

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: October 10 2017

REGULAR X CONSENT _____ EFFECTIVE DATE Upon Approval

DATE: October 5, 2017

TO: Public Utility Commission

FROM: JP Batmale *JB*

THROUGH: *E* Jason Eisdorfer

SUBJECT: Energy Trust of Oregon: (Docket No. UM 1696) Cost Effectiveness Exceptions Requests for Electric Measures.

STAFF RECOMMENDATION:

The Commission adopt Staff's proposed schedule regarding stakeholder comments and finalization of major exceptions to cost effectiveness on certain energy efficiency measures, as requested by Energy Trust of Oregon (Energy Trust).

DISCUSSION:

Issue

Whether the Commission should adopt Staff's proposed schedule for stakeholder comment and finalization of the recommended, major cost effectiveness exceptions.

Applicable Law

Order No. 94-590 in Docket No. UM 551 establishes guidelines for cost effectiveness of energy efficiency measures. Section 13 of the Order details seven conditions under which exceptions to Oregon's two cost effectiveness tests may be granted by the Commission.¹ The exceptions conditions are as follows:

¹ The cost effectiveness test required under Order No. 94-590 is the Total Resource Cost Test (TRC). Energy Trust has used this test since its inception to guide what measures can be offered (TRC) by Energy Trust programs. UM 551 also allows for the use of other cost effectiveness tests. Energy Trust use the Utility Cost Test (UCT) to set the maximum allowable incentive amount that can be offered to participants.

- a) The measure produces significant non-quantifiable non energy benefits. In this case, the incentive payment should be set at no greater than the cost effective limit (defined as present value of avoided costs plus 10 percent) less the perceived value of bill savings, e.g., two years of bill savings.
- b) Inclusion of the measure will increase market acceptance and is expected to lead to reduced cost of the measure.
- c) The measure is included for consistency with other demand side management (DSM) programs in the region.
- d) Inclusion of the measure helps to increase participation in a cost effective program.
- e) The package of measures cannot be changed frequently and the measure will be cost effective during the period the program is offered.
- f) The measure or package of measures is included in a pilot or research project intended to be offered to a limited number of customers.
- g) The measure is required by law or is consistent with Commission policy and/or direction.

Analysis

Background

Beginning in August 2017, Energy Trust submitted requests for the following measure packages listed below to receive cost effectiveness exceptions for select measures within those Packages.

Measure Package	Sector	Program	Measures in Package	Measures Needing Exception
Irrigation - Sprinklers	Industrial	Streamlined	15	7
Ductless Heat Pumps (Single Family)	Residential	Existing Homes	4	2
Ductless Heat Pumps (Manuf. Homes)	Residential	Existing Homes	4	2
Ductless Heat Pumps (Multi Family)	Commercial	Multi-Family	2	2
Gas Water Heaters	Residential	All	5	2
EPS New Homes	Residential	New Homes	16	6
New Manuf. Homes Gas Heat	Residential	New Homes	12	6
Windows Retrofit Multi-Family	Commercial	Multi-Family	4	3

Each measure has a different reason for not passing the cost effectiveness tests in 2018 and why Energy Trust believes they should be considered for an exception.

The current process to consider exceptions was reaffirmed in Docket No. UM 1622:²

- For minor exception requests, where the size and scope are limited, Energy Trust provides details to PUC Staff who review and if appropriate, provide approval through an email. A copy of the email is kept on file by the PUC Staff.
- For major exception requests, Energy Trust provides an official filing and requests an exception. PUC Staff opens a docket, solicits comments from parties, and then makes formal recommendations to the Commission at a public meeting. Commissioners then make a decision on the exception request at the public meeting.

Minor exceptions, approved by Staff, are those measures where the:

- The TRC score is below 1 and above 0.8;
- The measure's savings do not comprise more than 5 percent of a program's annual savings; and,
- The measure's cost does not represent more than 5 percent of the program's annual budget.

