



# DETERMINING WHEN EFFICIENCY IS THE BEST ENERGY BUY FOR ALL UTILITY CUSTOMERS

## **COST-EFFECTIVENESS TESTS: GUIDELINES ENERGY TRUST OF OREGON FOLLOWS WHEN MAKING INVESTMENT DECISIONS**

Energy Trust of Oregon is dedicated to serving utility customers with energy-saving and renewable power solutions. By investing in cost-effective energy-efficiency projects in homes and businesses, we help utilities avoid having to invest in new, higher-cost resources to meet customer energy needs.

Energy efficiency is one of the most affordable resources and helps keep overall energy costs for utility ratepayers lower than they otherwise would have been. This handout provides an overview for how Energy Trust applies cost-effectiveness guidelines when making investment decisions.

### **Introduction to cost-effectiveness tests**

Cost-effectiveness tests are commonly used by energy-efficiency programs to determine whether and how much to invest in a project that saves electricity or natural gas.

In Oregon, Energy Trust is required by legislation to invest in cost-effective energy efficiency. The Oregon Public Utility Commission oversees Energy Trust's implementation of the cost-effectiveness requirement and determines what can be counted as a benefit and cost in the cost-effectiveness tests. The OPUC has directed Energy Trust to apply the Total Resource Cost Test benefit cost ratio and Utility Cost Test benefit cost ratio to ensure that Energy Trust is responsibly investing ratepayer funds.

The tests compare the benefits of the energy savings to the costs of the investment from two viewpoints. Together, the tests assess the value of the energy-efficiency investment compared to a utility supplying the same amount of energy and determine whether energy efficiency is the best energy buy for all utility customers. The tests don't evaluate the economics influencing a customer's individual decision to invest in a project.

## How Energy Trust applies the cost-effectiveness tests

For Energy Trust to provide an incentive for a project, the benefit must meet or outweigh the cost. This is expressed as a ratio with the benefits in the numerator and the costs in the denominator. For Energy Trust to invest in a project the ratio must be 1.0 or greater for both tests.

### *Total Resource Cost Test benefit cost ratio (TRC)*

This test is the main test that determines whether Energy Trust can offer an incentive for a project. It is central to how Energy Trust delivers on its mission. The test also reflects the region's approach to long-term energy planning by prioritizing investment in low-cost energy resources—energy efficiency is often the most affordable resource.

1. Benefits: The value of energy savings to the ratepayers of the utility system over the expected life of the energy-efficiency resource (otherwise known as the avoided cost of energy). In some cases the benefits also include quantifiable non-energy benefits, such as water savings and operations and maintenance benefits.
2. Costs: The total cost of the energy-efficiency resource, including Energy Trust incentives and the remaining project cost paid by the participating customer.

## Non-energy benefits

In addition to direct energy benefits, Energy Trust accounts for some non-energy benefits to utility customers and other stakeholders in its cost-effectiveness calculations when they are generally applicable and can be credibly quantified at a reasonable cost. Quantifiable benefits are:

- Comfort from adding cooling to a home or business
  - Spending less on wood, propane or heating oil
  - Spending less on lightbulbs and operations and maintenance thanks to longer-lasting LEDs
  - Water savings from certain irrigation infrastructure improvements
  - Saving water at home that would otherwise go through a water treatment system
  - Longer warranties for efficient equipment than for less efficient alternatives
  - Certain productivity benefits at industrial and agricultural sites (labor and maintenance savings, less clean-up time, improved crop yields, custom process improvements)
  - Avoided or reduced fines from emissions violations (not yet used but could be if applicable)
- Other non-energy benefits are not yet quantified and would require more research. These include:
- Health benefits from home weatherization, including fewer hospital visits or fewer missed days of work
  - Fewer late utility payments and debt thanks to lower bills
  - Fewer fires thanks to reduced use of fireplaces and baseboard heaters

### *Utility Cost Test benefit cost ratio (UCT)*

This second test is used to help determine the incentive amount for a project. It helps Energy Trust understand whether providing an incentive is cost-effective for the utility system.

1. Benefits: The value of energy savings to the ratepayers of the utility system over the expected life of the energy-efficiency resource (otherwise known as the avoided cost of energy).
2. Costs: The cost of the Energy Trust incentive.

