

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1696

In the Matter of

PUBLIC UTILITY COMMISSION OF
OREGON,

Energy Trust of Oregon Cost Effectiveness
Exception Requests for Manufactured Homes.

ORDER

DISPOSITION: STAFF'S RECOMMENDATION ADOPTED

At its public meeting on September 21, 2021, the Public Utility Commission of Oregon adopted Staff's recommendation in this matter. The Staff Report with the recommendation is attached as Appendix A.



BY THE COMMISSION:

A handwritten signature in blue ink, appearing to read "Nolan Moser".

Nolan Moser

Chief Administrative Law Judge

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 Circuit Court for Marion County in compliance with ORS 183.484.

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: September 21, 2021**

REGULAR X **CONSENT** **EFFECTIVE DATE** September 22, 2021

DATE: September 13, 2021

TO: Public Utility Commission

FROM: Anna Kim

THROUGH: Bryan Conway, JP Batmale, and Sarah Hall **SIGNED**

SUBJECT: OREGON PUBLIC UTILITY COMMISSION STAFF:
(Docket No. UM 1696)
Energy Trust of Oregon Cost Effectiveness Exception Requests for
Manufactured Homes.

STAFF RECOMMENDATION:

The Oregon Public Utility Commission (Commission or OPUC) grant exceptions to cost effectiveness of energy efficiency measures for manufactured home replacements, as requested by Energy Trust of Oregon (Energy Trust).

DISCUSSION:

Issue

Whether the Commission should grant exceptions to cost effectiveness for energy efficiency measures for manufactured home replacements.

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. The exceptions listed in the Order are as follows:

- 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.

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- 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.¹

The current process to consider cost effectiveness exceptions was reaffirmed in Docket No. UM 1622 and is as follows;²

- For minor exception requests, where the size and scope are limited, Energy Trust provides details to OPUC Staff who review and if appropriate, provide approval through an email. A copy of the email is kept on file by OPUC Staff.
- For major exception requests, Energy Trust provides an official filing and requests an exception. OPUC Staff makes formal recommendations to the Commission at a public meeting. Commissioners then decide on the exception request at the public meeting. For more significant requests, the recommendation presentation and the decision may occur on different meetings to allow more time for comments.

The threshold by which Staff can consider minor exceptions was officially established in

¹ The cost effectiveness test required under Order No. 94-590 is the Total Resource Cost Test (TRC). *In The Matter Of An Investigation Into The Calculation And Use Of Conservation Cost-effectiveness Levels*, Docket No. UM 551, Order No. 94-590 (April 6, 1994). Energy Trust has used this test since its inception to guide what measures can be offered by Energy Trust programs. Orders entered in Docket No. UM 551 also allow for the use of other cost effectiveness tests. Energy Trust uses the Utility Cost Test (UCT) to set the maximum allowable incentive amount that can be offered to participants.

² *In the Matter of Energy Trust of Oregon, Request for Approval of Exceptions to Cost Effectiveness Guidelines*, Docket No. UM 1622, Order No. 14-332 (October 1, 2014).

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Docket No. UM 1696.³ These orders codified a previous working arrangement in Docket No. UM 1622 whereby Staff could consider measure level cost effectiveness exceptions under the following circumstances:

- The measure's Total Resource Cost (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 goes through the Commission's major exception request process.

In May 2020, the Commission granted exceptions for manufactured home replacement measures through December 31, 2021 so that Energy Trust could complete a pilot study to explore the costs and benefits of manufactured home replacement.⁴

At the August 24, 2021, Public Meeting, the Commission approved the schedule for submission of public comments and for Staff to return with final recommendations at the September 21, 2021 Public Meeting.⁵

Analysis

This memo will summarize the August 24, 2021 Staff memo that introduced this topic, discuss stakeholder comments, and present final recommendations. See Attachment 1 for the August 24 memo.

Background

In July 2021, Energy Trust requested an exception for the retirement of existing pre-1995 vintage manufactured homes and replacement with new Northwest Energy-Efficient Manufactured Housing Program (NEEM) 1.1 (ENERGY STAR) or better manufactured homes. This request falls under the major exception category as these measures are expected to have TRCs below 0.8 which is the threshold for minor exceptions. Energy Trust requested these exceptions under Categories A, B, and G:

³ *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696, Order Numbers 17-395 and 17-457.

