program or major program track. PMCs keeps costs low for utility customers, draw from existing expertise and skills in the market, and allow Energy Trust to remain flexible and nimble as the market changes. PMC contracts are competitively selected, reviewed by a committee with internal staff and external representatives, and approved by the board.

Program Delivery Contractor (PDC)
Company Energy Trust contracts with to implement a specific program track. PDCs keeps costs low for utility customers, draw from existing expertise and skills in the market, and allow Energy Trust to remain flexible and nimble as the market changes. PDC contracts are competitively selected, reviewed by a committee with internal staff and external representatives, and approved by the board.

Public Purpose Charge
Established in SB 1149, the public purpose charge is a 3 percent charge from PGE and Pacific Power Oregon customers. Three fund administrators distribute the ratepayer dollars: Energy Trust of Oregon for energy efficiency, market transformation and renewable energy programs; the Oregon Department of Energy for energy efficiency in schools; and Oregon Housing and Community Services for low-income weatherization and housing assistance. Energy Trust is funded through the public purpose charge (SB 1149), supplemental funding (SB 838) and contracts with two gas utilities.

Public Utility Commissions
State agencies that regulate, among others, investor-owned utilities operating in the state with a protected monopoly to supply power in assigned service territories.

Public Utility Regulatory Act of 1978 (PURPA)
Federal legislation that requires utilities to purchase electricity from qualified independent power producers at a price that reflects what the utilities would have to pay for the construction of new generating resources. The Act was designed to encourage the development of small-scale cogeneration and renewable resources.

Qualifying Facility (QF)
A power production facility that generates its own power using cogeneration, biomass waste, geothermal energy, or renewable resources, such as solar and wind. Under PURPA, a utility is required to purchase power from a QF at a price equal to that which the utility would otherwise pay to another source, or equivalent to the cost if it were to build its own power plant.

Renewable Energy Certificates (RECs or Green Tags)
A Renewable Energy Certificate is a tradable commodity that represents the contractual rights to claim the environmental attributes of a certain quantity of renewable electricity. The environmental attributes include the reductions in emissions of pollutants and greenhouse gases that result from the delivery of the renewably-generated electricity to the grid.

Here's how emission reductions occur: When a renewable energy system generate electricity, the grid operators allow that electricity to flow into the grid because it is less expensive to operate, once it has been built, than generators that burn fossil fuels. But the electricity grid cannot have more electricity flowing into it than is flowing out to electricity users, so the grid operators have to turn down other generators to compensate. They generally turn down those that burn fossil fuels. By forcing the fossil fuel generators to generate less electricity, the renewable energy system causes them to generate fewer emissions of pollutants and greenhouse gases. These reductions in emissions are the primary component of RECs.

RECs were developed as a separate commodity by the energy industry to boost construction of new wind, solar, landfill gas and other renewable energy power plants. RECs allow owners of these power plants to receive the full value of the environmental benefits their plants generate. They also allow consumers to create the same environmental benefits as buying green electricity, or to neutralize the pollution from their consumption of fossil fuels.

RECs are bought and sold every day in the electricity market. They are measured in units, like electricity. Each kilowatt hour of electricity that a renewable energy system produces also creates a one-kilowatt hour REC. *Reference the Board Renewable Energy Certificate Policy*

Renewable Energy Resources
a) Electricity-generation facilities fueled by wind, waste, solar or geothermal power or by low-emission nontoxic biomass based on solid organic fuels from wood, forest and field residues
b) Dedicated energy crops available on a renewable basis
c) Landfill gas and digester gas
d) Hydroelectric facilities located outside protected areas as defined by federal law in effect on July 23, 1999

Renewable Portfolio Standard
A legislative requirement, including in Oregon, for utilities to meet specified percentages of their electric load with renewable resources by specified dates, or a similar requirement. May be referred to as Renewable Energy Standard.

Retrofit
A retrofit involves the installation of new, usually more efficient equipment into an existing building or process prior to the existing equipment's failure or end of its economic life. In buildings, retrofits may involve either structural enhancements to increase strength, or replacing major equipment central to the building's functions, such as HVAC or water heating systems. In

industrial applications, retrofits involve the replacement of functioning equipment with new equipment.

