Oregon
John A. Kitzhaber, MD, Governor

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February 13, 2015

Chair Jessica Vega Pederson
Vice Chair Mark Johnson
Vice Chair Jeff Reardon
House Committee on Energy and Environment
900 Court Street NE
Salem OR 97301

RE: Oregon Public Utility Commission of Oregon (PUC) Answers to Follow-up Questions – Energy Efficiency

Madame Chair:

Thank you for the opportunity to present information about the Public Utility Commission on Thursday, February 5th. A number of questions were raised regarding the cost effectiveness of energy efficiency given low natural gas prices and the cost of energy efficiency in Oregon compared with the rest of the nation. I endeavor to address these questions below, with the following key points:

- **Energy Efficiency Costs Less Overall:** Energy efficiency is cost effective as a resource for both electricity and natural gas, even when natural gas prices are low because energy efficiency measures include no fuel costs, system integration costs, transmission costs or upfront, steel-in-the-ground capital costs.

- **PUC Process to Eliminate Non-Cost-Effective Energy Efficiency:** To the extent that some energy efficiency measures become non-cost-effective over time, the PUC process either prohibits investment in those energy efficiency measures or may allow exceptions based on long-established criteria in a Commission order.

- **Electric Energy Efficiency Costs to Customers:** In 2013, the levelized costs for Energy Trust's electric energy efficiency savings were 2.4 cents per kilowatt hour (kWh). This is comparably lower than the levelized avoided cost of electricity, which is 6.2 cents per kWh, during the same period that the energy efficiency provides savings.

- **Natural Gas Energy Efficiency Costs to Customers:** In 2013, the levelized costs for Energy Trust's natural gas energy efficiency savings were 33 cents per therm. This is comparably lower than the levelized avoided cost of natural gas, which is 49 cents per therm during the same period that the energy efficiency provides savings.

- **Certain Specific Natural Gas Measures are Not Cost Effective**: In September 30, 2014, the PUC determined the Energy Trust could no longer support certain gas measures after April 30, 2015. Some measures received an exception, which comprises less than 6% of

Energy Trust's total portfolio of natural gas savings in 2013. Energy Trust eliminated a few of the measures as of January 1, 2015, and has been working with contractors in the market to prepare for expiration of the remaining weatherization measures on April 30, 2015.

- **Energy Efficiency Projects:** Energy Trust assisted residential, commercial, and industrial customers with more than 70,000 energy efficiency projects in 2013. Of these, Energy Trust assisted industrial customers with 1,020 projects, commercial customers with 5,259 projects, and residential customers with 67,000 projects.

- **Comparison to the Rest of the Country:** While the Oregon PUC does not collect data about other states, a recent industry study shows that Oregon's energy efficiency costs per kWh are slightly below the average cost and slightly above the median cost across the county. This is a good showing, given Oregon's strict evaluation protocols and the maturity of its markets where much of the lowest-cost savings were acquired in the early years of energy efficiency programs.

Energy Efficiency Cost Effectiveness Discussion

Energy efficiency is cost effective as a resource for both electricity and natural gas, even when natural gas prices are low. In part this is because energy efficiency includes a wide variety of measures with a range of costs, none of which have fuel costs, system integration costs, transmission costs or upfront, steel-in-the-ground capital costs. Generally, energy efficiency cost effectiveness is not compared with short term energy commodity and market costs because these costs are volatile and energy efficiency provides a hedge against spikes in the market.

Even with the current low cost of natural gas, utility Integrated Resource Plans (IRP) have shown that significant cost effective efficiency remains as a prudent investment for both gas and electric utilities and their customers. This includes savings related to electricity use and natural gas for heating and water heating in residential homes and for all types of commercial, industrial, and agricultural businesses. To the extent that some energy efficiency measures become non cost-effective over time, the PUC either prohibits ETO incentives for those measures or may allow exceptions for measures based on long-established criteria in a Commission order.

Energy Trust promotes 801 standard electric efficiency measures and 288 natural gas efficiency measures across five Energy Trust programs. Energy Trust provides electric efficiency and natural gas efficiency services through five major programs in the residential, commercial, and industrial sectors: (1) Existing Homes, (2) New Homes & Products, (3) Existing Buildings, (4) New Buildings, and (5) Production Efficiency. Measures are individually screened to determine the standard amount of energy saved in the applications that qualify for an incentive. Energy Trust also works with large commercial and industrial customers on custom energy efficiency measures, such as elements of complex industrial process improvements or new building designs. Several measures may make up a project. In 2013, Energy Trust assisted industrial customers with 1,020 projects, commercial customers with 5,259 projects, and residential customers with 67,000 projects.

