

# Energy Trust Board of Directors Meeting

July 20, 2016

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# 144th Board Meeting

Wednesday, July 20, 2016  
 421 SW Oak Street, Suite 300  
 Portland, Oregon

	<b>Tab</b>	<b>Purpose</b>
<b>11:00 am Executive Session</b> <i>The board will meet in Executive Session pursuant to bylaws section 3.19.1 to discuss internal personnel matters.</i>  <b><i>The Executive Session is not open to the public.</i></b>		
<b>12:15 pm 144th Board Meeting—Call to Order</b> (Debbie Kitchin) <ul style="list-style-type: none"> <li>Approve agenda</li> </ul> <b>General Public Comment</b> <i>The president may defer specific public comment to the appropriate agenda topic.</i>  <b>Consent Agenda</b> ..... <b>1</b> Action <i>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.</i> <ul style="list-style-type: none"> <li>May 19 and 20 Board strategic planning retreat minutes</li> <li>June 8 Board meeting minutes</li> </ul>		
<b>12:20 pm President’s Report</b> (Debbie Kitchin)		
<b>12:35 pm Energy Programs</b> (Peter West) <ul style="list-style-type: none"> <li>Authorize Funds for Opal Springs Hydropower Project—R776 (Jed Jorgensen, Dave Moldal) ..... <b>2</b>      Action</li> <li>Authorize Existing Buildings Program Management Contract with ICF International—R777 (Oliver Kesting) ..... <b>2</b>      Action</li> <li>Authorize Streamlined Industrial Lighting Program Delivery Contract for Production Efficiency Program with Evergreen Consulting Group, LLC—R778 (Kim Crossman, Lindsey Diercksen)..... <b>2</b>      Action</li> <li>Authorize Streamlined Industrial and Agriculture Program Delivery Contract for Production Efficiency Program with Cascade Energy—R779 (Kim Crossman, Lindsey Diercksen)..... <b>2</b>      Action</li> <li>Program Management and Program Delivery Contract Terms..... <b>2</b>      Info</li> </ul>		
<b>2:05 pm Break</b>		
<b>2:20 pm Committee Reports</b> <ul style="list-style-type: none"> <li>Compensation Committee (Dan Enloe)</li> <li>Evaluation Committee (Alan Meyer) ..... <b>3</b>      Info</li> <li>Finance Committee (Dan Enloe)..... <b>4</b>      Info</li> <li>Policy Committee (Roger Hamilton)..... <b>5</b>      Info</li> </ul>		
<b>3:00 pm Staff Report</b> <ul style="list-style-type: none"> <li>Feature Presentation: E3 Update on Sustainability Report (Katie Wallace and Robert Wiley)</li> <li>Highlights (Margie Harris)</li> </ul>		
<b>4:00 pm Adjourn</b>		

**The next meeting of the Energy Trust Board of Directors will be held  
Wednesday, September 28, 2016 at 12:15pm  
at Energy Trust of Oregon, 421 SW Oak Street, Suite 300, Portland**

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TAB 1

# Board Strategic Planning Workshop Mercy Corps, Portland, Oregon

Thursday, May 19, 2016

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**Board members present:** Susan Brodahl, Ken Canon, Heather Beusse Eberhardt (arriving late), Dan Enloe, Roger Hamilton, Lindsey Hardy, Mark Kendall, Debbie Kitchin, Alan Meyer, John Reynolds, Anne Root, Eddie Sherman, Steve Bloom (arriving late), Warren Cook

**Board members absent:** Melissa Cribbins

**Staff attending:** Mike Bailey, Sarah Castor, Scott Clark, Amber Cole, Kim Crossman, Chris Dearth, Sue Fletcher, Fred Gordon, Margie Harris, Betsy Kauffman, Steve Lacey, Ted Light, Dave McClelland, Debbie Menashe, Lori Miller, Spencer Moersfelder, Dave Moldal, Thad Roth, Mariet Steenkamp, Julianne Thacher, John Volkman, Sam Walker, Peter West

**Others attending:** Jim Abrahamson (Cascade Natural Gas), JP Batmale (OPUC), John Charles (Cascade Policy Institute), Julia Harper (NEEA), Holly Meyer (NW Natural), Kerry Shroy (Avista), Bob Stull (CR), Nick Viele (Facilitator)

## Call to Order and Welcome

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President Debbie Kitchin called the workshop to order at 8:00 a.m. Debbie thanked Ken Canon, members of the Strategic Planning Committee and staff for organizing and planning for this retreat. Every year, Energy Trust holds a strategic planning retreat to identify emerging challenges and opportunities, and assess the organization's strategic direction. The purpose of the retreat is not to make decisions, but to learn from staff, ask questions and engage in strategic discussion.

## Context Setting and Agenda Review

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Mark Kendall outlined the schedule and purpose for the retreat. The agenda includes reviewing progress to Energy Trust's five-year Strategic Plan by referencing the new 2015-2019 Strategic Plan Dashboard tool and reflecting on future challenges and opportunities. Energy Trust anticipates challenges ahead especially for the residential sector regarding cost-effectiveness and for the renewable energy sector regarding uncertain policy landscape. The board will also discuss the organization's direction and strategy for demand management, the potential impact of Oregon's Clean Energy Act and a staff proposal for more robust investment in educating consumers about energy efficiency and renewable energy benefits.

Nick Viele, retreat facilitator, summarized the schedule, which will include staff updates and requests for board input on potential changes to the organization's approach.

## Opening Remarks

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Executive director Margie Harris welcomed the board, staff and workshop attendees. She acknowledged the commitment of the board and the work of board members and staff in researching and preparing for the day.

To begin Energy Trust's 16th board strategic planning retreat, Margie reflected on how Energy Trust began, where the organization is today and potential opportunities for the future. At the first strategic planning retreat 16 years ago, the board reviewed the grant agreement with the OPUC plan and focused on hiring an executive director, hiring staff and gaining customer trust as a new entity in the market. At Margie's first retreat in 2002, the board discussed goals of its first strategic plan and crafted initial policies and programs, including an equity policy.

Looking back to 2005, Energy Trust's third full year of operation, the organization experienced growth in efficiency savings, incentives and demand for services. At that time, Energy Trust acquired record energy savings and exceeded annual expectations. Already, the organization claimed successful market transformation for LED traffic lights. Solar electric systems were installed at 73 homes. The first wind project was dedicated near Wasco. Similar to today, approximately 60 percent of annual electric savings and 40 percent of annual gas savings were delivered in the last quarter of the year.

As of today, Energy Trust is a well-established, well-respected and high-performing organization that delivers clean, affordable energy. 2015 was one of Energy Trust's top years for electric savings, the highest year ever for gas and a record-breaking year for new solar system installations. New construction of single family homes, commercial buildings and multifamily housing contributed to strong annual savings, along with new data centers, distribution centers and restaurants. More than one-third of all homes in Energy Trust territory exceeded the efficiency standards of current building codes.

Also in 2015, 20 percent of savings came from LEDs and Energy Trust completed its largest ever single gas project. Staff engaged irrigation districts to save energy and water, generate hydropower and boost economic investment in rural communities. Roughly 75 percent of all incentive applications were processed online. Costs to save and generate energy were the lowest ever. From 2002 to 2015, Energy Trust saved 548 average megawatts and 45.3 million therms and generated 119 aMW. To date, Energy Trust has invested \$1.3 billion to help customers ultimately save \$5.6 billion on their energy bills. Energy Trust's work prevented 17.4 million tons of carbon dioxide, equal to removing 3 million cars from our roads for a year. The organization exceeded all OPUC minimum performance measures and has gained recognition as a national and international leader.

Looking ahead 10 years to 2025, Energy Trust will be approaching the sunset date of public purpose charge investments. If not for a change in the statute, Energy Trust will wind down programs by that year end. States will be coming into compliance with the U.S. Environmental Protection Agency's Clean Power Plan. Oregon utilities will have 15 years remaining to deliver one-half of their energy from renewables. Energy Trust could be offering affordable energy storage, supporting products that help with demand response and grid management, claiming market transformation for net-zero buildings and/or supporting electric vehicle charging stations. There will be areas of uncertainty and new opportunities.

This year's agenda and packet are different than prior board retreats. In the past, the board focused on big organizational questions such as five-year strategic planning goals and planning for an executive director transition. Today, the agenda focuses on sharing thoughts and plans for the future. Questions, feedback and input are desired from the board.

This being her last board retreat, Margie shared parting thoughts about qualities Energy Trust should preserve and what the organization might do differently in the future. Energy Trust should maintain its culture, identity and focus on collaboration. Staff are committed to the mission and each other, welcome different perspectives, ask questions and speak out. Staff are accountable for and proud of their work, have high expectations and deliver results. They laugh with and enjoy each other. They collaborate and are transparent about results. Culture is key to Energy Trust's success.

What might Energy Trust do differently in years ahead? Change is coming, and with it new opportunities. Demographics are changing in Oregon, and Energy Trust serves increasingly more diverse customers. Energy Trust has developed a diversity vision and action plan. The vision includes diverse employees working together in a supportive culture. Energy Trust seeks to work with more diverse customers and contractors, which will result in more eligible customers participating in programs and benefitting from results. Staff identified three specific diversity initiative focus areas, including organizational development, market and customer insights and business operations.

As Energy Trust honors the past, staff are making room for a new and different executive director who will challenge staff and take the organization in new directions. Board members need to rally around and support the success of the next executive director. Margie expressed her commitment to supporting this executive transition.

Margie concluded by sharing personal reflections on her career. When she graduated from college in 1973, a professor suggested she apply her natural resources degree to the energy field. She soon experienced the large and complex and multiple dimensions of the field, including its global impacts on the economy and the environment. For 40 years, that conversation has manifested in Margie's career. Her accomplishments include helping craft the first energy conservation and solar legislation for the state of Oregon and designing and implementing local, state and regional energy policies and programs. For the last 15 years, Energy Trust has exceeded expectations and left a tangible imprint in every part of the state. Margie expressed pride in Energy Trust's accomplishments and confidence in passing a strong organization along to a new executive director.

The board thanked Margie for her tremendous leadership and contributions over the years, and reflected on Energy Trust's history of being responsive to changes and opportunities. Margie leaves a great legacy. The board noted that public purpose funding is set to expire at the end of 2025, and identified this as a strategic issue. The possibility of alternate funding strategies to support the work of the organization could be pursued should the public purpose charge expire.

## **Strategic Plan Progress Update**

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### ***2015-2019 Strategic Plan Implementation Dashboard (Debbie Menashe)***

Mark Kendall acknowledged general counsel/director of legal and contracts Debbie Menashe for coordinating the retreat agenda and content. Debbie thanked the strategic planning committee for its guidance creating the Strategic Plan Implementation Dashboard and requested board feedback on the usefulness of the tool. The dashboard provides highlights and progress indicators on achievement to the 2015-2019 Strategic Plan goals and strategies. The board can refer to briefing papers, quarterly reports and annual reports for additional details and information.

### ***Energy Goals (Fred Gordon, Betsy Kauffman)***

Betsy Kauffman, renewable energy sector lead, presented on projected renewable energy achievements for the 2015-2019 Strategic Plan period. These conservative projections are based on expected projects in the renewable energy pipeline, mostly consisting of solar, hydropower and biopower projects. It is difficult to identify exact completion dates for large hydropower and biopower projects. Based on current analyses, Energy Trust expects to achieve the 2019 strategic plan goal of 10 aMW in 2017.

Fred Gordon, director of planning and evaluation, presented on expected efficiency achievements for the 2015-2019 Strategic Plan period. Energy Trust exceeded energy efficiency goals in 2015. For 2016, staff expect to achieve budgeted savings goals. Results for 2017, 2018 and 2019 are expected to be positive, and projected results are estimates and not guaranteed. These results do not take into consideration unknown market forces that could potentially influence results, especially for the residential sector. Energy Trust is confident it will meet 2019 strategic plan goals, and results will be influenced by future challenges and opportunities.

The board asked what factors unknown in 2014 enabled Energy Trust to anticipate exceeding the 2019 renewable energy goal in 2017. Betsy cautioned that the estimated date that Energy Trust will meet its renewable energy Strategic Plan goal is uncertain. In 2014, the pipeline of renewable energy projects was not as strong as it is today, which led staff to set a conservative 2015-2019 Strategic Plan goal. In addition, at the time Energy Trust created the Strategic Plan, Energy Trust expected federal Investment

Tax Credits, ITC, to expire at the end of 2016. However, the ITC was unexpectedly extended in late 2015.

The board asked what staff are learning now that they can apply to the next five-year strategic plan, which will be developed in 2018. Betsy explained that Other Renewables projects are large projects with long construction timelines, and therefore it is difficult to predict precise completion dates.

The board asked why Energy Trust expects less generation in 2017 than in 2016 and 2018. Betsy responded that there are no hydropower or biopower projects expected to complete in 2017, so the 2017 pipeline consists entirely of solar generation. Because large Other Renewables projects take a long time to develop and complete, projects that complete in 2017 would already be in Energy Trust's pipeline.

The board asked about the impacts of recent state and federal legislation on renewable energy generation, especially the Oregon Clean Electricity Act, Senate Bill 1547, with its requirement that the Renewable Portfolio Standard, RPS, increase to 50 percent of retail load by 2040.

Betsy responded that Energy Trust's ability to fund large-scale solar projects is limited by budget and above-market costs. RPS is not a driver of the small renewable energy projects supported by Energy Trust. RPS may influence wholesale power rates and general technology costs. However this is unknown and not incorporated into Energy Trust's renewable energy projections. Betsy added that new RPS does not exceed the current RPS requirement of 25 percent until 2025, when it increases to 27 percent. The impacts of the U.S. Environmental Protection Agency's Clean Power Plan are also not incorporated into Energy Trust's projections, as these are unknown given that the Plan is currently on hold. Fred added that the Clean Power Plan largely includes activities in which Energy Trust is already engaged.

The board noted that the nexus of energy and water benefits is an opportunity for Energy Trust, demonstrated by previous projects with biopower projects with wastewater treatment plants and hydropower projects with irrigation districts.

A recent large industrial gas-saving project also provided pollution control benefits. The board asked if new energy-saving opportunities exist to align with clean air efforts, and suggested Energy Trust coordinate with the Department of Environmental Quality to identify opportunities. Kim Crossman, industrial sector lead, responded that Energy Trust is currently working with the Oregon Department of Environmental Quality in addition to working with Program Delivery Contractors to engage with customers concerned about emissions control. Energy Trust staff have been involved with DEQ through a program called Economy, Energy and Environment, or E3. In addition, DEQ will begin distributing information about Energy Trust to help customers control emissions more efficiently. Staff are also researching best practices for energy-efficient emissions controls.

***Comparison of the Northwest Power and Conservation Council Seventh Power Plan to Energy Trust Goals (Ted Light)***

Ted Light, senior planning project manager, presented on Energy Trust's alignment with the Northwest Power and Conservation Council's Seventh Power Plan. Overall, Energy Trust predicts slightly less energy savings potential than the Seventh Power Plan. Ted acknowledged differences between Energy Trust projections and the Seventh Power Plan, adding none present concerns. Energy Trust and the Council use different assumptions when setting goals. For example, the Council counts savings from many codes and standards while Energy Trust counts savings only from actions for which it can directly claim influence. The Council also counts gross savings, which are uncorrected for free riders and other factors, while Energy Trust reports net savings.

Ted noted that Energy Trust overachieved the goals set for forth in the Council's Sixth Power Plan, and that trend is expected to continue through the Seventh Power Plan.



Ted described significant changes between the Sixth Power Plan and the Seventh Power Plan. The Seventh Power Plan emphasizes demand response and the value of energy efficiency during periods of peak power use. Emerging technologies are also key in the Seventh Power Plan. The Seventh Power Plan identifies energy efficiency as the largest resource needed to meet the Pacific Northwest's energy needs. The Plan also concluded that the region may not have enough energy capacity and therefore needs to develop demand response to meet peak power needs. A debatable conclusion is that the Plan found energy efficiency and demand response to be more economical than renewable energy investments.

Energy Trust estimates slightly less energy savings potential, as a percentage of load, than the Seventh Power Plan, especially for residential and commercial sectors. Energy Trust sees more potential than the Northwest Power and Conservation Council for industrial and agricultural sectors, which is offset by lower potential estimated for commercial and industrial sectors. Oregon may have more industrial businesses than the Pacific Northwest region as a whole.

Energy Trust's resource potential amounts to 17 percent of the Council's region-wide potential, and Energy Trust is on target to achieve these savings.

Ted described Energy Trust's and the Council's estimated pace of savings acquisition over the next 20 years. Energy Trust projects to start at a high pace of savings acquisition in year one, with a steeper decline in savings potential over 20 years.

Ted reviewed emerging technologies featured in the Seventh Power Plan, which include solid state lighting and controls, advanced power strips, embedded (not standalone) data centers, variable refrigerant flow and ductless heat pumps.

Demand response and emerging technologies were identified by the Council as areas of increasing importance. The Plan calls for the region to develop 600 megawatts of demand response resources to meet winter peak resource capacity by 2021. Capacity is the amount of generation the system can generate. Capacity represents a power plant's potential generation, measured in MW, not what the plants actually generate. Capacity is directly relevant to peak demand, which occurs at limited times. Energy is the amount of electricity (produced from capacity) customers actually consume over time, measured in megawatt hours or average megawatts.

The board asked about the difference between Energy Trust's Integrated Resource Plan, IRP, targets and Energy Trust's Strategic Plan. Ted explained that Energy Trust sets goals through two different processes, which include Energy Trust's annual budget process and also working with utilities every two years to develop IRP targets. Some of the differences between these goals and targets are due to timing.

The board asked about the difference between net and gross savings estimates. Ted estimates that net and gross savings should be roughly 10-15 percent different.

The board asked Ted to explain ramp rates. Ted explained that Energy Trust estimates ramp rates, which are rates of savings acquisition, based on what programs are currently doing compared to projections over the next few years to determine available potential. The Council applies ramp rates to individual measures based on market acceptance and adoption. Energy Trust looks at ramp rates at a higher level based on program performance.

Fred added that Energy Trust expects to reach market saturation for certain measures. Staff are trying to understand how discrete events like market saturation for single measures will impact program performance. The impact of current market impacts are not yet clear.

The board asked about Energy Trust's percentage of the region's achievement. Ted responded that Energy Trust accounts for about 20 percent by share of load. Energy Trust's resource potential amounts to 17 percent of the council's region-wide potential.

The board asked why the Seventh Power Plan emphasizes winter peak demand over summer peak demand. Staff responded that the region as a whole has larger peak energy needs in winter, though this varies based on utility territories. The winter peak is longer, with more hours total. Even if the summer peak increases, it still takes place over a shorter time period and is therefore less costly than winter peak.

The board asked if the differences between Energy Trust and Council projections are influenced by Montana and Idaho having acquired less energy efficiency than Oregon or Washington. Ted responded that Oregon's achievement is a key driver and whether it is the main driver is unknown.

The board asked about the relationship between load growth and efficiency required. Fred responded that efficiency helps mitigate load growth.

The board asked if the Council considers population growth, given growth in population from many people moving to Oregon. Ted responded yes.

The board asked about impact of projections for any power plant closures in Energy Trust service territory. Staff responded that Energy Trust relies upon utility load forecasts rather than developing its own load forecasts. Utilities are talking with their large customers to predict future loads, and those predictions are factored into their load forecasts. It is very difficult to predict large industrial plant closures. The board suggested Energy Trust can assume that plants will close in the next 15 years, and noted that the planning Council used ranges to predict and account for this uncertainty.

Staff described utilities also had difficulty forecasting large data centers recently built in Oregon. There are uncertainties that increase load and uncertainties that decrease load, and to some extent they balance each other out.

The board asked about surprising differences between the sixth and seventh power plans, commenting that the rapid emergence of LEDs is notable. Staff responded there are few new technologies in the Seventh Power Plan in which Energy Trust is not already engaged. Variable refrigerant flow is not yet incorporated into Energy Trust's work and will be soon. In creating the Seventh Power Plan, the Council took into account Energy Trust activities. Staff acknowledged they were surprised by the emphasis on demand response and capacity constraints when the seventh plan was released.

The board asked about the relationship between the Seventh Power Plan and IRP processes. How do IRPs inform the plan? Staff responded that load forecasts are part of IRP planning. The Council and utilities share measure assumptions and measure data.

The board asked about SEM and behavioral measures. To what extent does the Plan consider the persistence of behavioral measures? Staff responded it varies by sector and how much ongoing human intervention is needed. Persistence was a concern for the residential sector. A single intervention that continues to save energy over time has longer persistence than a strictly behavioral measure that requires repeated actions.

The board asked about the impact of increased renewable energy investments on energy efficiency. Staff replied that when renewable energy resources are added, utilities must build gas plants to back them up when renewable resources are not available. New gas plants would cause overall electricity

prices to decline and create cost-effectiveness challenges. New Oregon legislation states that priorities are “loaded” in order of energy efficiency, demand response and then renewable energy. The baseline for avoided costs is still being determined.

*The board took a break from 10:32 a.m. to 10:46 a.m.*

***Emerging Energy Efficiency Resources Development (Mike Bailey)***

Mike Bailey, engineering manager, presented the 2015-2019 Emerging Efficiency Resources Dashboard, depicting a very complicated process in a simple, linear graphic. The dashboard describes the work of both Energy Trust and NEEA, and shows how Energy Trust work intersects with and supports NEEA's work.

Energy Trust works on testing and implementation, while NEEA works on development and production. Energy Trust only works on products that are commercially available in the market. Energy Trust focuses on pilots and evaluations to determine if a technology can be delivered cost-effectively, which helps the organization include emerging technologies in its pipeline to ensure future energy savings. By 2019, NEEA expects to save 35 aMW as part of its work to support Energy Trust's pipeline. Energy Trust pilots fit into the middle of NEEA's pipeline, in the market assessment, strategy and development, and market development phases.

NEEA's gas market transformation initiatives began in 2015, with savings anticipated in the next NEEA funding cycle. The efforts are largely on track, and it is still too soon to expect results.

The board asked exactly where Energy Trust's work feeds into NEEA's pipeline, and noted that Energy Trust can support new technologies after NEEA's market assessment, strategy and testing and market development stages. A good example is heat pump water heaters, which NEEA took from the scanning to research phases. Energy Trust now provides incentives for heat pump water heaters. However, customers are not installing them as expected, so Energy Trust is again working with NEEA to address this market opportunity.

The board asked if the OPUC requested that 2015-2019 Emerging Efficiency Resource Dashboard be updated every year. Fred explained the OPUC's request for Energy Trust to provide an annual update and report for the OPUC showing Energy Trust pilot activities underway. In addition, this dashboard shows pilots and how they fit into the larger landscape of creating new resources.

The board asked how technical specifications, codes and standards impact Energy Trust's measure life calculations. Can Energy Trust no longer claim savings on a measure once it is required by code? Staff responded that if a technology becomes a code standard and NEEA has a strong case that Energy Trust influenced that standard, Energy Trust can claim some of those savings. Energy Trust works closely with NEEA to ensure new building codes and equipment standards are successfully adopted by the market.

***Expanding Participation (Debbie Menashe)***

Debbie Menashe presented on expanding participation, one of the strategies outlined to achieve Energy Trust's 2015-2019 Strategic Plan goals. Energy Trust is working to reach more customers to save and generate more energy. The diversity initiative is one part of Energy Trust's expanding participation strategy.

Energy Trust identified market research progress indicators for its expanding participation strategy. Staff compared aggregated market data to Energy Trust's actual customer participation in three project areas to understand penetration with various demographic groups. Based on this information, staff are now compiling a customer insights study and organizing focus groups. Subsequently, staff plan to apply this

analysis to program design. Energy Trust wants to learn why its programs may or may not be resonating with certain groups of people.

The board asked how Energy Trust defines demographic groups. Debbie explained that market research aggregators can analyze groups in many different ways. Energy Trust is looking at race, ethnicity, income, age and education level. Information is available at a block-by-block level of detail.

The board asked if Energy has requested PMC and Program Delivery Contractor input about the most important demographic groups to target. Staff responded that staff are tapping CLEARResult expertise and Margie has also reached out to Lockheed Martin and to trade ally contractors. Energy Trust is also gathering input from utilities and is just at the surface of understanding this research.

The board observed that market research is not always accurate. An important part of engaging new communities is building relationships with organizations that represent and serve those communities. Organizations often miss that step. The board encouraged Energy Trust to take this work a step further by building relationships with these communities and seeking different insights and perspectives. Staff responded that the research is a foundation for that relationship building, and the board encouraged staff to include more diverse participants and perspectives in these early conversations. Margie responded that Energy Trust is beginning with training and education for our staff and further commented that some of her outreach on the diversity initiative has engaged both organizations and individual leaders.

Staff described program design and execution progress indicators. One effort is to translate program materials, particularly for Spanish and Russian communities. A consultant helped Energy Trust plan to invest prudently and effectively. There are other ways to get messages across for different cultural audiences than just word-for-word translation. In addition, staff are using competitive solicitations to engage PMCs, PDCs and creative services agencies who have experience delivering programs to diverse communities.

The board suggested that Energy Trust can apply information about cross-cultural communications and translation to further improve its communications and marketing. Staff noted that this is the kind of innovation that results from the diversity initiative.

The board noted that engaging new participant groups can bring additional customer benefits. For example, energy efficiency support helps community members stay in their homes when housing and rent increase. A board question was asked about how Energy Trust can improve its market research efforts. Debbie M responded initial market research suggests the organization is not reaching all groups equally. Energy Trust will learn more through an upcoming customer insights study and customer focus groups.

The board asked when results of these efforts will be available and what additional information is expected to be shared in the future. Debbie M responded that in one year, staff can share program design and execution strategies specifically tailored based on this market research.

*The board took a break from 11:30 a.m. to 1:00 p.m. for a board photo and lunch*

## **Morning Recap**

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Nick asked board members to share general thoughts on presentations and discussions from this morning. The board noted its interest in the findings about Energy Trust's approaches to engaging diverse participants.

Commissioner Stephen Bloom arrived at 1:00 pm.

## Strategic Plan Progress Update, continued

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### **Key Process Improvements** (*Amber Cole, Mariet Steenkamp, Scott Clark*)

Chief financial officer Mariet Steenkamp described Energy Trust's progress on improving key processes. Process improvement is a focus area for the organization because it supports efficient achievement of energy savings and generation. Process improvement opportunities were also identified in 2014 as part of Energy Trust's Management Review.

To identify areas for improvement, staff started by identifying four major administrative processes: energy project tracking; internal procurement and payment; customer information and customer services; and incentive processing. These are significant and repetitive processes for which it makes sense to identify and define improvement metrics. Because Energy Trust has a variety of diverse and semi-repetitive processes, time needed to track against performance metrics may exceed the value of efficiency for these processes.

Scott Clark, director of IT, described Energy Trust's efforts to improve energy project tracking. In 2015, Energy Trust processed 108,000 projects, a 10 percent increase from the prior year. To improve energy project tracking, Energy Trust replaced its former project tracking system with a new and easier-to-use system called Project Tracker. The new system is flexible, allowing improvements to be made in a matter of weeks rather than months. Project Tracker also enables staff to process projects more efficiently and easily. With so many projects, this small and simple change adds up to big savings. To measure this process improvement, Energy Trust assessed one program to set a baseline measurement.

Mariet described the organization's efforts to improve internal procurement and payment processes, such as procurement of goods and services and approval of documents. This includes all steps from purchasing an item to making a payment for that item. Energy Trust needs to implement an automated solution for tracking improvements to this process, and recently published a request for information to solicit solutions from software vendors.

The board asked Mariet to explain automatic procurement. Mariet responded that Energy Trust receives invoices from vendors. A staff person prints that invoice, routes the paper invoice internally for approval, then enters that invoice into an electronic system. Energy Trust wants to make this entire process electronic. This may include functionality to automate routing and processing.

Amber Cole, director of communications and customer service, presented Energy Trust's work to improve processes and systems for customer information and customer services. Amber noted that Energy Trust maintains very high customer service ratings of 90 percent or more. Two years ago, Energy Trust upgraded its Customer Relationship Management, CRM, system and continues to invest in the system by adding capacity to track relationships with stakeholders. Recently, Energy Trust upgraded its interactive voicemail response system to save time for customers and increase customer satisfaction. Since upgrading this system in April, Energy Trust has recorded a 20 percent decrease of time a customer spends trying to find needed information. To further track success, staff worked with the Existing Homes program to establish baseline measurements, which include reducing time for the customer and reducing time and resources for Energy Trust. Finally, Energy Trust completed a website usability study to understand how customers access and navigate its website. Staff learned that one-half of all users access the website through mobile devices such as smart phones and tablets. Staff are currently working to redesign the website, which will launch in the fall to be optimized for mobile users.

Mariet described work to improve processing of incentive payments to participants and trade allies. Work is beginning to evaluate the overall incentive processing system and to result in identifying and prioritizing improvements.

The board asked about how improvement is tracked and measured, and encouraged Energy Trust to pursue low-cost measurement methods. Staff responded that to measure success of the Project Tracker, staff captured information for one program over four months. Energy Trust does not plan to capture all data at all times.

The board noted that the goal is to improve efficiency, not to measure the efficiency improvement. The board reiterated the importance of making processes efficient not just for Energy Trust, but for customers.

The board asked if Energy Trust can quantify savings from these process improvements, such as in dollars or time. Staff responded that quantifiable cost savings are expected for the interactive voicemail response system improvements.

The board asked about another Management Review recommendation to simplify reporting. Staff responded that staff eliminated the stand-alone Q4 report and now delivers Q4 activity data as a shorter appendix to the annual report. In addition, subsequent to the Management Review, staff have worked to streamline the content development process for reporting. Feedback from program staff indicate that reporting is less time-intensive than it was in the past. Staff is looking for additional ways to streamline reports, including featuring less narrative and more graphics. Margie added that updates and quantification of process improvements are also noted in reports.

The board asked if Energy Trust is tracking demographic information from customers and suggested purchasing information on customers from a third-party. Staff responded that this is our approach.

The board expressed confidence staff will prioritize process improvements over measurement of process improvements and requested more information on finance improvements for the board Finance Committee.

The board asked if Energy Trust will survey customers on how they like these new systems. Amber responded that is possible and something staff will consider.

Board members appreciated anecdotal examples of process improvements.

***Staff Engagement (Sarah Castor)***

Sarah Castor, evaluation senior project manager, described Energy Trust's history of surveying staff to determine engagement since 2005. An engaged employee is one who is fully absorbed by and enthusiastic about their work and takes positive action to further the organization's reputation and interests. Drivers of employee engagement have been identified as an enabling workplace, work-life balance, work alignment, rewards and recognition, leadership and accountability, and future growth.

Each year, staff complete an anonymous survey with 46 statements. Staff rate each statement on a five-point scale from strongly agree to strongly disagree. Agree and strongly agree are considered engaged.

Sarah presented highlights from Energy Trust's 2015 staff survey, completed by 76 percent of staff. Over the last three years, employees were most engaged in areas of leadership and accountability and work-life balance. Employees were least engaged in future growth and rewards and recognition. To compare with other workplaces, Gallup reports that approximately 35 percent of U.S. employees are engaged.

Sarah described trends over time and survey themes. Employees appreciate Energy Trust's mission people and culture, challenging work, integrity and accountability, achievement, and opportunities for

training and development. Energy Trust could be improved by more opportunities for promotion and advancement, more coaching and mentoring and reduced administrative workload.

The board asked how staff would like to broaden the mission. Sarah responded that suggestions included mitigating climate change and greenhouse gas emissions. The board noted that broadening the mission could also create new opportunities for employee growth, learning and advancement.

Since 2015, Energy Trust took several actions to address survey responses. In 2015, Energy Trust engaged a consultant on company-wide career planning and professional development, including exploring concerns about fairness of promotions. Energy Trust has also encouraged staff and managers to discuss professional growth and development, and Energy Trust has invested in more staff training, including on supervision, cultural competency and conflict resolution. In addition, Energy Trust revised position descriptions across the organization and offered a new benefits plan option in 2016

The 2016 staff engagement survey is currently open and results are expected in June.

The board asked if notable events influenced survey responses in the past. Sarah responded that staff responded more positively to a question about receiving meaningful feedback from supervisor following a training for supervisors. Margie added that Energy Trust revamped its employee recognition program based on staff feedback.

The board asked if supervisors could see results for their supervisees. Sarah responded that results were reported in aggregate by programs and operational support functions to maintain confidentiality.

The board discussed why Energy Trust's grant agreement includes only investor owned utilities, investor owned utilities comprise the majority of Oregon's load. The board also acknowledged that Energy Trust added staff and budget dramatically after the passage of Senate Bill 838, and now has reached a plateau. That impacts employee growth opportunities.

Heather Eberhardt arrived at 2:00 pm.

***New Opportunities for Collaboration (Debbie Menashe, Mariet Steenkamp)***

Debbie M presented on the new opportunities strategy identified in the 2015-2019 Strategic Plan, including irrigation modernization, water savings, wood stove conversions, federal load repayment, carbon reduction, Nest thermostats demand response, and solar energy storage. Energy Trust is on track for all seven new opportunity initiatives highlighted for the board at the prior year's retreat except working on carbon mitigation projects proposed by NW Natural pursuant to Senate Bill 844. Energy Trust will continue to monitor opportunities for engagement with these carbon reduction efforts. The Strategic Plan dashboard organizes new opportunities into three categories: complementary initiatives, response to policy initiatives and load and demand management with utilities.

Mariet described potential work to get Energy Trust ready to pursue new federal funding opportunities. Energy Trust has systems in place to evaluate these opportunities, including ability to track federal funding and comply with federal funding regulations. Recently, Energy Trust staff were approached by external organizations asking if Energy Trust would like to pursue federal grants. It is important to evaluate Energy Trust's infrastructure and processes required to comply with federal funding regulations. The U.S. Office of Management and Budget recently issued uniform administrative guidance for nonprofits to receive federal funding. Staff will evaluate if Energy Trust can meet these requirements and will report back to the board.

The board asked how Energy Trust would pay for work to pursue federal grants given that our dollars are restricted for ratepayers. Mariet explained that this is as an opportunity to assess our systems and

processes more broadly to align with industry best practices, and one of the other outcomes is to identify alignment with uniform administrative requirements.

Debbie M added that Energy Trust received a request from the Clean Energy States Alliance to participate in an effort to support solar energy for low-income households. This would be an opportunity to leverage federal funding to support work Energy Trust is already doing, and to deliver more value for ratepayer dollars.

The board asked if federal funding would include funding for program design and partnerships with other organizations. Debbie replied that this is likely but depends on the specific opportunity.

The board cautioned staff to consider that receiving outside funding puts us at risk of scrutiny from legislators who think Energy Trust may no longer need state-directed funding anymore. Staff noted that the grant agreement does permit Energy Trust to seek outside funding. This is not to pursue funding indiscriminately, but to prepare to take advantage of the right opportunity should it arise. The next step would be to put together a project team within the organization, with board support.

The board asked if staff asked the OPUC for input, and Debbie responded that Energy Trust has not yet requested specific input from the OPUC but will as the effort proceeds further.

The board requested boundaries about how much time and energy this effort would require and a description of potential benefits, and suggested staff put together a few brief sample proposals to evaluate the opportunities. Federal grant opportunities could help Energy Trust increase capacity to serve a new part of the market and staff should limit resources spent on this effort.

The board noted that Energy Trust is already pushing boundaries in several different areas, such as irrigation and industrial emissions mitigation. The benefit of receiving federal funding could be in creating partnerships with other organizations that expand our capacity, such as through matching funds with low-income organizations.

A board member approved of Energy Trust's strategic growth, especially in the area of renewable energy development. Another board member cautioned that seeking new funding sources while Energy Trust has significant funding reserves makes the organization vulnerable to scrutiny.

Debbie M added that Energy Trust has a process to scrutinize potential benefits before pursuing any new opportunities and examination of internal controls and systems will help Energy Trust be ready to evaluate future opportunities.

*The board took a break from 2:25 p.m. to 2:40 p.m.*

## **Strategic Issues in Energy Trust Programs**

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### ***Energy Trust and Demand Response (Ted Light)***

Senior project planning manager Ted Light described needs for demand response and how energy efficiency can support demand response efforts. Demand is the rate at which energy is delivered by a system or used by a customer at any given instant. Demand is measured in units of power, like kW or MW, whereas energy is measured in units that include a dimension of time, like kWh or MWh.

Utilities must meet energy demand at all times, including in mornings and evenings and during summer and winter when cooling or heating needs for homes and businesses are greatest. The timing of energy use is becoming increasingly important due to growing loads, constraints on the hydropower system and



increased renewable energy on the system. The hydropower system is constrained by low water years and requirements for fish. There is also increasing disparity for the price of power between peak and nonpeak periods.

For the first time, the Northwest Power Planning and Conservation Council has prioritized demand response in the Seventh Power Plan. Demand response is a variety of strategies to reduce customer energy uses during periods of peak demand or system constraints. Strategies can include increasing prices during peak times of use, offering incentives for customers to turn down or shut off equipment or having utilities directly control equipment through pre-arranged agreements with customers.

Demand response is widely and routinely used across the country. On average, the U.S. has enough demand response in place to meet 6 percent of peak loads. The Pacific Northwest has only enough demand response to meet 2-3 percent of peak load.

Technologies exist that provide both efficiency and demand response benefits. Nest thermostats have built-in energy efficiency functions, such as occupancy detection and improved heat pump operation. In addition, Nest offers services to utilities that support demand response efforts by trimming fractions of a degree from thermostat settings when customers will not notice. Rush Hour Rewards reduces demand by tuning thermostat automatically to reduce demand during peak periods. Portland General Electric offers incentives for customers that install Nest and enroll in the Rush Hour Rewards program.

Heat pump water heaters are another prominent technology offering energy efficiency and demand response benefits. Heat pumps are highly energy efficient, and they also have an easy-to-use vacation setting. A \$50 add-on enables Wi-Fi connection and demand response capability.

Demand response opportunities for commercial and industrial participants include engaging graduates of SEM, who are savvier about energy use than general participants, and installing controls that save energy and facilitate demand response participation.

Ted described synergies from combining energy efficiency and demand response efforts. Energy Trust can promote widespread adoption of equipment that utilities can later use to meet peak energy needs. Given that demand response efforts are new to the Pacific Northwest, Energy Trust could also play a role as an educator.

Ted described Energy Trust's existing efforts in support of demand response. In 2015, Energy Trust adopted load shapes from the Seventh Power Plan, improving Energy Trust's ability to report peak demand reductions caused by energy savings. Energy Trust now quantifies energy savings at a more granular level based on time of day and time of year use. Energy Trust also engaged with PGE on cross-program referrals. Pacific Power shared details about a demand response pilot with irrigators in Southern Oregon. Energy Trust is also working with NW Natural to quantify the value of natural gas saved on peak days or peak hours to eliminate adding new pipe infrastructure. Energy Trust staff are also having discussions with Bonneville Power Administration on how energy efficiency could help mitigate grid congestion issues on a transmission system. Energy Trust's next steps are to look at the Council's valuation of energy efficiency peak capacity benefit and to continue discussions with utilities.

The board emphasized that the Pacific Northwest is the last part of the U.S. to be concerned with demand response. Energy Trust's enabling legislation specifies it acquires cost-effective energy conservation only. The board would like direction from the OPUC supporting Energy Trust's demand response efforts.

The board discussed the concept that demand response is conservation because it reduces the need to build additional power lines and asked if recent interest in demand response is driven by hotter weather

and higher summer peak demand. Also, doesn't an effective demand response system require real-time meters?

Ted responded that the OPUC is primarily concerned with meeting the winter peak demand during critical water years. PGE and Pacific Power are more concerned with summer peaks. In answer to the second question, PGE already deployed smart meters and Pacific Power announced plans to install smart meters over the next few years.

The board commented that the region's need for 600 MW of demand response is huge, half of the capacity of Bonneville Dam.

A board member pointed out in response to the 2015 budget, the OPUC asked Energy Trust to explore and report on demand response efforts.

The board asked about best practices for demand response efforts across the U.S. Staff responded that Energy Trust is currently only looking at demand response efforts that overlap with its energy efficiency mission.

***Renewable Energy Sector Strategic Issues and Opportunities*** (Betsy Kauffman, Dave McClelland)  
Betsy summarized the impact of Senate Bill 1547 and the expanded Renewable Portfolio Standard, RPS, on Energy Trust. The bill increased the RPS to 50 percent of retail load by 2040. The majority of RPS requirements will be met by large projects outside of Energy Trust's purview. The bill also includes a mandate to set up community solar programs with low-income participation, as well as requiring 8 percent of aggregate capacity to come from small-scale community solar projects. It is unclear how this will impact Energy Trust or if this requirement has already been met for the state. OPUC rulemaking is still to come.

Betsy provided context for the RPS as a driver of renewable energy projects. The RPS is an effective tool at driving development of large solar and large wind projects and is not directly a driver of the types of project Energy Trust does: small solar, small wind, biopower and hydropower projects. The RPS is not aimed at driving broad participation or building resiliency at the local level.

The board asked about how to calculate "aggregate capacity." Dave McClelland, solar program manager, responded that retail load is around 5,000 to 6,000 aMW, and it is not yet clear what is meant by aggregate capacity. Betsy added that there are various ways to define aggregate capacity. How do you include gas plants that meet load in multiple states? Firm capacity? Nameplate capacity? Operating capacity?

Dave then described Energy Trust's solar program forecasting, which is driven by external policy and market factors. A year ago, Energy Trust anticipated the expiration of the investment tax credit, ITC, at the end of 2016, which would have increased the above-market cost for solar projects starting in 2017. In December 2015, however, the ITC was extended. It is now scheduled to stay at 30 percent through 2019 and then decrease to 26 percent in 2020 and 22 percent in 2021, expiring for residential solar at the end of 2021. The result is that above-market costs are now expected to decrease more quickly than originally anticipated.

Energy Trust's incentives help bridge the customer above-market costs, and it is not yet clear how the ITC extension will impact above-market costs for solar installations. In the last six years, Energy Trust saw an 8 percent annual reduction in average solar installation costs. Above-market costs will depend on the rate at which solar prices decline, whether the Residential Energy Tax Credit, RETC, expires as scheduled at the end of 2017 and potential changes to net metering. If the RETC expires, there will still be above-market costs through 2020. If the energy compensation is reduced to a lower resource value,

there could be as much above-market costs in 2020 as there were 5 years ago. Energy Trust will need to stay adaptable and flexible.

Betsy summarized current OPUC dockets, noting increased focus on renewable energy generation. Energy Trust is closely watching five dockets. Outcomes of these dockets could affect program design and incentive levels.

Dave described the solar programs study UM 1758. House Bill 2941 asked the OPUC to review all current policies that provide incentives for solar projects, including Energy Trust, net metering, RETC, voluntary utility grant programs, Renewable Portfolio Standard and others. The legislature asked the OPUC to make a recommendation to continue, modify or discontinue each of these programs. No public criteria has yet been published by the OPUC, and a report is due to the legislature in September.

Dave described the resource value of the solar docket, UM 1716, which has been going on for about a year. UM 1716 aims to determine the resource value of solar, including elements such as energy and capacity values and avoided emissions. The OPUC sought input from stakeholders and is expected to make a final decision and close the docket by the end of 2016. SB 1547 directly references this decision as the compensation rate for subscribers to community solar projects.

Betsy described a review of Energy Trust's renewable energy programs requested by the OPUC, given recent market changes like the ITC extension and increased RPS. As a result, Energy Trust will re-evaluate the renewable energy strategic plan to explore maximizing a range of values. This project will kick-off in June at the Renewable Energy Advisory Council meeting.

Betsy described an OPUC review of Energy Trust and voluntary funds, which includes determining whether a project can receive Energy Trust incentives and Pacific Power Blue Sky<sup>SM</sup> or PGE Clean Wind funding. A decision is expected in fall 2016. In the interim, Energy Trust will cease providing incentives for solar projects that receive Blue Sky or Clean Wind funding.

Betsy presented on Energy Trust's potential alignment with public interest and investment in community resilience. The costs of solar and storage are falling, and some Oregonians are interested in planning to sustain energy and infrastructure in the event of a natural disaster, such as an earthquake. Energy Trust may be able to help communities achieve resilience through deployment of solar systems and batteries. This effort comes with challenges, such as the need for financing, increased costs of wiring a subpanel for existing buildings and lack of experience and institutional knowledge. On the east coast, projects can sell grid services to the utilities, and this is not an option in Oregon.

Energy Trust staff are engaged in conversations with cities about several project opportunities. This is part of a larger dialogue about how Energy Trust can provide additional value through renewable energy projects. Betsy described the collaboration between Energy Trust and PGE developed at a recent Rocky Mountain Institute workshop.

The board was happy to hear that Energy Trust is thinking about its renewable energy role. SB 838 gave Energy Trust a goal of installing 8 percent of the state's energy from small renewable energy projects. Now that the 8 percent is mandated, what is Energy Trust's role? Betsy replied that even with an 8 percent mandate, small rooftop solar projects would not be feasible without Energy Trust support. The board noted the OPUC needs to raise these questions.

The board stated Energy Trust has a role in funding renewable energy projects, and asked if staff approached the governor to discuss opportunities to support community resilience efforts. Are there broader opportunities for Energy Trust to support this effort? Betsy replied that the governor's office has not been engaged. Conversations have begun with the cities of Portland, Coos Bay and Talent.

The board noted that \$4 per watt for solar still seems high. Dave responded that this average price per watt includes both PGE and Pacific Power markets. The PGE market is more competitive, with costs around \$3.50 per watt. The board noted that large projects can generate more energy for less money than small projects, but these large project do not result in local infrastructure. The most challenging solar projects are the ones between small and large, like at church or school rooftops, where customers cannot purchase a system on their own and there is no financing option. The board expressed skepticism about community solar because the owner will claim the RECs, not the individual investors. Staff noted this is also an issue for Energy Trust customers, because Energy Trust retains some RECs when it provides an incentive.

Dave continued that if there are no above-market costs for solar in a few years, Energy Trust will need to figure out how to transition out of the solar market. Dave noted there are more above-market costs for small commercial projects, and Energy Trust spends roughly twice on commercial projects compared to what it spends on residential projects. If there are no residential above-market costs, Energy Trust may be able to invest more in the commercial sector.