Roof-top Units (RTU)
Packaged heating, ventilating and air conditioning unit that generally provides air conditioning and ventilating services for zones in low-rise buildings. Roof-top units often include a heating section, either resistance electric, heat pump or non-condensing gas (the latter are called “gas-paks”). Roof-top units are the most prevalent comfort conditioning systems for smaller commercial buildings. Generally small (<10 ton) commodity products, but very sophisticated high-efficiency versions are available, as are units larger than 50 tons.

R-Value
A unit of thermal resistance used for comparing insulating values of different material. It is basically a measure of the effectiveness of insulation in stopping heat flow. The higher the R-Value number for a material the greater its insulating properties and the slower the heat flow through it. The specific value needed to insulate a home depends on climate, type of heating system and other factors.

SB 1149
Oregon legislation enacted in 1999 allowing for the creation of a third party, nonprofit organization to receive approximately 74 percent of a 3 percent utility surcharge (public purpose charge) and deliver energy-efficiency and renewable energy programs to the funding Oregon ratepayers of Portland General Electric and Pacific Power. Energy Trust was approved by the OPUC to deliver the services. The rest of the surcharge is distributed to school districts through the Oregon Department of Energy and to low-income customers through Oregon Housing and Community Services. SB 1149 is one stream of funding for Energy Trust, which is also funded through SB 838 to deliver achievable energy efficiency above the 3 percent and identified in utility integrated resource planning processes, and individual contracts with NW Natural and Cascade Natural Gas to deliver natural gas efficiency programs.

SB 838
SB 838, enacted in 2007, augmented Energy Trust’s mission in many ways. It provided a vehicle for additional electric efficiency funding for customers under 1 aMW in load by allowing PGE and Pacific Power to fund cost-effective energy efficiency above the 3 percent, and restructured the renewable energy role to focus on renewable energy systems that are 20 MW or less in size. SB 838 is also the legislation creating the state’s Renewable Portfolio Standard and extended Energy Trust’s sunset year from 2012 to 2026.

SB 838 is often categorized as supplemental funding in Energy Trust budget documents.

Sectors
For energy planning purposes, the economy is divided into four sectors: residential, commercial, industrial and irrigation. At Energy Trust, programs are divided into four sectors: residential, commercial (including multifamily), industrial (including irrigation) and renewable energy.

Self-Directing Consumers
A retail electricity consumer that has used more than one aMW of electricity at any one site in the prior calendar year or an aluminum plant that averages more than 100 aMW of electricity use in the prior calendar year, that has received final certification from the Oregon Department of Energy for expenditures for new energy conservation or new renewable energy resources and that has notified the electric company that it will pay the public purpose charge, net of

credits, directly to the electric company in accordance with the terms of the electric company's tariff regarding public purpose credits.

Solar Power
Using energy from the sun to make electricity through the use of photovoltaic cells.

Solar Thermal
The process of concentrating sunlight on a relatively small area to create the high temperatures needed to vaporize water or other fluids to drive a turbine for generation of electric power.

Spillover
Additional measures that were implemented by the program participant for which the participant did not receive an incentive. They undertook the project on their own, influenced by prior program participation.

Strategic Energy Management (SEM)
A program offering for both commercial and industrial customers: commercial Strategic Energy Management and industrial Strategic Energy Management. Through SEM, customers engage with Energy Trust for a year or more in a systematic and ongoing approach to lowering energy usage. Energy Trust helps customers track and monitor energy use and performance, identify and implement no-cost and low-cost operations and maintenance changes, develop an energy management plan and more. SEM creates culture change around energy, training employees at all levels that energy use can be tracked, reduced and managed.

Therm
One hundred thousand (100,000) British thermal units (1 therm = 100,000 Btu).

Total Resource Cost Test
The OPUC has used the total resource cost (TRC) test as the primary basis for determining conservation cost-effectiveness as determined in Order No. 94-590 (docket UM 551). SB 1149 allows the "self-directing consumers" to use a simple payback of one to 10 years as the cost-effectiveness criterion. This test is central to how Energy Trust delivers on its mission. This test is the main test that determines whether Energy Trust can offer an incentive for a project. It also reflects the region's approach to long-term energy planning by prioritizing investment in low-cost energy resources. *Reference the Board Cost-Effectiveness Policy and General Methodology*

Tidal Energy
Energy captured from tidal movements of water.