⁴ *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696, Order Number 20-158.

⁵ *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696, Order Number 21-267.

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- 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.
- G. The measure is required by law or is consistent with Commission policy and/or direction.

Staff analyzed Energy Trust's requests for cost effectiveness exceptions and presented initial recommendations at the August 24, 2021, Public Meeting, agreeing that these criteria apply:

- 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.

Staff agrees that there are significant non-quantifiable non-energy benefits for customers when their aging affordable manufactured housing is replaced. These non-energy benefits would be the primary benefits to participation. These benefits could include reductions in financial, physical, and mental burdens that are likely to outweigh the energy benefits alone.

- B. *Inclusion of the measure will increase market acceptance and is expected to lead to reduced cost of the measure.*

Staff agrees that that establishing this proposed manufactured home replacement measures and collaboration framework have the opportunity to lead to increased adoption of these measures, which will lead to reduced costs.

- G. *The measure is required by law or is consistent with Commission policy and/or direction.*

Staff agrees that these exceptions are consistent with Commission policy and direction. These measures would support Energy Trust's diversity, equity and inclusion efforts, which the Commission supports through DEI-specific performance metrics. These measures will be offered in partnership with organizations that advocate for affordable housing, and other organizations that provide services to low-income customers. These exceptions would also support Executive Order 20-04 by reducing greenhouse gases while also mitigating energy burden among low income customers.

Staff proposed granting exceptions from cost effectiveness requirements for the replacement of manufactured homes. In response to Energy Trust's requests and Staff's memo, the Commission issued Order No. 21-267 on August 26, 2021, directing

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Staff to present final recommendations at the September 21, 2021, Public Meeting. This provided time for stakeholder comment in response to Staff's initial recommendations.

Stakeholder Comments

The comments deadline for inclusion in Staff's final memo was September 7, 2021. Seven comments were filed by the deadline. The following stakeholders submitted written comments:

- Earth Advantage
- Representative Pam Marsh
- Portland General Electric (PGE)
- Citizens Utility Board (CUB)
- Oregon Housing and Community Services (OHCS)
- Community and Shelter Assistance of Oregon (CASA)
- Network for Oregon Affordable Housing (NOAH)

Staff thanks these organizations and individuals for providing comments. Staff particularly appreciates the context and information they provided.

All seven organizations expressed support for moving forward with a transition to a permanent offering, each discussing the challenges and benefits to affordable housing. Representative Marsh, OHCS, and NOAH also discuss the potential role in wildfire recovery.

The Oregon Citizens' Utility Board (CUB) clarifies that while Staff's memo describes a TRC of 0.2 to 0.3 for these measures, these estimates are only in the absence of other funding sources. "The TRC assumes the owner of the manufactured home must pay all of the incremental cost of the program beyond the ETOs costs, but the program is designed to braid funding for several sources beyond the ETO to bring the participant's costs down to an affordable level." ⁶ CUB is correct: Energy Trust provided the worst-case measures of cost-effectiveness with no additional funding, as well as the funding necessary to pass the TRC. (Please see Attachment 1: Attachment A.) The TRC will vary heavily depending on the availability of other sources of funding overall, the funding available to any individual participant.

⁶ CUB Comments on Manufactured Homes Replacement Exceptions, *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696 found at <https://edocs.puc.state.or.us/efdocs/HAC/um1696hac133035.pdf>.

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OHCS particularly notes that “[T]he transition from a pilot to a standard program will mean that manufactured housing partners can more effectively market and deliver manufactured home replacement resources to some of Oregon’s most vulnerable homeowners.”⁷ This statement supports Energy Trust’s argument for Criteria B, that these measures will increase market acceptance and reduce costs in the future.

NOAH recommends increasing the budget for these exceptions from the \$5 million that Staff proposed in the initial memo. NOAH based this recommendation on the size of the need for assistance.⁸ Staff supports having an initial monetary limit for these exceptions to manage budgets as these offers are being launched and Energy Trust finds more partners to fund these replacements. The availability of complementary funds will significantly impact the cost-effectiveness of these measures, and may lead to more replacements being cost-effective. This budget limit is flexible and could be revisited at any time. Staff proposes meeting annually with Energy Trust to revisit the cost-effectiveness of the program and the appropriate budget for measures under exception.