If a measure does not meet all of the minor exception criteria the request must go through the Commission's major exception request process. In addition to measure level analysis, Staff also considers the cumulative impact of measures with exceptions on Energy Trust performance. Energy Trust now files an annual report with its budget that details the percent of savings from measures with exceptions and lists all of them.³

Measures Needing an Exception

22 of the 30 measures requiring an exception fall into the major category. Nearly all of them have a TRC below 0.8 or have savings in excess of 5 percent of a program's annual savings.

Many of these measures are part of an aggregated measure package. For example, only two of the measures in the Gas Water Heater measure package require an exception. The Commission has directed Energy Trust to operate at this level of granularity for many reasons, including transparency, accountability, and fidelity to state policy directives around measure cost effectiveness.

² See Order No. 14-332.

³ See for example, Energy Trust's Finalized 2017-2018 Budget and Action Plan.

https://www.energytrust.org/wp-content/uploads/2016/12/approved_2017_budget_and_action_plan.pdf

The table below summarizes the number of measures needing exceptions, percent of program savings, percent of program budget, and cost effectiveness score.⁴

Measure Package	Ratio of Measures Needing Exception in Package	Type of Exception	Past % of Program Savings	2018 Cost Effectiveness of Measures Needing Exceptions	
				TRC	UCT
Irrigation	7/15	MAJOR	2.8%	0.5	0.9
Ductless Heat Pumps (Single Family)	2/4	MAJOR	10.0%	0.6	1.0
Ductless Heat Pumps (Manuf. Homes)	2/4	MAJOR	0.2%	0.7	1.3
Ductless Heat Pumps (Multi Family)	2/2	MAJOR	9.7%	0.7	1.0
Gas Water Heaters	2/5	Minor	0.1%	0.8	1.0
EPS New Homes	6/16	MAJOR	3.0%	0.7	1.3
New Manufactured Homes Gas Heat	6/12	Minor	0.12%	0.8	1.2
Windows Retrofit Multi-Family	4/4	MAJOR	13.5%	0.9	1.0

The following sections provide the details behind each **major exception** cost effectiveness request, the particular cost effectiveness challenge, the measure’s cost effectiveness history, which of the seven, UM 551 exception conditions the request falls under, and Staff’s action and/or recommendation.

Irrigation – Sprinkler Measures

Sprinkler hardware measures at agriculture operations save pumping energy by reducing water use, leakage and waste. In an effort to streamline implementation and increase adoption of sprinkler measures statewide, Energy Trust and BPA coordinate to offer the same set of sprinkler measures and incentives.

In 2014 the Commission granted Energy Trust an exception to continue the use of four irrigation measures.⁵ The exception was based on Docket No. UM 551 exception criteria C: “the measure is included for consistency with other DSM programs in the region” and criteria D: “helps increase participation in a cost effective program”.

⁴ For reference purposes, measures should have a TRC and UCT score of 1 or higher.

⁵ See Docket No. UM1696, July 22, 2014, Order No.14-266.

For 2018 Energy Trust has updated these measures with new savings and cost information provided by the Regional Technical Forum (RTF). Please see Appendix A for a full listing of all irrigation sprinkler measures. The primary reason for the fall in the TRC for these measures is the reduction in Energy Trust's avoided costs.

One of the four measures from the 2014 exception, new drains, is now cost effective due to higher savings. With the updated measures and 2018 avoided costs, a total of seven measures do not pass the TRC. Additionally, two of these measures do not pass the UCT with incentives matching BPA's. Finally, several of the measures were able to participate in Oregon Department of Energy's Small Premium Projects (SPP) program. This competitive tax credit program ends in 2017.

Energy Trust requests an exception through 2019 to align with BPA's plans. BPA's recently approved implementation manual maintains these measures through 2019. Energy Trust's sprinkler offering is based on RTF measures which are scheduled to sunset during 2018. In 2018, RTF members will decide if and how to proceed with these measures: to re-analyze, re-approve or cancel. Energy Trust Proposes coordinate with BPA at that time on whether to update the measures early or wait and update in 2019 as planned.