## RESOURCES

Energy Trust cost-effectiveness policy  
[www.energytrust.org](http://www.energytrust.org)

OPUC UM 551 Order 94-590 available upon request to the OPUC

For questions or feedback on Energy Trust's use of cost-effectiveness tests in determining what projects to support with cash incentives, contact the OPUC Energy Efficiency Programs staff member [www.oregon.gov/puc](http://www.oregon.gov/puc)

## Evaluating a project's cost-effectiveness

When evaluating a project's cost-effectiveness, Energy Trust evaluates each piece—or measure—of the project.

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)
<b>Purpose</b>	To determine whether to provide an incentive for an energy-efficiency measure.	To help determine the maximum allowable amount of the incentive.
<b>Measure passes if...</b>	The value of the energy saved exceeds the total cost of the measure, and the cost of the energy-efficiency resource provides good value to all utility customers and the participating customer.	The value of the energy saved exceeds the cost of the incentive, and the cost of the energy-efficiency resource provides good value to all utility customers.
<b>Benefits calculation</b>	<ul style="list-style-type: none"><li>• Savings from avoiding the use of more expensive energy</li><li>• Quantifiable non-energy benefits to the participating customer or the utility, like water savings or operations and maintenance benefits</li></ul>	Savings from avoiding the use of more expensive energy.
<b>Costs calculation</b>	<ul style="list-style-type: none"><li>• Amount of incentive</li><li>• Remaining amount of participant's costs</li></ul>	Amount of incentive
<b>Calculation used by Energy Trust</b>	$\frac{(\text{Lifetime (Savings)} \cdot (\text{Avoided Costs}) + (\text{Non-Energy Benefits}))}{\text{Total Cost of Measure}}$	$\frac{(\text{Lifetime (Savings)} \cdot (\text{Avoided Costs}))}{\text{Incentive Amount}}$

*NOTE: The term project is used throughout this document for ease of reading and to indicate the overall package of energy-efficiency measures a customer is considering. A project may consist of one energy-efficiency measure or it may include many measures. When evaluating the cost-effectiveness of a project, Energy Trust applies the test to each individual measure.*

## When a project is not cost-effective

The OPUC provides some flexibility to how Energy Trust applies the cost-effectiveness requirement. Exceptions may be allowed for a few situations, for example, pilots, new technologies, the presence of significant hard-to-quantify non-energy benefits and projects that provide consistency for the market. These exceptions are rare and need to be well supported (refer to OPUC UM 551). Only a small portion of Energy Trust annual savings result from projects supported under cost-effectiveness exceptions.

In some cases, Energy Trust can make adjustments to requirements (like resetting eligibility requirements where the savings are higher or costs are lower) and will then seek OPUC guidance on whether the project can continue to be supported with an exception to the cost-effectiveness requirement.



## Considerations for customers: How cost-effectiveness may impact your project

If you are considering an energy-saving project, Energy Trust allied contractors and service providers help assess the associated costs and savings. The following information may be helpful in understanding whether your project is cost-effective and may qualify for an incentive.

- Energy Trust cash incentives are available to lower your upfront project costs.
- The availability and amount of an incentive for a project is determined by Energy Trust's use of two cost-effectiveness tests, as required by the OPUC.
- The cost-effectiveness tests compare the benefits to the costs of the energy-efficiency project.
- When the benefits outweigh the overall costs, the project is cost-effective.
- The two tests used by Energy Trust compare the cost of energy efficiency to the cost of a utility supplying the same amount of energy, and determine whether energy efficiency is the best energy buy for all ratepayers.
- By supporting cost-effective energy-efficiency improvements, Energy Trust is helping customers install energy-saving projects, and helping to keep overall energy costs for all utility customers lower than they otherwise would have been.
- The tests don't evaluate your individual decision to invest in a project but they do evaluate the costs and benefits of the project from a ratepayer and utility system perspective.
- A project, or some parts of a project, you are considering may not pass Energy Trust's cost-effectiveness tests for a variety of reasons:
  - The costs to install may have increased without increased energy savings.
  - Your operating circumstances (hours of use, total water heating needs, etc.) and additional equipment installed may not consume enough energy for the savings from the energy-efficiency project to offset the costs.
  - The cost of energy may mean the dollar value of the energy you save over the expected lifetime of the project won't cover (or payback) the total costs of your investment.
- An Energy Trust incentive is provided when the project meets both cost-effectiveness tests and additional program requirements.
- Even if you don't receive an Energy Trust incentive, the project may still save energy and/or provide other types of value to you (for example, water savings, operations and maintenance reductions or the satisfaction of your customers).
- Consult your contractor to determine the best solution for your circumstances and goals.



For more information on Energy Trust programs and services, visit [www.energytrust.org](http://www.energytrust.org) or call **1.866.368.7878**.