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Final Report

Impact and Process Evaluation of the 2006-2007 Building Efficiency Program

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IMPACT AND PROCESS EVALUATION OF THE 2006-2007 BUILDING EFFICIENCY PROGRAM



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ACKNOWLEDGEMENTS



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EXECUTIVE SUMMARY

Energy Trust of Oregon, Inc. (Energy Trust) was incorporated as an Oregon nonprofit public benefit corporation in March 2001 and began operation in March 2002, to fulfill a mandate to invest “public purposes funding” for new energy conservation, the above-market costs of new renewable energy resources, and new market transformation in Oregon. It receives funding from a 3% public purposes charge to the rates of the two largest investor-owned electric utilities in the state: PacifiCorp and Portland General Electric (PGE). Additionally, under separate agreements with NW Natural, Cascade Natural Gas Corporation, and Avista Corporation, Energy Trust administers funding for gas efficiency. Energy Trust has responsibility to communicate with the Oregon Public Utilities Commission (OPUC) on how it is spending its funding and what it achieves.

Energy Trust began operating the Existing Buildings (EB, formerly Building Efficiency or BE) program in early 2003. The program seeks to acquire large volumes of electric and gas savings at modest cost from a wide variety of efficiency strategies by providing positive financial, energy, and related benefits for participating businesses and institutions. The program design is market-driven and builds on existing market relationships, which is consistent with best practices among resource acquisition and market transformation efforts.

Energy Trust follows a continuous improvement approach to its operations and relies on timely evaluations of its activities. This report describes an impact evaluation and a process evaluation of the 2006-2007 program years, completed in 2008.

PROGRAM DESCRIPTION

Lockheed Martin Corporation has acted as the Program Management Contractor (PMC) for this program since January 2006, when it acquired Aspen Systems Corporation (Aspen), which had run the program since December 2002. The most recent contract started in January 2008 and runs through December 2010, with two one-year options to extend the contract.

The Existing Buildings program provides a range of electric and gas energy-saving services and incentives for existing Oregon commercial and institutional facilities. Services include energy surveys and technical analysis (studies), contractor referrals, project facilitation, and post-installation assistance.

The program works through a network of trade allies (vendors and contractors) to identify and deliver energy-saving lighting and mechanical projects for their customers. Projects may involve combinations of measures, but those involving extensive work on two building systems would be referred to the New Building Efficiency program for new construction.



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The EB program provides for both standard (prescriptive) and custom incentives for lighting retrofit projects, electrically-powered mechanical projects, and projects that upgrade gas-fired equipment. All measures must meet the cost-effectiveness criteria established by Energy Trust.

Estimates of expected measure savings and paybacks, required for custom incentives, must be either reviewed by the PMC or determined by a technical study. The latter is performed by Allied Technical Analysis Contractors (ATACs), who also identify potential participants.

For all EB projects, the facility representative must sign an *Energy Release Form*, *Incentive Application Form*, and *Completion Certification Form*. In addition, the facility's selected contractor must complete an *Information Form* to convey basic information describing the facility and its energy use. The contractor or PMC staff complete the *Project Detail Form* to verify and document all the details of a project.

EVALUATION GOALS AND METHODS

The previous combined process and impact evaluation of the program, conducted in 2005, offered six recommendations, five of which have been addressed. The one recommendation that was not addressed was to develop a summary sheet to be included in the project file of each mechanical project. In addition, based on results of the previous evaluation, the current evaluation included more detailed building characteristic data to attempt to provide better billing analysis results and more detailed spillover analysis.

The impact and process evaluation of the 2006 and 2007 EB Program has the following objectives:

- ➔ To develop reliable estimates of program, site, and measure-specific electric (kWh and kW) and gas (therms) savings for 2006 and 2007
- ➔ To estimate the extent of free-ridership and spillover effects, and the associated net realization rate
- ➔ To document the history of the program, provide a market characterization, and yield recommendations for program enhancements

The data sources for this process evaluation were: in-depth interviews with Energy Trust and PMC staff members involved in implementing and managing the program, and with ATACs; telephone surveys of trade allies and nonparticipating vendors, program participants, and program nonparticipants; and on-site examinations of projects performed for the impact analysis. Table ES.1 shows the size of each data source.



Table ES.1: Data Sources

SOURCE	SAMPLE SIZE
In-Depth Interviews with Energy Trust and PMC Staff	9
In-Depth Interviews with ATACs	13
Survey of Most Active Trade Allies	20
Survey of Least Active Trade Allies	34
Survey of Nonparticipant Vendors	59
Survey of Program Participants	212
Survey of Program Nonparticipants	130
On-Site Inspections of Program Participants	145
Billing Analyses – Participants	358
Billing Analyses – Nonparticipants	1,386

EVALUATION RESULTS

Participants are happy with the program, especially with the services they receive from program representatives. During 2006 and 2007, the program completed about 3,074 projects, saving over 57 million first-year kilowatt-hours of electricity and 1.5 million therms of gas. Excluding food service locations where free pre-rinse sprayers were installed, the program reached about 10% to 11% of the total square footage of nonresidential building in Oregon (12% to 13% when those projects are included).

Results are summarized in terms of: program impacts; marketing and outreach strategies; program communication; data collection, processing, and tracking; customers' relationships with Energy Trust and the program; the role of technical studies; and characterization of the existing building market.

Program Impacts, Free-Ridership, and Spillover Effects

Table ES.2 shows preliminary estimates of the gross and net electricity savings from the 2006 and 2007 Existing Buildings Program. Gross realization rates ranged from 90% to nearly 103%. Savings-weighted mean free-ridership levels were about 30% for both gas and electric projects in 2006; in 2007, they were about 36% for gas projects and 35% for electric ones. Across the two project years, they averaged about 32% for both fuel types. When free-ridership was taken into account, net realization rates ranged from about 64% to about 70%.



Table ES.2: Gross and Net Energy Savings from the 2006-2007 Existing Buildings Program

TYPE	NUMBER OF SITES	ESTIMATED THERMS	REALIZATION RATE	ADJUSTED GROSS	NET FACTOR	NET SAVINGS
2006						
Gas (Therms)	1611	985,727	98.4%	970,117	70.1%	679,713
Electric (kWh)	1611	31,326,511	90.0%	28,182,099	70.0%	19,740,016
2007						
Gas (Therms)	1463	526,998	102.6%	540,940	63.6%	343,819
Electric (kWh)	1463	26,531,894	94.1%	24,959,443	65.3%	16,298,977
2006-2007 TOTAL						
Gas (Therms)	3074	1,512,725	99.9%	1,511,057	67.7%	1,023,532
Electric (kWh)	3074	57,858,405	91.8%	53,141,542	67.8%	36,038,993

Free-ridership (unweighted) was relatively higher for self-reported prior participants, companies with an energy-efficiency purchasing policy, those who replaced failed equipment, and those who bought HVAC, motors, and boilers, compared to respondents who did not share those characteristics. It was lower for those who bought lighting and those who bought the efficient equipment to save energy costs or because efficiency features were common for the equipment's application. However, the range of free-ridership estimates remained below 50% in almost all subgroups examined and below 40% in most subgroups.

The current free-ridership estimates are higher than those found in the previous evaluation, but some of that difference may be due to a change in the method of calculating free-ridership since the last evaluation. Moreover, the rates are within the wide range of estimates that other evaluations have found (see Chapters 7 and 9 for more detail). There are several reasons to be cautious about making any revisions to the program based on these findings, including the controversial nature of the meaning of free-ridership estimates, the potential adverse impact of making frequent or significant changes to the program on the program's relationship with trade allies, insufficient reliability of free-ridership estimates for specific measure types to decide what aspects of the program to change, and climate considerations that continue to make it essential to acquire all the savings possible.

On average, the program had a moderate influence on the purchase of non-incented energy-efficient equipment purchased in the past two years. One-sixth of participants had planned or purchased non-incented energy-efficient equipment during or after program participation. Of those, six (3% of all participants) bought equipment that they indicated was highly influenced by the program: two bought HVAC equipment and one each bought equipment of a variety of other types.



Program Marketing and Outreach Strategies

The PMC continues to work largely through contractors and vendors, and to work effectively with them. Contractors continued to be participants' primary source of program awareness and the main *person* influencing the decision to undertake the project. The program contributes substantially to trade allies' business and their effectiveness at selling energy efficiency. However, brand-name awareness is low and there is room for additional program reach into the vendor market.

The PMC began to work directly with end-users in certain sectors during the 2006-2007 program years, resulting in a decrease in the contractors' role as the source of awareness and an increase in that of program staff. Whether the main contact was a contractor or program staff member had little effect on satisfaction, although program staff were perceived as more knowledgeable about the program than were contractors.

A program of free direct installation of energy-efficient pre-rinse sprayers in food service establishments, implemented in 2005 through 2007, had some effect in developing interest in energy efficiency, but it is not clear how much effect it had. Most surveyed sprayer recipients said that it had increased their likelihood of undertaking future energy efficiency improvements. Analysis of Energy Trust's *FastTrack* database showed that only about 11% of sprayer recipients later installed other energy efficient measures through the program, but that analysis did not account for business chains that received a sprayer at one location and then installed other measures at different locations (that were recorded in the database under different site identification numbers). It would be valuable to contact participants who received free sprayers to determine whether they purchased additional energy efficiency equipment without an incentive.

Overall, nonparticipant feedback indicates a high level of program interest and suggests that participation in this group was limited largely by lack of program awareness. Greater program awareness likely would induce more energy efficiency investment, which will be important in helping Energy Trust achieve increased savings goals.

Program Communication

The program and PMC staff reported frequent and effective communication within the PMC and between the PMC and other groups. However, about half of ATACs indicated a need to improve the amount or quality of PMC communication or program information. Trade allies reported no communication challenges, but encouraged continued communication of program information. Nonparticipant vendors would like more printed program information to share with customers. A significant subset of both nonparticipant vendors and trade allies frequently use the program website.



Program Data Collection, Tracking, and Processing Activities

No significant issues were uncovered relating to incentive processing. The only significant change to forms was the development of an alternative Form W-9, to facilitate its completion by customers. The only new tool completed was a spreadsheet tool for managing data from incentive application forms.

Some data-related issues were identified. Challenges were reported with the use of Energy Trust's data tracking systems, which Energy Trust was addressing, but had not yet completely resolved. Also, documentation errors were uncovered in a large number of 2006 projects. The PMC identified and addressed the cause, and documentation appeared to improve for 2007 projects. Finally, the trade ally list may not be up to date and shows duplication and inconsistency.

Customers' Relationships with Energy Trust and the Existing Buildings Program

The overall quality of program experience was good. A generally high level of program satisfaction was reported, particularly with program staff and contractors, and little uncertainty or confusion about the program was reported. Nearly all respondents said that they would participate in the program again if they were to install qualified equipment.

Technical Studies and ATACs

Technical studies appear to be a valuable program component, although it is difficult to assess exactly how valuable. Analysis of Energy Trust's *FastTrack* database revealed that projects followed about 30% of technical studies (with a mean lag of about a year and two months). However, while one-third of the respondents to the participant survey said that technical studies were influential in their project decision, the database analysis showed that studies were performed for only about 3% of the participants who had projects. The difference between one-third and 3% must result from some combination of program participants with technical studies performed outside of the program and those with technical studies performed through the program that did not get recorded in the database.

The ATACs who carried out the technical studies reported no specific customer questions or concerns about them or the projects that might result. The ATACs generally were quite satisfied with the program, but most would like more training on the program, particularly on analysis tools. Most were unaware either of the number of walk-throughs converted to projects or of the PMC's plans to increase the conversion rate.



Market Characterization

Penetration into the Vendor and Building Owner/Occupant Markets

The 459 Existing Buildings trade allies listed at the time of the evaluation represent approximately 11% of the Oregon market, as defined by the services they most frequently offer. Awareness of the program has penetrated to about 59% of the vendor market. Completed 2006 and 2007 projects likely represent approximately 12% to 13% of the Oregon nonresidential building owner/occupant market (10% to 11% when only projects with measures other than free pre-rinse sprayers are considered) and awareness has penetrated to about 31% of the market.

Energy Trust's Role in the Market

The Existing Buildings program is well positioned to serve the market. Nonparticipants were interested in a variety of program services, and most said that they would participate in the Existing Buildings program if they were to install qualifying equipment. Vendors are actively marketing the program, more actively and thoroughly than we observed in the previous process evaluation.

Evidence suggests that the number of projects done in the existing building market that received Energy Trust incentives in 2006-2007 was about equal to the number that received a BETC. The Existing Buildings participants who had applied for a BETC generally indicated that the Existing Buildings incentive had more influence than the BETC, although this could change if the BETC were increased.

Corporate Energy Policies and Decision-Making

Consistent with other recent research¹, most surveyed companies were engaged in or planning energy cost controls, and corporate policy contributed to about a quarter of projects. Saving energy costs was the most frequently identified reason for the purchase of efficient equipment. The percentage of respondents reporting a company policy to purchase energy efficiency equipment (30%) was half again higher than that reported in the previous process evaluation.

Other than energy savings or program influence, other common influences were reliability, improved comfort or work environment, non-energy savings, improved work efficiency, and safety. Four in 10 program participants said that they bought energy-efficient equipment partly because efficiency features were a common practice for that application, indicating transformation of the market. Codes or regulations did not exert much influence on the decisions

¹ "How Companies Think About Climate Change: A McKinsey Global Survey." The McKinsey Quarterly. Accessed by Internet March 26, 2009, URL: http://www.mckinsey.com/clientservice/ccsi/pdf/climate_change_survey.pdf.



to install energy-efficient equipment – it will be worth revisiting this question after updated codes go into effect in 2010.

While most respondents accept the reality of global climate change, the level of acceptance was not related to what their companies were actually doing to reduce energy costs or to their history of energy-efficient investment.

Building tenancy is a barrier to making energy efficiency investments, although it does not necessarily impede energy management through other means, such as through changing operations and management practices.

Repeat Participation

Repeat participants were more likely to have large projects than first-time participants. To see whether repeat participation leads to larger projects, we examined data from the Energy Trust *FastTrack* database on project size of repeat participants over the program's five years from 2003 to 2007. Examining the total annual savings for participants who had projects in consecutive years from 2003 through 2007, we found varying results, with increases between some pairs of years and decreases between others; large variances in all year pairs indicated large increases as well as large decreases from year to year. However, ignoring year of participation, we found a mean increase of 8.1% from the first year's savings to the mean savings for all subsequent years. Thus, generally, repeat participation is associated with larger projects.

CONCLUSIONS AND RECOMMENDATIONS

Program Marketing and Outreach Strategies

1. **Conclusion:** Program awareness was low among nonparticipants, and results suggest that greater program awareness would induce more energy efficiency investment.

Recommendation: The program should increase the amount of general program marketing directed toward the vendor and nonresidential building owner/occupant market. It also should increase the production of marketing collateral to distribute to vendors.

2. **Conclusion:** It is difficult to evaluate the effectiveness of the free pre-rinse sprayer distribution program, although there is some evidence that it increased awareness of and intention to pursue energy efficiency.

Recommendation: The pre-rinse spray valve is now required by state and federal standards. However, similar activities should be carefully considered.



- 3. Conclusion:** The increased direct involvement of PMC staff in outreach to end-users has had little if any adverse impact and participants rated the program staff as more knowledgeable than contractors about the program.

Recommendation: The current approach of having PMC staff carry out direct outreach to end-users in certain sectors should continue.

Communication with ATACs

- 4. Conclusion:** ATACs indicated a need for more frequent, consistent, and detailed communication with program staff, contrasting with what the PMC contact said on the subject.

Recommendation: The PMC should review its procedures for communicating with ATACs and establish guidelines to ensure more frequent, consistent, and detailed communication.

- 5. Conclusion:** ATACs would benefit from training on a variety of topics.

Recommendation: The PMC should schedule more regular ATAC training sessions to cover a variety of topics and should develop a program handbook for use by ATACs.

Program Data Collection, Tracking, and Processing Activities

- 6. Conclusion:** While data tracking challenges are being addressed, the system is still described as difficult to use.

Recommendation: Discussion between Energy Trust and the PMC to identify ways to improve the efficiency of data entry and tracking should continue.

- 7. Conclusion:** While documentation problems identified in project records from the 2006 program year appear to have been addressed, additional quality control review will help prevent future problems.

Recommendation: The PMC should carry out an additional quality control review of project documentation for a random sample of records from 2007 and 2008.

- 8. Conclusion:** The evaluation team found that the list of trade allies may not be up to date and found multiple instances of trade ally firm names being represented inconsistently in the file.

Recommendation: The PMC should carry out a thorough review of the trade ally list to ensure that it is up to date, that it is consistent with the trade ally information listed on the Energy Trust website, and that redundancies are minimized.



9. **Conclusion:** The percentage of records in the program database that had building size data (8%) did not permit a reliable estimate of market penetration.

Recommendation: The PMC should record building size for all incentive applications.

10. **Conclusion:** It was difficult to use the Energy Trust database to analyze the number of free pre-rinse sprayers that resulted in other energy efficient measure installations. There were many cases in the Energy Trust database in which a given business had different identification numbers for multiple locations and no easy and consistent way to match the multiple locations up.

Recommendation: Add a higher-level identification code field to the Energy Trust database to allow multiple locations of single business to be identified with a single code and establish conventions for assigning a single higher-level code to entities with separate site identifiers. Build the capability into the database to identify likely matches to the name entered for a new record and establish naming conventions to increase the likelihood that a new record will be name-matched to an existing one.

11. **Conclusion:** The evaluation's analysis of the result of technical studies could not take the studies' recommendations into account as they are not recorded in the Energy Trust database.

Recommendation: The Energy Trust database should include fields for recording technical studies' recommendations.

Program Impact

12. **Conclusion:** Cohort variation still produces surprises. There are clear differences in the performance of the 2006 participants and the 2007 participants, particularly in the lighting group.

Recommendation: In the future, include a small sample of lighting-only participants in the site-visit sample and develop a correction factor for lighting for the billing analysis.

13. **Conclusion:** Free-ridership ratios are within the normal range for similar commercial retrofit programs.

Recommendation: Do not make any changes to the program based on free-ridership rates.

14. **Conclusion:** Hard refusals compromise the integrity of the site-visit approach, especially with the largest participants. Efforts by Energy Trust and PMC staff to intervene did not change the outcome.



Recommendation: In the future, initiate interventions with program participants at the start of the project, rather than after the site engineers attempt to schedule visits.

- 15. Conclusion:** Realization rates for the site-visit group were generally close to 100%. Where they were less, the decrement was usually a function of problems at a small number of sites, but no systematic engineering issues were found.

Recommendation: Re-examine the program quality control procedures to ensure that more complex sites have inspections and that program behavioral recommendations are implemented. (See also Conclusion 7, above.)

- 16. Conclusion:** Billing analysis results produced large relative precision bands around the point estimates. The 2007 lighting-only sample was the only estimate with a less than 10% precision.

Recommendation: Implement surveys at nonparticipant sites to better account for changes in operation and behavior.

Future Evaluations

- 17. Conclusion:** Most ATACs were unaware either of the number of walk-throughs converted to projects or of the PMC's plans to increase the conversion rate.

Recommendation: The next evaluation should examine the PMC's reported plan to increase the effort to convert studies to projects.

- 18. Conclusion:** There appears to be a trend for an increase in corporate policies related to energy management.

Recommendation: Future evaluations should continue to track corporate energy management policies.



MEMO

Date: August 31, 2009
To: Board of Directors
From: Greg Stiles, Sr. Business Sector Manager
Philipp Degens, Evaluation Manager
Subject: Staff Response for the 2006-2007 Building Efficiency Impact Evaluation

The Existing Buildings (EB) program increased its scope in 2006 and 2007 providing incentives for measures to over 3,000 nonresidential buildings. It was estimated that over one in ten buildings of the total commercial building stock in Energy Trust's service territory took part in the program over these two years above and beyond installing energy efficient spray valves (slightly more if those buildings installing only energy efficient spray valves are included).

Based on site visits, the program did a very good job of estimating energy savings of both gas and electric efficiency measures. Lighting savings based on billing analysis fared poorly. This was inconsistent with site visit results that had realization rates (97-98%) for efficient lighting. Earlier studies also indicated that on average lighting measures hours and change in watts were being correctly estimated. Energy Trust plans to perform site visits in Q4 2009 of a sample of the 2006 and 2007 lighting-only sites to validate billing analysis results. The findings will help Energy Trust evaluate the use of billing analysis in our evaluations of nonresidential buildings.

Increasing free rider rates estimated in the evaluation are indicators that the participants perceived that the program's influence has waned over time. With the program working with a considerable portion of the market over a significant period of time it is not unexpected that the perceived influence of the program is declining. Over 40% of the participants are reporting that efficient equipment is standard and the majority of interviewed vendors report including efficient equipment in the majority of their bids. The free rider rates did not reveal significant trends that could provide guidance for program redesign. Energy Trust is currently running a pilot that gathers feedback on free ridership and program satisfaction closer to the time of the investment decision. The pilot also aims to determine what collection methods provide adequate, cost-effective response levels. Energy Trust hopes to integrate this information gathering into a process that generates regular reports on program feedback.

Another indicator of a transforming market is that both participants and nonparticipants more frequently install energy efficient equipment without incentives. Only a small percentage of participants (2%) and nonparticipants (3%) report that the program had a high level of influence on their purchase decision. In the case of nonparticipants even this small number could have a significant program multiplier effect. Energy Trust is not currently considering any attempts to quantify these

spillover impacts as they would require significant resources to estimate both the preconditions (baseline) as well as verifying the operations and specifications of the installed equipment.

Energy Trust plans on continuing to actively work through contractors and other supply chain trade allies, as well as having the PMC directly engage customers and their trade associations. The program offerings are well aligned with both participants' and nonparticipants' stated needs and thus should be able to ramp up if and when required. The study's finding of an increased number of firms with energy policies and a designated staff member in charge of energy and energy efficiency decisions will provide the program with a single contact and champion at many firms. The tenant market was also identified by the evaluation as a challenging market that would require some research to identify new strategies to reach this customer segment.

When rolling out new measures, such as the spray valves, Energy Trust plans on monitoring how they are being received by the market. In the case of measures that are being offered through a pilot initiative, monitoring will be part of a more formal pilot implementation and evaluation process. Other measures that expand to contribute a significant share of a program's efficiency portfolio will be reviewed to determine if a separate analysis is warranted outside of the standard program evaluation cycle. Program staff will continue to review project documentation and studies for completeness to ensure consistent and replicable savings estimates.

To increase the evaluation participation rate, the program plans on communicating the need for, and the expectation of participation in, evaluations to participants.

1

INTRODUCTION AND BACKGROUND

Energy Trust of Oregon, Inc. (Energy Trust) was incorporated as an Oregon nonprofit public benefit corporation in March 2001 and began operation in March 2002, to fulfill a mandate to invest “public purposes funding” for new energy conservation, the above-market costs of new renewable energy resources, and new market transformation in Oregon. It receives funding from a 3% public purposes charge to the rates of the two largest investor-owned electric utilities in the state: PacifiCorp and Portland General Electric (PGE). Additionally, under separate agreements with NW Natural, Cascade Natural Gas Corporation, and Avista Corporation, Energy Trust administers funding for gas efficiency. Energy Trust has responsibility to communicate with the Oregon Public Utilities Commission (OPUC) on how it is spending its funding and what it achieves.

Energy Trust began operating the Existing Buildings (EB) program in early 2003. The program seeks to acquire large volumes of electric and gas savings at modest cost from a wide variety of efficiency strategies by providing positive financial, energy, and related benefits for participating businesses and institutions. The program design is market-driven and builds on existing market relationships, which is consistent with best practices among resource acquisition and market transformation efforts.

Energy Trust follows a continuous improvement approach to its operations and relies on timely evaluations of its activities. This report describes an impact evaluation and a process evaluation of the 2006-2007 program years, completed in 2008. Previous impact evaluations have covered the program’s first three years, 2004 to 2005, and process evaluations have been conducted half-way through the program’s first year and in 2004 to 2005.^{2, 3, 4} The Energy Trust hired the team of Research Into Action, Inc. and Quantec, LLC (since purchased by and incorporated into The Cadmus Group, Inc.) to conduct the impact and process evaluations described in this report.

The remainder of this section addresses and provides a program overview and describes prior program evaluations, evaluation objectives, and the evaluation approach, followed by a brief description of how the remainder of this report is organized.

² *Building Efficiency Program: First Mid-Year Process Evaluation*. Prepared for Energy Trust of Oregon by Research Into Action, Inc., September 2003.

³ *Building Efficiency Program Process and Impact Evaluation: End of Second Program Year*. Prepared for Energy Trust of Oregon by Research Into Action, Inc., December 2005.

⁴ *Evaluation of Building Efficiency Program 2004 & 2005*. Prepared for Energy Trust of Oregon by ADM Associates, February 2008.



PROGRAM OVERVIEW

Program Implementation

Energy Trust relies upon a PMC model to implement a majority of its programs, because this model is believed to provide a quick avenue to program launch and because it leverages the existing expertise in the marketplace that delivers energy efficiency. In a competitive proposal process initiated in the fall of 2002, Aspen Systems Corporation (Aspen) was selected to run the program. It entered into a PMC agreement for the development, implementation, and management of the Existing Buildings program in December 2002, and has since won multiple re-competitions for the contract.

Lockheed Martin Corporation (Lockheed Martin) acquired Aspen in January 2006, and since that time Lockheed Martin has acted as the PMC for this program. The most recent contract started in January 2008 and runs through December 2010, with two one-year options.

Program Delivery and Administration

The Existing Buildings program provides a range of electric and gas energy-saving services and incentives for existing Oregon commercial and institutional facilities. Incentives are offered for qualified improvements, such as lighting, HVAC, motors, controls, and natural gas space and water heaters, restaurant equipment and insulation. Services include energy surveys and technical analyses (studies), contractor referrals, project facilitation, and post-installation assistance.

The program leverages the relationships that exist between contractors and their customers through a market-based program design that relies on a network of trade allies (vendors and contractors) to identify and deliver energy-saving projects for their customers. Their services and the information these trade allies bring relieves customers of the burden and potential confusion of negotiating the steps required to receive a rebate. This relationship is supplemented through direct marketing and business development by the PMC, targeting specific market segments.

The program efficiency activities are divided into two groups: lighting and mechanical (including HVAC, motors, and projects that involve gas-fired equipment or measures). Projects may involve combinations of measures (for example, both lighting and mechanical, or lighting and gas). However, extensive work on two building systems would constitute a major renovation and the project would be referred to the New Existing Buildings program for new construction.

The EB program provides for incentives in three main areas: for lighting retrofit projects, for electrically-powered mechanical projects (including HVAC and motors), and for projects that upgrade gas-fired equipment (including heating, cooking, domestic hot water, and boilers). The program offers standard incentives (also known as prescriptive incentives) for each qualifying unit of lighting equipment, HVAC equipment, solar energy equipment, or motors purchased. Custom incentives are available for efficiency measures not covered by standard incentives.



All measures must meet the cost-effectiveness criteria established by Energy Trust. Prescriptive measures are pre-screened to ensure that they meet the criteria, while custom projects are screened as they are identified and require some level of technical review.

The Existing Buildings program offered the following incentives in 2006-2007:

- ➔ **Prescriptive Lighting Equipment:** Incentives range up to \$75 per fixture for a variety of identified equipment, including T8 lamps and fixtures, compact fluorescent lamps and hard-wired fixtures, high-intensity discharge fixtures, exit sign retrofits or new fixtures (LED, cold cathode or electroluminescent), and lighting control measures.
- ➔ **Custom Lighting Equipment:** Incentives are \$0.15 per kWh up to 30% of total approved project cost (including equipment and installation).
- ➔ **Prescriptive Mechanical Equipment:** Incentives vary depending upon the measure; they include packaged AC equipment, a variety of heat pump types, premium motors, variable frequency drives (VFDs), and kitchen equipment. Incentives cover approximately 80% of the incremental cost associated with high-efficiency equipment.
- ➔ **Custom Mechanical Equipment:** Provides incentives for projects involving electrically-powered, non-lighting equipment; incentives are \$0.20 per kWh or \$1 per therm, up to 35% of the total approved project costs.
- ➔ **Prescriptive Gas Equipment:** Incentives vary depending on the measure, which include efficient furnace, boiler, water heater, HVAC unit heater, radiant heater, steam trap, insulation, fryer, and oven.
- ➔ **Custom Gas Equipment:** Provides incentives for all projects involving gas-fired equipment or measures; \$1 per each therm saved, up to a maximum of 50% of the total approved project cost.⁵
- ➔ **Solar Water Heating:** For solar water heating measures, incentives depend on the application (commercial hot water or commercial pools) and the utility service area.

For the purpose of determining custom incentive levels, expected measure savings and paybacks must be estimated. Estimates may be determined by the vendor or participant, subject to review by the PMC Technical Manager or Technical Advisor, or estimates may be determined by a technical study. Technical studies are conducted to identify appropriate measures in support of a specific project or at a facility interested in doing energy efficiency improvements.

⁵ The EB program launched incentives for gas measures with an Energy Trust Board Decision on July 2, 2003. Under the terms of the launch, gas custom incentives were 35% of total costs. The incentive was raised to 50% in 2004. Yet the Energy Trust website as of April 2005 continues to report a maximum custom gas incentive of 35% of total approved project cost.



When a study is required, the program delivers it free, if it is the first study requested by a given participant or, in the case of a repeat participant, that previous studies resulted in projects.⁶ The PMC Technical Manager or Technical Advisor assigns one of three study types (a walkthrough audit, or a Level I or Level II study) to be conducted for the facility.

Qualified engineers and energy professionals under contract to the PMC perform the technical studies. The program refers to these contractors as Allied Technical Analysis Contractors (ATACs); their role also includes assisting with marketing the program by identifying potential participants. The energy savings estimates provided by the studies are intended to be “reasonable,” not perfect. The analysis reports take the form of short letters, with executive summaries that lay out the facts in support of the identified projects, including estimated costs, savings, and incentives.

The program offers three types of a technical study: walk-through, Level I, and Level II. As the name implies, in walk-through studies the ATAC inspects the facility to identify energy-saving opportunities, but no technical analysis is performed. Level I studies are less complex than Level II. A study typically is defined as Level I if calculations can be done by hand or using spreadsheet tools on no more than three measures, or if modeling can be done based on current energy usage. A study usually is defined as Level II if it involves hand or spreadsheet calculations on at least eight measures, or modeling involves complex simulations.

For all EB projects, the facility representative must sign the following three forms:

- ➔ **Energy Release Form 110** – to release a facility’s utility energy consumption data to the Energy Trust
- ➔ **Incentive Application Form 120**
- ➔ **Completion Certification Form 140**

To request a free technical analysis study, the representative must also sign **Form 105**.

In addition to these forms, the facility’s selected contractor must complete **Information Form 100** to convey basic information describing the facility and its energy use; this form does not need the signature of the facility representative. The contractor or PMC staff complete the **Project Detail Form 103** (which differs by type of equipment) to verify and document all the details of a project, including the specific equipment installed.

⁶ Previously, the study was provided free on the condition that the participant commits to installing at least one measure if any are found to have a payback shorter than 18 months. However, this stipulation has been discontinued.



PRIOR PROGRAM EVALUATIONS

The current evaluation follows three previous evaluations of the program: a process evaluation conducted at the end of its first six months of operation, a combined process and impact evaluation conducted in 2004 to 2005, and an impact evaluation of the 2004 and 2005 programs. The second evaluation offered six recommendations. Table 1.1 shows the recommendations, along with a description of the Energy Trust and PMC responses to each one.

Table 1.1: Recommendations from the Second Process Evaluation

RECOMMENDATION	RESPONSE
<p>The Energy Trust should ensure the Existing Buildings incentive budget is sufficient to support qualified applications.</p>	<p>After having been reduced in 2006 and 2007, incentive levels have returned to 2005 levels. Most key staff believe these are appropriate. Participants rated the incentive as having a strong influence and nonparticipants generally did not mention insufficient incentives as a barrier. Some vendors recommended increasing incentives for certain types of measures, particularly lighting.</p>
<p>The PMC should develop a summary sheet for each custom mechanical project describing: the equipment to be changed out, its consumption, demand, and operating parameters; the equipment to be installed, its consumption, demand, and operating parameters; and the expected energy and demand savings.</p>	<p>This has not yet been done.</p>
<p>The Energy Trust and PMC should continue efforts to streamline program application forms and provide tools to assist in project and application development.</p>	<p>The PMC indicated no significant changes to forms, although some have gotten longer. The PMC has developed a spreadsheet tool to help in-house staff manage projects and a tool for calculating savings for lighting projects, but has not developed any other tools.</p>
<p>The Energy Trust should investigate the savings from custom mechanical projects completed between March 31, 2004, and December 31, 2005.</p>	<p>The evaluation team could not determine whether this has been done.</p>
<p>The Energy Trust should review indicators relating to whether the PMC Technical Manager role is understaffed and should consider how the structure of the PMC's contract affects project quality control.</p>	<p>ATACs indicated that PMC responsiveness has been an issue in 2006 and 2007, with some recognition that it was due to understaffing. Problems were noted in the documentation of some 2006 projects, suggesting insufficient technical review. The PMC has increased overall staffing and the Technical Manager is now assisted by a Technical Advisor and others, which has improved responsiveness. Fewer documentation problems were noted with 2007 projects.</p>
Continued	



RECOMMENDATION	RESPONSE
<p>The Energy Trust should consistently enter the utility account number (electricity or gas, as relevant to the project) of each Existing Buildings participant into its program tracking system and should develop a mapping of service territory zip codes to NOAA weather stations.</p>	<p>Account numbers are now entered in the database for each project and service territory zip codes have been mapped to NOAA weather stations.</p>

EVALUATION OBJECTIVES

The impact and process evaluation of the 2006 and 2007 EB Program has the following objectives:

- ➔ To develop reliable estimates of program, site, and measure-specific electric (kWh and kW) and gas (therms) savings for 2006 and 2007
- ➔ To estimate the extent of free-ridership and spillover effects, and the associated net realization rate
- ➔ To document the history of the program, provide a market characterization, and yield recommendations for program enhancements

These three primary objectives consolidate a number of program research issues Energy Trust staff discussed with the evaluation team on several occasions. These research issues include:

1. Have there been any changes in the program in response to the findings and recommendations of the first and second process evaluations?
2. Are vendors actively engaging in green marketing and are they informing their customers of the state tax credits available for energy efficiency?
3. What factors influence vendors' participation in and promotion of the EB Program and what could be done to increase participation and promotion?
4. How well is the program reaching the mechanical market?
5. What factors may influence current participants to expand their participation and what may influence nonparticipants to participate?
6. What influence, if any, does global climate change have on energy management?
7. To what degree are participants, especially large participants, adopting corporate policies on sustainability and/or Strategic Energy Management Plans (SEMPs)?
8. How well is the PMC model for program delivery working?



9. Have there been any changes to the program's model of relying primarily on market actors (vendors) for program delivery and secondarily on program staff (PMC) and, if so, how have the changes been working?

EVALUATION APPROACH

This process evaluation is based in part upon in-depth interviews with Energy Trust and PMC staff members involved in implementing and managing the EB program and ATACs that support the program through engineering and technical review services. These interviews took place in April and May 2008.

The evaluation team also conducted telephone surveys with customers in support of both the process and impact evaluation objectives. On-site examinations of projects performed for the impact analysis were completed from February through August 2008. The telephone surveys were completed from March through April 2008.

Chapter 7 provides a detailed discussion of the methods used to develop adjusted project savings, free-ridership rates, and savings realization rates.

ORGANIZATION OF THE REPORT

Following this introductory chapter are seven additional chapters.

- ➔ *Section 2, Program History*, describes the program status as of December 31, 2007, including the number and type of projects, incentives paid, study costs, kWh and therm savings, and other information derived from the program-tracking database.
- ➔ *Section 3, Program Activities and Experiences of Key Contacts*, describes findings from interviews with Energy Trust and PMC program staff and ATACs.
- ➔ *Section 4, Participant Feedback*, describes findings from a survey of participants with completed lighting and mechanical projects.
- ➔ *Section 5, Vendor Feedback*, describes findings from surveys with participating and nonparticipating vendors.
- ➔ *Section 6, Nonparticipant Feedback*, describes findings from a survey of nonparticipants from the program's target market.
- ➔ *Section 7, Impact Analysis*, describes the data sources and analytical methods used to estimate the program's energy impacts and the findings from the impact portion of the evaluation.
- ➔ *Section 8, Market Penetration*, describes analyses of the program's reach into the vendor and building owner/occupant markets.



- ➔ *Section 9, Conclusions and Recommendations*, provides final analysis and recommendations arising from this evaluation.