The board asked about solar costs in Energy Trust's market compared to other markets. Are prices higher in Oregon because we have incentives? Equipment costs are declining, but are installation costs declining? Staff responded that Energy Trust's soft cost reduction efforts are intended to quantify and reduce those non-equipment marketing and installation costs.

Staff continued that while larger solar projects are cheaper per kWh, there are benefits to broad participation and building the industry. There are also efficiencies to generating energy exactly where it is used. Large scale solar projects generally do not have above-market costs and do not need Energy Trust incentives.

The board noted the need for a stable market for large solar projects, which are heavily influenced by tax credits and policies. Staff responded that one of Energy Trust's goals is to provide stable, predictable incentives for the market, even if incentives are gradually reduced as costs climb.

The board added that Oregon residents have fixed price net metering, not time-of-day net metering. Customers who install storage could, theoretically, save money by moving to a time-of-day plan, but that Commissioner Bloom stated the OPUC currently has eight active dockets on SB 1547 alone, and staff are very busy evaluating and addressing current legislation. He noted an additional need to ensure natural gas safety during an earthquake, which the state has been working on for a long time.

The board commented that Energy Trust can use data from recent natural disasters to inform these decisions and recommended that staff study what other communities are doing.

## **Public Comment**

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Holly Meyer, NW Natural, asked how Energy Trust will coordinate with community action agencies and other entities to reach diverse customers, as Energy Trust does not work directly with low-income customers. Margie replied that Energy Trust currently coordinates with community action agencies to serve residential customers, and nothing prevents the organization from doing more work to benefit low-income customers and communities.

## **Closing Comments**

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The board observed potential opportunities for Energy Trust to broaden its approach, and wants to ensure that Energy Trust has support from the OPUC before pursuing these opportunities. The board also thanked staff for the informative briefings and was impressed with Energy Trust's progress toward

its 2015-2019 Strategic Plan goals. Energy Trust goes above and beyond to continuously improve its operations. Energy Trust should always check in on its core mission before continuing to adapt.

The board liked the retreat location and appreciated learning about and discussing a variety of topics, including continuous improvement, stakeholder engagement, demand response and renewable energy and resilience. The board thanked each other for robust discussion and staff members for careful preparation. The board appreciated the Strategic Plan dashboard tool.

The board acknowledged what almost happened in the legislature, noting that it is important Energy Trust continue to concentrate on non-solar Other Renewables opportunities like the irrigation modernization efforts.

The board suggested Energy Trust connect its resiliency and low-income efforts, as low-income populations are often hit hardest by natural disasters.

*The board adjourned for the day at 4:30 p.m.*

## **Board Strategic Planning Workshop Mercy Corps, Portland, Oregon**

Friday, May 20, 2016

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**Board members present:** Susan Brodahl, Ken Canon, Heather Beusse Eberhardt, Dan Enloe, Roger Hamilton, Lindsey Hardy, Mark Kendall, Debbie Kitchin, Alan Meyer, John Reynolds, Anne Root, Eddie Sherman, Warren Cook, Stephen Bloom

**Board members absent:** Melissa Cribbins

**Staff attending:** Mike Bailey, Kathleen Belkhat, Shelly Carlton, Amber Cole, Kim Crossman, Sue Fletcher, Fred Gordon, Margie Harris, Marshall Johnson, Betsy Kauffman, Steve Lacey, Scott Leonard, Debbie Menashe, Lori Miller, Spencer Moersfelder, Pati Presnail, Thad Roth, Mariet Steenkamp, Julianne Thacher, John Volkman, Peter West,

**Others attending:** Jim Abrahamson (Cascade Natural Gas), Julia Harper (NEEA), Holly Meyer (NW Natural), JP Batmale (OPUC), Bob Stull (CLEAResult), Kerry Shroy (Avista), Sarah Frederickson (CLEAResult), Elaine Prause (OPUC), John Franklin (NW Natural), Jason Eisdorfer (Oregon Public Utility Commission), David Kelleher (Ecova), Don Jones (Pacific Power)

### **Welcome and Day One Recap**

Nick asked board members to share reflections and observations from day one. The board expressed interest in learning more about OPUC dockets regarding recent legislation and receiving clear guidance.

### **Strategic Issues in Energy Trust Programs, continued**

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***Residential Sector Strategic Issues and Opportunities*** (Thad Roth, Marshall Johnson)

Thad Roth, residential sector lead, presented on strategic issues and opportunities for the residential sector.

In Energy Trust's 2015-2019 Strategic Plan, several challenges were noted for the residential sector, including measures that are no longer cost-effective, rising products standards, measure saturation and market transformation. These challenges are the result of Energy Trust's success in transforming the

market. Energy Trust's challenge is to redirect efforts on new opportunities while capturing current opportunities.

In recent years, Energy Trust maintained cost-effective residential programs by reducing program costs, streamlining processes and capping weatherization incentives. Staff also created new savings opportunities by expanding measure offerings within the current program structure.

The residential sector is now assessing savings potential, including measures with declining opportunities, measures with sustained or increasing opportunities, or new measures expected to provide savings. Savings from some measures are expected to decline in the next few years, such as lighting. Savings from water heating and heating and cooling equipment may maintain or increase in the next few years.

Staff are also currently assessing residential program structure. Currently the sector includes three programs: Existing Homes, New Homes and Products programs. This structure may not be optimal for promoting specific technologies in the future. Staff aim to assess the extent of restructuring needed and organize programs around technologies, in an effort to decrease costs and reduce duplication of measures across programs.

Energy Trust expects to move toward mid- and upstream engagement and away from customer-facing incentives. This strategy is expected to reduce program costs and improve cost-effectiveness, but it will change the way Energy Trust engages with consumers and residential customers. Energy Trust will still have a role in educating customers through its website to engage with customers, online purchasing tools and point-of-purchase materials in stores.

Changes may impact savings forecasts and program budgets, internal staff roles, PMC contracts and external stakeholders. Staff will complete a savings analysis in June 2016, create an assessment of program structure by September 2016 and develop a transition plan in 2017. Implementation is expected in 2018. These changes are expected to impact savings and budget starting in 2017.

The board asked when customers will see program changes. Staff responded that changes have already begun for some measures, such as for water heating and smart thermostats. Many of these changes are behind the scenes, and impact how we measure benefits and costs and how we allocate them to residential programs. The greatest impact will be on internal staff and PMCs. Energy Trust's program structure is not likely to be visible to customers.

The board asked for early notice of measures that may discontinue. Staff responded that the board will learn more through reviewing the budget for 2017. The board will also learn more as Energy Trust renews or changes PMC contracts. Energy Trust rebids PMC contracts periodically, and the board is involved in that process.

The board asked if staff program changes will impact cost-effectiveness. Staff responded that restructuring programs will allow Energy Trust to continue to support market adoption of efficient gas water heaters at a lower cost.

Homes program manager Marshall Johnson described Energy Trust's OPOWER efforts as an example of evolving residential program delivery to include behavioral savings. Energy Trust issued OPOWER's personal energy reports to customers of PGE, Pacific Power and NW Natural and measured the persistence of behavioral energy-saving efforts over several years. Staff learned that providing these reports does save energy and those savings are not cost-effective.

The board asked if the efforts would have been cost-effective if delivery costs were cheaper. Marshall responded yes, and cost-effectiveness is also impacted by how long the savings last.

Energy Trust later conducted several pilots to test Nest thermostats, discovering Nest can deliver cost-effective savings in homes with heat pumps and gas forced-air furnaces. In November 2015, Energy Trust launched an incentive for customers who install smart thermostats. Because customers perform the installation, the program delivery costs are minimal. In November and December 2015, Energy Trust received 500 incentive applications leveraging PGE promotional efforts.

The board asked how much a Nest thermostat costs. Staff responded that a Nest thermostat costs roughly \$250.

The board asked how many energy savings from Nest thermostats break out by fuel? Marshall estimated 80 percent of savings are gas and 20 percent are electric.

Marshall described a 2016 pilot to test automated behavior controls. Energy Trust will work with Nest to deploy an algorithm to slightly modify temperature and schedules for each season. Set points will be adjusted by 0.7 to 1.3 degrees when Nest thinks customers will not notice. Energy Trust will compare billing analysis to run-time reports from Nest. Key research questions are about the quantity and duration of energy savings and satisfaction of customers.

The board asked if Energy Trust will continue to track and study customers after the pilot, and staff responded that could be possible.

Energy Trust can deploy the pilot annually through Nest. Savings potential could be as much as 10 percent of residential sector gas savings in 2017 and 13 percent of residential gas savings in 2018. Nest provides opportunities to save energy from both heating and cooling costs.

The board asked if Nest will know specifically which customers participate, and staff responded that Nest will provide unique identifiers so Energy Trust can track individual sites.

The board noted that Energy Trust estimated less potential from behavioral measures than in the Seventh Power Plan and there seems to be huge opportunities for behavioral savings from smart controls like Nest thermostats. Marshall responded that the Council is looking at electricity only, and most of the Nest savings is for gas customers. Three-quarters of residential heating systems in Oregon are gas.

The board asked about a demand response device for heat pump water heaters mentioned in Ted's presentation. Marshall responded that this is a potential future technology. Staff cautioned that Energy Trust needs to test new measures before offering them, and the board is interested in pursuing faster pilot approaches to learn more.

The board asked if the algorithm is one-size fits all or if it is tailored to the individual. Staff responded that the algorithm is customized somewhat based on occupancy information and local weather data.

A board member shared a positive experience installing a Nest thermostat and participating in PGE's demand response program and asked about additional strategies to market Nest to diverse communities. Staff responded that Energy Trust could pursue Nest thermostat installations in high-potential savings areas as a direct installation offer. There could also be an opportunity to partner with low-income agencies to support direct install efforts.

The board asked if the baseline in a heat pump heated home is a night setback thermostat, and staff responded that the control group homes did have programmable thermostats. Nest saves more energy than other programmable thermostats.

The board asked if independent rating bodies exist so Energy Trust doesn't have to conduct specific pilots for new technologies. Marshall responded that Energy Trust works with ENERGY STAR and the Consortium for Energy Efficiency to share pilot results. Standard certification for smart thermostats will not be available for more than a year. Marshall noted Energy Trust is interested in a faster, provisional approach to conducting pilots or leveraging efforts from other entities.

The board asked about installation costs. If a customer paid a contractor to install Nest, it would cost more and reduce the cost-effectiveness of the measure. But the savings are the same. Why does Energy Trust care how the customer installs the measure if the energy savings is equal? Staff noted it is important to consider the various sources of residential savings and total participant costs are used in measuring portfolio Total Resource Costs. Weatherization are still real savings, even though they are more expensive. Energy Trust designs programs with a variety of offerings. Cheaper savings sources balance more expensive savings sources. Staff added that lighting and showerheads have a lot of non-energy benefits and help offset higher cost measures. There are also non-energy benefits from smart thermostats.

### **Energy Trust as Educator** *(Amber Cole)*

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Communications and customer service director Amber Cole presented a proposal for Energy Trust to engage in more educational work, and requested board interest, thoughts, concerns and suggestions.

Education helps build knowledge, understanding and skills. At Energy Trust, staff focus on educating market allies and eligible customers to fulfill the organization's mission and purpose, such as by teaching industrial and commercial customers Strategic Energy Management. Sometimes education has a direct relationship with participation in energy programs, sometimes the relationship is less direct. Sometimes participation comes immediately, sometimes it takes more time to see results in savings or generation.

Awareness is the first step in participation. Education helps build awareness of opportunities, particularly for customers unfamiliar with energy efficiency and renewable energy. Education is currently part of our work where it can directly and in the short term lead to participation and engagement. Energy Trust efforts are less focused on educating customers when education promotes energy savings or generation indirectly or over a long time period.

Staff see three main customer benefits to expanding Energy Trust's educational efforts beyond what is currently offered. First, education provides customers with a baseline of stable and consistent access to information so that a customer is more interested in participating when they are able. Second, education supports the 2015-2019 Strategic Plan objective of expanding participation. Third, education develops customer readiness in an increasingly complex energy landscape, which may include electric vehicles, demand response and community solar.

Amber presented a few examples of current education work. One example is LivingWise kits and curriculum provided to sixth grade students in schools. The kits include light bulbs, showerheads and faucet aerators for children to take home and install with their families, along with educational activities used in the classroom. In the future, these products may no longer deliver savings or the product mix may change, but this educational vehicle and connection to many schools and families may be important to continue. Other examples are kilowatt energy monitors available in public libraries with educational materials and modest sponsorships for community energy workshops. These have the potential to motivate customers and do not always result in immediate or measurable energy savings.



Amber proposed four ideas for potential expansion to educational work. First is expanding support for community and partner-driven initiatives, such as through community workshops with nonprofits or governments. Another is to resume or expand activities previously offered as a vehicle for acquiring program savings. A third idea is partnerships with educational institutions, such as energy curriculum or student internships. Recently, Oregon Tech asked Energy Trust to provide support for graduate student energy-efficiency capstone projects. Energy Trust has partnered with Blue Mountain and Lane community colleges to deliver building operator certification training, and we may want to work with community colleges to deliver other educational content leading to potential engagement with our programs. A fourth idea is a broad educational campaign to increase customer knowledge of energy efficiency and renewable energy options. Utilities could be an important partner in this area.

Other organizations offer education, such as utilities and ENERGY STAR. Amber noted that Efficiency Vermont has dedicated efforts that lead to education rather than savings, such as an energy literacy program in K-12 schools. They contract with an implementer, the Vermont Energy Education Program, to deliver curriculum in schools. The goal is an educated citizenry able to participate in programs and make wise energy decisions. Efficiency Vermont also has a consumer education section of its website and promotes its call center and online chat tool as a source of unbiased third-party expertise. This goes a step beyond what Energy Trust currently markets and provides.

Energy Trust needs to consider what are the reasonable costs and scope for education activities, including treatment of costs in our budget, evaluation options and parameters, and how to maximize benefits. Energy Trust's grant agreement with the OPUC allows some latitude to engage in education programs, and Energy Trust could explore this further. Amber asked if the board supports further exploration of education efforts.

The board acknowledged value in education efforts, and discussed the importance of ensuring that Energy Trust is true to its charter for both market transformation and achieving local conservation. The board noted that Energy Trust has largely delegated market transformation to NEEA.

The board commented would be great if Energy Trust can get customers to save energy without giving them incentives, but that would be difficult to measure, and measurement is important for accountability.

The board asked about the goal of these potential efforts and requested a specific proposal about benefits, costs and goals. How is education different from general marketing and outreach? Amber responded that the scale and the level of investment is different than our current efforts in general marketing and outreach. Similar to yesterday's discussion about whether Energy Trust should invest time in becoming ready to accept federal grants, Energy Trust is seeking direction from the board on whether or not it should put resources into developing such a proposal.

The board added that Energy Trust currently has room for staff and administrative spending, and that may not always be the case. Increasing administrative costs for education work means the organization may have less flexibility in the future. Delivering core programs is more important than education efforts.

The board noted it is difficult to separate education from marketing. Resiliency, self-sufficiency and climate change have emerged very recently as salient issues. The millennial generation needs to be engaged. The Oregon Climate Change Research Institute in Corvallis has a program that addresses resiliency education. The board urged staff to consider the importance of motivating and leveraging interest in broader climate and resiliency issues.

Amber noted that Energy Trust does market research and adjusts marketing messaging to resonate with customers. For example, during the 2008 recession, Energy Trust marketing focused on cost savings. Marketing is trying to get someone to apply for an incentive. Education is work that may lead customers

to be more receptive to incentive offerings. Education can also help develop a future energy efficiency workforce.

The board indicated that partial scholarships for energy management college programs could directly relate to commercial and industrial savings and would not have to be included as administrative costs.

Kathleen Belkhat, senior project manager, added that Energy Trust currently supports Building Operator Certification and energy management certification through community colleges. These programs are small, with 12 people enrolled in the energy management certificate and a few dozen people enrolled in Building Operator Certification.

The board noted that much of Energy Trust's work is transactional. Pursuing education is about broadening Energy Trust's voice, trust and recognition, and building goodwill that helps customers engage in future energy transactions. The exposure to new markets is very valuable. How does Energy Trust identify the best markets and the most targeted opportunities? Where does marketing end and education begin? Education is how we transform perspectives for longer lasting change.

The board noted that successful organizations evolve and grow. Changing our scope to include education is a bold move and staff should make this decision deliberately. Where does education get Energy Trust in 2025 or in 2040? Is that where Energy Trust wants to be?

The board stated support for education because it builds up Energy Trust as a trusted information resource and prevents consumers from having bad energy-efficiency experiences with scam contractors. Education could be a strategy to reach new communities.

The board expressed that educational efforts should be viewed with a diversity and equity lens, and expressed interest in more people of color joining the board and participating in Energy Trust programs. This is critically important for success. The board encouraged staff to reach out to community-based organizations that know and have deep relationships with their communities. Energy Trust could track engagement over time from customers who participate in education efforts. Energy Trust should see how Vermont Energy tracks and measures the effectiveness of its educational initiatives.

The board requested that educational efforts link back to specific programs and strategic goals.

The board encouraged Energy Trust to target education to children ages 8 through 12 as a marketing strategy. Amber responded that the 6<sup>th</sup> grade LivingWise curriculum is currently broadly deployed with 200 schools a year, but it will likely be phased out of programs in the future as savings claimed from light bulbs and faucet aerators decrease. The board suggested that if programs can't justify education expenses because it impacts their cost-effectiveness, Energy Trust should consider including education in overhead expenses.

Amber concluded her remarks by thanking the board for their thoughts and direction on this topic. This guidance will be helpful in formulating a proposal as staff moves forward with 2017 budget planning.

The board noted that all utility customers in our territory will need a water heater sometime in the next 10 years, and education seems like a simple way to prepare everyone to make an efficient choice when faced with that decision.

## **Public Comment**

Jason Eisdorfer, program director at the OPUC, expressed the OPUC's interest in hearing more concrete description of changes to the residential sector. Discussions about moving the market further upstream

raises questions, including questions about measurement of savings. Also to be discussed is at what point do Energy Trust activities blur with NEEA activities? Jason emphasized that Energy Trust should maintain relationships with residential customers.

Julia Harper of NEEA, stated that NEEA is supportive of Energy Trust's residential sector moving to a midstream incentive approach. Preliminary conversations are already happening between NEEA and Energy Trust about leveraging platforms in place. Julia added that NEEA's education efforts are targeted to specific contractors, installers and inspectors. NEEA does not do broad consumer education, so there is no conflict with Energy Trust.

### **Summary of Next Steps**

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General counsel and policy director John Volkman indicated he will email the list of next steps to board members and ask for corrections or additions by the end of next week. At that point, staff will take the list to the Strategic Planning committee to identify actions. The board agreed reviewing detailed next steps over email is the best approach.

### **Closing Comments**

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The board appreciated opportunities to learn from and engage with staff, finding it useful for to discuss the scope, depth and breadth of potential changes to Energy Trust programs. This helps board members understand the organization and prepares board members to give useful feedback during the budgeting process.

The board appreciated the physical setup of the room and the mix of content, including both status and progress updates and opportunities to provide input about strategic issues.

The board thanked Margie, Debbie M and staff for supporting the retreat and Strategic Plan committee.

Margie reflected that this was one of the best retreats for content, physical space, board discussion and engagement. She thanked the board for thoughtful participation on all topics. She also thanked the Strategic Planning committee and staff for preparing for the retreat.

### **Adjourn**

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The workshop adjourned at just before 12:00 p.m.

**The next regular meeting of the Energy Trust Board of Directors** will be held Wednesday, June 8, 2016, at 12:15 p.m. at Energy Trust of Oregon, Inc., 421 SW Oak Street, Suite 300, Portland, Oregon.

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Alan Meyer, Secretary



# Board Meeting Minutes—143rd Meeting

June 8, 2016

**Board members present:** Susan Brodahl, Ken Canon, Melissa Cribbins (by phone), Heather Beusse Eberhardt, Dan Enloe, Roger Hamilton, Lindsey Hardy, Mark Kendall, Debbie Kitchin, Alan Meyer, John Reynolds, Anne Root, Eddie Sherman, Stephen Bloom (OPUC ex officio)

**Board members absent:** Warren Cook (Oregon Department of Energy special advisor)

**Staff attending:** Margie Harris, Lori Miller, Amber Cole, Mike Bailey, Mark Wyman, Peter West, Thad Roth, Marshall Johnson, Mariet Steenkamp, Debbie Menashe, Fred Gordon, Erin Rowland, Steve Lacey, Jay Ward, Julianne Thacher, Mia Hart, Scott Clark, Hannah Cruz

**Others attending:** Roger Kainu (Oregon Department of Energy), Don Jones, Jr. (PacifiCorp), Jim Abrahamson (Cascade Natural Gas), Alex Reedin (Portland General Electric), JP Batmale (OPUC), Bob Stull (CLEAResult), BJ Moghadam, (NW Energy Efficiency Alliance), Roger Spring (Evergreen Consulting)

## Business Meeting

Debbie Kitchin called the meeting to order at 12:30 p.m. Reminder that consent agenda items can be changed to regular agenda items at any time.

## General Public Comments

The president may defer specific public comment to the appropriate agenda topic.

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. April 6 board meeting minutes

Moved by: Dan Enloe

Seconded by: John Reynolds

Vote: In favor: 12  
Opposed: 0

Abstained: 0

## President's Report

There was an executive session of the board before the board meeting today. The board of directors has selected Michael Colgrove as Energy Trust's next executive director. Ken Canon worked with staff to develop the employment agreement, which was shared with the board at the executive session. Michael signed the agreement, which is effective August 15, 2016. There are a number of conversations happening to plan for the transition from Margie to Michael.

**RESOLUTION 774****AUTHORIZING THE PRESIDENT TO SIGN AN UPDATED EMPLOYMENT AGREEMENT  
WITH THE EXECUTIVE DIRECTOR****WHEREAS:**

1. **Energy Trust's current executive director, Margie Harris, is planning to retire.**
2. **On behalf of the full board, the Executive Director Transition Committee conducted a search for Energy Trust's next executive director and recommends Michael T. Colgrove for the position.**
3. **In executive session, the President and Vice President of the board have engaged in discussions with the board regarding parameters of a proposed employment agreement with Michael T. Colgrove, and the President and Vice President of the board have engaged in negotiations with Mr. Colgrove consistent with those parameters.**
4. **The President and Vice President of the board recommend (1) entering into an executive director employment agreement with Michael T. Colgrove consistent with discussions with the full board and Mr. Colgrove and (2) authorizing the president of the board to sign such an agreement.**

**It is therefore RESOLVED that the Energy Trust of Oregon, Inc. Board of Directors:**

1. **Authorizes the President to sign an executive director employment agreement with Michael T. Colgrove, as discussed in connection with this meeting.**
2. **The agreement shall be effective beginning August 15, 2016.**

Moved by: Alan Meyer

Seconded by: Roger Hamilton

Vote:        In favor: 12  
              Opposed: 0

Abstained: 0

*Melissa Cribbins joined the meeting at 12:34 p.m.*

The Executive Director Review Committee completed its annual review of Margie Harris based on the 2015 work plan and accomplishments from the year. The committee's review included gathering feedback from external parties, staff and board members, and reviewing Margie's accomplishments to ensure alignment with her work plan. Based on that review, the committee recommends a 6 percent merit increase and a 2 percent market adjustment increase to Margie's salary, effective February 1, 2016.

Mark K. suggested and the board discussed an amendment to Resolution 775 to clarify in the resolution language itself that the 8 percent salary adjustment is comprised of a 6 percent merit increase and a 2 percent market adjustment.

The board voted on the amended Resolution 775.

**AMENDED RESOLUTION 775  
EXECUTIVE DIRECTOR PERFORMANCE REVIEW**

**WHEREAS:**

1. Energy Trust's Executive Director Review Committee completed its evaluation of Margie Harris' performance in 2015.
2. The committee evaluated Margie's performance as outstanding.
3. The Executive Director Review Committee also considered the following in proposing a merit increase from the review:
  - a. Energy Trust's existing salary structure and Margie's current salary position on that range.
  - b. Periodic survey and market analysis of comparable position salaries.

**It is therefore RESOLVED:**

The Board of Directors authorizes ~~a merit award~~ increasing Margie's salary by a merit increase of 6.0 percent and a market adjustment of 2.0 percent to be awarded 8.0% effective February 1, 2016.

Moved by: John Reynolds

Seconded by: Dan Enloe

Vote:        In favor: 13  
              Opposed: 0

Abstained: 0

## **Committee Reports**

### ***Executive Director Review Committee, Melissa Cribbins***

The President's Report summarized the committee's process and findings for the executive director annual performance review.

### ***Evaluation Committee, Alan Meyer***

The committee reviewed a report on the smart thermostat pilot evaluation. The report concluded smart thermostats save energy and incentives are now being offered on the product.

From a report on the Core Improvement pilot, a downsized version of Strategic Energy Management (SEM) for smaller customers, there were a number of findings. The main findings are that the pilot showed persistent savings, but discipline of looking for new savings isn't to the same extent as it is with larger customers. As described in the staff memo, based on the findings of the pilot, the program created a single industrial SEM offering called Core SEM and is launching a new, continuous SEM offering for industrial customers that participated in SEM training.

The New Homes program process evaluation shows the program transforming the residential new construction market to using energy performance scores. The evaluation recommended incremental improvements and some changes were already underway.

The board discussed the feedback from builders not participating with the program. It was noted many of the evaluations' recommendations were about communications and working with

homeowners and realtors. There were also some issues raised by nonparticipants, including complaints about paperwork, perceived lower demand from customers, lack of educated local subcontractors and other areas where there is room for improvement. The board asked whether the program is looking at these barriers perceived by nonparticipating builders and whether they can be more directly addressed to get builders to participate more.

Mark Wyman said the key word is perception. The program uses a market-based model where all energy modeling and paperwork between the project and Energy Trust is done by market actors, like verifiers. There can be varying views by builders on what is participation with Energy Trust. Mark W. noted every major builder participates in the program, pulling in smaller builders, and the program works with the Homebuilders Association in Portland and statewide. The challenge is educating builders on how they can participate and the process to participate. The program's use of the Pivotal platform is helping to cut down on soft costs and making it easier for builders and verifiers to participate.

The board asked whether the program works with appraisers to ensure the energy efficiency of new homes is valued. Mark W. said Earth Advantage published a study on the valuation of ENERGY STAR homes and there are other national data sets, too. In Energy Trust's market, the volume is in Portland where there is a lot of noise because the market is overheated. This makes it difficult to give a specific answer in terms of a percentage increase in the value of a home because of its energy efficiency. The program does find homeowners are happy with their purchase, as evidenced by reduced callbacks on issues like comfort.

The board commented it would be worthwhile to quantify so energy efficiency can become a value-add for mortgage companies. Mark noted the program prepopulates the addendum to appraisals.

## Energy Programs

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Peter West introduced the discussion. This is the first of three sets of conversations for the board this year on program management and program delivery contracts. There are a number of programs with ongoing contracts that have five-year terms with annual renewals. This meeting will review three residential program contracts. The July board meeting will review results of the Existing Buildings Program Management Contract Request for Proposals, and the September board meeting will review the Production Efficiency program streamlined track RFP and custom track contract renewal.

### ***CLEAResult Contract Extension as Existing Homes Program Management Contractor, Thad Roth***

Staff proposes to extend the Existing Homes Program Management Contract for one year through the end of 2017. The contract started in 2013 with a two-year agreement and three optional one-year extensions. This is the third, one-year extension.

Thad reviewed CLEAResult's achievement of the contract extension criteria: cross-program referrals, project pipeline, innovation, teamwork and satisfactory execution of statement of work deliverables.

Cross-program referrals are important to the Existing Homes program because of the wide array of measures. The program tends to impact or interact with other programs, mainly Products and Multifamily. CLEAResult coordinates across multiple programs, especially with Multifamily and New Construction, and provides services to effectively direct customers to the correct program.

CLEAResult exceeded electric and gas goals in 2015 and used a targeted marketing campaign to drive savings at different times throughout year.

Demonstrating innovation, CLEAResult was effective at improving the customer experience and reducing costs. The Existing Homes program has been under pressure to reduce costs and meet cost-effectiveness criteria over the last few years. CLEAResult has been a partner in helping Energy Trust accomplish that requirement. CLEAResult also displayed innovation on the processing side by moving from paper-based to more online activities.

Teamwork is an important value at Energy Trust and with program management contractors. CLEAResult demonstrated strong commitment to teamwork and reinforced staff priorities and processes. CLEAResult was effective on cross-program measure development, a new approach for Energy Trust.

CLEAResult met its contract deliverables, which in the Existing Homes program is more than hitting savings goals but also achieving service level agreements.

Thad clarified the contract ends at the end of 2017. In 2017, the program will go out to market and rebid the contract.

The board asked how savings are attributed when a measure crosses different programs and contracts. Thad clarified the savings are attributed to the program that pays the incentive. The board asked whether the originating company gets any credit in those instances. Marshall Johnson said measures that are most applicable are smart thermostats and water heaters. It is possible for the PMC to receive an incentive either through Existing Homes or Products. There are sorting rules that determine what program receives the savings. For instance, when the product is purchased through retail, Products incentives are used and the savings go to the Products program. The Existing Homes program tends to have a lot of measures. The programs expect PMCs to market offers outside their program. Marshall believes CLEAResult does that to serve Energy Trust and not just their Existing Homes contract.

The board asked whether the rebidding of this contract in 2017 will take into account the residential sector changes the board was briefed on at the board strategic planning workshop. Thad said all three residential contracts are in extension periods, which gives flexibility in whether Energy Trust wants to offer an extension or wants to consider a different structural approach. Once 2017 ends, there will be a lot of flexibility in how Energy Trust can manage these residential contracts.

Peter clarified to the board any new structure to the residential sector would begin at the earliest in 2018.

***CLEAResult Contract Extension as New Homes Program Management Contractor, Thad Roth***

Staff proposes to extend the New Homes Program Management Contract for one year through the end of 2017. The contract started in 2015 with a two-year agreement and three optional one-year extensions. This is the first, one-year extension.

Thad reviewed CLEAResult's achievement to the contract extension criteria: cross-program referrals, project pipeline, innovation, teamwork and satisfactory execution of statement of work deliverables.



New Homes cross-program referrals are necessary with the Existing Homes, New Buildings and Solar programs. Energy Trust has benefited from CLEARResult's activity on small multifamily new construction and support of Energy Trust as a whole.

CLEARResult has been successful in the residential building market, garnering 36 percent of market share and exceeding forecast goals. The program has a strong pipeline, and the same level of activity is expected in 2016.

CLEARResult demonstrated innovation through improved service and reduced costs, which support additional savings. With CLEARResult, the New Homes program expanded to reach new audiences and improved overall participation. CLEARResult is beginning to work with developers and planning commissions to expand reach and scope of the program.

CLEARResult showed teamwork by collaboration with key market stakeholders like builders and trades. CLEARResult met its contract deliverables, leading to strong market penetration and adoption by a wide range of builders.

The board asked about the remaining 64 percent of the market given the program has reached 36 percent market saturation. Mark W. said mobile homes are not included. New manufactured homes are engaged through the Products program. The volume is stronger in the Portland metro area and has been increasing in Northeast Oregon and Bend. Market share is relatively consistent across the state with the exception of Southern Oregon where 90 percent of homes are gas-heated in the electric-only territory of Pacific Power. The program tends to do better in dual-fuel territories versus single-fuel territories. There may be changes to this as the program expands operations and Avista services come online in 2017.

The board said the addition of Avista will be important, as they have heard from builders that they don't understand the value Energy Trust has for them in Southern Oregon. Mark W. said the overarching objective of the program is to raise building practices as a whole. While Energy Trust has no formal role in advocating for raising the building code, the program is building capacity into the market so if codes change it's not as much of a lift for all builders. This makes future code changes less costly for everybody. The time spent by the program on improving builder technical capacity comes back as market transformation savings.

The board asked whether packaged homes are part of the New Homes program. Mark W. said it is determined by what state jurisdiction applies. If state building codes apply, the unit is in the New Homes program. If U.S. Housing and Urban Development requirements apply, the unit is in the Products program as a new manufactured home.

The board asked whether there is any specific focus on individual mass-market developers. Mark W. said an area for Energy Trust to engage with is modular factory-built homes. This is an area the program could do more in, but outreach resources are currently focused on manufactured homes.

The board asked whether low gas prices are affecting the New Homes program. Mark W. said New Homes is doing well. When Energy Trust reports, New Homes and Products are combined and presented together. The acceleration of the new construction market has made up for a deficit on the Products side. Products is doing much less with appliances and showerheads, which are a large piece of retail gas savings. For showerheads, retailers don't see them as a value add. Unlike lighting where the program helps retailers sell more bulbs and fixtures, the program is helping retailers sell different showerheads and not necessarily more units.

In regards to the 36 percent market share, the board asked whether the program is edging past early adopters or if the share is coming from measure-by-measure acceptance. Mark W. said that when the program shifted to a performance-based program, the strategy was to allow builders to participate in the program who were doing less than ENERGY STAR while rewarding builders for doing more. The program has seen a lot more volume and on the gas side, one-third of homes are coming in at the lowest tier compared to a couple of years ago when it was one-half of the homes. Builders are open to doing shell measures and the program wants to change the conversation to designing around different equipment choices.

The board asked whether CLEAResult has a role in sharing information with the building codes division. Mark W. said that after the last code change, the Home Builders' Association (HBA) was requested to convene a working group to talk about the structure and target of potential code changes. Energy Trust's role is demonstrating whether the industry has technical capacity and showing builders are achieving above-code practices at a reasonable cost to them. The HBA conveys the information back to the Buildings Codes Division, and the program is available for technical assistance.

The board asked if the program helps builders advertise to neighbors about the good features of a new home to avoid negative neighborhood reactions to the new building. Mark W. said the program supports the completion of 2,500 homes a year and some are infill projects. Energy Trust does not take a position on infill projects and does help builders market the energy-efficiency features of the homes.

The board discussed whether Energy Trust should encourage builders to market the features of the new homes to other types of audiences, like potentially disgruntled neighbors when a house is infill. Peter said this is a fair point. As New Homes and Multifamily programs move into denser environments, Energy Trust could move upstream to the design and community involvement of a new housing development. On the Multifamily side, the program supports pre-design assistance that often involves neighborhood activities and community members. As Portland becomes denser and denser, this will become more of a question, especially on the new Multifamily side.

***Ecova Contract Extension as Products Program Management Contractor, Thad Roth***

Staff proposes to extend the Products Program Management Contract for one year through the end of 2017. The contract started in 2015 with a two-year agreement and three optional one-year extensions. This is the first, one-year extension.

Thad reviewed Ecova's achievement to the contract extension criteria: cross-program referrals, project pipeline, innovation, teamwork and satisfactory execution of statement of work deliverables.

Ecova demonstrated strong performance in cross-program referrals. The project pipeline is strong for retail lighting. Ecova consistently hit its electric savings targets and accurately forecasted the savings, even with a volatile retail lighting market. The gas side is more challenging. In the Products' program, gas savings are a small part of the sector's portfolio and are made up largely from showerheads and faucet aerators. The program's challenge is the ability to market those products that have been around for a while, dealing with market saturation levels on showerheads, and seeing limits to customers' willingness on how they will accept a showerhead's low gallons per minute rating.

Peter said staff thought low-flow showerheads would be a successful strategy and directed Ecova to market them but customers didn't agree. Thad said the total gas savings related to

retail showerheads are about 8 to 10 percent of the sector portfolio. Even though there is a shortfall, it is not large enough to impact sector performance for gas.

Ecova demonstrated innovation by effectively promoting lighting and increasing retail partnerships, resulting in Energy Trust reaching new communities and customers. Ecova has a commitment to build relationships with retailers in rural communities.

Ecova displayed teamwork by bringing new measures to market that cross programs. This approach takes coordination among PMCs, a new requirement for Ecova, which they met by cross-promoting smart thermostats and water heaters.

For deliverables, Ecova delivered on its savings goals, service level agreements and retailer relationships.

At a recent workshop, a board member spoke with an Ecova representative about engaging with six Dollar Stores being built in Southern Oregon. Thad noted Ecova is in the process of bringing those new stores on as retailers. The board commented on Ecova's responsiveness to engaging with stores in rural areas.

The board asked what gas saving strategies were implemented to reduce the savings gap. Erin Rowland clarified the briefing paper is referencing outreach to water bureaus to reach customers outside the metro area.

The board noted the pipeline is filled with thermostats and water heaters, and asked what the strategy will be going forward. Erin said new partnerships and new retailers, like Costco.

## **Committee Reports continued**

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### ***Strategic Planning Committee, Mark Kendall***

At the April meeting, the committee reviewed the final agenda for the strategic planning retreat. The retreat on May 19 and 20 was well received and a valuable use of time.

The committee met this morning to review several takeaways from the retreat, including logistics, presentations and time allowed for dialogue. The committee also reviewed potential topics for the 2017 workshop, which is another mid-strategic plan check-in. Before the next board meeting, the board will see a final version of the to-do list, including feedback, takeaways and changes for the next workshop as well as input into program changes.

### ***Finance Committee, Dan Enloe***

In May, the committee received an update on heat pump water heater issues through a joint program with NEEA. A number of AirGenerate units are failing in the region, including in Energy Trust service territory. NEEA put in place a remediation plan and demand for funding has exceeded NEEA's replacement budget. Most units have been in place since 2013; of those that may fail, it will most likely be during winter. Energy Trust is committed to continuing to provide customer service for those units that may fail in the future. Staff will keep the board updated.

Energy Trust's tenant improvement upgrades at the Lincoln Building recently went out to bid. The approved projects are expected to be completed by next summer. Any unused funds for improvements will offset rent.

The April financial statement shows revenues down slightly. A rate adjustment for Pacific Power will help to close the gap. Incentive spending is under budget but over this same time last year. Existing Homes, New Homes, Products and Solar programs are strong. Other expenses are 7 percent below budget.

**Policy Committee, Roger Hamilton**

The committee reviews Energy Trust policies on a rolling basis every three years. At the last meeting, the committee approved technical corrections to the Policy on Eligibility of Self-Direct Businesses for Energy Trust Incentives that were inadvertently left out of the full board's approval of changes to the policy at the February board meeting.

The Public Interest Policy and Fuel-Switching Policy were reviewed and no changes were made.

The committee completed its annual review of contracts over \$500,000. No issues or irregularities were found.

The committee received an update that Lisa Hardie's appointment to the OPUC by Governor Brown was confirmed by the senate. Commissioner Hardie was then appointed chair of the OPUC by the governor. At the same hearing, Commissioner Bloom's term was extended.

*The board took a break from 1:51 to 2:10 p.m.*

**Staff Reports**

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**Highlights, Margie Harris**

Margie reviewed a recent new affordable housing project, the Iron Horse Lodge, in Prineville, Oregon. Pacific Crest Affordable Housing developed the project, and its primary objective to provide affordable rents for its tenants. The developer relied on energy efficiency and enrolled in the Path to Net Zero initiative to help achieve that goal. The building is 40 percent more efficient than code and includes a solar system.

First quarter activity followed Energy Trust's trend of fewer savings in the first part of the year while staff is completing assessment and studies for projects closing later in the year. Margie reviewed progress to savings and generation goals, and revenues and expenditures for the quarter. High interest in new commercial and residential construction, solar and LED lighting carried over from 2015 into the first quarter of 2016. The Products program launched a clothes washer recycling incentive, and the organization started planning work related to serving Avista gas customers in Oregon. 2016 Avista services will be limited and include discounted showerheads at retail, incentives for distributors selling gas hearths and financial support to complete technical design studies for commercial new construction projects. A full array of gas programs will be rolled out to Avista customers starting in 2017.

Margie highlighted various customer recognition events and outreach activities, including a partnership with the Portland Trail Blazers, a solar system ribbon cutting at the Tamastslit Cultural Institute and results from Pacific Power's annual business customer roadshows.

The board asked if there is a similar partnership with the Portland Timbers. Margie replied we do not currently have a similar relationship with the Timbers as they have existing relationships with PGE and NW Natural as sponsors.

Margie reviewed a new solar + storage pilot. The Solar program is working in collaboration with PGE and the OPUC. The three organizations are in the process of drafting a project charter and creating the project team. Once completed, the pilot will focus on supporting demonstration projects and crafting technical requirements.

The board noted the Office of Emergency Management is conducting a statewide exercise with regard to the Cascadia Subduction Zone. Margie said Energy Trust is not part of that exercise.

The board asked what type of batteries will be allowed in the solar + storage pilot. Margie said staff will follow-up with more specific information.

Don Jones with Pacific Power noted the utility is scheduled to have two-way meters starting in 2017 or 2018, with a two-year roll out after that.

Margie provided a final update on the 2014 Management Review. Out of the review, Energy Trust received 16 recommendations and flagged 11 for implementation. Staff has acted on and/or fully implemented all 11 recommendations.

Margie presented on a handful of Energy Trust's all-time results. Energy Trust has invested \$1.3 billion in utility customer funds to save and generate 667 average megawatts and save 45 million annual therms. Those energy-saving investments have transformed approximately 600,000 homes and businesses. Margie highlighted the customer, economic and environmental benefits, including that participants will realize \$5.6 billion in utility bill savings over time.

The board asked what the value is of the energy efficiency industry in Oregon, like employment or revenue generated. Staff will follow-up with the board.

Margie described a May 4 customer event at the Clean Water Services-Durham Wastewater Treatment Plant. The facility offsets 60 percent of its energy through solar energy and biogas from the anaerobic digestion of wastewater, fats, oil and grease.

Margie announced Energy Trust received a Clean Energy States Alliance "State Leadership in Clean Energy" award for the Irrigation Modernization Program delivered jointly with Farmers Conservation Alliance. She acknowledged staff for their leadership role.

Peter provided an update that of the 400 AirGenerate heat pump water heater units installed in Energy Trust territory, 77 have failed. NEEA had set aside \$200,000 to cover failures, and that budget has been exhausted. In the next year, Energy Trust anticipates an additional 50 to 75 units may fail, for a potential total of 150 failed units. With the budget from Energy Trust and GE, each customer will receive approximately \$1,000 to replace each failed unit. This will cost Energy Trust an additional \$75,000. Pacific Power, PGE and NEEA are all supportive of this customer service approach. Next summer, Energy Trust will reassess its strategy.

The board asked if AirGenerate will reimburse failed units, and Peter explained that AirGenerate is bankrupt and no longer exists.

Margie added that while this scale of equipment failure has never happened before for NEEA-supported technology, this risk is inherent in launching new technologies. Energy Trust is handling this as a customer service issue. Looking at the big picture, the market for heat pump water heaters has been transformed and GE has a good heat pump water heater product in the market.

The board noted that Energy Trust learned from this experience.

The board asked how customers have responded to failing AirGenerate units. Peter shared that these customers recognize they are on the cutting edge of new technology and have worked with Energy Trust to find another cutting edge solution.

***Energy Trust of Oregon Communications, Hannah Cruz and Jay Ward***

Hannah Cruz, communications manager, and Jay Ward, senior community relations manager, presented how Energy Trust's communications activities supports the organization's energy goals.

Hannah described the Communications Team within Energy Trust's Communications and Customer Service group. The Communications Team delivers Energy Trust's organizational communications in coordination with staff across the organization, including the executive director and staff from programs, marketing, planning and finance. Jay Ward helps shape strategy and implements communications tools out in the field.

This presentation follows a previous presentation on Energy Trust marketing activities, which overlap with Communication's work. Communication's activities include outreach to media through press releases, responses to media requests, quarterly and annual reports to the OPUC, support for executive director speeches and presentations, Energy Trust's blog and monthly newsletter and website copy. Communications range from internal, such as the Pit Stop staff newsletter, to external, with the majority of focus on external communications.

The Communications Team excels at translating highly technical information into simple terms and tangible examples, such as by representing carbon dioxide emissions reduction as cars off the road.

Objectives of the Communications Team are to develop and maintain Energy Trust's credibility, improve awareness, deliver on the organization's commitment to transparency and accountability and to help programs build relationships and partnerships to ultimately save or generate energy. Energy Trust's Irrigation Modernization effort is a strong example of the benefits of partnerships.

Jay described Energy Trust's target audiences, from customers to stakeholders to community leaders. The Communications Team translates Energy Trust's work into benefits for these audiences. For example, last summer's drought commanded the attention of Oregonians. Energy Trust was able to leverage this public interest in water savings by sharing through events and news articles Energy Trust's energy- and water-saving efforts, such as modernizing irrigation district systems.

Jay described Energy Trust's communication cycle. Once an energy project is completed, the Communications Team analyzes results, reports results, identifies audiences, translates results into relevant benefits for target audiences and leverages those benefits into stronger customer relationships that result in new projects.

Hannah highlighted recent examples of Communication's activities and described how they fit into the communications' cycle. One example is Energy Trust's public annual reporting, which is an example of the Communications Team analyzing and sharing out results in meaningful and simple language for key audiences. Another example is a fact sheet explaining cost-effectiveness requirements, which was created in response to recent OPUC dockets. The Communications Team plays an important role in ensuring internal staff and external stakeholders understand these issues.

The board asked how the cost-effectiveness fact sheet was distributed. Hannah responded that it is currently available on the website and printed as needed. Staff are thinking through ways to elevate this content on our website.

Jay added an example of a news article about the Iron Horse Lodge project. News articles like this help communicate Energy Trust's impacts and benefits to stakeholders.

Jay discussed the rapidly changing media landscape, which is now dominated by a variety of social media venues like Facebook and Twitter. Energy Trust uses social media to leverage relationships with customers and stakeholders and promote results to new customers. This allows Energy Trust to amplify the impact of Communication's work and to receive real-time feedback from customers and stakeholders.

Hannah explained that Energy Trust uses Twitter, Facebook and LinkedIn following a question from the board asking about specific social media platforms.

The board requested additional anecdotes about Communication's work resulting in new customers or communities engaging in projects. Jay described a recent example of an event in Astoria about a hydropower project that resulted in interest from new customers. Hannah added that Energy Trust is a sponsor of Sustainable Northwest's *Making Energy Work for Rural Oregon* workshops. Following these events, several rural communities have reinvigorated efforts in energy efficiency.

Margie acknowledged the important work of Communications and Outreach staff.

