# IMPACT EVALUATION OF NEW BUILDING EFFICIENCY PROGRAM FOR 2004 AND 2005

**Final Report**

**(Final Version)**

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# EXECUTIVE SUMMARY

This report presents the results of the impact evaluation of the New Building Efficiency (NBE) Program that Energy Trust of Oregon (Energy Trust) offered for businesses in Oregon during 2004 and 2005.

Data for the study were collected through interviews with NBE program staff, review of program materials and processes, on-site inspections, end-use metering, and interviews with participating firms.

- On-site visits were used to collect data for savings impacts calculations. The on-site visits were used to verify installations and to determine any changes to the operating parameters since the measures were first installed. Facility staff were interviewed to determine the operating hours of the installed system and to locate any additional benefits or shortcomings with the installed system.
- Monitoring of lighting, HVAC equipment, or motors/VFDs was conducted to obtain more accurate information on hours of operation.
- Electric and gas billing data for some participants were provided by The Energy Trust.
- Using the on-site, monitored, and billing data, gross savings were estimated using proven techniques, including computer simulations using DOE-2.
- A survey of decision makers for sites in the NBE Program in 2004 and 2005 provided the information for the net-to-gross analysis. Survey-based techniques for estimating free-ridership in a program were applied to the data collected through the survey of decision-makers.
- Data collected through the survey of decision makers were also used to assess qualitatively the extent of program spillover effects. Participants representing about 5.6% of realized kWh savings for 2004 projects and about 4.5% for 2005 projects provided answers that indicated some spillover was occurring at their sites.

Table ES-1 provides summary statistics on the numbers and square footages for sites for which different types of data collection were conducted.

The results of the impact evaluation of the New Building Efficiency Program for 2004 and 2005 are summarized in Table ES-2.

- In general, the evaluation of the projects in the NBE Program in 2004 and 2005 resulted in confirmation of the expected energy savings, with realization rates for gross savings being just over 100% for kWh savings in 2004 and 2005 and therm savings in 2004. Therm savings in 2005 showed a lower realization rate of 41.9%.
- Net-to-gross ratios were also similar between the two years.

*Table ES-1. Summary of Data Collection Effort*

| | ***2004*** | | ***2005*** | |
|---|---|---|---|---|
| | ***Number of Sites*** | ***Square Footage of Sites*** | ***Number of Sites*** | ***Square Footage of Sites*** |
| *Program Participants* | | | | |
| | 18 | 999,461 | 85 | 3,866,462 |
| *Sites where Data Collected On-Site* | | | | |
| | 18 | 999,461 | 72 | 3,585,523 |
| *Sites Monitored* | | | | |
| Monitored for lighting | 4 | 256,928 | 27 | 1,708,912 |
| Monitored for HVAC, VFDs, etc. | 0 | 0 | 3 | 48,204 |
| Monitored for both lighting and HVAC | 2 | 76,545 | 5 | 432,651 |
| Totals for monitored sites | 6 | 333,473 | 35 | 2,189,767 |
| *Sites with electric billing data* | | | | |
| | 9 | 495,731 | 41 | 2,662,281 |
| *Sites Represented in Decision Makers Survey* | | | | |
| | 14 | 818,833 | 70 | 3,366,565 |

*Table ES-2. Summary of kWh and Therm Savings and kW Reductions for New Building Efficiency Program in 2004 and 2005*

| | ***Expected Gross*** | ***Realization Rate*** | ***Achieved Gross*** | ***Net-to-Gross Ratio*** | ***Achieved Net*** |
|---|---|---|---|---|---|
| *2004* | | | | | |
| kWh savings | 3,007,619 | 108.4% | 3,259,592 | 67.2% | 2,190,793 |
| kW reductions | n/a | n/a | 1,030 | 67.2% | 692 |
| Therm savings | 25,573 | 100.7% | 25,759 | 67.2% | 17,310 |
| *2005* | | | | | |
| kWh savings | 8,719,145 | 103.6% | 9,035,782 | 68.8% | 6,216,949 |
| kW reductions | n/a | n/a | 2,401 | 68.8% | 1,652 |
| Therm savings | 124,854 | 41.9% | 52,341 | 69.1% | 36,168 |