Staff's action and/or recommendation for Irrigation Sprinklers:

Of the seven measures needing an extension three have a TRC score below 0.5. They are:

- New Drop Tube or Hose Extension for Low Pressure
- Rotating Type Low Pressure Sprinkler Replacement
- Impact Sprinkler Rebuild or Replacement

All three were granted a cost effectiveness exceptions in 2014. Staff recommends retiring these measures and recommends only a one-year exception to wind down these measures. Staff is basing this recommendation on Docket No. UM 551 criteria C and that with a year's advanced notice regional entities, other stakeholders and Energy Trust participants can be reasonably prepared for these measures to retire in 2019.

Staff recommends that the remaining four measures receive a two-year cost effectiveness exception based on Docket No. UM 551 criteria C. They are:

- New Goose Necks
- Flow Controlling Nozzle Impact Sprinkler Replacement
- Multi-Trajectory Low Pressure Sprinkler Replacement
- Rotating Type Impact Sprinkler Replacement

Ductless Heat Pumps – All Three Categories

Energy Trust offers incentives for ductless heat pumps (DHP) installed in single family, multifamily and manufactured homes. Due to changes in residential building code, Energy Trust plans to sunset the ductless heat pump measure in New Homes starting in 2018.

Energy Trust has supported DHPs beginning with pilot efforts in 2007. Along with the Northwest Energy Efficiency Alliance (NEEA) and the Bonneville Power Administration (BPA), Energy Trust has supported the development of a robust installer and distribution network in the Northwest.

The primary driver for the fall in cost effectiveness is the reduction in avoided costs for 2018. Additionally, DHP's for single family and manufactured homes were negatively impacted by the recent elimination of Residential Energy Tax Credit.

DHP's are a key component of Energy Trust's pivot to new sources of electric savings in the Residential Sector, as lighting measures begin to expire in 2019 due to high levels of LED adoption.⁶ For DHP's to become cost effective and larger source of Residential energy savings DHP prices must come down and penetration levels must increase.

NEEA regional cost analysis conducted in 2017 found a steady decrease in the cost of certain DHP's. If this trend continues, driven by volume, costs will be reduced making this measure more cost effective. A key initiative run by NEEA to improve market adoption is the Northwest Ductless Heat Pump Initiative. Energy Trust incentives align with this regional initiative.

In addition Energy Trust is evaluating cost reduction efforts such a promotion of specific contractors, other contractor-facing incentives, and engagements with distributors to reduce DHP costs and increase adoption. These efforts are just launching and need time to begin working so results can be measured and evaluated.

Staff's action and/or recommendation for DHP's:

Six of Energy Trust's ten DHP measures require a cost-effectiveness exception. Please see Appendix B for more details. In 2017 these measures had TRC scores around 1. The recent reduction in avoided costs, along with the retirement of the RETC, forced the requirement of exceptions in 2018.

Staff believes that the proposed efforts by Energy Trust and NEEA to lower DHP costs and increase market adoption are credible and should be given an

⁶ See May 3, 2017 and Sept. 13, 2017 Energy Trust Conservation Advisory Council presentations and meeting notes.

opportunity to produce results. A two year exception is warranted under Docket No. UM 551 criteria B, and C. However, if at the end of two years the cost of DHP program and/or Energy Trust's customer participation rates remain relatively unchanged another exception should not be granted.

EPS New Homes

The Energy Performance Score (EPS) New Homes program is based on modeled performance of new homes above Oregon Code. Builders have the flexibility to pursue combinations of measures. The program provides examples of measure combinations, called pathways. These yield tiered improvements over code. These pathways are designed to represent likely scenarios and serve as a proxy to screen the program for savings and cost effectiveness

For 2018 the pathways were redesigned in consideration of the new Oregon Residential Specialty Code (ORSC). The new code increased minimum efficiency of air source heat pumps and furnaces, which necessitated the program to specify very high efficient equipment to maintain savings. The code also specified 100 percent efficient lighting, which eliminated all the lighting savings from the offering.