***Energy Trust of Oregon Information Technology, Scott Clark***

Scott Clark, director of Information Technology, provided a brief overview of the work of Energy Trust's IT group. IT is comprised of two teams, an infrastructure team responsible for computers and phones and a business systems team responsible for development of information and reporting systems.

Scott described Energy Trust's IT strategy, which focuses on engaging internal customers and using technology to solve Energy Trust's business problems. IT projects are prioritized by a Business Systems Prioritization Team and an IT Steering Committee based on Energy Trust's business needs.

Energy Trust also invests in maintaining and enhancing current IT systems. The group serves approximately 100 Energy Trust employees and 350 Program Management Contractor employees with services ranging from hardware, software, backup and recovery, integrations with external systems, data and reporting, remote access and access through mobile devices, security and an IT help desk.

IT uses an agile process for product development and project management, which is a successful approach to moving projects forward and collaborating with staff across the organization.

Scott described recent IT accomplishments, including automating software updates, upgrading to a virtual server environment, improving Energy Trust's wireless network, adding a new spam filter, creating online enrollment for trade allies, and enhancing project tracking and customer relationship management systems. These improvements save staff time, improve efficiency and reduce administrative costs.

The board asked if IT projects are on time and on budget. Scott responded that this varies by project.

The board acknowledged IT for delivering a high volume of major systems upgrades. Margie acknowledged Scott's strong leadership of the IT group.

## **Adjourn**

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The meeting adjourned at 3:35 p.m.

**The next regular meeting of the Energy Trust Board of Directors** will be held Wednesday, July 20, 2016, at 12:15 p.m. at Energy Trust of Oregon, Inc., 421 SW Oak Street, Suite 300, Portland, Oregon.

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Alan Meyer, Secretary



TAB 2

# Board Decision

## Authorize Funds for Opal Springs Hydropower Project

July 20, 2016

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### Summary

Authorize up to \$750,000 paid in two payments, to offset the above-market cost of upgrading the existing 4.3 megawatt (MW) Opal Springs Hydropower Project (OSHP) on the Crooked River owned by the Deschutes Valley Water District (District) near Culver, OR. The District proposes raising the dam at the facility to increase hydropower generation by approximately 3,227 megawatt hours (MWh) annually and enable the installation of fish passage facilities. Energy Trust's proposed incentive is related only to the energy portion of the project.

### Energy Trust Goals

- The OSHP supports Goal 2 of the 2015-2019 Strategic Plan: to accelerate the rate at which renewable energy resources are acquired. The project also supports Strategic Plan Strategies focused on building relationships with outside organizations around projects with mutual benefits that support and enable collaborative investments.
- This project will add to the portfolio of 14 operational hydropower projects Energy Trust has supported, currently representing 8.1 MW of capacity and 3.3 average megawatts (aMW) of energy.

### Background

- In December, 2015 Energy Trust announced a competitive process to allocate up to \$3.0 million in incentives for certain types of renewable energy facilities in Pacific Power territory. A total of four applications were received, including two hydropower projects in addition to OSHP, and one small wind project. The three other projects are receiving project development assistance or are still under evaluation.
- The District owns and operates the 4.3 MW OSHP located on the Crooked River southwest of Culver, Oregon. The OSHP is comprised of a 21-foot high earth-fill dam topped with six feet of flash-boards that are used to adjust the total dam height. The majority of the water behind the dam is diverted into two 12.5-foot diameter, 1,200 foot long penstocks that transport water to the existing turbine and generator. The total head of the current system averages 46 feet and flows typically range between 900 – 1,750 cubic feet per second. The District has operated the OSHP for nearly 30 years and delivers energy to Pacific Power. Over the last ten years the project has generated an average of 28,000 MWhs per year, a capacity factor of approximately 74 percent.
- The District pumps groundwater from the area of Opal Springs and conveys it to about 4,000 residential and commercial customers. Revenue from the hydropower project helps to offset the costs of water pumping. No water is removed directly from the Crooked River.
- In 2007, fish passage became operational at three dams downstream of OSHP. The OSHP impedes the migration of listed mid-Columbia steelhead and Bull trout as well as resident

fish species. Once fish passage became operational downstream, the District recognized the value of providing fish passage via a ladder at the Opal Springs dam.

- The hydro facility is licensed by the Federal Energy Regulatory Commission (FERC) to 2032. The District understands that fish passage will likely be required for re-licensing the facility, and wishes to move forward now as a demonstration of good faith.
- Due to the physics involved in building a fish ladder, the height of the dam has to be raised, enabling an increase in the generation of the hydropower project. The District reached out to Energy Trust in 2010 to explore project development assistance incentives related to the potential increased generation. Since then Energy Trust has provided \$191,135 in incentives supporting feasibility, engineering, permitting, and grant writing to help the project move forward.
- In 2011, the District entered into a *Settlement Agreement* with federal and state natural resource agencies and Trout Unlimited (a pre-requisite to amending their FERC license) and initiated final permitting and design work. The project is widely supported by natural resource agencies and non-governmental organizations.
- The District proposes to install fish passage facilities and raise the height of the dam about six feet by installing four inflatable weirs. Following commercial operation and taking into account water diverted for fish passage through the proposed ladder, the additional hydraulic head from the project will result in about 3,227 megawatt hours of additional generation per year, increasing the project's capacity factor by approximately 8 percent.
- Project construction is expected to take about 20 months with two summer and fall in-water work periods. The District anticipates commissioning and testing to start in November, 2018.

## Staff Evaluation

- Energy Trust staff thoroughly evaluated the following:
  - Site control
  - Development and operational team expertise
  - Resource assessment
  - Energy conversion technology and estimated generation
  - Permitting
  - Interconnection
  - Power purchase agreement
  - Project capital costs and operational and maintenance expenses
  - Financing
  - Project revenues
- In these terms, the evaluation was positive: the District has site control, a proven team capable of developing and operating the project, appropriate technology and a successful permitting process.

## Project costs (including Interconnection), and financing

- Because the OSHP includes costs and benefits that are not directly tied to energy generation, as is common for Energy Trust hydro and biogas projects, staff excluded non-energy costs and benefits in its above-market cost analysis. For OSHP, this means identifying and excluding costs and benefits related purely to fish passage.
- Total capital costs are approximately \$8.80 million, including the cost of raising the dam, electrical upgrades, fish passage infrastructure, mobilization and earthwork, as well as up-

front development and permitting. Energy Trust staff deducted fish passage costs, which account for approximately 50 percent of total project costs. We reduced costs with both a generation and fish passage component by 50 percent.

- The project will use existing interconnection facilities to deliver power to Pacific Power. Based on experience with past projects, staff added \$150,000 in capital costs to account for potentially necessary interconnection upgrades.

Development & Install Costs	Total Cost	Energy Costs	Notes
Fish ladder & spillways	\$ 2,691,783	\$ -	Deleted
Earthwork / dewatering	\$ 1,370,747	\$ 685,373	Reduced by 50%
Foundation / sediment removal	\$ 55,391	\$ 27,696	Reduced by 50%
Diversion dam / gates	\$ 2,304,201	\$ 1,152,101	Reduced by 50%
Powerhouse / wiring	\$ 298,636	\$ 298,636	Energy cost
Intake structure	\$ 632,681	\$ 632,681	Energy cost
Interconnection/Transmission	\$ 150,000	\$ 150,000	Energy cost
Dated construction estimate cost escalation (4% per year)	\$ 600,041	\$ 324,465	Reduced by \$275,576 directly related to fish passage
Total project development costs	\$ 889,243	\$ 444,622	Reduced by 50%
Energy Trust PDA	\$ (191,134)	\$ (191,134)	
<b>Total upfront costs</b>	<b>\$ 8,801,589</b>	<b>\$ 3,524,439</b>	

- After eliminating project costs associated with fish passage and reducing those not easily identified as purely generation related, the total cost is reduced to \$3.52 million.
- The District has accumulated financial resources for this project and does not anticipate assuming any debt.

#### Grants and revenues (including PPA)

- The District has sought and received significant grants for this project. Those entirely related to fish passage were not included in our assessment of above-market costs.

Grants	Total Grants	Energy Grants	Notes
ODFW - Fish passage, awarded	\$ 1,200,000	\$ -	Deleted
OWEB - Fish passage, awarded	\$ 2,000,000	\$ -	Deleted
Blue Sky - Energy, applied	\$ 400,000	\$ 400,000	Energy grant
<b>Total</b>	<b>\$ 3,600,000</b>	<b>\$ 400,000</b>	

- The current power purchase agreement (PPA) expires on January 1, 2021. A new PPA will be negotiated and signed with Pacific Power that will allow for delivery of electricity thereafter. As the existing PPA runs out in 2020 and negotiations for a new PPA have not yet begun, staff used Pacific Power's currently proposed Schedule 37 Qualifying Facility avoided cost rates, date shifted to begin in 2021, as a proxy. Under this scenario, the incremental generation will result in about \$2.47 million (NPV) in revenue over twenty years.

## Conclusions

- The project appears viable. It has completed its design phase and faces no significant permitting challenges.
- The project has significant strengths: it will be constructed at an existing hydropower project; it is municipally owned; and the District has access to significant equity. OSHP has a long, proven track record as a successful hydropower operator. As an existing run-of-the-river hydropower facility, the OSHP has few risks.
- Staff contracted with Evergreen Energy to provide an independent evaluation of the project. Evergreen has a broad experience in renewables and has provided many similar reviews for Energy Trust in the past. Their review concurred with staff's assessment.

## Above-Market Cost Analysis

- Under SB1149, Energy Trust may “fund...the above-market costs of new renewable energy resources...” SB1149 defines “new renewable energy resource” as “a renewable energy resource project, or a new addition to an existing renewable energy resource project, or the electricity produced by the project” (emphasis added).
- Above-market cost is the difference between the cost to produce the power and the market value of the power over a specific term. Above-market costs are calculated on a present-value basis: all costs and revenues over the project term are discounted to their current value, as if they existed today.
- Staff evaluated this project over a 20-year term. The length of the term was chosen to match what we have used for other similar hydro projects.
- The project was evaluated at an 8 percent discount rate, consistent with the 8-10 percent range of discount rates Energy Trust has applied when evaluating other municipally or government-owned projects.

<b>Project Financial Summary - Present Value Basis - Evaluated over 20 years</b>	
<b>Project Costs - Energy Only</b>	
Total Design & Construction - Energy Only	\$ 3,524,439
Grants - Energy Only	\$ 400,000
Equity: Total Design & Construction - Grants	\$ 3,124,439
<b>Expenses</b>	
NPV Total Project Expenses - Energy Only	\$ 181,651
<b>Total cost: Equity + Expenses</b>	<b>\$3,306,090</b>
<b>Revenue</b>	
NPV Revenues	\$ 2,471,541
<b>Above Market Cost: Total Cost - Revenues</b>	<b>\$ 834,549</b>

- Under the most conservative energy-related-only costs and revenue view, the project's above-market costs total \$834,549 (NPV).

- Staff proposes to provide an incentive of \$750,000, split into two payments. The first payment of \$375,500 would be made after the following: 1) completion of construction and resumption of commercial operation; and 2) certification from the Low Impact Hydropower Institute (LIHI). The second payment of \$375,000 would be made no sooner than 12 months later, pending the project meeting generation performance milestones.
- On a present-value basis Energy Trust's incentive is worth \$668,742, or 80 percent of the project's above-market cost. At \$2.04 million/aMW the incentive is in the mid-range of incentive costs for hydropower projects.
- Energy Trust would ask for 64,540 Renewable Energy Certificates (RECs) from OSHP, equivalent to 100 percent of the expected additional generation produced by the project over 20 years. This equates to \$11.62 per REC, less than our current PUC benchmark of \$25 per REC as calculated on a three year rolling average across all custom renewable energy projects.
- The REC allocation goes beyond board policy requiring Energy Trust to take ownership of RECs in proportion to its contribution to above-market costs. Because the original hydropower facility was constructed in the mid-1980s, the project is not producing RECs eligible for the Oregon RPS. LIHI certification, which can reasonably be expected upon installation of fish passage equipment, would allow all generation from the project to be eligible for Oregon's RPS. Energy Trust staff feels justified in requesting 100 percent of the RECs from the incremental additional generation.
- Staff proposes to negotiate a contract with the District with milestones to allow Energy Trust to withdraw funding if the project is unable to move forward.
- Funds for the project are within the 2016 Other Renewables program budget.

## Recommendation

Authorize the executive director to negotiate and sign a contract committing \$750,000 in funding for the Opal Springs Hydropower Project, by adopting resolution 776, below.

### RESOLUTION 776

#### APPROVING FUNDS FOR THE OPAL SPRINGS HYDROPOWER PROJECT

#### WHEREAS:

1. The Deschutes Valley Water District proposes to increase the head on the existing Opal Springs Dam to increase generation by 3,227 MWh annually, an approximately 11 percent increase above existing average annual generation.
2. Staff and an independent contractor reviewed the project design and costs and found them to be standard and reasonable for what is proposed.
3. The project's above-market costs are \$834,549 over a 20-year period on a present-value basis.
4. Staff proposes an incentive of \$750,000 to be paid in two equal payments. The first payment would be made upon: 1) completion of construction and resumption of commercial operation; and 2) certification from the Low Impact Hydropower Institute (LIHI). The second payment would be made not sooner than twelve months later if the project meets generation performance milestones.
5. Staff proposes that Energy Trust seek up to 64,540 RECs, representing 100 percent of the RECs estimated to be generated from the incremental additional generation.
6. At \$2.04 million per average megawatt (aMW), the incentive is below the 2016 Other Renewables budget goal of \$2.5 million/aMW.

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

1. Payment of up to \$750,000 to be made in two payments to the Deschutes Valley Water District to offset the above-market costs of raising the height of the existing dam and cost of appurtenant facilities;
2. Energy Trust to take ownership of 64,540 RECs produced by the project; and
3. The executive director to enter into a contract(s) consistent with this resolution.

Moved by:

Seconded by:

Vote:

In favor:

Abstained:

Opposed: [list name(s) and, if requested, reason for "no" vote]

# Board Decision

## Authorize a Program Management Contract for the Existing Buildings Program

July 20, 2016

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### Summary

Approve basic terms for a contract with ICF International, Inc. for program management services for Energy Trust's Existing Buildings program for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years.

### Background

- In April 2016, Energy Trust staff issued a request for proposals for a Program Management Contractor (PMC) to deliver services for the Existing Buildings program.
- The RFP produced six intents to respond. Two proposals were received. After review and scoring of proposals, both respondents were selected for interviews.
- The following procedure was followed:
  - Staff pre-screened proposals for completeness and adherence to financial, legal and IT requirements, completeness of proposal and adherence to response guidelines.
  - A review team comprised of 14 Energy Trust staff and two external reviewers, one from the Northwest Energy Efficiency Alliance and one from the City of Portland, Bureau of Planning & Sustainability, reviewed the proposals and:
    - provided a preliminary score based on written proposals
    - posed questions to finalists selected for interviews
    - interviewed both respondents
    - had follow-up discussions and updated scoring
    - made a recommendation

### Discussion

Reviewers identified the following strengths of the ICF International, Inc. proposal:

- Experience in delivering the Existing Buildings program since 2013.
- Clear demonstration of understanding of our market and program needs.
- Strong program team and established relationships in the market.
- The ICF International proposal gave the reviewing team confidence that ICF International, Inc. would deliver the program design and achieve savings goals, by proposing:
  - Specific innovations to bring new delivery strategies and tools to the market, facilitate customer participation, and leverage data to target new projects.
  - Strategies for expanding participation by hard-to-reach customers, including increased outreach to rural areas through strategically placed representatives who are local to areas including central, eastern and southern Oregon, and strategies for each market segment's barriers to participation.
  - A commitment to maintaining lighting approaches that are currently working well in the market and to continuously evolving the program as lighting standards and products change.



- Realistic costs and savings expectations reflecting the firm's demonstrated understanding of the existing buildings market.
- A reasonable commercial strategic energy management (SEM) integration and delivery approach.
- Better distribution of staffing resources and significantly higher staffing allocations compared to other proposal.
- Best rates for both internal staffing and subcontractors.
- Continued collaboration among subcontractors to identify and document cross-sell opportunities to improve pipeline of Trade Ally Network.

In addition, ICF International, Inc. has a strong history of successfully implementing innovations in the program including the retrocommissioning offering, a small business direct install strategy, two midstream lighting offerings, small district outreach for schools, and a pay for performance implementation strategy.

### **Recommendation**

Authorize staff to negotiate and sign a new Existing Buildings Program Management Contract with ICF International, Inc. for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years. If the board agrees, staff will provide notice to the OPUC that we are entering into this agreement.

**RESOLUTION 777  
 AUTHORIZE A PROGRAM MANAGEMENT CONTRACT  
 FOR THE EXISTING BUILDINGS PROGRAM**

**WHEREAS:**

1. With assistance from a selection committee including outside parties, staff has conducted a fair and open procurement process to select a program management contractor to manage Existing Buildings program services for the next 3-5 years;
2. ICF International, Inc. was selected and contract terms are being negotiated;
3. Staff has assumed and estimated a total first-year program management budget for 2017, including first-year incentives, contracted delivery, and possible performance compensation of approximately \$41.97 million, which includes approximately \$14.23 million in delivery, \$27.74 in incentives; and
4. Actual savings and costs will be reviewed by the Energy Trust board as part of the annual budget and action plan process. Based on current assumptions, staff estimates the following program savings and fully loaded costs in 2017:

	Electric	Gas
<b>Savings</b>	122,036,243 kWh	2,178,195 therms
<b>\$/Unit Savings</b>	\$0.28/kWh	\$3.35/therm
<b>Levelized Cost</b>	\$0.029/kWh	\$0.30/therm

**IT IS THEREFORE RESOLVED:**

1. Subject to determination of a final contract amount based on the board-approved 2017 budget, the executive director or his or her designee is authorized to enter into a contract with ICF International, Inc. to manage the Existing Buildings program for an initial term from January 1, 2017 through December 31, 2019.
2. First-year contract costs and savings goals included in the contracts shall be consistent with the board-approved 2017 budget and two-year action plan. Thereafter, the contract(s) may be amended consistent with the board's annual budget and action plan decisions and the executive director or his designee is authorized to sign any such contract amendments.
3. The final contract may include a provision allowing staff to offer one-year extensions beyond the initial term if the program management contractor meets certain established performance criteria. In no event would the total term of the contract plus extensions exceed five years.
4. Before extending this contract beyond the initial term, staff will report to the board on the program management contractor's progress and staff's recommendation for any additional extension time periods. If the board does not object to extension, contract terms would remain as approved in the most recent action plans, budgets and contract at the time of extension, and the executive director or his designee is authorized to sign any such contract extensions.

Moved by:

Seconded by:

Vote: In favor:

Abstained:

Opposed:

# Authorize Streamlined Industrial Lighting Program Delivery Contractor for the Production Efficiency Program

July 20, 2016

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## Summary

Approve basic terms for a contract with Evergreen Consulting Group, LLC (Evergreen) for program delivery services for Energy Trust's Streamlined Industrial Lighting track for the Production Efficiency program for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years.

## Background

- Energy Trust's Production Efficiency program is designed and managed in-house. Staff utilizes multiple program delivery contractors (PDCs) to perform outreach and delivery functions on behalf of the program.
- Streamlined Track PDCs recruit and manage trade ally networks and help develop streamlined and prescriptive measures and the associated forms and calculator tools. The program utilizes two Streamlined Track PDCs. One manages the Lighting track and the other the Streamlined Industrial and Agriculture track.
- In May 2016, Energy Trust staff issued a request for qualifications (RFQ) for each of its Streamlined Track PDCs.
- The Streamlined Industrial Lighting RFQ received one notice of intent to respond, of which one response was submitted.
- The following procedure was followed:
  - Energy Trust staff pre-screened qualifications for completeness and adherence to financial, legal and IT requirements, completeness of response and adherence to guidelines.
  - A review team comprised of Energy Trust staff and an external reviewer from the Northwest Energy Efficiency Alliance reviewed and scored the qualifications. Based on the score, they made a recommendation.

## Discussion

Reviewers identified the following strengths of Evergreen's qualifications that gave the team confidence that Evergreen would implement the program and achieve savings goals.

- Experience in delivering the Industrial Lighting streamlined track, with strong savings acquisition growth. In 2015, saved almost 28 mil reportable kWhs, 40 percent more than in 2010 with average project size decreasing by 50 percent.
- Clear demonstration of understanding our markets, trade allies and vendors, and program implementation needs.
- Experienced team and established relationships with stakeholders and market actors in the northwest regional market.
- Nineteen years of industrial lighting program management administration implementation across five states in the northwest.

- Experts with management, training and cultivation of trade ally networks by working with trade ally networks across multiple utilities since 1995, and managing over 250 trade allies in Energy Trust's territory. They have provided training and technical support, as well as administrative support for project processing.
- Strong technical competence and expertise with several staff members participating and presenting at Illuminating Engineering Society, LIGHTFAIR International and National Council for Qualification of Lighting Professionals.
  - 16 Lighting Certified staff members, designated by the National Council for the Qualification of Lighting Professionals
  - Participated and presented at LED Specifier Summit and DOE Connected Lighting System Workshop
- New marketing and outreach initiatives for expanding participation of hard-to-reach customers, including:
  - Increased outreach to rural areas through representatives in central, eastern and southern Oregon
  - Webinar trainings for trade allies in remote areas
  - Proven implementation of mid-stream promotion to reach smaller industrial customers
- Active participation in diversity and inclusion by being certified as a Small Business Concern by the federal government and providing a company-wide diversity training annually.
  - They have also developed literature and handouts available in Spanish by working with Hispanic communities in Washington as part of their Pacific Power savings efforts.

## **Recommendation**

Authorize staff to negotiate and sign a new Program Delivery Contract with Evergreen for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years. If the board agrees, staff will provide notice to the OPUC that we are entering into this agreement.

**RESOLUTION 778  
 AUTHORIZE STREAMLINED INDUSTRIAL LIGHTING PROGRAM DELIVERY CONTRACT  
 FOR THE PRODUCTION EFFICIENCY PROGRAM**

**WHEREAS:**

1. With assistance from a selection committee including an outside party, staff has conducted a fair and open procurement process to select a program delivery contractor to manage the Production Efficiency program’s Streamlined Industrial Lighting Track services for the next 3-5 years.
2. Evergreen Consulting Group, LLC was selected and contract terms are being negotiated.
3. Staff has assumed and estimated a total first-year program delivery budget for 2017, including first-year incentives, contracted delivery, and possible performance compensation of approximately 6.2 million dollars.
4. Actual savings and costs will be reviewed by the Energy Trust board as part of the annual budget and action plan process. Based on current assumptions, staff estimates the following program savings and fully loaded costs in 2017:

	<b>Electric</b>
<b>Savings</b>	<b>32,356,500</b>
<b>\$/Unit Savings</b>	<b>\$0.041/kWh</b>
<b>Levelized Cost</b>	<b>\$0.020/kWh</b>

**IT IS THEREFORE RESOLVED:**

1. Subject to determination of a final contract amount based on the board-approved 2017 budget, the executive director or his designee is authorized to enter into a contract with Evergreen Consulting Group, LLC to deliver the Streamlined Industrial Lighting Track for the Production Efficiency program for an initial term from January 1, 2017 through December 31, 2019.
2. First-year contract costs and savings goals included in the contracts shall be consistent with the board-approved 2017 budget and two-year action plan. Thereafter, the contract(s) may be amended consistent with the board's annual budget and action plan decisions and the executive director or his designee is authorized to sign any such contract amendments.
3. The final contract may include a provision allowing staff to offer one-year extensions beyond the initial term if the program management contractor meets certain established performance criteria. In no event would the total term of the contract plus extensions exceed five years.
4. Before extending this contract beyond the initial term, staff will report to the board on the program delivery contractor’s progress and staff's recommendation for any additional extension time periods. If the board does not object to an extension, contract terms would remain as approved in the most recent action plans, budgets and contract at the time of extension, and the executive director or his designee is authorized to sign any such contract extensions.

Moved by:

Seconded by:

Vote:      In favor:  
               Opposed:

Abstained:

## Board Decision

# Authorize Streamlined Industrial and Agriculture Program Delivery Contractor for the Production Efficiency Program

July 20, 2016

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## Summary

Approve basic terms for a contract with Cascade Energy (Cascade) for program delivery services for Energy Trust's Streamlined Industrial and Agriculture track for the Production Efficiency program for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years.

## Background

- Energy Trust's Production Efficiency program is designed and managed in-house. Staff utilizes multiple program delivery contractors (PDCs) to perform outreach and delivery functions on behalf of the program.
- Streamlined Track PDCs recruit and manage trade ally networks and help develop streamlined and prescriptive measures and the associated forms and calculator tools. The program utilizes two Streamlined PDCs. One manages the Lighting track and the other the Streamlined Industrial and Agriculture track.
- In May 2016, Energy Trust staff issued a request for qualifications (RFQ) for each of its Streamlined Track PDCs.
- The Streamlined Industrial and Agriculture RFQ received six notices of intent to respond, of which four responses were submitted.
- The following procedure was followed:
  - Energy Trust staff pre-screened qualifications for completeness and adherence to financial, legal and IT requirements, completeness of response and adherence to guidelines.
  - A review team comprised of Energy Trust staff and an external reviewer from the Northwest Energy Efficiency Alliance reviewed and scored the qualifications. Based on the score, they made a recommendation.

## Discussion

Reviewers identified the following strengths of Cascade's qualifications that gave the team confidence that Cascade would implement the program and achieve savings goals.

- Experience delivering the Industrial and Agriculture streamlined track with strong savings acquisition growth. In 2015, they acquired over 14 million reportable kWh; an increase of 7.5 million reportable kWh over a five year period.
- Clear demonstration of understanding our markets, trade allies and vendors, and program implementation needs.
- Seasoned team in both industrial and agriculture sectors with established relationships with stakeholders and market actors in the northwest regional market.

- Developed trade ally network for the program in compressed air, irrigation, greenhouse, refrigeration and HVAC measures.
- Strong technical competence and expertise in development of calculator tools and forms. The Cascade team has developed 13 calculator tools for the program and continues to collaborate with Energy Trust staff to develop and maintain the tools with six potential new tools for 2017.
- Growth in outreach initiatives with multiple strategies for expanding participation of hard-to-reach customers, including:
  - Team members based in eastern and central Oregon
  - Dedicated outreach staff that continues to represent the program at all major trade shows, and provides one-on-one support for the trade allies.
- Active initiatives in diversity and inclusion by participating and presenting at Women in Environment and Agriculture sessions as well as collaborating with Sustainable Northwest and Farmers Conservation Alliance to service the agricultural customers.

## **Recommendation**

Authorize staff to negotiate and sign a new Program Delivery Contract with Cascade for an initial term of three years, with the potential for one-year performance-based extensions and a total contract term not to exceed five years. If the board agrees, staff will provide notice to the OPUC that we are entering into this agreement.

**RESOLUTION 779  
AUTHORIZE STREAMLINED INDUSTRIAL AND AGRICULTURE PROGRAM DELIVERY  
CONTRACT FOR THE PRODUCTION EFFICIENCY PROGRAM**

**WHEREAS:**

1. **With assistance from a selection committee including an outside party, staff has conducted a fair and open procurement process to select a program delivery contractor to manage the Production Efficiency program’s Streamlined Industrial and Agriculture Track services for the next 3-5 years.**
2. **Cascade Energy was selected and contract terms are being negotiated.**
3. **Staff has assumed and estimated a total first-year program delivery budget for 2017, including first-year incentives, contracted delivery, and possible performance compensation of approximately.**
4. **Actual savings and costs will be reviewed by the Energy Trust board as part of the annual budget and action plan process. Based on current assumptions, staff estimates the following program savings and fully loaded costs in 2017:**

	<b>Electric</b>	<b>Gas</b>
<b>Savings</b>	<b>17,747,050</b>	<b>437,500</b>
<b>\$/Unit Savings</b>	<b>\$.082/kWh</b>	<b>\$.323/therm</b>
<b>Levelized Cost</b>	<b>\$.033/kWh</b>	<b>\$.159/therm</b>

**IT IS THEREFORE RESOLVED:**

1. **Subject to determination of a final contract amount based on the board-approved 2017 budget, the executive director or his designee is authorized to enter into a contract with Cascade Energy to deliver the Streamlined Industrial and Agriculture Track for the Production Efficiency program for an initial term from January 1, 2017 through December 31, 2019.**
2. **First-year contract costs and savings goals included in the contracts shall be consistent with the board-approved 2017 budget and two-year action plan. Thereafter, the contract(s) may be amended consistent with the board's annual budget and action plan decisions and the executive director or his designee is authorized to sign any such contract amendments.**
3. **The final contract may include a provision allowing staff to offer one-year extensions beyond the initial term if the program management contractor meets certain established performance criteria. In no event would the total term of the contract plus extensions exceed five years.**
4. **Before extending this contract beyond the initial term, staff will report to the board on the program delivery contractor’s progress and staff’s recommendation for any additional extension time periods. If the board does not object to an extension, contract terms would remain as approved in the most recent action plans, budgets and contract at the time of extension, and the executive director or his designee is authorized to sign any such contract extensions.**

Moved by:

Seconded by:

Vote:

In favor:

Abstained:

Opposed:



# Briefing Paper

## Program Management and Program Delivery Contract Terms

July 20, 2016

### Summary

To provide context for contract extension and approval recommendations, staff has prepared a summary of Energy Trust’s Program Management Contracts and Program Delivery Contracts, their possible durations, remaining extension term potential, and timing information about upcoming competitive RFP and/or RFQ processes. Staff will be available at the meeting to answer questions.

PMC	Program	End Date of Initial Term	Current Expiration Date	Possible Extensions to Initial Term	Extension Years Approved (Board Briefing Date(s))	Next Anticipated Extension Presentation	File #
CLEARresult Consulting, Inc.	Existing Homes	12/31/14	12/31/16	3 years	3/3 (7/30/14 for 1 yr) (7/29/15 for 1yr) (6/8/16 for 1yr)	NA	1806
ICF Resources, LLC	Existing Buildings	12/31/14	12/31/16	3 years	2/3 (7/30/14 for 1 yr) (7/29/15 for 1 yr)	In rebid process	1778
CLEARresult Consulting, Inc.	New Buildings	12/31/15	12/31/17	3 years	2/3 (5/20/15 for 2 yrs)	2017	1962
Lockheed Martin Corporation	Existing Buildings - Multifamily	Through 12/31/18	12/31/18	2 years	0/2	2018	2366
Ecova, Inc.	Products	12/31/16	12/31/16	3 years	1/3 (6/8/16 for 1 yr)	2017	2181
CLEARresult Consulting, Inc.	New Homes	12/31/16	12/31/16	3 years	1/3 (6/8/16 for 1 yr)	2017	2182

PDC	Program	End Date of Initial Term	Current Expiration Date	Possible Extensions to Initial Term	Extension Years Approved (Board Briefing Date(s) if applicable)	Next Anticipated Extension Presentation	File #
Energy 350, Inc.	Production Efficiency	12/31/16	12/31/16	2 years	0/2	2016	1960
RHT Energy, Inc.	Production Efficiency	12/31/16	12/31/16	2 years	0/2		1957
Portland General Electric Company (PGE- CTS)	Production Efficiency	12/31/16	12/31/16	2 years	0/2		1959
Evergreen Consulting, LLC	Production Efficiency)	12/31/14	12/31/16	2 years	2/2 (5/14/14 for 1 yr) (5/20/15 for 1 yr)	In rebid process	1576
Cascade Energy, Inc.	Production Efficiency	12/31/14	12/31/16	2 years			1575
CLEAResult Consulting, Inc.	Existing Buildings	12/31/16	12/31/16	3 years	No extensions will be requested	In rebid process: staff intends to include future Commercial SEM management and delivery under Existing Buildings PMC contract	2195
HSTV, LLC dba Strategic Energy Management Group (SEG)	Existing Buildings	12/31/16	12/31/16	3 years	No extensions will be requested		2214

PMC			
PMC	Program	Final End Date <sup>1</sup>	Anticipated RFP (if contract extended for all possible extensions)
CLEAResult Consulting, Inc.	Existing Homes	12/31/17	Spring 2017
ICF Resources, LLC	Existing Buildings	12/31/16	In process
CLEAResult Consulting, Inc.	New Buildings	12/31/18	Spring 2018
Lockheed Martin, Inc.	Existing Buildings – Multifamily	12/31/20	Spring 2020
Ecova, Inc.	Products	12/31/19	Spring 2019
CLEAResult Consulting, Inc.	New Homes	12/31/19	Spring 2019

PDC			
PDC	Program	Final End Date <sup>2</sup>	Anticipated RFP/Q (if contract extended for all possible extensions)
Energy 350, Inc.	Production Efficiency – Custom Track	12/31/18	Spring 2018
RHT Energy, Inc.	Production Efficiency – Custom Track	12/31/18	Spring 2018
PGE-CTS	Production Efficiency – Custom Track	12/31/18	Spring 2018
Evergreen Consulting, LLC	Production Efficiency – Streamlined Track	12/31/16	In process
Cascade Energy, Inc.	Production Efficiency – Streamlined Track	12/31/16	In process

<sup>1</sup> Assumes each of the possible extension years are offered and accepted by the PMC

<sup>2</sup> Assumes each of the possible extension years are offered and accepted by the PDC

TAB 3

# Evaluation Committee Meeting

March 31, 2016 12:00 pm—3:00 pm

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## Attendees

### Evaluation Committee Members

Alan Meyer, Board Member, Committee Chair

Lindsey Hardy, Board Member

Heather Eberhardt, Board Member

Ken Keating, Expert Outside Reviewer

Jennifer Light, Expert Outside Reviewer

### Energy Trust Staff

Steve Lacey, Director of Operations

Fred Gordon, Director of Planning and Evaluation

Phil Degens, Evaluation Manager

Sarah Castor, Evaluation Sr. Project Manager

Dan Rubado, Evaluation Project Manager

Erika Kociolek, Evaluation Project Manager

Andy Eiden, Planning & Evaluation Data Analyst

Ted Light, Sr. Planning Project Manager

Adam Shick, Planning Project Manager

Andy Hudson, Planning Project Manager

Andrew Shephard, Sr. Project Manager, Residential

Mike Bailey, Engineering Manager, Planning

Jackie Goss, Planning Engineer

Peter West, Director of Energy Programs

Thad Roth, Residential Sector Lead

Susan Jamison, Residential Marketing Manger

Scott Leonard, Sr. Project Manager, Residential

Marshall Johnson, Sr. Program Manager, Residential

Mark Wyman, Program Manager, Residential

Sue Fletcher, Sr. Manager, Communications and Customer Service

## 1. 2015 New Homes Process Evaluation

Presented by Dan Rubado

Background: The New Homes program is implemented by the Program Management Contractor (PMC) CLEARResult. Participating builders apply to receive Energy Performance Scores (EPS) for homes enrolled in the program. EPS provides a measure of the expected energy use of a home, and this is what is used to assign incentives. Third-party verifiers help builders navigate the program. They do inspections, performance testing, and modeling, and issue the EPS to the builder. Builders receive incremental incentives based on the efficiency level of the home from EPS. The program offers training, design assistance, and other services to builders, verifiers, and subcontractors. The program and incentives vary by region due to utility service territories, and other market factors. Subcontractors can receive incentives for installing standalone measures in non-program homes.

There has been some evolution of the program over the past few years. The more flexible performance path has become more popular – in this path, incentives are tied to the efficiency

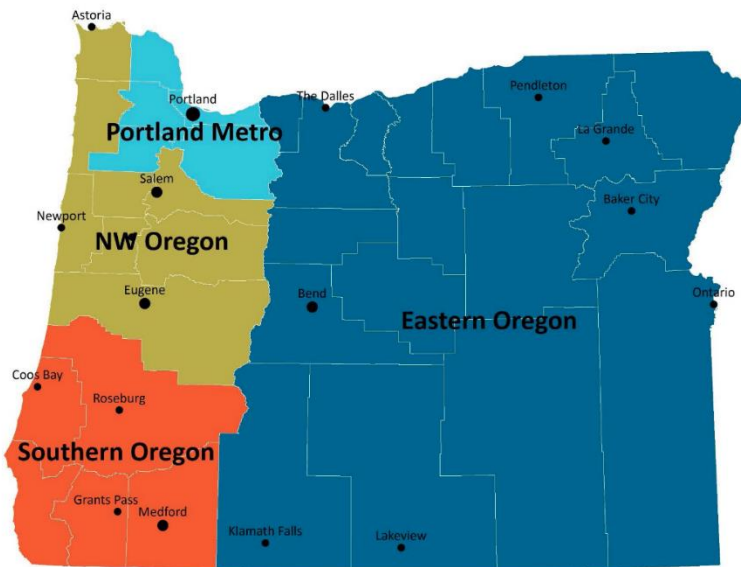
level of the home. Verifiers now receive a single incentive that is equal to 25 percent of the builder's incentive with a \$300 minimum. The implementation of the Axis database is up and running – this manages verifier workflow and streamlines data entry and EPS scoring. The program added staff in Eastern Oregon to recruit and support builders and verifiers. In addition, the program has increased field support to verifiers and subcontractors, increased early design assistance outside of the Portland Metro region, and contracted with a third-party quality assurance (QA) firm to do site visits in Portland Metro (where the majority of the program activity is occurring).

**Evaluation Goals:** The goals of this evaluation were to focus on program operations and see if the evaluator could identify any additional opportunities for efficiencies or recommendations for improving how the program works. The evaluation also sought to document key program achievements, obtain feedback on program design and processes, identify operations that are working well and those needing improvement, document program changes and enhancements, and develop recommendations to streamline participation, reduce costs, and increase market share.

**Methodology:** Evergreen Economics completed this process evaluation. Evaluation tasks included a characterization of the entire new homes market in Oregon (and how the program fits into that market), a review of program documents and plans, staff interviews (with Energy Trust, CLEARresult, Earth Advantage, and homebuilder association staff), data analysis, verifier interviews, a survey of real estate allies, and a summary of builder responses from a separate fireplace study.

The analysis regions mentioned in the report and in this presentation are shown below.

Analysis regions for New Homes process evaluation



**Market Characterization:** As part of the market characterization, Evergreen analyzed Construction Monitor data from January 2014 – August 2015. There are 2,769 active builders in Oregon, a 74 percent increase from two years ago. Over 10,000 homes were constructed in

Oregon, a 73 percent increase. Increases in construction were seen across the state. The Portland Metro region had 34 percent of builders and 51 percent of all new homes. There are 249 program builders who completed at least one home in the time period analyzed, a 13 percent increase from two years ago. However, there are large regional differences. Portland Metro and Eastern Oregon saw increases, while Northwest Oregon showed a slight decrease and Southern Oregon stayed flat. The number of program homes increased by 68 percent from two years ago, but this was heavily concentrated in Portland Metro. The Portland Metro region had 53 percent of program builders and 83 percent of program homes, much higher than its share of the market in Oregon.

Looking into the overall market share of the program, we can see that the program targets production builders to capture as much activity as possible. Smaller builders represent a much smaller percentage of activity in the program. The market share has steadily increased, to 36 percent last year, indicating deep penetration into the market. The program exceeded its gas and electric savings goals in 2014 and 2015 as a result of having such good market penetration.

The program has 17 active verifier firms. This number has been fairly constant over the past few years. The largest two verifiers conducted 87 percent of all verifications. Thirteen verifiers operated in the Portland Metro region, and six verifiers operated in more than one region. Each region is dominated by its largest verifier that is active in that region. There was an increase in the number of verifiers in the Northwest region, at the same time as a decrease in program builders in that region.

Twelve percent of program homes were at least 35 percent more efficient than code. The majority of program homes were 20-35 percent better than code, and just under a quarter were 10-20 percent better than code. The average EPS of electric-heated homes was 49, and the average EPS of gas-heated homes was 65.

Alan commented that it appears we have not eliminated the gap between gas and electric. Dan responded that this is due to the difference in efficiency between gas and electric heating equipment. Almost all electric-heated homes have a heat pump, with greater than 100 percent efficiency, whereas the efficiency of a gas furnace is capped at 99 percent. Andrew added that very high efficiency homes – passive homes and net zero homes – may be skewing the average.

Ken commented that it is important to continue emphasizing EPS; the problem with “percent better than code” is that it is becoming complicated right now. As code increases “percent better” becomes less meaningful, so having a unitary scale is useful as you shrink down energy use in these homes. Mark responded that incentives are determined by percent above code, but the score is an expression of building performance, influenced by building size. The distinction being called out is pertinent to program design, and reaching builders the way they think about their projects.

Data Analysis: The most common EPS measures were air sealing, lighting, ventilation, windows, insulation, and duct sealing in over 90 percent of homes. 64 percent did tanked water heater measures while 27 percent had tankless water heat. Efficient furnaces were installed in 90 percent of gas-heated homes, and efficient heat pumps were installed in 75 percent of electric-heated homes. 980 out of 1,000 standalone measures were air sealing.

Of centrally heated and cooled homes, half of ducts were installed in conditioned spaces, which is about the same number observed in the last process evaluation. 94 percent of windows had

u-values in the 0.28 to 0.30 range. Two-thirds of ceiling insulation R-values were in the 45-49 range, with only 3 percent that were higher. 36 percent had air changes per hour (ACH) less than 3.0, while the majority were in the 3.0 to 4.9 range. 90 percent of gas furnaces had AFUE values of 91-95, and 10 percent had higher ratings. 82 percent of heat pumps had HSPF values of 9.0 or higher, and 5 percent were 12 or higher. Water heater energy factors (EFs) varied widely, but, on average, EF increased dramatically from 2014 to 2015.

Staff Interviews: Evergreen conducted interviews with 13 program staff. There were no major concerns raised by staff about program design or program delivery. Energy Trust staff are responsible for program planning, design, and oversight of budget and delivery, while PMC staff manage day-to-day operation; program requirements; the Axis database and EPS scoring; outreach; quality assurance (QA); and training for verifiers, builders, and subcontractors. The Axis database automated data entry and EPS scoring tasks, allowing several staff members at CLEAResult to provide more field support. Earth Advantage is contracted to provide training to real estate brokers. Energy Trust partially funds two positions at Home Builders' Associations to represent and promote the program to builders. The PMC does quality control on all energy models and QA site visits outside of the Portland Metro area.

When asked about interactions with builders, staff reported that over the past few years, builder requirements have not changed. Verifiers are now the primary recruitment channel and point of contact for builders. The program helps verifiers with recruitment and does some direct outreach to builders. Staff reported that market share for the program has increased, especially with new, high production builders. Production builders are at the lower end of the EPS spectrum, but are 10 percent above code. EPS is well established in urban areas; rural areas are just starting to adopt EPS, and require more support. Reliance on verifiers may have an adverse impact where the program interacts less with rural builders; this is an area to keep an eye on, to make sure that the program doesn't leave behind lower volume and rural builders. Staff reported that builders are generally satisfied with their program experiences, especially with ease of participation.

Verifiers' role in the program has evolved. Verifiers are the front line of the program: recruiting and educating builders, promoting and attending early design assistance meetings (EDAs), providing technical coaching, performing inspections, doing REM/Rate modeling and data entry, and delivering EPS scores. Since verifier incentives are now tied to the efficiency of the home, so the more verifiers push their builders, the higher their incentive. The Axis database has streamlined the verification process, scoring, and incentive delivery. High volume verifiers don't always check data quality, so some upload errors have gone into the system. EDAs have increased due to better promotion and have been successfully providing education, focusing builders on high value upgrades, reinforcing best practices, and incorporating savings into design.

Alan commented that the incentive seems high for verification. Dan responded that the verifiers' role in the program is significant. Mark added that the alternative is a fixed budget regardless of the savings acquired; this was a big rationale for transitioning the incentive design.

Fred asked who participates in the EDAs. Mark commented that the program provides an incentive to encourage participation by builders and verifiers, and program staff participate in the discussions. Steve asked about the QA performed on verifiers. Dan responded that a third party contractor hired last year does QA on 10 percent. Mark added that staff QC file uploads. Interviews were conducted when the program was shifting the incentive processing system, and there were some operational stresses between Axis and Project Tracking. For 10 percent of



projects, the program does some of the same testing to verify the numbers, and does on-site inspections.

Ken asked if there is a penalty for being erroneous. Mark responded that the program has not had issues of deliberate fraud. Scott noted that when the program has caught mistakes in QA, the program responds with training. If the program catches mistakes when QC is being performed on the model or in the field, the program adjusts incentives, ensures that remediation is done, and deploys outreach staff to provide training on the mistake that was made.

Earth Advantage recruits and trains realtors to promote EPS homes. Real estate allies must earn Earth Advantage Broker accreditation through a training course and exam. The training content is developed jointly by Earth Advantage, Energy Trust, and the PMC. Real estate ally enrollment increased in 2015. The program has improved training content, increased value to realtors, done trainings more frequently and expanded the training providers, and focused on a broader audience and broader topics instead of people who are only interested in green construction. Alan asked if Energy Trust funds Earth Advantage's work. Mark responded that Earth Advantage is a subcontractor to CLEAResult to do trainings.

Overall, staff reported that there has been excellent coordination among Energy Trust, the PMC, and others. New measure development has been challenging; the PMC desires more formal communication and protocols for doing measure development. Cost-effectiveness also remains a challenge. There is uncertainty about 2017 code changes. More production builders in the program could further increase market share. Staff identified opportunities to recruit more affordable housing builders. The modeling and scoring system work well, but the accuracy of the modeling software could be improved; this could take the form of testing other modeling software or making calibrations to REM/Rate, the modeling software currently used.

Verifier Interviews: Evergreen interviewed 10 of 17 active verifiers. Eight had worked with the program for more than two years. Four were self-employed, and six were companies, and there was one high volume company. Seven had plans to grow verification business. Seven receive more than a quarter of their revenue from verification. On average, these firms had verified over 330 homes and worked with 13 builders. Seven firms charge a fee averaging \$581; other firms reported getting builders' incentives routed to them so they do not charge a fee or offering multiple services, of which verification is one. Nine believed training on technical material and program procedures was sufficient. Several desired more assistance in marketing EPS to builders. Verifiers were generally satisfied with program trainings, although maintaining certifications can be frustrating due to lack of classes.