Staff Recommendations

After reviewing written comments, Staff maintains its initial recommendations to grant exceptions from cost effectiveness requirements for the replacement of manufactured homes based on Criteria A, B, and G. As outlined in the previous memo, Staff determined that these exceptions met multiple criteria: a range of significant non-quantifiable non-energy benefits from a new, efficient home (Criteria A), potential for improvements on cost-effectiveness by supporting other affordable housing efforts (Criteria B), and reducing energy burdens in affordable housing (Criteria G).

Staff proposes granting three-year exceptions for these measures with a total incentive cap of \$5 million over the exception period for measures that require an exception. This cap would not apply to cost-effective measures. At a \$5 million cap, these measures may potentially reach five percent of total Residential Program costs in a given year. Staff recommends that Energy Trust provide a workshop before the launch of this offer in order to collect feedback on program design, including allocations. Staff also recommends that Energy Trust meet with staff in Q3 of each year of this exception to discuss whether there is a need to request a change in the exception budget.

⁷ OHCS Comments on Manufactured Homes Replacement Exceptions, *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696 found at <https://edocs.puc.state.or.us/efdocs/HAC/um1696hac135121.pdf>.

⁸ NOAH Comments on Manufactured Homes Replacement Exceptions, *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696 found at <https://edocs.puc.state.or.us/efdocs/HAC/um1696hac173520.pdf>.

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Conclusion

At the August 24, 2021, Public Meeting, Staff presented its initial cost effectiveness recommendations. Staff proposed granting three-year exceptions for these measures with a total incentive cap of \$5 million over the exception period. Staff was ordered to return with final recommendations at the September 21, 2021, Public Meeting. To date, stakeholders have been supportive of Staff's proposed exceptions. Staff believes that its initial recommendations for cost effectiveness exceptions needing Commission approval should be adopted by the Commission. These are to grant exceptions to cost-effectiveness requirements for the replacement of manufactured homes through March 31, 2025, with an initial cap of \$5 million in measures under the exception. Staff recommends that Energy Trust hold a stakeholder workshop prior to the launch of these measures and report to Staff twice annually on progress.

PROPOSED COMMISSION MOTION:

Adopt Staff's recommendation to grant exceptions to cost effectiveness of energy efficiency measures for manufactured home replacements through March 31, 2025, with a cap of \$5 million in measures under the exception.

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ITEM NO. CA2

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: August 24, 2021**

REGULAR _____ CONSENT X EFFECTIVE DATE August 25, 2021

DATE: August 13, 2021

TO: Public Utility Commission

FROM: Anna Kim

THROUGH: Bryan Conway, JP Batmale, and Sarah Hall

SUBJECT: OREGON PUBLIC UTILITY COMMISSION STAFF:
(Docket No. UM 1696)
Energy Trust of Oregon Cost Effectiveness Exception Requests for
Manufactured Homes.

STAFF RECOMMENDATION:

Adopt Staff's proposed schedule for submission of public comments and for Staff's final recommendation on major exceptions to cost effectiveness on energy efficiency measures for manufactured homes, as requested by Energy Trust of Oregon (Energy Trust).

DISCUSSION:

Issue

Whether the Commission should adopt the Schedule for public comments and Staff's presentation of its final recommendation on exceptions to cost effectiveness for energy efficiency measures for manufactured homes.

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. The exceptions listed in the Order are as follows:

- 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.⁹

The current process to consider cost effectiveness exceptions was reaffirmed in Docket No. UM 1622 and is as follows;¹⁰

- For minor exception requests, where the size and scope are limited, Energy Trust provides details to OPUC Staff who review and if appropriate, provide approval through an email. A copy of the email is kept on file by OPUC Staff.
- For major exception requests, Energy Trust provides an official filing and requests an exception. OPUC Staff makes formal recommendations to the Commission at a public meeting. Commissioners then decide on the exception request at the public meeting. For more significant requests, the recommendation presentation and the decision may occur on different meetings to allow more time for comments.

⁹ The cost effectiveness test required under Order No. 94-590 is the Total Resource Cost Test (TRC). *In The Matter Of An Investigation Into The Calculation And Use Of Conservation Cost-effectiveness Levels*, Docket No. UM 551, Order No. 94-590 (April 6, 1994). Energy Trust has used this test since its inception to guide what measures can be offered by Energy Trust programs. Orders entered in Docket No. UM 551 also allow for the use of other cost effectiveness tests. Energy Trust uses the Utility Cost Test (UCT) to set the maximum allowable incentive amount that can be offered to participants.