Four appendices follow the body of the report:

- ➔ *Appendix A: Free-Ridership and Spillover*
- ➔ *Appendix B: Interview Guides and Survey Instruments*
 - PMC Staff Interview Guide
 - Energy Trust Program Manager Interview Guide
 - Energy Trust Marketing Staff Interview Guide
 - ATAC Interview Guide (active, inactive)
 - Participant Survey
 - Nonparticipant Building Owner/Occupant Survey
 - Trade Ally Survey (active, inactive)
 - Nonparticipating Vendor Survey
- ➔ *Appendix C: Impact Regression Model Coefficients*
- ➔ *Appendix D: Impact Process Flow Diagram*



2

PROGRAM HISTORY

This chapter provides a summary of the information available in the Existing Buildings program tracking database as of the end of 2007.

PROGRAM GOALS AND ACHIEVEMENTS

Goals and installed savings have varied over the program's five-plus years. Electricity savings goals initially showed a sharp increase from under 20,000 MWh in both 2003 and 2004 to over 30,000 MWh in 2005, then fell to below 25,000 MWh in both 2006 and 2007. Except for program year 2003, savings have exceeded goals by a margin ranging from less than 2,000 MWh (in 2007) to more than 15,000 MWh (in 2004). Gas savings goals rose from around 400,000 therms in 2004 (when gas measures were introduced) and 2005 to nearly one million therms in 2006, then fell to about 600,000 therms in 2007. Generally (except for program year 2005), gas savings have fallen well short of best case goals.

According to the program-tracking database, in 2006 and 2007, EB had installed 3,074 projects (1,385 electric-only, 647 gas-only, and 1,042 both) at 2,762 sites, for total savings of about 58.4 million kWh and 1.6 million therms.

PROGRAM EVOLUTION

The Existing Buildings program has remained relatively stable throughout its history. However, some evolution has occurred. While the basic program theory of reaching the end-user through contractors and vendors remains in place, this approach is now supplemented through direct marketing and business development by the PMC, targeting end-users in two specific market segments: restaurant and lodging, and large commercial establishments.

In addition, a new program component was added in 2006 and 2007. The program provided free direct install of energy-efficient pre-rinse sprayers to food service facilities. The purpose was to demonstrate the value of installing energy-efficient measures, in the hope that this would lead to additional energy efficiency investment in this relatively underserved segment.

GOING FORWARD

A possible increase in funding in the coming years means that the Existing Buildings program may have the opportunity to achieve a significantly broader and deeper reach into the nonresidential market. As described in subsequent sections, the PMC has begun to increase its staffing to meet anticipated increases in work and to better handle the current workload. The



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results of this evaluation and the recommendations offered will help Energy Trust fully capitalize on its opportunity to expand energy savings.



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3

PROGRAM ACTIVITIES AND EXPERIENCES OF KEY CONTACTS

This chapter describes the activities and the experiences of program staff and contractors responsible for implementing the Existing Buildings program. Findings from Energy Trust and the Program Management Contractor (PMC) staff were obtained from in-depth, open-ended interviews. These interviews consisted of one group interview conducted in person with several members of the PMC staff in October 2007, and a series of telephone interviews conducted with individual program and PMC staff in April and May 2008. Interviews lasted between one and two hours. Findings from ATACs – with whom the PMC contracts to conduct technical studies in support (usually mechanical) of efficiency projects – were obtained from telephone open-ended interviews conducted in May 2008, lasting approximately half an hour.

The evaluation team conducted interviews with:

- ➔ Two Energy Trust program staff (in-depth interviews)
- ➔ Six PMC staff members (in-depth interviews)
- ➔ One coordinator of the lighting trade ally network who functions as an extension of PMC staff (in-depth interview)
- ➔ Thirteen ATACs

To elicit the experiences of a variety of ATACs, we spoke with ATACs conducting each type of TAS, and included ATACs that the PMC considered “inactive” as well as those considered “active.” This section describes the organization of PMC and program staff, their comments and concerns, and ATACs’ concerns, followed by a summary of key staff comments and experiences.

ORGANIZATION OF PMC AND PROGRAM STAFF

We separately describe the organization and activities of PMC and contracted staff, and that of the Energy Trust program staff.

PMC and Contracted Staff

The PMC Existing Buildings team includes 12 full-time (or nearly full-time) in-house staff members, two additional in-house staff members who bill three-quarters of their time or more to the program, and three part-time staff. In total, these staff members constitute 14 to 15 full-time equivalent (FTE) staff.



The PMC EB Program Manager provides overall management and coordination, communicates with Energy Trust's Program Manager, and provides direction and input to the PMC's marketing, technical, and operations staff. In addition to developing program strategies and marketing approaches, and guiding staff to implement them, he fields disruptive questions and completes administrative reports so that these requests do not interfere with the work of the program staff.

A full-time Technical Manager is responsible for overseeing the program's technical details, including applications and studies. He assigns ATACs to particular jobs and leads the review of technical studies done by ATACs and vendors, sometimes performing energy calculations when they are missing from applications. He also prepares incentive offers and tracks program savings against goals. In addition, he: provides input to Energy Trust in developing new measures; conducts some outreach to technical organizations, such as the American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE) and the Building Owners and Managers Association (BOMA); and interacts with customers, manufacturers, vendors, and distributors on issues relating to what products qualify for incentives. He helps develop the program's strategy on trade ally development.

The Technical Manager receives assistance from a full-time Technical Advisor (who previously served as Technical Manager) and two part-time engineers.

During the period covered by this evaluation, the PMC had three Business Development Managers. These staff members are responsible for recruiting and managing the mechanical trade allies. They also work directly with customers, going over where the customers is in their budget cycle, what projects they have on the horizon, how the EB program can help, and what other programs might provide assistance. One Business Development Manager described herself as a "facilitator."

Reflecting a new approach, each Business Development Manager is responsible for a particular market sub-sector.⁷ One handles large customers (office buildings, healthcare, and institutions); one focuses on the food service/lodging sub-sector; one deals with smaller to mid-sized contractors to promote program awareness and up-selling, particularly for gas measures.⁸

One full-time Project Coordinator and one part-time Special Projects Coordinator assist with special projects, such as the new pre-rinse sprayer free-install program.⁹ Their day-to-day responsibilities include entering data in Energy Trust's *FastTrack* database and coordinating energy audits. The latter involves processing applications for energy audits, preparing work

⁷ Previously, one Business Development Manager was responsible for recruiting and managing a network of mechanical trade allies and addressing gas-fired projects; another focused on large facilities, energy service companies (ESCOs), and large contractors.

⁸ An additional Business Development Manager was hired in 2008 to work with municipalities and groceries.

⁹ An additional Project Coordinator was hired in 2008.



orders, scheduling audits, and following up audits regarding the recommended measures. The Project Coordinator also serves as the trade ally coordinator.

A Marketing Manager directs marketing activities. Her primary role is to develop strategic marketing materials. She also funnels feedback to Energy Trust's Program Manager for Existing Buildings from trade associations, their constituents, and members.

In addition to the above staff, contracted staff – housed outside of the PMC office, but functioning as an extension of PMC staff – coordinate the lighting trade ally network. Led by the program's Lighting Coordinator, this network is comprised of ten contract staff, equaling five FTE positions.

The Operations Manager supports the program by tracking program data, monitoring program status and contract compliance, and processing incentive and contract payments. She relies on a PMC-created spreadsheet to track completed forms and enters data into the Energy Trust's *FastTrack* database so that incentive requests and checks may be processed.¹⁰ The Administrative Coordinator provides administrative support to the two programs the PMC implements and to the PMC office generally. This includes monthly invoicing and labor-hours tracking, intra-company communication, project tracking, and other administrative tasks.

As a result of Energy Trust's recent increase in funding, and the expectation of a continued increase, the PMC began a staffing-up effort in the last months of 2007. The PMC Program Manager noted that this has resulted in a shift in his role, from "keeping the machine moving" to preparing for future growth. Several additional staff members were added in the months prior to the evaluation. One outcome of this, according to the PMC Program Manager, has been the ability to identify the areas where each person is most effective and to establish a "clearer definition of roles and responsibilities." As a result, it is now clearer whom the right person is in the PMC office to talk to about specific matters.

This evolution in staffing management reflects the decision, described above, to assign specific market sub-sectors to particular individuals. Previously, when a new opportunity was identified, no clear criteria existed for determining who would be assigned to follow it up. Despite the change in staffing organization, "every now and then" projects are identified that do not clearly fit a specific sub-sector. In such cases, a marketing assistant determines to which Business Development Manager it should be assigned. Sometimes this is based on who has the lowest caseload, sometimes it is based on which Business Development Manager is working with which trade ally.

¹⁰ According to the PMC, its database is considered to be very complete and accurate by Energy Trust staff charged with creating the *FastTrack* database. Energy Trust staff reportedly used the PMC's database to debug *FastTrack* during its initial implementation.



Energy Trust Existing Buildings Staff

Two Energy Trust staff are dedicated to this program: the Existing Buildings Program Manager and a Business Sector Coordinator. The new Program Manager began work in July 2006. The Program Manager approves invoices for the PMC and subcontractors, performs a weekly approval of incentive payments listed in the *FastTrack* database, performs quality control on a sample of incentive checks, and carries out quarterly forecasting of program activities. He also oversees the annual budgeting process.

The Program Manager also communicates and coordinates with the PMC staff on a regular basis, particularly with the PMC management and business development staff. In addition, he is directly involved in outreach, accompanying the PMC lighting subcontractor's trips to do presentations to lighting contractors and vendors, and occasionally accompanying PMC staff on on-site inspections of participant facilities and incentive check presentations. He sometimes facilitates new customer intake by arranging introductions between potential customers and PMC or contractor staff. These introductions often come about because a potential customer contacted him or he received information about an opportunity from a utility representative.

The Business Sector Coordinator has been on staff since about May 2007. She responds to requests from Energy Trust sector managers for information on measures and savings. She also develops marketing collateral.

COMMENTS AND CONCERNS BY PROGRAM AND PMC STAFF

Our interviews elicited detailed comments from program and PMC staff on a wide range of topics. Following the description of the desired areas of feedback laid out in Energy Trust's RFP, we have organized most comments under three headings: Program Marketing and Outreach Strategies; Data Tracking, Data Collection, Processing, and Payment; and Communication. Under the final heading, we describe comments on several additional topics that arose in the course of the interviews.

Program Marketing and Outreach Strategies

A significant portion of the in-depth interviews with Energy Trust and PMC staff addressed program marketing, communication, and outreach strategies. Contacts indicated that activities have been effective. The main findings, as detailed below, are that some changes have occurred in the overall approach to marketing and outreach, and the PMC was planning to promote a more tightly-knit network of mechanical trade allies. In addition, contacts described the program's reach into new and underserved markets, and discussed planned efforts to convert more walk-through surveys into projects.



Overall Approach to Marketing and Outreach

Originally, the program was conceived to build on existing relationships between contractors and their customers. The PMC would work with the contractors – the trade allies – who would promote the program within their market segments. We asked the PMC contacts whether this remains the primary method of participant recruitment and what, if anything, has changed.

The contacts reported that the particular approach differs somewhat by segment. One major change is that some PMC staff members work primarily with end-users in specific segments. One PMC staff member works primarily in the restaurant and lodging segment, dealing mainly with prescriptive measures. A large part of her effort to reach this segment is through attending industry events to promote the program, supported by heavy use of marketing collateral. Another member works in the large commercial segment. She deals directly with large end-users, such as hospitals and large offices, meeting proactively with prospective customers to push studies and projects.

Some PMC staff continue to deal largely with contractors who focus in particular areas or types of measures. One works with small to mid-sized contractors to procure projects with gas savings. She promotes program awareness with the contractors and helps them with paperwork, with planning and packaging projects, and with upselling. The staff member who works in the restaurant and lodging segment also works with distributors to ensure that they have the correct equipment stocked and know how to upsell it and use the correct program forms.

As before, a subcontractor works exclusively with lighting measures. The subcontractor staff work mainly through trade allies but also will work directly with end-users as needed. In cases where a customer may be concerned that a trade ally is motivated mainly by the desire to sell equipment, the presence of the subcontractor's staff represents Energy Trust's "seal of approval."

The PMC has coordinated marketing and outreach with other organizations to enhance its reach. It coordinates in various ways with utilities – for example, utilities often support outreach by organizing meetings with groups of large customers at which PMC staff may promote the program. Other examples of coordination include working with the Northwest Energy Efficiency Alliance (NEEA) BetterBricks program to market the program to a large hospital chain. The PMC also has attempted to expand the program's reach through an increased presence with large Energy Service Companies (ESCOs) and property managers.

The Energy Trust Program Manager indicated that the PMC has achieved "a pretty good split" between its focus on segment-specific end-users and trade allies. This is evident in the split among the various PMC staff on the different segments. The approach allows the market specialists to get to know the vendors for the buildings in their segments, which permits more "hand-holding" in these new niche areas.



Marketing Channels and Activities

Energy Trust and the PMC promote the Program through a range of channels and activities aimed variously at trade allies, end users, or both. Activities include both one-on-one and group meetings with industry trade groups, supported by advertising collateral. Funds are provided to trade groups for cooperative advertising to “co-brand” advertising, in which logos for both Energy Trust and the trade association appear on materials aimed at a targeted group.

Another channel is the use of electronic newsletters for customers (*Synergies*) and trade allies (*Insider*). In addition to featuring information aimed at their respective target groups, these newsletters are leveraged against each other – for example, the customer newsletter may include stories featuring particular trade allies.

Other channels include paid advertisements in general business trade magazines, joint press releases with utilities and trade groups, utility bill inserts targeted to specific industries, tradeshow booths and speakers, coordination with other programs, use of various collateral, the program website, and promotions aimed at trade allies. Promotions include competitions in which prizes are awarded to the ally that sells the most of a given technology.

Marketing Effectiveness

Marketing was considered effective in 2006 and 2007, particularly in the restaurant and lodging sectors, and with large offices. Direct mail to specific market segments also reportedly has been effective: the rate of return on the most recent direct mailings had not yet been calculated at the time of the interviews, but it was thought to have been higher than the norm. Targeted trade shows also have worked well.

No serious concerns about marketing were voiced. The only suggestions for new or additional activities related to incorporating some more narrowly focused outreach, such as facilities managers and technical personnel.

Outreach to Trade Allies

As indicated above, outreach to trade allies remains a large component of the program’s success strategy. During the course of interviews, several comments were made that pointed to strengths and weaknesses of the current approach, and underscored the overall complexity of the trade ally relationship.

One point that emerged in interviews was the difference in the degree to which lighting and mechanical trade allies are networked. Through a long history of working in the lighting field, the PMC’s subcontractor has developed a tight-knit network of allies – the idea of a lighting trade ally network arose 13 to 14 years ago. The PMC’s subcontractor has cultivated this network through such activities as periodic informal “focus groups” with the lighting trade allies.



The mechanical trade allies, by contrast, are not organized. One factor that might help explain why lighting trade allies are more organized than mechanical ones is that lighting covers a relatively homogeneous array of equipment, whereas “mechanical” can refer to a varied range of equipment types. It is thus possible that there is a greater degree of overlap among lighting contractors, than among mechanical contractors, in the equipment and types of application they deal with. The greater degree of overlap may lend itself more to a higher level of organization.

The trade ally survey (described in the next chapter) revealed another possibly relevant difference. Mechanical-only and mechanical-lighting contractors were about four times as likely as lighting-only contractors to report that a substantial proportion of their customers approached them for program information. This suggests a need for lighting-only contractors to take a more active role in program marketing, which might be facilitated by having a well organized network.

At the time of the interviews, the PMC had recently hired someone to target mechanical trade allies and promote a more cohesive approach among them.

Another important point relates to changes in the degree to which Energy Trust staff have been directly involved in outreach to trade allies. One contact noted that Energy Trust traditionally has been insulated from the market. However, the current Energy Trust Program Manager has made a concerted effort to be more directly involved in outreach to the trade allies than was his predecessor. To this end, he conducts an annual road show, coordinated with the lighting subcontractor, to explain the program to lighting contractors.¹¹

Some advantages were noted for this increased level of direct contact between Energy Trust staff and trade allies. There was recognition that Energy Trust’s prior insulation from the market made it more difficult for its staff to understand and work effectively with trade allies and that increasing contact is the only way to overcome that insulation. In addition, involving Energy Trust staff more in trade ally outreach may enhance a sense of program continuity. Moreover, greater centralized coordination of trade ally contact may be beneficial to trade allies that work with multiple Energy Trust programs implemented by different PMCs.

Several comments suggested, however, that the amount and type of contact should take trade allies’ needs into consideration. A frequently raised concern was that trade allies have little time for or interest in attending meetings or presentations about issues that do not directly affect them. Others commented that some trade allies would like less direct contact with Energy Trust or that they get confused when Energy Trust contacts them directly rather than working through an already-established relationship. The trade ally survey (*Section 4, Vendor Feedback*) did not directly address this question, and none of the surveyed trade allies made comments indicating

¹¹ In addition, Energy Trust established a Trade Ally Coordinator in the beginning of 2008, after the period covered by this evaluation. The Trade Ally Coordinator, among other things, conducts quarterly round-robin meetings to provide trade allies with information on the range of Energy Trust programs.



that this has been a problem. However, three of ten of the most active trade allies surveyed indicated that some training was redundant.

Other comments were that trade allies in rural areas do not receive as much attention as those in urban areas and that training lighting trade allies on the use of controls could enhance savings.

New and Underserved Markets

Contacts mentioned several new and evolving markets. The restaurant and lodging segment was new in the current program cycle. The PMC introduced a free, direct-install pre-rinse sprayer program in this segment in 2006 to demonstrate the benefits of energy-efficient equipment. (As part of the participant data collection activities, we conducted a survey of sprayer recipients to gauge this program's effectiveness; see *Section 5, Participant Feedback*.)

The most frequently mentioned emerging market was data centers (or *server farms*), which account for three percent of the nation's energy usage.¹² This segment provides large potential for energy reduction through use of energy-efficient cooling and through virtualization applications to reduce the number of servers in use. Three projects are on the books right now, with one in the implementation phase.

Another new market has been large grocery chains, where new projects have been done. This is another area of possible coordination with NEEA's BetterBricks program, and PMC staff already have had discussions with NEEA staff.

In addition, contacts mentioned government buildings, small communities, congregations, nonprofits, small commercial (and specifically automobile dealerships and retirement centers), and building tenants as new or underserved markets. Retirement centers might be approached as a subgroup of the food service and lodging segment, although with a greater emphasis on custom mechanical projects. The program has contacted an ecumenical organization that offers consulting services and resources on energy-related issues¹³ to explore ways to generate more projects in the segment. No specific plans were mentioned for exploring the other potential new markets that were identified.

Converting Walk-Throughs to Projects

Another area in which potential exists for increasing program participation through enhanced PMC effort is in converting walk-through audits to projects. One PMC contact said that fewer than five percent of walk-throughs turn into a project. In the past, little effort has been made at

¹² At the time of report preparation, we were unable to identify the corresponding percentage for Oregon.

¹³ Oregon Interfaith Power & Light (http://www.emoregon.org/power_light.php).



conversion: typically, the ATAC who performed the walk-through would leave a form with the property representative, listing recommendations and providing a number to call to request assistance with project planning. At the time that interviews were being conducted, the PMC was planning to put more effort into converting walk-throughs to projects, starting in the congregations market.

Data Tracking, Data Collection, Processing, and Payment

Several comments addressed data collection and tracking, and the processing and payment of incentives. As described below, some forms and tools were developed and some are still ongoing; challenges in using Energy Trust's *FastTrack* and *Goldmine* systems are being addressed; a relatively high rate of documentation error in 2006 projects, traced to failure to document study results electronically, was rectified and documentation improved by late 2007. This section also addresses issues that arose during this evaluation related to the management of trade ally lists.

Forms and Tools

Contacts reported few changes to forms or tools in the 2006-2007 period. No significant changes to program forms were reported, other than that some forms got longer. In response to notification by the U.S. Internal Review Service that incentives might be considered taxable income, the PMC developed a "substitute" *Form W-9, Request for Taxpayer Identification Number and Certification*. The purpose was to provide clearer directions on recording the correct business name on the form.

One form-related concern raised by a PMC staff member was the lack of coordination between EB and BETC application criteria for mechanical projects, which means that calculations have to be done separately for the two applications. Allowing the same information to be used for both applications would reduce the burden to applicants, thereby reducing one of the barriers to participation.

The PMC has developed some spreadsheet tools for internal use. One allows PMC staff to input data from all hard copy forms into a single workbook. This tool can be used to generate program forms and documentation to guide PMC staff in allocating incentives between electric and gas measures. Contacts indicated that they planned to develop an on-line version of form 100E (the incentive application form) that would be used to populate the workbook with participant information. The hope was to put that tool online sometime in 2008. At the time of a follow-up contact in September 2008, this had not yet been accomplished.

Respondents also described a spreadsheet tool that lighting trade allies can use when performing audits. This tool allows them to produce a bid that shows savings and incentives, calculate BETC credits, and print out necessary forms. The PMC contacts reported that they would like to



develop similar tools for other types of measures. In September 2008, PMC staff reported that they were considering adapting a tool built for a specific mechanical application.

Data Collection and Tracking

Several contacts reported challenges with the *FastTrack* and *Goldmine* systems. Specific comments covered both the data content and the way in which data are organized – how these affect the ease of both data entry and report generation and the overall usefulness of the system for tracking ongoing projects – as well as the ease and reliability of remote access to the system from the PMC’s office.

Remarks about the data content and organization ranged from general observations that it is difficult to use to comments about specific facets. Sources of difficulty included having to “drill down a lot” to enter or find data and the fact that there is a single measure code for all custom measures, with hard-copy project files being the only source of additional detail.

There was general consensus that it is difficult to generate reports. Although there are a few stock reports, there are “many different ways to slice and dice the data.” Moreover, the current system does not provide a way to calculate useful management data, such as average time from incentive offer to incentive acceptance, or from incentive acceptance to project completion. A few contacts indicated that the system was not an efficient way to track ongoing projects.

Contacts acknowledged that Energy Trust has been receptive and responsive to feedback on this issue. At the time that interviews were being conducted, Energy Trust was setting up tickler systems to notify users when projects were within four to six weeks of incentive acceptance. This should provide better information on drop-out rates and improve realization rates and budgeting. However, as of the time that interviews were conducted, the system was still considered difficult to use by most PMC contacts.

In addition to the data structure and reporting challenges, some contacts reported that there had been frequent slow and disrupted connections to Energy Trust’s server in 2006 and 2007. Energy Trust’s IT department has addressed this problem and its efforts have helped.

Documentation Issues

During its review of project records prior to conducting site visits of selected 2006 projects, the evaluation team discovered a relatively high rate of documentation error. Specifically, approximately 25% of the project records did not show adequate documentation of assumptions and baseline conditions. We asked the Energy Trust Program Manager and four PMC staff members about their knowledge of documentation problems in 2006 and what had been done to improve documentation; we also reviewed the documentation process with PMC staff to discover how errors may have occurred. Contacts clarified that there had not been a requirement that ATACs performing a study generate an *eQUEST* model in electronic format. Some ATACs



therefore documented study results on paper printouts, which contain less detail on building structure and energy impacts. The use of paper documentation has been a problem: one contact noted that “using the hard-copy file means the file has to travel to whoever is using it ... and two years later the file may be buried in the basement.”

Documentation reportedly has improved, with an electronic copy of the *eQUEST* model being required in all cases since the evaluation team identified this problem. Additional training for ATACs on this issue may be warranted. An Energy Trust contact confirmed that documentation had improved, but that having more explicit standards would still be helpful. The evaluation team’s review of records for 2007 projects selected for site visits found that documentation had indeed improved by late 2007.

The greater use of electronic records should have other benefits than permitting more detailed modeling. It could reduce the risk of lost documentation (assuming that electronic files are properly backed up), as well as increase the ease of information sharing. Moreover, maintaining better and more detailed electronic records on the results of a study would be useful in identifying additional measures for a given building if the owner re-contacts the program after initiating a project.

Effect of Long Lead Times on Project Payment

During initial conversations with PMC staff, we were informed that some difficulties were encountered in 2006 because Energy Trust’s accounting system did not accommodate large projects with long lead times. Money committed in one program year might not be spent until the next year. However, PMC contacts indicated that this is no longer a problem. The PMC has implemented a system to forecast project completion dates and Energy Trust has successfully adjusted its processes to be able to carry over money from one year to the next.

Management of Trade Ally Lists

In the process of conducting the surveys of trade allies and vendors, we identified two areas for possible improvement in list management.

First, we noted a very common issue in list management: inconsistencies in the way in which the names of given trade allies were recorded. In a file that listed project counts by year for each trade ally, we found that approximately 10% of trade allies had at least one record (representing one program year) in which the firm’s name was represented somewhat differently from how it was recorded in the other records for that firm. For example, one record might include “Inc.” or “LLC” while the others did not, or “company” may have been abbreviated as “co.” in one record and not the others. In some cases, the variations were more significant. This type of inconsistency increases the time and effort required to extract accurate information about trade ally participation, such as a given ally’s tenure and level of activity, and increases the risk that some data for a firm may be excluded, resulting in inaccurate results.



Second, we found indications that the trade ally list may not be completely up to date. When we compared the list of trade allies that Energy Trust provided with the list that is shown on the Energy Trust website, we found that only slightly more than one-third of the 2006-2007 records on the provided list matched trade allies shown on the website. Conversely, only 199 of the 291 trade allies shown on the website matched firms in the entire (2003-2008) list that we received, meaning that there were 92 trade allies shown on the Energy Trust website that were not in the list provided us. In addition, during the course of conducting the nonparticipant vendor survey, we encountered 10 firms that claimed that they were trade allies and one that had applied to be one, none of which were in the list of trade allies provided to us.

Communication

The interviewed Energy Trust and PMC staffs described the communication between Energy Trust and the PMC, and within the PMC, as well as the communication and coordination with other Energy Trust programs and with the Oregon Department of Energy (ODOE). Contacts reported open and clear lines of communication within the PMC and between the PMC and Energy Trust, other PMCs and program sponsors, ATACs, trade allies, and the ODOE. The few communication concerns were non-serious.

Communication between Energy Trust and the PMC

Both the Program Manager and the PMC contacts described frequent and effective communication between Energy Trust and the PMC. Formal communication is conducted through monthly team meetings and quarterly summary meetings (which include the PMC's lighting subcontractor), with additional, more frequent informal interaction via telephone or email. On occasion, the Energy Trust Program Manager asks the PMC Program Manager to send written notices to the PMC team regarding issues that all team members need to be aware of (such as cases in which participants did not complete an application correctly).

The general consensus was that communication is good. The relationship between the Program Manager and PMC staff was described as open – an improvement over the past, when things that were not working well may not have been dealt with. There is a clearer understanding now on the PMC's part about what Energy Trust expects; conversely, the roles and responsibilities of PMC staff have gelled more, making it easier for the Energy Trust Program Manager to know who to talk to about specific issues.

PMC staff consistently praised the Energy Trust Program Manager for being receptive and accessible, as well as being very involved in new initiatives, in championing programs that the PMC has had success with, in finding new markets for the program, and in working with participants and trade allies. As one contact put it, it would be work to find an example of something that the Program Manager did that PMC staff did not understand.



Communication between Energy Trust and PMC is not highly funneled: the Energy Trust Program Manager communicates directly with a variety of PMC staff members. He is in touch with the PMC Program Manager on at least a weekly basis and communicates with others, such as the Technical Manager and the Marketing Manager on an “as needed” basis, ranging from twice a week to once every two weeks. The Energy Trust Program Manager indicated that a further increase in the PMC staff might make it necessary to funnel requests more between the organizations.

Some PMC staff interact with Energy Trust staff other than the Program Manager. For example, the Technical Manager sits on Energy Trust’s Conservation Advisory Council and discusses program matters with other Energy Trust staff on that council. He also works directly with Energy Trust’s information technology (IT) staff to develop new features for *FastTrack*. The PMC’s trade ally coordinator interacts directly with Energy Trust staff members who manage the trade ally roundtables and the trade ally enrollment process.

A few communication concerns were raised, none of which were serious. The major communication shortfall was that Energy Trust told the PMC in October 2007 that ATACs would be brought in-house. As a result, the PMC did not attempt to renew contracts with ATACs, which expired in January 2008, and then had re-establish contracts with them later.

One PMC staff member said that it would be helpful if incentive levels for the coming year were made known by the end of November or early December. According to this contact, waiting until the middle of the first quarter causes delays in customer projects.

Other contacts indicated that the PMC is waiting on Energy Trust input on some issues, such as updating legal language on forms, rewording the program implementation manual, making minor revisions to the marketing plan, and developing an Operations & Management (O&M) program; these were not considered major issues.

Communication within the PMC

Within the PMC, communication was described as open and collegial. The PMC Manager maintains an “open door” policy, and biweekly staff meetings enforce formal interaction among all groups (business development/ marketing, operations, technical/engineering). Beyond that, contacts described a high level of informal interaction. The PMC’s program staff is still small enough that “everyone knows what everyone else is doing. At some point in the day, everyone talks with just about everyone else.” As the staff continues to grow, however, it may become necessary to create more formal lines of communication.

The communication between the PMC prime contractor and the subcontractor that handles lighting measures also appears good. The prime and subcontractor meet on at least a biweekly basis. The subcontractor contact indicated that both Energy Trust and the PMC prime contractor recognize and respect his experience and are responsive to his inputs and needs. A PMC contact



noted that the recent emphasis on lighting controls has strengthened contact between the prime and subcontractor.

Communication with Trade Allies and ATACs

Each January, the PMC invites all mechanical trade allies to a program rollout to talk about program changes and to introduce new program staff. These rollouts usually occur in Portland. A lighting rollout (the annual *Lighting Road Show*) is done separately in four locations around the state.

Program contacts reported that the PMC Technical Manager has daily telephone contact with ATACs to assign studies and review their reports, and that PMC staff frequently contact ATACs to encourage them to submit reports on studies they have performed.

Communication and Coordination with Oregon Department of Energy

The PMC maintains contact with ODOE – each business development person at the PMC has a relationship with an ODOE staff person. To keep trade allies informed of ODOE offerings, the PMC invites an ODOE representative to talk at each year’s January trade ally rollout.

PMC contacts reported that communication and coordination with ODOE is hampered by limitations on ODOE’s resources, including the fact that it has lost staff. These limitations have hindered some efforts at coordination, such as: developing prescriptive tax credit measures for refrigeration and commercial washers and dryers to supplement Energy Trust incentives on these items; and establishing consistent documentation requirements for custom mechanical projects so that the same calculations can be used for both Existing Buildings and BETC applications. Despite ODOE’s limited resources, the department staff are seen as responsive and eager to work with Energy Trust.

Other Program Issues

In the course of the interviews, contacts commented on a variety of other program issues, specifically coordination with other programs, quality control issues, incentive levels, and desired market knowledge.

Coordination with Other Programs

Contacts indicated that the PMCs for the new building and multifamily programs have developed a good relationship. Communication is open and frequent. They have had meetings, facilitated by Energy Trust, on how to interact on facilities. As a result, they have been able to hand off projects from the existing building program to the new building program when it has become clear that a project was more complex than originally believed.



The PMC also has coordinated with NEEA's BetterBricks program in two areas. In one case, the PMC coordinated with the BetterBricks Hospitals Initiative, helping a large healthcare organization with capital upgrades and long-term planning. In the other case, the PMC coordinated with BetterBricks on BOMA's outreach efforts in Portland to get buildings reviewed for an ENERGY STAR[®] score.

Quality Control

Contacts described active quality control. Each project file contains a checklist of quality control steps that the PMC staff are supposed to carry out for that project. Each quarter, the Energy Trust Program Manager reviews 20 projects, comparing the project records to documentation in the corresponding project files and reviewing the quality control activities documented on the checklist.

Despite these activities, as noted above, the evaluation team found that approximately 25% of the records for 2006 projects selected for impact analysis site visits had inadequate documentation. Beginning in 2008, the program will carry out field inspections and review customer calculations for a small selection of projects of a given measure type. This is expected to provide information in a more timely way than waiting for outside evaluation inspections.

All lighting projects with incentives over \$5,000 have both a pre- and post-installation inspection, and about 10% of projects under that threshold are randomly selected for the same. Moreover, pre- and post-installation inspections are performed in any cases involving new trade allies or situations in which the project coordinator believes the vendor may have erred. In all, about 15% to 20% of projects have both inspections. No quality control issues were uncovered for lighting projects.

Incentives

The reduced incentive levels for electrical projects in 2006 and 2007 had an adverse impact on gas savings, which are achieved from large mechanical projects with both electrical and gas components. The increased electrical incentives, as well as a more comprehensive list of prescriptive gas measures adopted for the 2008 program year, were considered "about right" and likely to improve gas savings for 2008, compared to 2006 and 2007.

Expanding incentives is done mainly through adding measures, rather than increasing the amount per measure. Some suggested changes were incentives for glazing and increased incentives for controls. A concern of both Energy Trust and the PMC is that the BETC does not apply to upgrades to direct digital controls (DDC), which limits the number of control upgrade projects that EB can motivate. Increasing the incentive for controls would overcome this limitation.

Contacts consistently reported that the incentive payment process works as it should. As one put it, incentives are paid on project completion "99.99% of the time," usually within two to three



weeks after the paperwork is in-house. With very large projects, the PMC occasionally makes partial payments based on achievement of project milestones. Sometimes the process is slowed because the business name recorded on the application does not match that on the W9 form.

Summary of Program and PMC Contacts' Comments

Marketing and Outreach Strategies

Interviews produced the following key findings regarding marketing and outreach strategies:

- ➔ The PMC continues to work largely through contractors and vendors, but also has some PMC staff members now working directly with end-users in certain sectors.
- ➔ The PMC has coordinated marketing and outreach with other program sponsors and promotes the program through a range of marketing channels and activities.
- ➔ The PMC is attempting to forge a more tightly knit network of mechanical trade allies, similar to what has existed with lighting-related trade allies.
- ➔ The level of direct contact by Energy Trust staff with trade allies has increased, which has advantages, but should continue with consideration of trade allies' needs.
- ➔ The PMC is reaching into new and underserved markets, such as restaurants and lodging, data centers, and large grocery chains.
- ➔ The PMC is planning an effort to convert more walk-through surveys into projects.

Data Tracking, Data Collection, Processing, and Payment

Following are the key findings relating to data collection and tracking, and the processing and payment of incentives:

- ➔ The PMC has made no significant changes to forms, but has developed a method to facilitate completion of Form W-9 by customers.
- ➔ The PMC has developed a spreadsheet tool for internal use in managing data from incentive application forms; plans to develop other tools, including an online version of the incentive form, are still ongoing.
- ➔ Some challenges have occurred with the use of Energy Trust's database systems and with connection to Energy Trust's server, which Energy Trust is currently working to resolve.
- ➔ A relatively high rate of documentation errors in 2006 projects was traced to the lack of a requirement for detailed electronic documentation of study results, which the PMC has addressed.



- ➔ Energy Trust and the PMC worked together to respond to difficulties encountered in 2006 in accommodating large programs with long lead times.

Related to the above, but not a finding from interviews with program staff, we found many inconsistencies in the way in which the names of given trade allies were recorded, as well as evidence that the trade ally list may not be up-to-date.

Communication

Following are the key findings regarding communication within the program:

- ➔ Good communication was reported within the PMC, and between the PMC and Energy Trust, other PMCs and program sponsors, ATACs, trade allies, and ODOE.
- ➔ Some non-serious communication concerns occurred, including a lack of communication about Energy Trust's plans regarding ATACs.
- ➔ Limitations on ODOE's resources have hampered some coordination efforts.
- ➔ As the PMC staff continues to grow, it may be necessary to create more formal job definitions and lines of communication.

Other Program Issues

Finally, the following summarizes other program concerns and issues:

- ➔ Efforts are ongoing to determine how to re-divide work among the various Energy Trust programs to provide for the most effective delivery of program services.
- ➔ The PMC plans to increase quality control activities.
- ➔ Program and PMC staffs believe that current incentive levels are good overall, although suggestions were made to add incentives for glazing, increase existing incentives for controls, and increase the payback period for institutions expected to have a long period of existence.
- ➔ Areas where improved market knowledge would be useful include: descriptions of the players in new markets (the data center market in particular), such as the kinds of work they do and renovations cycles; the funding sources and cycles of nonprofit organizations; more technical and usage information about controls and heat pumps; and the decision criteria that various customer types use.



ATAC CONCERNS

The PMC provided a list of 24 ATACs and one ACOC. Of the ATACs, they considered 18 to be active and 6 to be inactive. Our goal was to interview 10 of the active ATACs and as many of the inactive ones as possible. We succeeded in interviewing 10 active and 3 inactive ATACs. The 10 active ATACs each had performed at least 20 surveys in the past two years; the inactive ATACs each had performed 12 or fewer. Of the remaining three inactive ATACs, one declined to be interviewed and two could not be reached.