One-third of homes inspected require some remediation. Most issues are minor, easy to address, and usually fixed right away, including problems with air sealing, insulation, and ventilation systems. Verifiers reported that the Axis database has improved significantly since its launch. Verifiers worked with the program to resolve initial issues, and there are now very few complaints. About 25 minutes per home is spent using Axis, and the EPS is received in 2-5 days. Verifiers were generally satisfied with the QA process, although they reported some scheduling challenges. All verifiers use the EPS field guide, and report that it is best in class as far as resources available for new construction.

When recruiting builders, verifiers emphasize the availability of cash incentives, reduced energy use, increased home value and certification as benefits. The main barrier to builders is the cost of meeting program requirements. Other barriers are insurance requirements and the lack of subcontractors that can meet requirements. The program has become harder to sell as the

housing market had picked up. Eight verifiers provide a significant amount of assistance to builders on many energy-related aspects of homes. Verifiers were very complimentary of program interactions and all indicated that they were satisfied.

Andy asked if the program tracks the sales price of EPS homes relative to non-EPS homes. Sarah mentioned that Energy Trust did a study a year or two ago, and did not find any significant premium for EPS over other green certifications, although there is a small premium for green certifications in general.

Real Estate Ally Survey: Evergreen conducted a web survey of realtors that completed Real Estate Ally training in the past year. Twelve realtors responded (a 32 percent response rate). These realtors worked in the Portland Metro and Eastern Oregon regions. Six specialize in “green” homes. Most homes sold by respondents in the past year were existing homes. On average, 4.4 new homes were sold in the last year, and 37 percent were EPS homes. Half of the respondents had sold a new EPS home. The top three reasons for taking the training were to increase knowledge of efficient homes, to help clients save money, and to help the environment.

Prior to the training, most had heard of EPS but were not familiar with it. Eleven of 12 agreed that the training gave them tools to promote EPS to clients, and more than half said the training changed the way they promote EPS as a result (they discuss energy efficiency more). Three increased sales of EPS as a result of the training, and several said more customer demand for efficiency is needed to increase EPS home sales. They reported that automatic uploads of EPS to real estate listings would be at least somewhat valuable. EPS benefits discussed with clients were: energy savings, higher comfort level, higher quality construction, and healthier indoor air.

Most respondents reported that they were fairly knowledgeable about the benefits of EPS homes and common energy efficiency measures, including duct sealing, insulation, and windows. Respondents reported that they most often heard customers express interest in windows and HVAC systems.

Seven out of 12 respondents believe that EPS has a positive impact on home sales, half believe that customer interest in efficiency is increasing, and half believe customers are at least somewhat interested in EPS benefits (especially energy bill savings). Eleven of 12 respondents receive information from Energy Trust via e-mail, and five believed that information was useful. Some wanted additional information about specific efficiency measures and Energy Trust program offerings. Eight of 12 were satisfied with their experiences with Energy Trust.

Recommendations: Recruit more builders in Bend and the southern coast regions, where customers are very interested in efficient homes. Conduct more early design assistance in Eastern and Southern Oregon to continue to help builders in more rural areas. Continue education of new, high volume builders on efficiency measures and practices to increase program home efficiency. Continue to reduce Axis data entry errors with high volume verifiers. Determine if the QA contractor spreads QA visits throughout the year better than in the past. Consider reducing energy model QC for the most reliable verifiers (currently, 100 percent of energy models entered into Axis are QC'ed).

Real estate trainings could focus on high efficiency windows and HVAC systems. Spend more time on how to interpret EPS and what it means in real estate trainings so realtors can better explain it to customers. Automatically upload scores to a central repository, ideally the multiple listing service. Marketing materials should make more explicit links between specific home

features and benefits. Advocate for EPS scoring as a performance path to code compliance in the 2017 code update. Formalize roles and protocols for new measure development. Consult with legal counsel to see if builder insurance requirements can be reduced. Work with affordable housing builders to see if the program can better serve them.

Alan asked about where information on EPS is contained for homes in multiple listing services. Mark commented that there are multiple fields, and there is not consistency among agents in how they identify high efficiency homes. The Multiple Listing Services has a number of fields where that information could go; a subset of those are funneled up to third party services.

Energy Trust Take: The New Homes program has been successful in building market share and achieving goals. Only incremental improvements in systems and processes need to be made at this time. Good progress has been made on improving the measure development process and coordination. EPS is starting to get a strong foothold in the market, and more builders and realtors are familiar with it. Lagging consumer demand for efficient homes is still a limiting factor – this is an area marketing may help improve. Outlying areas will continue to take more effort and support from the program, and there is a need to ensure volume builders and verifiers don't adversely impact the program.

Fred asked for more clarification on the last point. Dan responded that high volume builders can present opportunities and challenges. They are largely responsible for the high market share of the New Homes program. Getting them involved is good, but they can be at the lower end of the efficiency scale, generally speaking, and are more resistant to changing practices than other builders. Mark added that a few years ago, the program discovered that floor insulation for a high-volume builder was out of compliance with the program practice. The program had to consider whether it was going to toss out all the projects (potentially harming the relationship with the builder) or negotiate a settlement and adjust down the savings and incentives. So, working with these builders can be great, but it can have downside.

Phil commented that getting ready for the upcoming code change and future code changes is important. It's also important to include builders (especially high production builders) in the program because when these folks shift practices or procurement strategies, it sends a signal to the rest of the market and to code officials.

## **2. Savings Within Reach On-Bill Repayment Pilot Evaluation**

Presented by Sarah Castor

Background: Research Into Action performed this process evaluation of the Savings Within Reach (SWR) on-bill repayment (OBR) pilot. The study period was December 2014 through February 2016. There were quarterly reports from Q1 2015 through Q3 2015; the results of those reports have been compiled into this final report.

Evaluation Goals: The goals of this process evaluation are to assess pilot effectiveness, understand the participant and contractor experience, and provide recommendations for program improvement.

Methodology: The evaluation involved reviewing program documents and data; a literature review; and interviews with program staff, trade ally contractors, utilities, and Craft3 (lender). In addition, Research Into Action surveyed completed participants, incomplete participants (those

approved but who did not move forward), and non-participants (SWR participants who did not take advantage of the loan product).

SWR Background: The SWR track of the Existing Homes program has offered increased incentives to moderate income households since 2010. In September 2015, the program changed the income guidelines for SWR. Before September 2015, the guidelines specified that household income needed to be between 200 and 265 percent of federal poverty guidelines. After September 2015, the guidelines specify that household income must be no more than 120 percent of statewide median income. Alan asked how the new guidelines were developed.

Mark noted that a prior Energy Efficiency and Sustainable Technology (EEAST) pilot created a mechanism for using utility repayment history as credit enhancement and the utility bill as a servicing vehicle. This pilot was Clean Energy Works Oregon (now called Enhabit), which delivered a product through the Home Performance contractor network. Energy Trust saw an opportunity to deliver a streamlined approach that did not require lots of modeling and assessment for relatively low-cost projects.

The loan product was developed and launched in early 2014 to allow more moderate income households to complete projects. This is offered through a subset of SWR trade allies who apply to offer the loan product. SWR trade allies are a subset of Existing Homes program trade allies. Customers' utility bill repayment history is used as a credit enhancement (this was incorrectly characterized in the draft report). It is not used to approve or deny the loan; the credit enhancement allows those with a higher debt-to-income ratio or lower credit score to qualify for the loan. A bill estimator tool was developed to allow customers to see the change in their heating bill considering energy savings and the monthly payment made for the loan; the idea was to make clear the net bill impact before projects were undertaken.

The loan product is offered to PGE, Pacific Power, and NW Natural customers. CNG has a small number of customers, and there is a significant cost to develop the systems needed to support OBR. The loan amount can be up to \$5,000; a few customers put some cash towards the loans, especially if the project cost is more than \$5,000. Fifty-one loans were completed by the end of 2015.

Participation begins with a contractor proposing a project. CLEAResult verifies project eligibility (only certain measures are eligible: insulation, heat pumps, gas furnaces, water heaters). The customer completes the loan application, which Craft3 reviews and approves or denies. If approved, the customer signs loan documents. Craft3 closes the loan and the contractor installs measures. CLEAResult pays incentives to the contractor and Craft3 pays the remaining costs to the contractor.

Findings: The SWR OBR loan product did enable projects that would not have otherwise happened. Six of 8 trade allies reported that most or all customers would not have been able to do the project without having a loan. 71 percent of participants reported that the loan was "very important" to their decision to do the project; without it, four-fifths would have reduced scope, delayed, or canceled their project. Two-thirds of applicants who did not qualify did not move forward with any improvements due to lack of funds.

The loan product was appealing to customers; participants and incomplete participants liked the ability to make payments on utility bills, the lack of fees or closing costs, and the fact that no collateral was required. Several participants noted that the SWR OBR loan was more affordable

than other options. Trade allies said the loan was beneficial to customers and their business. A few customers suggested a lower interest rate.

Alan asked if most folks were able to save enough energy to break even. Sarah responded that these were not bill neutral; in most cases, there were increases. We asked participants about this as part of the survey.

At the outset of the pilot, SWR OBR had enough funds to make approximately 300 loans. At the end of 2015, 8 percent of SWR participants had used the loan product, which is roughly equivalent to other similar programs around country, but on the low end. There were some challenges that initially limited participation; there was good initial interest at the beginning, then a drop off, and then an uptick in late 2015 in the number of customers applying.

Steve commented that Energy Trust did not do direct marketing of SWR OBR given the limited pool of funds; this was primarily marketed through contractors.

There a number of difficulties experienced, including a delay in the loan approval (not instant) due to the need for utility bills, and the volume of documents (19) required to be signed for loan processing, including a lien filing (to make sure everyone involved is notified if the property is sold). The volume of paperwork and nature of the lien filing was challenging for some participants. Some participants had trouble printing, signing, and scanning the documents; in a few cases, trade allies stepped in to make this process easier. Trade allies reported challenges in communicating with Craft3 regarding the status of loans, although when the last round of interviews was completed in November 2015, trade allies, program staff, and Craft3 all reported improvements in this area.

Other challenges included difficulties identifying SWR-eligible households, which is a relatively small segment of the population (18 percent under the new income guidelines). On a related note, contractors reported not wanting to ask about income. Finally, there has been limited marketing of SWR, and no marketing of SWR OBR so far. 52 percent of non-participants were not aware of the availability of SWR OBR loans.

The evaluation found that the pilot has addressed many early issues. There has been increased program outreach to trade allies, and the program has electronic loan document signing in place, so there is no need to print, scan, etc. NW Natural preferred contractors are now required to be able to offer SWR OBR loans, which has increased the pool of participating trade allies. The program is exploring options for a portal to enhance communications between the program, lender, and trade allies. Finally, increased uptake in late 2015 indicates that these efforts have been successful.

Other findings include: the majority of loans are repaid on NW Natural bills, and OBR projects are slightly larger than average SWR projects because of the prevalence of heating system measures. Importantly, the measure costs for OBR are not higher than for SWR in general, suggesting there's no inflation of measure costs because they are going on a loan.

Most customers saw a net bill increase; 42 percent were as expected, 30 percent were lower than expected, and 17 percent were higher than expected.

Conclusions and Recommendations: Energy Trust, CLEAResult, and Craft3 recognized challenges to the pilot and took steps to resolve those challenges. The evaluator recommends that the program continue to monitor loan uptake, contractor engagement, and participant

satisfaction; investigate additional opportunities to simplify the loan process; and review the challenges and value of the lien filing.

Heather asked when the pilot will transition to regular program offering. Mark commented that one of the key questions (whether the offering is bringing forward projects that otherwise would not happen) has been answered. The volume is lower than what we want it to be, and there are opportunities for improvement to operations. Fred commented that pilots are run to answer questions that require experience and research to answer. Ken commented that it sounds like the program found there is a market for the product that is incremental to the regular program.

Sarah continued, noting that the evaluator found that trade allies can play a valuable role in supporting participants, and recommends that the program expand trade ally training about loan requirements and processes, and encourage them to offer to assist customers. The evaluator also recommended that the program develop a tool to improve tracking and communication of project status. The evaluator notes that there are drawbacks to relying on trade allies to inform customers about the SWR OBR offering. They recommend directly informing potential participants about the availability of SWR OBR loans.

Next Steps: Continue offering SWR OBR. The Existing Homes program will monitor loan uptake, and explore opportunities for expanding participation and increasing communication between trade allies, the lender, and the program.

### **3. CORE Improvement Pilot Evaluation, Year 2**

Presented by Dan Rubado

Background: This study was conducted during the second year of the CORE pilot and was meant to follow-up with participants and look back at those who participated in the first and second years. CORE improvement is a pilot to test delivering strategic energy management (SEM) training to small and medium industrial customers. It is implemented by Triple Point Energy (Triple Point is now CLEAResult but we'll refer to them as Triple Point throughout the presentation for simplicity). CORE targeted small to medium sized customers with \$50,000 to \$500,000 in combined annual energy costs. The pilot provided training, support and energy modeling to get customers to aggressively manage energy and plan more proactively. CORE delivered two cohorts of 10-12 highly motivated industrial customers, and was designed to be very similar to SEM for large customers. In 2015, CORE was rolled into the current industrial SEM offering for customers of all sizes, and now is referred to as "Core SEM." (Distinguishing between CORE and Core without all caps.) So the offering described here is not exactly the current offering.

The pilot goals were to test if SEM could be successful and cost-effective at small to medium industrial sites. We wanted to determine if barriers faced by smaller companies could be overcome, including:

- Lower energy use
- Fewer employees
- Lower production capacity and variability

There are two cohorts, launched in 2012 and 2013. Each participating site formed an energy team. There were four group workshops and on-site activities, including energy walk-throughs and opportunities to implement identified strategies. During the workshop participants received training on energy models and how to use the monitoring, targeting, and reporting (MT&R)

workbooks to analyze their energy use. There are three milestone incentives of \$1,000 each, which are geared to get participants to do specific tasks at specific times. There is also a further performance incentive based on operations and maintenance (O&M), which is \$0.02 per kWh and \$0.20 per therm.

Evaluation Overview: Navigant conducted a follow-up evaluation with cohorts 1 and 2. The process evaluation aimed to document the pilot; compile feedback; identify successes and challenges; identify traits of successful firms; assess effectiveness of energy teams and employee engagement; and identify SEM services with the biggest and most lasting benefits. We wanted to see how successful the pilot initiative was and how people are keeping up with SEM. There was also an impact assessment component looking back at cohort 1 to verify energy savings and assess persistence of savings over time. For cohort 2 we did a technical review of models and tools.

Navigant completed interviews with Energy Trust and Triple Point staff, follow-up interviews with cohort 1 participants, first-year interviews with cohort 2 participants, verification of cohort 1 savings (including site visits and impact analysis) and review of cohort 2 MT&R models and tools.

Findings – Staff Interviews: CORE participants tended to have an interest in sustainability, enthusiastic leadership, and existing continuous improvement initiatives (e.g., lean manufacturing). Customers were enticed by peer-to-peer networking, the data logger package, and learning about MT&R models. Energy Trust allowed Program Delivery Contractors (PDCs) to count cohort 2 savings towards their goals and got them more involved. PDCs were very effective in recruiting for cohort 2 due to customer relationships and better ability to count savings. Milestone incentives continued to motivate participants to complete tasks. CORE boosted confidence in energy management and participants undertook more capital projects as a result. Most participants had some level of success with SEM but it was difficult to predict which ones would be most successful. Important elements for success appeared to be: having an effective energy champion, management support, regular energy team meetings, and executing projects early to build momentum and show that this would be a success with the company.

CORE participants required similar services as larger companies. Participants of different sizes encountered similar challenges – size didn't have that big of an effect on what companies needed, though some did seem too small to be successful with SEM. A couple companies did not have sufficient resources or energy use to be successful. Gas savings were more difficult to model than electric and there was an unexpected lack of gas savings achieved. About half of cohort 2 sites had simple models and were likely to keep updating them – while sites with more complex energy models struggled.

Fred asked, are these are more complex models because they have more complex opportunities? Dan responded that they might be more complex sites or more complicated modeling was required.

Dan continued, noting that cohort 2 site savings averaged 7.5 percent of electric usage, making it cost-effective. As a result of pilot, Energy Trust consolidated CORE and Industrial Energy Improvement (IEI) into a single offering.

Findings - Cohort 1 Interviews: Navigant interviewed all nine participants one year after the cohort concluded. And to reinforce, for cohort 1, half of the firms owned facilities and operated

one or two sites, and half were subsidiaries of much larger companies. The figure below summarizes the main successes and challenges in maintaining SEM.

Summary of successes and challenges in maintaining SEM (number of respondents is in parentheses)

<b>Main Successes in Maintaining SEM</b>	<b>Main Challenges to Maintaining SEM</b>
<ul style="list-style-type: none"> <li>• Considering energy when making capital purchases (3)</li> <li>• Continuing or initiating new O&amp;M measures (4)</li> <li>• Maintaining an energy team and replenishing members as necessary (4)</li> <li>• Tracking energy use (4)</li> </ul>	<ul style="list-style-type: none"> <li>• Employee and/or energy team turnover (5)</li> <li>• Inability to maintain energy tracking (5)</li> <li>• Limited resources and competing priorities (2)</li> </ul>

Some of the challenges were energy team turnover. This came up again and again in cohort 1 and 2. Staff knowledge was lost and was related to an inability to maintain energy tracking over time. Others identified competing resources as a challenge in keeping up SEM practices over time.

Six participants still had energy teams, but most teams had changed or lost members. Three teams disbanded entirely and lost SEM knowledge. Six said management was still supportive of energy management activities. Staying engaged with maintenance and production staff was a challenge due to layoffs, turnover, and shifting priorities. Factors that contributed to success were corporate recognition of efforts, tying energy team compensation to savings, corporate goals, and initiatives to reduce energy. One company tied annual employee incentives to company energy savings, which was very popular.

Four firms continued to set numeric energy goals. Four firms continued to track energy – two had corporate initiatives requiring energy tracking, which was helpful, and one used a key performance indicator (KPI). Challenges included staff turnover, difficulty with MT&R or obtaining data, process changes within the facility that impacted baseline, and low interest or loss of interest over time. Seven still used the monitoring equipment they received (data loggers, spot metering equipment). Three purchased air leak detection equipment after CORE. Opportunity registers were regarded as useful tools. Three were even continuing to complete items on registers, two had added items, and four stopped using them due to staff turnover.

O&M measures are the basis of SEM savings and with cohort 1 they tended to persist a year later. Several firms continued O&M practices even after entire energy teams left or support for SEM disappeared. Several firms now consider energy efficiency of capital equipment prior to purchase as a result of CORE. Fred asked, did folks say whether they had done that before, or is this new? Dan responded that this is a result of CORE.

Some had gotten support for capital projects from management by quantifying the ROI of energy savings. Six had not yet worked with their PDCs, primarily because they had no capital projects.



Findings - Cohort 2 Interviews: Navigant interviewed all 12 cohort 2 participants right after cohort 2 wrapped up. Cohort 2 firms tended to be privately owned, owned their facilities, and operated at least five sites, often in multiple states. They were attracted to CORE by potential cost savings, tools to demonstrate energy savings to management, and networking. Participants rated the workshops, onsite meetings, and support they received from the implementer very highly across the board. All firms set an energy goal and most believed they would maintain energy savings and continue to identify new opportunities. Several firms are sharing SEM lessons with their other facilities. A majority of firms wanted to stay engaged with Energy Trust and receive continued support.

A general theme was that broad organizational engagement was challenging. Some successful strategies included tying activities to cost savings, sustaining energy teams, employee awareness, and training. Tying savings to bonuses came up again in cohort 2 as a good strategy. Implementation challenges included changing established practices, lack of time, and competing with production. Maintenance staff were heavily involved in implementation. Production employees were difficult to engage but often helped with tasks such as turning off equipment or tagging air leaks, so when they were given specific tasks to do they tended to do them. Energy teams tended to have turnover and lose members over time. Six reported a good mix of team members, others struggled to recruit the right people. Five firms had members with energy management in job descriptions – those were the firms that tended to dedicate more time to SEM and be more successful.

Opportunity registers were useful tools, but only four participants were still using them. All planned to continue using MT&R models, and eight were regularly updating them. Models were useful for: identifying issues and energy projects, determining impact of facility changes, communicating energy savings. Some challenges with models were the same as cohort 1, and included staff turnover, facility changes that impacted baseline, difficulty obtaining data, and complexity of models. Milestone incentives again strongly motivated completion of requisite tasks but savings incentives not as influential – they were outweighed by cost savings. Primary O&M measures used were shutting off lights and equipment, adjusting set points, fixing air leaks, HVAC maintenance, and installing timers and occupancy sensors. One facility also changed its layout to streamline the production process, which was a much more in depth change with savings associated. Seven firms did capital projects – which is a pretty big proportion and is impressive. Nine identified potential projects.

In summary, firms continued O&M measures after CORE, even if none of the SEM practices continued. As previously reported, firms learned from their peers and really valued the networking. Energy teams experienced significant turnover which affected their ability to continue SEM. Many firms had difficulty continuing SEM practices after CORE, especially energy tracking. Production employees were particularly difficult to engage in SEM due to conflicting priorities.

Cohort 1 Impact Methods: For cohort 1, we did an impact evaluation. There were a fairly limited number of sites so it is hard to generalize too much, but we did evaluate 94 percent of electric savings and 39 percent of gas savings. Navigant first completed on-site inspections at six sites covering:

- Simple verification of O&M measures and ongoing actions associated
- Confirmed capital equipment counts, capacities, efficiencies, installation quality
- Collected nameplate and performance data for relevant equipment
- Observed control systems and schedules

- Collected production data for MT&R models to update and confirm baseline conditions with facility operations
- Discussions with building operators about facilities, occupancy schedules, systems

Next, the MT&R models were updated using billing data, production data from sites, and weather data to compute savings for first and second full year. We used the same baseline models as the implementer to compute savings. We subtracted evaluated capital project savings from SEM savings to get the final savings to compare with original estimated savings and arrive at a final realization rate.

Cohort 1 Measure Verification: Most O&M actions were verified but some had not been implemented. All capital measures were operating as expected. We didn't do a real in-depth evaluation of those installed measures, but they looked good and were given 100 percent realization rates.

#### Cohort 1 O&M measures

O&M Measure Category	Implemented and Verified	Planned or In Progress	Total Identified
Compressed Air Leak Detection	6	1	7
Thermostat Adjustments	3	2	5
Equipment Shutoffs	6	-	6
HVAC Maintenance	1	1	2
Employee Training	4	2	6
Standard Operating Procedures	-	2	2
Other	3	-	3

In the table above we can see the types of measures verified. The "other" category would include changes to process layout. The vast majority were identified as still in place, and some were planned for in the future.

Cohort 1 Electric Realization Rates: The cohort 1 electric realization rates are shown in the table below. There is a big range and a lot of variability here. The expected percent in the first column ranges from 5 to 16 percent. Some are way over or under – but the average is 91 percent, which is pretty good. On average, the savings at cohort 1 sites were close to the estimated. But when looking at individual sites there is high variability. In year 2, we see that site-level variability again but overall they are dropping over time. This is not to say that 74 percent is the actual savings, but it is looking at the trend over time.

## Cohort 1 electric realization rates

Site	Ex Ante Year 1 kWh	% of facility usage (Ex Ante)	Year 1 Realization Rate	Year 2 Realization Rate
1	261,223	5%	186%	98%
2	125,209	5%	69%	261%
3	426,689	6%	80%	103%
4	52,682	7%	166%	134%
5	218,327	9%	126%	3%
6	24,969	8%	156%	283%
7	837,115	16%	55%	31%
<b>Total</b>	<b>1,946,214</b>	<b>8%</b>	<b>91%</b>	<b>74%</b>

Ken commented that statistically, there is no difference between 91 percent and 74 percent because of the variability around each one. Dan agreed, it is more indicative.

We only analyzed gas savings at two sites; the savings were minor, and the year 1 and year 2 realization rates were zero.

Fred asked if we have a sense of whether the wide range in electric realization rates is caused by noise entering the models. Dan responded that from an individual-site basis he didn't know if we can say much – you have to look at the whole cohort. We see that site 7 was responsible for the majority of electric savings – they did have an issue where savings were seasonally driven and were estimated during a high savings season, and that is why the realization rate was much lower. Site by site variability perhaps flattens out at the cohort level. Ken noted that for industrial especially, gas tends to have even wider variance than that. Dan said that gas savings were difficult to model and they were small to begin with; they were hard to see in the model two years later. Fred said that was inconclusive then. Dan responded that all it says is that we didn't find any gas savings.

Cohort 1 Impact Findings Summary: First year realization rates were 91 percent for electric and 0 percent for gas. Annual savings calculations were based on the last three months of the implementation period. This method does not always reflect important seasonal variations. One site had very seasonal production and savings were measured during peak production when savings were highest – savings were much lower for a full year.

Baseline models can “break” if there are substantial facility changes, and that happened at one site. One site substantially increased production and installed a new production line. Model validity was in question so the evaluation contractor did update the model to account for that. We don't have the highest confidence in that, but they did it.

Energy Trust assumed a three-year measure life for CORE. This assumes savings from O&M measures will continue for 3 years on average. The 74 percent realization rate for year 2 is consistent with three-year average measure life – the decrease in savings makes sense given that some sites have fallen off and others will persist.

Cohort 2 MT&R Review Findings: The table below shows savings claimed, and the percent of facility usage for both electric and gas.

## Summary of site savings and evaluation approach

Site	Ex Ante Savings kWh	% of Facility Usage	Ex Ante Savings therms	% of Facility Usage	Approach
1	163,893	10%	28,789	16%	MT&R
2	329,227	6%	3,164	7%	MT&R
3	211,232	9%	N/A	N/A	MT&R
4	189,484	19%	N/A	N/A	MT&R
5	427,519	16%	N/A	N/A	MT&R
6	0	0%	N/A	N/A	MT&R
7	177,435	7%	0	0%	MT&R
8	21,543	8%	N/A	N/A	Bottom Up
9	0	0%	N/A	N/A	MT&R
10	654,177	11%	0	0%	MT&R
11	286,908	7%	0	0%	MT&R
12	323,500	10%	0	0%	MT&R

Again, we do not see a whole lot of gas savings, and there weren't a lot of sites that reported gas savings. For one site, Navigant did a bottom-up analysis because they just couldn't get a model that would work for that facility because of how the meters were setup.

MT&R workbooks were set up to track energy usage and savings over time. The workbooks could be fairly simply updated over time. The assumptions used to track energy use and savings were reasonable. All models had solid baseline periods of at least one year, which was good. Capital measures were clearly identified and separated out from the O&M. CORE energy savings seemed reasonable and in the realm of what the evaluator expected.

Recommendations: Our recommendations are to stick with the current program design. Cohorts offer great networking and good balance between group and on-site activities. Participants want continuing engagement with Energy Trust and support for SEM. There is a desire for us to stay involved; Energy Trust is initiating continuous SEM as a result. Continue making milestone incentive payments, as they were a big motivator in getting firms to complete specific tasks. MT&R models may not always work, so use bottom up analysis or key performance indicators when needed. Ensure that MT&R baseline models are robust - use monthly data when possible with a year or two years of usage data if possible. Savings should be analyzed over a full year or adjusted for seasonality to avoid big differences. Future SEM cohorts should focus more on identifying gas savings, as this seems to be an area where we are still lacking.

Energy Trust Take: CORE showed us that smaller industrial sites can be successful with SEM. Large and small industrial sites have been combined into one SEM offering and continuous SEM is here. O&M measures appear to be persisting and savings are on track to last at least 3 years. Savings are being estimated reasonably well, but seasonality is an issue in some cases. Staff turnover and persistence of SEM practices are big challenges that need to be tackled. Fred asked if this is a bigger challenge than other SEM participants. Kim responded that these are the same barriers. The main finding is that there is no difference between small and large, which is why we combined them and why we don't see a difference. This last bullet, staff turnover and persistence of practices, is a big part of continuous SEM. Alan commented that with a large customer there is more potential, so the savings are larger. So, the same effort for smaller customers won't yield the same results, but we can make the same effort. Kim responded that we aren't paying the same for large and small customers. Some on-site activities are happening at large sites but not small sites; customers don't see that difference. We can still fine tune what is happening. While large customers bring in wildly cost-effective savings, small and medium customers are still cost-effective. Ken commented that this is part of

the reason for the three year measure life. You're in and after a time, you walk away. Now you're continuously engaging, but should also stretch the life. Fred responded that we are researching that issue. Kim noted that the program was told it was approved for a five-year measure life. Phil commented that the five-year measure life is on the assumption that continuous SEM continues for two years, and then a five-year measure life is the three years after that. Fred commented that we are extending out to see if we can make it a long-term resource.

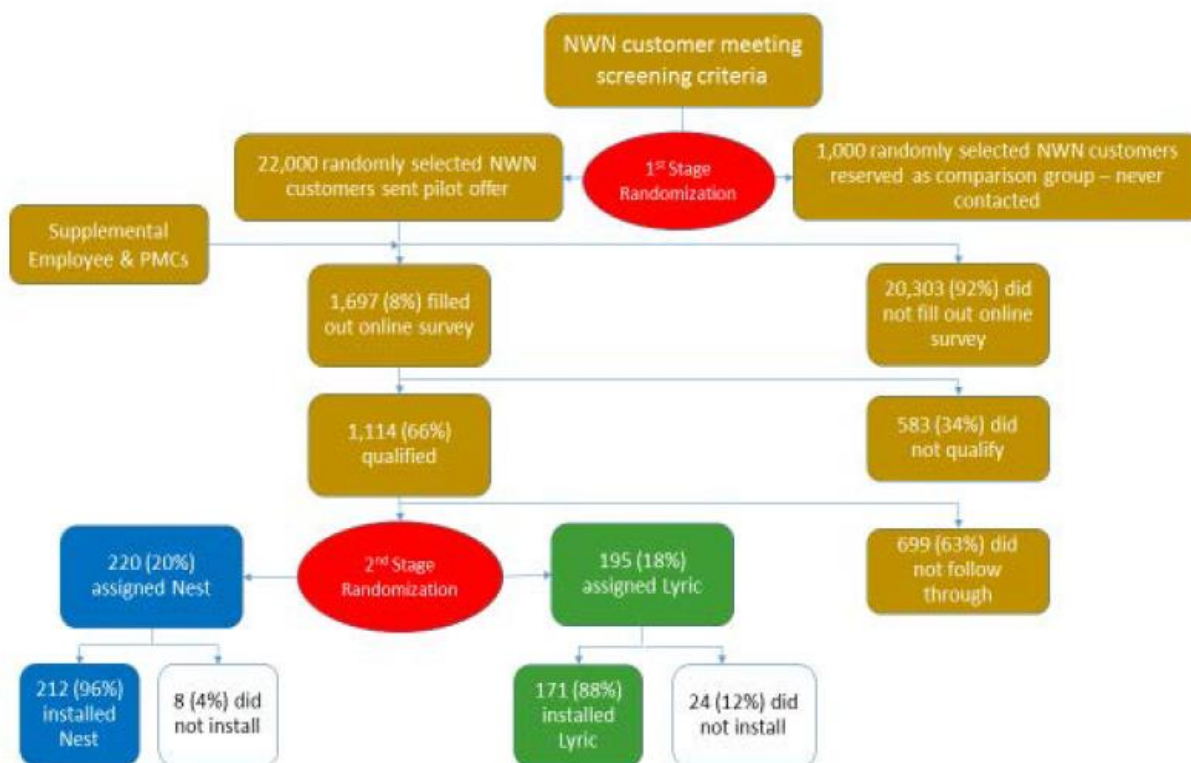
#### **4. Gas Thermostat Pilot Evaluation**

Presented by Dan Rubado

Background: In 2013-2014, Energy Trust launched a pilot to test the Nest thermostat's ability to act as a heat pump control, which was very successful. In 2014, the Existing Homes program launched a pilot to test smart thermostats in gas-heated homes; the Nest learning thermostat and Honeywell Lyric were selected for this study. The feature that staff expected to have the biggest impact on energy savings in gas-heated homes was occupancy detection. Nest's occupancy detection feature is called Auto-Away, and uses a motion sensor to determine whether or not the home is occupied. Lyric's occupancy detection feature is called geofencing, and determines whether or not the home is occupied based on the GPS location of users' smartphones. This pilot was implemented by the Existing Homes Program Management Contractor, CLEAResult. For the most part, participants were recruited via e-mail by NW Natural; some Energy Trust employees and contractors were recruited to boost the number of participants. The program offered a discounted Nest or Lyric thermostat, and used an online application and purchase process. The study required participants to install the thermostat, connect it to the internet, set up an online account, and forward the confirmation e-mail to Energy Trust. Verified participants received a \$200 rebate. Program staff performed site visits to 10 percent of participating homes (randomly selected) to verify installation, thermostat settings, and home characteristics.

Pilot Structure: NW Natural randomly selected 22,000 current customers who paid their bills online, had a gas account for at least one year, and had winter usage twice that of summer months (indicating the customer heats with gas) for the treatment group. They also randomly selected 1,000 customers who met the same criteria to serve as a comparison group. Recruitment e-mails directed interested customers to complete a survey. Customers were deemed eligible to participate if they agreed to participate in the study, lived in single family homes heated by forced air gas furnaces, had high-speed internet or Wi-Fi, had a valid e-mail address, had a smartphone or tablet (to interact with the smart thermostat), and had no plans for major home upgrades. Eligible customers were then randomly assigned to the Nest or Lyric group.

## Diagram of sample randomization



The diagram above shows the process just described in graphical format. Customers were first randomly assigned into a treatment or control group, then, eligible customers were randomly assigned to the Nest or Lyric group.

**Evaluation Goals:** The goals of the pilot were to quantify gas savings from self-installed smart thermostats in homes with a gas furnace, identify differences in the level of savings between the two thermostats tested, identify differences in savings by demographic and home characteristics, obtain feedback from staff and participants, understand participant interactions and satisfaction with thermostats, and determine if smart thermostats are a viable technology for achieving savings.

**Methodology:** Apex Analytics performed the evaluation. They conducted staff interviews, fielded two participant surveys (one in the middle of the heating season and one after the heating season), and reviewed billing analysis performed by Energy Trust evaluation staff.

Billing analysis involved the analysis of monthly gas billing data; billing data was weather-normalized to control for the impact of weather. Three different comparisons were made to reduce potential biases: 1) all qualified customers vs. comparison group, 2) pilot participants versus comparison group, and 3) pilot participants vs. matched comparison group. Subgroup analysis was performed to see if savings varied between groups.

**Findings:** The self-install model worked well, and resulted in few calls for technical issues. There was a 7.5 percent response rate to the initial recruitment e-mail, and a 35 percent conversion rate from qualified customers to thermostat purchases. Ultimately, 383 thermostats were installed.

There were minor differences between homes installing the Nest and Lyric thermostats. 90 percent were replacing a programmable thermostat, and 90 percent reported that they programmed their previous thermostat, which is a high baseline.

Most participants installed their thermostat in one hour or less without additional support. Installation and setup were significantly easier for Nest users than Lyric users; Lyric took 22 minutes longer to install than Nest. 10 percent of Nest users reported installation problems, and 37 percent of Lyric users reported installation problems. Issues for Nest included furnace incompatibility, wiring, and Wi-Fi connectivity. Issues for Lyric including wiring, Wi-Fi connectivity, dead battery, geofencing, and thermostat failures.

Customers found the ability to adjust their thermostat with their phone very useful (for both Nest and Lyric). Nest users found the energy history, Nest Leaf, and Auto Schedule features useful. Lyric users found the shortcuts, adaptive recovery, and away button features useful.

Many more Nest users enabled occupancy detection than did Lyric users. Many Lyric users did not use geo-fencing; they had difficulty setting it up, had multiple phones, were not aware of it, could not figure out how to set it up, or didn't think it would work for their lifestyle. Nest users had the Auto Away feature enabled by default; a few disabled this feature because they were retired, working from home, or had the thermostat located in a low traffic area.

Between the first and second survey, we observed the number of Nest users adjusting their thermostat every day drop off; more Lyric users made adjustments more frequently.

Fewer Nest users had issues after installation relative to Lyric, and more Nest users thought their thermostat was easy to use relative to Lyric users. Nest users were more satisfied with their thermostat and were more likely to recommend the thermostat to others relative to Lyric users.

As noted above, the billing analysis involved three comparisons: 1) all qualified customers vs. comparison group, 2) pilot participants versus comparison group, and 3) pilot participants vs. matched comparison group. The table below shows the second comparison: participants versus the comparison group.

Billing analysis results; pilot participants versus comparison group

Thermostat	Annual Therm Savings	SE	90% Conf. Interval	p-value
Nest	34	11	13, 55	0.018*
Lyric	-29	14	-55, -3	0.071*

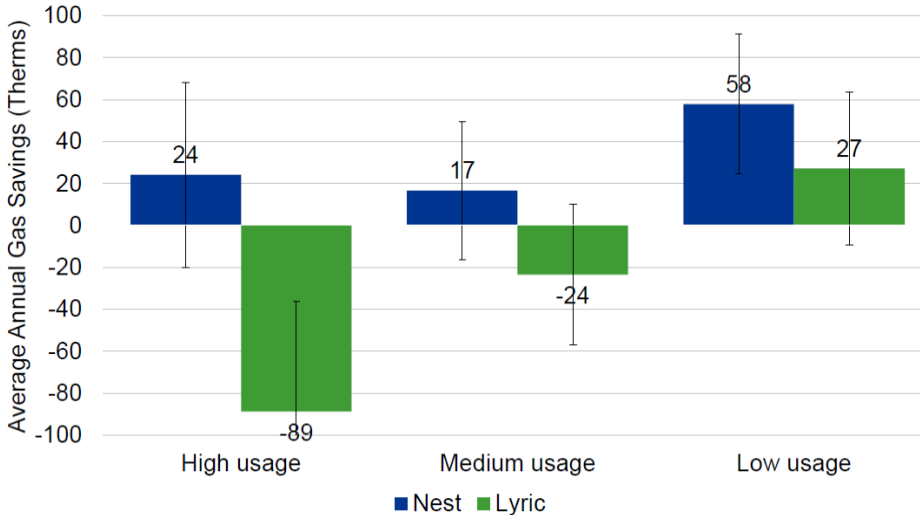
The table above indicates that, on average, Nest users saved 34 therms relative to the comparison group. This result is statistically significant. Lyric users, on average, added about 30 therms of gas use. This result is also statistically significant. This translates to 6 percent heating savings for Nest users and a 5 percent increase in heating load for Lyric users.

Looking at all qualified customers versus the comparison group, the point estimates are similar, although they are not statistically significant. And when we look at participants versus a matched comparison group, the results are almost identical to the table above.

Removing Energy Trust staff and contractors from the sample, removing those who reported (via the survey) uninstalling their thermostat, and removing those who made major changes to their home during the study period (reported via the survey) did not impact the results.

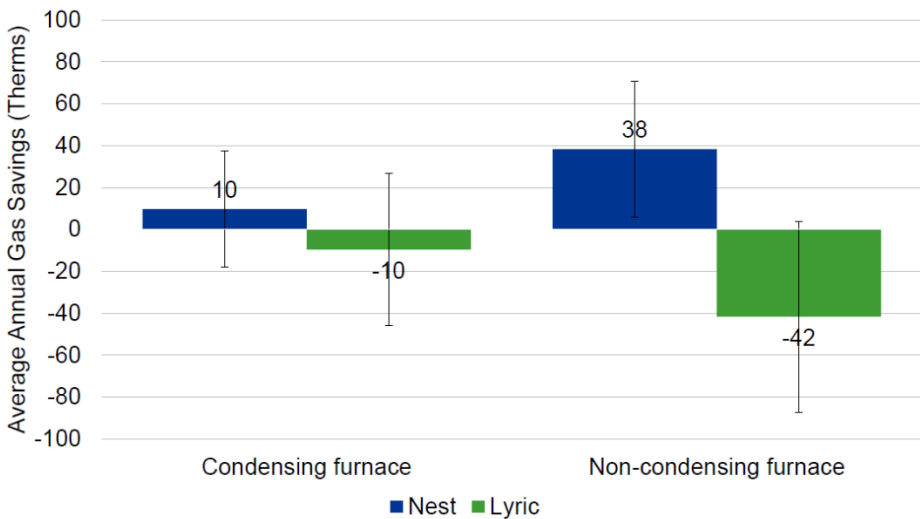
Looking at usage category (low, medium, and high gas use), the savings estimates did vary (see graph below), but they were not statistically significantly different. However, they do provide an indication that lower users had higher savings, which is consistent with what was found in the prior Nest heat pump study.

Savings by usage category



When comparing savings by type of furnace (condensing versus non-condensing), there were no statistically significant differences (see graph below), but the savings for condensing furnaces are closer to zero. This may indicate that condensing furnaces are so efficient, that a thermostat doesn't change gas use that much. Fred added that it could also be something else about those homes driving this result.

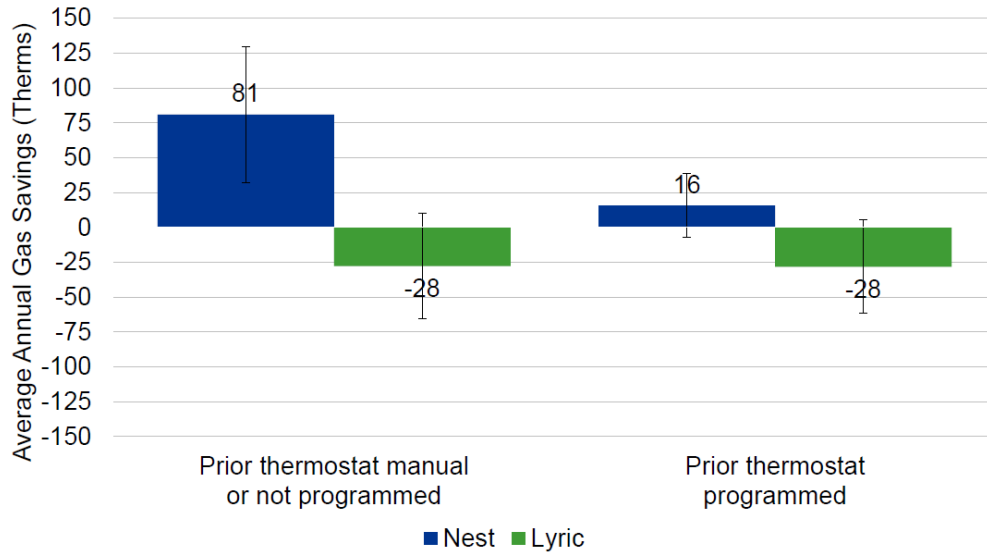
Savings by furnace type





Finally, we compared users who previously had manual, non-programmed thermostats compared to those who reported programming their thermostat. As shown in the graph below, it looks like savings are concentrated in those homes replacing manual or non-programmed thermostats.

Savings by prior thermostat type



Alan asked, how can a thermostat cause someone to use more energy? Dan responded that the study doesn't provide a clear picture, but the survey results suggest that users perhaps did not set up their thermostat properly, or that users previously set back their thermostat and moved to something that was too complicated for them, and this caused them to use more energy.

Marshall commented that from a residential portfolio perspective and from a cost-effectiveness perspective, the residential program sees a lot of promise in this measure for acquiring savings.

### Wrap-Up & Next Steps

We are thinking about scheduling another evaluation committee meeting in May. Erika will send out a Doodle poll to see what days would work best for folks in May.

# Evaluation Committee Meeting

May 24, 2016 12:00 pm—3:00 pm

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## Attendees

### Evaluation Committee Members

Alan Meyer, Board Member, Committee Chair  
Susan Brodahl, Board Member  
Ken Keating, Expert Outside Reviewer  
Jennifer Light, Expert Outside Reviewer

### Energy Trust Staff

Steve Lacey, Director of Operations  
Mike Bailey, Engineering Manager, Planning  
Jackie Goss, Planning Engineer  
Phil Degens, Evaluation Manager  
Sarah Castor, Evaluation Sr. Project Manager  
Dan Rubado, Evaluation Project Manager  
Erika Kociolek, Evaluation Project Manager  
Andy Eiden, Planning & Evaluation Data Analyst  
Spencer Moersfelder, Planning Manager  
Ted Light, Planning Sr. Project Manager  
Elise Breshears, Planning Intern  
Sue Fletcher, Sr. Manager, Communications and Customer Service  
Marshall Johnson, Sr. Program Manager, Residential  
Scott Leonard, Sr. Project Manager, Residential  
Oliver Kesting, Commercial Sector Lead  
Jessica Iplicki, Program Manager, New Business  
Sam Walker, Sr. Project Manager, Commercial  
Lindsey Diercksen, Program Manager, Industrial

### Other Attendees

Lauren Gage, Bonneville Power Administration (phone)  
Elaine Prause, Oregon Public Utility Commission (phone)  
Jeff Schwarz, ICF International (phone)  
Karla Hendrickson, ICF International (phone)

## 1. Short Take: Air Sealing Pilot Evaluation

Presented by Dan Rubado

Pilot Description: This pilot was launched by the New Homes program, and taken on by CLEAResult (the New Homes Program Management Contractor, or PMC) as an in-house project. The goal of the pilot was to see if two air sealing strategies could be incorporated into the New Homes program as standalone measures. Two air sealing strategies were examined: a whole home latex sealant and attic blackout treatment using spray foam. The latex sealant is applied to all interior wall surfaces, and the attic blackout strategy is performed by putting spray foam around penetrations in the attic, and shining a light from below to see if there are any missed spots. These strategies were implemented in a group of EPS homes. All of the homes were constructed by a single builder and a single insulation contractor performed this work in all of the homes. This was helpful, as it made the pilot simple to manage and reduced variability in

implementation. In addition, all homes were in a single subdivision and had very similar designs; they were all three-story homes ranging from 1,400 to 2,300 square feet and had similar configurations.

Air Leakage Testing: 37 homes received the whole home latex sealant (“treatment” homes) and there were 39 “control” homes in the same subdivision that did not receive the sealant. All of the homes, both treatment and control, received the attic blackout. To test the impact of these two measures, blower door tests were done before and after attic blackout; a final blower door test was done at completion as part of the EPS process.

Alan asked if the committee had previously seen a presentation about this topic. Dan responded that a similar study examined a different air sealing strategy: sill sealer on the top plate. The study being discussed today is a follow-on to identify other air sealing measures.