¹⁰ *In the Matter of Energy Trust of Oregon, Request for Approval of Exceptions to Cost Effectiveness Guidelines*, Docket No. UM 1622, Order No. 14-332 (October 1, 2014).

The threshold by which Staff can consider minor exceptions was officially established in Docket No. UM 1696.¹¹ These orders codified a previous working arrangement in Docket No. UM 1622 whereby Staff could consider measure level cost effectiveness exceptions under the following circumstances:

- The measure's Total Resource Cost (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 goes through the Commission's major exception request process.

In May 2020, the Commission granted exceptions for manufactured home replacement measures through December 31, 2021 so that Energy Trust could complete a pilot study to explore the costs and benefits of manufactured home replacement.¹²

Analysis

This analysis will a) provide background to the manufactured homes initiative and the proposed exception; b) outline activities undertaken under the previous exception to date; c) review the request and rationale; and d) present a proposal for further action.

Background

Energy Trust was granted a major exception for manufactured home replacement energy efficiency measures in order to continue funding the manufactured home early replacement pilot, which explores the costs and benefits of manufactured home replacements.

Without the manufactured homes replacement activities through this pilot or permanent measures, Energy Trust's work with new manufactured homes would be very limited. Currently, the work outside of the completed pilot and proposed exceptions accounts for less than a tenth of a percent of the Residential Program's savings and costs.

A significant component of this pilot was developing new relationships and bringing together support, particularly funding sources, to complete projects. Energy Trust

¹¹ *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696, Order Numbers 17-395 and 17-457.

¹² *In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures*, Docket No. UM 1696, Order Number 20-158.

initially partnered with Craft3, Oregon Housing and Community Services (OHCS), CASA of Oregon, NeighborWorks Umpqua, and St Vincent de Paul of Lane County to conduct the pilot.

Since the exceptions were granted, Energy Trust has completed the pilot. Energy Trust hired a third-party consultant to conduct an evaluation of the manufactured homes replacement pilot in 2020.¹³ While the initial exceptions for the pilot expire on December 31, 2021, Energy Trust has already collected enough information about costs, benefits, and processes to support the development of more permanent measures.

Since the exception was granted, Energy Trust held two workshops discussing the pilot at September 2020 and May 2021 Conservation Advisory Council (CAC) meetings. These workshops were open to the public and OPUC stakeholders were invited. Energy Trust also discussed the manufactured homes replacement pilot at a UM 2114 workshop on April 1, 2021 focused on opportunities to expand low-cost and no-cost energy efficiency measures.

The Exception Request

Energy Trust requests an exception for the retirement of existing pre-1995 vintage manufactured homes and replacement with new NEEM 1.1 (ENERGY STAR) or better manufactured homes. These exceptions would permit Energy Trust to support a framework for combining the funding sources necessary to complete projects and replace homes.

Energy Trust is requesting exceptions for these measures because their TRC scores of 0.2 to 0.3 falls below the minor exception threshold for these measures. The proposed energy efficiency measures and their cost-effectiveness scores are listed in Attachment A. While the purpose of these measures is to collaborate with other programs, Energy Trust calculated cost-effectiveness assuming there are no additional funds from other programs available to the participants to support these measures to represent the worst-case calculations. Without supporting funding, the UCT scores are cost-effective, ranging from 1.2 to 2.5, while the TRC scores are extremely low at 0.2 to 0.3. This combination indicates that these measures would provide greater benefits to the system than costs, but the energy-saving benefits to the participant are small relative to the total cost of home replacement.

The actual cost-effectiveness of each home will vary based on a number of factors, primarily the amount of complementary funding that is available to the specific project.

¹³ Manufactured Home Replacement Pilot Evaluation, August 12, 2020, found at <https://apps.puc.state.or.us/orders/2020ords/20-158.pdf>

Energy Trust proposes measures that would be cost-effective at the system level, but without significant funding from other sources, are unlikely to be cost-effective to the participant for the purposes of energy savings. Energy Trust estimates that additional funding of \$18,000-\$44,000 per unit would be needed to make these measures pass the TRC.