The four redesigned pathways have energy efficiency ranging from 10-40 percent better than the recently updated code. Each of the four pathways were modeled with alternative sets of gas and electric space and water heating equipment. In total 16 specific combinations were created for new homes in 2018.

The Pathways become progressively more demanding as the numbering increases, requiring higher modeled efficiency and more costly technology. Path 1 is the least demanding, acting as an entry point for builders that are new to the program. Path 4 serves as an aspirational target to encourage builders to continue to aggressively improve their building practices.

In August 2016 Staff granted the new homes program a cost effectiveness exception within Path 4 – the most energy efficient of the pathways – based on Docket No. UM 551 criteria B, C & D. With the recent updates to ORSC along with the reduction in avoided costs three other pathways now require cost effectiveness exceptions: Path 1 and 2 involving electric heating and Path 4 gas heating.

Staff's action and/or recommendation for EPS New Homes:

The overarching goal of the New Homes program is to increase the industry's technical capacity to apply, and market acceptance of, energy-saving approaches. These generally result in code to advancements to the ORSC. As an example, the 2017 ORSC adopted upgrades that are common to the majority of EPS homes.

EPS has generally been effective, growing in market penetration.

Year	EPS Market share	Number of EPS Homes
2014	34%	2,171
2015	35%	2,521
2016	36%	3,323
2017 (forecast)	37%	3,400

As shown in Appendix C, each of the four overall pathways is cost effective when weighted by expected participation, and overall the entire EPS offering has a TRC of ~1.3. Rather, some of the very specific pathways have a TRC below 1.

Staff would note that while pathways within Paths 1 and 2 have declining TRC scores – due to higher participation costs and lower avoided costs – the pathways within Path 4, which previously required an exception, have improved TRC scores.

	2018	2018	2018	2017	2017	2017	
Measure	Incremental Costs (\$)	TRC	Incremental Costs (\$)	Maximum Incentive (\$)	TRC	TRC	TRC point Variance
2018-Path 1 AHEW	\$3,232	0.54	\$1,713	\$1,713	1.37		-0.82
2018-Path 1 AHGW	\$3,232	0.56	\$1,713	\$1,713	1.29		-0.73
2018-Path 2 AHEW	\$4,876	0.74	\$3,966	\$2,649	1.00		-0.26
2018-Path 2 AHGW	\$3,676	0.64	\$3,338	\$2,649	1.02		-0.38
2018-Path 4 GHEW	\$8,049	0.93	\$8,985	\$4,681	0.74		0.19
2018-Path 4 GHGW	\$8,550	0.72	\$9,275	\$4,681	0.53		0.18

Staff finds that the measures all qualify for an exception based on Docket No. UM 551 criteria B, C & D. Staff recommends that Path 1 receives a one year exception and the TRC must be reevaluated during the 2019 budgeting process. If the TRC is not projected to rise above 0.6 than Staff suggests that the non-cost effective pathway be removed. Staff recommends that Path 2 and Path 4 receive two year exceptions with the possibility for a future extension.

Windows Retrofit for Multi-Family

Energy Trust is requesting a broadening of the current exception for windows retrofit in electrically-heated, multifamily, stacked structures. Originally Energy Trust requested a continued exception for all four measures in the Windows retrofit measure package. One measure in particular – Double Pane Window Replacement – had a new TRC of 0.5. The others three measures were well above 0.8.

Measure	Measure Life (years)	2018 UCT	2018 TRC
single pane (aluminum frame) to U < 0.30	45	1.00	0.92
single pane (wood frame) to U < 0.30	45	1.00	0.86
single pane (aluminum frame) and storm window to U < 0.30	45	1.00	0.88
double pane (aluminum frame) to U < 0.30	45	1.00	0.50

In 2016 the Energy Trust was granted an exception to continue the double pane window replacement offering in electrically-heated, stacked, multifamily buildings. This exception was approved under the “minor measure” approval process, on the basis Docket No. UM 551 criteria A – “the measure produced significant non-quantifiable non-energy benefits.”