Dan noted that the blower door tests before and after the attic blackout provided insight into the impact of that measure; comparing control and treatment homes provided insight into the impact of the whole home latex sealant measure.

Sealant Application: Two latex sealant products were tested; both sealants had major application issues. The application machines got clogged, broke down, and required frequent cleaning, which was time-consuming. The sealants were variable in consistency and as a result, were difficult to apply. The contractor estimated the cost (including labor and materials) to be between \$1,250 and \$1,750 per home, which is high for an air sealing measure.

Attic Blackout Application: For the attic blackout measure, spay foam was applied to all attic penetrations, and contractors used a light from below to find areas to seal. This was done just prior to the installation of attic insulation. There were no real installation issues other than added time. The cost was estimated to be between \$250 and \$350 per home.

Air Leakage Findings: For the latex sealant, treatment and control homes had the same air leakage rate (3.0 air changes per hour, or ACH) so there was no difference and no savings. For the attic blackout treatment, the study found an average air leakage reduction of 1 ACH on average, which is fairly substantial, although there was a lot of variability from home to home. And it’s important to note that attic insulation interacts with this measure to some degree, and we don’t know the extent of that interaction given the results of the study.

Attic Blackout Savings: To figure out the gas energy savings for code-built homes, the evaluator used energy modeling software called BEOpt, which had an EnergyPlus modeling engine. A variety of prototype homes were modeled with and without the measure. The prototypes assumed 2014 Oregon code, a condensing gas furnace, an unheated attached garage, and an unfinished attic with R-38 insulation. The table below shows the seven prototype homes used; the most similar prototype home was the 2,000 square foot, three-story home in the top row of the table.

## Attic blackout results by prototype

Prototype Home	Heating usage @ 5 ACH50 (therms)	Heating usage @ 4 ACH50 (therms)	Annual Savings (therms)	Prototype weighting
3-story 2,000 sf	318	303	15	21%
3-story 1,275 sf	205	192	13	7%
Split-level 2,500 sf	378	364	14	15%
2-story 2,400 sf	340	327	13	21%
1-story 2,000 sf	298	293	5	21%
1-story 1,400 sf	174	171	3	10%
3-story 3,100 sf	469	442	27	5%
<b>Weighted Average</b>	<b>313</b>	<b>301</b>	<b>12</b>	

The table shows heating usage at 5 ACH50 and 4 ACH50 (e.g., with and without the measure); the difference between those two columns is annual savings. The last column shows how each prototype home was weighted (based on percent of all new homes matching each prototype) so the homes could be combined to get a single savings estimate, which is shown in the last row. Savings were estimated to be 12 therms, which is slightly lower than what was expected.

Conclusions: Latex sealants were expensive, difficult to apply, and did not reduce air leakage. The attic blackout strategy saved about 12 therms on average, but the savings are likely highly variable.

Energy Trust Take: The latex sealants clearly did not work, and Energy Trust will not pursue this measure. The attic blackout strategy seemed promising and easy to install, but produced modest savings and is not currently cost-effective on its own. It may be incorporated as a strategy for EPS homes.

Ken noted that this study was done on EPS homes, which are already tight to begin with, so it's a big gain to get a one-third reduction in air leakage. The question might come up that this might not be a good marginal measure in a home that's already tight given stack effects, but in a home that is not as well sealed as EPS, and given reduced stack effects, could it be a code measure? Dan responded that it could be a code measure. This study was trying to get at a best case scenario by assuming code conditions – that is, taking a code home, and applying the amount of air leakage reduction observed in the study. Ken noted that applying 1 ACH versus one-third is different; it could potentially be a larger number for a code home. This is something that the New Homes program could think of in terms of a code measure. Ken asked if the study looked at how much this changed the EPS. Dan responded that they did not, but could.

## 2. Short Take: Pay for Performance Pilot Evaluation

Presented by Phil Degens

Background: This pilot was launched in 2013, and came about as a result of an OPUC docket that suggested Energy Trust do a pilot to test Pay for Performance (PfP). Energy Trust issued an RFP in 2014, and six proposals were received from two contractors. Two proposals were

selected, one from each contractor, and ultimately, one PfP contract between Energy Trust and a building was signed. The other contract was negotiated for over a year before Energy Trust decided to not continue the contract negotiations. The person at the building who had been involved in the pilot left, so staff turnover was an issue. The first year savings of the single completed PfP project exceeded goals, and currently PfP will be offered through the Existing Buildings program; recruitment for additional PfP projects will start at the end of this year. The focus will be on operations and maintenance (O&M) measures.

Alan asked if one project provided enough information to make a decision about expansion. Sam responded that the program is treating the rollout as a “phase two” pilot, which will be limited to four or five projects, and will help the program gain additional information and learnings.

Evaluation: MetaResource Group did the evaluation, which was intended to obtain feedback on the RFP process, the contracting and project implementation process, and the savings reporting process. MetaResource Group completed data and document reviews, and conducted interviews with two building owners, three contractors, two program staff, and one Northwest utility who did a PfP pilot. Interviews were done at two points in time for a subset of the people that were just listed. For some program staff, and the contractor and building owner involved in the pilot, interviews were conducted after the contracting phase was complete, and then again after the first savings analysis report was completed.

Findings: One of the two contractors and both building owners believe that Energy Trust should continue to offer PfP. The second contractor had issues with the contracting process, which reduced their willingness to participate in the future. The first year savings were 140 percent of the expected savings, and saved 16 percent of the total kWh used at the building. This was an electric-only building, and the types of measures done were economizer tuning, changing settings, adding variable frequency drives, etc. So, this involved a mix of controls, changing settings, and tuning equipment – a mix of O&M and capital measures.

The owner was satisfied that they were able to bill project-related costs to tenants – something that can stop owners from participating. Energy Trust was satisfied with the energy savings reporting due to its simplicity and transparency.

Energy Trust is planning to have PfP as a service offering that is implemented by pre-qualified service providers and will remove capital measures from PfP. Customers can still install measures and receive incentives from Energy Trust, just not through PfP.

Ken asked about the decision to remove capital measures from PfP. Oliver responded that the program already offers incentives for capital measures. The main driver was measure life, and the differences in measure life between O&M and capital measures – it gets in the way of negotiations based on levelized cost. Ken noted that problems can arise, since you’re measuring the total effect, and if you’re subtracting out the deemed or modeled value for capital measures (which are often overestimated), when you remove those savings from the total savings, it makes the O&M measures less cost-effective. Oliver responded that the program is targeting customers who are not making major capital improvements, and if they are or have, we can pull that out, and through PfP, optimize the savings on the capital projects and pay more. Phil noted that the pilot project did have a capital measure installed in the baseline – it was noted by the contractor, who accepted the estimated savings at 100 percent of the deemed value and backed those out. There was also a lighting project done inadvertently (those savings were also removed), and yet the pilot project still had very high savings.

Phil commented that the contractors doing PfP projects need to be sophisticated and know how to deal with both capital and O&M projects. Sam noted that if a participant did not want to pursue an incentive for a capital project, they could just have the savings measured as part of PfP and collect the incentives associated with PfP savings as opposed to the incentive for the capital project. As long as folks aren't double-dipping, that is OK. Phil noted that as part of PfP, Energy Trust will pay the customer for the agreed-upon savings for three years. Contractors will have a separate contract with the customer.

Recommendations: The evaluator recommended expanding the potential building market by reducing savings goals (e.g., to 5-10 percent instead of 10-15 percent) and including other building types. They also recommended reducing the reporting frequency from monthly to quarterly; in later years, this could be further reduced to being done on an annual basis. If an RFP is used in the future, the evaluator recommends making the RFP and contracting language more transparent, and using layman's terms where possible. In addition, the evaluator recommends cross-marketing the incentive program for capital measures through PfP, and involving the PMC for project and savings review, and customer communications.

Energy Trust Take: PfP fills an important niche for in-depth, multi-year O&M results. The pilot project was cost-effective and the business model worked for the service provider. PfP uptake may be limited by the number of qualified contractors that can implement standalone O&M projects or combine capital projects with PfP measures. With contractor pre-qualification and the removal of capital measures, communicating PfP goals and expectations should lead to a better understanding of PfP by contractors and owners.

Alan asked how PfP and strategic energy management (SEM) are related. Oliver responded that SEM is comprehensive, often targeted at campuses, and aims to change the way a customer does operations at a site. This is geared towards single buildings, although it involves the same concepts. Phil added that SEM is more internal to customers; PfP may be more geared to contractors, who notice buildings and work with the customer to go in and make changes. Oliver noted that there are similar savings, but SEM is more expensive and focused on changing the way the customer does business, whereas PfP involves contractors holding customers' hands and making changes for them. Sam noted that in the future, the PMC will help with recruitment, and should be able to see if customers are a better fit for SEM (i.e., they have the capacity to participate in SEM), PfP, or retro-commissioning.

### **3. 2012 New Buildings Impact Evaluation Follow-Up**

Presented by Sarah Castor

Ken commented that it would be nice to note up front that this is a commercial program. This isn't made clear in the report.

Background: This is an evaluation we discussed a little over a year ago at the January 2015 evaluation committee meeting. At that time, we were still waiting for two sites to be visited. We discussed at length one data center that had a low realization rate due to incomplete loading. At that meeting, we discussed what to do about that project, which was the only data center project in the sample. The program estimates savings based on the average load over the first three years of operation and claims half of that, which is very conservative. At the time of the evaluation, the site had only been operating for two years, and we were undecided on how to move forward.

**Final Results:** Cadmus, the evaluator, completed the remaining site visits and the report was finalized in April 2015. A hospital project (one of the two sites referenced earlier) had a large chiller that was not operating because the space was not yet fully occupied. This was the largest gas saving project in the sample, and had a large, negative effect on the gas realization rate. Staff concluded that the data center and hospital were evaluated too early, and both sites needed more time to allow the facilities to load.

Alan commented that this was a big deal and this was even discussed at the full board meeting. Alan asked the two outside experts to weigh in on whether this approach is valid.

Ken commented that you certainly want data centers and hospitals in your program, but you might want to treat them separately, and measure them over time. They have this loading problem, and you don't want to throw them out but if you average them in with the other projects in your sample, then you are really making the rest of the program look bad because of a question of timing. Jennifer agreed; you don't want to include them, but you want to keep an eye on them and try to get the data later on.

Phil commented that there is a question about how long is long enough – when do you zero out the savings?

Sarah continued, noting that the plan is for the data center and large hospital to be re-evaluated in 2016 to get a more accurate estimate of savings. Project-specific realization rates will be applied in true-up. Both of these projects were removed from the 2012 evaluated savings and realization rates (which will be applied to all other projects in true-up and used for budgeting).

The table below shows the final 2012 realization rates. The only changes are to the custom track, and then nothing appears in the data center row because we removed the only data center project. The final 2012 realization rates are 93 percent for electric and 95 percent for gas.

#### New Buildings 2012 realization rates

Program Track	Total Measures	Reported Savings		Evaluated Savings		Realization Rate	
		Electricity (kWh)	Gas (therms)	Electricity (kWh)	Gas (therms)	Electricity Savings	Gas Savings
Standard	1,038	16,182,856	286,180	16,623,669	282,621	103%	99%
Custom	128	7,307,513	89,379	6,587,911	88,726	90%	99%
LEED	7	7,449,816	118,510	5,571,041	96,068	75%	81%
Data Center	0	0	0	0	0	N/A	N/A
Market Solutions	13	26,971	1,804	24,034	1,707	89%	95%
<b>Total Program</b>	<b>1,186</b>	<b>30,967,156</b>	<b>495,873</b>	<b>28,806,655</b>	<b>469,122</b>	<b>93%</b>	<b>95%</b>

**Next Steps:** The next steps are to contract with an evaluation firm to revisit these sites, apply the realization rates in true-up and budgeting for 2016, and implement a new evaluation process for future large/complex projects.

In the future, we will implement a new evaluation process for large and complex projects that is similar to what we do for mega-projects (but for projects that are not technically mega-projects).

This will involve more customer engagement and a longer evaluation timeframe (more like 3-5 years).

Alan commented that the approach seems sound. Susan asked how we decide which projects are large and complex. Sarah commented that we looked at projects over the last several years and saw projects that were very clearly different. These are projects that saved more than 2.4 million kWh and/or over 50,000 therms. Co-location data centers also fit the bill, since they are complex and often large savers. We tried to enumerate guidelines in the draft document that describes this new evaluation process.

Alan commented that if this is applied consistently, it could impact the overall program realization rates in either direction. Sarah responded that it doesn't impact which projects we evaluate since we always try to include the largest-saving projects in program impact evaluations.

Ken commented that luckily in new buildings, if you estimate the savings incorrectly, it's less of a problem than if you are dealing with retrofits, because the load that was to be saved never drew power from the utility system. You didn't save it, but it doesn't increase the need to generate to make up for the lost savings. Phil responded that in some cases, these are large retrofits.

Susan asked if we need to worry about the perception that we are picking and choosing how to evaluate each site. Sarah responded that the process won't change which sites will be evaluated, this is only change the timeline. Phil added that evaluators will develop plans for what data to collect and how to evaluate the projects, just like they do for other large custom projects; these large and complex projects will just be on a separate timeline.

#### **4. Path to Net Zero Impact Evaluation**

Presented by Sarah Castor

Background: The New Buildings program launched the Path to Net Zero (PTNZ) pilot in 2009. The pilot had a goal of helping buildings achieve at least 50 percent energy savings beyond the 2007 code through energy efficiency, and 60 percent through energy efficiency and solar. The pilot offered participants early design assistance and technical assistance (which have since become staple offerings for the New Buildings program), as well as installation and commissioning incentives. There were requirements for monitoring and reporting (M&R) to monitor energy use and fine-tune the operations of the site. Eight projects were completed by the end of 2014. A process evaluation was completed in 2012, which occurred during the construction and completion of these projects, and the impact evaluation began after the projects were finished and occupied, in April 2015.

Evaluation Objectives: The objectives of the evaluation were to measure actual savings and compare them to the estimated savings. In particular, the evaluation sought to answer these questions: how well did program predict savings for each project, and how well did the PTNZ pilot meet its goals for percent savings over code? Another objective was to obtain feedback to help the program and future offerings for the highest-performing buildings.

There were eight projects completed under the pilot. Two sites were not included in the evaluation. One is a very small project that was grandfathered into the pilot, and the other has known HVAC equipment issues and is not fully occupied. For these reasons, these two sites



were dropped from the sample. The remaining six sites are a mix of education, office, and multifamily buildings. The sites varied in terms of size and in terms of the level of estimated savings. Most of the savings are coming from HVAC and lighting.

The evaluator, SBW, reviewed baseline models and developed measurement and verification strategies for each site, which structured the onsite data collection and interviews with site personnel. In addition to interviews, the evaluator obtained data from active M&R systems and other control systems. The evaluator then conducted impact analysis, which involved calibrating whole building energy models based on utility and weather data, and occupancy characteristics gathered onsite.

Findings: Data issues emerged as an area of focus in the report. Of all the evaluated sites, five of them were experiencing issues with their M&R system (gaps in data, not enough historical data stored, or submeter issues) and one site's M&R system was inactive. Sites with better data had better savings realization, but this isn't causal, since data in and of itself doesn't cause a building to operate well – it's the people in the building who gather and use the data. In addition, data isn't the only way sites manage their energy use – some sites reported frequent walk-throughs, etc.

Some sites included innovative designs and newer technologies; the evaluator noted they require experienced maintenance and controls contractors to achieve and maintain the savings. The report gives an example of a building with new owners who did not understand the control systems, and left the boiler running when it was not needed. Some buildings are still experimenting with ways to further optimize energy savings.

The evaluator noted that one facility had a design that made it difficult to access systems for maintenance; the evaluator emphasized that it is important to be able to access key building systems.

One major renovation project had to work with pre-existing systems and equipment, specifically, a large HVAC system that was not replaced as part of the project. The boiler is oversized, and required time and effort to make it run well for the new building design. Although this presents a limit on overall efficiency, the site was able to manage its way through this issue.

Electric and renewable measures are performing well; we saw more variability in gas measures. The evaluator noted that gas usage was often underestimated in both baseline and efficient models, however, the number of sites with gas savings was small, so it is hard to say much more. That being said, we have seen in other New Buildings evaluations that the models don't do as good of a job at estimating gas use compared to electric use. The evaluator noted that the energy model quality was very high for projects, and they felt that the high level of program technical review was a major reason for the quality of the models. The table below shows realization rates for electric, gas and renewables.

Realization rates by site

Project Site	Realization Rate			Overall
	Electric Savings	Gas Savings	Renewable Generation	
1*	68%	70%	-	70%
2	107%	55%	86%	77%
3	86%	-	111%	97%
4†	118%	122%	163%	119%
5	107%	-	100%	103%
6	98%	116%	95%	104%
7††	-	-	-	-
8††	-	-	-	-
<b>Sites Overall</b>	<b>105%</b>	<b>65%</b>	<b>113%</b>	<b>85%</b>

\* Site 1 did not have renewables installed.

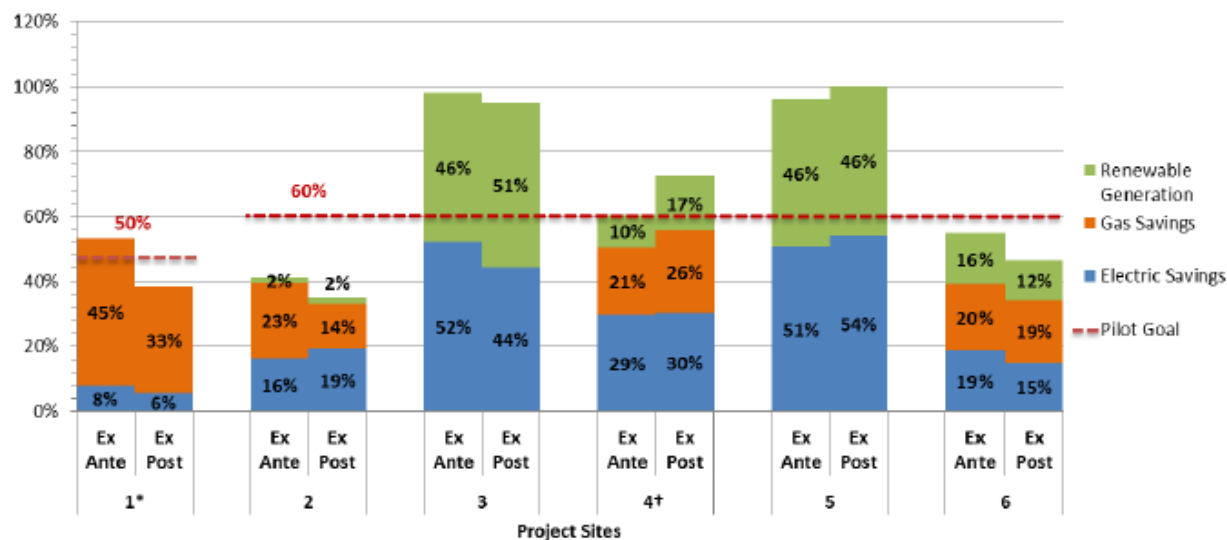
† Site did not receive incentives for renewables, but claimed generation toward PTNZ savings goal.

†† Site not included in evaluation.

Overall, the electric realization rate is 105 percent, the gas realization rate is 65 percent, and renewables is 113 percent; overall (if these three categories are combined into BTUs) this equates to a realization rate of 85 percent.

The graph below shows percent savings over code by site.

Percent savings over code by site



For the one project with zero renewables, the goal was 50 percent savings above code; for the other projects, the goal was 60 percent savings above code. Two projects (3 and 5) are virtually net zero.

Ken asked if Energy Trust has a definition of net zero energy and if the pilot is called Path to Net Zero because the goal is to drive efficiency until somebody decides on a definition of net zero energy?

Jessica responded that the program is keeping the “path to” language and not defining “zero” for now. Ken commented that it makes sense, since if you define net zero ahead of time, it restricts what you can do. Jessica noted that the goals are relative to code, so as the baseline inches up, the percent beyond code doesn’t shift much. It is constantly evolving and getting more challenging, but at the same time, standard practice is shifting, enabling savings from code.

Conclusions and Recommendations: Data allows building owners to quickly detect rises in energy, identify the causes, and ensure that applied solutions are working. There were issues with data at each of the evaluated sites. The evaluator’s recommendations are to review and improve M&R methods, encourage participants to keep M&R systems active and regularly check historical trend system data, and consider extending M&R and submetering to gas measures (the pilot only included electric measures).

The evaluation re-enforced that high performing buildings can be complex to operate, and require skill and persistence on the part of building maintenance staff. The evaluator’s recommendations were to support advanced system trainings for staff, encourage periodic walkthroughs and collaboration with tenants and controls contractors to ensure optimal operation, and encourage designs that allow access to key systems.

Current PTNZ Offering: The current PTNZ offering is aligned with the Architecture 2030 challenge, targeting an energy use intensity roughly 40 percent better than 2010 code through efficiency, renewables, and/or solar ready. There are a variety of optional incentives: early design and technical assistance, solar ready assistance, installation incentives, and performance and post-occupancy incentives (functional testing; M&R, dashboards, or other energy management information systems; recalibrating building models to learn how to save energy; and pursuing net zero certification with incentives). Jessica commented that the pilot targeted several key points of influence throughout the project lifecycle of early planning through occupancy. As part of the revised and relaunched PTNZ offering, the program is maintaining what it found to be successful within each of the major targeted points of influence. It is also deploying different strategies and tactics to different projects, so that if a project is simple, the program applies simple and streamlined strategies and tactics, whereas more complex projects might have more strategies, tactics, and resources deployed. Alan asked if this offering includes extensive remodels. Jessica responded that major renovations are eligible for the offer – in fact, a fair amount of major renovations are considering net zero because when they remove all of the systems and envelope, it’s a good opportunity to modernize the building. Sarah asked how many projects are currently enrolled. Jessica responded that 30 projects are enrolled to date, and several are now complete. The 30 projects represent a mix of public and private, and include a wide mix of design strategies.

Energy Trust Take: The New Buildings program’s technical review is robust, and is key to good savings realization. The quality of modeling was high, with few errors. Three of the six evaluated projects achieved more than 50 percent savings over code, which is significant. Realization rates were lower for gas measures, which is something to watch for in the current PTNZ offering.

Alan asked whether the absence of data plays a role. Sarah responded that data is important, but a building also has to have people who know what to do with that data. Jessica added that staff need to translate data into useful information; this is a gap, and the program can be a resource to customers in this regard, especially as the program gains more exposure to the many systems in the market.

## 5. Small Business Energy Savings Process Evaluation

Presented by Sarah Castor

Background: Small Business Energy Savings (SBES) offers direct-install lighting and controls to small businesses. It has been offered since late 2014, and targets areas outside of the Portland Metro area. The firm SmartWatt, a subcontractor to the Existing Buildings PMC, ICF, conducts audits to identify lighting and non-lighting opportunities, and contracts with lighting installers to install the equipment. Incentives cover a significant portion of the cost, and financing is offered to cover the participant portion of the cost.

Alan asked why this offering is limited to commercial. Oliver responded that this is a commercial offering developed by the Existing Buildings PMC.

There were 361 projects in 2015, which saved 4.3 million kWh. This is very small compared to savings obtained by other Existing Buildings lightings projects, which was about 62 million kWh in 2015. However, this initiative is reaching a group of businesses that are historically harder to reach.

Evaluation Objectives: PWP was the evaluation contractor, and started this process evaluation in September 2015. The objectives were to obtain feedback on the current program design, assess marketing and outreach strategies, analyze the types of participating businesses, determine whether participants are completing additional measures after participating in SBES, and measure participant satisfaction.

Evaluation Tasks: PWP reviewed documents and data, and performed interviews with program staff, utility staff, installation contractors, participants, and non-participants (defined as those business that completed an audit, but did not ultimately install measures).

Findings: In 2015, there were 606 audits completed, and 361 resulting projects. The initiative met its savings goals for 2015. The average project incentive was about \$5,000. The most common business types participating in SBES were office, retail, and auto repair/service. Savings came primarily from T8s and LEDs.

Program staff and utility staff reported that the initiative is working smoothly; utilities are providing leads to SmartWatt, and helping to identify zip codes for targeting.

Invoicing has changed to better reflect the cost of measures, not SmartWatt overhead. Formerly, the program advertised “up to 80 percent” covered by incentives; now it is more like “up to 60 percent.” The net cost to the customer is the same, there’s just been a change in the way invoicing is being done. Mike commented that in 2016, another change was made that may not have been covered in the evaluation report: the costs would only cover the ballasts and lighting for standard fixtures. This change was made after the program saw specialty measures such as explosion-proof fixtures coming through; covering these types of costs were making the initiative come close to not being cost-effective. In 2016, Energy Trust will pay for regular fixtures, ballasts and lights; if there are special business requirements for specialty fixtures, the customer pays the increased cost.

Oliver noted that the utilities are providing leads, and some of the time, SmartWatt is receiving customer referrals from the utilities that are slightly larger than the size intended for the offer. SmartWatt does ask customers if they are working with trade allies; if the customer has not

been approached by a trade ally and there is a need for what can be provided by SmartWatt, SmartWatt will serve those larger customers.

Sarah continued, noting that interviews were completed with 36 participants who installed measures. 55 percent had previously talked to a contractor, which was higher than what the program anticipated. Half of those talked with a contractor within the last year. As noted previously, SmartWatt checks to make sure customers are not currently working with another contractor during the sales process to determine if they proceed. When asked customers why they did not act before, cost and lack of priority for the improvement were the most common reasons. PWP noted that the businesses who had previously talked with a contractor were larger projects (of a size that would be attractive to a traditional lighting trade ally).

About a third of customers are taking the financing offer. Sixteen of the 36 interviewed participants have noticed energy savings on their bills; some participants felt the savings were less than expected or reported that they had seen an increase in their electricity usage. Customers may not be aware of the seasonality of lighting use and savings. Few respondents recalled non-lighting opportunities being called out by SmartWatt. Jeff commented that when SmartWatt conducts the audit, they are instructed to look for highly visible opportunities as well, and make recommendations. They provide the program's standard incentive brochure to customers.

Sarah continued, noting that 62 percent of participants said they are more likely to do future measures. PWP noted that respondents needed a lot of follow-up with the program; they had questions or issues with their project, or questions about additional things they could do. Out of 36 participants interviewed, seven or eight were referred back to ICF by PWP. Half of respondents were aware that the incentives were from Energy Trust. Respondents were asked about their satisfaction with a number of elements; 92 percent were satisfied overall.

PWP interviewed five PGE and five Pacific Power customers who received an audit but did not install measures. Three had previously discussed a lighting project for which the costs were too high to proceed. Three said "cost" was a reason for not doing an SBES project. Three said they still might do the project, two mentioned that their building was for sale (not a good time) and there were a few "other" responses. Nine of 10 were satisfied with the audit.

There have only been two installers for SBES. One of them started when this initiative began in 2014, and has completed the majority of SBES projects. The contractor has two full-time crews working on SBES projects, and is very satisfied with the working relationship with SmartWatt. The other installer initially complained to the program because one of their customers did a project through SBES rather than a project they pitched, so in response they became an installer. This arrangement did not work out for the company – they did some projects, but are not continuing to do installations, and did not want to be interviewed for the evaluation.

Conclusions and Recommendations: SBES is working well and meeting savings goals. It is a good way to reach small customers not served by the existing trade ally network. The evaluator noted it may make sense to allow buildings with a small amount of industrial use to participate in SBES, and that utility outreach efforts seem effective and should continue.

The evaluator also noted that there is potential for conflicts with trade allies based on the fact that the initiative is reaching customers who have previously discussed lighting projects with trade allies. The evaluator recommended that the program make more explicit criteria for SBES eligibility to avoid overlap; however, it's not clear how much further the program can go in that

area. Alan commented that on the one hand, you want to avoid overlap, but on the other hand, you want to avoid having customers fall through the cracks. Oliver noted that there will always be some overlap.

Sarah continued, noting that the evaluator felt that customers were not aware of the seasonal nature of lighting use and savings, and recommended a leave-behind to explain this, and encourage non-lighting projects. In it, the program could also include some program contact information for follow-ups, and the program might consider making follow-up calls or e-mails to future participants to see if the customer has questions or interest in other energy efficiency opportunities.

Next Steps: The Existing Buildings program will continue to offer SBES and coordinate with utilities to target outlying areas. In February 2016, the program held a training for utilities on lighting offerings and how to sort the right customers to SBES. The Program is performing post-install verification visits, which represent an opportunity to address customer needs and concerns. SmartWatt is collecting information about where customers heard about SBES and will be able to provide that back to the utilities so they can assess the effectiveness of their outreach and lead generation activities. The program is also exploring the potential to include information about the seasonality of savings in the proposal materials.

Jeff commented that SBES has gotten a lot of interest. There have been some issues with trade allies that the program is sensitive to, but this happens with most direct-install or midstream programs. Alan asked about how SBES serves Portland Metro. Jeff responded that SmartWatt does not serve Portland Metro; the concept was to serve small and rural customers that don't have access to many trade allies. We are going zip code by zip code, working in cooperation with PGE and Pacific Power. Ken commented that it would be useful to see a map showing the geographic dispersion of SBES projects. Karla provided a map that was viewed by the meeting attendees; so far projects have been completed mostly in the Albany/Corvallis area and areas surrounding Salem.

Mike commented that this is a really important offering for the utilities. When Planning staff were looking at the measure last year, the utilities really wanted to see the measure continue to be offered. Mike asked if the evaluation looked at who pays (the tenants or the building owners), and how many of the participants were leasing versus occupying a building they own. And were there any issues between tenants and landlords? Jeff responded that there are sometimes issues. The key question for tenants is, how long is my lease and how soon does it pay back? Steve asked about respondent feedback on the loan and associated qualification process. Jeff responded that there is no prequalification process for the financing package. SmartWatt offers 100 percent financing for up to 12 months at no interest to all customers. To date, there have not been any defaults.

Spencer commented that this initiative is an attempt to balance reaching an underserved customer group and working with trade allies that have brought in high quantities of lighting savings since the program began in 2002. Some trade allies see this as direct competition to their businesses; we need to continue to address these concerns as they come in. Right now, our perspective is this strikes a good balance in reaching customers we have not previously reached, and continuing to work with trade allies, who are a much larger sales force, on other lighting projects.

## Wrap-Up & Next Steps

Phil asked if the amount of reading for the evaluation committee is too much for committee members, and if there is anything that evaluation staff can do, such as bringing fewer evaluations to the committee, emphasizing review of the executive summaries instead of the full reports, etc.

Alan commented that it's important to him to review evaluations for the key programs, for pilots, and any controversial studies. Not everything needs to be reviewed by the evaluation committee.

Ken commented that reviewing the executive summary is useful, but not all reports have them. Phil responded that yes, sometimes we don't have an executive summary at the draft stage, but we can ensure that this is included moving forward.

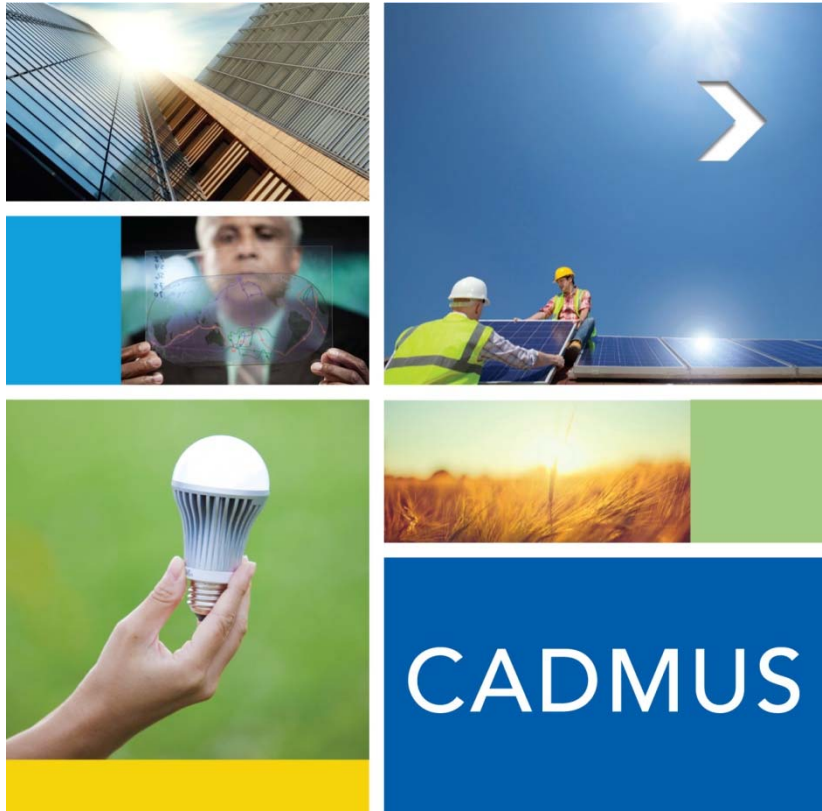
Susan commented that it is a lot of reading. She is mostly listening to the presentations and verifying that the logic makes sense.

Ken noted that over the years, the executive summaries have become better, more neutral, and candid, and the presentations are more complete.

Jennifer also noted that there is a lot of reading, and commented that having the reports earlier would be useful.

In terms of scheduling the next meeting, the evaluation team is free July 12th and 15th, as well as the last two weeks in August. Erika will send out a Doodle poll to see what works for the committee members.

Phil also mentioned that an upcoming meeting may involve one or two evaluations for which we will have a "closed session" – that is, the only folks who will be permitted to attend and who will receive the materials are those who have signed Energy Trust's non-disclosure agreement. [Energy Trust's board-adopted Participant Information Policy limits the public disclosure of certain customer-specific information. Because staff plans to present one or two evaluations which contain customer-specific information at an upcoming meeting, portions of the meeting will be conducted in closed session, limited to folks who are able and have signed Energy Trust's required non-disclosure agreements for review of such information.]



# 2012 New Buildings Program Impact Evaluation

April 26, 2015

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# MEMO



**Date:** May 12, 2016  
**To:** Board of Directors  
**From:** Jessica Rose Iplikci, Business Sector Manager, New Buildings Program  
Sarah Castor, Evaluation Sr. Project Manager  
**Subject:** Staff Response to the 2012 New Buildings Program Impact Evaluation

## Summary

Evaluation results for the New Buildings program were consistently strong for program years 2009 through 2011, with realization rates ranging from 93% to 97% for electric savings and 92% to 98% for gas. The overall program 2012 realization rates, excluding premature results from a few large projects in the report, are consistent with earlier years at 93% for electric savings and 95% for gas. New commercial buildings and major renovation projects can take several years after completion to become fully occupied or for systems to be fully loaded. Energy Trust finds a two year delay between project completion and evaluation to be sufficient in most cases, but based on the evaluator's report, staff found that three projects in the Custom and Data Center tracks were evaluated too early. These projects will be examined further through individual project evaluation plans, separate from this overall program evaluation.

- The 2012 evaluation found realization rates for Standard Track measures were very good, as we have seen in previous evaluations.
- The 2012 evaluation was our first opportunity to see the performance of the first two projects to complete through the new Market Solutions track – a track that represents six different packages specific to building type. Program staff expect the full range of Market Solutions building types to be available for the 2014 evaluation. An evaluator was retained to complete a technical review of the pre-modeled savings packages in late 2013, as a program QC step, and the evaluator found no issues with estimated savings.
- As noted previously and in the report, several large projects are loading their facilities. One data center project site was not fully loaded, as data centers typically take three years to ramp-up. A large hospital was not able to use a custom heat recovery chiller because it was not yet sufficiently occupied, and may connect additional load to the new energy-efficient plant, a common plan. The program has cause to believe that these sites will fully load. To accurately evaluate and reflect long-term project savings, sites are planned for upcoming re-evaluation. To account for this, we are removing these two sites (consisting of three projects) from the evaluation factors and will be applying the project-specific realization rates from a separate follow-up evaluation, expected in 2016.

Excluding premature results from a few large projects provides a much clearer picture of the program's performance across the normal range of projects. The following rates will be applied.

Program Track	Total Measures	Reported Savings		Evaluated Savings		Realization Rate	
		Electricity (kWh)	Gas (therms)	Electricity (kWh)	Gas (therms)	Electricity Savings	Gas Savings
Standard	1,038	16,182,856	286,180	16,623,669	282,621	103%	99%
Custom	128	7,307,513	89,379	6,587,911	88,726	90%	99%
LEED	7	7,449,816	118,510	5,571,041	96,068	75%	81%
Data Center	0	0	0	0	0	N/A	N/A
Market Solutions	13	26,971	1,804	24,034	1,707	89%	95%
<b>Total Program</b>	<b>1,186</b>	<b>30,967,156</b>	<b>495,873</b>	<b>28,806,655</b>	<b>469,122</b>	<b>93%</b>	<b>95%</b>

Finally, staff observed several instances where the evaluator, who also performed the evaluations for the 2008-2011 program years, did not adequately take into consideration staff responses made to previous evaluations. In the 2011 Impact Evaluation staff response, program staff detailed adjustments made to program procedures, analysis and documentation (i.e., obtain energy simulation models during the program year, maintain consistent documentation on modeling files, and encourage participants to enable energy management system trends). We found several opinions represented by the evaluator be inaccurate, as noted below, or in conflict with other statements made in the report. A central issue with the report is with lack of documentation and detailed technical analysis provided by evaluators to evidence claims made and adjustments to modeled savings, a significant portion of the program's overall impact.

With the objective of gaining insights needed to improve savings performance, staff requested, and evaluators provided, calibrated building energy modeling files. The program has plans to review calibrated models and understand where improvements may be made.

As a result of experiences in this evaluation, staff conclusions and recommendations for future evaluations are:

- Future evaluations need to clearly document all adjustments evaluators made to building energy simulation models that conclude final evaluated savings, including adjustments in baseline, HVAC schedule, occupancy and load, and provide the basis for these adjustments.
- Timely reporting with the appropriate level of detail are also needed in order for program staff to implement timely process improvements or adjust technical review process.
- Energy Trust has developed and will apply new guidelines for the evaluation of large/complex projects. These guidelines detail the timing of evaluations and set communication protocols for involving customers in evaluation. The guidelines will be

used with large or complex projects beginning in 2016 and staff expect to see improvements with evaluation efforts.

- Staff are confident in the program's technical reviews, processes, procedures and guidelines used to review each and every project. It's our conclusion that many improvements have already been made and no further adjustments to the program to improve savings estimation need to be made at this time. Looking ahead, we expect evaluation reports to provide details needed to make adjustments and refine a mature program.

**Detailed response to selected evaluation recommendations:**

As noted above, the evaluator made several recommendations that were also made in the 2011 program year evaluation and staff have already appropriately addressed them. The new recommendations from the 2012 program year report are listed below, along with the staff response that focuses on our technical procedures used in the context of a new construction program.

*(1) Consider a ramp-up period for savings.*

Aligning evaluation to program procedures for estimating savings and customer plans to load their facilities is part of the planned large/complex project evaluation.

The New Buildings program works with data center projects in the early stages to influence design decisions and equipment selection. When working with data centers, the program bases savings estimates on the assumed IT load over the first three years of operation. Our current estimates take the average load over these first years to estimate the project's energy savings, and assumes that the peak load will not exceed 50% of the design capacity, unless the project team can demonstrate a higher percentage (i.e. by showing loading at a comparable data center). These estimates are revisited at the time of the installation payment to capture the most up-to-date information and loading plans.

*(2) Consider commissioning completion as a program requirement.*

Commissioning is a program offering and can be a very extensive and costly endeavor. Unless there is a clear savings benefit to the customer and savings can be documented for program purposes, which hasn't been made clear in the evaluation report, commissioning would increase the cost of participating in our program.

The way the program has structured the commissioning offering to make it approachable, worthwhile and least-costly for participants is to encourage what's called a "functional test" on equipment and systems where operations are variable; because this is a new construction program, outreach managers engage owners about benefits of "design commissioning", a high-value point of intervention for owners, and focus on what is commonly known as "owner's project requirements" with the objective of supporting building owners in pursuing the level of commissioning they see as appropriate for their project. We expect to see more fully commissioned projects enter the program and more

small commercial projects conduct the functional test. Commissioning is best practice when done at the right level and scope for the project, and will not be a requirement to work with the program.

(3) *Develop lower limits for area on Market Solutions projects.*

This recommendation is based on only a single case. Market Solutions requirements have lower and upper limits on project square footage and receive site visits according to the program's quality control plan. In a prior contract, evaluators determined that the program's pre-modeled energy savings estimates and assumptions were reasonable. The program has no concerns with the estimated savings or project implementation on a forward basis.

(4) *Improve feedback mechanism between implementer audit findings and reported savings.*

The evaluator cites only two instances out of 42 projects where a program site-verification finding was not reflected in final savings or incentive payments. Program staff feel that these cases are anomalies and that program procedures are currently sufficiently robust to prevent such occurrences from happening in the future.

(5) *Engage data centers facilities in the evaluation process.*

Staff experienced that the way evaluators engaged the two data centers made getting responses from customers difficult and required many people at the site to engage – resulting in customer service concerns. Through a collaborative engagement effort led by program staff taking the customer's needs into consideration, one data center has since completed a site-specific evaluation, in 2015; the other is able to provide loading information for the planned re-evaluation in 2016.

To summarize, program staff are confident in the program's technical reviews, processes, procedures and guidelines. With the changes we've outlined here for future evaluations, we expect to obtain detailed documentation that will provide a reasonable basis for program adjustments, and in the meantime, program staff will begin to review calibrated models to see where adjustments can be made to custom savings estimates. Revised evaluated savings will be applied and we find consistency in the rates between 2009 and 2012 to be a good indicator of performance.

To: Sarah Castor, Energy Trust of Oregon  
 From: Brad Jones, Cadmus  
 Cc: Jeff Cropp, Jennifer Hockett, Cadmus  
 Subject: 2012 New Building Program – Impact Evaluation  
 Date: 5/9/16

As requested, Cadmus removed the following sites from the 2012 New Buildings Program Impact Evaluation data set:

- Data center
- Large hospital (involving two Custom track projects)

These sites were removed from the program population and the evaluation analysis was run without the sites. The results of the analysis are shown in Table 1 below.

**Table 1. Revised Report Table 1 Sites Removed**

Program Track	Total Measures	Reported Savings		Evaluated Savings		Realization Rate	
		Electricity (kWh)	Gas (therms)	Electricity (kWh)	Gas (therms)	Electricity Savings	Gas Savings
Standard	1,038	16,182,856	286,180	16,623,669	282,621	103%	99%
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LEED	7	7,449,816	118,510	5,571,041	96,068	75%	81%
Data Center	0	0	0	0	0	N/A	N/A
Market Solutions	13	26,971	1,804	24,034	1,707	89%	95%
<b>Total Program</b>	<b>1,186</b>	<b>30,967,156</b>	<b>495,873</b>	<b>28,806,655</b>	<b>469,122</b>	<b>93%</b>	<b>95%</b>

## Executive Summary

Energy Trust of Oregon retained The Cadmus Group, Inc., to complete an impact evaluation of the 2012 New Buildings program, a comprehensive effort to assist owners of newly constructed or substantially renovated commercial and industrial buildings in achieving energy savings through three major tracks: Standard, Custom, and LEED. Additionally, the evaluation effort included projects from the Data Centers and Market Solutions Tracks. These tracks are described as follows:

- The Standard Track supports prescriptive equipment measures, such as lighting, motors, HVAC, and others, through deemed savings.
- The Custom Track provides incentives to owners who reduce a building's energy use below a minimally code-compliant value. Measures usually involve more complex energy savings analysis than do prescriptive measures.
- LEED Track projects receive incentives for achieving energy savings as part of certification by the U.S. Green Building Council.
- Data Centers Track projects receive incentives that are targeted specifically at new construction data center projects.
- Market Solutions Track projects are smaller (less than 70,000 square feet) projects that lend themselves to simple, streamlined measures.

The evaluation did not include projects in the 2012 New Buildings program that were performed under the Path to Net Zero, ENERGY STAR, and Small Commercial Efficiency Pilot (Core Performance Pilot).

A third-party program management contractor, Portland Energy Conservation, Inc. (PECI), implemented the 2012 New Buildings program<sup>1</sup>.

For its study of the 2012 program, Cadmus evaluated projects permitted under both the 2007 Oregon Structural Specialty Code and the 2010 Oregon Energy Efficiency Specialty Code (OEESC).

Specifically, Cadmus evaluated 285 measures that were installed at 42 sampled sites. For the Standard, Custom, and LEED Tracks the sample included 14 of the sites with the largest savings (all with reported electric savings greater than 1,000,000 kWh or gas savings greater than 10,000 therms) and a random sample of 24 smaller sites. For the Data Center and Market Solutions Tracks, Cadmus evaluated three of the four projects performed in 2012. Cadmus originally included a second data center project in the 2012 program in the sample and evaluation process; however, we removed it during the course of the evaluation effort because the program participant stated they did not have staff available at that time to provide the information that was being requested by Cadmus. The site is not included in the analysis, but Energy Trust plans to evaluate it at a later date. As shown in Table 1, the final sample represented 68% of the program's total reported electric savings and 41% of the gas savings.

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<sup>1</sup> PECI was acquired by CLEAResult in 2014. CLEAResult is currently implementing the New Building program.



**Table 1. 2012 Standard, Custom, LEED, Data Center and Market Solutions Tracks**

**Program and Sample Totals\***

Group	Total Projects**	Total Measures***	Reported Savings	
			Electricity (kWh)	Gas (therms)
Program Total	326	1,211	38,118,923	559,077
Sample Total	42	285	25,839,306	227,311
Portion of Total Sampled	12%	23%	68%	41%

\* Does not include the large data center.

\*\*Number of unique project IDs.

\*\*\*Number of unique measure IDs.

Cadmus evaluated the program through site visits and reviews of engineering calculations and building simulation models. During site visits, we validated the proper installation and functioning of equipment for which incentives were provided and recorded operational characteristics data to support our engineering analysis. We evaluated the Standard Track measures primarily using industry-standard algorithms. We analyzed measures installed in the Custom Track through algorithms, detailed calculation spreadsheet reviews, simulation modeling, and/or energy management system (EMS) trend data. Cadmus engineers analyzed the differences between baseline and as-built simulation models for LEED projects. Through this impact evaluation, we identified a variety of factors that affected the overall program realization rate (the ratio of evaluated to reported savings), as shown in Table 2. Savings values listed in the impact evaluation are gross values. Calculation of a net-to-gross ratio fell outside the scope of this evaluation.