If exceptions are granted, Energy Trust estimates working with approximately 100 homes per year, resulting in roughly 1,500,000 kWh in savings. This would be less than five percent of total Residential Program savings and incentive budget.

Energy Trust requests the exception under Categories A, B, and G, providing the following arguments.

C. 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.

Energy Trust is able to incorporate quantifiable non-energy benefits, but these quantified benefits are negligible. However, there are significant non-quantifiable benefits to customers when their aging affordable manufactured housing is replaced. For instance, the third-party evaluator found the following:

Our assessment to date indicates that participants realize substantial non-energy benefits after moving from a pre-1994 manufactured home to a new, efficient one. The biggest difference noted by participants was improved thermal comfort. They no longer needed extra blankets and jackets to stay warm. Most reported health improvements due to improved air quality in the new home. They also worried less about things in the new home, and one felt much safer in their new home and had an easier time getting around in their wheelchair and walker.¹⁴

While the TRC scores are very low, indicating these are poor investments for a homeowner on the grounds of energy savings, the primary benefits to participants would come from non-energy benefits.

D. Inclusion of the measure will increase market acceptance and is expected to lead to reduced cost of the measure.

Energy Trust believes that establishing this proposed manufactured home replacement measures and collaboration framework will lead to increased adoption of these measures, which will lead to reduced costs. The offering may also support the adoption of higher efficiency manufactured homes.

¹⁴ Manufactured Home Replacement Pilot Evaluation, August 12, 2020, pg. 2. found at <https://apps.puc.state.or.us/orders/2020ords/20-158.pdf>

G. The measure is required by law or is consistent with Commission policy and/or direction.

The Commission approved DEI-specific performance metrics for Energy Trust through Order No. 21-068.¹⁵ These measures will be offered in partnership with organizations that advocate for affordable housing, as well as other organizations that provide services to low-income customers. Energy Trust also collaborates with OHCS, which runs a manufactured home replacement program.

These exceptions would also support Executive Order 20-04 by reducing greenhouse gases while also mitigating energy burden among low income customers.

Staff agrees with these assessments and believes exception Categories A, B, and G are applicable. Staff particularly notes that the non-quantifiable non-energy benefits make these measures worthwhile to participants, despite the low TRCs. Overall, Staff believes that exceptions for these measures can support the efforts of other organizations to improve low income housing.

Proposed Action Plan for the Exception

Staff proposes granting three-year exceptions for these measures with a total incentive cap of \$5 million over the exception period. At a \$5 million cap, these measures may potentially reach five percent of total Residential Program costs in a given year.

Based on Staff's analysis and overall stakeholder engagement, Staff proposes a schedule to allow the filing of public comment through September 7, 2021. This will allow stakeholders two weeks after the August 24, 2021, Public Meeting to review and respond. Staff will receive and compile comments, and return at the September 21, 2021, Public Meeting with a final recommendation.

Proposed Schedule:

Event	Date
Public Comment to be Filed in UM 1696 on Major Exception Request	September 7, 2021
Staff's Final Recommendation to Commission	September 21, 2021

Conclusion

Staff concludes that Energy Trust should be granted exceptions for manufactured home replacement measures through March 31, 2025 with a total incentive cap of \$5 million

¹⁵ *In the Matter of Energy Trust of Oregon: Recommendations for Performance Measures*, Docket No. UM 1158, Order Number 21-068.

for measures under exception. Staff proposes that stakeholders have until September 7, 2021 to file comments or contact Staff regarding the recommended major cost effectiveness exceptions. Staff will present stakeholder comments and Staff's final recommendations at the September 21, 2021, Public Meeting.

PROPOSED COMMISSION MOTION:

Adopt Staff's proposed schedule for submission of public comments and for Staff's final recommendation on major exceptions to cost effectiveness of energy efficiency measures for manufactured homes, as detailed in this memo.

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Attachment A: Manufactured Home Replacement Measures

These table describes the proposed manufactured home replacement energy efficiency measures under this request. The costs used for screenings in the first table do not include any complementary funding. The second table shows the additional funding necessary to achieve cost-effectiveness for energy efficiency.