Trade Ally Contractor (Trade Ally)
Energy Trust trade allies are valued ambassadors in the field. The network of independent contractors andother allied professionals helps homeowners, businesses, public and nonprofit entities, developers and others complete energy-efficiency and renewable energy projects across Oregon and in southwest Washington. Quite often, trade allies are the first, last and only Energy Trust representative a customer will see.

Trade Ally Network
Energy Trust statewide network of trained contractors and other allied businesses.

Utility Cost Test
This test is used to indicate the incentive amount for a project. It helps Energy Trust determine whether providing an incentive is cost effective for the utility system. *Reference the Board Cost-Effectiveness Policy and General Methodology*

U-Value (U-Factor)
A measure of how well heat is transferred by the entire window—the frame, sash and glass—either into or out of the building. U-Value is the opposite of R-Value. The lower the U-Value number, the better the window will keep heat inside a home on a cold day.

Wave Energy
Energy captured by the cyclical movement of waves in the ocean or large bodies of water.

Watt
A unit of measure of electric power at a point in time, as capacity or demand. One watt of power maintained over time is equal to one joule per second.

Wind Power
Harnessing the energy stored in wind via turbines, which then convert the energy into electricity. Mechanical power of wind can also be used directly.

Weatherization
The activity of making a building (generally a residential structure) more energy efficient by reducing air infiltration, improving insulation and taking other actions to reduce the energy consumption required to heat or cool the building. In practice, “weatherization programs” may also include other measures to reduce energy used for water heating, lighting and other end uses.

Acronyms Related to Energy Trust of Oregon's Work

AAMA	American Architectural Manufacturers Association	Trade group for window, door manufacturers
A/C	Air Conditioning	
ACEEE	American Council for an Energy-Efficient Economy	Environmental Advocacy, Researcher
AEE	Association of Energy Engineers	
AEO	Annual Energy Outlook	
AESP	Association of Energy Services Professionals	Energy services and energy efficiency trade organization
AFUE	Annual Fuel Utilization Efficiency	The measure of seasonal or annual efficiency of a furnace or boiler
AIA	American Institute of Architects	Trade organization
AOC	Association of Oregon Counties	
aMW	Average Megawatt	A way to equally distribute annual energy over all the hours in one year; there are 8,760 hours in a year
AOI	Associated Oregon Industries	
APEM	Association of Professional Energy Managers	
ARI	Air-Conditioning and Refrigeration Institute	AC trade association
ASE	Alliance to Save Energy	Environmental advocacy organization
ASERTTI	Association of State Energy Research and Technology Transfer Institutions, Inc.	
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers	Technical (engineers) association
ASME	American Society of Mechanical Engineers	Professional organization
BACT	Best Achievable Control Technology	
BCR	Benefit/Cost ratio	See definition in text
BEF	Bonneville Environmental Foundation	Nonprofit that funds renewable energy projects
BETC	Business Energy Tax Credit	Former Oregon tax credit
BOC	Building Operator Certification	Trains and certifies building operators
BOMA	Building Owners and Managers Association	
BPA	Bonneville Power Administration	Federal power authority
BPS	Bureau of Planning and Sustainability	City of Portland government agency
CAC	Conservation Advisory Council	Energy Trust advisory council to the board
CCS	Communications and Customer Service	A group within Energy Trust
CCCT	Combined Cycle Combustion Turbine	
CEE	Consortium for Energy Efficiency	National energy efficiency group
CEW	Clean Energy Works	
CFL	Compact Fluorescent Light bulb	
CHP	Combined Heat and Power	
CNG	Cascade Natural Gas	Investor-owned utility
ConAug	Conservation Augmentation Program	BPA program