At the time of the exception it was anticipated that RTF would be providing updates to their windows analysis which would inform next steps for Energy Trust. And the exception was granted through 2017 with the expectation of new savings information in Q2 2017. Since this time, RTF has provided a recommended savings analysis plan, but does not have plans to conduct the analysis themselves. Energy Trust does not plan to carry out RTF’s plan as it would be expensive compared to the measure’s potential and it is not clear if it would provide any more accuracy than current savings estimates.

Energy Trust is seeking an exception based on Docket No. UM 551 criteria A, “the measure produces significant non-quantifiable, non-energy benefits.” Market research conducted by the Energy Trust indicates that owners installing energy-efficient windows do so for a wide range of reasons, including increased comfort, aesthetics, noise mitigation and ability to rent space. Additionally, the current savings analysis is based on heating-load savings only. There are additional cooling load savings that are not captured in current savings estimates. This is due to the unknown prevalence and usage of cooling in multifamily settings. These additional savings could eventually be quantifiable, but the research and analysis are time and cost prohibitive.

Staff’s action and/or recommendation for Windows Retrofit:

After discussions with Staff, Energy Trust agreed to retire the double pane window replacement measure at the end of 2017. In so doing Energy Trust modified their exception request to cover the remaining three measures which all had much higher TRC scores. Staff believes that a cost effectiveness exception is warranted for these three measures in the measure package and should be granted for two years.

The following measures fell under the minor cost effectiveness exception rule because their TRC score was close to or above 0.8 and their annual incentive costs and/or total

savings amounted to less than 5 percent of their respective program's 2018 budget and/or savings goals.

- Gas Water Heaters
- New Manufactured Homes Gas Heat

Recommended Next Steps

Staff proposes the following:

- All stakeholders be given until October 26, 2017 to file comments or contact Staff's regarding its cost effectiveness recommendations.
- At the November 7, 2017 public meeting Staff will return to the Commission to summarize stakeholder positions and present its final, 2018 cost-effectiveness recommendations for Commission approval.

Conclusion

Energy Trust presented the information necessary for Staff to consider cost effectiveness exceptions for 31 measures in 2018. In the case of measures that qualify for minor exceptions Staff has recommended that most receive a cost effectiveness exception. For major exceptions, Staff has recommended that 17 out of 31 measures receive a cost effectiveness exception. Staff proposes that stakeholders be given twelve business days to file comments or contact Staff regarding the recommended major cost-effectiveness exceptions. Staff will present stakeholder comments and its final recommendations at the November 7, 2017 public meeting.

PROPOSED COMMISSION MOTION:

Adopt Staff's proposed schedule to receive stakeholder comments and for the Commission to review at the November 7, 2017 public meeting Staff's finalized major exceptions to cost effectiveness on select energy efficiency measures in 2018.

APPENDIX A – Irrigation Sprinkler Measures

Measure	Measure Life (years)	Proposed Incentive (\$) – Aligned with BPA	2014 TRC	2018 TRC	2018 UCT
Pipe Press and Repair	8	\$10.00	1.1	1.3	2.6
New Goose Necks	15	\$1.65	1.6	0.8	2.2
Base Boot Gasket Replacement	8	\$175.00	2.8	1.5	2.3
New Drains (2014 exception)	5	\$1.00	0.6	2.6	38.8
New Drop Tube or Hose Extension for Low Pressure (2014 exception)	10	\$3.00	0.7	0.3	0.8
Flow Controlling Nozzle Impact Sprinkler Replacement	4	\$4.00	1.0	0.6	0.9
Gasket Replacement	5	\$2.75	1.5	6.1	9.7
Low-Pressure Regulator Replacement	5	\$5.00	2.2	1.23	1.5
Multi-Configuration Nozzle Low Pressure Sprinkler Replacement	5	\$3.00	5.3	3.0	4.5
Multi-Trajectory Impact Sprinkler Replacement	5	\$4.00	3.3	1.9	2.5
Multi-Trajectory Low Pressure Sprinkler Replacement	5	\$1.00	1.1	0.6	3.4
Worn Impact Sprinkler Nozzle Replacement	4	\$1.50	3.5	1.9	2.6
Rotating Type Impact Sprinkler Replacement	5	\$4.00	1.3	0.7	3.2
Rotating Type Low Pressure Sprinkler Replacement (2014 exception)	5	\$4.00	0.5	0.3	1.2
Sprinkler Rebuild or Replacement (2014 exception)	5	\$3.75	0.4	0.3	1.2