Interview Format

We followed a structured format for all interviews. The interview guides for all ATACs covered the number and type of jobs done, communication with the PMC, reporting requirements, assignment of jobs, pay appropriateness, training provided, overall satisfaction with the program, and desired changes. The guides for the active ATACs also asked about study recipients' questions or concerns about the studies and/or resulting projects. Finally, because the PMC is planning to put more effort into converting walk-throughs to projects, we asked active ATACs about their thoughts on this topic.

Most interviewees provided codable responses to all of the questions put to them and all provided codable responses to most questions. However, in a few cases, the number of responses coded was smaller than the number of ATACs who were asked the question.

Number and Type of Jobs Performed

The ATACs we interviewed varied widely in terms of the number and types of jobs performed in the past two years for EB, as shown in Table 3.1 (next page). As this shows, most ATACs were distributed evenly over a range of zero to about 30 projects. Interestingly, one of the three that had not performed any jobs was one the PMC considered active; this interviewee provided responses to only the first four questions of the interview.

The types of jobs performed did not relate strongly to the number performed, except that the least active ATACs did only walk-throughs or Level I jobs, and the ATAC that was by far most active did only Level I and Level II. However, those between them tended to do all levels.

The distribution of number and type of jobs was consistent with what PMC staff told us, indicating a good general awareness of ATAC activity. However, the fact that one ATAC that had not performed any jobs in the past two years was listed as active and that one that had performed two jobs was listed as inactive suggests a possible lag in record keeping (albeit one that does not appear to be serious).

We did not ask those ATACs that had not performed any jobs about reporting requirements, job assignments, or pay levels.



Table 3.1: Number and Types of Jobs Performed

NUMBER OF JOBS	NUMBER OF ATACS	TYPES OF JOB PERFORMED					
		WALK-THROUGH		LEVEL I		LEVEL II	
		ATACs	JOBS	ATACs	JOBS	ATACs	JOBS
None	3	0	0	0	0	0	0
One to Five	3	1	5	2	3	0	0
Ten to Twelve	3	1	3	1	0	3	29
Twenty to Thirty	3	3	55	2	23	2	22
More than 200	1	0	0	1	100	1	100
TOTAL	13	–	–	–	–	–	–

Converting Walk-Throughs into Projects

Only five of the interviewed ATACs had done walk-throughs in the past two years. Those respondents provided varying feedback on the effort put into converting walk-throughs into projects. Two reported that they attempt to advance the process but do not necessarily know on a case-by-case basis whether the customer eventually participates in the program. One explicitly stated that no effort is made to convert walk-throughs. The other two ATACs did not know.

Three of the other eight interviewed ATACs had relevant comments, based on walk-throughs done before the time period identified. One said that all walk-throughs that identified opportunities turned into studies and, then, into projects. The other two did not know how many were converted – one tried to follow up with clients but said that it often was a “hassle,” and the other did not attempt any follow up after submitting a report to the implementer.

Most indicated that they did not know how many were converted. However, two indicated that little or no effort is made to convert walk-throughs to projects, while one reported that all walk-throughs that identify opportunities result in studies and projects.

None indicated awareness of an intention to increase the effort at conversion, suggesting that this was still in the planning stage when we spoke with the PMC contacts. This issue should be addressed in future evaluations to determine whether the PMC put such a plan in place, how it was implemented, and what the ATACs thought of it.

Customers' Questions and Concerns

We asked the ATACs about the kinds of questions or concerns they had heard from the customers who had received studies, either about the studies or about the projects that might



result from them. Three explicitly stated that they had heard no customer concerns, two of whom explicitly reported customer appreciation for the program.

Five ATACs reported seven specific questions and concerns that they had heard from customers. Most of these were comments about the program in general and not questions about the specific study or any project that might result. Topics mentioned were:

- ➔ Program processes, including how long it would take to get a report and confusion about the process on the part of some customers.
- ➔ Communication issues, including difficulty getting clear, timely responses from PMC staff about incentive levels and program steps and requirements.
- ➔ Funding or incentives, including concerned caused by the interruption in funding in 2006 and 2007, and the change in incentive levels from year to year.
- ➔ Coordination between the Energy Trust and BETC application processes.

ATACs' Program Experiences

We asked ATACs about several facets of their experience with the program. As described more fully below, generally program satisfaction is high, communication is good, program requirements are non-problematic, job assignments work well, and pay is appropriate. Most ATACs receive little or no training and would welcome training on analysis tools and on the program in general. However, some issues were identified with most program facets. These are detailed in the following subsections.

Program Satisfaction

Generally, ATACs were satisfied with the program. Five stated either that they were very or totally satisfied, or just satisfied without qualification. Another six said that they were fairly or pretty satisfied. The particular aspect of the program that they were most uniformly satisfied with were the reporting requirements, about which eight said that they had no problems.

Seven respondents reported satisfaction with their communication with the PMC. One particular respondent highlighted what he regarded as one of the program's strengths: that his role as an independent third party, rather than as a utility representative, gives the program credibility with customers.

However, all but one of the ATACs interviewed had some comment or concern about at least one aspect of the program. These comments and concerns are addresses by topic in the following sections.



Communication with the PMC

Most of the 13 ATACs interviewed had positive comments about the PMC and either specifically indicated that communication with the PMC was good, or had no communication issues or concerns to report. One specifically noted that one PMC staff contact was “very knowledgeable about his customers and about what’s going on out there” and the other was “very knowledgeable on the tech side.” This characterization is consistent with a PMC staff contact, who said that the PMC technical manager is on the phone with them on a daily basis.

However, eight respondents reported one or more specific communication issues (including two who otherwise thought communication was good). Four of those eight indicated that communication had been sporadic, insufficient, or slow. Two indicated that they have heard from the PMC only to receive a job assignment, an invitation to a presentation, or a contract amendment. One who said that PMC staff responded more slowly than they used to attributed this to the PMC’s workload, commenting that “they appear overwhelmed.”

Four respondents specifically cited PMC slowness in responding to draft reports. Two indicated that it can take several weeks, and two said that they have submitted report drafts for which they never got a response at all. One attributed the slow payment to the “cumbersome” payment process.

Reporting Requirements

Of the ten ATACs asked about reporting, eight said that there were no challenges meeting them. Most did not describe the requirements; in view of the above-reported documentation problems that occurred in 2006, it is noteworthy that two ATACs called for stricter reporting requirements. One ATAC described the reporting requirements as “...kind of open-ended. We are told to do standard engineering reports backed up with calculations ... it is a generic or descriptive standard, not a clear standard.” That contact further reported that the PMC had given a seminar “a couple of years ago” on standards and reporting requirements and what to expect from customers, but that there had been no follow up and there was no written handbook, which would improve the program.

Job Assignment

Nine of the ten ATACs questioned about job assignments said that they receive some or all of their assignments from the PMC. The job assignment process is relatively simple and straightforward: the ATAC will get a call from someone at the PMC (or in some cases according to one respondent, from Energy Trust) to ask about availability. If available, the ATAC will receive an email with a work-order and information about the customer.

Most respondents indicated that they usually get the assignment from one specific PMC staff member. Three said they had received assignments from two or more different PMC or Energy



Trust staff, although they did not report this as a problem. Four interviewees said that some or (in one case) all of their jobs result from their own customer contacts. In those cases, they contact the PMC and receive an application, after which the process is the same.

Seven of the respondents reported no issues with the process. Three concerns mentioned were:

- ➔ The job assignment sometimes does not have detailed background information and instructions.
- ➔ Turnaround time between submittal of an application for a survey to job assignment had slowed from about a week to as much as a month.
- ➔ The job assignment process is too informal.

Pay Appropriateness

Seven respondents indicated that pay was generally appropriate for the type of study, three said that it was not appropriate, and three gave no response. A few ATACs mentioned the following concerns (none of which was mentioned by more than two respondents):

- ➔ There had been pressure to reduce fees after Energy Trust had taken over this activity from the utilities.
- ➔ Basing fees on the square footage of buildings was misleading, as smaller buildings often have more complex systems (compared, for example, to a warehouse).
- ➔ There should be flexibility in the pay for Level I studies, as there is not always a clear-cut difference between the two types.
- ➔ Walk-throughs generally lose money, although it is made up on the follow-up studies or resulting jobs.
- ➔ Travel time is not reimbursed, even though ATACs often had to travel long distances to perform a study.

Training

A PMC contact reported that the PMC conducts training for ATACs once per year on program processes, covering such topics as changes to forms, incentive structure, and so forth. The last one carried out was in the beginning of 2007; at the time of the interview (April), the PMC had not yet conducted any training in 2008.

We asked all 13 ATACs about training. Most indicated that they received little or no training. Those who discussed the training in any detail described it as occurring “from time to time” or as “periodic.” Training topics identified were reporting standards, forms and updates, and changes (e.g., in incentives).



Two explicitly stated that training either was adequate or was not necessary, while five others made comments that did not clearly indicate adequacy or inadequacy – for example, one stated that he would like additional training only if it enhances his job performance, but did not indicate what that would entail.

Six respondents offered suggestions for training. Four of these had to do with analysis tools, including *EZ Sim*[®]. Other suggestions were:

- ➔ More regular information on the program – “Program training on changes and new requirements, profile of clients, results of other projects, etc., would be helpful.”
- ➔ Training on BETC requirements
- ➔ Training on HVAC systems they would likely encounter in the field
- ➔ A monthly or quarterly a forum to share lessons learned from other Energy Trust programs

Other Concerns or Desired Changes

To capture any additional concerns or desires not reflected in responses to the other questions, we asked ATACs what changes, if any, they would like to see made. Additional suggestions that were not covered in previous responses included upgrading to *DOE 2* software, using more utility data, using more up-to-date weather data, and increasing the amount of program marketing.

Comparison of Highly Active versus Less Active ATACs

We noted some differences in how the most active ATACs (those with 20 or more completed jobs in the past two years) and those less active (with 12 or fewer completed jobs) answered some of the questions. Two of the four active ATACs made positive comments about the program and expressed a desire to receive more regular program information and clarification of program processes, compared to none of the nine less active ATACs. Similarly, three of four active ATACs said that they were very or totally satisfied with the program, compared to two of seven less active ATACs (two discontinued the interview before we asked this question).

Obviously, a small sample size makes the use of inferential statistics inappropriate. However, as this sample was a large part of the entire population, these differences are worth considering.

These results suggest that, compared with the less active ATACs, the most active ones were both more pleased with the program overall and more engaged in it, as evidenced by their desire for more regular program information.



ATAC Summary

The interviewed ATACs covered a wide range of activities, in terms of both the number and type of jobs performed. The PMC appears to have a good general awareness of the range of ATACs' activities, although its recordkeeping does not perfectly reflect this.

Most ATACs were unaware of how many walk-throughs were converted to projects; those who had opinions, varied. As the PMC indicated that it planned to put more emphasis on conversions, this should be examined in future evaluations.

ATACs generally were satisfied with the program, in particular with the reporting requirements. In particular, the most active ATACs appeared more pleased with the program overall and more engaged in it. However, nearly all of the respondents expressed some comment or concern about the program. We summarize these comments in terms of crosscutting issues, rather than by interview question.

The area of concern mentioned most frequently was the turnaround time for various program activities. Eight respondents made a total of 12 comments relating to the slowness of program processes, PMC staff responsiveness (in general or relating to draft reports), job assignments, or payments.

Six respondents voiced eight concerns about the amount or quality of PMC communication or program information, including that communication was insufficiently frequent or detailed.

Finally, four respondents made as many comments about incentive or funding levels. Three related to the desire for greater stability in incentive or program funding levels, while the other addressed uncertainty about incentive levels (not directly related to changes in incentives).

No other specific concern was mentioned by more than two of the interviewed ATACs. It is, however, noteworthy in view of the documentation problems in 2006 that two ATACs called for stricter reporting standards.

The comments made about communication, contrasted with what the PMC contact said on the subject, suggesting that PMC staff may not be fully aware of the need for more frequent and consistent communication with ATACs. The discrepancy between the descriptions of training by the PMC contact and some ATAC comments, while less notable than that regarding communication, also suggests a need for more frequent and regular training.



4

VENDOR FEEDBACK

We sought the feedback of both participating and nonparticipating mechanical contractors and vendors through brief (approximately 15-minute) phone surveys in May and June 2008. Participating vendors are those that have formally signed on as trade allies with Energy Trust. They receive benefits in terms of program-related information and training from Energy Trust. Nonparticipating vendors are those that have not formally signed on as trade allies, although they may have completed projects that received Energy Trust incentives.

We conducted three surveys: one each with the most active participating trade allies (those who had performed at least 30 projects in the past two years); the least active trade allies (those who had performed five or fewer projects in the past two years); and nonparticipating vendors.

OVERVIEW

The survey sample of trade allies and vendors found that the Existing Buildings program enjoys good awareness and influence, and underscored the important role that vendors play in educating customers about energy efficiency and the Energy Trust incentives. Nonparticipating vendors reported somewhat less program awareness and influence.

Most trade allies and vendors include energy efficiency in a large proportion of their bids. Vendor interest in selling renewable energy equipment is good, but respondents reported low customer interest in and awareness of financial support for renewables.

Satisfaction with the program is generally high. Some suggested changes included increasing incentives for particular equipment types (such as certain kinds of lighting), providing user-friendly tools for calculating savings and incentives, and providing more program informational materials. Responding to some or all of these suggestions could result in increased program activity by many trade allies and vendors.

DEFINITION OF SURVEY FRAME AND LIST DEVELOPMENT

Our approach to developing the sample frame and call list varied somewhat for the three surveys to accommodate differences in the three populations. One common element was establishing a call list that was approximately three times as large as the number of desired completions. This is because it normally is necessary to make up to five repeated calls to at least three list records to achieve one completion. Experience dictates that making more than five attempts results in diminished returns in terms of completions.



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Trade Allies Lists

We identified the two groups of trade allies – most active and least active – from a file provided by Energy Trust. Each record in that file listed one firm and indicated the number of projects, and the total incentives paid on those projects, for a given program year. We created a subset of the list with only firms that had performed at least one project in 2006 or 2007 (the two years preceding the evaluation). We then identified duplicate records of the same firm and created a cumulative count of projects and a cumulative total of incentives over all records for each firm. After eliminating duplicate records, we were left with a file that had one record for each firm, with the cumulative count of projects completed by that firm and the cumulative total of associated incentives, over 2006 and 2007.

To select the sample of most active trade allies, we identified all firms that had performed at least 30 projects in 2006 and 2007. A total of 53 firms met that criterion. With a population of 53 firms, a sample of 20 gives a precision of at least 10%, at a confidence level of at least 90%, for responses expressed as percentages.¹⁴ This resulted in a list-to-sample ratio of 2.65:1, somewhat lower than the desired 3:1 ratio. To attempt to complete the survey with the most active trade allies, we ordered the list based on the number of projects completed in 2006 and 2007 – from the most to the fewest – and called firms in the resulting order until we had completed 20. (As it turned out, we called through the entire list to achieve 20 completes, which were well distributed throughout the list, so the results likely were similar to what they would have been if we had called in random order.)

To select the sample of least active trade allies, we identified all firms that had performed 10 or fewer projects in 2006 and 2007. A total of 171 firms met that criterion. With a population of 171, a sample of 34 gives a precision of at least 10%, at a confidence level of at least 80%, for responses expressed as percentages. (As the proportion of a particular response to a given item approaches 0.8, the confidence approaches 90%. See preceding footnote.) We randomly ordered the list of 171 trade allies and made calls to the first 102. This provided a list-to-completion ratio of 3:1. We retained the other 69 allies as a reserve call list.

Our original plan was to randomly order the list and call firms in the resulting random order until we completed the survey with representatives of 34 firms. However, we discovered during the course of the survey that several of the trade allies from this list did not consider themselves to be inactive, even though they had done fewer than ten projects in the past two years. Most of these were mechanical contractors for which one large project could take months and achieve

¹⁴ The computation of confidence and precision in a categorical variable assumes that half of respondents give a certain response (e.g., *yes* to a *yes/no* question, 3 on a five-point scale); this proportion of responses results in the highest possible variance, and therefore the lowest possible precision/confidence. Thus, any response that represents a proportion greater than or less than 0.5 will produce greater precision and/or confidence.



incentives worth thousands of dollars. Therefore, we changed the criterion to a maximum of five completed projects in 2006 and 2007. We also attempted to call as many lighting contractors as possible, as a lighting contractor with fewer than five (or even ten) projects in two years would easily be considered “less active.”

Nonparticipating Vendors List

We identified the nonparticipating vendors from a list of all Oregon vendors operating under the same NAICS codes as those listed by the Energy Trust trade allies. The list had a total of 635 records. We matched the list against a list of all Energy Trust trade allies and eliminated records for 14 trade allies. To ensure that we contacted only vendors that were within Energy Trust service territory, we also matched the list against one of ZIP codes corresponding to the Energy Trust service territory; we eliminated one firm that was outside the service territory. From the remaining 620 records, we identified and eliminated 70 duplicate records of firms, leaving a final population of 550 vendors. With that size population, a sample of 60 gives a precision of at least 10%, at a confidence level of at least 90%, for responses expressed as percentages. We randomly ordered that list and made repeated calls to the first 300. This provided a list-to-completion ratio of 3:1. We retained the other 250 vendors as a reserve call list.

SAMPLE DISPOSITIONS AND REPRESENTATIVENESS

Sample Dispositions

Table 4.2 shows the final dispositions of all elements of each sample. The percentage of firms excluded or determined to be ineligible was considerably higher for the most active than for the least active trade allies (36% vs. 17%). Seven most active allies were excluded because: they had bad or wrong telephone numbers (three), they did not have contact information (two), or they were duplicate records of firms that had not been identified earlier as such (two). Of those determined to be ineligible, seven had been interviewed previously as ATACs or had been interviewed for the Production Efficiency program, and five gave responses indicating that they did not belong in the most active group (e.g., they said that they had not performed any projects in recent years or were unfamiliar with Energy Trust, even though the project tracking database indicated that they had completed at least 30 projects in 2006 to 2007). The largest groups of excluded or ineligible least active trade allies were nine who did not pass screening questions (i.e., indicated they were not familiar with Energy Trust) and seven for which the listed telephone number was incorrect, disconnected, a fax number, or some other unworkable number.

Not surprisingly, the percentage of excluded or ineligible nonparticipating vendors (52%, almost entirely because of missing information) was much higher than for either group of trade allies. We also encountered a much higher refusal rate for this group compared to the trade allies (46% vs. 5%), again not surprising in a nonparticipant population.



Table 4.1: Sample Dispositions

OUTCOME		DISPOSITION		
		MOST ACTIVE TRADE ALLIES	LEAST ACTIVE TRADE ALLIES	NONPARTICIPATING VENDORS
ELIGIBLE FOR SURVEY				
Surveyed	Complete	20	34	59
	Partial	0	0	0
Not Surveyed	Refused	1	5	67
	Quota Met	13	55	19
Subtotal		34	94	144
EXCLUDED OR INELIGIBLE				
Duplicate		2	0	4
Missing Information		2	0	152
Bad Number ¹		3	7	0
Out of Frame ²		0	3	0
Failed Screen		5	9	0
ATAC/PE Trade Ally		7	0	0
Subtotal		19	19	156
TOTAL		53	113	300

¹ Disconnected, fax, wrong number, etc.

² Firm is out of business, contact is no longer at the firm, deceased, etc.

Sample Representativeness

To determine how well the samples we drew of most active and least active trade allies represented the populations from which they were drawn, we compared the sample data with the data in the *FastTrack* database in terms of the distributions of the allies' location and program tenure. We collapsed the range of values of each item into a smaller number of categories¹⁵ and used the goodness-of-fit *chi-square* test to compare the sample distribution of each item with the corresponding population distribution. Neither sample differed significantly from its corresponding population in terms of location or tenure.

¹⁵ *Location* was collapsed into Multnomah County, nearby counties, western Oregon, and other areas; *tenure* was collapsed into one to two years, three to four years; and five to six years; *mean number of projects per year* and *mean incentive per year* were collapsed into three-level variables that divided each population into approximate thirds.



CONTACT AND VENDOR CHARACTERISTICS

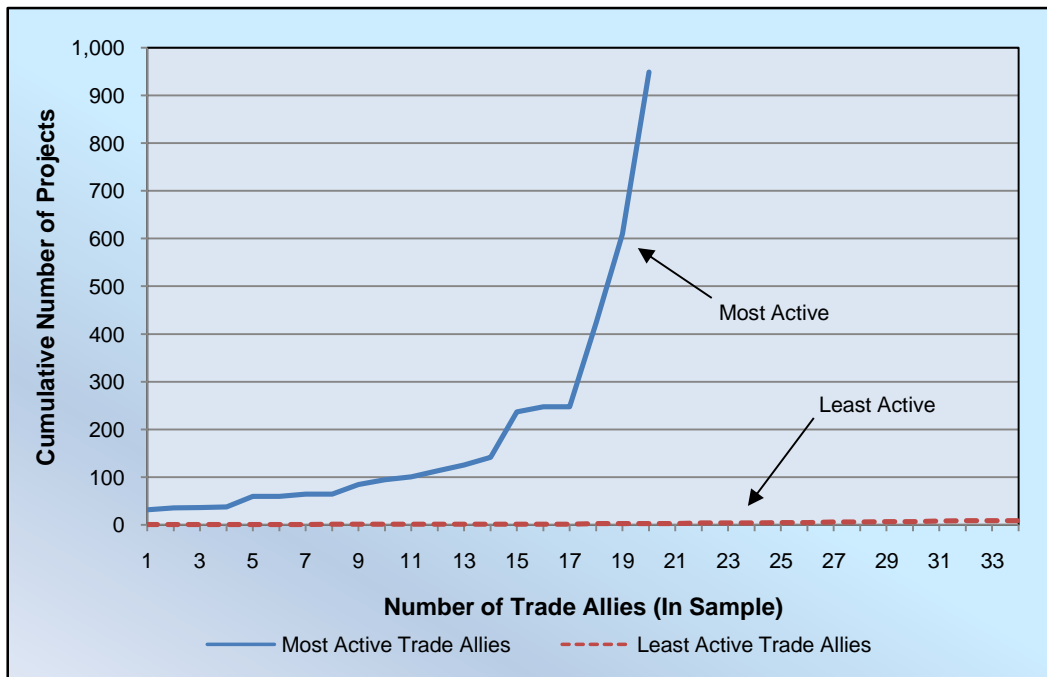
Trade Ally Activity Level and Tenure

All trade allies in the sample had been at least somewhat active with the EB Program as recently as 2006, and several had been active over the entire span of the program’s existence, from 2003 to 2008. The number of years in which an ally had at least one project ranged from the minimum (one) to the maximum possible (six). Eighty-five percent had been active more than two years, almost identical to the percentage reported in the 2008 Energy Trust trade ally survey.¹⁶

About 54% of trade allies said that one-fifth or fewer of their projects received Energy Trust incentives, consistent with what the Energy Trust trade ally survey found.

The total number of projects completed by allies in the most active group varied widely. (By definition, the range for the least active group could not vary greatly.) This is seen clearly in Figure 4.1, which shows the number of completed projects for each ally in both groups.

Figure 4.1: Cumulative Number of Projects, 2006-07, for Most Active and Least Active Trade Allies



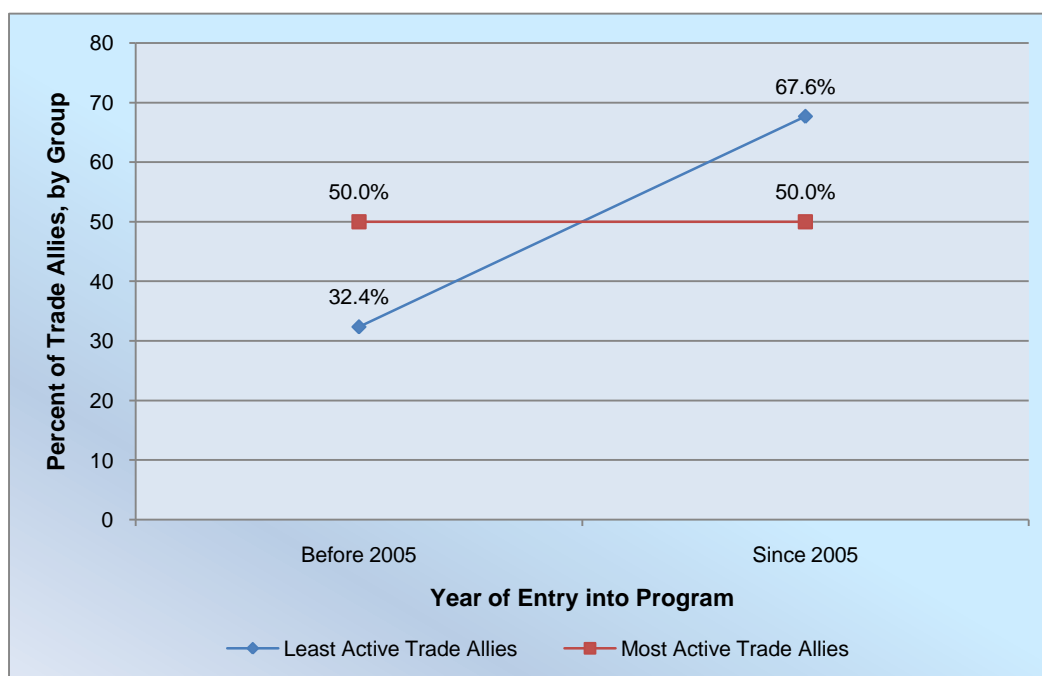
¹⁶ S. Castor, P. Degens, and B. Sipe, *2008 Energy Trust Trade Ally Survey*. Energy Trust of Oregon, October 23, 2008.



One of the purposes of comparing highly active and less active trade allies was to provide information that may be helpful in increasing the activity level of inactive trade allies. An implicit assumption is that the two groups differ somehow in their motives or commitment to energy efficiency, awareness, or understanding of the program, or some other factors.

Another possibility, however, is that the difference in level of activity was at least partly a function of how long the trade ally had been enrolled in the program.¹⁷ To address that possibility, we looked at whether the most active and least active group differed in terms of program tenure. Figure 4.2 shows the relationship between level of recent activity and tenure as a trade ally¹⁸.

Figure 4.2: Percentage of Most Active and Least Active Trade Allies by Year of Entry into Program



¹⁷ As noted above, we discovered during the course of the survey that the least active group included some mechanical contractors who did not consider themselves inactive, suggesting that the difference between the two groups could reflect a difference in the mix of mechanical and lighting contractors. As described, we attempted to control for this by trying to include as many lighting contractors as possible. However, this may have decreased, but did not eliminate, the difference in the mix of mechanical and lighting contractors. We discuss this at greater length below.

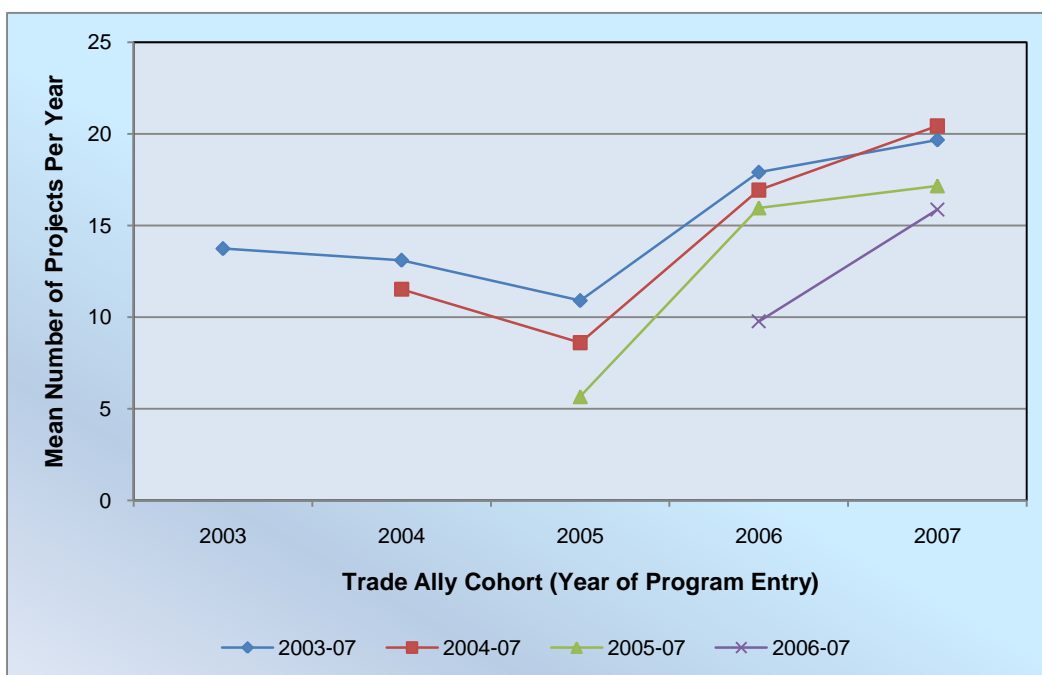
¹⁸ Tenure for any particular trade ally was determined by finding the first program year in any projects were recorded in the project *FastTrack* database for that trade ally.



The most active trade allies were equally likely to have entered the program before 2005 or since 2005. The least active ones, on the other hand, were far more likely to have entered the program since 2005. This supports the idea that at least some of the difference in level of activity is due to the difference in program tenure. It is possible that, over time, the “least active” group will show an increased level of activity.

However, it is still possible that the lower level of activity of the one group is partly due to briefer tenure and partly due to other factors. To get a closer look at this issue, we used data in the *FastTrack* database to chart the mean number of projects completed per year separately for allies entering the program in each year, through 2007. This is seen in Figure 4.3.

Figure 4.3: Mean Number of Projects per Year by Trade Ally Cohort: Entire Population



This figure shows a very similar trend over time for each cohort of trade allies (i.e., each group of allies entering in any given year). The increasing trend since 2005 is consistent with the Energy Trust trade ally survey finding that most trade allies expected their program involvement to increase in 2008.

However, it appears that, on average, those firms entering the program later tended to have completed fewer projects in each year than those entering before them. This suggests that, while tenure in the program tends to result in an increase in activity, it does not account for all of the difference in activity among trade allies.



Type of Service

The vendors and trade allies we surveyed offered a broad range of services and equipment (Table 4.2). The most common were lighting fixtures, followed by HVAC and lighting controls. This table shows that nonparticipating vendors were much more likely than trade allies to sell water heaters or offer architectural services. They also were more likely to offer a variety of other miscellaneous services, none of which accounted for more than three respondents. Recall that the sample frame for nonparticipating vendors was defined on the basis of the set of NAICS codes under which trade allies operate; these results indicate that those NAICS codes include vendors that provide services other than those offered by most Existing Buildings trade allies.

Table 4.2: Equipment and Service Provided (Multiple Responses Allowed)

EQUIPMENT/ SERVICE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Lighting Fixtures	13	9	21	43	38.1%
HVAC	5	16	13	34	30.1%
Lighting Controls	5	4	17	26	23.0%
Water Heaters	1	0	12	13	11.5%
Architecture	0	0	12	12	10.6%
Motors	3	0	5	8	7.1%
Custom Controls	3	2	2	7	6.2%
Plumbing	1	1	4	6	5.3%
Insulation / Ductwork	1	5	0	6	5.3%
Chillers	0	3	3	6	5.3%
Walk-Through Surveys	0	4	1	5	4.4%
Food Preparation	2	1	2	5	4.4%
Other	1	5	16	22	19.5%

As noted above, we discovered during the course of the survey that mechanical contractors were more likely than lighting ones to fall in the least active category because they tend to do fewer, but much larger, projects. We attempted to adjust for this, as described above, and were somewhat successful. Table 4.3 shows a good distribution of mechanical and other service types across the two groups; while lighting is less well distributed, there still is a reasonable number of contractors who provide lighting services in the least active group. Still, the most active trade



allies were more likely to report that they provided lighting fixtures, while the least active allies were more likely to offer HVAC services.

Table 4.3: Trade Ally Group by Type of Service (Multiple Responses Allowed)

SERVICE TYPE	MOST ACTIVE TRADE ALLIES (N = 20)		LEAST ACTIVE TRADE ALLIES (N = 34)	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Mechanical	8	40.0%	17	50.0%
Lighting	14	70.0%	10	29.4%
Other	4	20.0%	9	26.5%

The trade ally and vendor surveys were not planned around comparing those offering different kinds of services. However, we examined differences between lighting and mechanical trade allies to shed light on other known differences – notably, the fact that lighting contractors have a well developed network while mechanical contractors do not.

We found relatively few differences related to type of service offered. The most striking difference in terms of their role in the market was that lighting-only vendors were less likely than the others to have customers who actively sought information about the program: only 10% of that group reported that more than one-fifth of their customers had asked about the program, compared to 38% of mechanical-only vendors and 44% of those who offer both lighting and mechanical service. This suggests that lighting-only vendors must take a somewhat more active role in marketing the program than other vendors.

We also found some differences in firm size. Lighting-only trade allies were more likely than their mechanical-only counterparts (34% vs. 23%) to be small firms (10 or fewer employees), but were about equally likely to be large (more than 50 employees). Firms that provide both types of service were more likely than the others to be large (36% vs. 23% lighting-only or mechanical-only).

Firm Size

Table 4.4 shows the size distribution of firms. Across all three groups, the firms were almost equally distributed across the four size categories. The distribution of size differed significantly by group. Trade allies were much more likely to have 10 or fewer employees than the nonparticipating vendors. The two trade ally groups did not differ in terms of firm size.



Table 4.4: Number of Employees in Firm

NUMBER OF EMPLOYEES	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 58)	TOTAL (N = 112)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
10 or Fewer	7	13	7	27	24.1%
11 to 20	3	6	19	28	25.0%
21 to 50	6	5	18	29	25.9%
More than 50	4	10	14	28	25.0%
TOTAL	20	34	58	112	100.0%

The distribution of trade ally size differed somewhat from that found by the 2008 Energy Trust trade ally survey.¹⁹ The median firm size found in that survey was nine employees; the median in the current survey was 19.

Building Types Served

The most commonly cited types of building that the respondents provided equipment and services for were office, mentioned by nearly four in ten respondents, followed by retail, restaurant, manufacturing, hospitals, and other health care facilities (Table 4.5). There was considerable overlap between the respondents who served hospitals and other health care facilities; if these two building types are considered together, they are the third most commonly mentioned type.

About one in seven respondents said that they serve all types of commercial and/or industrial buildings. Three of these also identified individual building types. Twelve respondents mentioned a variety of other buildings, none of which was identified by more than two of them.

Some interesting differences emerged among the groups in terms of the types of buildings served. Compared to trade allies, a higher proportion of nonparticipating vendors provided equipment and services to retail buildings, health facilities other than hospitals, and colleges and universities. In addition, a higher proportion of both the nonparticipating vendors and most active trade allies served institutional and government buildings than the least active trade allies. The

¹⁹ Castor, Degens, and Sipe, *op. cit.*, p. 40.



most active trade allies also were more likely than the other two groups to say that they serve all industrial or commercial building types.

Table 4.5: Building Types Served (Multiple Responses Allowed)

BUILDING TYPE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Office	4	14	25	43	38.1%
Retail	1	9	28	38	33.6%
Restaurant	4	5	20	29	25.7%
Manufacturing	1	10	16	27	23.9%
Hospital	2	7	17	26	23.0%
Other Health	1	3	22	26	23.0%
Multifamily Dwelling	3	5	16	24	21.2%
Institution / Government	4	1	19	24	21.2%
School (K-12)	3	3	15	21	18.6%
College / University	2	2	15	19	16.8%
All Industrial	11	3	3	17	15.0%
Warehouse	1	4	11	16	14.2%
All Commercial	10	2	3	15	13.3%
Lodging	3	1	9	13	11.5%
Grocery	2	0	9	11	9.7%
Church	2	1	6	9	8.0%
Other	2	6	4	12	10.6%

The above differences in the distribution of building types served may be related to the differences among the three groups in the types of services provided.

Contact's Role in the Firm

We spoke with the firm's owner in nearly half the cases and with a business or project manager, or someone in sales/business development, each about one-fifth of the time (Table 4.6). Other roles were distributed over engineer and a variety of miscellaneous responses.



The contacts for the most active trade allies, which tended to be lighting firms, were more likely to be in sales or business development and less likely to be engineers, compared to the other groups.