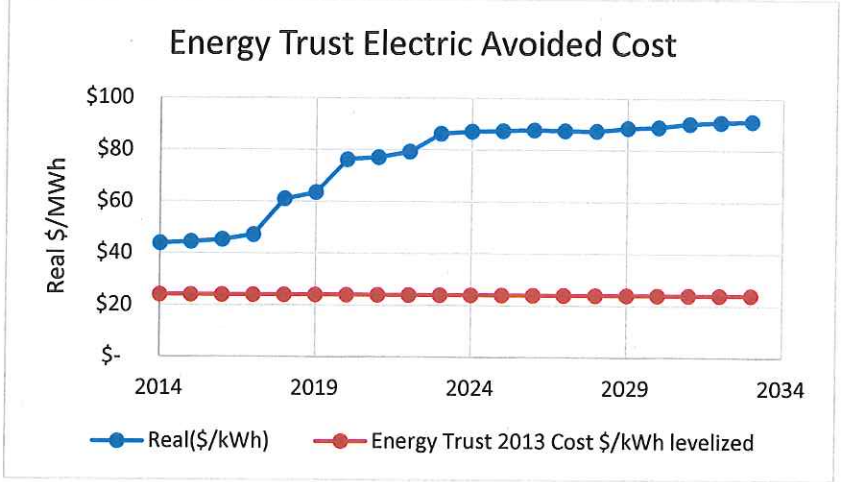
Under PUC guidance, Energy Trust completes cost-effectiveness tests for each standard measure available to customers, all individual custom measures, and all five programs as a whole. By testing for cost-effectiveness at each instance, Energy Trust assures that all individual and custom measures

and projects are cost-effective, and also demonstrates the entire program is cost-effective, including the cost of program management.

Electric Energy Efficiency

In 2013, the levelized cost for Energy Trust's electric energy efficiency savings was 2.4 cents per kilowatt hour (kWh), accounting for the total of all costs across all 801 electric measures and all five programs, including administration and program support costs. *See Attachment 1* for a table that shows the costs of serving customers with electric energy efficiency.

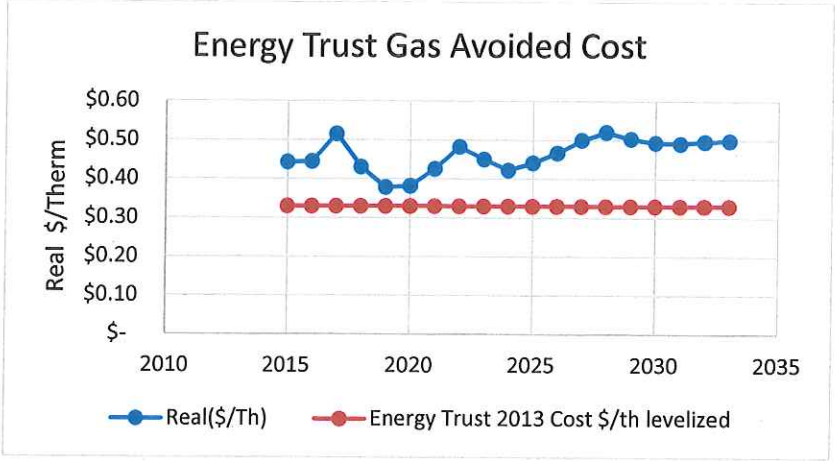
The graph below shows PGE's and PacifiCorp's 20 year IRP period from 2014 to 2034. The blue line shows avoided cost, which is a calculation of the value that the electric utilities avoid paying in meeting their customers' electricity demand. The red line shows ETO's levelized cost per kWh from electric efficiency over the same period of time. The graph shows that over time, the value of energy efficiency measures remains because the measures continue to yield energy savings and will decrease demand for energy.



Natural Gas Energy Efficiency

In 2013, the levelized cost for Energy Trust's natural gas energy efficiency savings was 33 cents per therm, taking into account the total of all costs across all 288 natural gas measures and all five programs, including administration and program support costs. *See Attachment 1* for a table that shows the costs of serving customers with electric energy efficiency.

The graph below shows NW Natural's and Cascade Natural Gas' 20 year IRP period that forecasts annual energy prices. The blue line shows avoided cost, which is a calculation of the value that the natural gas utilities avoid paying in meeting their customers' gas demand. The red line shows ETO's levelized cost per therm from natural gas efficiency over the same period of time. The graph shows that over time, the value of energy efficiency measures remains because the measures continue to yield energy savings and will decrease demand for energy.