CHT	Coefficient of Heat Transmission (U-Value)	A value that describes the ability of a material to conduct heat. The number of Btu that flow through 1 square foot of material, in one hour. It is the reciprocal of the R-Value (U-Value = 1/R-Value.
COU	Consumer-Owned Utility	
COP	Coefficient of Performance	The ratio of heat output to electrical energy input for a heat pump
CR	CLEAResult	Program Management Contractor for Existing Homes, New Homes and New Buildings
CRM	Customer Relationship Management system	Energy Trust's system to capture information on program participants and non-participants that have communicated with us
CT	Combustion Turbine	
CUB	Citizens' Utility Board of Oregon	Public interest group
Cx	Commissioning	
DG	Distributed Generation	
DSI	Direct Service Industries	Direct Access customers to BPA
DOE	Department of Energy	Federal agency
DSM	Demand Side Management	
EA	Environmental Assessment	
EA	Earth Advantage	
EASA	Electrical Apparatus Service Association	Trade association
ECM	Electrically Commutation Motor	Also known as a variable-speed blower motor, can vary the blower speed in accordance with the needs of the system
EE	Energy Efficiency	
EER	Energy Efficiency Ratio	The cooling capacity of the unit (in Btu/hour) divided by its electrical input (in watts) at standard peak rating conditions
EF	Energy Factor	An efficiency ratio of the energy supplied in heated water divided by the energy input to the water heater
EIA	Energy Information Administration	
EMS	Energy Management System	See definition in text
EPA	Environmental Protection Agency	Federal agency
EPRI	Electric Power Resource Institute	Utility organization
EPS™	Energy Performance Score	Energy Trust rating that assesses a newly built or existing home's energy use, carbon impact and estimated monthly utility costs

EQIP	Environmental Quality Incentive Program	
EREN	Energy Efficiency and Renewable Energy Network	DOE program
ESS	Energy Services Supplier	
EUI	Energy Use Intensity	See definition in text
EWEB	Eugene Water & Electric Board	Utility organization
FCEC	Fair and Clean Energy Coalition	Environmental advocacy organization
FEMP	Federal Energy Management Program	
FERC	Federal Energy Regulatory Commission	Federal regulator
GHG	Greenhouse gas	
GP	Great Plains	Energy Trust's financial tracking system
HBA	Home Builders Association	
HER	Home Energy Review	Online review of a residential customer's home
HSPF	Heating Season Performance Factor	
HVAC	Heating, Ventilation and Air Conditioning	
IBEW	International Brotherhood of Electrical Workers	
ICNU	Industrial Customers of Northwest Utilities	Trade interest group
ICF	ICF International	Existing Buildings Program Management Contractor
IEEE	Institute of Electrical and Electronic Engineers	Professional association
IESNA	Illuminating Engineering Society of America	
IOU	Investor-Owned Utility	
IRP	Integrated Resource Plan	
ISIP	Integrated Solution Implementation Project	
ISM	Instant-Savings Measure	See definition in text
ITC	Investment Tax Credit	Federal
kW	Kilowatt	
kWh	Kilowatt Hours	8,760,000 kWh = 1 aMW
LBL	Lawrence Berkeley Laboratory	
LED	Lighting Emitting Diode	Solid state lighting technology
LEED	Leadership in Energy & Environmental Design	Building rating system from the U.S. Green Building Council
LIHEAP	Low Income Housing Energy Assistance Program	
LIWA	Low Income Weatherization Assistance	
LM	Lockheed Martin	Existing Multifamily Program Management Contractor
LOC	League of Oregon Cities	Local government organization
MEEA	Midwest Energy Efficiency Alliance	Midwest Market Transformation organization, Alliance counterpart
MT&R	Monitoring, Targeting and Reporting	See definition in text
MW	Megawatt	Unit of electric power equal to one thousand kilowatts