Table 4.6: Contact's Role

ROLE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Owner	7	13	31	51	45.1%
Business/Project Manager	5	8	12	25	22.1%
Sales/Business Development	8	4	10	22	19.5%
Engineer	0	6	1	7	6.3%
Other	0	3	5	8	7.1%
TOTAL	20	34	59	113	100.0%

Level of Energy Trust-Related Work

We asked the trade allies what percent of their total business that Energy Trust projects represent. Although it rarely accounted for the majority of their business, most indicated that it made up a substantial portion: of 54 respondents, 29 said that it represented up to one-fifth of their business and 15 said that it represented between one- and two-fifths of their work. Nine of the remaining 10 respondents gave responses that ranged between three-fifths and all of their business, and one did not know.

We also asked nonparticipating vendors how many projects they have worked on since the beginning of 2007 for which the customer applied for an Energy Trust incentive, and what percent of their total business those projects represent. We found an overall low level of Energy Trust participation with this group. Eighteen respondents said that they had worked on 5 or fewer projects that resulted in applications for Energy Trust incentives; four reported 6 to 10 applications; and three each reported 11 to 25 and 26 to 50. The remainder provided no response. Similarly, nineteen said that projects resulting in an Energy Trust incentive represented 20% or less of their business and three said that it made up more than 20%; the rest did not respond.



AWARENESS OF EXISTING BUILDINGS

To find out what channels have been most effective in introducing vendors to the Existing Buildings program, we asked all groups how they first heard about it. However, we tailored other questions about program awareness to the respondent type.

Source of Program Awareness

The distribution of the reported initial source of program awareness is shown in Table 4.7. The frequency with which each source was mentioned differed by group. For all three groups, a program contact was among the most frequently mentioned source; however, a higher proportion of the most active trade allies than the other groups mentioned this source. Other vendors or contractors were mentioned frequently by the least active trade allies, as well as the nonparticipating vendors, but proportionally they were mentioned much more often by the former. Finally, both the active trade allies and nonparticipant vendors cited utilities as a source of program awareness relatively often, but with the former doing so proportionally more often.

Table 4.7: Source of Initial Program Awareness (Multiple Responses Allowed)

SOURCE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON- PARTICIPANT VENDOR (N = 59)	TOTAL (N=113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Program Contact	5	10	6	21	18.6%
Vendor / Contractor	0	12	7	19	16.8%
Utility	5	0	7	12	10.6%
Trade Association	1	3	2	6	5.3%
Other	9	4	16	29	25.7%
Don't Know, No Response	4	5	6	15	13.3%
Not Familiar with EB*	–	–	24	24	–

* By definition, all trade allies were familiar with the Existing Buildings program. The 24 nonparticipating vendors who said that they were not familiar represented 40.7% of the total for that group.

Existing Buildings Brand Awareness

Thirty-five of the 59 nonparticipating vendors (59%) said that they were familiar with the Existing Buildings program.



To ascertain the level of brand awareness of the Existing Buildings program, we asked the most active trade allies by what name they knew the program. Of 22 respondents, only 5 recalled the name *Existing Buildings*, 2 gave another name, and 15 could not provide a name at all. Of the two other responses, one said *the commercial program* and one said *ENERGY STAR*[®].

Nonparticipating Vendors' Awareness of EB

To find out whether other vendors and contractors are a potential source of information about the program, we asked just the nonparticipating vendor contacts if they were personally familiar with other firms that are working with Energy Trust. Twenty-four of 59 (41%) said that they did know other firms that work with Energy Trust.

We asked those 24 contacts what they had heard about Energy Trust. Six gave no specific details about what they had heard. However, the other 18 provided a total of 19 comments.

Ten of the comments referred to the Energy Trust incentives. Most of these did not go much beyond stating that they had heard that Energy Trust is a good source for rebates, although one additionally mentioned hearing that the incentive application process was particularly user-friendly.

Five comments were positive. Four of these were general positives, such as that Existing Buildings is “a great program” that “helps a lot in getting energy efficiency measures enacted.” One referred to the equipment that Energy Trust recommends, specifically that it provides huge savings and pays for itself in a short time.

Four comments related to program negatives: that Energy Trust has run out of money; the paperwork is complicated; that Energy Trust does not have enough energy-efficient lamps on its list; and that Energy Trust can, in general, be difficult to work with.

These findings suggest that firms that currently work with Energy Trust can indeed be a good vehicle for promoting the program to others. However, the general nature of most of the comments shows that detailed program information does not get disseminated through this channel. One possible way to exploit this channel better might be to offer promotions to vendors that bring in new business through others that have not previously worked with Energy Trust.

VENDOR MARKETING

We asked several questions to gain an understanding of the role that energy efficiency plays in these vendors' marketing. Questions covered vendors' experience selling energy-efficient equipment that does not qualify for Energy Trust incentives, the level of customer interest in the program, and vendors' experience in promoting Energy Trust incentives.



Non-Qualifying Energy-Efficient Equipment Sold

We first asked what energy-efficient equipment vendors sold that did not qualify for an Energy Trust incentive and why that equipment did not qualify. This might provide input to Energy Trust in considering what new measures to incent.

As Table 4.8 shows, the most frequent single type of equipment mentioned, particularly among the most active trade allies, was lighting-related, specifically: T-8 lamps (four respondents), LEDs (three), daylighting (two), and a variety of other lighting-related equipment not mentioned by more than one respondent. The second most common non-incented equipment mentioned was HVAC, not surprisingly mentioned mainly by the least active allies.

Table 4.8: Most Common Non-Incented Energy-Efficient Equipment

EQUIPMENT/ SERVICE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Lighting Fixtures	6	2	3	11	9.7%
HVAC	1	7	0	8	7.1%
Don't Know	0	4	28	32	28.3%
Other	9	5	15	29	25.7%

Also unsurprisingly, a large number of the nonparticipating vendors said that they did not know what energy-efficient equipment of theirs qualified. However, this was related to firm size: none of the nonparticipating firms with 10 or fewer employees knew what energy-efficient equipment they sold did not qualify, compared to nearly three-quarters of those with 50 or more employees. Thus, the largest vendors were relatively familiar with Energy Trust requirements, even if they were not participating as trade allies. The lack of familiarity with Energy Trust requirements among small vendors suggests a potential target group for educational efforts.

If a trade ally reported selling any energy-efficient equipment that did not qualify for an Energy Trust incentive, we asked why it did not qualify.²⁰ Seven each said that the equipment was sold to someone outside the Energy Trust service territory or that the efficiency rating was too low (even though it was efficient). Four each said that the project was too small or that the equipment was

²⁰ We omitted this question from the survey of nonparticipating vendors, first, to reduce the burden on this group, and, second, because we assumed that they would not be sufficiently familiar with Energy Trust requirements to provide reliable information.



not on Energy Trust's list of qualified equipment (but did not specify that it was because of efficiency issues). Two said that the payback period did not qualify, and one each said that energy efficiency was part of the equipment specifications or that the bid already had been accepted without an incentive. Eight respondents gave a variety of unspecific answers.

Promoting Energy Trust Incentives

We asked all respondents about their promotion of energy-efficient equipment and Energy Trust incentives. We tailored the line of questioning to the three groups. Therefore, we are able to compare responses to some questions across groups, but for others we cannot do so.

Awareness and Promotion of Incentives

We asked all three groups what percentage of bids or proposals that they had done over the past year included energy-efficient equipment (see Table 4.9). More than four in ten respondents said that all of their bids or proposals had included energy-efficient equipment. Nearly six in ten said that energy-efficient equipment was included in more than 80% of bids. About one in five said that they included energy-efficient equipment in 20% or fewer of bids. The responses to this question did not differ by respondent group.²¹

Table 4.9: Percent of Bids or Proposals that Have Included Energy Efficient Equipment

GROUP	PERCENT OF BIDS OR PROPOSALS						
	0% TO 20%	21% TO 40%	41% TO 60%	61% TO 80%	81% TO 99%	ALL	TOTAL*
Most Active Trade Allies	2	3	1	2	4	8	20
Least Active Trade Allies	7	2	0	2	5	18	34
Nonparticipant Vendors	14	4	5	6	8	20	57
TOTAL	23	9	6	10	17	46	111
	20.7%	8.1%	5.4%	9.0%	15.3%	41.4%	100.0%

* Does not include those who did not know or did not respond.

To probe further into the most active trade allies' level of familiarity with and understanding of the program, we asked them two additional questions. First, we asked what percentage of time they knew whether the bid equipment was likely to qualify for an incentive. Second, we asked, of

²¹ We collapsed responses in several categories for this variable prior to comparing the groups because of the small counts in each cell.



the projects they had done in Energy Trust territory, in what percentage had they recommended equipment that could qualify for an Energy Trust incentive.

As seen in Table 4.10, responses to these questions were distributed very similarly. More than half of these respondents said that they always knew whether equipment they were including in a bid was likely to qualify for an Energy Trust incentive and six in ten said that they always include equipment that would likely qualify in projects within Energy Trust territory. More than eight in ten reported knowing the qualification requirements and bidding, qualifying more than 60% of the time. These results indicate that the program has been effective at communicating incentive requirements to the trade allies that have been most active in the program.

Table 4.10: Knowledge and Promotion of Incentives

QUESTION	PERCENT OF BIDS OR PROPOSALS						TOTAL
	0% TO 20%	21% TO 40%	41% TO 60%	61% TO 80%	81% TO 99%	ALL	
Knew Equipment Likely to Qualify	2	1	0	4	2	10	19
Included Equipment that Could Qualify	1	1	0	3	3	12	20

* Does not include those who did not know or did not respond.

We asked the least active trade allies and the nonparticipating vendors what percentage of the time they suggested that customers apply for an Energy Trust incentive. Responses to this question are shown in Table 4.11. Over both groups, the responses were distributed similarly to the question of how often they bid energy-efficient equipment. However, a far greater proportion of trade allies said that they always recommended applying for the incentive (20 of 31 vs. 8 of 33), and a much higher percentage of nonparticipating vendors said that they did it no more than 20% of the time (15 of 33 vs. 3 of 31).

Table 4.11: Percent of Time Has Suggested that Customer Apply for Energy Trust Incentive

GROUP	PERCENT OF BIDS OR PROPOSALS						TOTAL*
	0% TO 20%	21% TO 40%	41% TO 60%	61% TO 80%	81% TO 99%	ALL	
Least Active Trade Allies	3	2	1	3	2	20	31
Nonparticipant Vendors	15	3	1	3	3	8	33
TOTAL	18	5	2	6	5	28	64
	26.2%	7.8%	3.1%	9.4%	7.8%	43.8%	100.0%

* Does not include those who did not know or did not respond.



While it is encouraging that these vendors recommend energy-efficient equipment and suggest that customers apply for the incentive a relatively high percentage of time, these results clearly show opportunities for increased promotion of energy efficiency and of the Energy Trust incentive, particularly among the vendors who do not participate as Existing Buildings trade allies.

Reasons for Not Promoting Energy Efficiency or Incentives

We sought to determine why vendors sometimes did not bid equipment that was energy-efficient or that would qualify for an incentive, or did not even recommend that customers apply for an incentive. First, we asked the least active trade allies and nonparticipating vendors why they sometimes did not bid equipment that was energy-efficient. The distribution of responses is shown in the left-most portion of Table 4.12.

Table 4.12: Reasons for Not Bidding Equipment or Suggesting Energy Trust Incentive

REASON GIVEN	DID NOT BID EQUIPMENT				DID NOT SUGGEST APPLYING (LEAST ACTIVE TAs ONLY)
	LEAST ACTIVE TRADE ALLIES	NON-PARTICIPATING VENDORS	TOTAL	MOST ACTIVE	
Non-Efficient / Non-Qualifying Equipment Was Specified	4	22	26	1	5
Recommended Equipment Better Suited to Customer Needs	8	1	9	1	0
Did Not Think the Customer Would Want It	1	5	6	1	2
Insufficient Savings	1	1	2	5	0
Did Not Know What Was Energy Efficient / Qualified for an Incentive	2	1	3	0	3
Difficulty Obtaining Energy-Efficient / Qualifying Equipment	0	3	3	0	0
Counter to Vendor's Interest	2	1	3	0	0
Applying for Incentive Too Much Hassle	0	0	0	0	3
Don't Know	0	3	3	0	2
Other	1	8	9	0	5
TOTAL	16	59	75	8	10



The most common response differed for these two groups. By far, the most frequent reason given by nonparticipating vendors was that the customer had specified other equipment, often per an architect or engineer's recommendation. This accounted for about one-third of this group's responses. On the other hand, the trade allies were most likely to say that they had recommended equipment that was better suited to the customer's needs – exactly half gave this reason.

Similarly, we asked the most active trade allies why they sometimes did not bid equipment that was likely to qualify for an Energy Trust incentive. To reduce the interview burden on the most active trade allies and to avoid asking questions that were very similar and might appear repetitive, we did not ask this group why they sometimes did not bid equipment that was energy-efficient. Their responses are shown in the center portion of **Error! Reference source not found.** Recall that 10 of 19 respondents in this group said that they bid qualifying equipment every time. Of the remaining 9, 5 said that the project or equipment would not produce enough savings to qualify or justify applying, and one each gave three other responses.

Finally, we asked the least active trade allies what their reasons were when they did not suggest that a customer apply for an Energy Trust incentive. Of the 11 respondents in this group who did not always suggest applying for the incentive, 10 gave a reason why not. Half of these said that the customer had specified equipment that did not qualify. Three each said that they had not known at the time what equipment qualified for an incentive and that applying for the incentive was too much of a hassle.

Looking across the reasons given for not bidding equipment that was energy-efficient or that would qualify for an Energy Trust incentive, and for not suggesting that customers apply for an incentive, we see a fairly broad range of responses given, with few dominating. However, two results were suggestive.

First, the fact that so many of the nonparticipating vendors cite customer specifications as the reason that they do not bid energy-efficient equipment suggests that they may not be highly proactive in promoting energy efficiency. Admittedly, the customer has the last word, but the experience with program participants (see Section 5, below) shows that vendors and contractors can be a strong influence in the decision about what equipment to purchase. Influencing the general population of equipment vendors to be more proactive in promoting energy efficiency and the Existing Buildings program is one potential source of generating new energy savings.

Second, of those in the least active trade ally group who sometimes did not bid energy-efficient equipment, half said that they had recommended equipment that was better suited to customers' needs. This points up the importance of continually reviewing the list of qualifying measures and of soliciting the input of vendors and trade allies in that process.



CUSTOMER RESPONSE

To gain an understanding of the customers' impact on the inclusion of energy-efficient equipment in projects, we asked about the level of customer inquiry about the Existing Buildings program, as well as the role that trade allies play in helping customers decide to implement energy efficiency.

Level of Customer Inquiry

To gauge customer awareness of, and interest in Existing Buildings, we asked all respondents what percent of their customers had asked about the program over the past year. Responses are shown in Table 4.13.

Table 4.13: Level of Customer Inquiry about Existing Buildings Program

GROUP	PERCENT OF CUSTOMERS INQUIRING ABOUT EB					
	NONE	1% TO 20%	21% TO 40%	41% TO 60%	61% TO 100%	TOTAL*
Most Active Trade Allies	3	10	2	2	2	19
Least Active Trade Allies	4	18	5	3	3	33
Nonparticipant Vendors	13	18	1	1	0	33
TOTAL	20	46	8	6	5	85
	23.5%	54.1%	9.4%	7.1%	5.9%	100.0%

* Does not include those who did not know or did not respond.

These responses indicate an overall low level of customer inquiry. Three-quarters of respondents said that no more than one-fifth of their customers had inquired about the program, nearly one-quarter saying that none had done so. The distribution of responses differed somewhat by group. The nonparticipant vendors were more likely than the trade allies to say that none of their customers had inquired about the program, while the trade allies were more likely than the others to say that more than one-fifth had made inquiries. This overall low level of customer inquiry underscores the important role that vendors and trade allies have in educating customers about the program and generating interest in energy efficiency.

Most Active Trade Allies' Role in Customers' Decision-Making

We asked the most active trade allies several additional questions to gain a sense of the role that trade allies play in their customers' decision-making process about energy efficiency. We first asked about the proportion of projects in which customers had revised the project plan to qualify for an incentive after discussing it with the respondent. We then asked about the proportion of projects in which customers decided not to use energy-efficient equipment that could have



qualified for an incentive; for such projects, we asked whether the respondent or the customer had brought up the issue of efficiency. Table 4.14 shows how respondents answered these questions.

The results indicate that the majority of most active trade allies have been successful at convincing some of their customers to incorporate energy-efficient equipment in their projects; in most cases, however, projects were not revised. Similarly, most reported a relatively low percentage of projects in which customers decided not to use qualifying energy-efficient equipment. The latter finding is consistent with respondents' reports, cited above, that most of their projects over the previous year had included energy-efficient equipment.

Table 4.14: Most Active Trade Ally Influence on Customer Decision-Making

WHAT PERCENT OF PROJECTS...	PERCENT OF PROJECTS						
	NONE	0% TO 20%	21% TO 40%	41% TO 60%	61% TO 80%	81% TO 99%	ALL
ALL PROJECTS (N = 20)							
...were revised to qualify for an incentive	6	5	8	0	0	1	0
...customer decided not to use EE equipment	4	11	4	1	0	0	0
WHEN CUSTOMER DECIDED NOT TO USE ENERGY-EFFICIENT EQUIPMENT (N = 15)							
... vendor brought up EE equipment	2	2	0	1	1	1	8
...owner brought up EE but then decided against it	11	3	0	0	0	0	1
...neither brought up EE equipment	13	2	0	0	0	0	1

When asked about projects in which the customer decided not to use energy-efficient equipment, more than half the respondents said that they had always raised the issue of using it; the rest were distributed across the range of possible responses. Nearly all said that the customer never or infrequently raised the possibility of using energy-efficient equipment and then dropped it, or that neither brought it up.

The above findings together suggest the following conclusions: 1) many customers already have decided on using energy-efficient equipment when they begin discussing a project with one of these trade allies; 2) when this is not the case, the trade allies usually, but not always, bring up the issue of using energy-efficient equipment and frequently convince the customers to change



their minds; but, 3) something on the order of one in seven²² customers is not interested in energy efficiency, even after discussing it with the vendor.

The most active trade allies' self-reported role in influencing customers' decisions provides evidence that the program has been successful in its goal of using trade allies to promote energy efficiency. The fact that upwards of one-seventh of project owners are perceived to be resistant to energy efficiency indicates a potential opportunity for increased program activity. It would be valuable to obtain more information on these owners, including the types of buildings, businesses, and projects they undertake, and their reasons for refusing to consider efficient purchases and upgrades.

VENDOR PREFERENCES

We asked respondents a variety of questions to elicit comments about changes they would like to see in the program. The purpose was to identify ways to increase vendor participation. We asked the trade allies questions specifically about changes to qualifying projects and equipment, and about desired tools and training. We also asked the less active trade allies and nonparticipating vendors what else the program might do to increase their level of activity.

At the conclusion of the survey, we again asked what changes they would like to see, as well as what they thought were the best and worst aspects of the program. We examined responses to those final questions to see if they provided additional responses to the earlier questions.

Suggested Changes to Qualifying Projects or Equipment

We asked all trade allies what changes they would like to see in the types of projects or equipment that qualify for Energy Trust incentives. Thirty-three of the 54 respondents (61%) could not think of anything to change. This response was more likely to be given by the least active trade allies (68%) than the most active ones (50%). Another 6 respondents made suggestions that were not about equipment or project types (these are discussed elsewhere).

Eleven respondents made specific equipment-related suggestions. These included increasing incentives or cost-effectiveness criteria for LEDs (four respondents) as well as for controls, variable capacity heating/cooling systems, restaurant equipment, televisions, roofing, natural ventilation, and other design improvements (one respondent each), and extending incentives to efficiency improvements on existing heating equipment (one respondent).

Five allies made several suggestions (one respondent each) that were not specific to certain equipment types: putting less focus on leading-edge equipment that have been on the market a

²² This was estimated by computing the mean, across all respondents, of the midpoint of each response category: $[(4*0) + (11*10) + (4*30) + (1*50)] / 20 = 14$.



short time (and for which servicing warranties can be a problem), extending incentives to equipment with short paybacks or that is ancillary to incented equipment, generally increasing incentive levels, and generally increasing the range of equipment types that qualify.

In addition, 5 of the 59 nonparticipating vendors mentioned equipment-related issues when asked what changes would make participating easier. Three of these mentioned increasing incentives for lighting (one for LEDs and two for T-5s). One indicated uncertainty whether Energy Trust provides incentives for commercial refrigeration and one indicated that Energy Trust was not accepting ENERGY STAR[®] equipment that it offers.

Tools and Training

We also asked the trade allies what kinds of training or tools for estimating the energy savings of efficient equipment they would like Energy Trust to provide. As shown in Table 4.15, about 6 in 10 respondents had no suggestions. Roughly, a third of respondents said they would like some type of savings-estimation tool and a similar proportion mentioned some kind of training they would like to see offered.

Table 4.15: Requested Tools and Training

TOOLS OR TRAINING	TRADE ALLIES (N = 54)	
	RESPONDENTS	PERCENT
<i>Nothing Recommended</i>	32	59.3%
<i>Tools to Calculate Energy Savings</i>	17	31.5%
• Chart, table, matrix of savings	3	
• Tools to calculate net costs	3	
• More detailed explanation of savings	2	
• Estimating for complex projects	2	
• Incorporate baseline data	2	
• Other (savings for pumps, cost of running equipment, tax credits)	3	
• Not specific	2	
<i>Training</i>	19	
• General program information/general training	8	
• Renewables	5	
• What qualifies or is available	4	
• Other (hazardous materials, video on difference between efficient and non-efficient equipment, "Check Me" training)	3	



Descriptions of desired tools varied in level of detail and in the features mentioned. Three respondents simply requested some type of chart, table, or matrix that showed the savings and incentives available for various types of equipment. Three indicated that they would like a tool to help estimate net costs. No more than two respondents mentioned any other specific feature.

Of the 19 respondents who mentioned training, the most common request was for general training or general program information, followed by training on renewables and training on what equipment qualifies for incentives or is available in the market. Four respondents expressed a general desire for more training. Three other suggestions were made by one respondent each.

With the most active trade allies, we followed up the question about desired tools or training by asking if there was any training that they had not found particularly useful. Sixteen of 20 answered in the negative. Three said that training was somewhat redundant for them, mainly because they had extensive experience in the field. Two reported that they had not received any training. One said that all training was good, but that in-person training was better than webinars.

In addition, when we asked nonparticipating vendors what would increase their level of program activity, six mentioned the provision of tools to help estimate savings. None mentioned training.

Other Desired Changes

In addition to the above changes, respondents mentioned several other issues in response to our questions. Table 4.16 shows the distribution of responses.

Table 4.16: Desired Program Changes

DESIRED CHANGE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Nothing / Don't Know	3	17	7	27	23.9%
Increase Marketing / Distribution of Program Information	3	10	12	25	22.1%
Simplify Application / Approval Process	4	5	4	13	11.5%
More/Different Incentives	5	3	3	11	9.7%
Shorten Approval Time	2	4	3	9	8.0%
Coordinate with the BETC	4	0	0	4	3.5%
Other	6	8	3	17	15.0%



The most common response, given by 27 respondents, was to suggest no changes. This response was given by a far larger proportion of the least active trade allies than the other groups. Nonparticipant vendors were overwhelmingly most likely to say that they would like more program information to educate themselves and their customers about the program.

The change requested by the highest number of respondents was for the program to distribute more information (i.e., through brochures and other marketing channels), both to themselves and to their customers.

Thirteen respondents – split equally between groups – said that they would like to see the application/approval process simplified or streamlined. Others mentioned changes in the incentives or the equipment or services incented, a shortened approval time, and closer coordination between the Existing Buildings and BETC applications. Twenty-one respondents mentioned a variety of miscellaneous issues, none of which was raised by more than two persons.

Increasing Program Activity

If any of the less active trade allies or nonparticipating vendors mentioned any desired program change in response to any of our questions, we asked how likely it was that he or she would become more actively involved in the program if the suggested changes were made. We asked them to answer on a scale from 1 (not at all likely) to 5 (very likely). As Table 4.17 shows, nearly one-quarter of these respondents could not answer. However, of those who could answer, most said that it was either “very likely” or “somewhat likely” that they would become more active – roughly equal proportions of the trade allies to nonparticipants gave one of those responses.

Table 4.17: Likely Effect of Desired Changes on Level of Program Activity

LIKELIHOOD OF INCREASED ACTIVITY	LEAST ACTIVE TRADE ALLIES	NON-PARTICIPANT VENDOR	TOTAL	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Very Likely	15	15	30	50.8%
Somewhat Likely	5	7	12	20.3%
Neither Likely Nor Unlikely	1	2	3	5.1%
Don't Know / No Response	8	6	14	23.7%
TOTAL	29	30	59	100.0%

Very few gave even chances and nobody said that increased activity was unlikely. Even if we assume that those who did not respond would fall into one of these categories, the above results suggest that program activity could be significantly increased. The one change that was



mentioned frequently and would be relatively easy to implement is to increase the distribution of information about the program to vendors and their customers.

Of the three respondents who said that they were neither likely nor unlikely to become more actively involved, two said they already were as active as they could be and one said that it was not applicable to their business.

Receiving Program Information

Of the 59 nonparticipating vendors to whom we spoke, 51 (86%) said that they would be interested in receiving information about Energy Trust programs. Of those, 21 said that they would like program information on specific energy-related subjects pertinent to their business (e.g., commercial electrical and lighting efficiency, plumbing-related, motors, and so forth). The same number said that they would like general program information for customers. Six would like information on incentives and cost savings, and five gave a variety of miscellaneous responses.

On the whole, the responses reflect earlier comments that vendors need more program information targeted to their own needs, as well as general information for their customers.

We asked all respondents, not just the nonparticipating vendors, what their preferred method would be for receiving program information. As Table 4.18 shows, email is the most strongly preferred method, mentioned by two-thirds of the respondents. About one-quarter would prefer to receive information by postal mail. Less frequently mentioned were group presentations or other in-person approaches, the web, telephone, and through a professional association.

Table 4.18: Preferred Methods for Receiving Program Information (Multiple Responses Allowed)

METHOD	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Email	17	22	38	77	68.1
Postal Mail	2	9	20	31	27.4
Group Presentation	4	3	10	17	15.0
Web	1	5	6	12	10.6
Telephone	2	1	4	7	6.2
Professional Association	0	0	4	4	3.5
Other	0	2	1	3	2.7



Table 4.19 shows how frequently respondents had used the Energy Trust website over the previous year. Interestingly, the most common responses were “more than 10 times” and “never,” each given by about one-quarter of respondents. About one in five said that they had used it a maximum of five times.

Table 4.19: Frequency of Use of Program Website

ANNUAL USE OF ENERGY TRUST WEBSITE	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
Never	6	4	16	26	23.0%
One to Five Times	4	11	7	22	19.5%
Six to Ten Times	2	4	3	9	8.0%
More than Ten Times	8	13	9	30	26.5%
Don't Know, No Response	0	2	24	26	23.0%
TOTAL	20	34	59	113	100.0%

These results reflect the above finding that, for most vendors and trade allies, the web is not a preferred method for getting program information. However, it is frequently used by a significant group of vendors, more so for trade allies. Therefore, it seems reasonable to suggest that continued effort be made to maintain and improve the website. It may be worthwhile also to explore ways to make the website more accessible to those who do not prefer to use it.

ROLE OF BETC AND ENERGY TRUST RENEWABLE ENERGY INCENTIVES

Combining Energy Trust incentives with the BETC should increase project owners' ability to make energy efficiency investments. Therefore, we inquired about respondents' awareness of the BETC and its role in their business. We also asked about interest in and awareness of support for investment in renewable energy.

Awareness and Influence of the BETC

We asked respondents if they were aware of the BETC and, if so, if they knew that it applies to renewable energy and gas projects. We also asked what percentage of respondents' customers had asked about tax credits for energy efficiency in the past year and the percentage of their bids that had included a BETC if they qualified. Responses are shown in Table 4.20.



More than eight in ten respondents reported that they were aware of the BETC, the majority of whom knew that it applies to renewables and gas; these percentages did not differ significantly among respondent groups. However, respondents also reported that few customers had inquired about energy efficiency tax credits. Based on the reported percentages of qualifying bids that included a BETC, it appears that the vendors influence some customers to apply: while only 8 respondents (7%) said that all customers had asked about tax credits, 26 (28%) said that all qualifying bids included a BETC.

Table 4.20: Awareness / Interest in the BETC

AWARE OF THE BETC / LEVEL OF AWARENESS	MOST ACTIVE TRADE ALLIES (N = 20)	LEAST ACTIVE TRADE ALLIES (N = 34)	NON- PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
AWARENESS OF BETC TAX CREDITS (N = 113)					
Aware of the BETC	19	27	47	93	82.3%
Aware the BETC Applies to Renewables*	14	21	30	65	57.5%
Aware the BETC Applies to Gas*	14	21	23	58	51.3%
PERCENT OF CUSTOMERS THAT HAVE ASKED ABOUT TAX CREDITS FOR ENERGY EFFICIENCY (N = 113)					
None	7	5	19	31	27.4%
1% to 20%	9	15	26	50	44.2%
21% to 99%**	2	8	9	19	16.8%
All	2	5	1	8	7.1%
Don't Know / Refused	0	1	4	5	4.4%
PERCENT OF BIDS THAT INCLUDED A BETC IF QUALIFIED (N = 93)					
None	4	8	14	26	28.0%
1% to 20%	0	2	6	8	8.6%
21% to 99%*	4	8	8	20	21.5%
All	11	8	7	26	28.0%
Don't Know / Refused	0	1	12	13	14.0%

* We asked this question only of those respondents who said that they were familiar with the BETC. However, the percentage in the final column is based on the entire count.

** This row combines multiple response categories with low frequencies of responses. In general, the responses were distributed more-or-less evenly over those categories.



Groups differed in their reported likelihood of including a BETC in qualified bids. The most active trade allies were most likely to say that they always did so, while the nonparticipating vendors were least likely to say so. Conversely, the nonparticipating vendors more frequently said that none of their bids included a BETC or that they did not know how many did.

Of those who had not included a BETC in qualifying bids, 30 gave some reason why they had not. The most common reason (14 respondents) was that they had not had enough information or knowledge about the BETC. Six said that someone else, such as the customer or an engineer, does the application. Five indicated that the amount of the tax credit was not sufficient to justify the effort. Three said that customers were not interested. Two others cited miscellaneous reasons.

To provide additional information about the role of the BETC in their business, we asked the most active trade allies whether BETC or Energy Trust incentives had had more influence on their customers' decisions to install energy-efficient equipment. Just over half (11 of 20, 55%) said that the Energy Trust incentive had more influence and an additional six (30%) said that they had equal influence. The remaining three either said that the BETC had more influence, did not know, or did not respond. These responses are very similar to participants' own evaluations of the relative influence of the Energy Trust incentives and BETC (see *Participant Feedback*). Taken together, these results suggest that BETC has an influence on the decision to install energy-efficient equipment, but that the Energy Trust incentive usually has a greater influence.

Awareness/Interest in Renewable Energy

To gauge interest in renewable energy, we asked respondents about their interest in promoting and selling renewable energy products and services and the percent of customers that had asked about renewables. Responses are shown in Table 4.21.

Table 4.21: Awareness/Interest in Renewables

INTEREST / AWARENESS	MOST ACTIVE TA (N = 20)	LEAST ACTIVE TA (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
	RESPONDENTS	RESPONDENTS	RESPONDENTS	RESPONDENTS	PERCENT
INTEREST IN PROMOTING AND SELLING RENEWABLE ENERGY PRODUCTS AND SERVICES					
Already Doing It	3	11	23	37	32.7%
Planning to Do It Soon	7	18	0	25	22.1%
Interested, But Not Doing or Planning	3	1	18	22	19.5%
Not Interested	4	3	14	21	18.6%
Don't Know / Refused	3	1	4	8	7.0%
					Continued



INTEREST / AWARENESS	MOST ACTIVE TA (N = 20)	LEAST ACTIVE TA (N = 34)	NON-PARTICIPANT VENDOR (N = 59)	TOTAL (N = 113)	
AWARENESS OF INCENTIVES AND TAX CREDITS FOR RENEWABLES					
Aware	16	33	17	66	58.4%
Not Aware	4	1	42	47	41.6%
PERCENT OF CUSTOMERS THAT HAVE ASKED ABOUT RENEWABLES					
None	3	11	16	30	28.3%
1% to 20%	9	16	20	45	42.5%
21% to 99%*	2	6	7	15	14.2%
All	0	1	4	5	4.7%
Don't Know / Refused	0	0	11	11	10.4%

* This row combines multiple response categories with low frequencies of responses. In general, the responses were distributed more-or-less evenly over those categories.

About three-fourth of respondents expressed interest in selling renewables products and services, with about one-third saying that they already sell them. Interestingly, the least active trade allies were *more* likely than the other groups to say that they were interested in renewables and were more likely than the most active group to say that they were already doing it. To determine whether this was because of differences in the types of services they provide, we looked at responses to this question by service type (lighting only, mechanical only, both, or neither). There was no statistically significant relationship between service type and interest in renewables, so that could not explain the difference between the most active and least active trade allies.

The level of awareness of Energy Trust incentives for renewables did not quite match the vendor interest in selling them. Just less than 6 in 10 respondents said that they were aware that Energy Trust provided incentives for renewable energy, about the same proportion who said that they knew that the BETC applies to renewables. Nonparticipating vendors were less likely than were trade allies to report awareness of Energy Trust's renewables incentives.

While respondents were interested in selling renewables, they reported generally low levels of customer interest. Most said that less than one-fifth of their customers had asked about it in the past year.

Taken together, the findings regarding interest in and awareness of support for renewables indicate that customer demand falls well short of vendor interest. This suggests a need to investigate the barriers to greater demand for renewable energy in this sector and to develop strategies for overcoming those barriers.



To learn how Energy Trust can support vendors in promoting renewable energy, we asked what types of information or support they need about Energy Trust's renewable energy program. Fifty of the interviewees gave a total of 61 responses. The most frequent request was simply for general information about the program (20 respondents). Ten comments related specifically to incentives and seven to the need for other cost-related information (such as how to calculate savings). Nine would like to know more about the qualifying technologies and equipment. Two gave miscellaneous other responses and 13 said that they did not need any information or did not know what to ask for.

SATISFACTION

We asked the most active trade allies about their level of satisfaction on several program facets and their reasons for any dissatisfaction. Specifically, we asked how satisfied they were with the information they receive from Energy Trust about the program, the range of equipment for which incentives are available, the application process, their program contact, their ability to get answers to questions about the program, and the program overall. The satisfaction ratings are shown in Table 4.22.

Table 4.22: Program Satisfaction

PROGRAM COMPONENT	SATISFACTION RATING (N = 20) (1 = Not At All to 5 = Completely)					
	1	2	3	4	5	DON'T KNOW
Information Received	0	2	3	6	9	0
Range of Incented Equipment	0	1	3	9	5	2
Application Process	1	0	8	3	7	1
Program Contact	0	1	1	5	13	0
Ability to Get Answers	0	2	1	4	13	0
Program Overall	0	2	2	8	7	1

This table shows high levels of program satisfaction, particularly with the program contact and the ability to get answers about the program. The area of least satisfaction appears to be the application process. These ratings indicate a good relationship between the program staff and the trade allies that generate the greatest number of projects, which is consistent with the program's original theory.

Only four respondents stated reasons for dissatisfaction. One said that incentive calculations can be complex, making it difficult to put together a package telling the customer what to expect. One said that the program needed to include incentives for tubular daylighting systems and skylights, and that the incentives for LED need to be higher. One respondent's cause for



dissatisfaction was not knowing who the program contact was. Finally, one commented generally on not receiving enough program information.

We also asked what percent of their customers had contacted them with comments or concerns about their program participation. Eight of the 10 respondents mentioned a total of 19 types of comments. Seven mentioned general comments or inquiries, not generally complaints, related to program requirements or processes. Six indicated that customers ask about the progress of their incentive payment or complain about a delay in payment. Three said that participants had made comments about paperwork, including tax forms. Finally, one each referred to complaints about the BETC, questions about return on investment, and general program inquiries.

PROGRAM EFFECTS

Finally, we asked the most active trade allies what effects participation in the program had had on various aspects of their business. We asked about several indices of business success, specifically their number of customers, their ability to identify opportunities to improve the energy efficiency of equipment systems, the frequency with which they discuss energy-efficient options with customers when developing project plans, how often they include energy efficiency in their bids, and how often they include a BETC in their bids.

We asked respondents to rate the effect of program participation on each index on a scale of 1 to 5, where 1 was defined as “greatly decreased” (e.g., program participation had greatly decreased the number of customers), 3 was defined as “no change,” and 5 was defined as “greatly increased” (e.g., program participation had greatly increased the number of customers). The distribution of responses is shown in Table 4.23.