Cost Effectiveness

Cost-effective investments in energy efficiency keep overall electricity and natural gas heating costs for customers lower than they otherwise would have been. The availability and level of an incentive for an energy-efficiency measure is determined by two cost-effectiveness tests, as defined by the PUC. In 1994, the PUC established these tests and criteria for non-cost effective measures that could be included in utility programs with a strong demonstration of identifiable and concrete benefits. The cost-effectiveness tests compare the benefits and costs of energy efficiency improvements. When the benefits outweigh the overall costs, the measure is cost effective. When an energy efficiency measure is not cost-effective, the PUC can either grant an exception or eliminate the measure. Within the last seven months the PUC examined the cost effectiveness of energy efficiency measures for both electric and natural gas customers.

Electric Cost Effectiveness

In May 2014, Energy Trust determined several electric efficiency measures were no longer passing the total resource cost test for cost effectiveness due to a decline the cost of electricity on the market. PUC docket UM 1696 examined the cost effectiveness of these electric efficiency measures, which make up less than 5% of Energy Trust's total portfolio of electric savings in 2013. In July 2014, the PUC approved exceptions for some measures but did not approve exceptions for solar water heating, wheel line levelers, and 1HP motors. Energy Trust has discontinued offering these three types of measures as of January 1, 2015. The large majority of electric measures continue to be cost effective.

Natural Gas Cost Effectiveness

During summer and fall 2014, the PUC reviewed gas energy efficiency measures such as floor and wall insulation, air sealing and duct sealing, which were no longer cost effective given low natural gas prices. In September 30, 2014, the PUC determined the Energy Trust could no longer support certain gas measures after April 30, 2015. Some measures received an exception, which comprises less than 6% of Energy Trust's total portfolio of natural gas savings in 2013. Energy Trust eliminated a few of the measures as of January 1, 2015 and has been working with contractors in the market to prepare for expiration of the remaining weatherization measures on April 30, 2015.

As an example, attached is a memo from the PUC proceeding that concluded that some natural gas measures were no longer cost-effective to pursue for customers of Northwest Natural and Cascade Natural Gas (*See Attachment 2*: natural gas efficiency cost effectiveness staff memo & PUC Order).

Comparison of Oregon with Other States

The PUC does not collect data for other states, but a recent industry study[1] shows the following tables that compare the cost of utility energy efficiency programs across the nation. Because measurement methods vary, these comparisons are rough and it is important to consider local circumstances and variance among regional energy markets.

State	2009	2010	2011	2012	4-year average (2009-2012)
Arizona	$0.016	$0.019	$0.020	$0.021	$0.019
California	$0.039	$0.041	$0.056	n/a	$0.045
Colorado	$0.023	$0.029	$0.027	$0.027	$0.027
Connecticut	$0.037	$0.050	$0.045	$0.047	$0.045
Hawaii	$0.025	$0.024	$0.033	$0.040	$0.031
Illinois	n/a	n/a	$0.019	n/a	$0.019
Iowa	$0.019	$0.018	$0.020	$0.018	$0.019
Massachusetts	$0.056	$0.048	$0.037	$0.051	$0.048
Michigan	$0.017	$0.016	$0.017	$0.018	$0.017
Minnesota	$0.021	$0.027	$0.029	$0.026	$0.026
New Mexico	$0.025	$0.024	$0.022	$0.018	$0.022
Nevada	$0.013	$0.014	$0.016	$0.020	$0.016

State	2009	2010	2011	2012	4-year average (2009-2012)
New York	$0.020	$0.020	$0.020	n/a	$0.020
Oregon	$0.028	$0.025	$0.029	$0.026	$0.027
Pennsylvania	n/a	n/a	$0.017	n/a	$0.017
Rhode Island	n/a	$0.040	$0.044	$0.050	$0.045
Texas	$0.025	$0.026	$0.028	n/a	$0.026
Utah	$0.029	$0.033	$0.024	$0.029	$0.029
Vermont	$0.043	$0.041	$0.042	$0.037	$0.041
Wisconsin	n/a	n/a	$0.022	$0.015	$0.019
Average	**$0.027**	**$0.029**	**$0.028**	**$0.030**	**$0.028**
Median	**$0.025**	**$0.026**	**$0.026**	**$0.026**	**$0.026**
Minimum	**$0.013**	**$0.014**	**$0.016**	**$0.015**	**$0.016**
Maximum	**$0.056**	**$0.050**	**$0.056**	**$0.051**	**$0.048**

The study shows that Oregon's energy efficiency costs per kWh are slightly below the average cost and slightly above the median cost across the county. Importantly, Oregon is getting high volumes of energy savings relative to the size of Oregon's energy demands. This is a good showing, given Oregon's strict evaluation protocols and the maturity of its markets where much of the lowest-cost savings were acquired in the early years of energy efficiency programs.