MWh	Megawatt Hour	Unit of electric energy, which is equivalent to one megawatt of power used for one hour
NAHB	National Association of Home Builders	Trade association
NCBC	National Conference on Building Commissioning	
NEB	Non-Energy Benefit	See definition in text
NEEA	Northwest Energy Efficiency Alliance	
NEEC	Northwest Energy Efficiency Council	Trade organization
NEEI	Northwest Energy Education Institute	Training organization
NEEP	Northeast Energy Efficiency Partnership	Northwest market transformation organization
NEMA	National Electrical Manufacturer's Association	Trade organization
NERC	North American Electricity Reliability Council	
NFRC	National Fenestration Rating Council	
NRC	National Regulatory Council	Federal regulator
NRCS	Natural Resources Conservation Service	
NRDC	Natural Resources Defense Council	
NREL	National Renewable Energy Lab	
NRTA	Northwest Regional Transmission Authority	
NWEC	Northwest Energy Coalition	Environmental advocacy organization
NWBOA	Northwest Building Operators Association	Trade organization
NWFPA	Northwest Food Processors Association	Trade organization
NWN	NW Natural	Investor-owned utility
NWPPA	Northwest Public Power Association	Trade organization
NWPCC	Northwest Power and Conservation Council	Regional energy planning organization, "the council"
NYSERDA	New York State Energy Research & Development Authority	New York energy efficiency and renewable energy organization funded by a systems benefit charge
OBA	Oregon Business Association	Business lobby group
OEFSC	Oregon Energy Facility Siting Council	Authority to site energy facilities in Oregon
ODOE	Oregon Department of Energy	Oregon state energy agency and one of three public purpose charge administrators
OHCS	Oregon Housing and Community Services	One of three public purpose charge administrator
OPUC	Oregon Public Utility Commission	
OPUDA	Oregon Public Utility District Association	Utility trade organization
OPEC	Organization of Petroleum Exporting Countries	
ORECA	Oregon Rural Electric Cooperative Association	Utility trade organization
OSEIA	Solar Energy Industries Association of Oregon	Volunteer nonprofit organization dedicated to education/promotion
P&E	Planning and Evaluation	A group within Energy Trust
PAC	Pacific Power	

PDC	Program Delivery Contractor	Company contracted with Energy Trust to identify and deliver industrial and agricultural services, and commercial Strategic Energy Management services, to Energy Trust customers
PECI	Portland Energy Conservation, Inc.	Portland nonprofit; former Energy Trust PMC
PGE	Portland General Electric	Investor-owned utility
PG&E	Pacific Gas & Electric	California investor-owned utility
PMC	Program Management Contractor	Company contracted with Energy Trust to deliver a program
PNUCC	Pacific Northwest Utilities Conference Committee	
PPC	Public Power Council	National trade group
PPL	Pacific Power	Formerly Pacific Power and Light
PSE	Puget Sound Energy	Investor-owned utility
PT	Project Tracking	Energy Trust's database that tracks details on customer projects
PTC	Production Tax Credit	Federal incentive that provides financial support for the first 10 years of a renewable energy facility's operation
PTCS	Performance Tested Comfort Systems	Promotes the efficiency of air-systems in residential homes
PTNZ	Path to Net Zero	See definition in text
PUC	Public Utility Commission	
PUD	Public Utility District	
PURPA	Public Utility Regulatory Policies Act	See definition in text
QF	Qualifying Facility	
RAC	Renewable Energy Advisory Council	Energy Trust advisory council to the board
RE	Renewable Energy	
REIT	Real Estate Investment Trust	
RETC	Residential Energy Tax Credit	Oregon tax credit
RFI	Request for Information	
RFP	Request for Proposal	
RFQ	Request for Qualification	
RNW	Renewable Northwest	Renewable energy advocacy group
RSES	Refrigeration Service Engineers Society	Trade association
RTF	Regional Technical Forum	BPA funded research group
RTU	Rooftop HVAC Unit Tune Up	Rooftop HVAC unit tune up
SCCT	Single Cycle Combustion Turbine	
SCL	Seattle City Light	Public utility
SEED	State Energy Efficient Design	Established in 1991, requires all state facilities to exceed the Oregon Energy Code by 20 percent or more

SEER	Seasonal Energy Efficiency Ratio	A measure of cooling efficiency for air conditioners; the higher the SEER, the more energy efficient the unit
SIS	Scientific Irrigation Scheduling	Agricultural information program
SNOPUD	Snohomish Public Utility District	Washington State PUD
SEIA	Solar Energy Industries Association	Volunteer nonprofit organization dedicated to education/promotion
SWEEP	Southwest Energy Efficiency Partnership	Southwest market transformation group
T&D	Transmission & Distribution	
TRC	Total Resource Cost	See definition in text
U-Value		The reciprocal of R-Value; the lower the number, the greater the heat transfer resistance (insulating) characteristics of the material
USGBC	U.S. Green Building Council	Sustainability advocacy organization responsible for LEED
VFD	Variable Frequency Drive	An electronic control to adjust motion
WUTC	Washington Utilities and Transportation Commission	
Wx	Weatherization	
W	Watt	