APPENDIX B – Ductless Heat Pumps

Measure	Measure Life (years)	Maximum Incentive (\$)	2018 TRC	2018 UCT
Single Family DHP for Zonal Heating Zone 1	18	\$2,058	0.57	1.00
Single Family DHP for Zonal Heating Zone 2	18	\$2,258	0.62	1.00
Single Family DHP for Forced Air Furnace Heating Zone 1	18	\$3,743	1.00	1.00
Single Family DHP for Forced Air Furnace Heating Zone 2	18	\$3,505	1.02	1.00

Measure	Measure Life (years)	Maximum Incentive (\$)	2018 TRC	2018 UCT
Manufactured Home DHP for Zonal Heating Zone 1	18	\$2,058	0.63	1.00
Manufactured Home DHP for Zonal Heating Zone 2	18	\$2,258	0.69	1.00
Manufactured Home DHP for Forced Air Furnace Heating Zone 1	18	\$4,878	1.26	1.15
Manufactured Home DHP for Forced Air Furnace Heating Zone 2	18	\$4,878	1.25	1.13

Measure	Measure Life (years)	Maximum Incentive (\$)	2018 TRC	2018 UCT
Multifamily DHP Heating Zone 1	18	\$1,952	0.64	1.0
Multifamily DHP Heating Zone 2	18	\$2,147	0.79	1.0

APPENDIX C – EPS New Homes

Measure	Measure Life (years)	Maximum Incentive (\$)	2018 TRC	2018 UCT
2018-Path 1 AHEW	35.6	\$1,543	0.54	1.14
2018-Path 1 AHGW	35.0	\$1,543	0.56	1.18
2018-Path 1 GHEW	40.4	\$1,543	0.97	1.00
2018-Path 1 GHGW	39.6	\$1,543	1.05	1.08
2018-Path 1 Weighted	39.7	\$1,543	0.98	1.06
2018-Path 2 AHEW	28.2	\$2,091	0.74	1.74
2018-Path 2 AHGW	34.5	\$2,091	0.63	1.12
2018-Path 2 GHEW	30.3	\$2,091	1.07	1.65
2018-Path 2 GHGW	37.1	\$2,091	1.19	1.19
2018-Path 2 Weighted	33.3	\$2,091	1.11	1.50
2018-Path 3 GHEW	34.0	\$3,149	1.48	1.48
2018-Path 3 GHGW	38.7	\$3,149	1.03	1.19
2018-Path 3 DHPEW	37.8	\$3,149	3.79	2.09
2018-Path 3 DHPGW	41.3	\$3,149	2.23	1.58
2018-Path 3 Weighted	38.9	\$3,149	1.73	1.65
2018-Path 4 GHEW (2017 exception)	38.5	\$5,835	0.93	1.28
2018-Path 4 GHGW (2017 exception)	42.2	\$5,835	0.72	1.05
2018-Path 4 DHPEW	40.2	\$5,835	1.90	1.90
2018-Path 4 DHPGW	42.6	\$5,835	1.46	1.58
2018-Path 4 Weighted	41.1	\$5,835	1.52	1.69
Overall	36.6		1.27	