# Energy Trust of Oregon

# Production Efficiency Program 2003-2005

# Impact Evaluation

***Final Report***

***Funded By***

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Providing business energy solutions

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# *Executive Summary*

Energy Trust of Oregon, Inc. (Energy Trust) is an independent nonprofit 501(c)(3) corporation dedicated to energy efficiency and renewable energy development in Oregon. Under an agreement established with the Oregon Public Utility Commission in January 2002, Energy Trust receives funding from a 3% public purpose charge paid by the customers of Portland General Electric and PacifiCorp, Oregon's two major investor-owned electric utilities. These funds are in turn invested by Energy Trust in energy efficiency and renewable energy.

Energy Trust's Production Efficiency (PE) Program offers energy efficiency services for industrial processes, including manufacturing, agricultural and water/wastewater treatment. The program funds studies to identify electrical energy efficiency opportunities and provides financial incentives to implement these opportunities.

This impact evaluation covers industrial projects completed under the PE Program between January 1, 2003 and December 31, 2005. The evaluation included all projects at industrial facilities including compressed air, refrigeration, motor systems, pumps, and fans, as well as industrial process modifications. Some prescriptive measures, such as motors and lighting, are also included in these results.

Energy Trust has two overall goals for this impact evaluation:

- To develop reliable estimates of program savings, and
- To report observations and make recommendations on improving energy savings estimates and future evaluations.

## Evaluation Approach

As the majority of the energy savings were realized by a relatively small number of customer sites, stratification by energy savings was used for the sampling approach.

A total of 98 site visits were performed for this evaluation. This includes 6 sites visited for an earlier process evaluation. Another sample was used for telephone interviews of 22 smaller participants using the same questions as were asked during the site visits.

In addition to the participant site visits and telephone interviews, the evaluation also performed telephone interviews with 33 "audit-only participants" that

received an Energy Trust-funded energy study but did not apply for an incentive on a recommended project.

## Results Summary

Table I summarizes PE Program energy savings achievements by end-use, and Table II provides an overall program summary. The PE Program has achieved an overall realization rate of 92.8% for projects implemented in calendar years 2003-2005 with an overall free-ridership for the program of 17.2% (7.8% with Mega-projects included).

Table I: Program Results by End-use, PE Program 2003-2005

| Measure Category | Working kWh | Engineering Adjustment /Realization Rate | Gross Savings, kWh |
|---|---|---|---|
| Compressed Air | 27,089,414 | 99.95% | 27,075,110 |
| Fresh Water | 4,519,322 | 63.25% | 2,762,685 |
| HVAC | 9,564,380 | 100.00% | 9,564,380 |
| Hydraulics | 3,579,654 | 104.16% | 3,728,634 |
| Lighting | 10,567,189 | 93.20% | 9,848,620 |
| Motors | 805,943 | 77.40% | 623,800 |
| Pneumatic Conveyance | 16,122,115 | 89.24% | 14,386,953 |
| Process Fans | 5,768,788 | 84.78% | 4,890,877 |
| Process Modification | 184,955,244 | 93.76% | 173,419,192 |
| Process Pumping | 6,251,153 | 63.81% | 3,989,023 |
| Refrigeration | 5,566,445 | 97.23% | 5,411,981 |
| Wastewater | 4,144,378 | 77.48% | 3,211,238 |

Table II: Overall Program Results, PE Program 2003-2005

| | Working kWh | Engineering Adjustment /Realization Rate | Gross Savings, kWh | Overall Market Adjustment Factor | Net Program Savings, kWh |
|---|---|---|---|---|---|
| **Total, Mega-projects[1]** | 153,073,574 | 92.3% | 141,307,774 | 100% | 141,307,774 |
| **Total, without Mega-projects** | 125,860,451 | 93.4% | 117,604,718 | 82.8% | 97,362,788 |
| **Total, all projects** | 278,934,025 | 92.8% | 258,912,492 | 92.2% | 238,670,562 |

## Evaluation Observations

This is a summary of the evaluation observations of the PE Program. Detailed recommendations to address these observations and for Energy Trust to consider for current and future program design and implementation are in the expanded version on page 28 of this report.

The observations are grouped into three categories: program satisfaction, those related to evaluation, and customer service.

### Program Satisfaction Observations

- Satisfaction with the PE Program is very high.
- Regard for PE Program representatives is very high.
- For a number of customers, this is their first experience with an energy efficiency incentive program and it has been positive.
- Some customers have concerns with perceived variation in Energy Trust programs and policies.
- Some customers have concerns about the number of different people representing Energy Trust interests.

[1] Mega-projects include two projects at pulp and paper mills and one project at a wood products facility. There is no free-ridership associated with Mega-projects.

## Evaluation Observations

- Project evaluability is an issue: key information for impact evaluation was not uniformly present in project documents.
- Project data has been inconsistently recorded – the database should be redesigned to accommodate all program needs, including evaluation.
- Much of the variance in project realization rate is not due to performance, but to baseline assumptions, measure operating assumptions and inappropriate analysis approaches – Energy Trust should establish standards for level of effort, documentation, and analysis of project savings.
- Many program audit-only participants have installed or are planning to install recommended efficiency measures without incentives – Energy Trust should consider performing an impact evaluation of the projects implemented by the audit-only participants.
- Very large projects should have evaluation oversight assigned early in the design and development process.

## Customer Service Observations

- Knowledge and use of the Oregon Business Energy Tax Credits (BETC) program is not universal and there is uneven awareness that it can be used for projects that save natural gas.
- Not all customers understand that the PE Program can help with efficiency projects beyond their current effort. A communications plan could help resolve this issue.
- For "major accounts" a regular and formal review of project opportunities should be undertaken.
- Projects identified by the evaluation as "not operating as designed" and "not achieving savings" should be revisited.