Table 4.23: Program Effect on Trade Ally Business

BUSINESS FACET	PROGRAM EFFECT (N = 20) (1 = Greatly Decreased 3 = No Change 5 = Greatly Increased)					
	1	2	3	4	5	DON'T KNOW
Number of Customers	0	0	5	7	6	2
Ability to Identify Opportunities	1	1	5	7	6	0
Frequency Discuss Energy Efficiency with Customer	1	0	4	5	10	0
Frequency Include Energy Efficiency In Bids	0	1	5	5	9	0
Frequency Including a BETC In Bids	1	1	6	5	7	0



The results in this table indicate that the program has had a significant impact on these trade allies. Fifteen of the 20 respondents said that they discuss energy efficiency more with customers, and 14 said that they include energy efficiency in their bids more often as a result of their program participation. Thirteen each said that program participation had increased their number of customers, as well as their ability to identify energy efficiency opportunities. Finally, 12 said that they include a BETC in bids more frequently because of the program's influence.

When we asked respondents if the program had had any other effects, two said that association with the program had given them more recognition with customers and one said that it had enabled their firm to expand geographically.

SUMMARY

The sample of trade allies and vendors offered a broad range of services and equipment, with some variability by group. The firms also were well distributed by size and types of buildings served. As summarized below, survey results indicated that the Existing Buildings program enjoys good awareness and influence, and underscored the important role that vendors play in educating customers about energy efficiency and the Energy Trust incentives. The program's reach into and influence through the general vendor market could be extended. Satisfaction with the program is generally high. Some suggested changes might increase the level of program activity among some vendors and trade allies.

Program Awareness and Influence

Results indicate that the program has had a strong impact on trade allies. Energy Trust projects represent a substantial portion of trade allies' business. Existing Buildings program contacts and other vendors or contractors are most often the initial source of program awareness. However, the Existing Buildings brand name has little awareness, even among the most active trade allies.

Participation in the program has been beneficial for most trade allies, increasing: their number of customers; their ability to identify energy efficiency opportunities; the amount they discuss energy efficiency with customers; and how often they include energy efficiency equipment and a BETC in their bids.

The program accounts for a portion of the nonparticipating vendors' work, although substantially less than for the trade allies. Other firms that work with Energy Trust have been a source of program awareness for nonparticipating vendors, although most recalled hearing little more than that Energy Trust provides incentives. There is thus room for significant additional program reach into the vendor market.

By contrast, the BETC does not exert a strong influence on decisions to implement energy efficiency. Moreover, customer interest in and awareness of financial support for renewables falls



well short of vendor interest, suggesting a need to investigate the barriers to greater demand for renewable energy in this sector and to develop strategies for overcoming them.

Vendor Marketing

Results indicate that most trade allies and vendors include energy efficiency in a large proportion of their bids. The fact that most respondents reported low levels of customer inquiries as to the program underscores the importance of having vendors proactively educate their customers about it.

Many customers of the most active trade allies already have decided on using energy-efficient equipment when they begin discussing a project with them; when this is not the case, the trade allies frequently convince the customers to change their minds. Nevertheless, perhaps one in seven customers are not interested in energy efficiency, even after discussing it with the vendor.

Most trade allies said that they usually or always know what equipment qualifies for Energy Trust incentives, include that equipment in their bids, and/or suggest that customers apply for an Energy Trust incentive. A smaller proportion of nonparticipating vendors said that they usually or always suggest the Energy Trust incentive. Part of the reason may be that they are less likely to know what qualifies, particularly the smaller firms among them.

One of the most common reasons for not bidding energy-efficient equipment or recommending the incentive was that non-efficient equipment was specified by the customer. This suggests that additional savings can be garnered if the general population of equipment vendors can be influenced to be more proactive in promoting energy efficiency when non-efficient equipment is specified. Another common reason for not bidding efficient equipment was that the vendor thought that the available energy-efficient equipment was not the best suited to the customer's needs. This indicates the importance of continually reviewing the list of qualifying measures and of soliciting the input of vendors and trade allies in that process.

Program Satisfaction and Desired Changes

Trade allies reported high levels of program satisfaction, particularly with the program contact and the ability to get answers about the program, indicating a good relationship between the program staff and the trade allies that generate the greatest number of projects, which is consistent with the program's original theory. The lowest level of satisfaction is with the application process.

A large proportion of trade allies suggested no changes to the program, consistent with the generally high level of satisfaction. The most frequently suggested changes were to increase the types of incented equipment, the most common one being LEDs. This is consistent with the fact that lighting was the most common type of non-incented energy-efficient equipment sold.



Other frequently suggested changes were to provide tools for calculating savings, offer more training, and increase the distribution of program informational materials – both firm-specific information for the vendors and general information for customers.

Consistent with the suggestion that the program increase the distribution of its collateral, a large majority of nonparticipating vendors said they would be interested in receiving information about Energy Trust programs – again, firm-specific information for the vendors and general information for customers. In addition, to help them promote renewable energy, vendors and trade allies would like general information on the renewables program, as well as on incentives, other cost-related issues, and the qualifying technologies and equipment.

The strongly preferred method of receiving information, for the nonparticipants as well as the trade allies, was by email. The nonparticipants also were likely to indicate postal mail as a preferred method of delivery, most likely related to the desire for printed information to share with customers.

The web is not a preferred method for getting program information for most respondents, but it is frequently used by a significant group of vendors, more so for trade allies. Therefore, continued efforts to maintain and improve the website are suggested, as well as exploring ways to make the website more accessible to those who do not prefer to use it.

Increasing Program Activity Levels

Most nonparticipating vendors and less-active trade allies indicated that they likely would increase their program activity if their requested changes were made. Probably the easiest way to achieve this would be to increase the production and distribution of program informational materials, including those discussing particular types of equipment to be targeted to specific vendor categories, as well as general materials to offer customers.

The program also should continue to review the list of incented equipment for possible additions and/or changes to incentive levels – in particular, increasing the acceptance criteria and incentives for LEDs.

In addition, the program should develop and distribute a broader range of tools for calculating energy savings, incentives, net costs, and tax credits. These tools should include simple charts or tables for use with relatively straightforward project types, as well as spreadsheet-based tools for use with more complex, custom projects.





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5

PARTICIPANT FEEDBACK

This chapter provides information derived from telephone interviews and site visits with participants in the Existing Buildings program whose lighting and mechanical projects were completed during 2006 and 2007. In addition to individuals who received incentives to carry out the usual range of projects, these participants included a group within the food service sector who received free installation of energy-efficient pre-rinse sprayers. As described elsewhere, Energy Trust installed pre-rinse sprayers at no cost at restaurants and other establishments where food is prepared to demonstrate the value of installing energy efficiency measures.

Interview questions addressed: level of familiarity with Energy Trust and the Existing Buildings program; familiarity with and use of the Oregon Business Efficiency Tax Credit (BETC); previous and ongoing experience and satisfaction with the Existing Buildings program, including the program contact; and project decision-making, especially the likelihood that projects would have taken place without the program's help. The survey instruments used to interview sprayer recipients and to interview site visit participants differ somewhat from that used for the other participants; all three instruments are included in Appendix B.

As well as providing feedback on program processes, information gathered from these interviews was also analyzed and used to estimate free-ridership and net program impacts (*Section 7, Impact Analysis*, provides the impact evaluation methodology and results).

DEFINITION OF SURVEY FRAME AND LIST DEVELOPMENT

The survey population consisted of all 2006 and 2007 participants, except those that only had studies performed. From this population, we created several survey frames. The first division of the population was by program year. Within each program year, the population was further divided. First, all those participants that were identified for a possible site visit comprised one survey frame. Those participants who were not identified for a possible site visit were divided into two groups: 1) food service businesses that received pre-rinse sprayers; and 2) all others. The latter group was divided into those with large (>16,000 kWh or therm equivalent) projects and those with small (16,000 or fewer kWh or therm equivalent) projects.

Thus, within each program year, we identified the following four frames:

- ➔ Potential site visit recipients
- ➔ Pre-rinse sprayer recipients (no site visit)
- ➔ Participants with large projects (non-sprayer, no site visit)



➔ Participants with small projects (non-sprayer, no site visit)

Table 5.1 shows the number of unique participants that we identified within each of these sample frames, as well as the desired number of completions – i.e., the desired final sample size. Within each program year, our goal was to achieve 15 telephone survey completions in the “large” and “small” non-sprayer project frames.

Table 5.1: Sample Frames and Desired Sample Size by Program Year

SURVEY MODE		2006		2007		TOTAL	
		FRAME	SAMPLE	FRAME	SAMPLE	FRAME	SAMPLE
Site Visit		135	– *	166	– *	301	– *
Telephone	Sprayer	1,196	15	861	15	2,057	30
	Non-Sprayer	281	30	436	30	717	60
	Subtotal	1,477	45	1,297	45	2,774	90
TOTAL				1,463		3,075	

* We did not establish a set sample size for this frame. The goal was to complete the survey with as many site visit participants as possible.

The method used to identify those participants selected for potential site visits is explained in *Section 7, Impact Analysis*). For each program year, we divided the remaining participants into the frames described above and eliminated duplicate records within each frame. We then randomized the order of each frame and selected a sample equal to approximately three times the desired number of completions.

SAMPLE DISPOSITIONS

Table 5.2 shows the final dispositions of all contact attempts for the 2006 and 2007 participant surveys. As can be seen, we exceeded the quota for telephone completions for both the 2006 and 2007 program years. This is because our callers were unable to reach many participants in the early part of the calling period but left many voice mail messages. In the last day of the calling period, they were able to complete a large number of interviews with people with whom they had left voice mail messages earlier. Therefore, we allowed the callers to exceed the quotas, as this minimized the non-response bias at very little additional cost.



Table 5.2: Final Dispositions for 2006 and 2007 Telephone Samples

OUTCOME		2006		2007	
		DISPOSITION	PERCENT	DISPOSITION	PERCENT
ELIGIBLE					
Complete	Complete	58	43.6%	54	36.2%
	Partial	2	1.5%	4	2.7%
Contacted	Not Completed	9	6.8%	8	5.4%
	Refused	10	7.5%	5	3.4%
Not Contacted-Quota Met		54	40.6%	78	52.3%
<i>Subtotal</i>		133	100.0%	149	100.0%
EXCLUDED CONTACT OR NON-ELIGIBLE					
Duplicates		14	8.3%	1	0.5%
Missing Information		0	0.0%	0	0.0%
Business Or Contact No Longer Available		4	2.4%	1	0.5%
Bad Or Wrong Number		12	7.1%	4	2.2%
Not Eligible		6	3.6%	12	6.5%
Subsample Quota Met		0	0.0%	17	9.2%
<i>Subtotal</i>		36	21.3%	35	19.0%
TOTAL		169	100.0%	184	100.0%

The numbers of completions is broken down by sample frame in Table 5.3. As this shows, the quotas for all telephone frames were exceeded. With the addition of the process data collected during site visits, this provided a final sample large enough to yield good precision and confidence even when subdivided by size of project or program year.

Table 5.3: Number of Survey Completions by Sample Frame

SURVEY MODE		2006			2007			TOTAL		
		LARGE	SMALL	TOTAL	LARGE	SMALL	TOTAL	LARGE	SMALL	TOTAL
On-Site (Non-Sprayer)		48	0	48	42	0	42	90	0	90
Telephone	Sprayer	–	–	21	–	–	29	–	–	50
	Non-Sprayer	19	18	37	18	17	35	37	35	72
	<i>Subtotal</i>	19	18	58	18	17	64	37	35	122
ALL NON-SPRAYER		67	18	85	60	17	77	127	35	162



DATA ANALYSES

Most survey questions were close-ended; responses were treated as categorical variables. Some questions elicited open-ended comment; the responses to these were transcribed verbatim and later the content was analyzed to shed additional light on responses to the close-ended questions.

We used chi-square to examine the relationship between each categorical variable and participant type (sprayer vs. non-sprayer), program year (2006 vs. 2007), and project size (large vs. small). Only statistically significant relationships are reported. However, most tables show the results for both sprayer and non-sprayer participants, even if the difference in the frequency distribution of responses was not statistically significant. In such cases, we describe the combined results in the text.

Both Type I and Type II errors had to be considered in determining how to report relationships between survey responses and participant type, program year, and project size. Type I error – a false positive – is a risk when a large number of statistical tests are performed, as in the present case. In such a case, there is a chance that a statistically significant result can occur by chance. This would argue for establishing a very strict criterion for significance (e.g., .001 rather than the standard .05).

On the other hand, it is important to know whether something like project size might have an important impact on program results; therefore, it is important to avoid Type II error – a false negative. In consideration of both these issues, we have decided to report results that meet the minimal criterion of .05, but to weigh other considerations – size of effect, consistency of similar results, and so forth – in our interpretation of them.

SAMPLE CHARACTERISTICS

From the 122 persons surveyed entirely by phone, we collected information on the type of building where their measure was installed, whether the company owns or leases the building, the company's number of facilities in Oregon, and the interviewee's role in the company. To facilitate conduct of site visits, we did not attempt to collect this information from those companies that we visited. We were able to recover building-type information from the Energy Trust participant database; however, we were not able to recover information on ownership, number of facilities, or the interviewee role.



Building Use

Not surprisingly, we found that the distribution of building usage types differed significantly for sprayer recipients vs. other participants.²³ By far, the most common building use for the former was a restaurant; K-12 schools ran a distant second, with only three mentions (Table 5.4). By contrast, of the non-sprayer participants who provided building-type data, the most common use type was office, followed closely by retail and manufacturing, then grocery stores, including large convenience stores. All other building use types were each mentioned by fewer than 5% of the sample.

Table 5.4: Building Use

BUILDING TYPE	SPRAYER (N = 41)		NON-SPRAYER (N = 151)		TOTAL (N=192)	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Restaurant	36	87.8%	2	1.3%	38	19.8%
Office	0	0.0%	35	23.2%	35	18.2%
Institution / Government	0	0.0%	18	11.9%	18	9.4%
Retail	1	2.4%	14	9.3%	15	7.8%
Manufacturing	0	0.0%	15	9.9%	15	7.8%
Grocery	1	2.4%	10	6.6%	11	5.7%
Warehouse	0	0.0%	9	6.0%	9	4.7%
Hospital / Health Care	0	0.0%	9	6.0%	9	4.7%
College / University	0	0.0%	8	5.3%	8	4.2%
School K-12	3	7.3%	5	3.3%	8	4.2%
Church	0	0.0%	8	5.3%	8	4.2%
Other	0	0.0%	18	11.9%	18	9.4%
TOTAL	41	100.0%	151	100.0%	192	100.0%

Building Ownership

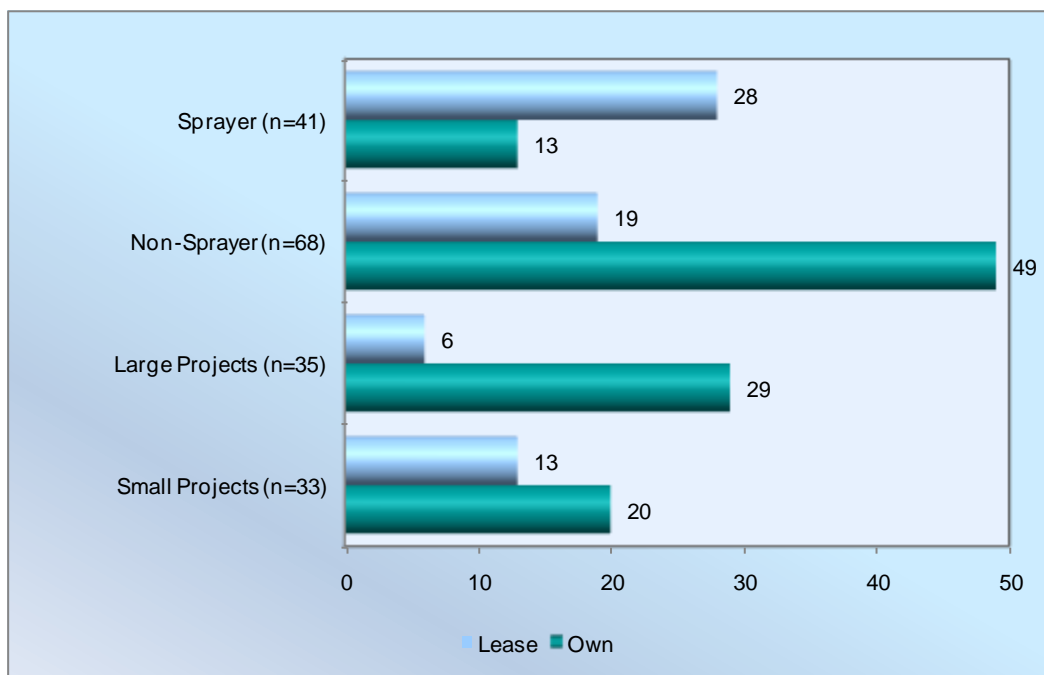
Overall, 57% of participants reported that their company owned the building. This differed by type of participant. As illustrated in Figure 5.1, about three in ten sprayer participants said that

²³ Because of the large number of building type categories with low numbers, we constructed a new variable that collapsed the building types into fewer levels, which we used in the chi-square analysis. This variable had six categories: 1) Office; 2) Retail and Grocery; 3) Manufacturing, Warehouse, and machine/service shops (previously coded as "other"); 4) Institution/Government, Hospital/Other Health Care, College/University; 5) Restaurant; and 6) Other.



their company owned the building, compared to more than seven in ten non-sprayer participants surveyed by phone (i.e., excluding the site visit participants). Building ownership also was related to project size among non-sprayer participants: more than eight in ten of those with large projects owned the building, compared to about six in ten of those with small projects. Building ownership was not related to program year.

Figure 5.1: Building Ownership



Given that those who received site visits generally represented larger projects than those surveyed by telephone, it is likely that the percentage of building ownership is even higher among non-sprayer participants than was found in our telephone survey. Assuming that the data collected from the telephone and site visit surveys were representative of their respective frames and adjusting for the size of the respective frames, we can estimate that approximately 75% of all non-sprayer participants owned the building where the measure was installed.²⁴

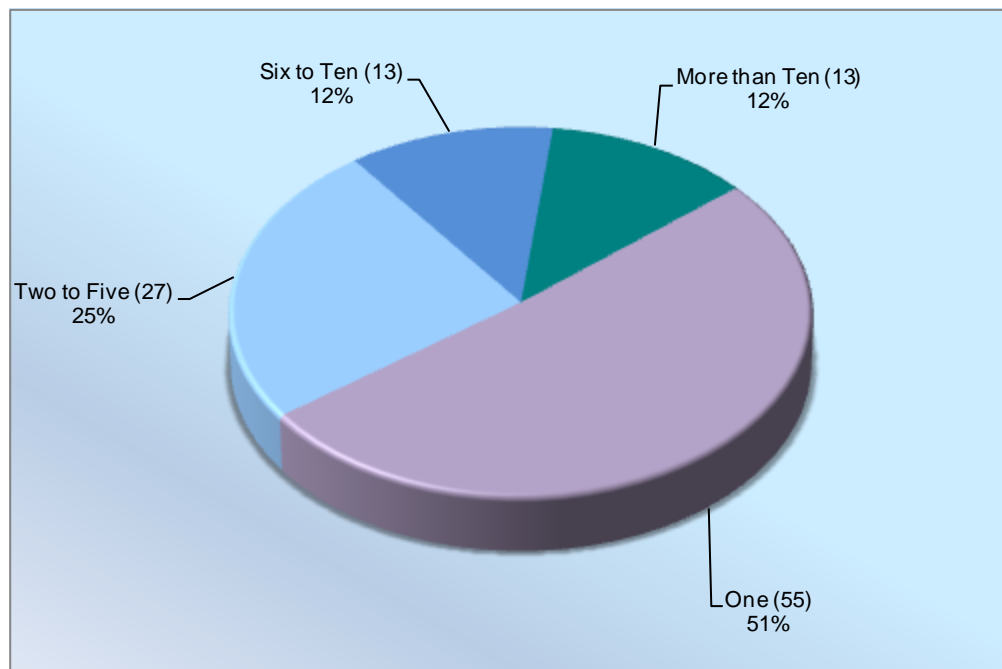
²⁴ If A = the proportion of all non-sprayer participants that own the building, the telephone sample frame for non-sprayer participants = 717, and the site visit frame = 301 (see Table 5.4), then $A = ((.721 * 717) + (.829 * 301)) / (717 + 301) = .753$.



Number of Facilities in Oregon

The sample was about evenly split between those that have facilities in more than one Oregon location and those that do not (Figure 5.2). This did not differ by participant type or program year. However, those with large projects were more likely than those with small projects to have facilities in multiple locations.²⁵ Of those who reported that their company owned more than one facility in Oregon, most said that it owned two to five; about one-quarter of respondents reported more than five locations.

Figure 5.2: Number of Locations in Oregon



Respondent's Role in the Organization

As Table 5.5 shows, the most common type of respondent was the company owner or top corporate officer (such as CEO, COO, or other financial officer), followed by facility managers and other corporate officers or directors. However, the interviewee's role in the company also was related to participant type. We were more likely to speak with the owner or top officer when

²⁵ Comparisons by project size consider only non-sprayer participants to avoid confounding project size by participant type, as projects for non-sprayer participants generally resulted in higher savings and a wider range of savings than those for sprayer recipients.



the participant was a sprayer recipient (generally a restaurant, and generally the owner) than with other participants. By contrast, we were more likely to speak with someone at a facility management level with non-sprayer participants than sprayer recipients.

Table 5.5: Respondent's Role in Organization

ROLE	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Owner / Top Corporate Officer	23	56.1%	34	48.6%	57	51.3%
Manager / Facility Manager	6	14.6%	19	27.1%	25	22.5%
Other Corporate Officer, Director	7	17.1%	7	10.0%	14	12.6%
Engineering / Maintenance	1	2.4%	5	7.1%	6	5.4%
Other	4	9.8%	5	7.1%	9	8.1%
TOTAL	41	100.0%	70	100.0%	111	100.0%

The interviewee's role also was related to project size among non-sprayer participants: when contacting those with large projects, we were slightly less likely to speak with an owner or top officer and somewhat more likely to speak with a lower officer or director, or someone in engineering or maintenance. The interviewee's role was not related to program year.

Prior Participation in Energy Trust Programs

We asked survey respondents if their company had previously participated in the Existing Buildings program. Sixty respondents (28%) identified themselves as past participants. Only one of those was a recipient of a free pre-rinse sprayer. Excluding the sprayer recipients, the 59 past participants made up 36% of the sample.

We attempted to verify the self-identification by matching the site identification field for each respondent with all records from previous program years in the Energy Trust *FastTrack* database. We found that only 47 (22%) of respondent records matched records of prior participation.

It is possible that some or all of the above discrepancy resulted from the fact that some businesses with multiple locations (e.g., large restaurant or retail chains) had participated multiple times, with different site identification numbers for various locations. If a respondent reported previous participation because of an earlier project at a different location, then that would have been counted in the self-report of prior participation but not necessarily in the analysis of previous database records.



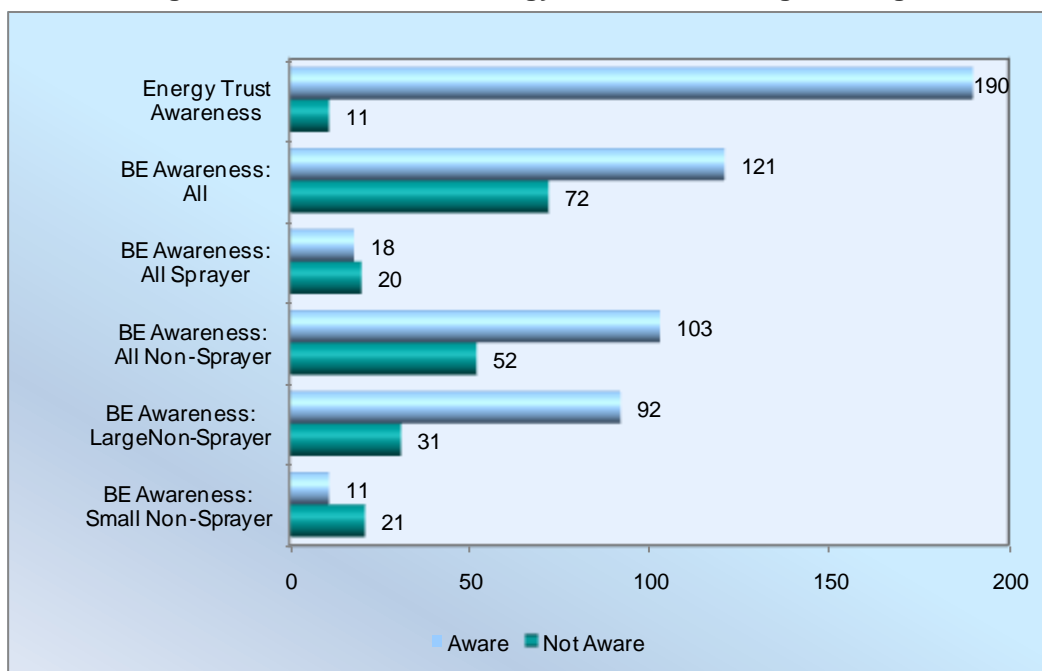
AWARENESS OF ENERGY TRUST

To understand the extent to which the Energy Trust and Existing Buildings “brands” are reaching the market, we asked participants whether they were aware that it was Energy Trust that had provided the incentive that they had received and that the program was called Existing Buildings. We also asked respondents how long they had been aware of the program, how they first learned about it, and who persuaded them to participate in the program.

Level of Brand Awareness

Awareness of the Energy Trust brand was high: more than 90% of participants reported that they knew that it was the source of the incentive (Figure 5.3). Of the eleven participants who had not known who provided the incentive, five thought that it had been a utility program, four said that they were not sure, and two mentioned other sources.

Figure 5.3: Awareness of Energy Trust and Existing Buildings



Awareness of the Existing Buildings brand was somewhat lower: just over six in ten respondents said they knew the program by that name. The percentage was much higher for non-sprayer than sprayer recipients (about 66% vs. 47%). It also was higher for non-sprayer participants with large versus small projects (75% vs. 39%).

The lower level of awareness of the Existing Buildings name among sprayer recipients is somewhat a cause for concern, as one of the primary purposes of the sprayer install program was



to induce recipients to work with Energy Trust on future energy efficiency upgrades. However, given the fact that the sprayer recipients had less overall exposure to the program than non-sprayer participants (see below), it is not surprising that their awareness of the Existing Buildings name was lower. Moreover, there was no difference between sprayer and non-sprayer participants in awareness of Energy Trust.

Duration of Awareness

Regardless of the name by which they knew it, most respondents said that they had been aware of the program for at least two years, about a quarter of them for five years or more (Table 5.6). Duration of awareness was strongly related to participant type: two-thirds of non-sprayer participants had been aware of the program at least two years, compared to about one in five sprayer recipients. The fact that most sprayer recipients had not been aware of the Existing Buildings program for long is consistent with the purpose of distributing the sprayers: to increase awareness of the opportunities to save energy. It seems less likely that it would achieve that purpose if the sprayers were distributed to recipients who had long been aware of the program.

Table 5.6: Duration of Awareness

DURATION	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Less than Two Years	29	78.4%	44	32.4%	73	42.2%
Two to Four Years	8	21.6%	48	35.3%	56	32.4%
Five or More Years	0	0.0%	44	32.4%	44	25.4%
TOTAL	37	100.0%	136	100.0%	173	100.0%

Among non-sprayer recipients, those with large projects were more likely to say that they had known about the program five or more years (38% vs. 13%) and less likely to say less than two years (27% vs. 52%) than those with small projects. (This relationship is explored more fully in *Section 8, Market Penetration.*)

Source of Program Awareness

As Table 5.7 shows, contractors were the most frequently cited source of program awareness across all participants, with Energy Trust itself or a program representative a distant second.



Table 5.7: Source of Program Awareness

SOURCE	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Contractor	3	8.3%	52	37.4%	55	31.4%
Energy Trust / Program Representative	17	47.2%	17	12.2%	34	19.4%
Utility	3	8.3%	28	20.1%	31	17.7%
Coworker / Colleague	3	8.3%	22	15.8%	25	14.3%
Industry Association	6	16.7%	5	3.6%	11	6.3%
Other	1	2.4%	16	10.1%	17	8.5%
Don't Know / Unspecified	9	21.4%	19	11.9%	28	13.9%
TOTAL	42	100.0%	159	100.0%	201	100.0%

For the specific groups, however, source of awareness was strongly related to participant type. Nearly half of sprayer recipients said that Energy Trust or a program representative was their source of information, compared to about one-eighth of the other participants. The high percentage of sprayer recipients who cited Energy Trust or a program representative again shows that the pre-rinse sprayer program largely fulfilled its function of expanding awareness of energy efficiency opportunities within the food service sector.

For the non-sprayer participants, contractors and utilities are the most common source of information about the program.

Persuasive Influence

To gain a sense of the source of the push for program participation, we asked respondents who had persuaded them that participation would be a good idea. We noted that we understood that the decision to participate ultimately was made within the company, but we wanted to know what their outside chief influence was.

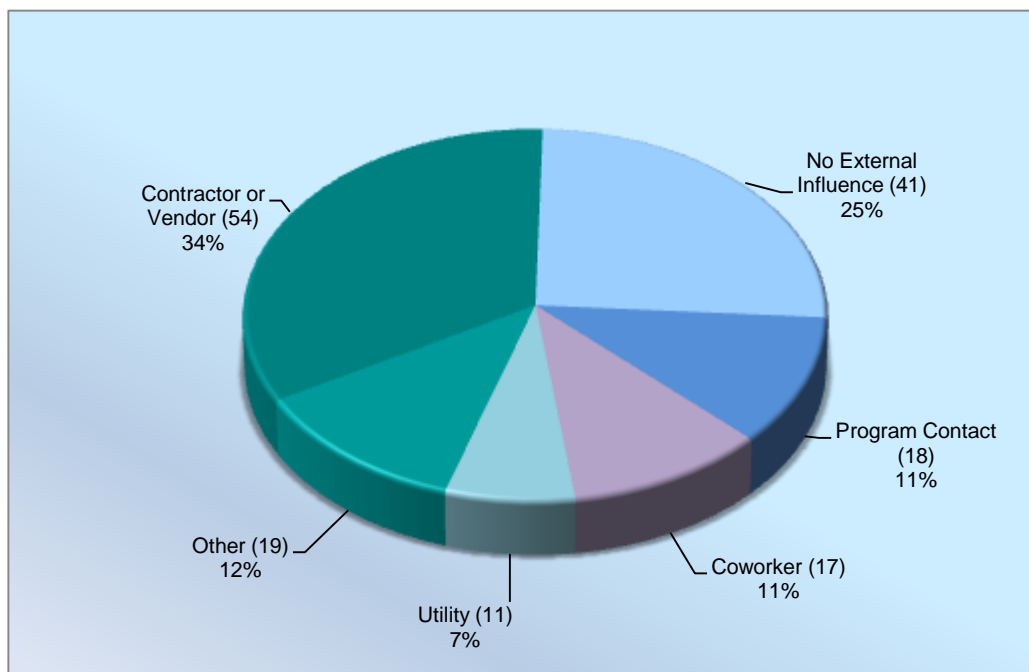
Since sprayer recipients received a free direct install of new equipment, the question of persuasion was less important for them. Therefore, we asked this question only of non-sprayer participants.

As Figure 5.4 shows, about one-third of respondents said that a contractor or vendor was their primary influence. The second most common response was that there was no external influence – that the decision originated and was finalized by the primary decision-maker. Approximately equal numbers mentioned a program representative or a coworker within the company, and slightly fewer cited a utility representative. These findings are consistent with those concerning the source of program awareness, except that utilities were mentioned proportionally less as an



influence. They support the key role of contractors and vendors in promoting the Existing Buildings program.

Figure 5.4: Primary External Influence for Program Participation



DECISION-MAKING

The bulk of the survey was devoted to learning how companies decided whether or not to undertake energy efficiency projects and to apply for an Energy Trust incentive. We asked about the influence of a variety of factors: their program contact, past program experience, desired project outcomes, the incentive itself, and so forth. We also asked about company policies and the relative importance of the Existing Buildings program and the BETC.

Reasons for Installing the Equipment

We asked respondents their reasons for installing equipment.²⁶ After recording their responses, we asked which of those things that they had mentioned was the most important. Most were able

²⁶ Responses of sprayer recipients to a similar question are described in a separate subsection, below.



to identify a single most important reason; however, nine respondents each selected two and three most important reasons.

As Table 5.8 shows, the most commonly identified reason for installing the equipment was to save energy costs – more than eight in ten respondents endorsed this item. This also was the most frequently cited as the most important reason for the installation. Other frequently identified reasons were improving equipment reliability, receiving the Energy Trust incentive, and improving comfort or other aspects of the work environment – each of these was endorsed by around six in ten respondents. The incentive and improvement of the work environment were the second and third most frequently cited as the most important reason.

The fact that participants were motivated most strongly by energy cost savings in their purchase of energy-efficient equipment should almost be taken as a given, since this is a major focus of program marketing. The other frequently cited reasons are more meaningful. The high ranking of the Energy Trust incentive supports the value of the program in inducing energy-efficient equipment purchases. Also noteworthy is the fact that the same equipment is seen as delivering energy savings, as well as increased comfort, an improved work environment, and greater reliability. This suggests that mentioning non-energy benefits, such as improved comfort, is meaningful to businesses.

Several additional findings stand out from this table. One is that the recommendation of a contractor or a technical study each was a reason for about one-third of the installations. While these were rarely cited as the most important reason, they may be important in helping “close the deal” in many cases. This points to the value of these program components. The program representative’s recommendation had far less influence, which would be consistent with the program intention to have contractors be the primary marketing agents.

Another interesting finding is that about four in ten respondents said they installed the equipment they did partly because energy efficiency was a common feature for that particular application – for about three-quarters of those, lighting was the principle measure type installed – by contrast, however, very few said that this was the most important reason. In retrospect, this makes perfect sense: if energy efficiency is a common feature of some application, it is likely that any equipment selected for that application will be energy-efficient; however, that is not the real reason driving the purchase of that specific equipment.

One final observation is that few respondents cited concern about global climate change as a reason for equipment purchase, and no one said that it was the most important reason (although one cited “environmental responsibility” as the most important reason).



Table 5.8: Reasons for Installing Incentivized Equipment (Multiple Responses Allowed)

REASON	A REASON (N=162, Except As Noted)		MOST IMPORTANT (N=162, Except As Noted)	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Energy Cost Savings	132	81.5%	71	43.8%
Improved Reliability (n=72)*	45	62.5%	0	0.0%
Energy Trust Incentive	101	62.3%	25	15.4%
Improved Comfort/Work Environment	92	56.8%	24	14.4%
Efficiency Is Standard For Application	67	41.4%	4	2.5%
Replace Failed Equipment	65	40.1%	18	11.1%
Non-Energy Cost Savings	65	40.1%	9	5.6%
Improved Work Efficiency	59	36.4%	4	2.5%
Contractor Recommended	57	35.2%	3	1.9%
Technical Study Recommended	52	32.1%	6	3.7%
Corporate Policy	42	25.9%	6	3.7%
Safety	26	16.0%	5	3.1%
Program Representative Recommended	23	14.2%	1	0.6%
Concern About Global Climate Change (n=90)**	9	10.0%	0	0.0%
Code or Regulations	10	6.2%	0	0.0%
Other	14	8.6%	4***	2.5%
Don't Know	1	0.6%	1	0.6%

* Not asked at site visits.

** Added to site visit survey after completion of telephone surveys.

***Environmental responsibility (1), keep staff happy (1), LEED certification (1), not specified (1).

Influence of Current Program Components

We asked a variety of questions designed to elicit a more detailed understanding of the influence of various program components on the decision to undertake the energy efficiency project. To ascertain the importance of the program representative's facilitation, we asked respondents how likely it was that they would have done the project if the program representative had not facilitated it. We also asked them to rate the influence of the technical study (if they had one) and the Existing Buildings incentive. The responses to these questions are shown in Table 5.9.



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Table 5.9: Likelihood of Doing the Project if the Program Representative Had Not Facilitated

LIKELIHOOD	RESPONDENTS	PERCENT
Definitely Would	19	12.7%
Probably Would	23	15.3%
Not Sure	17	11.3%
Probably Not	32	21.3%
Definitely Not	13	8.7%
No Reply	46	30.7%
Total	150	100.0%

As Table 5.10 shows, about three in ten respondents reported that they had no program representative – for these participants, there is no question of influence. About another one-quarter said that they “definitely” or “probably” would have done the project without facilitation by the program representative. Thus, the program representative had little or no influence in about six in ten projects. This is consistent with other findings of this survey that program representatives were not frequently cited as the source of program awareness, a persuasive influence, or a reason for purchasing the incentivized equipment.