**Table 2. Overall 2012 Program Realization Rates and Energy Savings by Measure Category**

Program Track	Total Measures*	Reported Savings		Evaluated Savings		Realization Rate	
		Electricity (kWh)	Gas (therms)	Electricity (kWh)	Gas (therms)	Electricity Savings	Gas Savings
Standard	1,038	16,182,856	286,180	16,623,669	282,621	103%	99%
Custom	140	9,641,714	152,370	8,546,389	86,665	89%	55%
LEED	7	7,449,816	118,510	5,571,041	96,068	75%	81%
Data Center	4	4,817,566	214	1,479,527	44	31%	21%
Market Solutions	13	26,971	1,804	24,034	1,707	89%	95%
<b>Total Program</b>	<b>1,211</b>	<b>38,118,923</b>	<b>559,077</b>	<b>32,244,660</b>	<b>467,105</b>	<b>85%</b>	<b>84%</b>

\*Number of unique measure IDs.

Most measure types in the Standard Track achieved high realization rates. Market Solutions Track measures achieved realization rates of 89% for electric savings and 95% savings for gas, but they accounted for a small portion of the program total savings. The overall program energy savings were primarily reduced by adjustments to Custom, LEED, and Data Center project energy savings. The primary factors that lowered the overall realization rate were as follows:

- Data center loads were observed to be significantly less than the anticipated loads that formed the basis of the energy savings calculations. If the Data Center Track is removed from the analysis, the program electric savings realization rate would be 92%, which is comparable to the 2011 program.
- One measure accounted for a large portion of the gas savings in the sample for the custom category. During the evaluation site visit, the facility staff reported that measure was not able to operate as intended due to a discrepancy between the building loads and equipment sizing. It was non-functional and the facility staff are looking at system modifications in the future to address the issue. This was the largest contributor to the low gas realization rate. Without this measure the custom gas realization rate would have been 83% and the program level realization rate would have been 90%.
- Building simulation models did not always accurately reflect as-built conditions or operating parameters. When the models were updated with observed conditions and calibrated to actual utility data, the evaluated savings were less than reported savings.
- Our verification process showed that some incented equipment only met baseline code efficiency and not the program requirements.
- Evaluated equipment operation sometimes differed from the expected patterns used to develop deemed savings estimates. This was usually either due to differences in as-built energy consumption or different applications than predicted when the deemed savings estimate was developed.
- Observed equipment quantities sometimes differed from reported quantities.

For comparison of the program over time, the evaluation results for the New Buildings program from 2008 through 2012 are presented in Table 3. The number of measures has been holding relatively steady since 2010. Electricity savings increased from 2011 and gas savings decreased. The 2012 electricity and realization rates have decreased from the 2011 program year, and also fell below the five year average.





**Table 3. Evaluated Savings by Program Year 2008-2012**

Program Year	Number of Measures*	Reported Savings		Evaluated Savings		Realization Rate	
		Electricity (kWh)	Gas (therms)	Electricity (kWh)	Gas (therms)	Electricity Savings	Gas Savings
2008	1,073	33,138,094	464,905	28,111,498	420,132	85%	90%
2009	1,071	20,715,091	640,716	20,029,136	608,621	97%	95%
2010	1,245	26,044,322	1,134,551	24,635,698	1,113,291	95%	98%
2011	1,235	24,005,521	788,302	22,284,382	726,100	93%	92%
2012	1,211	38,118,923	559,077	32,244,660	461,890	85%	84%
Five-Year Average						91%	92%

\*Number of unique measure IDs.

Overall, the 2012 program implementer performed a reasonable level of review and quality control to achieve high average project savings realization rates for the Standard Track measures. The measure types with lower evaluated savings represented large, complex measures whose final operating patterns can be difficult to predict, particularly in a new construction application. However, Cadmus did identify several issues with implementer quality control on one custom refrigeration project and one Market Solutions project. We also observed that several of the recommendations made during previous evaluations have been implemented.

Based on the evaluation findings, Cadmus offers the following recommendations for the program:

- **Consider a ramp up period for savings:** New building program participants can have difficult time predicting the timing of energy consumption patterns at a new facility. The sites can potentially have extended move-in periods before the assumed occupancy and load patterns are established. Cadmus recommends that Energy Trust consider including a ramp up period prior to reporting the full expected savings for projects at the data center projects and central plants when savings are dependent on future loads.
- **Consider commissioning completion as a program requirement:** The evaluation sample included several buildings at which the facility team reported that the systems were still being commissioned because the systems were not operating to meet their design intent. Cadmus observed that this resulted in measures that were not functioning optimally or, in some cases, not functioning at all. This resulted in savings being lower than predicted. Cadmus recommends that Energy Trust consider incorporating the commissioning process completion into its official project milestones.
- **Obtain energy simulation models during the program year:** As part of the 2011 program evaluation Cadmus recommended steps to improve the availability of project energy simulation files for use in the evaluation process. We observed an improvement in file availability from previous years, however, this continues to be an area of opportunity for improvement. Cadmus recommends PEI continue to work with project teams to obtain final versions of energy simulation model files during the program year.

- **Maintain consistent documentation on simulation files:** Cadmus found the project documentation for projects that performed analysis using energy simulation software was inconsistent from one project to the next, which made it difficult to determine the appropriate savings and relevant material to support energy savings. The basis for the final incentive, supporting documentation, final incentive amount, and simulation models should be categorized consistently, and clearly labeled, across all projects. Cadmus also recommends the implementer list any changes made to the simulation models and document the reasons for those changes.
- **Ensure energy simulation models match approved savings:** Specifically for projects utilizing the LEED track, many project files included simulation models that did not match LEED Energy and Atmosphere Credit 1 (EAc1) forms or the final approved building performance. The models should be clearly labeled with the exact information they support. We recommend the implementer verify that the models match the energy consumption output on a gross savings level at the time they are submitted. Final model files should be provided that reflect any revisions to the LEED EAc1 documentation that are made during the final LEED review process. A narrative listing the model files would also be helpful to all parties. One way to ensure accuracy in the models is to request simulation output reports (BEPS, BEPU, ESD) in PDF format, along with corresponding final models with consistent naming convention such that the output reports can be tracked to the corresponding modeling file. Further, verifying that the values reported in simulation output reports are identical to the values reported in the program calculator will significantly reduce the time it takes to track the accurate model.
- **Encourage participants to enable energy management system trends:** Cadmus has found that, in general, new construction facilities have energy management systems. In most cases the sites evaluated for this program year had enabled trend tracking on major equipment and controls systems. Such data were critical to our evaluation effort and can also provide important information for the participants about how their facilities are operating. In a couple of cases, trending was not enabled, although the participant was willing to enable trending at our request. The resulting data were limited but sufficient to make necessary adjustments to simulation models or calculation spreadsheets. We believe it would be helpful for participants and future evaluation efforts for the program to continue encouraging participants to enable EMS trends during the commissioning process.
- **Develop lower limits for area on Market Solutions projects:** Cadmus found one (of two) Market Solutions projects we evaluated was likely not appropriate for the program, based on area and space type. The reported area was 1,618 square feet, compared with the deemed savings model average of 20,000 square feet. The relatively small area resulted in much smaller HVAC consumption (and therefore savings) than estimated from the deemed savings simulation models. Instead of an office, the location was a restaurant event space with a small office in a separate room. We recommend the implementer consider setting a lower limit for Market Solutions project area. In this case, a lower limit of 5,000 square feet may be appropriate for offices to ensure closer agreement with deemed savings estimates.



- **Improve feedback mechanism between implementer audit findings and reported savings:** During verification site visits, Cadmus found several projects with significant discrepancies from reported values, or other issues with equipment performance. In two of those cases, the program documentation showed the implementer had conducted their own post-installation site visit. On one custom refrigeration project, the implementer’s notes show their staff identified a discrepancy between reported and verified values, but this discrepancy was not resolved for the reported savings or incentive provided to the participant. In another case, during a site visit, the implementer’s staff should have noted that a Market Solutions project was a restaurant event space instead of an office, a heat pump water heater was installed in a conditioned space, and this water heater was likely over-sized for the required load (a hand sink). These on-site observations were not reflected in the final savings or incentive payments for the project. We recommend the implementer examine their mechanism for translating post-installation audit findings into revisions to the reported savings and incentive values.
- **Engage data center facilities in the evaluation process:** The original sample for the 2011 and 2012 program years included a large portion of savings that were associated with data centers. In both program years, the largest of the data centers was eventually removed from the evaluation sample. Data centers are secure facilities and many owners are reluctant to share data center performance data. Additionally, the sites are high profile projects that receive scrutiny from Energy Trust at a variety of levels, so the program participants can experience evaluation “fatigue” when they are approached multiple times with data requests. Although this is a legitimate concern, when the data center sites represent such a large portion of the program savings, it is important to include them in the evaluation process. It is anticipated that the data center market will continue to grow along with energy efficiency potential. The lessons learned from the current projects can help to shape future programs. Cadmus recommends that the implementer start informing the data center program participants about the evaluation activities, data needs and timelines early in the project delivery process to allow them to prepare to support the evaluation process.



ENERGY + WATER + EFFICIENCY



EVERGREEN  
ECONOMICS

# **Energy Trust of Oregon New Homes Air Sealing Pilot II Evaluation Report**

Submitted by Evergreen Economics and  
SBW Consulting, Inc.

Final Report – April 21, 2016

## Executive Summary

In 2014 and 2015 the New Homes program implemented an air sealing pilot to assess the impacts of two different air sealing strategies in new homes: whole home air sealing and attic “blackout.” The whole home treatment used a latex sealant to seal each individual wall cavity, the top plate and the baseplate, prior to insulation and drywall. Two different latex sealant products were tested. The attic blackout treatment used spray foam to seal all attic penetrations prior to attic insulation. The two treatments were applied to homes sequentially and the impacts of each on air infiltration were measured using repeated blower door tests. The latex whole home air sealing was applied to 37 treatment homes, and was omitted for 39 control homes, for a total of 76 pilot homes. The attic blackout was applied to all pilot homes because a control group was not required. All of the homes were constructed by DR Horton in a single subdivision, used a single insulation contractor to install the air sealing measures, and were all very similar in design. They were narrow, three-story homes, ranging from 1,400-2,300 square feet with a first floor garage. All pilot homes were enrolled in Energy Trust’s New Homes program and received an Energy Performance Score. Energy Trust contracted with Evergreen Economics and SBW Consulting to provide key findings from the pilot and evaluate the energy savings associated with the air sealing measures.

The insulation contractor encountered major application problems with both latex sealant products, including the consistency of the material, keeping the applicator machines running properly, and extra time required to clean machines during and after use. The labor and material costs for applying the latex sealants were estimated to be \$1,250 to \$1750 per home. The attic blackout treatment had almost no problems with installation. Crews intermittently turned off their headlamps to observe any light from below, which proved to be a practical and accurate test for sealing all penetrations. The process took approximately 0.5 to 1 man-hours to complete. The labor and material costs for the attic blackout were estimated to be \$250 to \$350 per home.

The blower door test results revealed that the whole home treatment had no effect on air leakage. The tests had an average of 2.98 air changes per hour at 50 pascals (ACH50) in the control group, and 3.05 ACH50 in the treatment group, essentially indistinguishable. Thus, there was no evidence of energy savings due to the whole home treatment. The attic blackout treatment showed an average reduction in air infiltration from of 0.99 ACH50, from 4.70 to 3.71. Additional work, including attic insulation, reduced the final air infiltration to an average of 3.0 ACH50.

Natural gas savings were estimated using the building energy simulation program, BEopt, which uses the EnergyPlus simulation engine. Seven prototype homes were developed to represent the range of new construction home types in Oregon. All

prototype homes included an unheated garage, and were heated with a condensing gas furnace, consistent with the characteristics of the pilot homes. Envelope parameters were set to be consistent with 2014 Oregon Energy Code and weather data from Portland International Airport was used. Simulation results for each prototype home are shown in the table below. Average annual savings are 0.54 therms per 100 square foot, or 12 therms for the average home, about 4% of heating energy use. Savings for the prototype which most closely resembled the pilot homes (3-story, 2,000 sf) were slightly greater than the average – 15 therms.

<b>Prototype</b>	<b>Annual heating usage @ 5 ACH50 (therms)</b>	<b>Annual heating usage @ 4 ACH50 (therms)</b>	<b>Savings (therms)</b>	<b>Savings per 100 square feet (therms)</b>	<b>Prototype weighting</b>
3-story 2,000 sf	318	303	15	0.75	21%
3-story 1,275 sf	205	192	13	1.02	7%
Split level 2,500 sf	378	364	14	0.56	15%
2-story 2,400 sf	340	327	13	0.54	21%
1-story 2,000 sf	298	293	5	0.25	21%
1-story 1,400 sf	174	171	3	0.21	10%
3-story 3,100 sf	469	442	27	0.87	5%
<b>Weighted Average</b>	<b>313</b>	<b>301</b>	<b>12</b>	<b>0.54</b>	

Given the results, the evaluation team does not recommend that the New Homes program move forward with the whole home or attic blackout air sealing measures. Neither of the whole home latex sealants produced meaningful air leakage reductions. In addition, the significant application problems indicate that this measure is not yet suitable for widespread market adoption. While the attic blackout produced larger energy savings, the measure is not cost effective with estimated installation costs of \$250 to \$350 per home. Few application challenges were noted, so it is unlikely that installation costs would decrease significantly. Other contractors may be willing to install attic blackout for less than \$250, but in the current environment of low gas prices, this measure is unlikely to be cost effective for Energy Trust.

Going forward, Energy Trust may want to explore exterior air sealing options as a program measure. Builders are showing increasing interest in air sealing by placing rigid foam board over exterior walls and sealing the seams with very durable, self-adhesive air sealing tapes, which can be applied to a wide range of exterior materials. Moving the air barrier to the outside may provide an improved air and weather barrier.

# MEMO

**Date:** May 10, 2016  
**To:** Board of Directors  
**From:** Mark Wyman, Residential Sector Program Manager  
Dan Rubado, Evaluation Project Manager  
**Subject:** Staff Response to the New Homes Air Sealing Pilot II Evaluation

This report summarizes a pilot study conducted by Energy Trust's New Homes program to test two different air sealing strategies during construction. As noted in the report, the whole home latex air sealing products that were tested had a host of technical challenges, were expensive and did not result in measurable reductions in air leakage. As a result, Energy Trust will not be pursuing this measure any further. The attic blackout air sealing strategy appeared to be much more promising because it did not have any significant installation barriers and produced modest but significant reductions in air leakage. However, the energy savings associated with this reduction was relatively low, and is not nearly enough to justify the additional cost of \$250 to \$350 per home. Based on Energy Trust's screening criteria, this measure is not currently cost-effective and is unlikely to be in the near future. As a result, Energy Trust will not be pursuing this measure, although it may be incorporated into the program's Energy Performance Score (EPS) homes, as part of a larger strategy to achieve very air tight homes. This is in line with the program's move away from standalone air sealing measures. The New Homes program will continue to test new air sealing strategies and other efficient construction techniques and incorporate them into its EPS homes.



Final Report

# Process Evaluation of the Savings Within Reach On-Bill Repayment Loan Pilot

March 25, 2016



Final Report

Process Evaluation of the  
Savings Within Reach On-Bill  
Repayment Loan Pilot

March 25, 2016

Funded By:

Energy Trust of Oregon

Prepared By:

Research Into Action, Inc.

## Executive Summary

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This evaluation presents findings from a process evaluation of Energy Trust of Oregon's (Energy Trust's) Savings Within Reach (SWR) On-Bill Repayment (OBR) pilot. In April of 2014, Energy Trust added OBR loans to its SWR offering, which provides enhanced incentives for moderate-income households that install select energy efficiency measures. By making loans available to this population, Energy Trust sought to enable participants who could not otherwise pay the upfront costs to install energy efficiency measures, or allow existing participants to complete more comprehensive projects.

The SWR OBR pilot offers qualified participants loans at an interest rate of 5.99% to pay the costs of energy efficiency improvements after subtracting SWR incentives. Loans up to \$2,000 have a five-year term, while participants pay back loans between \$2,001 and the pilot's \$5,000 loan cap over ten years. Participants repay their loans as a line item on the monthly bill from the utility that provides their home's primary heating fuel. To increase the accessibility of the loans to moderate-income homeowners, the pilot uses an applicant's utility bill repayment history as a credit enhancement, providing greater flexibility in the use of traditional metrics like debt-to-income ratios and credit scores. Energy Trust subsidizes the cost of the loan application fee (\$150) and the loan origination fee (\$150); participants can apply for the loan and, if approved, install measures with no out of pocket costs.

This evaluation addressed a detailed list of research objectives probing the effectiveness of the pilot in facilitating projects that would not otherwise have occurred, the experience of pilot participants with the loan product and process, and overarching questions of drivers and barriers of financing uptake and the implications of pilot accomplishments for program design. Because the pilot experienced low uptake throughout the evaluation period, understanding the reasons for this limited uptake became a central focus of the research efforts.

Five data sources inform this evaluation: a review of pilot documents and industry literature; analysis of pilot measure installation and project tracking data; interviews with individuals involved in pilot administration, management, and delivery (pilot staff); interviews with trade allies; and surveys of SWR participants, including those using OBR loans, those not using OBR loans, and those who applied for, but did not receive, OBR loans; and interviews with trade allies offering SWR OBR loans. Table ES-1 summarizes the primary data collection efforts that contributed to this evaluation.

Table ES-1: Primary Data Collection Activities

POPULATION	DATA COLLECTION METHOD	POPULATION SIZE	NUMBER OF RESPONDENTS
Pilot staff*	In-depth interviews	12	12
Trade allies	In-depth interviews	12**	9
SWR OBR participants	Survey	51	24
SWR OBR applicants***	Survey	32	16
SWR participants not using OBR loans	Survey	588	31

\* Includes staff of Energy Trust, CLEAResult, Craft3, Portland General Electric, Pacific Power, and NW Natural.

\*\* Trade allies that had submitted SWR OBR applications between April 2014 and August 2015.

\*\*\* Participants with status of “Abandoned” and “Did Not Qualify.”

## Key Findings

Together, the data sources that inform this evaluation suggest six key findings regarding the accomplishments of the SWR OBR pilot. Pilot staff are aware of many of these findings and have taken steps to address some of the process challenges the pilot has faced. While it is too early to fully assess the influence of the changes pilot staff have made, recent data collection suggests an increase in both pilot uptake and satisfaction.

- › **SWR OBR loans allow participants to complete projects that would not otherwise occur.** Pilot staff and trade allies reported the perception that many SWR OBR participants would not be able to complete their projects without the loan, and participant survey data support their assessment. Majorities of participants reported access to the loan was important in their decision to make an upgrade (71%), and they would not have completed a similarly comprehensive project if the loan had not been available (79%). Most OBR applicants who did not receive loans (67%) did not complete projects because they could not afford the upfront cost.
- › **The OBR loan product is appealing to moderate income households and to trade allies.** More than 90% of SWR OBR participants and applicants reported they would consider an OBR loan for future upgrades. Participant and applicants found the ability to repay loans on their utility bills, the lack of fees or closing costs, and the fact that the loan did not require collateral as particularly appealing aspects of the loan product. Few SWR participants who did not use loans (17%) used some other financing mechanism to pay for their projects.
- › **Loan uptake was slower than expected.** Energy Trust designed the SWR OBR loan offering with capacity to make approximately 300 loans over an 18-month period. The pilot ultimately made 51 loans between May of 2014 and the end of 2015. Pilot activity was greatest in the second half of 2014, shortly after the pilot’s launch. Activity in both the OBR pilot and the larger SWR program increased notably in the fourth quarter of 2015.

- › **Participants' and trade allies' difficulty navigating pilot processes was a key driver of low uptake.** Trade allies in particular described the loan process as difficult; their challenges with the process made them less likely to recommend OBR loans and thus limited uptake. Pilot staff and trade allies reported that the need for participants to complete and return loan closing documents was the most challenging part of the process. Trade allies reported some participants needed a great deal of support in the lending process, but communication challenges made it difficult to provide that support. Trade allies reported they, and their customers, were not always aware of the status of a participant's loan application, including which documents the lender had received and which were missing. Indicating that the pilot addressed some of these challenges through its continuous improvement efforts, participant satisfaction with the lender increased over time.
- › **Beyond pilot processes, there are challenges inherent in providing financing to moderate-income homeowners.** These challenges include the relatively small, targeted nature of the moderate-income homeowner population. In addition, moderate-income homeowners can be difficult to identify. Moderate-income homeowners may not reach out for other income-qualified services, and a majority of the interviewed trade allies (five of eight) reported it is difficult to ask a customer about their income, expressing concern about offending customers with questions that are too personal. Finally, some moderate-income homeowners are reluctant to take on debt and others may identify a way to pay for a project before they contact a contractor.
- › **The pilot has taken steps to address many of the issues that led to slow uptake.** To increase uptake of SWR incentives and OBR loans, the pilot staff increased the maximum income threshold, increasing the number of households eligible for SWR. In addition, NW Natural required that, as of March 2016, trade allies must be eligible to offer SWR OBR loans in order to be part of NW Natural's preferred contractor network. To facilitate program processes, Craft3 began offering participants an option to sign loan documents electronically, and program staff described efforts to establish a project tracking portal to improve communication and identify participants that get stuck in the process. As noted above, loan uptake increased in the fourth quarter of 2015 and participant and trade ally data indicate an improvement in the ease of program processes resulting from these efforts and other steps Energy Trust and its partners have taken as part of their continuous improvement efforts.

## Conclusions and Recommendations

From these key findings, we draw three conclusions and make associated recommendations.

**Conclusion 1:** Over the evaluation period, the organizations implementing the pilot recognized the challenges that were slowing loan uptake and took steps to resolve them.

Staff within all of the organizations implementing the pilot took steps to reduce the complexity of program processes and increase program uptake. Efforts to facilitate program processes ranged from a general focus on improving communication and customer service, to broader

changes like Craft3's adoption of electronic loan document signing capabilities. Efforts to increase uptake included expanding the income eligibility criteria and NW Natural's requirement that its preferred trade allies become eligible to offer SWR OBR loans. Evaluation data show that these efforts are having some effect; loan uptake and contractor participation increased in the last quarter of 2015 and participant and contractor data suggest that processes improved over time. However, these are early findings; many of the most significant changes had not yet fully taken effect at the time of this evaluation.

- › **Recommendation 1: Continue to monitor loan uptake, contractor engagement, and participant satisfaction to gauge the effectiveness of the steps taken.** It is important for Energy Trust to ensure that the steps it has taken and plans to take are effective, particularly as participation increases.
- › **Recommendation 2: Investigate additional opportunities to simplify the loan process.** Energy Trust and Craft3 could review the loan processes that programs offering loans to moderate-income households for energy efficiency upgrades in other parts of the country use to identify any feasible opportunities to simplify the SWR OBR process. For example, the Solar and Energy Loan Fund in Florida and California's Residential Energy Efficiency Loan Assistance Program, which is one of several financing pilots under development in the state, both explicitly seek to reach moderate income households, although they are open to others. Further research may identify additional programs with experience applicable to SWR OBR.
- › **Recommendation 3: Specifically review the role the Uniform Commercial Code-1 (UCC-1) filing has in delays and incomplete participation, as well as its actual value to the lender.**<sup>1</sup> Assess whether the value of UCC-1 offsets its liability to the program and what alternatives exist to ensure that all parties are notified in the event of a home sale.

**Conclusion 2: Trade allies can play a valuable role in supporting participants through the loan process.**

Trade allies work closely with participants to scope and complete the project, and benefit when participants complete the loan process quickly. Therefore, it appears that trade allies are well positioned to assist participants with the loan process. However, the pilot's current process, in which participants work directly with the lender to complete the loan process, may limit trade allies' perception of their ability to support participants through the process. While the few trade allies that have completed the largest volume of SWR OBR projects have found ways to assist participants with the loan process, others lamented the complexity of the process while reporting little opportunity to help participants.

- › **Recommendation 4: Expand trade ally training to walk trade allies through the loan requirements and processes and encourage them to offer to assist participants.** A more detailed understanding of the loan process will help trade allies better prepare

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<sup>1</sup> As discussed below (Section 1.1.2), SWR OBR loans include a Uniform Commercial Code-1 (UCC-1) filing. While this filing places a lien on the energy efficient equipment a participant installs, its primary purpose in the SWR OBR program is to alert all parties involved, including Craft3, if the borrower sells their home.

participants to complete the process when they are discussing the loan initially. It will also prepare trade allies to take a more active role in the process, allowing them to explain requirements to participants and address participants' concerns. Encouraging trade ally sales and administrative staff to attend training, in addition to field staff, will also help trade allies better serve participants.

- › **Recommendation 5: Develop a tool to improve tracking and communication of project status.** An effective project tracking tool will help trade allies and others involved in delivering the program identify projects that have gotten stuck at some point in the process and follow-up with those participants to address any concerns that are preventing the participants from moving forward.

**Conclusion 3:** There are drawbacks to a reliance on trade allies to inform potential participants of the availability of SWR OBR loans.

The SWR OBR pilot faces two challenges that stem from a reliance on trade allies to inform participants about the loan offering. First, some trade allies fear their customers will find questions about their income too personal and so have difficulty promoting both SWR incentives and OBR loans. Trade allies reported looking for cues that a customer might be eligible for SWR, but this approach may lead to missed opportunities to promote the program to some eligible customers.

Second, moderate-income customers that have identified a project they would like to complete may not contact a contractor if they do not believe they can afford it, and thus lose the opportunity to be informed of the pilot from a contractor. Participant survey data provide some evidence this is occurring. SWR participants that were aware of loans, but did not use them, most often reported they had the cash to pay for their project; relatively few reported using some other financing mechanism. These findings suggest that potential participants who could benefit from an SWR OBR loan may not be aware the offering is available.

- › **Recommendation 6: Directly inform potential participants about the availability of SWR OBR loans.** Energy Trust could do this through targeted approaches like mailings, utility bill inserts, and social media. This type of outreach might bring participants into the program who do not otherwise believe they could afford an upgrade, and facilitate trade allies' conversations with participants' by allowing the trade allies to reference a message with which the participant may already be familiar.

## MEMO

**Date:** May 5, 2016  
**To:** Board of Directors  
**From:** Mark Wyman, Program Manager, Residential  
Andrew Shepard, Sr. Project Manager, Residential  
Sarah Castor, Evaluation Sr. Project Manager  
**Subject:** Staff response to the Savings Within Reach On-Bill Repayment Pilot Evaluation

In launching the Savings Within Reach On-Bill Repayment (SWR OBR) Pilot in 2014, Energy Trust's goal was to expand participation by moderate income customers who faced capital constraints when considering an energy efficiency upgrade.

The results of the evaluation show that the loan product has enabled energy efficiency projects that would not otherwise have occurred. Energy Trust and CLEAResult staff have been conscientious about making changes to processes throughout the pilot to improve customer and trade ally experience. Most participants reported that they were satisfied with their experience with the lender and more than 90% would consider SWR OBR for future energy efficiency projects.

Energy Trust plans to continue to support SWR OBR loans. Residential program staff plan to monitor loan uptake and explore opportunities for expanding participation. Staff are also interested in, and will explore the opportunity for, a web portal or other mechanism to enhance communications between Energy Trust, the lender and trade allies.

TAB 4



# Notes on May 2016 Financial Statements

June 17, 2016

## Revenue

We expect PAC revenue to be increased in June, which will eliminate the shortfall.

Revenue through May 2016

May-16	<u>YTD Actual</u>	<u>YTD Budget</u>	<u>YTD Var</u>	<u>YTD %</u>	<u>PY</u>
PGE	35,009,694	34,682,322	327,372	0.9%	34,809,207
PAC	21,803,838	23,094,130	(1,290,292)	-5.6%	21,294,150
NWN	10,783,417	11,674,770	(891,353)	-7.6%	10,562,243
CNG	962,658	1,096,283	(133,625)	-12.2%	837,100
Avista	46,800	-	46,800		-
Investment Income	320,558	125,000	195,558	156.4%	307,925
<b>Total</b>	<b>68,926,964</b>	<b>70,672,505</b>	<b>(1,745,540)</b>	<b>-2.5%</b>	<b>67,810,625</b>

## Reserves

Reserves decreased by about \$2 million this month. We expect reserves to continue to decrease in the latter part of the year.

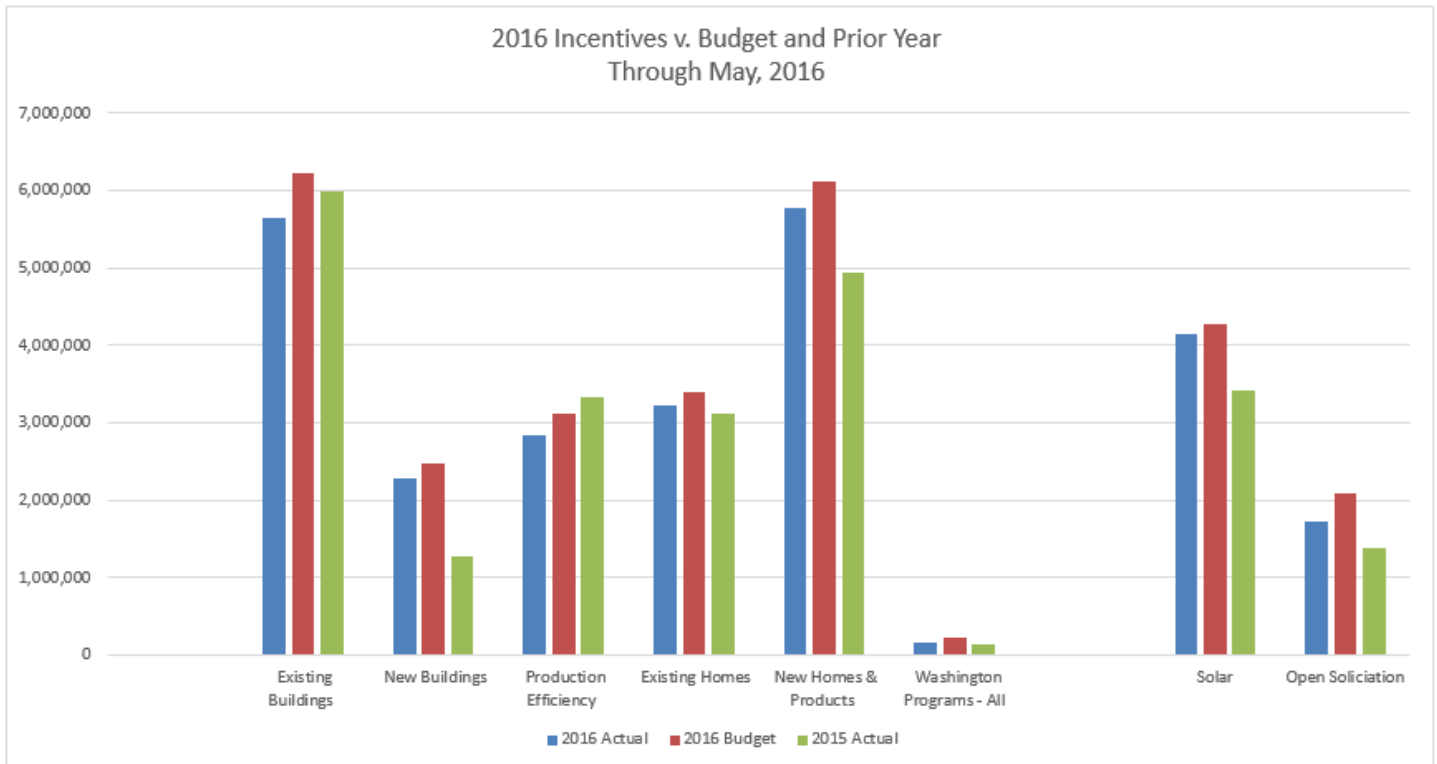
### Reserves

	<u>5/31/16</u> <u>Amount</u>	<u>Actual 12/31/15</u> <u>Amount</u>	<u>YTD</u> <u>% Change</u>
PGE	30,365,130	23,006,282	32%
PacifiCorp	9,154,446	7,481,735	22%
NW Natural	9,719,380	6,430,002	51%
Cascade	767,427	229,935	234%
Avista	40,044	0	
NWN Industrial	1,485,123	1,032,752	44%
NWN Washington	543,268	257,872	111%
PGE Renewables	8,337,647	10,144,624	-18%
PAC Renewables	11,537,522	10,910,203	6%
<b>Program Reserves</b>	<b>71,949,987</b>	<b>59,493,405</b>	<b>21%</b>
Contingency Reserve	5,000,000	5,000,000	0%
Contingency Available	4,060,443	3,739,885	9%
<b>Total</b>	<b>81,010,429</b>	<b>68,233,284</b>	<b>19%</b>

**Expenses**

Total expenses for May were \$13 million, about \$1 million below the budget. Incentives for May were \$563K below budget. Year-to-Date total expenses are \$4.3 million below budget (7%), with half of the underspending coming from incentives. We expect a bump in incentives in June as programs strive to meet mid-year goals.

Year to date incentives are below budget by \$2.1 million (8%). We have spent \$2.1 million more than we did at this time last year. \$1 million of the increase from last year is due to a higher level of renewables spending, particularly in Solar.

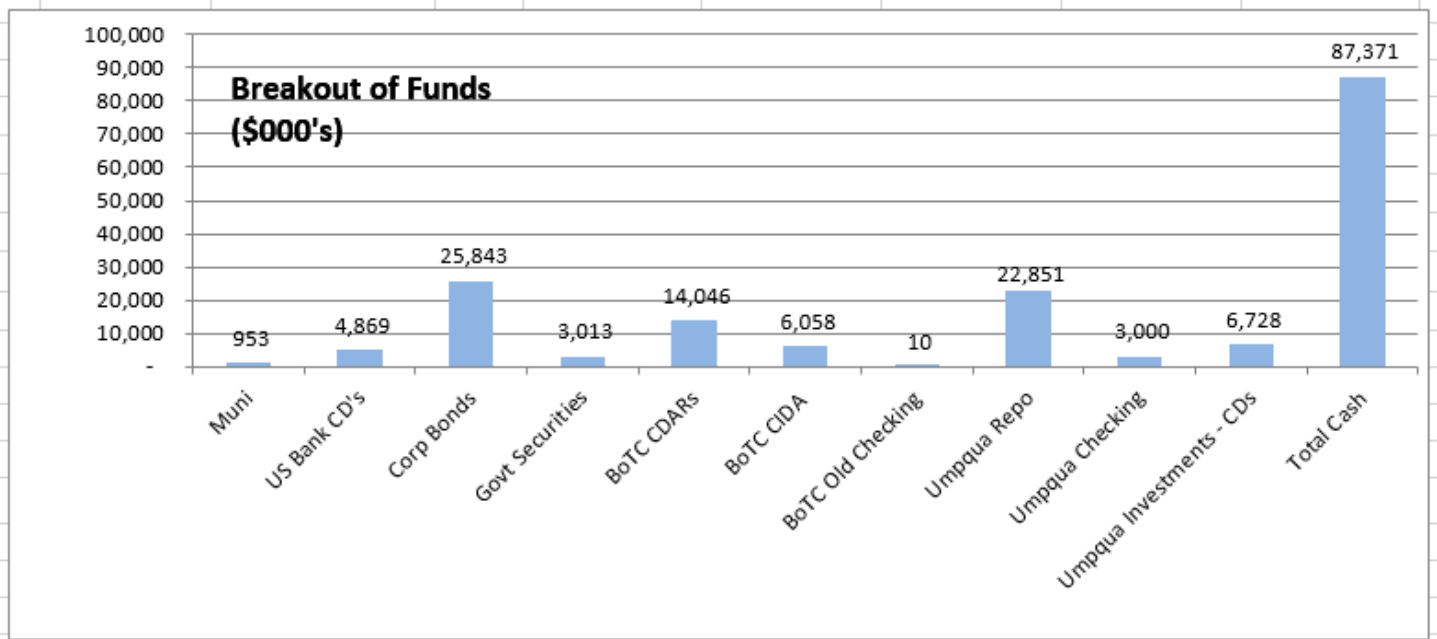


Incentives thru May 2016	<b>Total Incentives</b>			
	<u>Actual</u>	<u>Budget</u>	<u>Variance</u>	<u>Var %</u>
Existing Buildings	5,650,039	6,217,043	567,005	9%
New Buildings	2,274,508	2,468,779	194,270	8%
Production Efficiency	2,834,159	3,119,354	285,195	9%
Existing Homes	3,227,429	3,396,755	169,326	5%
New Homes & Products	5,784,258	6,114,616	330,358	5%
Washington Programs - All	156,712	235,254	78,542	33%
Solar	4,153,005	4,285,967	132,962	3%
Open Solicitation	1,718,145	2,096,526	378,381	18%
<b>Total Incentives</b>	<b>25,798,255</b>	<b>27,934,293</b>	<b>2,136,038</b>	<b>8%</b>
<b>Energy Efficiency Only</b>	<b>19,927,105</b>	<b>21,551,801</b>	<b>1,624,695</b>	<b>8%</b>

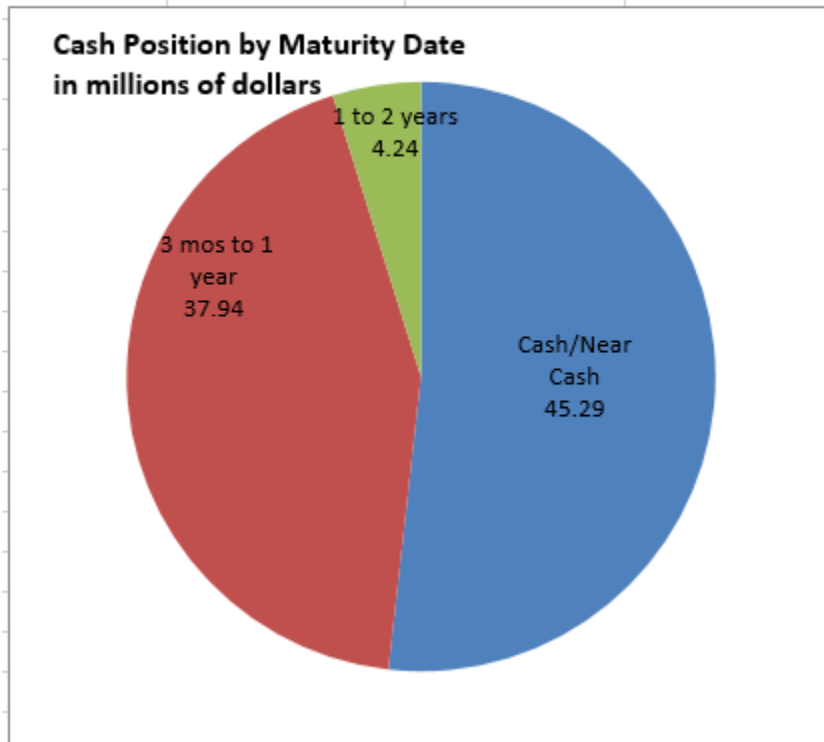
May 2016 vs. May 2015	<b>Total Incentives</b>			
	<u>Current Year</u>	<u>Prior Year</u>	<u>Variance</u>	<u>Var %</u>
Existing Buildings	5,650,039	5,994,740	344,701	6%
New Buildings	2,274,508	1,279,550	(994,958)	-78%
Production Efficiency	2,834,159	3,343,055	508,895	15%
Existing Homes	3,227,429	3,122,607	(104,822)	-3%
New Homes & Products	5,784,258	4,932,885	(851,373)	-17%
Washington Programs - All	156,712	148,967	(7,746)	-5%
Solar	4,153,005	3,425,740	(727,264)	-21%
Open Solicitation	1,718,145	1,384,327	(333,818)	-24%
<b>Total Incentives</b>	<b>25,798,255</b>	<b>23,631,871</b>	<b>(2,166,388)</b>	<b>-9%</b>
<b>Energy Efficiency Only</b>	<b>19,927,105</b>	<b>18,821,804</b>	<b>(1,105,302)</b>	<b>-6%</b>

**Investment Status**

The graphs below show the type of investments we hold and the locations where our funds are held at the end of May. As items mature, we will continue to invest in relatively short term options.