In the table, “SW” is a single wide home, and “DW” is a double wide home. NEEM 1.1 and 2.0 are the Northwest Energy Efficiency Manufactured Home energy efficiency specifications for newly constructed homes.¹⁶

Table 1: Measure-Level Cost-Effectiveness with No Complementary Funding

Measure	Savings (kWh)	Savings (therms)	Incremental Costs (\$)	Total NEB (Annual \$)	Proposed 2022 Incentives (\$)	UCT BCR at Proposed 2022 Incentive	TRC BCR
NEEM 1.1 SW- Any Zone-Electric	12,884	0.00	\$87,112	\$215	\$10,000	2.1	0.3
NEEM 1.1 DW- Any Zone-Electric	22,700	0.00	\$123,973	\$306	\$15,000	2.5	0.3
NEEM+ SW- Any Zone-Electric	13,265	0.00	\$89,078	\$215	\$11,000	2.0	0.3
NEEM+ DW- Any Zone-Electric	23,250	0.00	\$125,939	\$306	\$16,000	2.4	0.3
NEEM 1.1 SW- Any Zone-Gas	154	511.30	\$87,112	\$215	\$10,000	1.3	0.2
NEEM 1.1 DW- Any Zone-Gas	212	902.01	\$123,973	\$306	\$15,000	1.6	0.2
NEEM+ SW- Any Zone- Gas	156	530.10	\$89,078	\$215	\$11,000	1.3	0.2
NEEM+ DW- Any Zone- Gas	213	929.33	\$125,939	\$306	\$16,000	1.5	0.2
NEEM 1.1 SW- Any Zone-Gas- Gas Only	0	511.30	\$87,112	\$237	\$10,000	1.3	0.2
NEEM 1.1 DW- Any Zone-Gas- Gas Only	0	902.01	\$123,973	\$335	\$15,000	1.6	0.2
NEEM+ SW- Any Zone-Gas- Gas Only	0	530.10	\$89,078	\$237	\$11,000	1.2	0.2
NEEM+ DW- Any Zone-Gas- Gas Only	0	929.33	\$125,939	\$335	\$16,000	1.5	0.2

Table 2: Measure-Level Complementary Funding Need for Cost-Effectiveness

Measure	Savings (kWh)	Savings (therms)	Maximum Remaining Cost (\$)	Total NEB (Annual \$)	Proposed 2022 Incentives (\$)	UCT BCR at Proposed 2022 Incentive	TRC BCR with Co-Funding
NEEM 1.1 SW- Any Zone-Electric- Co-Funded	12,884	0.00	\$25,102	\$215	\$10,000	2.1	1.0

¹⁶ Details about NEEM specifications can be found at: <https://www.neemhomes.com/>

Measure	Savings (kWh)	Savings (therms)	Maximum Remaining Cost (\$)	Total NEB (Annual \$)	Proposed 2022 Incentives (\$)	UCT BCR at Proposed 2022 Incentive	TRC BCR with Co-Funding
NEEM 1.1 DW- Any Zone-Electric- Co-Funded	22,700	0.00	\$42,793	\$306	\$15,000	2.5	1.0
NEEM+ SW- Any Zone-Electric- Co-Funded	13,265	0.00	\$25,722	\$215	\$11,000	2.0	1.0
NEEM+ DW- Any Zone-Electric- Co-Funded	23,250	0.00	\$43,688	\$306	\$16,000	2.4	1.0
NEEM 1.1 SW- Any Zone-Gas- Co-Funded	154	511.30	\$17,618	\$215	\$10,000	1.3	1.0
NEEM 1.1 DW- Any Zone-Gas- Co-Funded	212	902.01	\$29,539	\$306	\$15,000	1.6	1.0
NEEM+ SW- Any Zone-Gas- Co-Funded	156	530.10	\$18,106	\$215	\$11,000	1.3	1.0
NEEM+ DW- Any Zone-Gas- Co-Funded	213	929.33	\$30,246	\$306	\$16,000	1.5	1.0
NEEM 1.1 SW- Any Zone-Gas- Gas Only- Co-Funded	0	511.30	\$17,739	\$237	\$10,000	1.3	1.0
NEEM 1.1 DW- Any Zone-Gas- Gas Only- Co-Funded	0	902.01	\$29,699	\$335	\$15,000	1.6	1.0
NEEM+ SW- Any Zone-Gas- Gas Only- Co-Funded	0	530.10	\$18,229	\$237	\$11,000	1.2	1.0
NEEM+ DW- Any Zone-Gas- Gas Only- Co-Funded	0	929.33	\$30,406	\$335	\$16,000	1.5	1.0