Table 5.10: Influence of Technical Study and Incentive on Program Participation

LEVEL OF INFLUENCE	PROGRAM COMPONENT			
	TECHNICAL STUDY		EXISTING BUILDINGS INCENTIVE	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
1 = No Influence	16	10.6%	16	10.1%
2	0	0.0%	0	0.0%
3	20	13.2%	29	18.4%
4	52	34.4%	49	31.0%
5 = Critical Influence	28	18.5%	64	40.5%
NA*	35	23.2%	0	0.0%
Total	151	100.0%	158	100.0%

* In the case of *Technical Study*, this was respondents who did not have a technical study; this column does not apply to the Existing Buildings initiative.

We found a large influence of program year on responses to this item. A much higher percentage of Year 2006 participants said that they probably or definitely *would not* have done the project without the representative’s influence (42% vs. 15%); conversely, a much smaller percentage



said that they probably or definitely *would* have done the project (14% vs. 41%). Program year was not related to those other indices of the program representative's impact cited above.

The influence of the technical study, incentive, and past program participation were rated on a 1 to 5 scale, where 1 was defined as “no influence,” 5 was defined as “critical influence,” and the midpoints were undefined (but represented ordinal levels between the end points). In contrast to the influence of the program representative, the Existing Buildings incentive was reported to have a strong influence on more than seven in ten respondents and the technical study had a similar level of influence on over half. These levels of influence are consistent with the frequency with which participants cited these program components as reasons for purchasing the equipment.

Year 2006 participants were more likely than those from Year 2007 to cite the technical study as a reason for installing the equipment (40% vs. 23%). They also were more likely to say that they installed energy-efficient equipment because efficiency features were a common practice for that application (49% vs. 32%). Moreover, all 10 of the participants who cited codes or regulations were from the 2006 program year.

Influence of Past Program Participation

We asked those respondents who previously had participated in Existing Buildings or another Energy Trust program to rate the influence of those experiences on their decision to participate this time. We used the same 1 to 5 scale that we used to rate the technical study and incentive. The distributions of responses are shown in Table 5.11.

Table 5.11: Influence of Past Participation

LEVEL OF INFLUENCE	TYPE OF PAST PARTICIPATION			
	EXISTING BUILDINGS		ANOTHER ENERGY TRUST PROGRAM	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
1 = No Influence	1	1.9%	0	0.0%
2	1	1.9%	0	0.0%
3	10	19.2%	0	0.0%
4	26	50.0%	10	55.6%
5 = Critical Influence	10	19.2%	7	38.9%
Don't Know	4	7.7%	1	5.6%
Total	52	100.0%	18	100.0%



As Table 5.11 shows, these respondents largely considered their previous program involvement to have been a significant factor in their current participation, pointing to the importance of a positive program experience.

Influence of Program on Purchase of Non-Incented Equipment

After identifying what equipment they had purchased in the past two years, we asked whether the equipment was energy-efficient and, if so, whether they had received an incentive for it. For any energy efficiency equipment purchased in the past two years for which they had not received an incentive, we asked them to rate the influence of participation in Existing Buildings on the decision to purchase the equipment. We asked them to respond on a scale of 1 to 5, where 1 was defined as “low influence” and 5 was defined as “high influence.”

Participation in Existing Buildings was considered to have had a moderately high to high influence (4 or 5 out of 5) for about two-thirds of the 68 projects described. This rated level of influence was consistent across most of the project types. These findings suggest that participation in Existing Buildings influences additional energy efficiency investment outside the program. Additional details are provided in Appendix A.

Corporate Policy

To understand the degree to which concern about energy efficiency is becoming formalized in corporate management practices, we asked participants which of a list of energy-related policies and procedures their company had in place.

The most common practice identified was informal management of energy costs through such behavior as turning off lights and turning down heat. More than eight in ten (101 of 122) respondents indicated that their company did this.²⁷

Table 5.12 shows the number and percentage of sprayer and non-sprayer participants who reported any of several more formally defined energy management practices. Nearly six in ten respondents reported one or more of the formal policies. The most common policy was assigning a staff member responsibility for energy and energy efficiency, followed by a policy of incorporating energy efficiency into operations and procurement. Written policies are less common: about one-fifth said that their company had a written sustainability policy and even fewer reported either a written energy management plan or numerical energy savings goals.

²⁷ We did not ask site visit participants about informal energy management. Therefore, the non-sprayer sample size for this question was 72 and the total sample size was 122.



Table 5.12: Corporate Energy-Related Policies

POLICY	SPRAYER (N=50)		NON-SPRAYER (N=162)		TOTAL (N = 212)	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Any Formal Policy	22	44.0%	99	61.1%	121	57.1%
Staff Member Responsible	19	38.0%	68	42.0%	87	41.0%
Operations and Procurement Policies	13	26.0%	48	29.6%	61	28.8%
Written Sustainability Policy	4	8.0%	41	25.3%	45	21.2%
Written Energy Management Plan	5	10.0%	22	13.6%	27	12.7%
Numerical Energy Savings Goals	4	8.0%	19	11.7%	23	10.8%
Other	0	0.0%	10	6.2%	10	4.7%

The above findings are consistent with responses given by nonparticipants, although a somewhat higher percentage of participants reported corporate operations and procurement policies or had a written sustainability policy. (More details are presented in *Nonparticipant Feedback*.)

In addition to the above, 10 participants (all non-sprayer) reported some other policy or activity that did not fit into one of the above categories. Two respondents said that they were trying to automate their facilities to allow remote access and control of energy use, and one each reported a policy of adopting a monthly upgrades budget, standardizing equipment, limiting projects to those with paybacks of less than five years, trying to get all buildings ENERGY STAR[®]-rated, and trying to get all buildings LEED certified. Three participants provided non-specific responses (e.g., “City of ___ looks to its facilities to reduce consumption on a city-wide level”).

Non-sprayer participants were more likely than sprayer recipients to have any formal policy. We also found that participants with large projects were more likely than were those with small projects to have an energy efficiency policy relating to operations and procurement.

In addition to asking about specific policies, we asked telephone respondents how convinced they were that global climate change is occurring and whether the issue of global climate change in any way affected the way they operated their facility.²⁸ Table 5.13 shows the distributions of responses to these questions.

²⁸ To reduce the burden on site visit participants, we did not ask them about this issue.



Table 5.13: Global Climate Change Opinions

POLICY	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
ACCEPTANCE OF GLOBAL CLIMATE CHANGE						
Completely Convinced	18	43.9%	29	41.4%	47	42.3%
Mostly Convinced	15	36.6%	14	20.0%	29	26.1%
Not So Convinced	5	12.2%	20	28.6%	25	22.5%
Not At All Convinced	3	7.3%	7	10.0%	10	9.0%
TOTAL	41	100.0%	70	100.0%	111	100.0%
AFFECT OF GLOBAL CLIMATE CHANGE ON FACILITY OPERATION						
Affected Facility Operation	18	43.9%	27	38.0%	45	40.2%
No Affect On Operation	22	53.7%	39	54.9%	61	54.5%
Don't Know/Not Sure	1	2.4%	5	7.0%	6	5.4%
TOTAL	41	100.0%	71	100.0%	112	100.0%

Just over two-thirds of respondents said that they were either completely or mostly convinced of the reality of global climate change. This percentage is slightly lower than that reported in a recent national study²⁹ and what we found in a recent household survey conducted for Energy Trust, but almost exactly what we found in our survey of program nonparticipants.

Although two-thirds of respondents were mostly or completely convinced of global climate change, fewer – about four in ten – said that the issue of global climate change had affected facility operations. This is a somewhat higher proportion than we found in our nonparticipant survey.

As would be expected, the percentage of respondents reporting that global climate change had affected facility operations was much higher among those who were completely convinced that global climate change is occurring (about 60%) than those who were mostly convinced (about 40%), which was greater than those who were not so convinced (about 16%) or not at all convinced (none).

We found a non-significant trend for level of acceptance of global climate change to be related to the likelihood of reporting at least one of the corporate policies shown in Table 5.12, but it was

²⁹ A. Leiserowitz, "American Opinions on Global Warming," A Yale University / Gallup / ClearVision Institute Poll. Accessed by Internet October 23, 2008, URL: <http://www.populationmedia.org/wp-content/uploads/2008/01/americansglobalwarmingreport.pdf>.



not related to endorsement of any specific policy. Finally, as noted previously, global climate change was cited by few respondents as a reason for undertaking the current project. Thus, while there is a perception among participants that concern over global climate change is related to company behavior, we did not find evidence that it was related to any specific policies or activities.

Past Partial Participation

One question of interest is why companies sometimes start a project with Existing Buildings but later discontinue the project or their participation in the program. We asked all respondents whether they had ever done this. Only 10 respondents reported that they had done so. Those 10 discontinued participations were spread fairly evenly over the program's existence. When we asked the reason for discontinuation, two said that incentives were not available at that time and one said that the incentive level was too low; two cited internal company reasons unrelated to the program; and one each mentioned concern about up-front financing, a planned tear-down that would have affected the installation, and weather-related complications. One respondent said that he did not know the reason.

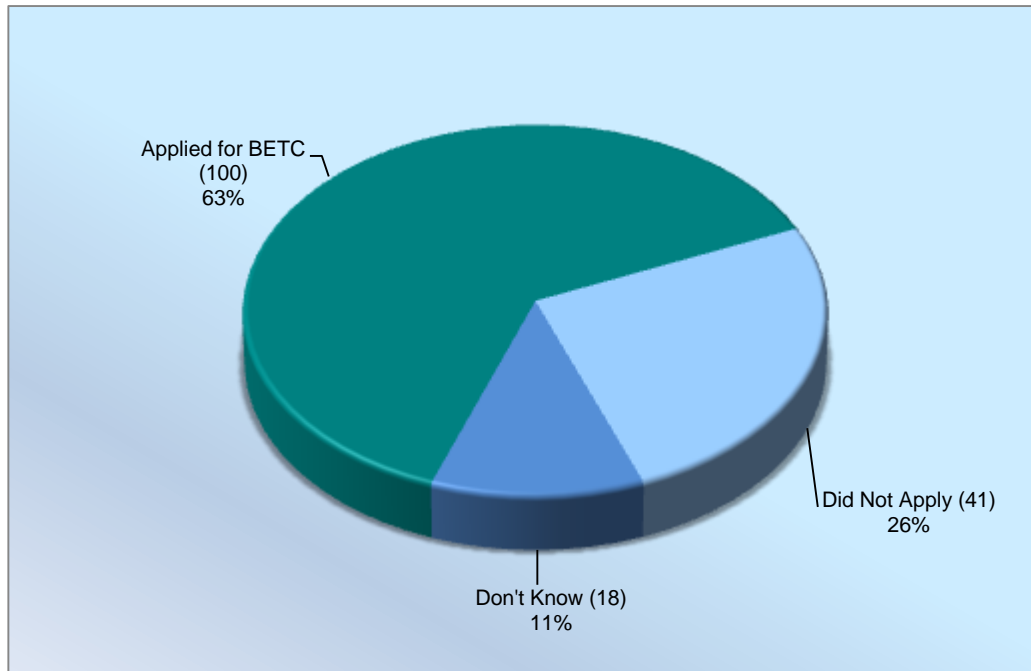
Awareness and Influence of the BETC

Nearly two-thirds of non-sprayer participants reported that they had applied for an Oregon Business Energy Tax Credit (BETC) on the equipment they installed through the Existing Buildings program (Figure 5.5). However, nearly four in ten said either that they had not or did not know whether they had applied for the credit. Combining the Building Energy incentive and BETC would offset project costs more than would either alone, which presumably would induce more energy efficiency investment over all.

To understand better the barriers to combining these two sources of project assistance, we asked a variety of questions regarding: awareness of the BETC and what it covered; reasons for not applying for a BETC; and, for those who had applied for a BETC, the relative influence of the Existing Buildings incentive and the BETC in the decision to do the current project.

Nearly one-third (13 of 41) of those who had not applied for a BETC said that they were not familiar with the BETC. Of those who had been aware of the BETC, eight said that the application process was too difficult or time consuming relative to what they would receive; eight said they thought a BETC was not available or that their equipment did not qualify; five cited internal company reasons not related to the program. Seventeen others cited a variety of other reasons and eleven said they did not know why their company did not apply.



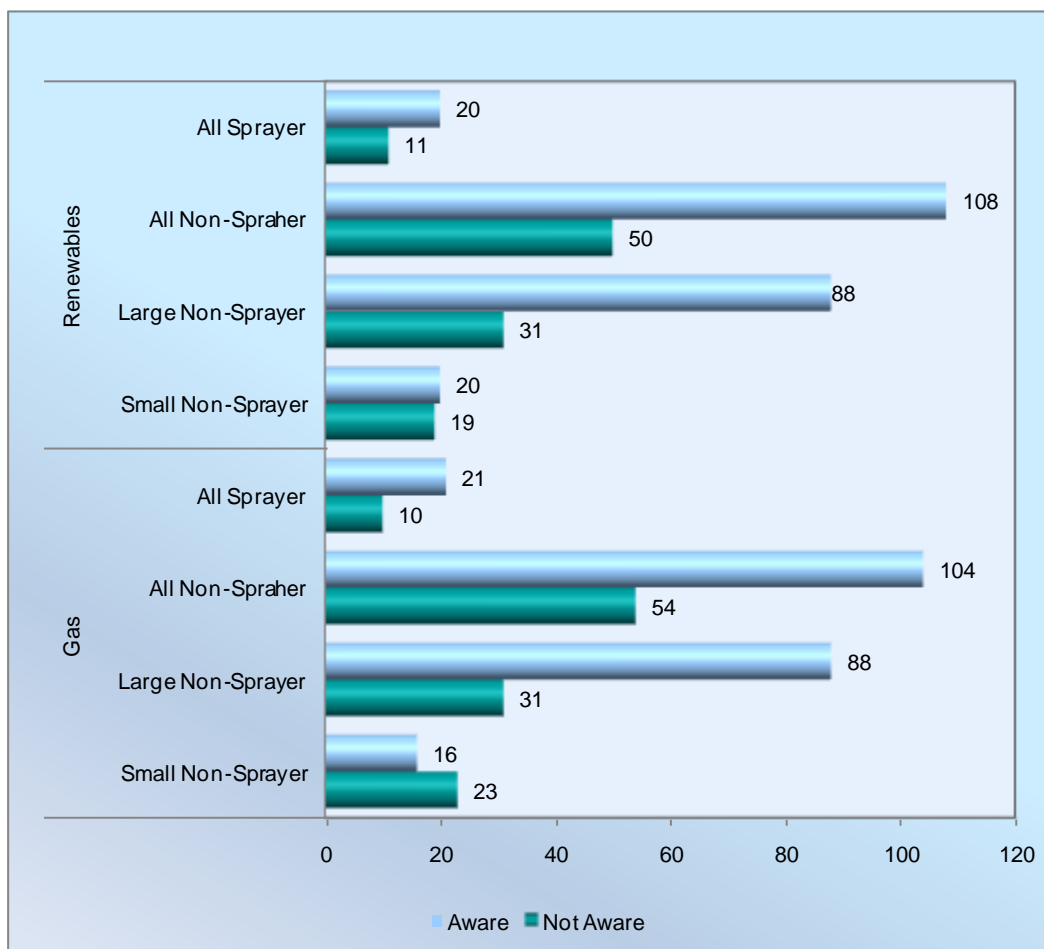
Figure 5.5: Applications for a BETC by Non-Sprayer Participants

We asked all participants if they were aware that the BETC applies to gas and renewable energy projects. About two-thirds said they knew that the BETC applied to gas projects (125 of 189) and to renewable energy projects (128 of 189). Level of awareness did not differ between non-sprayer and sprayer participants. However, among non-sprayer participants, those with large projects were more aware than were those with small projects to be aware that the BETC applies to gas and to renewable energy projects (Figure 5.6, next page).

This echoes the greater familiarity that they have with the Existing Buildings program. Based on this finding, there may be an opportunity to garner more gas savings by increasing awareness that the BETC applies to gas projects, particularly among businesses contemplating smaller equipment purchases and upgrades.



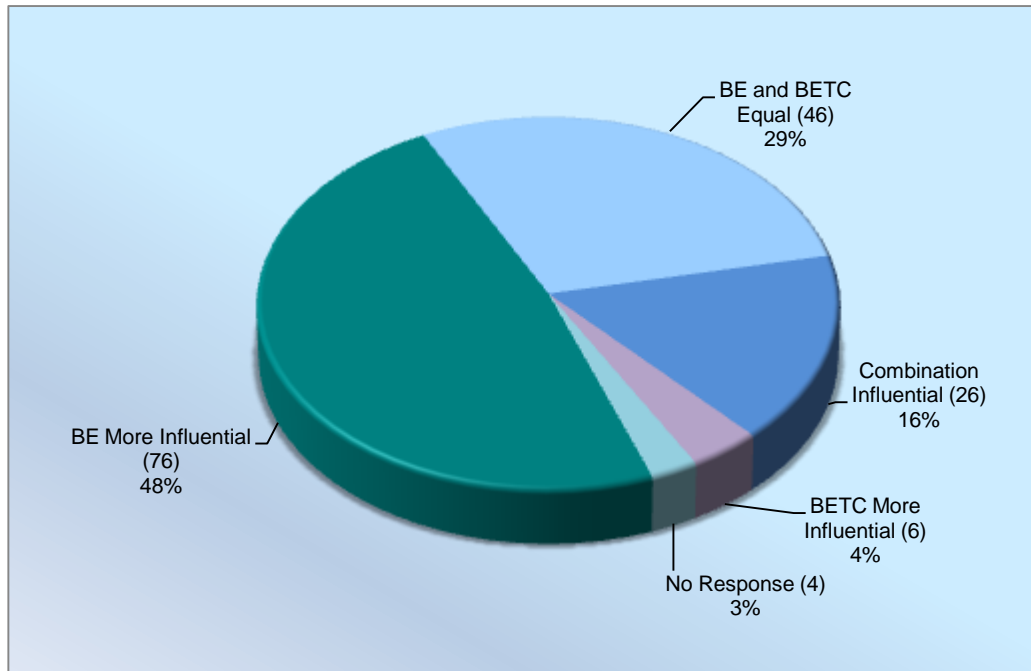
Figure 5.6: Awareness that the BETC Applies to Gas and Renewable Energy Projects



Finally, we asked participants who had applied for a BETC to indicate the relative influence of the BETC and the Existing Buildings incentive on their decision to do the current project. Nearly half of the respondents said that the Existing Buildings incentive had more influence, just more than one-quarter said that they had equal influence, and about one in six said that the combination of the two had more influence than either alone would have (Figure 5.7). Only four respondents said that the BETC had more influence. These responses demonstrate that the Existing Buildings incentive exerts a greater influence on decisions to implement energy efficiency than the BETC. Whether this is because incentives in general are superior to tax credits or because of characteristics of these specific programs is uncertain; further examination may be called for.



Figure 5.7: Influence of the BETC and Existing Buildings on Decision to Do Project



QUALITY OF EXPERIENCE

Quality of program experience is assumed to be a predictor of future program involvement. We therefore asked respondents several questions about the nature and quality of their contact with their program representative, as well as their satisfaction with a variety of program facets.

Experience with Program Contacts and Contractors

We asked respondents who their main point of contact was with the program and whether they thought this person understands the challenges of their business and was serving their best interests. We also asked whether they would contact (or had contacted) that person for assistance when contemplating an equipment purchase or facility upgrade.³⁰ Because the program relies to a large degree on contractors to bring in participants, we also asked those who had worked with a contractor how knowledgeable that contractor was about the program.

³⁰ We did not ask the latter two questions of site visit participants; therefore, the total counts for these two questions are considerably lower than for the other questions in this section.



Main Point of Contact

Just more than two in five participants said that their main point of contact was a program representative (although that person was not seen exerting a high level of influence – see above), while about one in three said it was a contractor (Table 5.14). Most of the remainders said that they did not know.

Table 5.14: Main Point of Contact

CONTACT	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Program Representative	24	58.5%	62	38.8%	86	42.8%
Contractor	1	2.4%	66	41.2%	67	33.3%
Other	3	7.3%	15	9.4%	18	9.0%
Don't Know / Unspecified	13	31.7%	17	10.6%	30	14.9%
TOTAL	41	100.0%	160	100.0%	201	100.0%

As with the source of program awareness, we found a strong relationship between the main point of contact and participant type. The non-sprayer participants were nearly evenly split between program representative and contractor as the main point of contact, while nearly three of five sprayer recipients said that it was the program representative. Moreover, the sprayer recipients were much more likely than were the others to say that they did not know who their main point of contact was.

Understanding of Participants' Business

Across participant types, just over one-third said that their program representative has an “excellent understanding” of their business or “understands quite a lot.” Only eight of the remaining 63 respondents gave a rating that was below that level; the rest said that they did not have an opinion. Nearly all (55 of 58) respondents said that the program contact serves their best interests.

Knowledge of the Program

Respondents' ratings of how knowledgeable contractors were about the program were strongly related to participant group. This was due almost entirely to differences in the percentages of respondents who expressed any opinion versus those that said that they had no opinion: nearly half of sprayer recipients had no opinion about the contractor, compared with about 5% of the others. Given the nature of the sprayer program – a free direct install that required little input from the participant or need to deal with the application process – it is not surprising that many of these participants would not have an opinion on this question.



When we considered only those who expressed an opinion, about two-thirds of participants said that the contractors they worked with were somewhat or very knowledgeable about the program (Table 5.15). Fewer than one in ten rated their contractor as less knowledgeable. These ratings did not differ significantly by group.

Table 5.15: Rating: How Knowledgeable is Contractor About the Program*

RATING	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Very Knowledgeable	10	58.8%	97	67.4%	107	66.5%
Somewhat Knowledgeable	5	29.4%	33	22.9%	38	23.6%
Less than Somewhat Knowledgeable	2	11.8%	14	9.7%	16	9.9%
TOTAL	17	100.0%	144	100.0%	161	100.0%

* Excludes participants who did not have an opinion.

Willingness to Call Program Contact

When asked if they would call the program contact to discuss new purchases or upgrades, a large majority said that they would or already had (Table 5.16).

Table 5.16: Would Call Program Contact

RESPONSE	SPRAYER		NON-SPRAYER		TOTAL	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Yes, and Have Done So	3	10.7%	44	34.1%	47	29.9%
Yes, and Plan To Call	2	7.1%	22	17.1%	24	15.3%
Yes, But Have No Plans to Call Now	16	57.1%	50	38.8%	66	42.0%
No	7	25.0%	13	10.1%	20	12.7%
TOTAL	28	100.0%	129	100.0%	157	100.0%

Responses to this question were strongly related to participant type. Non-sprayer recipients were much more likely to say that they had already called their program contact or had plans to do so. The fact that a higher percentage of the non-sprayer participants had called their program contact or were planning to do so is perhaps not surprising, given that they were more likely to be repeat participants and to have larger and more complex projects.



On the other hand, sprayer recipients represent a relatively underserved market sector, and it is not surprising that they are not as highly involved. Yet with more than 70% indicating a positive attitude toward calling the program contact, this further suggests that the sprayer program has been effective in developing interest in energy efficiency that can yet be tapped.

Satisfaction

Table 5.17 shows respondents' ratings of satisfaction on several program facets. The first several rows of data show satisfaction ratings on facets that were pertinent only to non-sprayer participants, while the last rows show ratings on facets that were relevant to all participants. Satisfaction was rated on a five-point scale, with 1 defined as "not at all satisfied," 3 defined as "neither satisfied nor unsatisfied," and 5 defined as "very satisfied" (2 and 4 were not explicitly defined). Because of the low number of participants who gave ratings of 1 or 2, we combined those categories in the table.

This table shows a generally high level of program satisfaction across most facets and for the overall program experience. In all cases, very satisfied was the most frequent response, followed by a rating of satisfied. The facets with the highest percentage of very satisfied participants were program staff's knowledge, equipment performance, and quality of contractor work. Those with the lowest percentage were energy savings, application process, and resolution of program issues.

These ratings support other survey findings that indicate that program staff and contractor performance are some of the program's strong components. Although the program contact was not explicitly seen as one of the primary influences on the decision to participate, satisfaction with the program contact can likely contribute to overall program satisfaction, offering the best opportunity, not only for repeat participation but also for spreading the word about the program to others.

The fact that the application process is one of the least-favored facets is consistent with the general experience of energy efficiency program evaluation.

Energy savings was the only program facet on which satisfaction was related to participant type. Among non-sprayer participants, just over half were very satisfied, compared to only one-quarter of sprayer recipients. However, when the top two box ratings are considered together, the difference between participant types disappears: about three-quarters of both participant types gave energy savings a very satisfied or satisfied rating. Sprayer recipients' satisfaction with energy savings is further evidence that the sprayer program may achieve the hoped-for success.

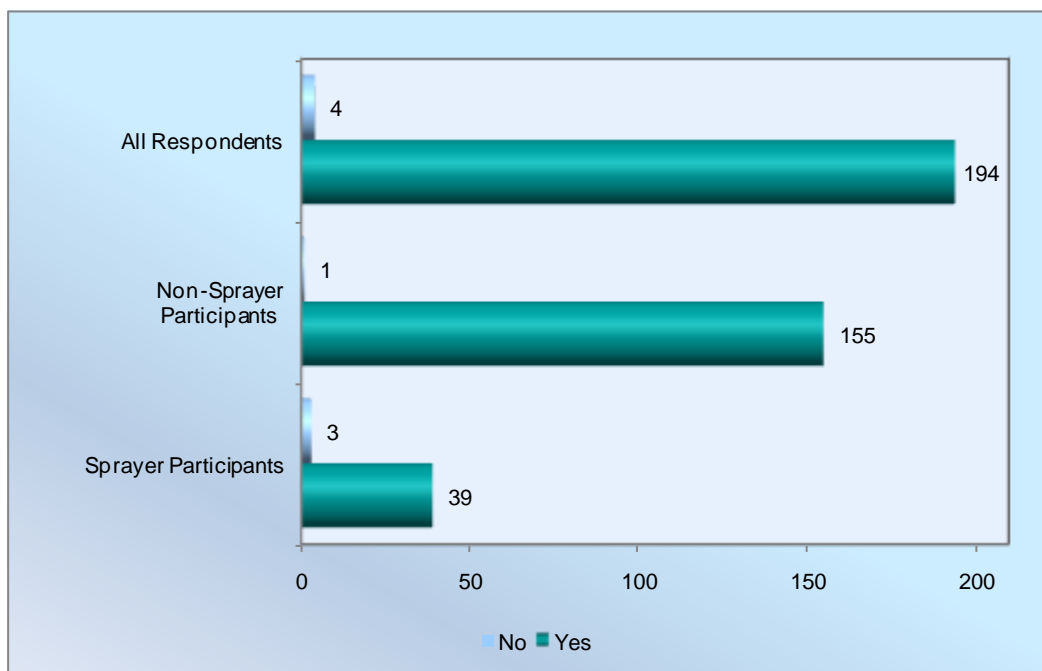


Table 5.17: Participant Satisfaction

PROGRAM FACET	SATISFACTION RATING								TOTAL N
	5 = VERY		4		3 = NEITHER SATISFIED NOR UNSATISFIED		1 OR 2 1 = NOT AT ALL		
	N	%	N	%	N	%	N	%	
NON-SPRAYER PARTICIPANTS ONLY									
Incentive	74	50.0%	57	38.5%	11	7.4%	6	4.1%	148
Application Process	56	42.1%	52	39.1%	17	12.8%	8	6.0%	133
Consistency of Information	88	59.9%	42	28.6%	10	6.8%	7	4.8%	147
Accuracy of Information	94	63.5%	43	29.1%	6	4.1%	5	3.4%	148
Program Staff Knowledge	35	74.5	10	21.3%	1	2.1%	1	2.1%	47
Speed Of Incentive Payment	26	45.6%	21	36.8%	9	15.8%	1	1.8%	57
ALL PARTICIPANTS									
Overall Program Experience	120	61.5%	68	34.9%	6	3.1%	1	0.5%	195
Equipment Performance	147	74.2%	42	21.2%	6	3.0%	3	1.5%	198
Interaction with Program Staff	86	61.4%	39	27.9%	11	7.9%	4	2.9%	140
Quality of Contractor Work	128	68.4%	37	24.3%	9	5.9%	2	1.3%	187
Resolution of Program Issues	32	47.1%	27	39.7%	6	8.8%	3	4.4%	68
Energy Savings	72	36.2%	48	31.2%	30	19.5%	4	2.6%	154
• Non-Sprayer	65	51.6%	33	26.2%	25	19.8%	3	2.4%	126
• Sprayer	7	25.0%	15	53.6%	5	17.9%	1	3.6%	28

Nearly all (194 of 198) respondents said that they would participate in the program again if they were to install qualified equipment (Figure 5.8). Although sprayer recipients were less likely to say that they would participate again, the percentage was still very high.



Figure 5.8: Would Participate in Existing Buildings Again if Installing Qualified Equipment

In this vein, one of the most telling findings is that only 12 participants (of 147, 8%) who worked with a program representative were able to suggest anything that their representative could have done to make it easier to get their company's approval for the project.

Four comments had to do with the information provided: two wanted more complete technical information, while one wanted an information brief that could be provided to decision-makers, and one simply wanted a list of eligible project types or equipment. Three comments had to do with having a more active or knowledgeable program contact. Two comments were related to savings calculations: one said that the program contact should do the calculations rather than the contractor, while the other complained that the program underestimates savings. Three comments were not really responsive to the question.

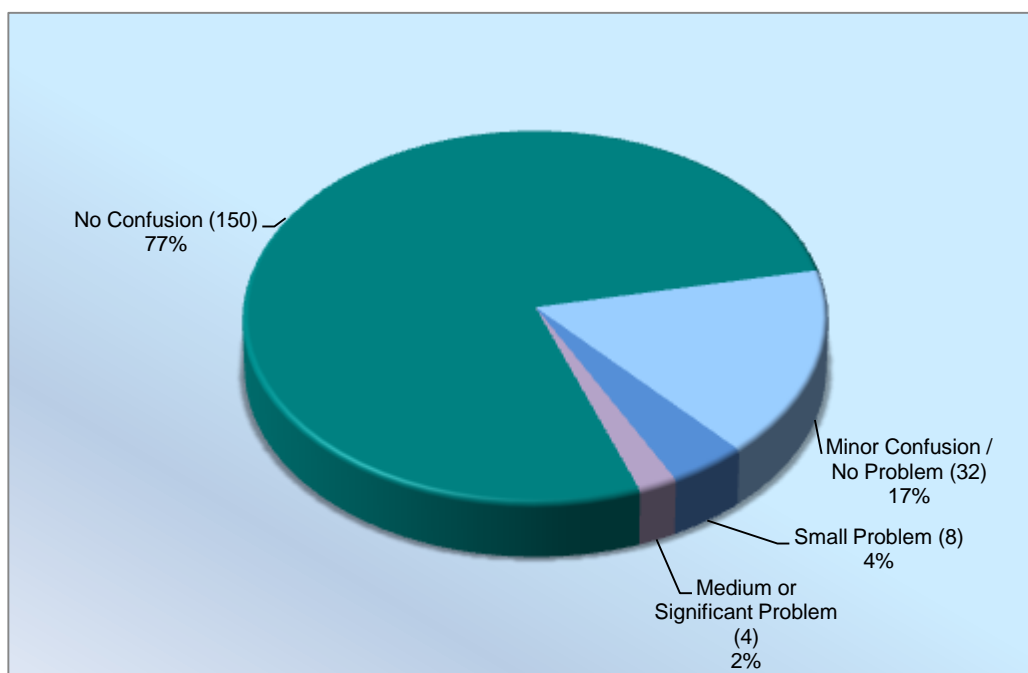
Uncertainty or Confusion About the Program

As a final assessment of the quality of the program experience, we asked participants about any uncertainty or confusion they may have had about the program. We asked all respondents about their overall level of uncertainty or confusion about the program. They were asked to indicate whether they had experienced no confusion, some confusion but not at all a problem, a small problem, a medium problem, a significant problem, or a problem so significant it nearly stopped the project from going forward.



Out of 194 respondents, only one reported a problem that nearly stopped the project and one other reported a significant problem, but one that did not endanger the project (Figure 5.9). Two reported a medium problem, and eight reported a small problem. About one in six reported minor confusion that was not a problem. Nearly all of the uncertainty or confusion mentioned (40 of 44 who reported any confusion) was reported by non-sprayer participants.

Figure 5.9: Experienced Confusion About the Program



We asked those respondents who reported uncertainty or confusion what the cause was. Most did not describe any specific situation or issue. Of 15 who made any comments, 6 simply noted general uncertainty about the program or the specific project. One each mentioned confusion or uncertainty about the connection between the BETC and the Energy Trust incentive, who the program contact was, how to speed up application process, and how to complete program forms.

Two respondents mentioned issues that did not really appear to be areas of uncertainty, but rather points of dissatisfaction – one noted that prices increased while the application was going through the approval process, and the one who had wanted information on how to speed up the application process said that it was difficult to get telephone calls returned.

In addition to asking about the overall level, we asked: whether they had experienced any uncertainty or confusion about who to call about program issues; areas of expertise of the various program contacts; which program contacts were able to make program decisions; program policies or procedures; the availability of Energy Trust incentives for that year; and the amount paid for energy savings.



We did not ask sprayer recipients the questions about specific areas of uncertainty or confusion, as they were not pertinent to them. Moreover, we eliminated these questions from the survey with site visit recipients to reduce the burden on them. Therefore, we asked these questions only of non-sprayer participants who did not receive site visits.

Fourteen of the remaining 72 respondents (about one in five) indicated that they had experienced uncertainty or confusion in any of the six areas. The facet most often causing uncertainty was the availability of incentives, reported by eight respondents. Seven said that they had experienced uncertainty about who to call regarding program issues, six indicated some uncertainty about program policies or procedures, and five identified program contacts' areas of expertise as a point of uncertainty. Finally, four each said that they had had some question about which program personnel could make program decisions and how much the program paid for a given amount of savings.

The issue of availability of incentives most likely resulted from the fact that the program ran low on incentive money early in 2006. It is worth noting that the eight respondents who expressed uncertainty about incentive availability were exactly evenly split between the 2006 and 2007 program years, suggesting some lingering question about incentive availability. This points up the importance of maintaining consistency in this areas of the program in particular.

SPRAYER-SPECIFIC QUESTIONS

To provide information specifically about the pre-rinse sprayer direct install program, we devised several questions that were directed specifically at this group. These covered: the number and type of sprayers installed; whether any had been uninstalled and, if so, why; factors influencing their decision to participate in the install program; and what effect participating in the install program might have on future energy efficiency decisions. Of the 50 sprayer recipients we spoke with, 8 did not respond to these questions; therefore, the sample size for these questions is 42.

Number and Type of Installations

Two-thirds of respondents said that only one sprayer had been installed, six said that they had received two sprayers, another six reported from 3 to 10, and two said that they had gotten more than 10 installed (30 and 90 sprayers, respectively). A large majority were installed on mixed hot and cold water fixtures; four were installed on hot only; none were installed on cold water only.

A large majority (36 of 42, 86%) of respondents said that all sprayers were still installed. Four said that some had been uninstalled, but others remained, while only two respondents had uninstalled all sprayers. All sprayer removals were because of normal wear.



Reasons for Installing Sprayers

As with the non-sprayer participants, we asked sprayer recipients their reasons for having the sprayer installed, including the most important reason. Table 5.18 shows the responses. One respondent did not know the reason, as it was made at the corporate level. Of the remaining 41 respondents, all mentioned both energy cost savings and the Energy Trust program as reasons for the install. What is striking is that six in ten said that saving energy costs was the most important reason, compared to about one-third of that number who said that the install program was most important.

Table 5.18: Reasons for Installing Pre-Rinse Sprayer (Multiple Responses Allowed)

REASON	A REASON (N=41)		MOST IMPORTANT (N=41)	
	RESPONDENTS	PERCENT	RESPONDENTS	PERCENT
Energy Cost Savings	41	100.0%	25	61.0%
Because of Free Install Program	41	100.0%	9	22.0%
Improved Work Efficiency	29	70.7%	0	0.0%
Improved Comfort/Work Environment	25	61.0%	2	4.9%
Non-Energy Cost Savings	14	34.1%	2	4.9%
Contractor Recommended	14	34.1%	1	2.4%
Corporate Policy	8	19.5%	2	4.9%
Other	3	7.3%	0	0.0%

More than two-thirds of the respondents mentioned some non-energy benefit, such as improving work efficiency (71%), improving the work environment (61%), or non-energy cost savings (34%). Although few said that any of these was the most important reason, this finding confirms the importance of non-energy benefits and the potential value of using them as selling points.