<b>Average Days to Maturity:</b>	<b>98</b>
<b>Average Portfolio Yield:</b>	<b>0.53%</b>



**Energy Trust of Oregon**  
**BALANCE SHEET**  
**May 31, 2016**  
**(Unaudited)**

	May 2016	April 2016	December 2015	May 2015	Change from one month ago	Change from Beg. of Year	Change from one year ago
<b>Current Assets</b>							
Cash & Cash Equivalents	31,919,401	32,015,382	27,186,505	40,219,037	(95,981)	4,732,895	(8,299,636)
Investments	55,281,845	57,303,834	63,884,187	66,975,187	(2,021,989)	(8,602,342)	(11,693,342)
Receivables	318,597	297,637	374,615	336,546	20,960	(56,018)	(17,948)
Prepaid Expenses	587,862	527,520	479,349	521,017	60,342	108,513	66,844
Advances to Vendors	707,886	1,384,182	2,049,018	827,420	(676,296)	(1,341,132)	(119,534)
<b>Total Current Assets</b>	<b>88,815,591</b>	<b>91,528,554</b>	<b>93,973,675</b>	<b>108,879,206</b>	<b>(2,712,964)</b>	<b>(5,158,084)</b>	<b>(20,063,616)</b>
<b>Fixed Assets</b>							
Computer Hardware and Software	3,671,135	3,661,205	3,509,829	3,088,030	9,930.72	161,305.83	583,105
Software Development in Progress	0	0	150,148	259,451	-	(150,148)	(259,451)
Leasehold Improvements	318,964	318,964	318,964	318,964	-	-	-
Office Equipment and Furniture	701,604	701,604	701,604	679,343	-	-	22,260
<b>Total Fixed Assets</b>	<b>4,691,703</b>	<b>4,681,772</b>	<b>4,680,545</b>	<b>4,345,789</b>	<b>9,931</b>	<b>11,158</b>	<b>345,915</b>
Less Depreciation	(3,060,132)	(2,980,471)	(2,672,098)	(2,122,499)	(79,660)	(388,034)	(937,632)
<b>Net Fixed Assets</b>	<b>1,631,572</b>	<b>1,701,301</b>	<b>2,008,447</b>	<b>2,223,289</b>	<b>(69,729)</b>	<b>(376,876)</b>	<b>(591,718)</b>
<b>Other Assets</b>							
Deposits	223,339	223,339	132,340	132,340	-	90,999	90,999
Deferred Compensation Asset	768,579	760,120	724,981	674,711	8,460	43,598	93,868
Note Receivable, net of allowance	85,609	85,609	85,609	86,789	-	-	(1,180)
<b>Total Other Assets</b>	<b>1,077,527</b>	<b>1,069,068</b>	<b>942,930</b>	<b>893,840</b>	<b>8,460</b>	<b>134,597</b>	<b>183,687</b>
<b>Total Assets</b>	<b>91,524,689</b>	<b>94,298,923</b>	<b>96,925,052</b>	<b>111,996,335</b>	<b>(2,774,234)</b>	<b>(5,400,363)</b>	<b>(20,471,646)</b>
<b>Current Liabilities</b>							
Accounts Payable and Accruals	8,497,977	9,419,672	26,910,003	8,096,830	(921,695)	(18,412,026)	401,147
Salaries, Taxes, & Benefits Payable	876,026	854,901	735,510	799,263	21,125	140,516	76,763
<b>Total Current Liabilities</b>	<b>9,374,003</b>	<b>10,274,573</b>	<b>27,645,513</b>	<b>8,896,093</b>	<b>(900,570)</b>	<b>(18,271,510)</b>	<b>477,910</b>
<b>Long Term Liabilities</b>							
Deferred Rent	367,396	295,843	314,472	335,800	71,553	52,924	31,597
Deferred Compensation Payable	768,579	762,920	727,781	674,711	5,660	40,798	93,868
Other Long-Term Liabilities	4,290	4,290	3,990	5,380	-	300	(1,090)
<b>Total Long-Term Liabilities</b>	<b>1,140,265</b>	<b>1,063,052</b>	<b>1,046,243</b>	<b>1,015,890</b>	<b>77,213</b>	<b>94,022</b>	<b>124,375</b>
<b>Total Liabilities</b>	<b>10,514,268</b>	<b>11,337,625</b>	<b>28,691,756</b>	<b>9,911,983</b>	<b>(823,357)</b>	<b>(18,177,488)</b>	<b>602,285</b>
<b>Net Assets</b>							
Unrestricted Net Assets	81,010,421	82,961,298	68,233,296	102,084,353	(1,950,876)	12,777,125	(21,073,931)
<b>Total Net Assets</b>	<b>81,010,421</b>	<b>82,961,298</b>	<b>68,233,296</b>	<b>102,084,353</b>	<b>(1,950,876)</b>	<b>12,777,125</b>	<b>(21,073,931)</b>
<b>Total Liabilities and Net Assets</b>	<b>91,524,689</b>	<b>94,298,923</b>	<b>96,925,052</b>	<b>111,996,335</b>	<b>(2,774,234)</b>	<b>(5,400,363)</b>	<b>(20,471,646)</b>

**Energy Trust of Oregon**  
**Cash Flow Statement-Indirect Method**  
**Monthly 2016**

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>Year to Date</u>
<b>Operating Activities:</b>						
<i>Revenue less Expenses</i>	8,446,762	6,323,151	300,614	(342,524)	(1,950,876)	\$ 12,777,127
<i>Non-cash items:</i>						
Depreciation	76,179	75,997	76,143	80,055	79,660	\$ 388,034
Change in Reserve on Long Term Note	-	-	-	-	-	-
Loss on disposal of assets						-
Receivables	(0)	18,000	(9,000)	-	12,191	21,191
Interest Receivable	14,398	(18,742)	103,825	(31,503)	(33,151)	34,827
Advances to Vendors	626,135	626,136	(1,232,162)	644,727	676,296	1,341,132
Prepaid expenses and other costs	47,275	(241,163)	56,960	88,757	(60,342)	(108,513)
Accounts payable	(17,410,869)	(2,320,614)	303,039	1,936,464	(921,656)	(18,413,636)
Payroll and related accruals	54,950	24,319	119,657	(42,788)	26,784	182,922
Deferred rent and other	(15,317)	(20,616)	(98,216)	(10,318)	63,094	(81,373)
<b>Cash rec'd from / (used in) Operating Activities</b>	<b>(8,160,486)</b>	<b>4,466,467</b>	<b>(379,140)</b>	<b>2,322,869</b>	<b>(2,107,999)</b>	<b>(3,858,289)</b>
<b>Investing Activities:</b>						
Investment Activity (1)	3,750,021	45,768	4,263,600	(1,479,036)	2,021,989	8,602,342
(Acquisition)/Disposal of Capital Assets	(166)	-	(691)	(370)	(9,931)	(11,158)
<b>Cash rec'd from / (used in) Investing Activities</b>	<b>3,749,855</b>	<b>45,768</b>	<b>4,262,909</b>	<b>(1,479,406)</b>	<b>2,012,058</b>	<b>\$ 8,591,184</b>
<b>Cash at beginning of Period</b>	<b>27,186,505</b>	<b>22,775,874</b>	<b>27,288,109</b>	<b>31,171,878</b>	<b>32,015,382</b>	<b>27,186,505</b>
<b>Increase/(Decrease) in Cash</b>	<b>(4,410,631)</b>	<b>4,512,235</b>	<b>3,883,769</b>	<b>843,504</b>	<b>(95,981)</b>	<b>4,732,895</b>
<b>Cash at end of period</b>	<b>\$ 22,775,874</b>	<b>\$ 27,288,109</b>	<b>\$ 31,171,878</b>	<b>\$ 32,015,382</b>	<b>\$ 31,919,401</b>	<b>\$ 31,919,401</b>

(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 2016 - December 2017

	Actual					2016 Adjusted Budget						
	January	February	March	April	May	June	July	August	September	October	November	December
<b>Cash In:</b>												
<b>Public purpose and Incr funding</b>	14,818,951	15,914,519	13,829,079	13,092,884	10,950,974	11,000,000	11,900,000	12,700,000	12,000,000	12,100,000	11,800,000	14,400,000
<b>Trsfr from maturing investments</b>	3,750,021	45,768	4,263,600		2,021,989	-	-	-	-			5,000,000
<b>Investment Income</b>	110,687	28,809	180,066	11,289	24,534	25,000	25,000	25,000	25,000	25,000	25,000	25,000
<b>From Other Sources</b>		18,000			12,191							
<b>Total cash in</b>	18,679,659	16,007,096	18,272,745	13,104,173	13,009,688	11,025,000	11,925,000	12,725,000	12,025,000	12,125,000	11,825,000	19,425,000
<b>Cash Out:</b>												
Trsfr to investments	(23,090,291)	(11,494,861)	(14,388,972)	(10,781,678)	(13,105,625)	(15,200,000)	(13,000,000)	(12,700,000)	(16,000,000)	(15,300,000)	(16,500,000)	(22,000,000)
<b>Net cash flow for the month</b>	(4,410,631)	4,512,235	3,883,773	843,459	(95,981)	(4,175,000)	(1,075,000)	25,000	(3,975,000)	(3,175,000)	(4,675,000)	(2,575,000)
Beginning Balance: Cash & MM	27,186,505	22,775,874	27,288,109	31,171,882	32,015,382	31,919,401	27,744,400	26,669,400	26,694,400	22,719,400	19,544,400	14,869,400
<b>Ending cash &amp; MM</b>	<b>22,775,874</b>	<b>27,288,109</b>	<b>31,171,882</b>	<b>32,015,382</b>	<b>31,919,401</b>	<b>27,744,400</b>	<b>26,669,400</b>	<b>26,694,400</b>	<b>22,719,400</b>	<b>19,544,400</b>	<b>14,869,400</b>	<b>12,294,400</b>
<b>Future Commitments</b>												
Renewable Incentives	15,000,000	16,800,000	14,900,000	13,400,000	12,300,000	12,000,000	11,100,000	11,500,000	11,800,000	11,800,000	11,800,000	11,800,000
Efficiency Incentives	67,200,000	65,600,000	70,700,000	65,900,000	59,200,000	54,800,000	62,500,000	70,200,000	71,700,000	82,400,000	82,400,000	82,400,000
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
<b>Total Commitments</b>	<b>87,200,000</b>	<b>87,400,000</b>	<b>90,600,000</b>	<b>84,300,000</b>	<b>76,500,000</b>	<b>71,800,000</b>	<b>78,600,000</b>	<b>86,700,000</b>	<b>88,500,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>

(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 2016 - December 2017

2017 Projected Amounts												
	January	February	March	April	May	June	July	August	September	October	November	December
<b>Cash In:</b>												
Public purpose and Incr funding	19,000,000	18,100,000	14,900,000	15,700,000	12,900,000	12,300,000	13,300,000	14,000,000	13,200,000	13,500,000	13,300,000	16,100,000
Trsr from maturing investments	12,500,000											
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
From Other Sources												
<b>Total cash in</b>	<b>31,525,000</b>	<b>18,125,000</b>	<b>14,925,000</b>	<b>15,725,000</b>	<b>12,925,000</b>	<b>12,325,000</b>	<b>13,325,000</b>	<b>14,025,000</b>	<b>13,225,000</b>	<b>13,525,000</b>	<b>13,325,000</b>	<b>16,125,000</b>
<b>Cash Out:</b>												
Trsr to investments	(31,500,000)	(10,100,000)	(11,400,000)	(11,200,000)	(13,300,000)	(14,700,000)	(12,200,000)	(12,800,000)	(14,200,000)	(13,100,000)	(15,700,000)	(18,500,000)
<b>Net cash flow for the month</b>	<b>25,000</b>	<b>8,025,000</b>	<b>3,525,000</b>	<b>4,525,000</b>	<b>(375,000)</b>	<b>(2,375,000)</b>	<b>1,125,000</b>	<b>1,225,000</b>	<b>(975,000)</b>	<b>425,000</b>	<b>(2,375,000)</b>	<b>(2,375,000)</b>
Beginning Balance: Cash & MM	12,294,000	12,319,000	20,344,000	23,869,000	28,394,000	28,019,000	25,644,000	26,769,000	27,994,000	27,019,000	27,444,000	25,069,000
<b>Ending cash &amp; MM</b>	<b>12,319,000</b>	<b>20,344,000</b>	<b>23,869,000</b>	<b>28,394,000</b>	<b>28,019,000</b>	<b>25,644,000</b>	<b>26,769,000</b>	<b>27,994,000</b>	<b>27,019,000</b>	<b>27,444,000</b>	<b>25,069,000</b>	<b>22,694,000</b>
<b>Future Commitments</b>												
Renewable Incentives	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000	11,800,000
Efficiency Incentives	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000	82,400,000
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
<b>Total Commitments</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>	<b>99,200,000</b>

(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 Budget Comparison**  
**For the Five Months Ending May 31, 2016**  
**(Unaudited)**

	May				YTD			
	Actual	Budget	Budget Variance	Variance %	Actual	Budget	Budget Variance	Variance %
<b><u>REVENUES</u></b>								
Public Purpose Funds-PGE	2,787,089	2,874,352	(87,264)	-3%	16,238,496	16,074,097	164,399	1%
Public Purpose Funds-PacifiCorp	2,114,050	2,061,646	52,404	3%	12,340,371	11,685,148	655,223	6%
Public Purpose Funds-NW Natural	1,209,562	1,232,635	(23,073)	-2%	9,005,560	9,732,244	(726,684)	-7%
Public Purpose Funds-Cascade	122,000	137,460	(15,461)	-11%	962,658	1,096,283	(133,625)	-12%
Public Purpose Funds-Avista					46,800		46,800	
<b>Total Public Purpose Funds</b>	<b>6,232,701</b>	<b>6,306,093</b>	<b>(73,393)</b>	<b>-1%</b>	<b>38,593,885</b>	<b>38,587,771</b>	<b>6,113</b>	<b>0%</b>
Incremental Funds - PGE	3,161,812	3,163,383	(1,571)	0%	18,771,198	18,608,225	162,973	1%
Incremental Funds - PacifiCorp	1,556,461	1,832,143	(275,682)	-15%	9,463,467	11,408,982	(1,945,515)	-17%
NW Natural - Industrial DSM					1,009,017	1,071,908	(62,891)	-6%
NW Natural - Washington					768,840	870,618	(101,778)	-12%
Revenue from Investments	57,684	25,000	32,684	131%	320,558	125,000	195,558	156%
<b>TOTAL REVENUE</b>	<b>11,008,658</b>	<b>11,326,619</b>	<b>(317,961)</b>	<b>-3%</b>	<b>68,926,965</b>	<b>70,672,505</b>	<b>(1,745,540)</b>	<b>-2%</b>
<b><u>EXPENSES</u></b>								
Program Subcontracts	4,334,526	4,518,690	184,164	4%	21,373,393	22,161,060	787,666	4%
Incentives	6,843,571	7,406,665	563,093	8%	25,798,255	27,934,293	2,136,038	8%
Salaries and Related Expenses	1,017,514	1,063,743	46,229	4%	5,009,603	5,337,713	328,109	6%
Professional Services	506,164	681,000	174,835	26%	2,786,956	3,669,764	882,808	24%
Supplies	2,601	3,871	1,270	33%	13,205	19,354	6,149	32%
Telephone	5,118	6,267	1,149	18%	24,488	31,333	6,846	22%
Postage and Shipping Expenses	807	1,375	568	41%	4,988	6,875	1,887	27%
Occupancy Expenses	73,013	64,278	(8,735)	-14%	285,657	321,388	35,731	11%
Noncapitalized Equip. & Depr.	92,994	117,138	24,144	21%	481,976	574,197	92,222	16%
Call Center	14,403	15,617	1,214	8%	74,101	78,083	3,982	5%
Printing and Publications		8,208	8,208	100%	1,022	41,042	40,019	98%
Travel	12,615	16,678	4,063	24%	84,836	80,056	(4,781)	-6%
Conference, Training & Mtng Exp	17,336	21,419	4,083	19%	72,248	108,410	36,162	33%
Interest Expense and Bank Fees		208	208		1,621	1,042	(579)	-56%
Insurance	7,985	9,167	1,182	13%	41,926	45,833	3,907	9%
Miscellaneous Expenses	21,079	229	(20,850)		53,830	1,146	(52,684)	
Dues, Licenses and Fees	9,809	6,229	(3,580)	-57%	41,733	54,026	12,293	23%
<b>TOTAL EXPENSES</b>	<b>12,959,535</b>	<b>13,940,780</b>	<b>981,245</b>	<b>7%</b>	<b>56,149,839</b>	<b>60,465,614</b>	<b>4,315,776</b>	<b>7%</b>
<b>TOTAL REVENUE LESS EXPENSES</b>	<b>(1,950,876)</b>	<b>(2,614,161)</b>	<b>663,284</b>	<b>25%</b>	<b>12,777,125</b>	<b>10,206,891</b>	<b>2,570,236</b>	<b>-25%</b>

**Energy Trust of Oregon**  
**Income Statement - Actual and Prior Year Comparison**  
**For the Five Months Ending May 31, 2016**  
**(Unaudited)**

	May				YTD			
	Actual	Actual Prior Year	Prior Year Variance	Variance %	Actual	Actual Prior Year	Prior Year Variance	Variance %
<b>REVENUES</b>								
Public Purpose Funds-PGE	2,787,089	2,867,684	(80,596)	-3%	16,238,496	16,036,807	201,689	1%
Public Purpose Funds-PacifiCorp	2,114,050	2,073,600	40,450	2%	12,340,371	11,752,901	587,470	5%
Public Purpose Funds-NW Natural	1,209,562	1,121,871	87,692	8%	9,005,560	8,857,707	147,853	2%
Public Purpose Funds-Cascade	122,000	104,961	17,038	16%	962,658	837,100	125,559	15%
Public Purpose Funds-Avista					46,800		46,800	
<b>Total Public Purpose Funds</b>	<b>6,232,701</b>	<b>6,168,116</b>	<b>64,585</b>	<b>1%</b>	<b>38,593,885</b>	<b>37,484,515</b>	<b>1,109,370</b>	<b>3%</b>
Incremental Funds - PGE	3,161,812	3,191,292	(29,480)	-1%	18,771,198	18,772,399	(1,201)	0%
Incremental Funds - PacifiCorp	1,556,461	1,532,208	24,253	2%	9,463,467	9,541,249	(77,782)	-1%
NW Natural - Industrial DSM					1,009,017	1,026,144	(17,127)	-2%
NW Natural - Washington					768,840	678,392	90,448	13%
Contributions		700	(700)	-100%		700	(700)	-100%
Revenue from Investments	57,684	52,089	5,595	11%	320,558	307,925	12,633	4%
<b>TOTAL REVENUE</b>	<b>11,008,658</b>	<b>10,944,405</b>	<b>64,253</b>	<b>1%</b>	<b>68,926,965</b>	<b>67,811,324</b>	<b>1,115,640</b>	<b>2%</b>
<b>EXPENSES</b>								
Program Subcontracts	4,334,526	4,407,207	72,681	2%	21,373,393	21,011,364	(362,029)	-2%
Incentives	6,843,571	7,605,772	762,201	10%	25,798,255	23,631,871	(2,166,384)	-9%
Salaries and Related Expenses	1,017,514	869,137	(148,377)	-17%	5,009,603	4,425,079	(584,524)	-13%
Professional Services	506,164	554,724	48,560	9%	2,786,956	2,801,835	14,879	1%
Supplies	2,601	1,666	(934)	-56%	13,205	16,048	2,843	18%
Telephone	5,118	5,661	543	10%	24,488	24,006	(482)	-2%
Postage and Shipping Expenses	807	772	(35)	-4%	4,988	7,450	2,462	33%
Occupancy Expenses	73,013	53,565	(19,447)	-36%	285,657	268,623	(17,034)	-6%
Noncapitalized Equip. & Depr.	92,994	103,915	10,920	11%	481,976	447,533	(34,443)	-8%
Call Center	14,403	12,816	(1,587)	-12%	74,101	66,800	(7,302)	-11%
Printing and Publications		2,617	2,617	100%	1,022	40,121	39,098	97%
Travel	12,615	18,899	6,283	33%	84,836	50,920	(33,917)	-67%
Conference, Training & Mtng Exp	17,336	12,157	(5,178)	-43%	72,248	65,062	(7,186)	-11%
Interest Expense and Bank Fees			0		1,621	1,774	153	9%
Insurance	7,985	9,927	1,942	20%	41,926	44,446	2,520	6%
Miscellaneous Expenses	21,079		(21,079)		53,830	12	(53,818)	
Dues, Licenses and Fees	9,809	22,305	12,496	56%	41,733	51,151	9,417	18%
<b>TOTAL EXPENSES</b>	<b>12,959,535</b>	<b>13,681,140</b>	<b>721,605</b>	<b>5%</b>	<b>56,149,839</b>	<b>52,954,093</b>	<b>(3,195,746)</b>	<b>-6%</b>
<b>TOTAL REVENUE LESS EXPENSES</b>	<b>(1,950,876)</b>	<b>(2,736,735)</b>	<b>785,858</b>	<b>-29%</b>	<b>12,777,125</b>	<b>14,857,231</b>	<b>(2,080,106)</b>	<b>-14%</b>

Energy Trust of Oregon  
Statement of Functional Expenses  
For the Five Months Ending May 31, 2016  
(Unaudited)

	Energy Efficiency	Renewable Energy	Total Program Expenses	Management & General	Communications & Customer Service	Total Admin Expenses	Avista Development	Total	Budget	Variance	% Var
<b>Program Expenses</b>											
Incentives/ Program Management & Delivery	41,122,602	6,049,046	47,171,648					47,171,648	50,095,353	\$ 2,923,705	6%
Payroll and Related Expenses	1,392,167	416,810	1,808,977	946,182	554,562	1,500,744	6,756	3,316,476	3,578,914	262,438	7%
Outsourced Services	1,614,396	543,494	2,157,890	115,229	309,970	425,198		2,583,089	3,492,139	909,050	26%
Planning and Evaluation	977,166	32,481	1,009,646	722		722		1,010,368	1,049,755	39,387	4%
Customer Service Management	261,693	44,837	306,529					306,529	209,216	(97,313)	-47%
Trade Allies Network	132,938	9,048	141,986					141,986	149,198	7,212	5%
<b>Total Program Expenses</b>	<b>45,500,962</b>	<b>7,095,715</b>	<b>52,596,677</b>	<b>1,062,133</b>	<b>864,532</b>	<b>1,926,664</b>	<b>6,756</b>	<b>54,530,097</b>	<b>58,574,574</b>	<b>4,044,479</b>	<b>7%</b>
<b>Program Support Costs</b>											
Supplies	3,186	1,073	4,259	3,516	1,733	5,249		9,509	14,155	4,646	33%
Postage and Shipping Expenses	1,063	358	1,421	1,704	638	2,342		3,763	4,409	646	15%
Telephone	1,107	373	1,480	605	429	1,034		2,514	7,187	4,673	65%
Printing and Publications	367	12	379	588	14	602		981	39,491	38,510	98%
Occupancy Expenses	83,455	28,107	111,562	45,621	32,301	77,923		189,485	219,391	29,906	14%
Insurance	12,249	4,125	16,374	6,696	4,741	11,437		27,811	31,287	3,476	11%
Equipment	2,163	729	2,892	1,182	837	2,020		4,911	58,634	53,723	92%
Travel	27,159	7,762	34,922	14,570	18,964	33,535		68,456	66,056	(2,400)	-4%
Meetings, Trainings & Conferences	13,908	7,010	20,918	18,977	8,807	27,784		48,701	84,410	35,709	42%
Interest Expense and Bank Fees				1,621		1,621		1,621	1,042	(579)	-56%
Depreciation & Amortization	21,334	7,185	28,519	11,662	8,257	19,920		48,438	49,693	1,255	3%
Dues, Licenses and Fees	23,168	5,183	28,351	3,482	3,730	7,212		35,563	45,479	9,916	22%
Miscellaneous Expenses	52,585	162	52,747	262	268	530		53,277	782	(52,495)	-6713%
IT Services	743,985	98,144	842,129	167,374	115,209	282,584		1,124,712	1,269,024	144,312	11%
<b>Total Program Support Costs</b>	<b>985,729</b>	<b>160,223</b>	<b>1,145,952</b>	<b>277,862</b>	<b>195,929</b>	<b>473,791</b>	<b>0</b>	<b>1,619,742</b>	<b>1,891,040</b>	<b>271,298</b>	<b>14%</b>
<b>TOTAL EXPENSES</b>	<b>46,486,691</b>	<b>7,255,938</b>	<b>53,742,629</b>	<b>1,339,994</b>	<b>1,060,459</b>	<b>2,400,453</b>	<b>6,756</b>	<b>56,149,839</b>	<b>60,465,614</b>	<b>4,315,776</b>	<b>7%</b>

OPUC Measure vs. 8%

5.2%

**ENERGY TRUST OF OREGON**  
**Year to Date by Program/Service Territory**  
**For the Five Months Ending May 31, 2016**  
**Unaudited**

**ENERGY EFFICIENCY**

	PGE	PacifiCorp	Total	NWN Industrial	NW Natural	Cascade	Avista	Oregon Total	NWN WA	ETO Total
<b>REVENUES</b>										
Public Purpose Funding	\$12,586,117	\$9,592,382	\$22,178,499	\$0	\$9,005,560	\$962,658	\$25,200	\$32,171,917	\$0	\$32,171,917
Incremental Funding	18,771,198	9,463,467	28,234,665	1,009,017				29,243,682	768,840	30,012,522
Contributions										
Revenue from Investments										
<b>TOTAL PROGRAM REVENUE</b>	<b>31,357,315</b>	<b>19,055,849</b>	<b>50,413,164</b>	<b>1,009,017</b>	<b>9,005,560</b>	<b>962,658</b>	<b>25,200</b>	<b>61,415,599</b>	<b>768,840</b>	<b>62,184,439</b>
<b>EXPENSES</b>										
Program Management (Note 3)	1,132,484	808,142	1,940,625	60,085	240,696	22,614		2,264,019	42,441	2,306,460
Program Delivery	9,528,692	6,772,478	16,301,172	201,833	2,007,133	184,928		18,695,065	169,619	18,864,684
Incentives	9,772,007	7,169,615	16,941,622	233,597	2,443,434	151,739		19,770,393	156,712	19,927,105
Program Eval & Planning Svcs.	857,936	652,416	1,510,355	18,362	174,096	11,917		1,714,726	28,820	1,743,546
Program Marketing/Outreach	937,049	681,035	1,618,085	7,610	340,309	19,715		1,985,719	16,370	2,002,089
Program Legal Services	0	0	0	0	0	0		0	0	0
Program Quality Assurance	6,202	2,979	9,181	0	1,785	128		11,094	0	11,094
Outsourced Services	129,199	78,075	207,273	695	37,551	2,481		248,000	3,000	251,000
Trade Allies & Cust. Svc. Mgmt.	170,634	131,456	302,089	1,532	74,289	4,083		381,996	12,636	394,632
IT Services	334,443	259,952	594,396	6,147	119,118	7,230		726,892	17,093	743,985
Other Program Expenses - all	103,741	83,759	187,500	2,986	33,370	2,154		226,012	16,084	242,096
<b>TOTAL PROGRAM EXPENSES</b>	<b>22,972,387</b>	<b>16,639,907</b>	<b>39,612,298</b>	<b>532,847</b>	<b>5,471,781</b>	<b>406,989</b>	<b>-</b>	<b>46,023,916</b>	<b>462,775</b>	<b>46,486,691</b>
<b>ADMINISTRATIVE COSTS</b>										
Management & General (Notes 1&2)	572,784	414,892	987,675	13,286	136,431	10,147		1,147,540	11,538	1,159,078
Communications & Customer Svc (Notes 1&2)	453,297	328,341	781,638	10,513	107,970	8,030		908,153	9,131	917,284
<b>Total Administrative Costs</b>	<b>1,026,081</b>	<b>743,233</b>	<b>1,769,313</b>	<b>23,799</b>	<b>244,401</b>	<b>18,177</b>	<b>-</b>	<b>2,055,693</b>	<b>20,669</b>	<b>2,076,362</b>
<b>TOTAL PROG &amp; ADMIN EXPENSES</b>	<b>23,998,468</b>	<b>17,383,140</b>	<b>41,381,611</b>	<b>556,646</b>	<b>5,716,182</b>	<b>425,166</b>	<b>-</b>	<b>48,079,609</b>	<b>483,444</b>	<b>48,563,053</b>
<b>TOTAL REVENUE LESS EXPENSES</b>	<b>7,358,847</b>	<b>1,672,709</b>	<b>9,031,553</b>	<b>452,371</b>	<b>3,289,378</b>	<b>537,492</b>	<b>25,200</b>	<b>13,335,990</b>	<b>285,396</b>	<b>13,621,386</b>
<b>NET ASSETS - RESERVES</b>										
Cumulative Carryover at 12/31/15	23,006,283	7,481,737	30,488,020	1,032,752	6,430,003	229,935		38,180,711	257,872	38,438,582
Change in net assets this year	7,358,847	1,672,709	9,031,553	452,371	3,289,378	537,492	25,200	13,335,990	285,396	13,621,386
<b>Ending Net Assets - Reserves</b>	<b>30,365,130</b>	<b>9,154,446</b>	<b>39,519,573</b>	<b>1,485,123</b>	<b>9,719,381</b>	<b>767,427</b>	<b>25,200</b>	<b>51,516,701</b>	<b>543,268</b>	<b>52,059,968</b>
<b>Ending Reserve by Category</b>										
Program Reserves (Efficiency and Renewables)	30,365,130	9,154,446	39,519,573	1,485,123	9,719,381	767,427	25,200	51,516,701	543,268	52,059,968
Operational Contingency Pool										
Emergency Contingency Pool										
<b>TOTAL NET ASSETS CUMULATIVE</b>	<b>30,365,130</b>	<b>9,154,446</b>	<b>39,519,573</b>	<b>1,485,123</b>	<b>9,719,381</b>	<b>767,427</b>	<b>25,200</b>	<b>51,516,701</b>	<b>543,268</b>	<b>52,059,968</b>

**ENERGY TRUST OF OREGON**  
**Year to Date by Program/Service Territory**  
**For the Five Months Ending May 31, 2016**  
**Unaudited**

	RENEWABLE ENERGY			Avista		TOTAL	Approved budget	Change	% Change
	PGE	PacifiCorp	Total	Development	Other	All Programs			
<b>REVENUES</b>									
Public Purpose Funding	\$3,652,379	\$2,747,989	\$6,400,368	\$21,600	\$0	\$38,593,885	\$38,587,771	\$6,114	0%
Incremental Funding						30,012,522	31,959,734	(1,947,212)	-6%
Contributions						0	0	0	
Revenue from Investments					320,558	320,558	125,000	195,558	156%
<b>TOTAL PROGRAM REVENUE</b>	<b>3,652,379</b>	<b>2,747,989</b>	<b>6,400,368</b>	<b>21,600</b>	<b>320,558</b>	<b>68,926,965</b>	<b>70,672,505</b>	<b>(1,745,540)</b>	<b>-2%</b>
<b>EXPENSES</b>									
Program Management (Note 3)	297,800	118,891	416,691	6,756		2,729,907	3,001,645	271,738	9%
Program Delivery	114,180	63,716	177,896			19,042,580	19,517,877	475,297	2%
Incentives	4,403,299	1,467,850	5,871,150			25,798,255	27,934,294	2,136,039	8%
Program Eval & Planning Svcs.	48,591	18,668	67,259			1,810,805	2,018,547	207,742	10%
Program Marketing/Outreach	92,422	35,755	128,177			2,130,266	2,553,234	422,968	17%
Program Legal Services	1,868	682	2,550			2,550	0		
Program Quality Assurance	0	507	507			11,601	11,111	(490)	
Outsourced Services	118,532	258,950	377,482			628,482	924,500	296,018	32%
Trade Allies & Cust. Svc. Mgmt.	39,451	14,433	53,884			448,516	354,246	(94,270)	-27%
IT Services	70,151	27,993	98,143			842,128	973,510	131,382	13%
Other Program Expenses - all	39,643	22,554	62,198			304,294	364,934	60,640	17%
<b>TOTAL PROGRAM EXPENSES</b>	<b>5,225,937</b>	<b>2,029,999</b>	<b>7,255,938</b>	<b>6,756</b>	<b>-</b>	<b>53,749,384</b>	<b>57,653,898</b>	<b>3,904,514</b>	<b>7%</b>
<b>ADMINISTRATIVE COSTS</b>									
Management & General (Notes 1&2)	130,301	50,615	180,916			1,339,994	1,522,413	182,419	12%
Communications & Customer Svc (Notes 1&2)	103,119	40,056	143,175			1,060,459	1,289,302	228,843	18%
<b>Total Administrative Costs</b>	<b>233,420</b>	<b>90,671</b>	<b>324,091</b>	<b>-</b>	<b>-</b>	<b>2,400,453</b>	<b>2,811,715</b>	<b>411,262</b>	<b>15%</b>
<b>TOTAL PROG &amp; ADMIN EXPENSES</b>	<b>5,459,357</b>	<b>2,120,670</b>	<b>7,580,028</b>	<b>6,756</b>	<b>-</b>	<b>56,149,839</b>	<b>60,465,614</b>	<b>4,315,776</b>	<b>7%</b>
<b>TOTAL REVENUE LESS EXPENSES</b>	<b>(1,806,978)</b>	<b>627,319</b>	<b>(1,179,660)</b>	<b>14,844</b>	<b>320,558</b>	<b>12,777,125</b>	<b>10,206,890</b>	<b>2,570,236</b>	<b>-25%</b>
<b>NET ASSETS - RESERVES</b>									
Cumulative Carryover at 12/31/15	10,144,625	10,910,203	21,054,828		8,739,885	68,233,295	65,564,916	2,668,379	4%
Change in net assets this year	(1,806,978)	627,319	(1,179,660)	14,844	320,558	12,777,125	10,206,890	2,570,235	-25%
<b>Ending Net Assets - Reserves</b>	<b>8,337,647</b>	<b>11,537,522</b>	<b>19,875,168</b>	<b>14,844</b>	<b>9,060,443</b>	<b>81,010,421</b>	<b>75,771,806</b>	<b>5,238,615</b>	<b>7%</b>
<b>Ending Reserve by Category</b>									
Program Reserves (Efficiency and Renewables)	8,337,647	11,537,522	19,875,168	14,844		71,949,980			
Operational Contingency Pool					4,060,443	4,060,443			
Emergency Contingency Pool					5,000,000	5,000,000			
<b>TOTAL NET ASSETS CUMULATIVE</b>	<b>8,337,647</b>	<b>11,537,522</b>	<b>19,875,168</b>	<b>14,844</b>	<b>9,060,443</b>	<b>81,010,421</b>	<b>75,771,806</b>	<b>5,238,615</b>	<b>7%</b>

Energy Trust of Oregon  
Program Expense by Service Territory  
For the Five Months Ending May 31, 2016  
(Unaudited)

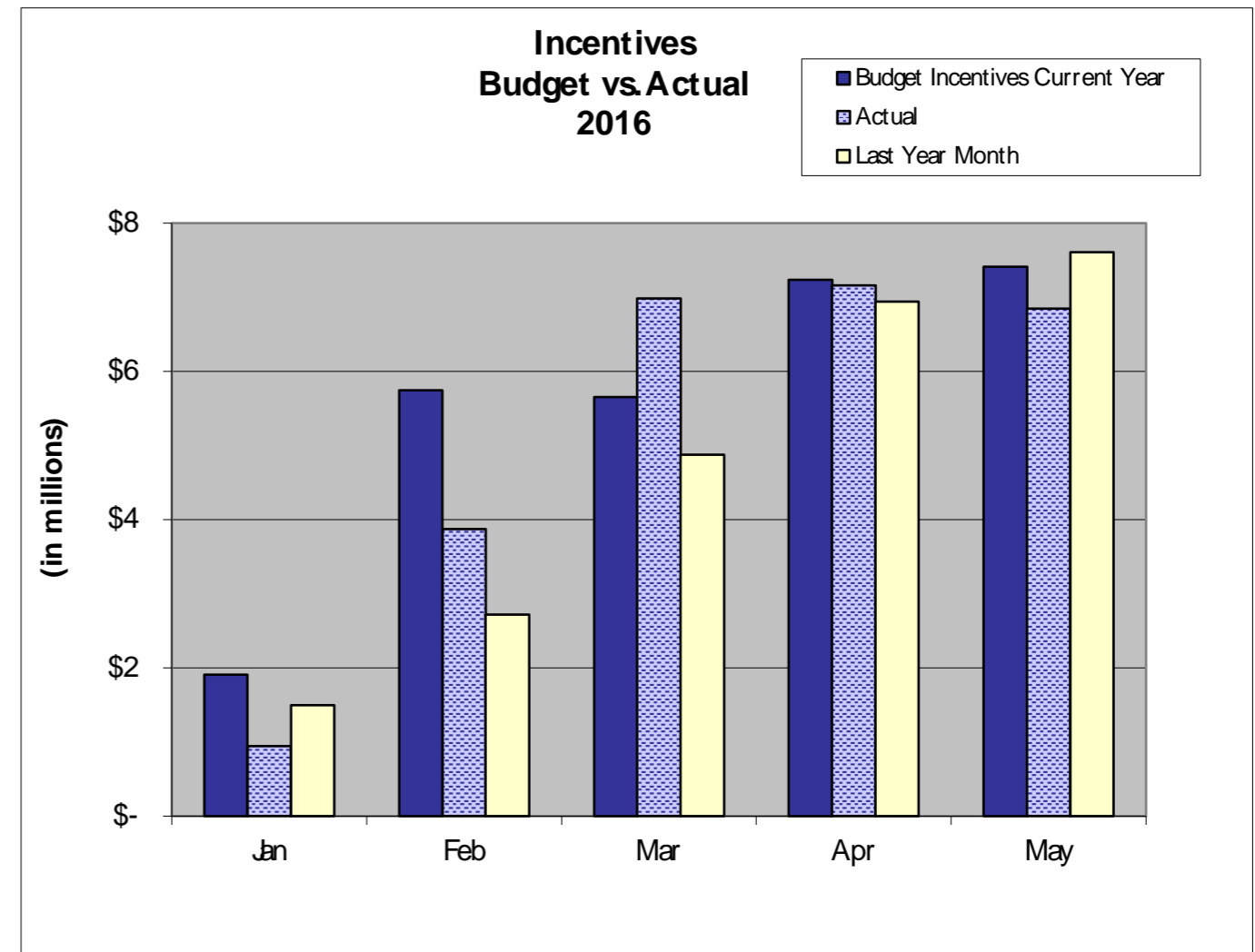
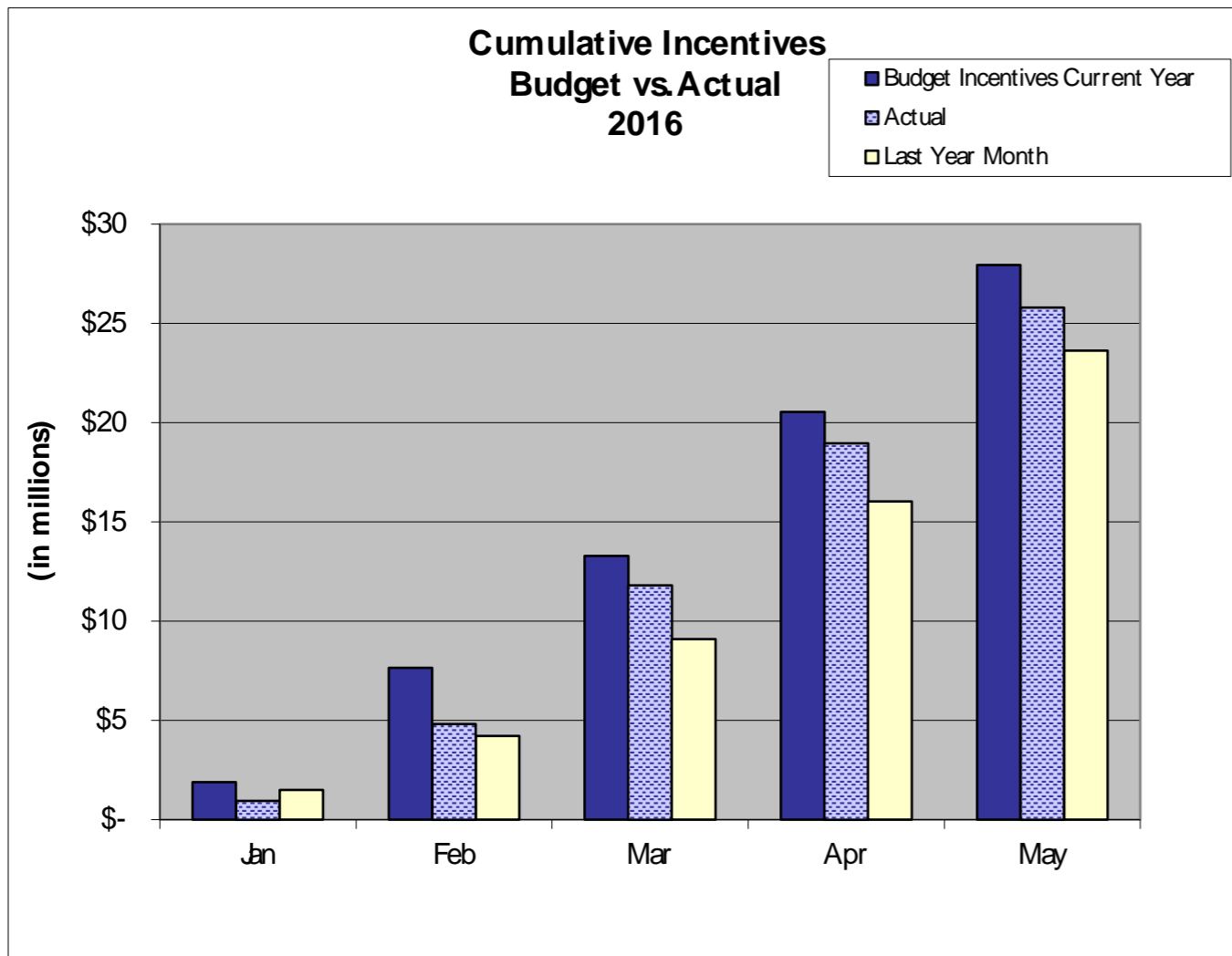
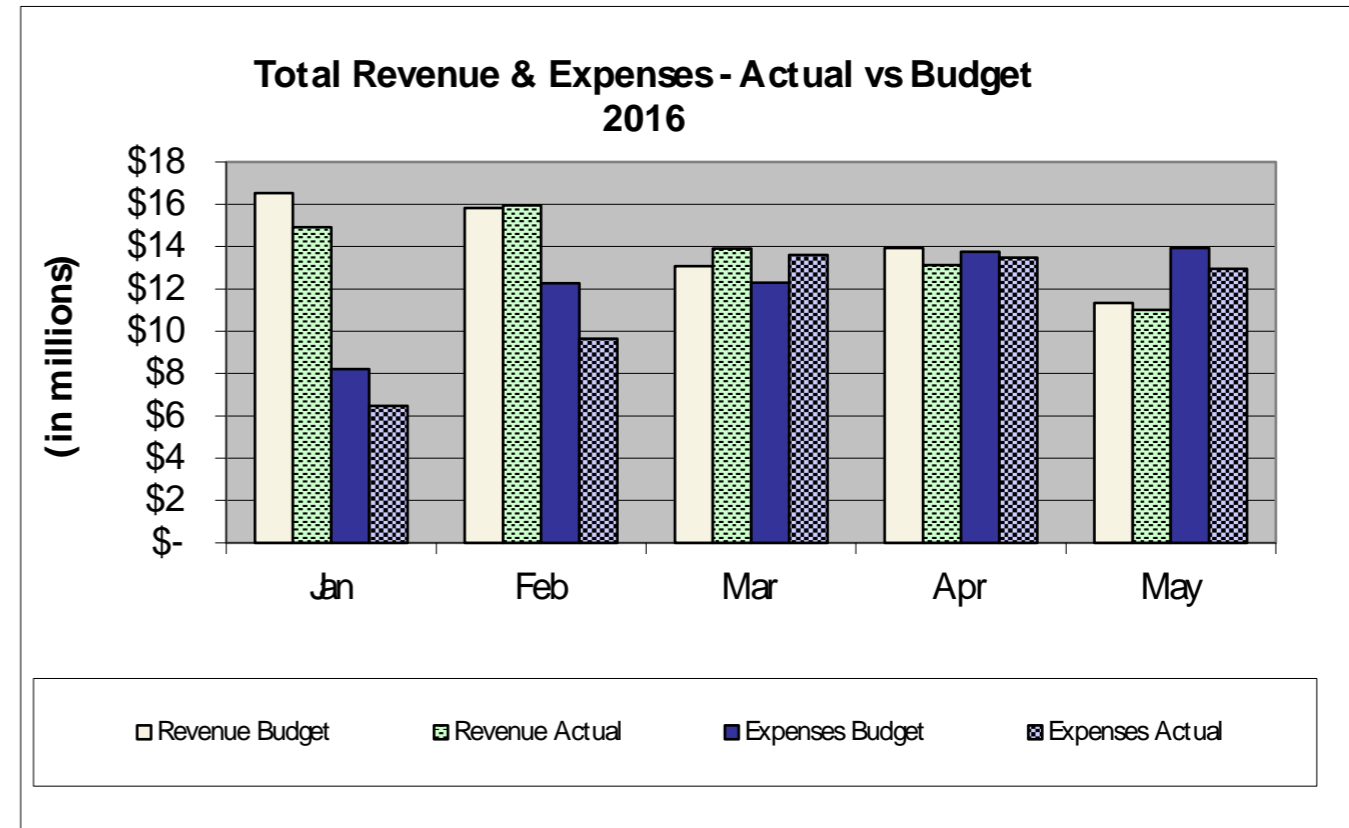
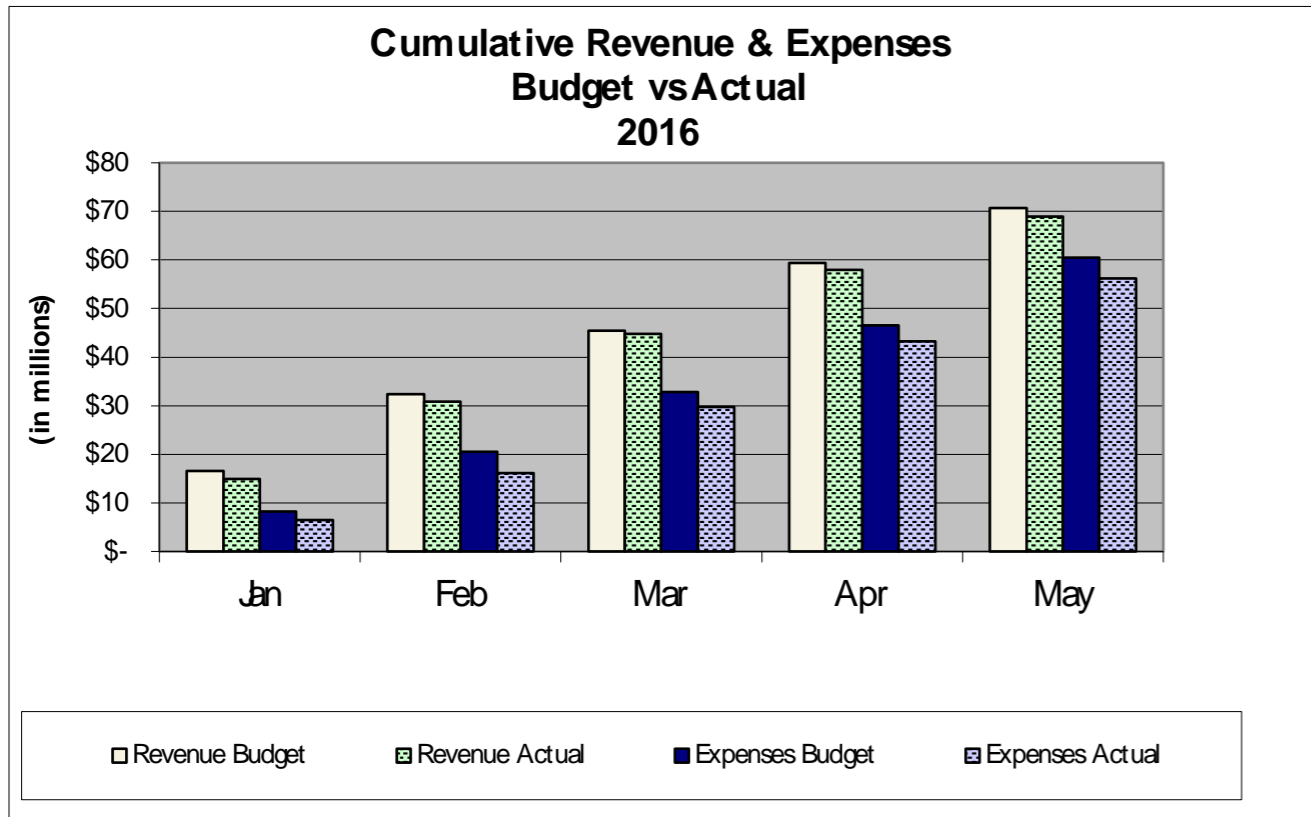
	PGE	Pacific Power	Subtotal Elec.	NWN Industrial	NW Natural Gas	Cascade	Avista	Subtotal Gas	Oregon Total	NWN WA	ETO Total	YTD Budget	Variance	% Var
<b>Energy Efficiency</b>														
<b>Commercial</b>														
Existing Buildings	7,403,382	5,626,457	13,029,840	175,579	1,059,636	71,499		1,306,714	14,336,554	125,650	14,462,204	16,084,306	1,622,102	10%
New Buildings	3,049,401	1,743,210	4,792,611	5,319	636,783	54,158		696,260	5,488,871		5,488,871	5,845,045	356,174	6%
NEEA	575,753	400,100	975,852		83,793	8,971		92,763	1,068,616	9,434	1,078,050	996,191	(81,859)	-8%
<b>Total Commercial</b>	<b>11,028,536</b>	<b>7,769,767</b>	<b>18,798,303</b>	<b>180,898</b>	<b>1,780,212</b>	<b>134,627</b>		<b>2,095,738</b>	<b>20,894,041</b>	<b>135,084</b>	<b>21,029,125</b>	<b>22,925,542</b>	<b>1,896,417</b>	<b>8%</b>
<b>Industrial</b>														
Production Efficiency	3,944,809	3,558,503	7,503,312	375,748	151,910	63,880		591,537	8,094,849		8,094,849	9,083,744	988,895	11%
NEEA	88,925	61,796	150,721						150,721		150,721	181,548	30,827	17%
<b>Total Industrial</b>	<b>4,033,735</b>	<b>3,620,298</b>	<b>7,654,033</b>	<b>375,748</b>	<b>151,910</b>	<b>63,880</b>		<b>591,537</b>	<b>8,245,570</b>	<b>0</b>	<b>8,245,570</b>	<b>9,265,292</b>	<b>1,019,722</b>	<b>11%</b>
<b>Residential</b>														
Existing Homes	2,418,800	2,627,580	5,046,379		1,967,975	87,269		2,055,244	7,101,623	143,138	7,244,761	7,705,198	460,437	6%
New Homes/Products	5,421,001	2,603,592	8,024,594		1,552,129	111,133		1,663,261	9,687,855	175,504	9,863,359	10,722,117	858,758	8%
NEEA	1,096,396	761,904	1,858,299		263,957	28,259		292,216	2,150,515	29,721	2,180,236	1,869,331	(310,905)	-17%
<b>Total Residential</b>	<b>8,936,197</b>	<b>5,993,075</b>	<b>14,929,272</b>		<b>3,784,060</b>	<b>226,661</b>		<b>4,010,721</b>	<b>18,939,993</b>	<b>348,363</b>	<b>19,288,356</b>	<b>20,296,646</b>	<b>1,008,290</b>	<b>5%</b>
<b>Energy Efficiency Costs</b>	<b>23,998,468</b>	<b>17,383,140</b>	<b>41,381,611</b>	<b>556,646</b>	<b>5,716,182</b>	<b>425,166</b>		<b>6,697,996</b>	<b>48,079,609</b>	<b>483,444</b>	<b>48,563,053</b>	<b>52,487,480</b>	<b>3,924,429</b>	<b>7%</b>
<b>Renewables</b>														
Solar Electric (Photovoltaic)	3,841,454	1,401,906	5,243,360						5,243,360		5,243,360	5,317,817	74,457	1%
Other Renewable	1,617,905	718,764	2,336,669						2,336,669		2,336,669	2,660,315	323,646	12%
<b>Renewables Costs</b>	<b>5,459,357</b>	<b>2,120,670</b>	<b>7,580,028</b>						<b>7,580,029</b>		<b>7,580,029</b>	<b>7,978,132</b>	<b>398,103</b>	<b>5%</b>
<b>Program Cost Total</b>	<b>29,457,826</b>	<b>19,503,811</b>	<b>48,961,637</b>	<b>556,646</b>	<b>5,716,182</b>	<b>425,166</b>		<b>6,697,996</b>	<b>55,659,633</b>	<b>483,444</b>	<b>56,143,080</b>	<b>60,465,612</b>	<b>4,322,532</b>	<b>7%</b>
<b>Avista Development</b>							<b>6,756</b>		<b>6,756</b>		<b>6,756</b>		<b>(6,756)</b>	
<b>Cost Grand Total</b>	<b>29,457,826</b>	<b>19,503,811</b>	<b>48,961,637</b>	<b>556,646</b>	<b>5,716,182</b>	<b>425,166</b>	<b>6,756</b>	<b>6,697,996</b>	<b>55,666,389</b>	<b>483,444</b>	<b>56,149,839</b>	<b>60,465,614</b>	<b>4,315,776</b>	<b>7%</b>