Please contact me if you have additional questions or need further information.

Sincerely,

for

Susan Ackerman
Chair

Copy: Margi Hoffman

[1] March 2014 ACEEE Report on The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs (*See Attachment 3*).

ATTACHMENT 1

Electric Energy Efficiency: The table below shows the total cost of serving customers with electric efficiency for each of the five major Energy Trust programs plus Energy Trust's investment in NEEA electric programs, and the levelized cost of the electric savings acquired. The levelized cost is the cost per kWh saved over the life of the efficiency measures, with a factor to account for the cost of up-front purchase of savings that accrue over many years.

Electric Efficiency		**2013**	**2015***
Sector	**Program**	**Cost/kWh (levelized)**	**Cost/kWh (levelized)**
Commercial	Existing Buildings	3.3¢	3.5¢
	NEEA Commercial	1.4¢	5.3¢
	New Buildings	1.4¢	3.0¢
	Commercial Total	2.3¢	3.4¢
Industrial	NEEA Industrial	2.5¢	1.7¢
	Production Efficiency	2.1¢	2.6¢
	Industrial Total	2.1¢	2.6¢
Residential	Existing Homes	3.7¢	3.9¢
	NEEA Residential	1.8¢	1.4¢
	New Homes & Products	3.5¢	3.4¢
	Residential Total	3.1¢	3.1¢
Total Electric Efficiency		2.4¢	3.1¢

Natural Gas Energy Efficiency: The table below shows the total cost of serving customers with natural gas efficiency for each of the five major Energy Trust programs plus Energy Trust's investment in NEEA gas programs (starting in 2015), and the levelized cost of the natural gas savings acquired. The levelized cost is the cost per therm saved over the life of the efficiency measures, with a factor to account for the cost of up-front purchase of savings that accrue over many years. Information about the costs of those programs is summarized in the table below:

Natural Gas Efficiency—Oregon		**2013**	**2015***
Sector	**Program**	**Cost/therm (levelized)**	**Cost/therm (levelized)**
Commercial	Existing Buildings	31¢	33¢
	New Buildings	20¢	26¢
	Commercial Total	**27¢**	**33¢**
	Production Efficiency	24¢	28¢
	Industrial Total	**24¢**	**28¢**
Residential	Existing Homes	53¢	42¢
	New Homes & Products	29¢	29¢
	Residential Total	**41¢**	**35¢**
Total Natural Gas Efficiency		**33¢**	**32¢**

*2015 expenditures and cost are budgeted. Actuals will be reported April 15, 2016.

ORDER NO. 14 332

ENTERED OCT 01 2014

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1622

In the Matter of ENERGY TRUST OF OREGON Request for Approval of Exceptions to Cost Effectiveness Guidelines.	ORDER

DISPOSITION: STAFF'S RECOMMENDATION ADOPTED

This order memorializes our decision, made and effective at the public meeting on September 30, 2014, to adopt Staff's recommendation, contained in the Staff Report attached as Appendix A, along with the following clarifications and additions:

(1) The current weatherization measures will continue through April 30, 2014;
(2) Staff is directed to report back in six months on the development of a hedge value for natural gas; and
(3) In six months, the Commission is open to considering the idea of an incentive cap proposal—especially for moderate income and multi-family customers—that includes the following elements:
   (a) Meaningful reduction in incentives;
   (b) Strong protocols to minimize free riders; and
   (c) A design that favors lowest cost, highest savings measures.

Dated this 1st day of Oct., 2014, at Salem, Oregon.

COMMISSIONER ACKERMAN WAS UNAVAILABLE FOR SIGNATURE

Susan K. Ackerman
Chair

John Savage
Commissioner

Stephen M. Bloom
Commissioner

A party may request rehearing or reconsideration of this order under ORS 756.561. A request for rehearing or reconsideration must be filed with the Commission within 60 days of the date of service of this order. The request must comply with the requirements in OAR 860-001-0720. A copy of the request must also be served on each party to the proceedings as provided in OAR 860-001-0180(2). A party may appeal this order by filing a petition for review with the Court of Appeals in compliance with ORS 183.480 through 183.484.