Influences on Sprayer Installations

The majority of respondents (33, 79%) said that they had not been considering installing an energy-efficient sprayer before Energy Trust offered them at no cost. Of the eight who said that they had been considering such an installation, all but one said that their budget could have accommodated it. Of those who had not been considering the installation, a much smaller fraction (18 of 33, 54%) said that they could have paid for it from their budget.

Consistent with this, 25 of 42 (60%) said that the Energy Trust program had a critical influence on their decision to install an energy-efficient sprayer, and another 9 (21%) also rated the influence as strong (but not critical).



These findings again provide evidence that the sprayer install program was effective at introducing energy efficiency into a previously under-tapped market.

Effect of Program on Future Energy Efficiency Decisions

A key indicator of the program's success would be the degree to which the program has influenced recipients' intentions or plans about energy efficiency decisions. With that in mind, we asked sprayer recipients how having installed the sprayer had affected their thoughts or plans about energy efficiency, whether it had affected the likelihood that they would install other energy efficiency measures, and whether it had affected the likelihood that they would work with Energy Trust if they did install other energy efficiency measures.

Regarding the first question, we asked sprayer recipients to say whether the amount of thought they gave to energy efficiency measures had increased or decreased compared to before they had installed the energy-efficient sprayers.

As Table 5.19 illustrates, more than half said that the amount of thought that they now give to energy efficiency is somewhat or much greater than before the sprayer was installed. About four in ten said that it had remained about the same, and one person did not know.

Table 5.19: Effect of Program on Thoughts and Plans

FUTURE ACTION	LEVEL OF EFFECT						TOTAL
	MUCH GREATER	SOMEWHAT GREATER	SAME	SOMEWHAT LESS	MUCH LESS	DON'T KNOW	
Thoughts or Plans about Energy Efficiency	9	14	18	0	0	1	42
	21.4%	33.3%	42.9%	0.0%	0.0%	2.4%	100.0%
FUTURE ACTION	LIKELIHOOD OF FUTURE ACTION						TOTAL
	INCREASED A LOT	INCREASED SOMEWHAT	NOT CHANGED	DECREASED SOMEWHAT	DECREASED A LOT	DON'T KNOW	
Installing Other Energy Efficiency Measures	17	13	12	0	0	0	42
	40.5%	31.0%	28.6%	0.0%	0.0%	0.0%	100.0%
Likelihood of Working with Energy Trust	26	11	4	0	0	1	42
	61.9%	26.2%	9.5%	0.0%	0.0%	2.4%	100.0

However, even some of those who do not think about energy efficiency any more now than before reported that the program has influenced their likelihood of future actions. More than seven in ten said that the program had increased their likelihood of installing additional energy efficiency measures either somewhat or a lot, and nearly nine out of ten said that having the



sprayers installed had either somewhat or greatly increased their likelihood of working with Energy Trust again.

These results suggest that the sprayer install program has increased awareness of energy efficiency opportunities and the intention to install energy efficiency measures. Analysis of Energy Trust's *FastTrack* database through 2008 showed, however, that only 11% of sprayer recipients later installed additional measures through the program. That figure does not include business chains that received a sprayer at one location and then installed other measures at different locations (that were recorded in the database under different site identification numbers).³¹ We do not know what percentage of sprayer recipients later installed energy efficient equipment without applying for an Energy Trust incentive. Longer tracking of sprayer recipients, through analysis of the database as well as by survey, may be warranted.

SUMMARY

The above-reported results suggest that the Existing Buildings program generally works well from the perspective of participants, although some areas for possible improvement are identified. After a brief summary of the sample description, we summarize results separately for those who participated in the main Existing Buildings program (i.e., non-sprayer participants) and those who participated in the free-sprayer direct install program.

Sample Description

The sample was distributed over a range of building types, with offices and large institutional building types being the most common. It also incorporated a good proportion both of participants who owned and leased the facility where the project was carried out, and was about evenly split between those who had just one versus multiple facilities in Oregon. We were most likely to speak with a top company officer or facility manager, particularly when dealing with large projects.

³¹ We attempted to conduct an analysis by assigning higher-level identification codes to businesses with multiple locations that had separate identifiers. However, that task was complicated by inconsistencies in naming conventions used in the database, uncertainty about which businesses were wholly-owned chains and which were franchise operations (and therefore would be expected to exhibit greater independence of one another in energy management decisions), and the sheer volume of records to review, which put such a task out of the scope of this evaluation.



Summary of Findings for Non-Sprayer Participants

Program Awareness and Sources of Influence

Program awareness was good. A large majority of participants were aware that Energy Trust was the source of the incentive. While only about two-thirds knew the program by the Existing Buildings name, that proportion was higher for those with large projects. Most respondents had been aware of the program for at least two years, about a quarter of them for five years or more. Those with large projects had been aware of the program a longer time, although it is not clear whether the length of program awareness was causally related to the size of program.

Contractors were most frequently cited as both the source of program awareness and the primary person influencing the decision to undertake the project. While they were rarely cited as the most important reason for undertaking the project (relative to such things as energy savings and the incentive), they may help “close the deal” in many cases. These findings are consistent with the program’s original theory of promoting Existing Buildings largely through trade allies.

A large percentage of participants mentioned the Energy Trust incentive as a reason for undertaking the project and rated it as having a strong influence on the decision, and more than half of the respondents rated the technical study as being influential. These results support the value of the program in inducing energy-efficient equipment purchases. The relatively frequent mentions of non-energy benefits support their value in promoting energy-efficient upgrades.

A program representative was not frequently cited as the source of program awareness; in addition, the representative’s recommendation was infrequently mentioned as a reason for doing the project, and the representative was rated as having had little or no influence in about six in ten projects. This may be cause for further examination.

BETC

Theoretically, effectively combining the BETC with the Existing Buildings incentive should increase energy efficiency investments. Results suggest that opportunities may exist to garner improved energy savings through increased awareness of the BETC and better coordination between the BETC and Existing Buildings.

Nearly four in ten respondents could not confirm that their company had applied for a BETC for the current project. About one-third of them were not familiar with the BETC. Of the remainder, the most common reasons for not applying were the amount of time or trouble relative to the value of the tax credit and the belief that a BETC was not available or that their equipment did not qualify.

Moreover, about one-third of respondents did not know that the BETC applied to gas projects and renewable energy projects, although those with large projects had greater awareness than those with small ones.



Finally, about half of participants who had applied for a BETC said that the Existing Buildings incentive had more influence than the BETC, and nearly half said either that they had equal influence or that the combination of the two had more influence than either one alone would have.

Previous Participation

Respondents who had participated previously largely considered their earlier program involvement to have been a significant factor, both in their current participation and in their decision to undertake other energy efficiency investments without an incentive, pointing to the importance of a positive program experience.

Corporate Policy and Role of Global Climate Change

We found a relatively high level of informal energy management and a somewhat lower, but still encouraging, level of adoption of formal energy-related corporate policies. About six in ten respondents reported at least one additional formal policy, most frequently assigning a staff member responsibility for energy and energy efficiency, followed by incorporating energy efficiency into operations and procurement, and developing a written sustainability policy.

We also found high levels of acceptance that global climate change is occurring and a reasonably high number of respondents who said that it had affected facility operations, with a strong relationship between these two factors. However, acceptance of global climate change was only weakly (and non-significantly) related to the likelihood of reporting any specific corporate energy-related policies. Moreover, few respondents cited global climate change as a reason for undertaking the current project. The question of how the global climate change issue has affected facility operations bears further inquiry.

Quality of Program Experience

Results suggested that the overall quality of program experience was good. Nearly all respondents said that the program contact (nearly evenly split between program representative and contractor) serves their best interests, and about nine in ten said that the representative understands their business. A large majority said that they would or already had called the program contact to discuss new purchases or upgrades.

A generally high level of program satisfaction was reported across most facets – particularly program staff's knowledge, equipment performance, and quality of contractor work – and for the overall program experience. These ratings support other survey findings that indicate that program staff and contractor performance are some of the program's strong components. Nearly all respondents said that they would participate in the program again if they were to install qualified equipment.



Few respondents reported serious uncertainty or confusion about the program. Only one reported a problem that nearly stopped the project and one other reported a significant problem, which did not endanger the project. About one-fifth of respondents cited any uncertainty or confusion about a specific program facet, the most frequently mentioned being the availability of incentives, who to call regarding program issues, program policies or procedures, and program contacts' areas of expertise.

Summary of Sprayer Program Results

Compared to other participants, those who participated in the free direct sprayer install program were less aware of the Existing Buildings name and had been familiar with the program a shorter time, although they were no less likely to be aware of Energy Trust. A high percentage of sprayer recipients cited Energy Trust or a program representative as the source of awareness and main point-of-contact for the program. These findings are consistent with the program's purpose of increasing awareness of energy efficiency opportunities in this segment.

Several findings provide strong evidence that the sprayer install program has been effective in developing interest in energy efficiency and increasing the likelihood of undertaking energy efficiency improvements:

- ➔ **Influence on the decision to install the energy-efficient sprayer:** All cited the program, as well as the desire to achieve energy savings, as reasons for installing the sprayers, with the latter cited most often as the most important reason. More than three-quarters said that they had not been considering installing an energy-efficient sprayer before Energy Trust offered them. Eight out of ten indicated that the program had had a strong influence on their decision to install energy-efficient sprayers.
- ➔ **Program satisfaction:** More than 70% of recipients indicated a positive attitude towards calling the program contact, and more than 75% indicated high satisfaction with energy savings.
- ➔ **Influence on future behavior:** More than half said that the program had increased the amount of thought that they give to energy efficiency, more than 70% said that the program had increased their likelihood of installing additional energy efficiency measures, and nearly 90% said that having the sprayers installed had increased their likelihood of working with Energy Trust. More than 90% said that they would participate in the program again if they were to install qualified equipment.

A follow-up study of sprayer recipients over the next few years would provide valuable information for confirming or disconfirming the effects of the program.



6

NONPARTICIPANT FEEDBACK

This chapter provides information derived from telephone interviews and site visits with a sample of business owners and building owners and managers who have not participated in the Existing Buildings program.

Interview questions addressed: level of familiarity with Energy Trust and the Existing Buildings program; familiarity with and use of the Oregon Business Efficiency Tax Credit (BETC), energy-related beliefs and concerns, company policies and preferences, and energy management history. The survey instrument used is included in Appendix B.

DEFINITION OF SURVEY FRAME AND LIST DEVELOPMENT

The survey population consisted of building tenants, owners, and managers in Oregon. The goal was to achieve a total sample of 150 respondents, to comprise 60 building tenants, 60 absent owners (those who do not occupy the building, but lease it to tenants), and 30 owner-occupants. The building owner groups were each to be split between owners of large (> 50,000 square feet) and small (\leq 50,000 square feet) buildings. The tenants were to be split between large (> 50 employees) and small (\leq 50 employees) businesses.

Energy Trust provided two sources for this population. One was a file of nonresidential buildings with the owners' names and addresses, purchased from MetroScan. The initial list consisted of 22,745 records. The second source was a file of businesses, which included both building owners and tenants, purchased from Dunn & Bradstreet. It consisted of 21,967 records.

For each source, we removed duplicate records and those without information on building or business size; we then split the remaining records into large and small groups based on the criteria stated above. We randomly ordered each group (large buildings, small buildings, large businesses, small businesses) and selected samples from them. As this was a survey of program nonparticipants, we expected to need a larger ratio of names to completions than what we would need for a participant survey. Therefore, we selected an entire initial sample of 665 records, a ratio of about 4.4:1.

Only about 8% of the records in the building owners file had telephone numbers. As selecting only those records with telephone numbers could have introduced an unknown source of bias, we selected the sample without regard to the presence of telephone numbers and then we attempted to find telephone numbers for those records without them.

Because the file of businesses included both building owners and tenants (although we did not know in what proportion), we took a higher proportion of the sample (67%) from this list than from the file of building owners (33%). However, during the course of the survey, we found that



we were having a difficult time reaching absentee owners. Analysis of the respondent type by source showed that the large building owner sample yielded the highest percentage of this group. Therefore, we added an additional 150 records to the sample for this group. Table 6.1 shows the frame and final sample size for each survey group.

Table 6.1: Sample Frames and Desired Sample Sizes

SURVEY GROUP	LARGE		SMALL		TOTAL	
	FRAME	SAMPLE	FRAME	SAMPLE	FRAME	SAMPLE
Building Owners	3,438	267	11,373	99	14,811	366
Businesses	3,134	225	14,670	225	17,804	450
TOTAL	6,572	492	26,043	324	31,615	816

SAMPLE DISPOSITIONS

Table 6.2 shows the final dispositions of all contact attempts.

Table 6.2: Final Dispositions for Nonparticipant Survey

OUTCOME		RESPONDENTS	PERCENT
ELIGIBLE			
Complete	Complete	128	29.4%
	Partial	2	0.5%
Contacted	Not Completed	28	6.4%
	Refused	109	25.1%
Not Contacted-Survey Halted		299	68.7%
Subtotal		435	100.0%
NOT ELIGIBLE			
Duplicates		14	5.6%
Missing Information		2	0.8%
Business or Contact No Longer Available		7	2.8%
Bad or Wrong Number		106	42.2%
Not Eligible		122	48.6%
Subsample Quota Met		0	0.0%
Subtotal		251	100.0%
TOTAL		816	100.0%



As this shows, the large majority of those coded as not eligible either had incorrect telephone numbers or were outside the Energy Trust service territory. Of those considered eligible, more than half were never resolved before the survey was halted. For most of these, we made multiple contact attempts, usually leaving voice mail messages or messages with coworkers.

Of the 130 completed or partially completed interviews, 41 were tenants, 21 were absent owners, and 68 were owner-occupants. Of the tenants, 24 were small businesses and 17 were large. The owner-occupants were split between 32 small and 36 large. Of the absent owners, 8 were associated with small buildings and 13 with large.

DATA ANALYSES

Most survey questions were close-ended; responses were treated as categorical variables. Some questions elicited open-ended comment; the responses to these were transcribed verbatim and later content analyzed to shed additional light on responses to the close-ended questions.

We used chi-square to examine the relationship between each categorical variable and participant type (tenant, owner-occupant, absent owner) and company size (large vs. small). Only statistically significant relationships are reported.

As with the survey of program participants, we considered both Type I and Type II errors in reporting relationships between survey responses and participant type and size. As we did in that survey, we report results that meet the minimal criterion of .05, but also weigh other considerations – size of effect, consistency of similar results, and so forth – in interpreting them.

RESPONDENT CHARACTERISTICS

As in the participant survey, we collected information on the usage type of the building where their measure was installed, the company's number of facilities in Oregon, and the interviewee's role in the company. We also asked about the percentage of the building that the respondent's organization occupied.

Building Use

By a more than two-to-one margin, the most common building use represented in this survey was offices (**Error! Reference source not found.**). When the percentages of responses represented by each building use are compared to the percentages from the NEEA study, we see that our survey was disproportionately successful with offices, restaurants, and, to a lesser extent, warehouse and storage facilities. The survey was disproportionately unsuccessful at reaching educational institutions.



Table 6.3: Building Use (N = 128)*

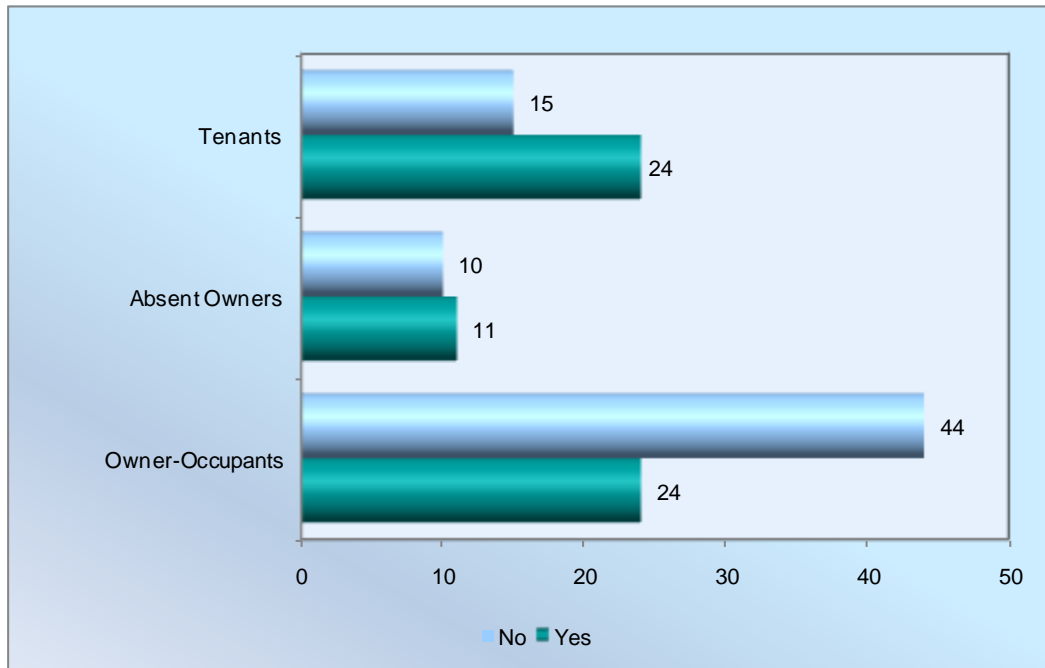
BUILDING USE	RESPONDENTS	PERCENT	% OF FLOOR SPACE (N = 56)	% OF FLOOR SPACE IN PNW
Office	59	46.1%	34%	19%
Retail	27	21.1%	14%	17%
Warehouse/storage	20	15.6%	16%	10%
Manufacturing/industrial	16	12.5%	24%	--
Restaurant/other food prep.	10	7.8%	4%	2%
Hospital or Other Healthcare	8	6.2%	1%	7%
Auto mechanic/shop	7	5.5%	6%	--
School K-12	6	4.7%	2%	10%
Institutional/Government	4	3.1%	4%	--
Church or Assembly	4	3.1%	11%	--
Lodging	4	3.1%	2%	5%
Grocery	3	2.3%	4%	4%
College/University	2	1.6%	0%	4%
Other	5	3.9%	2%	20%

* Several respondents specified more than one building type (e.g., office and retail, office and manufacturing). Therefore, the total number of building types sum to more than 128.

Building use was one of the relatively few items that showed significant differences between the survey groups: owner-occupants were less likely to be associated with offices (35%) than were absent owners (52%) or tenants (62%). (See Figure 6.1 **Error! Reference source not found.**) Even the owner-occupants were disproportionately likely to represent offices, compared to the building stock survey, suggesting that it is easier to reach and interview people occupying offices than, for example, educational institutions. However, the greater percentage of tenants that were reached at offices, compared to owners (and especially owner-occupants) suggests that office occupants were disproportionately represented among the tenants in the databases that we used to construct the survey sample.



Figure 6.1: Number of Buildings Categorized as Office by Occupancy Type



Comparison of the present survey’s results with those of the NEEA study is limited by several factors. First, data on floor space were available for less than half the respondents in the present study – if a larger portion of the cases had floor space data, it might be possible to use regression or similar types of analyses to estimate the floor space for those missing that data, but that would not be appropriate with the present data. Second, in the NEEA study, each building was counted as a single type, whereas in our survey a building might be counted in two or more categories (e.g., as office and retail). As a result, some building uses may represent a higher percentage of the total number of respondents or total floor space than they would if each were counted just once. Third, the NEEA study did not disaggregate a large group of “other” building uses, although ours did.

In future evaluations, Energy Trust may consider whether taking additional measures to achieve a nonparticipant sample that is more thoroughly representative of the population would be worth the added cost.

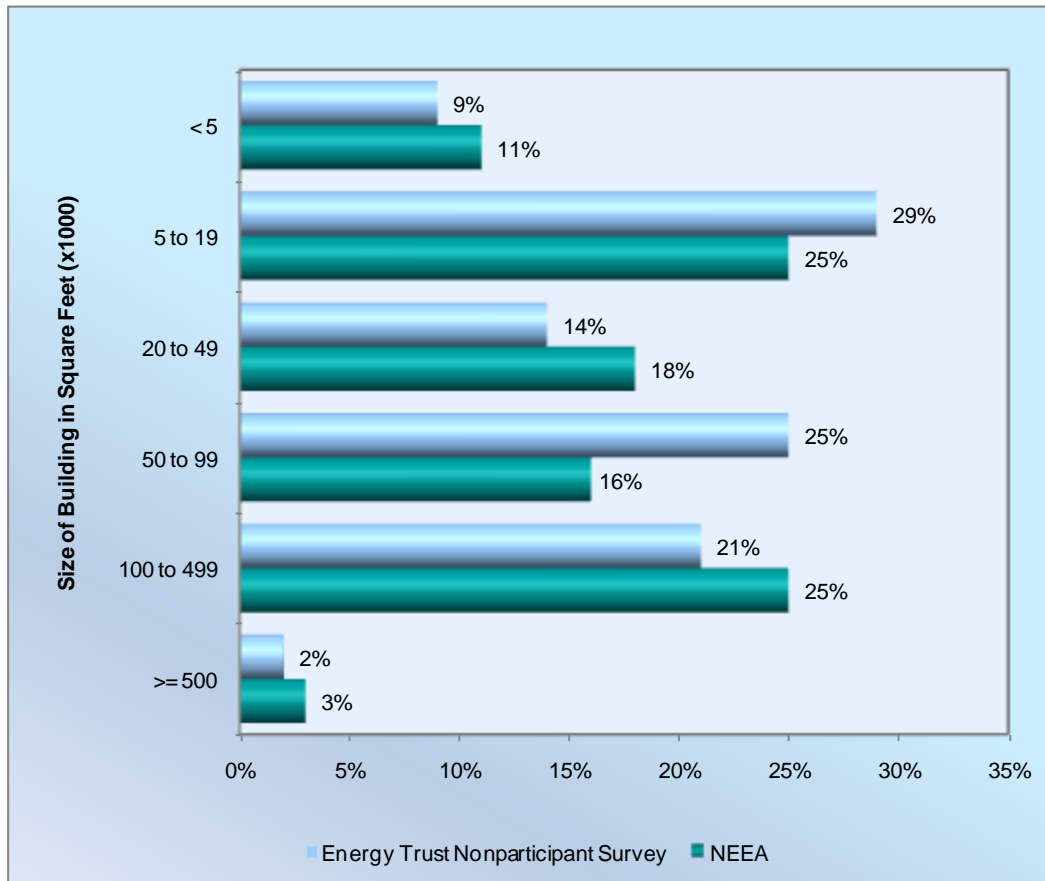
Building Size

We did not collect information on floor space during the survey, but the MetroScan file provided this information for 56 respondents. As Figure 6.2 shows, the distribution of floor space across



those 56 respondents was very close to the distribution found in a survey of Pacific Northwest commercial building stock published by the Northwest Energy Efficiency Alliance (NEEA).³²

Figure 6.2: Distribution of Building Size, Energy Trust Nonparticipant Survey and NEEA Commercial Building Stock Assessment



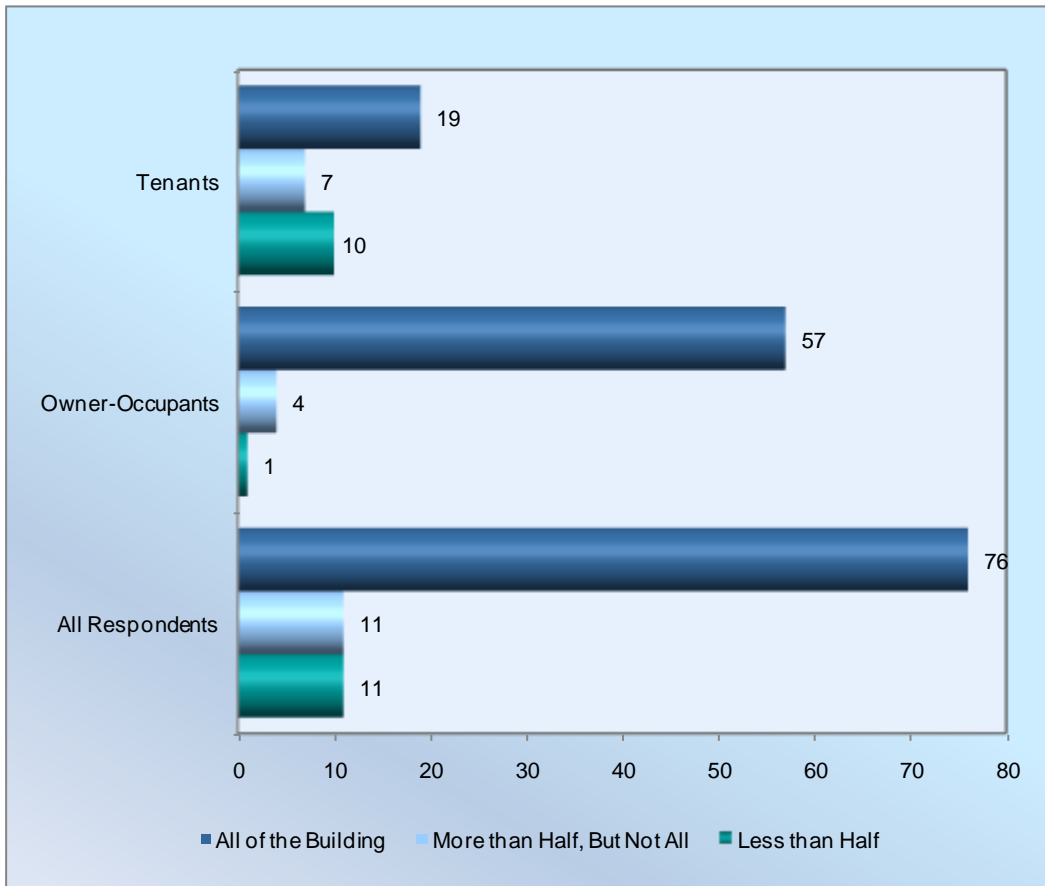
Building Occupancy

The amount of the building that the company occupied also differed by group. By definition, none of the absent owners occupied any part of the building. As Figure 6.3 **Error! Reference source not found.** shows, owner-occupants were far more likely to occupy the entire building than were tenants.

³² *Assessment of the Commercial Building Stock in the Pacific Northwest: Market Research Report (#04-125)*. Prepared by Kema-Xenergy Inc. for Northwest Energy Efficiency Alliance, March 8, 2004.



Figure 6.3: Level of Building Occupancy

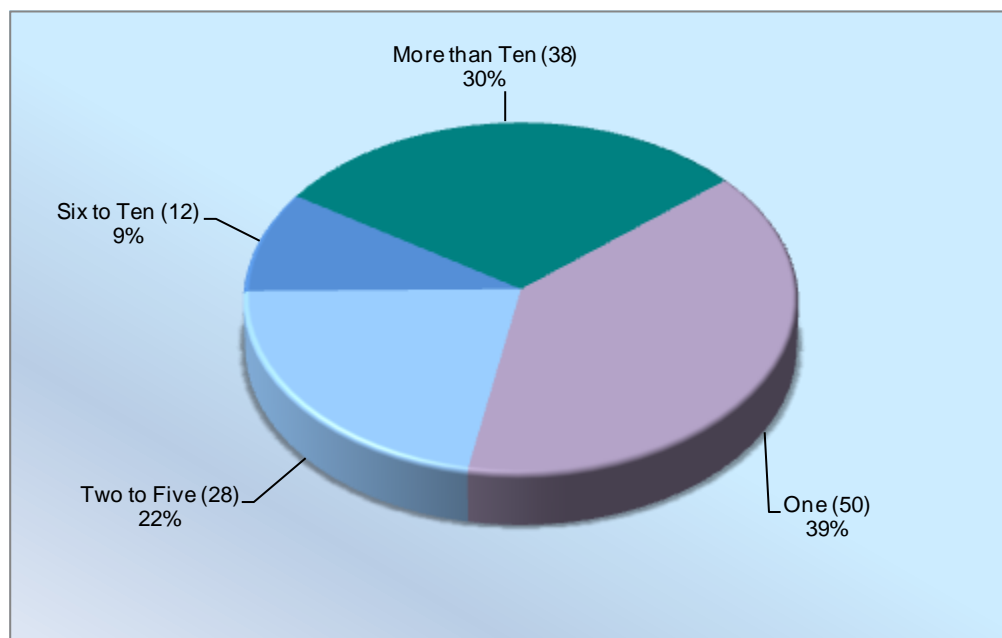


Number of Facilities in Oregon

Seventy-eight of 128 respondents who provided company descriptions reported that their company has more than one location in Oregon. As Figure 6.4 shows, nearly half of these reported more than ten locations. About one-third reported two to five locations, and the rest said that there were six to ten facilities.



Figure 6.4: Number of Locations in Oregon for Those Firms with Multiple Offices



Compared to participants (Figure 5.2), nonparticipants were less likely to have just one location and more likely to have more than ten locations.

Respondent's Role in the Organization

As Table 6.4 shows, the most common type of respondent was the company owner or top corporate officer (such as CEO, COO, or other financial officer), followed by facility managers and other corporate officers or directors.

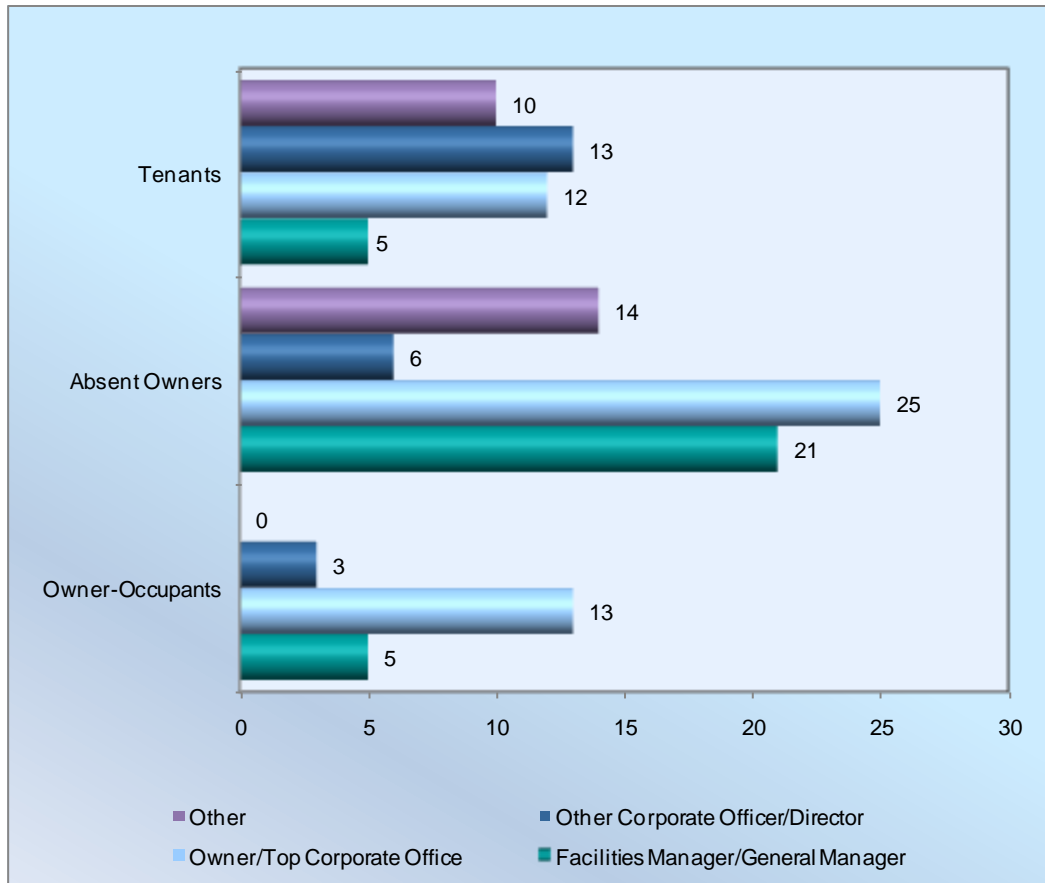
Table 6.4: Respondent's Role in the Organization

TITLE	RESPONDENTS	PERCENT
Owner or Top Corporate Officer	50	39.4%
Facilities Manager / General Manager	31	24.4%
Other Corporate Officer / Director	22	17.3%
Engineering/Maintenance	3	2.4%
Manager	9	7.1%
Administrative	6	4.7%
Energy Officer	6	4.7%
TOTAL	127	100.0%



However, the interviewee's role in the company was related to building type (Figure 6.5). When contacting absent owners, we spoke with the owner or a top officer well more than half the time, and all other contacts we made were with a corporate officer, director, or facilities or general manager. With owner-occupants, we spoke with a facilities manager or general manager almost as often as with the owner or top officer. With tenants, we spoke with relatively more corporate officers or directors and few facility managers or general managers.

Figure 6.5: Position of Respondent by Occupancy Type



PROGRAM AWARENESS

Awareness of Energy Trust

To gauge program awareness, we asked respondents if they were familiar with Energy Trust, as well as how they had first heard of it and what they had heard about it. We omitted this question with a small subset of out-of-state building owners to reduce the survey burden on this group; this group was assumed not to be highly familiar with Energy Trust.



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As Table 6.5 shows, about two-thirds of respondents were familiar with Energy Trust.³³ They most frequently reported having heard that Energy Trust provides energy efficiency programs for utility ratepayers and incentives for energy efficiency measures. Smaller numbers mentioned hearing that Energy Trust provides incentives for residential customers, provides incentives for solar electric and other renewable energy, or offers home energy analyses.

Table 6.5: Awareness of Energy Trust

RESPONSE	RESPONDENTS	PERCENT
AWARE OF ENERGY TRUST (N=123)		
Yes	81	65.9%
No / Don't know	42	34.1%
TOTAL	123	100.0%
WHAT HAVE HEARD ABOUT ENERGY TRUST (MULTIPLE RESPONSES ALLOWED, N = 81)		
Energy Efficiency for Ratepayers	33	40.7%
Incentives for Energy-Efficient Measures	30	37.0%
Energy Efficiency for Residential Customers	12	14.8%
Incentives for Renewable Energy Other Than Solar	11	13.6%
Incentives for Solar (PV) Electric	10	12.3%
Home Energy Analysis	10	12.3%
Provides CFLs	2	2.5%
Don't Know	9	11.1%
Other	14	17.3%
HOW FIRST HEARD ABOUT ENERGY TRUST (N=81)		
Energy Trust Contact or Ads	22	27.2%
Professional Source	19	23.5%
Contractor, Vendor, or Retailer	15	18.5%
Utility	12	14.8%
Personal Source	4	4.9%
Other	9	11.1%
TOTAL	81	100.0%

³³ We asked this question before we screened respondents for eligibility. Twelve persons answered this question and were later screened out because they were not serviced by utilities within Energy Trust service territory. Of these, seven (58%) reported that they were aware of Energy Trust.



Thus, while the majority of respondents reported awareness of Energy Trust, most were able to describe the services offered only at a relatively broad level.

Of the 81 respondents who reported familiarity with Energy Trust, slightly more than one-quarter said that they had first heard about it from Energy Trust itself, either directly from a program contact or through advertising, and slightly fewer heard about it from a professional source, such as a coworker, customer, or trade association. Other common sources were contractors or equipment retailers and utilities.

Awareness of Existing Buildings

Fewer respondents – about three in ten – were familiar with the Existing Buildings program (Table 6.6). However, of those who were familiar, the largest number said that they had known about the program for at least five years. The smallest group indicated awareness for the past two years or so. Given the relatively low overall awareness level, this suggests that the program has not achieved much new public awareness in the past two years.