**Energy Trust of Oregon**  
**Administrative Expenses**  
**For the 2nd Quarter and Five Months Ending May 31, 2016**  
**(Unaudited)**

<u>EXPENSES</u>	<b>MANAGEMENT &amp; GENERAL</b>						<b>COMMUNICATIONS &amp; CUSTOMER SERVICE</b>					
	<b>QUARTER</b>			<b>YTD</b>			<b>QUARTER</b>			<b>YTD</b>		
	<b>ACTUAL</b>	<b>BUDGET</b>	<b>REMAINING</b>	<b>ACTUAL</b>	<b>BUDGET</b>	<b>VARIANCE</b>	<b>ACTUAL</b>	<b>BUDGET</b>	<b>REMAINING</b>	<b>ACTUAL</b>	<b>BUDGET</b>	<b>VARIANCE</b>
Outsourced Services	\$35,506	\$129,375	\$93,869	\$113,139	\$212,708	\$99,570	\$114,770	\$185,625	\$70,855	\$309,970	\$431,500	\$121,530
Legal Services	575	2,500	1,925	2,090	4,167	2,077						
Salaries and Related Expenses	395,153	579,160	184,007	945,989	960,266	14,277	229,592	387,338	157,746	554,425	645,564	91,138
Supplies	128	1,338	1,210	1,774	2,229	455	180	250	70	500	417	(83)
Postage and Shipping Expenses				1,123		(1,123)	2		(2)	227		(227)
Printing and Publications		1,125	1,125	568	1,875	1,307		550	550		917	917
Travel	6,231	11,987	5,756	14,570	19,979	5,409	10,083	11,250	1,167	18,964	18,750	(214)
Conference, Training & Mtngs	8,915	31,460	22,545	18,977	54,083	35,106	3,982	4,000	18	8,807	6,667	(2,140)
Interest Expense and Bank Fees		625	625	1,621	1,042	(579)						
Miscellaneous Expenses										82		(82)
Dues, Licenses and Fees	2,620	2,175	(445)	3,482	4,805	1,323	1,276	4,000	2,724	3,730	6,667	2,937
Shared Allocation (Note 1)	29,005	51,167	22,163	68,565	85,279	16,715	20,478	35,123	14,645	48,546	58,538	9,992
IT Service Allocation (Note 2)	66,064	106,171	40,107	167,374	175,231	7,857	45,474	72,879	27,405	115,209	120,283	5,074
Planning & Eval	319	456	137	722	749	27						
<b>TOTAL EXPENSES</b>	<b>544,517</b>	<b>917,539</b>	<b>373,022</b>	<b>1,339,994</b>	<b>1,522,413</b>	<b>182,419</b>	<b>425,836</b>	<b>701,015</b>	<b>275,178</b>	<b>1,060,459</b>	<b>1,289,302</b>	<b>228,843</b>

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

Note 2) Represents allocation of Shared IT Costs





For contracts with costs  
through: 6/1/2016

CONTRACTOR	Description	City	EST COST	Actual TTD	Remaining	Start	End
<b>Administration</b>							
<b>Administration Total:</b>			<b>12,736,463</b>	<b>3,462,103</b>	<b>9,274,360</b>		
<b>Communications</b>							
<b>Communications Total:</b>			<b>3,800,404</b>	<b>2,055,705</b>	<b>1,744,699</b>		
<b>Energy Efficiency</b>							
Northwest Energy Efficiency Alliance	Regional EE Initiative Agmt	Portland	33,662,505	9,587,455	24,075,050	1/1/2015	7/1/2020
ICF Resources, LLC	2016 BE PMC	Fairfax	10,380,579	3,786,191	6,594,388	1/1/2016	12/31/2016
CLEAResult Consulting Inc	2016 HES PMC	Austin	6,634,665	2,264,986	4,369,679	1/1/2016	12/31/2016
Northwest Energy Efficiency Alliance	Regional Gas EE Initiative	Portland	6,200,354	757,405	5,442,949	1/1/2015	7/1/2020
CLEAResult Consulting Inc	2016 NBE PMC	Austin	5,868,253	2,382,847	3,485,406	1/1/2016	12/31/2016
Lockheed Martin Corporation	2016 MF PMC	Grand Prairie	4,496,935	1,634,790	2,862,145	1/1/2016	12/31/2018
Ecova Inc	2016 Products PMC	Spokane	3,756,714	1,340,020	2,416,694	1/1/2016	12/31/2016
Energy 350 Inc	PDC - PE 2016	Portland	3,123,000	1,112,271	2,010,729	1/1/2016	12/31/2016
CLEAResult Consulting Inc	2016 NH PMC	Austin	2,868,582	1,093,911	1,774,671	1/1/2016	12/31/2016
Intel Corporation	EE Project Incentive Agmt	Hillsboro	2,400,000	0	2,400,000	11/13/2015	12/31/2019
Portland General Electric	PDC - PE 2016	Portland	2,153,000	839,446	1,313,554	1/1/2016	12/31/2016
Northwest Power & Conservation Council	RTF Funding Agreement		1,825,000	647,560	1,177,440	2/25/2015	12/31/2019
Cascade Energy, Inc.	PDC - PE 2016 Small Industrial	Walla Walla	1,674,518	671,269	1,003,249	1/1/2016	12/31/2016
RHT Energy Inc.	PDC - PE 2016	Medford	1,665,000	656,565	1,008,435	1/1/2016	12/31/2016
Evergreen Consulting Group, LLC	PE Lighting PDC 2016	Tigard	1,371,500	547,294	824,206	1/1/2016	12/31/2016
CLEAResult Consulting Inc	PDC - SEM 2016	Austin	1,356,564	341,984	1,014,580	1/1/2016	12/31/2016
HST&V, LLC	PDC - SEM 2016	Portland	1,185,354	497,551	687,803	1/1/2016	12/31/2016
EnergySavvy Inc.	EnergySavvy Online Audit Tool	Seattle	587,500	581,181	6,319	1/1/2012	5/31/2016
Clean Energy Works, Inc.	EE Incentive & Services Agmt	Portland	492,570	399,150	93,420	7/1/2014	12/31/2016
Cascade Energy, Inc.	SEM Curriculum	Walla Walla	464,080	404,080	60,000	5/1/2014	12/31/2016
SBW Consulting, Inc.	PE Program Impact Evaluation	Bellevue	450,000	2,973	447,028	5/1/2016	4/30/2017
ADM Associates, Inc.	EB 2013/2014 Impact Evaluation	Seattle	422,000	36,871	385,129	1/1/2016	12/31/2016
EnerNoc, Inc.	Commercial SEM curriculum	Boston	360,101	300,323	59,778	6/27/2014	12/31/2016
The Cadmus Group Inc.	PE Impact Eval 2012	Watertown	345,000	345,026	(26)	4/15/2014	6/30/2016
Michaels Energy, Inc.	New Buildings '14 Impact Evalu	La Crosse	325,000	1,185	323,815	5/23/2016	3/31/2017
Craft3	SWR Loan Origination/Loss Fund	Portland	305,000	20,969	284,031	6/1/2014	12/31/2016
Craft3	Loan Agreement	Portland	300,000	100,000	200,000	6/1/2014	6/20/2025
CLEAResult Consulting Inc	2016 HES WA PMC	Austin	289,600	100,826	188,774	1/1/2016	12/31/2016

For contracts with costs  
through: 6/1/2016

Page 2 of 5

EnergySavvy Inc.	Optix Engage Online Audit Tool	Seattle	273,600	0	273,600	6/1/2016	5/31/2018
Pivotal Energy Solutions LLC	License Agreement	Gilbert	270,500	69,861	200,639	3/1/2014	12/31/2017
Alternative Energy Systems Consulting, Inc.	PE Mobile App Scoping Tool	Carlsbad	229,830	0	229,830	6/1/2016	5/31/2017
KEMA Incorporated	Commercial SEM Impact Eval	Oakland	222,000	214,104	7,896	9/1/2015	8/30/2016
Enervee Corporation	Online Marketplace Development	Venice	212,558	90,650	121,908	1/15/2016	8/30/2016
The Cadmus Group Inc.	PE SEM Impact Evaluation	Watertown	203,300	198,043	5,257	5/1/2015	7/31/2016
ICF Resources, LLC	2016 BE NWN WA PMC	Fairfax	200,724	55,891	144,833	1/1/2016	12/31/2016
Balanced Energy Solutions LLC	New Homes QA Inspections	Portland	174,000	43,730	130,270	4/27/2015	12/31/2016
ICF Resources, LLC	2016 BE DSM PMC	Fairfax	122,019	26,913	95,106	1/1/2016	12/31/2016
Hitachi Consulting Corporation	SOW #18 PMC Transition	Dallas	105,000	56,719	48,281	2/1/2016	7/31/2016
ICF Resources, LLC	OSU CHP Performance Monitoring	Fairfax	100,000	66,118	33,883	7/1/2013	6/30/2016
Pivotal Energy Solutions LLC	EPS New Home dbase construct	Gilbert	89,725	81,250	8,475	7/1/2014	6/30/2016
1000 Broadway Building L.P.	Pay-for-Performance Pilot	Portland	88,125	29,375	58,750	10/17/2014	11/1/2018
Illume Advising, LLC	Existing Homes Process Eval	Verona	84,000	34,222	49,778	2/20/2016	11/30/2016
Evergreen Economics	EB Process Evaluation	Portland	73,000	38,345	34,655	11/16/2015	9/30/2016
CLEAResult Consulting Inc	Professional Services/Trans	Austin	70,613	51,185	19,428	10/15/2014	10/15/2016
Research Into Action, Inc.	Multifamily Process Evaluation	Portland	64,717	27,525	37,192	3/18/2016	9/15/2016
The Cadmus Group Inc.	Solar PV Impact Evaluation	Watertown	53,135	41,278	11,857	10/26/2015	8/30/2016
The Cadmus Group Inc.	Existing Homes Pilot Eval	Watertown	53,000	18,565	34,435	2/18/2016	12/31/2017
MetaResource Group	Intel DX1 Mod 1&2 Megaproject	Portland	45,000	12,843	32,157	4/1/2015	5/1/2017
Research Into Action, Inc.	MPower Pilot Evaluation	Portland	43,900	43,011	890	2/1/2015	8/31/2016
Portland General Electric	2016 EE Workshop Sponsorship	Portland	40,000	40,000	0	1/1/2016	12/31/2016
KEMA Incorporated	Billing Analysis Review	Oakland	35,000	0	35,000	3/15/2015	12/31/2016
WegoWise Inc	benchmarking license 2015	Boston	35,000	18,568	16,432	6/15/2014	12/31/2016
Portland State University	Research Plan Development		29,945	14,500	15,445	2/1/2016	7/31/2016
SBW Consulting, Inc.	HVAC Economic Analysis	Bellevue	28,104	5,984	22,120	4/27/2016	8/1/2016
Energy Center of Wisconsin	Billing Analysis Review	Madison	25,000	0	25,000	3/15/2015	12/31/2016
Sustainable Northwest	Klamath PAC Ag Program Aware	Portland	24,992	21,886	3,106	11/1/2015	8/10/2016
MetaResource Group	Pay-for-Performance Pilot Eval	Portland	24,000	19,138	4,862	7/1/2015	6/30/2016
Collaborative Efficiency, LLC	EECLP Utility Outreach	Spokane	20,000	0	20,000	6/1/2016	12/31/2016
Ecotope, Inc.	NB VRF Pilot Evaluation	Seattle	20,000	7,330	12,670	1/1/2016	5/31/2017
MetaResource Group	Paper Plant Impact Evaluation	Portland	20,000	5,403	14,597	10/30/2015	7/30/2016
MetaResource Group	PMC Perf Comp Review	Portland	20,000	5,475	14,525	2/23/2016	9/30/2016
Sheepscot Creative LLC	SEM Videos	Portland	20,000	16,000	4,000	2/12/2016	8/30/2016
Consortium for Energy Efficiency	Membership Dues - 2016		19,392	19,392	0	1/1/2016	12/31/2016

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Northwest Food Processors Association	NW Industrial EE Summit 2016	Portland	18,710	19,027	(317)	1/1/2016	12/31/2016
Clark Public Utilities	Living Wise Kits Coop Agmt	Vancouver	15,000	0	15,000	11/1/2015	12/31/2016
Portland General Electric	Workshop Payment Agreement	Portland	15,000	0	15,000	3/18/2016	12/31/2016
Energy 350 Inc	Professional Services	Portland	14,920	14,920	0	12/10/2014	12/10/2016
Bridgetown Printing Company	January 2016 Bill Insert	Portland	14,677	9,677	5,000	1/1/2016	12/31/2016
BASE zero LLC	Quality Assurance Services	Bend	11,625	3,319	8,306	3/1/2016	12/31/2016
American Council for and Energy Efficient Economy	Intelligent Eff. Baseline		10,000	0	10,000	1/1/2016	12/31/2016
American Council for and Energy Efficient Economy	Smart Buildings		10,000	0	10,000	1/1/2016	12/31/2016
American Council for and Energy Efficient Economy	Small Business EE		10,000	0	10,000	1/1/2016	12/31/2016
Research Into Action, Inc.	Professional Services	Portland	9,590	9,570	20	9/1/2014	8/31/2016
Evergreen Economics	NH Gas Fireplace Survey	Portland	9,020	0	9,020	4/12/2016	7/31/2017
Portland State University	Manufactured Home Decommission		9,020	0	9,020	4/1/2016	6/30/2016
City of Portland Bureau of Planning & Sustainability	Sponsorship - 2016	Portland	8,000	8,000	0	1/1/2016	12/31/2016
Earth Advantage, Inc.	2016 Sponsorship	Portland	7,500	0	7,500	3/1/2016	2/28/2017
Northwest Environmental Business Council	Future Energy Conference 2016	Portland	7,450	3,950	3,500	1/1/2016	12/31/2016
LightTracker, Inc.	CREED Data	Boulder	7,300	7,300	0	8/5/2015	8/4/2016
FMYI, INC	Subscription Agreement	Portland	5,150	5,150	0	4/25/2016	3/1/2017
Social Enterprises Inc.	GoGreen Sponsorship - 2016	Portland	5,000	5,000	0	4/22/2016	12/31/2016
Sustainable Northwest	2015 Sponsorship	Portland	5,000	5,000	0	9/1/2015	9/1/2016

<b>Energy Efficiency Total:</b>	<b>98,296,515</b>	<b>31,918,343</b>	<b>66,378,172</b>
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**Joint Programs**

Portland State University	Technology Forecasting		153,808	126,990	26,818	11/7/2011	12/31/2016
E Source Companies LLC	E Source Service Agreement	Boulder	93,750	93,750	0	2/1/2014	1/31/2017
The Cadmus Group Inc.	Evaluation Consultant	Watertown	90,305	63,209	27,096	6/20/2013	12/31/2016
CoStar Realty Information Inc	Property Data	Baltimore	40,820	31,844	8,977	6/1/2011	5/31/2017
Research Into Action, Inc.	EH Attic Air Sealing Pilot Eva	Portland	30,000	30,000	0	10/8/2014	9/30/2016
Pinnacle Economics Inc	2015 Economic Impact Study	Camas	24,610	24,610	0	3/2/2016	6/30/2016
Excidian LLC	Business Finance Class	Wheeling	18,706	0	18,706	5/15/2016	8/1/2016
American Council for and Energy Efficient Economy	ACEEE Conference 2016		10,286	10,286	0	5/9/2016	8/31/2016

<b>Joint Programs Total:</b>	<b>462,285</b>	<b>380,688</b>	<b>81,597</b>
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**Renewable Energy**

Clean Water Services	Project Funding Agreement		3,000,000	1,013,106	1,986,894	11/25/2014	11/25/2039
JC-Biomethane LLC	Biogas Plant Project Funding	Eugene	2,000,000	1,500,000	500,000	10/18/2012	10/18/2032
Steel Bridge Solar, LLC	Project Funding Agreement	Seattle	2,000,000	1,000,000	1,000,000	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

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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	900,000	100,000	4/25/2012	9/30/2032
Farmers Irrigation District	FID - Plant 2 Hydro	Hood River	900,000	450,000	450,000	4/1/2014	4/1/2034
Farmers Conservation Alliance	Irrigation Collaboration Initi	Hood River	633,000	529,455	103,545	1/2/2015	12/31/2016
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	355,412	0	5/15/2014	12/31/2034
City of Gresham	City of Gresham Cogen 2		350,000	334,523	15,477	4/9/2014	7/9/2034
Clean Power Research, LLC	PowerClerk License	Napa	231,253	228,583	2,670	7/1/2014	6/30/2016
Henley KBG, LLC	Henley Proj Dev Assistance	Reno	150,000	43,683	106,318	4/10/2014	12/31/2016
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	12/31/2016
Gary Higbee DBA WindStream Solar	Solar Verifier Services	Eugene	100,000	87,800	12,200	8/1/2014	7/31/2016
Sunflower Energy Solutions, Inc	Solar Verifier Services	Terrebonne	100,000	21,070	78,930	1/12/2016	7/31/2016
Wallowa Resources Community Solutions, Inc.	Upfront Hydroelectric Project		100,000	39,463	60,538	10/1/2011	10/1/2016
Solar Oregon	2015 Outreach Agreement	Portland	72,800	38,800	34,000	1/1/2015	12/31/2016
Kendrick Business Services LLC	Solar TA Business Consulting	Albany	64,200	44,640	19,560	10/8/2015	12/31/2016
SPS of Oregon Inc	Project Funding Agreement	Wallowa	60,000	488	59,513	10/15/2015	10/31/2036
State of Oregon Dept of Geology & Mineral Industries	Lidar Data	Portland	40,000	40,000	0	11/7/2014	12/1/2016
Clean Energy States Alliance	CESA Membership		39,500	39,500	0	7/1/2015	6/30/2016
Glenna R Wiseman	Solar Marketing Curriculum	Redlands	36,500	39,500	(3,000)	10/20/2015	7/31/2016
University of Oregon	UO SRML Contribution - 2016	Eugene	24,999	25,000	(1)	3/9/2016	3/8/2017
Wallowa Resources Community Solutions, Inc.	Renewables Field Outreach		24,999	675	24,324	2/1/2016	1/30/2018
Robert Migliori	42kW wind energy system	Newberg	24,125	21,673	2,452	4/11/2007	1/31/2024
Oregon Clean Power Cooperative	Grant Agreement	Corvallis	17,000	17,000	0	6/15/2015	6/30/2016
Oregon Solar Energy Industries Association	Solar Technical Training Class	Portland	13,500	0	13,500	12/10/2015	12/31/2016
Warren Griffin	Griffin Wind Project	Salem	13,150	9,255	3,895	10/1/2005	10/1/2020
Oregon Solar Energy Industries Association	Sponsorship 2016	Portland	7,500	7,500	0	1/1/2016	12/31/2016
Clean Energy States Alliance	2016 CESA ITAC Sponsorship		5,000	5,000	0	1/1/2016	12/31/2016
Bonneville Environmental Foundation	REC/WRC Purchase 2016	Portland	2,430	0	2,430	1/1/2016	12/31/2016
<b>Renewable Energy Total:</b>			<b>16,444,562</b>	<b>10,557,613</b>	<b>5,886,949</b>		

For contracts with costs  
through: 6/1/2016

<b>Grand Total:</b>	131,740,229	48,374,452	83,365,777
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## **Financial Glossary**

(for internal use) - updated May 31, 2016

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### **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 unmodified or modified regarding specific items. Energy Trust strives for and has achieved in all its years an unmodified opinion.
- An unmodified 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 unmodified opinion regarding Energy Trust's financial statements.
- 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.

**Project Tracking Projects Forecasting**

Module developed in Project Tracking system (PT) 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 second 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 PT. 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 Strategic Energy Management programs, where some level of tracking of particular sites and participants is part of the program design.
- Lighting, hot water, and energy control devices through retailer buy down, on line fulfillment, and direct installation.

**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 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

June 23, 2016, 3:30–5:00 pm

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## Attending by teleconference

Ken Canon, Roger Hamilton, John Reynolds, Eddie Sherman

## Attending at Energy Trust offices

Amber Cole, Margie Harris, Jed Jorgensen, Betsy Kaufman, Oliver Kesting, Steve Lacey, Dave Moldal

## Policies for Review

No policies to review.

## Board meeting presentation previews

### Existing Buildings Program Management Contractor Recommendation

The Policy Committee reviewed a staff recommendation for a new Existing Buildings Program Management Contractor. The contract includes management of the Existing Buildings program, including commercial Strategic Energy Management and Pay for Performance initiatives. Energy Trust received two proposals for the contract, from Lockheed Martin and ICF International. The selection committee, which included six internal staff members and two external participants, unanimously recommended ICF based on the strengths of its proposal, team, cost, energy savings, and diversity policies of PMCs and subcontractors. The committee supported the staff recommendation.

### Opal Springs Hydropower Project

Staff briefed the Policy Committee on an Incentive Funding Agreement to the Deschutes Valley Water District. The project will offset the above-market cost of upgrading the district's existing Opal Springs Hydropower Project on the Crooked River to increase hydropower generation by approximately 3,200 megawatt hours annually. The project will feature installation of inflatable weir and a fish ladder to facilitate fish passage. The project will generate Renewable Energy Certificates that can count toward the Regional Portfolio Standard. Staff proposed an incentive of \$750,000 based on an above-market cost estimate of \$834,000. If approved, construction is expected begin in spring 2017 and the project could be operational by the end of November 2018. Project strengths include the presence of an existing hydropower system, municipal ownership, access to equity, few risks and support from government agencies and nonprofit organizations. The Policy Committee discussed potential impacts on water evaporation, power needed to inflate weirs and species of fish impacted. The Policy Committee expressed enthusiasm for the project.

## Brief Updates

Staff provided brief updates to the committee on: an executive director transition plan and preparations, a plan to transition Energy Trust's Northwest Energy Efficiency Alliance board representation to new executive director at the end of 2016, intent to develop written guidelines to evaluate and support board member training opportunities and conference attendance, anticipated litigation between two former trade allies that may require testimony of Energy Trust staff, and evaluation of legal considerations for program offerings for legal marijuana operations.

## Adjourn

The meeting adjourned at 4:35 pm. The next meeting of the Policy Committee is scheduled for September 8, 2016.

TAB 6

## Renewable Energy Advisory Council Meeting Notes

June 22, 2016

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### Attending from the council:

JP Batmale, Oregon Public Utility  
Commission  
Jason Busch, Oregon Wave Energy Trust  
Shaun Foster, Portland General Electric  
Suzanne Leta-Liou, SunPower  
Michael O'Brien, Renewable Northwest  
Rikki Seguin, Environment Oregon  
Frank Vignola, Solar Monitoring, University  
of Oregon  
Dick Wanderscheid, Bonneville  
Environmental Foundation

### Attending from Energy Trust:

Chris Dearth  
Sue Fletcher  
Matt Getchell  
Fred Gordon  
Jeni Hall  
Jed Jorgensen

Betsy Kauffman  
Ted Light  
Dave McClelland  
Dave Moldal  
Lizzie Rubado  
Jay Ward  
Peter West  
Lily Xu

### Others attending:

Erik Anderson, Pacific Power  
Stasia Brownell, 3Degrees  
Andria Jacob, City of Portland  
Caroline Moore, Pacific Power  
Les Perkins, Farmers Conservation Alliance  
Rhonda Rasmussen, Pacific Power  
John Reynolds, Energy Trust board  
Adam Schultz, Oregon Department of  
Energy  
Jaimes Valdez, Northwest SEED

### 1. Welcome, introductions, updates

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](http://www.energytrust.org/About/public-meetings/REACouncil.aspx).

Lizzie Rubado introduced her new role as program strategies manager. She will work across the renewable energy sector on project management, strategy and strategic communications.

Chris Dearth announced that the small wind program will transition from a standard program to a custom program similar to Other Renewables technologies. Trade allies have been notified.

Betsy announced that the Irrigation Modernization program has received the State Leadership in Clean Energy award from the Clean Energy States Alliance. This is a prestigious national honor recognizes the Irrigation Modernization program.

Betsy announced that Energy Trust hired a new executive director, Michael Colgrove, formerly with the New York State Energy Research and Development Authority.

### 2. Opal Springs Hydropower Project

Jed Jorgensen: The Opal Spring Hydropower Project resulted from a competitive solicitation in January. As of yesterday, Pacific Power proposed changes to its Schedule 37 rates. The proposed rates have not yet been approved by the Oregon Public Utility Commission. The changed rates have potential ramifications for the above-market cost calculations that Dave Moldal will walk through. The change will need to be considered over the next few months and



will raise questions. The prices are higher than the prices we modeled, though we did look at a range. We expect that the new rates may benefit this project.

Dave Moldal: This project involves increasing the head on an existing dam on the Crooked River in Central Oregon. We have provided project development assistance to this site in the past. The project has significant strengths and few risks.

In assessing the project's above-market costs, we reduced the overall project cost by separating capital costs supporting fish passage from costs required for generating additional energy. Capital costs with both a fish passage and energy component were reduced by 50 percent. Where the costs were required purely for energy production, we kept those costs in at 100 percent.

Our incentive proposal exceeds \$500,000 and will require board approval. It also includes claim to 100 percent of the incremental Renewable Energy Certificates. The project includes installation of inflatable weirs, a fish ladder and six feet of increased head.

Owned by Deschutes Valley Water District, the project is expected to result in additional energy production of 3,200 megawatt hours per year, based on an energy assessment by Energy Trust and reviewed by Evergreen Associates.

Fish passage was not required when the project was originally built. The dam has a Federal Energy Regulatory Commission license that expires in 2032. If the project does not address fish passage, that license will likely not be renewed. A 2012 settlement agreement paved the way for fish passage and relicensing to occur. Additionally, the project owners will plan to apply for Low Impact Hydropower Institute, LIHI, certification. This will allow the project to produce Renewable Energy Certificates eligible to count toward Oregon's Renewable Portfolio Standard.

Based on capital costs of \$3.5 million, the above-market cost was determined to be \$954,000. Energy Trust proposes a \$750,000 incentive and requests 64,540 Renewable Energy Certificates over five years. The energy value is \$2.04 million per average megawatt. Construction is expected in summer 2017, with commissioning expected in November 2018.

Dick Wanderscheid: Are all Renewable Energy Certificates eligible once LIHI certification is received?

Dave Moldal: Yes.

Michael O'Brien: How do you get LIHI certification?

Jed: LIHI is a third-party entity with an application process. They evaluate the environmental impacts of the facility and make a determination.

Michael: Do you have claims for any of the other Renewable Energy Certificates?

Jed: No.

Dick: How long do the weirs last? Do they stay in?

Les Perkins: They stay in, are very strong and last a long time. They lay flat when not in use.

Jed: We look at projects with multiple benefits all the time. Our mandate is to support energy generation, so we have to consider what costs we can assign related to the energy benefits. We have done this in the past, such as with the Three Sisters Irrigation District project.

Dick: Why are the interconnection fees higher?

Dave Moldal: We increased interconnection fees based on our experience with other projects. Pacific Power may require this fee as they renew the power purchase agreement.

Jed: With old interconnects, there are costs for changes based on safety. We think that there may be communications equipment costs.

Suzanne Leta-Liou: The above-market costs are in the mid-range. Why do you think that is?

Dave Moldal: We removed fish passage costs, which reduced project costs from \$8.8 to \$3.5 million.

Jed: The projects listed for comparison represent differing market conditions, especially with regard to tax credit availability. This results in above-market cost differences.

Rikki Seguin: Is the 8 percent discount rate standard?

Betsy: We make a decision based on the level of risk associated with the project and the reasonable rate of return. For municipal projects, this is standard and we check with outside reviewers to see if this is the right rate.

Dave McClelland: This turbine has been running for 30 years. What is its life span?

Jed: It is not uncommon for a turbine to last 50 or more years with good maintenance.

Dick: Do we know that the Pelton Round Butte fish passage is successful?

Dave Moldal: Yes.

Dick: How much more fish passage will be opened up?

Dave Moldal: All the way to Prineville.

Eric Anderson: Is there concern that the federal judge might require other fish passage upgrades related to the Columbia River system?

Jed: There is an adaptive management provision and they have to work with agencies over time to resolve any issues that arise.

Peter West: Oregon Department of Fish and Wildlife is supportive.

Michael O'Brien: This is a good project. This work increased the capacity factor and Energy Trust is paying 100 percent of the interconnection cost. Is there a case for more Renewable Energy Certificates for Energy Trust?

Jed: The fish passage and LIHI certification helps with generation, but it is a little complex because we are not looking at the revenue and costs of those elements. It might be hard to tease them apart.

Dave McClelland: There are new banking rules with the Regional Portfolio Standard. Are there any impacts to this project?

Jed: I don't know.

Erik Anderson: If the project owners choose the new rate, do the Renewable Energy Certificates transfer to the utility?

Jed: The first question is if they take the new rates, does this project still have above-market costs? The second piece is based on the renewable energy rates. Our above-market cost calculations say that we should compare to brown power prices. The standard rates are brown. These are renewable energy rates. Our renewable energy credits are shared with the utilities for Regional Portfolio Standard compliance. There are some complications to work through.

Dick: Will this go to the board at the next meeting?

Jed: We will probably present but with a contingency based on decisions to be made and potential changes to the project details, and with an off-ramp based on impacts to the above-market cost.

### **3. Renewable energy opportunities discussion**

Betsy introduced the renewable energy opportunities discussion as part of the sector's planning work. This work was requested by the OPUC. Five renewable energy sector opportunities have been identified for the next three to five years, including resilience and hazard mitigation; location-specific deployment; food waste planning; diversity and broadening the customer base; and grid modernization and distribution planning.

Renewable Energy Advisory Council members broke into small groups to discuss these opportunities and identify additional opportunities. Small groups identified several additional opportunities, including community solar; diversity in relation to trades and rural communities; electrification of vehicles; upstream focus on municipalities and driving renewable markets; load shape of Other Renewables; developing a clearing house for renewable technology; research, development and demonstration; wave energy; more scale in the market, specifically commercial solar over 300 kilowatt hours; cannabis cultivation assessment for renewable energy development; and load growth drivers.

Council members suggested combining resilience and hazard mitigation, location-specific deployment and grid modernization and distribution planning into one opportunity. Members shared feedback on the several identified opportunities.

Members saw research, development and demonstration as important, but only if it helps leverage other funding. They wondered if project development assistance dollars could be applied for evaluations, such as for wave technology.

Members suggested that the commercial market for solar is farther away from being transformed than residential.

There was also discussion of the cannabis industry. Members suggested conducting a resource assessment of that industry as it relates to renewables.

For grid modernization, members saw opportunity to test some things out with the utilities. Some data will be needed.

Members saw diversity as an important opportunity for focus. Energy Trust could leverage its expertise in marketing and creating access to customers.

Council members saw resilience an important opportunity and believe that there is a gap. They suggested that there needs to be a clear definition of the term. The City of Portland is working to pull together its own plan, as are others. This is a gap that needs to be understood to determine Energy Trust's role.

### **4. Public comment**

There was no additional public comment.

### **5. Meeting adjournment**

The meeting adjourned at noon. The next Renewable Energy Advisory Council meeting is scheduled on July 27.

## Conservation Advisory Council Meeting Notes

June 22, 2016

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### Attending from the council:

Jim Abrahamson, Cascade Natural Gas  
JP Batmale, Oregon Public Utility  
Commission  
Warren Cook, Oregon Department of  
Energy  
Wendy Gerlitz, Northwest Energy Coalition  
Julia Harper, Northwest Energy Efficiency  
Alliance  
Garrett Harris, Portland General Electric  
Don Jones, Jr., Pacific Power  
Don MacOdrum, Home Performance Guild  
of Oregon  
Tyler Pepple, Industrial Customers of  
Northwest Utilities  
Stan Price (by phone), Northwest Energy  
Efficiency Council  
Gary Smith (for Brent Barclay), Bonneville  
Power Administration

### Attending from Energy Trust:

Mike Bailey  
Amber Cole  
Kim Crossman  
Phil Degens  
Sue Fletcher  
Fred Gordon  
Steve Lacey  
Ted Light  
Spencer Moersfelder  
Thad Roth  
Julianne Thacher  
Jay Ward  
Peter West

### Others attending:

Dave Backen, Evergreen Consulting  
Mike Christianson, Energy 350  
Bill Henry, EQL Energy  
Bob Stull, CLEAResult  
Adam Shultz, Oregon Department of Energy

### 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](http://www.energytrust.org/About/public-meetings/CACMeetings.aspx).

### 2. Announcements and old business

April and May meeting notes were approved with one correction to the May notes. Allison Spector, not Alison Gowdon, attended from Cascade Natural Gas in May.

Tyler Pepple: On page five, the May notes feature a potential cap of 20 megawatts. Is that average megawatts or megawatt hours.

Warren Cook: That cap didn't actually make it into the bill.

### 3. Senate Bill 838 large customer funding restrictions compliance study results

Ted Light, senior planning project manager, presented the results of Energy Trust's compliance study for large customer funding restrictions stipulated in SB 838, passed by the Oregon Legislature in 2007. SB 838 stated that customers using more than 1 average megawatt of electricity are exempt and should receive no direct benefit from additional funding for cost-effective energy efficiency above the portion Energy Trust receives of the 3 percent public purpose charge outlined in SB 1149.

To determine if Energy Trust is under the threshold for funding large customers, staff calculated a cumulative average incentives to large customers as a percentage of SB

1149 revenue in pre- and post-SB 838 periods. The cumulative average spending for large customers is well under the spending threshold in Pacific Power territory and slightly under the threshold in PGE territory.

Garrett Harris asked roughly what percentage of large customers are industrial and commercial. Ted responded that it's roughly 80 percent industrial and 20 percent commercial.

JP Batmale: Does Energy Trust expect to exceed the incentive cap at the end of 2016?

Kim: If Energy Trust exceeds goals, it is likely to exceed this threshold. A small number of very large projects can have a big impact on annual outcomes.

Wendy Gerlitz: What happens if Energy Trust exceeds the cap?

Ted: Energy Trust will have three years to bring the cumulative average below the cap.

Kim: Several years ago when we thought this was imminent, we laid out several options to reduce spending for large customers. We would probably lower the cap for self-direct customers and create a cap for large customers. These changes would not impact customers using less than 1 aMW. Any of these changes would lead to a reduction in Energy Trust's overall energy goals. We also need to consider different changes for Pacific Power and PGE territories because reduction in spending on large customers would only be needed in PGE territory. If we make these kinds of changes, the board and Conservation Advisory Council members will be involved.

Don MacOdrum: Are all of these projects cost effective?

Kim: Correct, these are very cost-effective projects.

Garrett Harris: The baseline was established years ago, correct?

Kim: Yes. The baseline is lower in PGE territory because it took longer for Energy Trust programs to develop there, so early savings were low. This means we have a lower cap in PGE territory.

Tyler: Is the report available?

Ted: Yes, the reports are available in the Conservation Advisory Council June packet online.

Tyler: It's good that we're not at the cap, but the corollary of that is we didn't get as much savings as we could have from those customers.

#### **4. Commercial Pay for Performance pilot and offering**

Sam Walker, commercial senior project manager, presented Energy Trust's Pay for Performance pilot results and expansion plans.

Historically, Energy Trust had limited operations and maintenance and behavioral offerings for commercial customers. In 2011, the state legislature directed the Oregon Public Utility Commission to submit a report on energy-efficient power purchase agreements by the end of 2012, which led to the OPUC docket UM 1573 and a subsequent report. The report stated that Energy Trust and the OPUC would continue to explore opportunities for pilots.

Based on OPUC feedback and input from the public, Energy Trust issued a request for proposals to develop a Pay for Performance pilot in 2014.

The objectives of Energy Trust's Pay for Performance pilot were to encourage broader customer participation, deeper retrofits and greater persistence of savings. In addition,

Energy Trust sought to gain knowledge of whole-building analysis tools, implementation and verification costs, operations and maintenance and behavioral strategies that enhance commercial Strategic Energy Management, administrative management strategy and long-term potential for acquiring additional savings.

Sam described how the Pay for Performance pilot worked, including payment of performance-based incentives annually over three years. Participants were encouraged to implement a blend of operations and maintenance, behavioral and capital energy-efficiency investments. Energy Trust negotiated incentives based on the mix of measures implemented. Energy Trust required a whole-building modeling approach and a respondent-proposed modeling platform that was transparent to evaluators.

Energy Trust selected one pilot participant, the 1000 Broadway Building in Portland. The building was ENERGY STAR® certified. Energy 350 did the energy modeling through a contract with the customer.

Don MacOdrum: How many proposals were submitted?

Sam: Six.

Don MacOdrum: How many were you open to approving?

Sam: Three to five.

Oliver Kesting, commercial sector lead: Four of the applications were not cost effective. One application included one measure that was not cost effective. Energy Trust negotiated an exception with the OPUC for that measure, but the customer later decided not to participate.

Garrett: What does the market look like going forward? It seems like there are a lot of barriers to recruiting participants.

Sam: The measure mix for 1000 Broadway included operations and maintenance and capital improvements, but no behavioral improvements. Capital measures were primarily for variable speed drives on pumps. The customer requested an incentive of 5 cents per kWh of savings per year. Energy Trust added a cap on the total incentives.

Warren: What year was 1000 Broadway built?

Don Jones: The 1990s.

Sam: The year-one performance period ended in December 2015. The customer estimated 550,000 kWh in its proposal and achieved savings of 778,000 kWh. This is a 16 percent total reduction in the building's energy use. In the first year, Energy Trust paid \$29,000 in incentives, roughly 11 cents per kWh over three years. Project costs were less than expected.

Don MacOdrum: How would you have structured the incentives for a different measure mix, such as primarily capital upgrades?

Sam: We calculated the incentive rate based on the blended measure mix.

Don Jones: The rate is set upfront and can't be renegotiated if the measure mix changes?

Oliver: We had a disclaimer that we could renegotiate if the mix changed dramatically.

Don MacOdrum: Does the length of payment period impact the incentive offering?

Oliver: Yes.

Sam: For operations and maintenance, we are still evaluating the measure life. We worked with Planning to extend the measure life to five years for operations and maintenance measures.

Gary Smith: Do the customers cost share?

Sam: Yes. Incentives were allowed to cover up to 100 percent of the implementation costs.

JP: Is the payment from the customer to Energy 350 part of the cost share?

Oliver: Yes, that was built into the proposal.

Don MacOdrum: If the customer pays nothing, then the participant cost is zero. How do you achieve cost-effectiveness?

Oliver: I think the customer paid some portion of the capital upgrade costs. We will follow up with more information.

Sam described the lessons learned from the pilot. The approach appears to work. The customer is happy and so is the service provider. The market is interested.

However, negotiated incentives add complexity. Energy Trust has alleviated some of the complexity by going to a five-year measure life for operations and maintenance. Similar offerings, like operations and maintenance, should be aligned with Pay for Performance. Energy Trust also seeks to better understand the measure life after three years of visibility.

Sam offered recommendations from Energy Trust's Evaluation team, which include expanding the potential building market by reducing savings targets and including other building types, reducing the reporting frequency from monthly to quarterly, making the request for proposals and contracting language more transparent and using lay terms where possible, and cross-marketing incentives for capital measures through Pay for Performance.

Sam described Energy Trust's expansion plans for this offering. Staff aim to recruit up to five additional projects in late 2016. Staff will use a Program Management Contractor approach, prequalify service providers and specify simple regression analysis. Energy Trust will establish incentive rates rather than negotiate rates with the customers, and will align incentives with other measures. Finally, the measures will be limited to operations and maintenance and behavioral.

Wendy: These high-level results are encouraging. In talking to potential customers, it seems like having one simple approach for the building owner is important. I think capital upgrades should not be excluded, and I'd like to revisit that decision. I also think we should revisit the three-year timeframe constraint. Lengthening the payback period could alleviate customer concerns about cost differences between operations and maintenance and capital investments.

Kim: Is the constraint about extending our ability to pay customers over more than three years?

Oliver: Yes. I know a 10-year payback period would help alleviate cost differences between operations and maintenance and capital. However, we still have the same levelized cost targets. If we extend payment over 10 years, we would pay 1.5 cents per kWh. Is that enough to motivate customers? Also, we already have successful offerings to incent capital investments.

Wendy: Our construct for energy-efficiency programs is based on a single measure approach. The Northwest Energy Coalition is wondering if this new blended model could attract new customers who are not currently participating. I think you should add this as an additional offering rather than use it to replace existing offerings. There's value in the new approach, and it can't be compared to our current measure by measure approach. I think by divorcing the operations and maintenance from the capital incentives, you make this a less appealing offering for customers.

Oliver: We're not reverting back. We're just delivering the offering differently. Since we know we probably won't be able to deliver incentives over 10 years, why not deliver capital incentives upfront and operations and maintenance and behavior incentives over time? Also, if Energy Trust pays incentives to the service provider, the service provider can distribute incentives over however many years the customer wants.

Stan Price: Congratulations on a successful pilot. First, I second the points Wendy made. They're consistent with the point of view of Northwest Energy Efficiency Council. Energy Trust should think about new delivery methods and not stick to how we've done things in the past. My second point is that while 10 years is too long and three years is too short, somewhere in between may be viable, maybe seven or eight years. Extending the payment period could alleviate Energy Trust's concerns about overpaying in early years based on savings estimates. Third, this pilot exceeded expectations and energy-savings estimates in a building that seems like it would not have had a lot of conservation potential left. It's bewildering to redesign the program given that the pilot worked so well. The open-endedness of the program was key to the success.

Oliver: Our design is meant to respond to some of the complications regarding the contract negotiation brought on by the blended measures. Removing capital simplifies the application process for customers and streamlines administrative work for Energy Trust.

Julia Harper: What kind of customers would be best suited to Pay for Performance rather than SEM?

Oliver: We have three types of operations and maintenance offerings. First is retrocommissioning, which is about specific measures or pieces of equipment. The second is SEM, which is a longer-term commitment for larger customers with multiple buildings. Pay for Performance fills the niche of single buildings that are too small or lack the organizational infrastructure to invest in SEM.

Don Jones: I was involved in the initial docket. I was expecting this to suit a building that needed more capital upgrades and could blend them with operations and maintenance. I would like to engage these customers to help them make a great leap forward.

Garrett: What does the market look like? How small can the buildings be to participate in this program? How many eligible and high-potential buildings are out there?

Oliver: For the pilot, eligible buildings were 50,000 square feet or larger. I don't think we would want to engage buildings less than 50,000 square feet.

Sam: The City of Portland's new energy reporting policy is also for buildings of 50,000 square feet and greater. There are roughly 450 of these buildings in Portland.

Tyler: How did you promote the request for proposals?

Oliver: Through our website and PMCs. We also asked service providers to recruit participants.

Don MacOdrum: I echo Stan and Wendy. It doesn't make sense to exclude capital projects. One of your objectives was to encourage deeper retrofits. What kind of savings persistence are you seeing?

Oliver: We'll know more in years two and three of the pilot.

Sam: For some operations and maintenance measures that only require a single human intervention like relocating a sensor, we know savings will persist for many years.

Oliver: For SEM, we do have evidence that operations and maintenance savings persist for longer than three years.



Tony Galluzzo, McKinstry: I'm thinking about differences between owner managed buildings and third-party managed buildings. For third-party managers, turnover negatively impacts savings persistence. Of the 450 Portland buildings, how many of them are third-party managed? In addition, having an experienced building engineering staff will also impact a building's savings.

Kim: Are you saying that buildings managed by a third party are the best candidates?

Tony: I'm saying the motivations are different for third-party building managers because they think shorter term, so a three-year payment period would be more attractive.

Don MacOdrum: What was the management arrangement at 1000 Broadway?

Sam: It is owner managed.

JP: Thank you to Energy Trust, Stan and Wendy for contributing to this. I also want to note that this is still a pilot, so we're still evaluating the results. I think there will be chances to revisit this with the OPUC through the docket process. The OPUC appreciates how this approach shifts the risk by spreading it out over three years and aligns performance with incentives. We also appreciate the increased administrative work for both the customer and Energy Trust. Finally, we like how this product aligns with the market. The OPUC is not sure about pulling out capital upgrades. We need to revisit this conversation in six or nine months when we have more results.

Stan: We are eager for this pilot to become a more robust offering in the future.

#### **5. Public comment**

There were no additional public comments.

#### **6. Meeting adjournment**

The next scheduled meeting of the Conservation Advisory Council will be on July 27, 2016, from 1:30 p.m. – 4:30 p.m.

TAB 7

## 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 semiconductor 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 and other 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

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

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



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

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

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

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