Table 6.6: Awareness of Existing Buildings Program

RESPONSE	RESPONDENTS	PERCENT
AWARE OF EB (N=129)		
Yes	40	31.0%
No / Don't know	89	69.0%
TOTAL	129	100.0%
HOW LONG AWARE (N=39)		
Past Two Years or So	9	23.1%
Two to Four Years	12	30.8%
Five Years or More	17	43.6%
Don't Know	1	2.6%
Total	39	100.0%
HOW FIRST HEARD (N=39)		
Personal / Professional Source	9	23.1%
Energy Trust Contact or Ads	8	20.5%
Utility	8	20.5%
Vendor, Contractor, Retailer	8	20.5%
Other	6	15.4%
TOTAL	39	100.0%



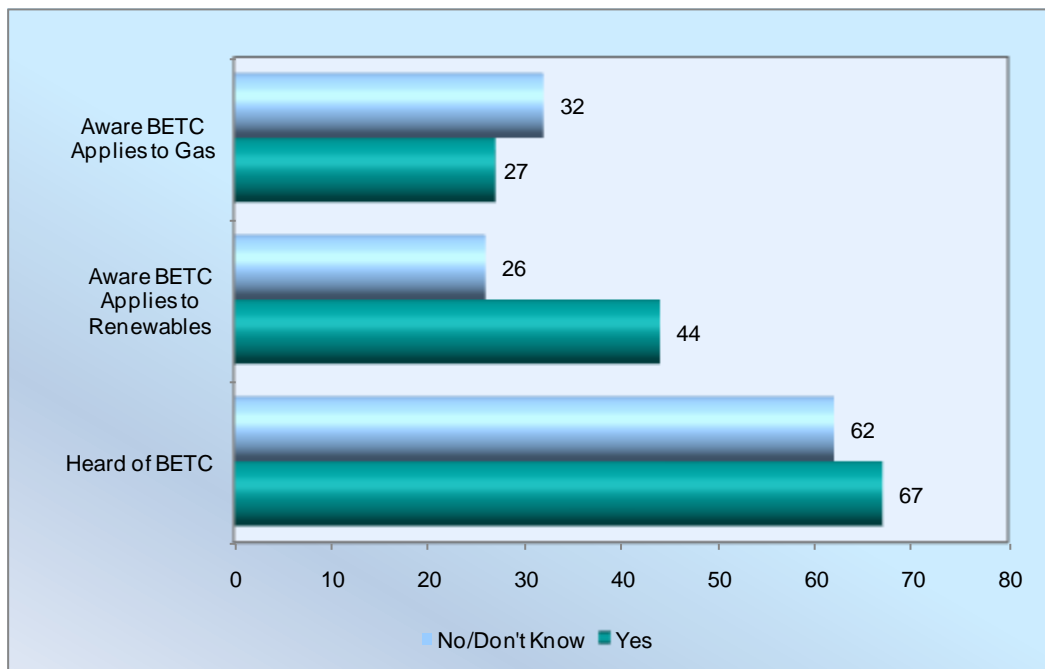
Unlike the case of awareness of Energy Trust in general, respondents were equally likely to have been made aware of the program through various professional or personal sources, Energy Trust itself, a utility, or suppliers.

Awareness of the BETC

We also asked about awareness of the Oregon BETC. This is useful information for two reasons. First, comparing the awareness of Existing Buildings with that of the BETC provides some information on the relative effectiveness of the program's marketing and outreach. Second, it is useful to know how familiar the market is with all sources of financial support for energy efficiency investments, as combining the sources should increase the ease of making those investments.

About six in ten respondents had heard of the BETC (Figure 6.6), not quite equal to the proportion who reported familiarity with Energy Trust in general but about twice that of those who knew of the Existing Buildings program.

Figure 6.6: Awareness of the BETC



Of those who were familiar with the BETC, about two-thirds were aware that it applies to renewables; among natural gas users familiar with the BETC, somewhat fewer than half knew that it applies to investments in gas measures.

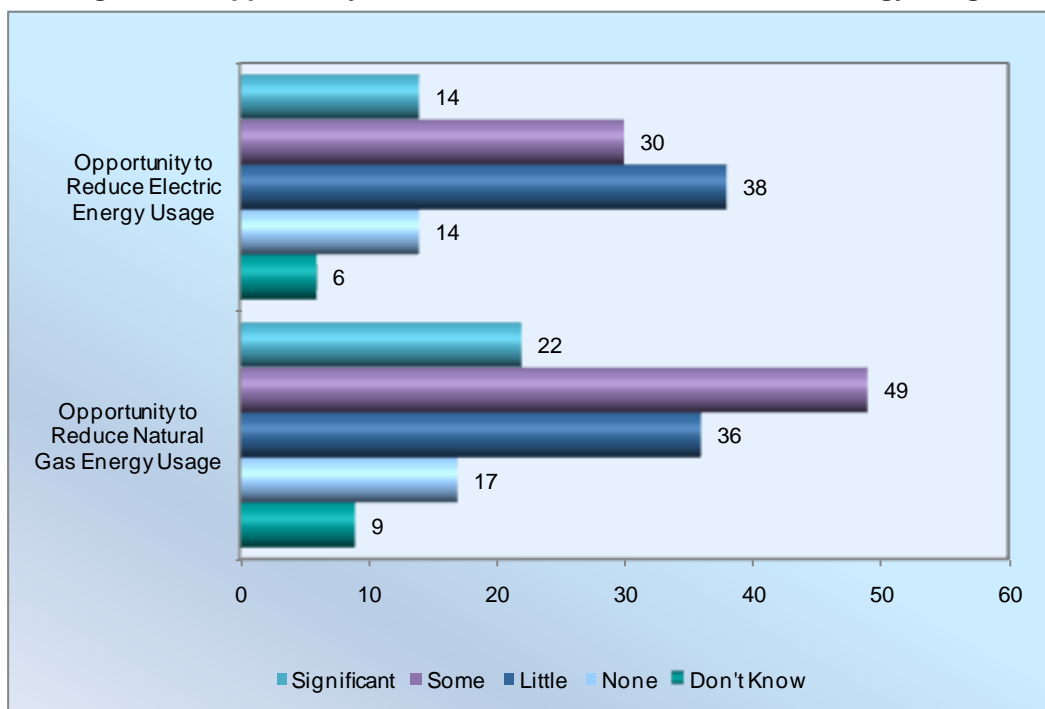


ENERGY-RELATED BELIEFS AND CONCERNS

Those who do not believe there is an opportunity to reduce energy usage in their building are likely to spend little effort finding ways to do so. Knowing the general level of belief in the opportunity to reduce energy usage can inform program developers as to the relative need for public education about energy-saving opportunities.

To address this, we asked respondents how much opportunity they believe exists to reduce natural gas and electric energy usage at their company in the coming years. Responses are summarized in Figure 6.7.

Figure 6.7: Opportunity to Reduce Electric and Natural Gas Energy Usage



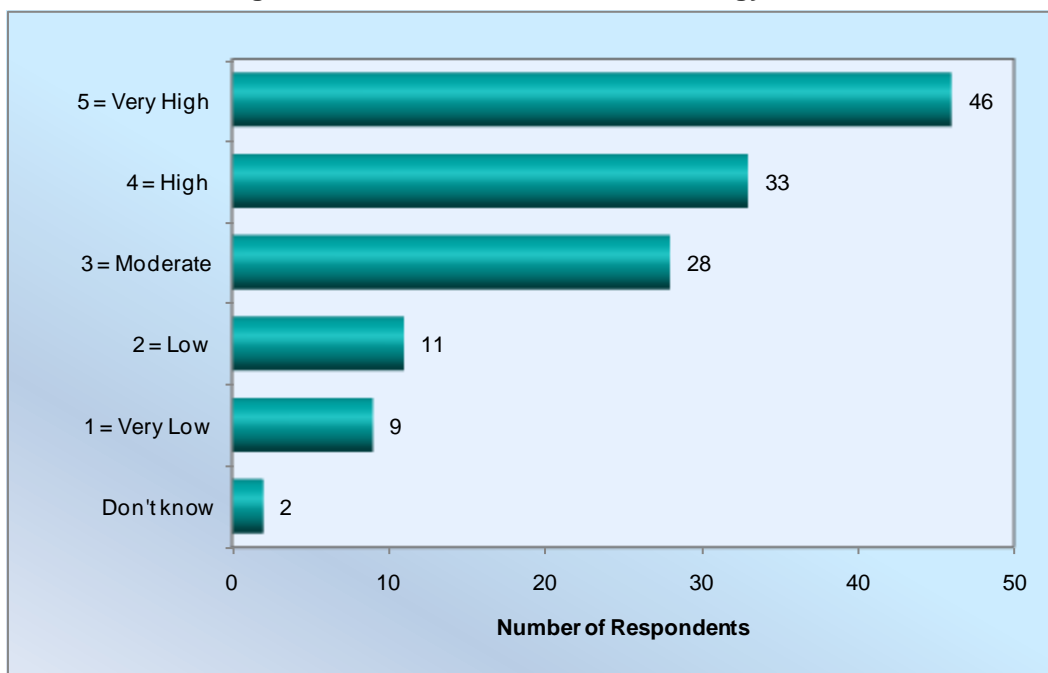
Just over half the respondents (two-third of those who had an opinion) said that they believe that there is some or significant opportunity to reduce electric usage; of those who use natural gas, however, only about four in ten (about half of those with an opinion) perceive that much opportunity to reduce gas usage.

These findings suggest that that a relatively large percentage of this sector would likely be receptive to effective program marketing and outreach. However, they also show that a large percentage remains skeptical about opportunities, suggesting the need for basic education about the opportunities that exist to reduce usage.



We also asked respondents about their level of concern about energy costs. As Figure 6.8 shows, the most frequent response was “very high.” Together, nearly two-thirds of respondents reported either high or very high concern, indicating potential interest in energy efficiency.

Figure 6.8: Level of Concern About Energy Costs



Company Policies

We followed the above by asking respondents whether their companies were actively engaged in controlling energy costs or planning to implement cost controls. About two-thirds (89 of 130) answered in the affirmative.

We asked those 89 respondents what policies or procedures were currently in place at their companies. Most reported that they were informally managing energy costs through behavior change, such as getting employees to turn off lights or equipment that were not in use, lowering heating or cooling, and so forth (Table 6.7).

Fewer reported more formal policies, although more than four in ten (about 30% of all nonparticipants) reported that their company had assigned a specific staff member to be responsible for energy and energy efficiency. The percentages reporting a written energy management plan and numerical energy savings goals were similar to what we found among the participants; however, the percentages reporting other policies and procedures were lower than



for the participants.³⁴ These findings are consistent with a NEEA survey of real estate firms (see below).

**Table 6.7: Company Energy-Related Policies or Procedures Currently in Place
(Multiple Responses Allowed)**

QUESTION	NUMBER OF RESPONDENTS	PERCENT	
		ENGAGED IN OR PLANNING ENERGY COST CONTROL (N = 89)	ALL RESPONDENTS (N = 130)
Informally Managing Energy Costs Through Behavior Changes	81	91.0%	62.3%
Staff Member Responsible for Energy and Energy Efficiency	39	43.8%	30.0%
Written Corporate Policies That Incorporate Energy Efficiency In Operations and Procurement	18	20.2%	13.8%
Written Corporate or Company Sustainability Policy	14	15.7%	10.8%
Numerical Energy Savings Goals	15	16.9%	11.5%
Written Energy Management Plan	12	13.5%	9.2%

The fact that about 14% of firms incorporate energy efficiency into their operations and procurement policies is consistent with the *McKinsey Quarterly* global study of executives.³⁵ In that study, 23% of all respondents said that climate change was frequently or always considered in purchasing or supply chain management. No figure was reported just for North American executives; however, since the comparable North American percentage for overall corporate strategy (21%) was roughly two-thirds of that for all respondents (30%), we can estimate that about 16% (two-thirds of 23%) of North American executives reported that climate change was frequently or always considered in purchasing or supply chain management.

³⁴ It is possible that some of the respondents that said their company was not controlling energy costs or planning to implement cost controls, and so were not asked about the specific policies, might have responded affirmatively to some of those latter questions. Therefore, the percentages in the right-most column of Table 6.7 should be taken as minimum percentages, with the possibility assumed that they could be higher, although it is unlikely that they are as high as the percentages in the second-right column.

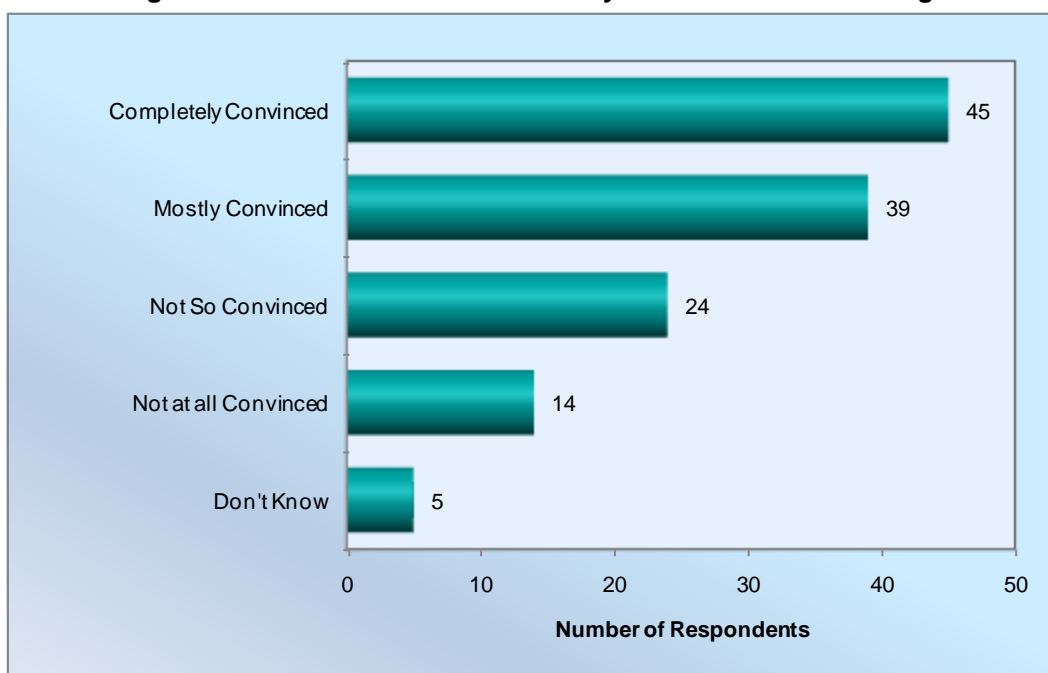
³⁵ "How Companies Think About Climate Change: A McKinsey Global Survey." *The McKinsey Quarterly*. Accessed by Internet March 26, 2009, URL: http://www.mckinsey.com/clientservice/ccsi/pdf/climate_change_survey.pdf.



Effect of Global Climate Change on Company Operations

We attempted to determine what impact, if any, the attention on global climate change has had on corporate energy-related policies and behavior. We first asked respondents how convinced they were of the reality of global climate change. As Figure 6.9 shows, about two-thirds reported being mostly or completely convinced. This is almost exactly the percentage we found in our survey of program participants, but it is slightly lower than that reported in a recent national study³⁶ and lower than what we found in a recent household survey conducted for Energy Trust.

Figure 6.9: Level of Belief in the Reality of Global Climate Change



We asked respondents whether concern about global climate change had affected the way they operate their facility (excluding those who were not at all convinced about global climate change). Of those 108 respondents, 41 (36%) said that global climate change had affected facility operations. Assuming that concern about global climate change did not affect facility operations among those who were not at all convinced of its reality, we can estimate that it affected facility operations for 31% of all nonparticipants. This figure is somewhat lower than what we found in our survey of program participants.

³⁶ A. Leiserowitz, "American Opinions on Global Warming," A Yale University / Gallup / ClearVision Institute Poll. Accessed by Internet October 23, 2008, URL: <http://www.populationmedia.org/wp-content/uploads/2008/01/americansglobalwarmingreport.pdf>.



However, the above findings are comparable to those from a global survey of executives conducted in December 2007, in which 51% of North American respondents said that it is important for their company to consider global climate change in its overall corporate strategy, but only 21% said that climate change actually is frequently or always considered in overall corporate strategy.³⁷ They also bear comparison with an international survey of over 7,000 consumers, which found that fewer than 40% of the respondents who were concerned about the environmental and social impacts of products actually buy green products.³⁸

As we found among participants, the percentage of respondents who reported that global climate change concerns had affected facility operations was much higher among those who said they were completely convinced that global climate change is occurring (over 60%) than those who said they were mostly convinced (26%) or not so convinced (12%).

As in the survey of program participants, we found no relationships between belief in global climate change and what respondents said their companies were doing about energy costs or their history of energy-efficient investment. However, those who said that recognition of global climate change had affected operations were more likely to say that their company was actively engaged in or planning energy cost controls (85% vs. 65%), that they had adopted numerical savings goals (29% vs. 7%), and that they had invested in energy-efficient equipment in the past two years (63% vs. 40%).

Thus, belief in the reality of global climate change does not by itself induce greater involvement in energy reduction, but it appears to serve as an attribution for some companies' activities.

Concerns and Questions

In addition to querying respondents about specific energy-related issues, we asked them what their general business-related concerns were. This allowed us to gain an insight into the general issues that influence their decision-making. As Table 6.8 shows, respondents were most concerned about the cost of transportation fuels and energy, as well as the overall poor performance of the economy. These concerns – particularly the concern about energy costs – indicate a market that should be receptive to effective energy efficiency programs.

³⁷ "How Companies Think About Climate Change: A McKinsey Global Survey." The McKinsey Quarterly. Accessed by Internet March 26, 2009, URL: http://www.mckinsey.com/clientservice/ccsi/pdf/climate_change_survey.pdf.

³⁸ S. Bonini and J. Oppenheim, "Helping 'Green' Products Grow." The McKinsey Quarterly, October 2008.



Table 6.8: Respondents' General Business-Related Concerns (Multiple Responses Allowed)

CONCERN	RESPONDENTS (N = 128)	PERCENT OF SAMPLE	PERCENT OF TOTAL RESPONDENTS
Transportation Costs (Diesel, Gasoline)	39	30.5%	31.7%
Energy Costs – Other or Unspecified	34	26.6%	27.6%
Poor Economy	34	26.6%	27.6%
Rising Costs – General or Other	25	19.5%	20.3%
Need for Alternative Energy	9	7.0%	7.3%
Business Competitiveness	8	6.3%	6.5%
Tax Issues	8	6.3%	6.5%
Other	14	10.9%	11.4%

This conclusion is supported by the fact that 100 of 128 respondents (78%) said that they would participate in the Existing Buildings program if they were to install equipment that qualified for an incentive.

When we asked what questions or concerns they had about the program, the largest number of them reported none (Table 6.9). Of the rest, the most frequent response was to express a desire for more program information. Second to that was the adequacy of incentives to offset costs.

Table 6.9: Questions or Concerns about Existing Buildings Program (Multiple Responses Allowed)

QUESTION OR CONCERN	RESPONDENTS (N = 130)	PERCENT
Would Like More Program Information	22	16.9%
Cost-Related Issues (e.g., ability of incentives to offset costs)	19	14.6%
Availability of Incentives	14	10.8%
Uncertainty About the Process	11	8.5%
Time Required to Participate	7	5.4%
Tenants Lack Power Over Decisions	5	3.8%
Other	15	12.3%
None	45	34.6%



Desired Assistance

To further clarify these respondents' needs, we asked what types of assistance from Energy Trust would be valuable to them. We asked respondents to identify the two most valuable forms of assistance from a list of six. As Table 6.10 shows, the most frequently mentioned was incentives for energy-efficient upgrades, followed closely by building audits.

Table 6.10: Assistance that Would Be Valuable (Multiple Responses Allowed)

VALUABLE ASSISTANCE	RESPONDENTS (N = 130)	PERCENT
Incentives for Energy-Efficient Building Upgrades	51	39.2%
Building Audit	49	37.7%
Information on Energy Management Best Practices	41	31.5%
Incentives for Tune-Ups of Existing Equipment	40	30.8%
Tax Credits for Energy-Efficient Building Upgrades	33	25.4%
Specialized Technical Training for Building Operators and/or Equipment Techs	13	10.0%

Smaller, but still substantial, proportions of respondents endorsed incentives for tune-ups of existing equipment and information on energy management best practices for their type of business. The least frequently endorsed item was specialized technical training.

When we asked what other assistance would be useful (put as an open-ended question), seven each mentioned the audit, information on best practices, and tax credits in addition to the two that they had selected as most valuable. Four each said incentives on tune-ups and upgrades, and three said technical training. Sixteen cited a variety of other assistance.

Building owners were more than twice as likely as were tenants to say that they would like incentives for existing equipment tune-ups (38% vs. 15%), but respondent groups did not differ on any of the other items.

ENERGY MANAGEMENT HISTORY

To help interpret what respondents told us about their current practices, we asked a variety of questions about their energy management history. Specifically, we asked about: their energy efficiency purchases and upgrades; reasons for not having made efficiency purchases and upgrades; any previous attempts to participate in the Existing Buildings program; other energy management activities that their company had engaged in; and what they believe are the main barriers to effective energy management.



Purchases and Upgrades

We asked survey respondents whether, in the past two years, their company had purchased energy-efficient equipment or made energy-efficient upgrades, had purchased equipment or made upgrades that were not energy-efficient, or had not purchased equipment or made an upgrade. The results are shown in the top half of Table 6.11.

Table 6.11: Energy-Efficient Purchases or Upgrades in Past Two Years

RESPONSE	RESPONDENTS (N=129)	PERCENT
PURCHASES OR UPGRADES IN PAST TWO YEARS		
Purchased Energy-Efficient Equipment or Made Energy-Efficient Upgrades	60	46.5%
Purchased Non-Efficient Equipment or Made Non-Efficient Upgrades	4	3.1%
Has Not Purchased Equipment or Made Upgrades	54	41.9%
Don't Know	11	8.5%
TOTAL	129	100.0%
TYPE OF ENERGY-EFFICIENT EQUIPMENT OR UPGRADE (MULTIPLE RESPONSES ALLOWED)		
Lighting	28	46.7%
Any Heating System*	20	33.3%
• Heating System (Gas)	17	28.3%
• Heating System (Electric)	6	10.0%
• Heating System (Other)	1	1.7%
Any Cooling System	13	21.7%
• Cooling System (Gas)	4	6.7%
• Cooling System (Electric)	6	10.0%
• Cooling System (Other)	4	6.7%
Any Envelope	13	21.7%
• Windows	6	10.0%
• Insulation	6	10.0%
• Other Envelope	5	8.3%
Water Heating	6	10.0%
Controls	5	8.3%
Cooking Equipment	4	6.7%
Don't Know/Other	19	31.7%

* Some respondents mentioned both gas and electric or other heating



As seen in Table 6.11, nearly half of respondents said that their company had purchased equipment or made upgrades that were energy-efficient. Of the rest, most had not purchased any equipment or made upgrades. Very few reported that their company had made purchases or upgrades that were not energy-efficient.

Of those who said that they had made energy-efficient investments in the past two years, nearly half said that those had been in lighting measures. One-third said that they had purchased or upgraded their heating system, most frequently gas heating. About one-fifth each said that they had invested in improving cooling systems or in envelope measures.

We asked those who 58 respondents who reported that they had not made energy-efficient purchases or upgrades why they had not done so. Consistent with the above finding, the most frequent response for this group was that they had not made any purchases (Table 6.12). However, this accounted for only about one in five respondents. Other common responses were that energy efficient was not a priority, the equipment cost was too high and/or not sufficiently offset by an incentive, and that they were not aware that energy efficient options were available.

**Table 6.12: Reasons for Not Making Energy Efficient Purchases or Upgrades
(Multiple Responses Allowed)**

REASON	RESPONDENTS (N=58)	PERCENT
No Equipment Purchases	13	22.4%
Energy Efficiency Not A Priority	9	15.5%
Cost Too High / Not Sufficient Incentive	9	15.5%
Not Aware That Energy Efficient Options Were Available	8	13.8%
Did Not Think Energy Efficient Options Would Work	1	1.7%
Don't Know / No Response	2	3.4%
Other	17	29.3%

Eleven of the 23 tenants who answered this question (48%) said that the fact that they lease the space was a reason they did not make energy-efficient purchases or upgrades. This finding confirms that building tenancy is a barrier to making investments in energy efficiency, and underscores the need to develop and market energy efficiency opportunities specifically to building tenants.

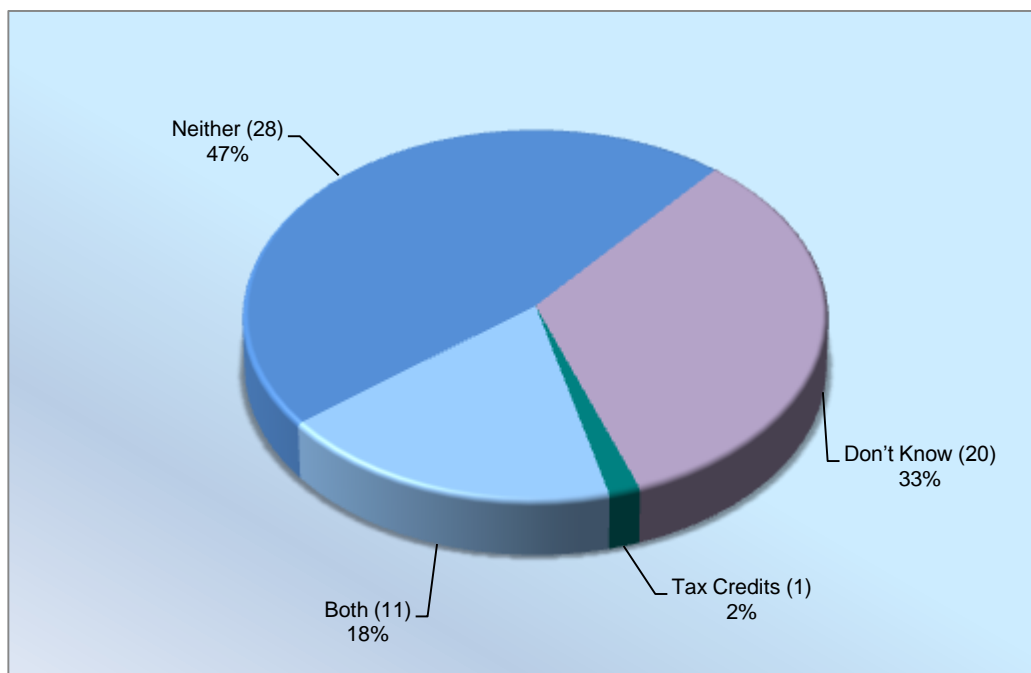
Reasons for Not Applying for an Incentive

We asked several questions to understand why those who had made energy-efficient investments had not applied for an Energy Trust incentive through the Existing Buildings program. First, we asked if the contractor or vendor who sold them the equipment had mentioned that incentives or



tax credits were available for energy-efficient equipment. As Figure 6.10 shows, only 12 said that the contractor or vendor informed them about either the incentive or tax credits: 11 said that that person mentioned both and one said they were told only about the tax credits.

Figure 6.10: Did Vendor Mention Availability of EB Incentives or the BETC for Energy-Efficient Equipment



We asked why they had not applied for an Energy Trust incentive. Nearly one-third mentioned lack of awareness of the Existing Buildings program (Table 6.13) – all but one of these were among those who said that their vendor had not mentioned the availability of an incentive or could not remember being told. Only about one-tenth of the respondents indicated that they had thought the incentive too small to bother about.

It is interesting that lack of program awareness was often mentioned as a reason for not applying for the incentive, even though it was not mentioned when we earlier asked respondents why they had not purchased energy-efficient equipment or made energy-efficient upgrades. The most frequent reason given for not purchasing energy-efficient equipment was simply that they had not purchased equipment or made upgrades at all.



Table 6.13: Reasons for Not Applying for an Energy Trust Incentive

REASON	RESPONDENTS (N = 59)	PERCENT
Not Aware of the Program	19	32.2%
Internal Company Reasons Unrelated to the Program	8	13.6%
Incentive Likely Too Small to Bother With	6	10.2%
Thought Incentives Not Available at the Time	2	3.4%
Would Have Caused An Unacceptable Delay	2	3.4%
Did Apply (Was Not Accepted)	5	8.5%
Don't Know	12	20.3%
Other	9	15.3%

Perhaps knowing about the availability of incentives would have induced some of them to make purchases or upgrades. In future evaluations, it would be worthwhile to ask respondents explicitly *why* they made no purchases or upgrades, whether they would have done so if they had known about the program, and whether they are likely to make purchases in the future now that they are aware of the program.

Application for a BETC

Of 33 respondents who had made energy-efficient equipment purchases or upgrades and had indicated familiarity with the BETC, nine (27%) reported that they had applied for a BETC. When those who had not were asked why, five said they thought the tax credit probably was too little to bother with and two thought that the tax credit was not available at that time. Four gave a variety of miscellaneous other responses, such as that they thought they did not qualify.

Past Participation in Energy Trust Programs

Eleven respondents reported that they previously had begun to participate in an Energy Trust program but had discontinued for some reason. Of these, six said that it had been within the past two years. The most common reason given for not continuing was that the equipment they were installing did not qualify. No other response was given by more than a single respondent. No one reported that they had discontinued participation because of the difficulty of fulfilling program requirements.

Other Actions to Reduce Energy Costs

To fill out our picture of the energy-reduction behavior of these respondents, we asked what else they had done to reduce energy costs. In all, 87 respondents (68%) reported at least one energy-



reduction behavior – almost exactly the number who said that their company was actively engaged in controlling energy costs or planning to implement cost controls. As Table 6.14 shows, about one-third reported that they made an effort to turn off equipment or put it in standby mode. Other common responses were reducing heating and lighting.

Again, these results indicate a high level of energy awareness in this market. The fact that the percentage that reported one or more of the above behaviors was about half again as high as the percentage that actually had made energy-efficient purchases or upgrades points to the opportunity for continued program intervention.

Table 6.14: Other Energy-Reduction Behaviors

ACTIONS	RESPONDENTS (N = 128)	PERCENT
Turned Off Equipment More / Put Equipment In Standby Mode	41	32.1%
Used Heating Less / Reduced Heating Temperature	23	18.0%
Reduced Lighting	22	17.2%
Bought Energy-Efficient Equipment	18	14.1%
Other / Unspecified Behavior Changes (e.g., cutting back usage)	15	11.7%
Installed Lighting Controls	12	9.4%
Used Cooling Less	11	8.6%
Made Energy-Efficient Upgrades to Building Space	10	7.8%
Employee / Tenant Awareness	8	6.2%
Other	10	7.8%

Primary Challenges to Improving Energy Management

We concluded by asking respondents what they thought were the primary challenges to improving energy management in their companies (Table 6.15). Nearly half cited resource issues, of which the most common was cost. About one-third mentioned management-related issues, most often raising staff awareness of the need to reduce energy consumption and how to do so. This is the first place where cost was mentioned as a primary barrier to greater energy efficiency. It is not entirely clear why this did not come out in earlier questions. Nevertheless, it does confirm that cost is still a barrier to investing in equipment and upgrades and underscores the value of the Energy Trust incentive. Together with the findings of lack of program awareness and the respondents' interest in and desire for information about the program, this supports the conclusion that continued and increased efforts to reach the nonresidential building sector through effective marketing and outreach should produce continued efficiency gains.



Table 6.15: Challenges to Energy Management

CHALLENGE	RESPONDENTS (N = 128)	PERCENT
Resource Issues	61	47.7%
• Cost	35	27.3%
• Difficulty In Implementing Energy Efficiency Measures	14	10.9%
• Availability of Appropriate Technology	8	6.2%
• Availability of Trained Staff	4	3.1%
• Availability of Time to Implement Energy Efficiency	4	3.1%
• Other Resource Issues	4	3.1%
Management-Related Issues	43	33.6%
• Staff Awareness	30	23.4%
• Management Awareness	12	9.4%
• Management Policy	11	8.6%
• Other Operational Issues	3	2.3%
Other	16	12.5%

Among the 41 tenants, six (15%) said that the fact that they lease the building is a primary challenge to energy management, indicating that the majority of those who lease realize that there still are energy management options open to them (other than, say, major facility upgrades).

TENANT-OWNER INTERACTIONS

We asked a variety of questions to get a sense of the level of discussions or negotiations between tenants and building owners or managers over utility energy costs and energy efficiency upgrades. We first identified tenants that paid their own electric or gas utility bills and asked about the existence of annual true-ups or pass-throughs, the importance of utility energy costs in negotiating leases, any assistance they had asked for and/or received with energy costs, and their satisfaction with what the building owners or managers had done regarding energy costs.

We then identified building owners or managers that had tenants that paid their own electric or gas utility costs. Of these, we asked about the existence of annual true-ups or pass-throughs, and whether any of the tenants had complained about energy costs or had undertaken their own energy-savings improvements in the past two years.

Tenants

Of 39 tenants, 12 indicated that either electricity or gas costs are covered in their lease. Eleven of the 12 said that they had neither an annual true-up nor pass-through, and one did not know.

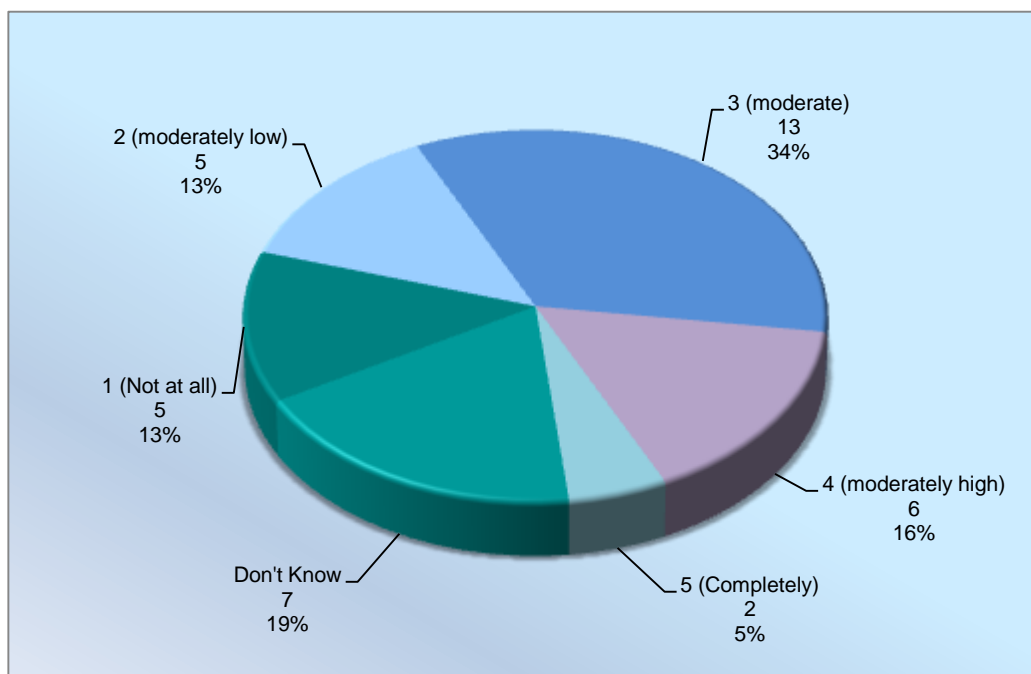


Six had negotiated a lease within the past year, none of whom said that utility energy costs had been important in negotiating the lease. Only two indicated that they were negotiating a new lease or planned to do so within the next two years, one of whom indicated that utility energy costs would be moderately important.

Only 2 of the 12 had ever asked the building owner or manager for assistance with energy costs. One of the 12 reported that the owner or manager had installed energy-efficient equipment; 8 of the others explicitly stated that the owner had done nothing, and the rest did not respond.

We asked all tenants to rate their satisfaction with what their building owner or manager had done regarding energy costs. We asked them to respond on a scale from 1 to 5, where 1 was defined as “not at all satisfied” and 5 was defined as “completely satisfied.” We told them that, even if the owner or manager had not done anything, we would like to know how satisfied they were with that fact. As Figure 6.11 shows, the largest group – about one-third – indicated a moderate level of satisfaction. The rest were somewhat evenly split between moderately high to complete satisfaction, moderately low to no satisfaction, and uncertain.

Figure 6.11: Tenants’ Satisfaction with Building Owner/Manager’s Attention to Energy Costs



Owners and Managers

Of the 91 owners and managers we spoke with, 31 had tenants. Of those, 27 said that electric or gas bills are covered in the lease for at least some of their tenants. One reported that tenants had



annual pass-throughs and one reported both pass-throughs and true-ups. Of the rest, 13 said there were neither pass-throughs nor true-ups, and 12 did not know.

Only three respondents reported that any of their tenants had complained to them about energy costs, and three different respondents said that tenants had made their own energy-saving improvements.

Summary of Tenant-Owner Interactions

Taken together, the above results suggest little discussion or negotiation between tenants and building owners/managers regarding energy costs. Both tenants and owners/managers reported a very low incidence of true-ups or pass-throughs. Few complaints were reported, energy costs did not play a large role in negotiating leases, and little assistance was asked for or provided. All in all, the tenants were neither highly satisfied nor highly dissatisfied with their building owner's /manager's actions to control energy costs.

There is some asymmetry between what the owners/managers reported about energy-saving improvements that their tenants had undertaken and what tenants reported in this survey. While only three owners reported that any of their tenants had undertaken any improvements, 14 of 38 tenants in this survey (37%) reported that their company had purchased energy-efficient equipment or made upgrades in the past two years. This asymmetry bears further investigation.

The generality of these findings is somewhat constrained by the small sample sizes. Moreover, there is some asymmetry between the tenants and owner/managers in the responses regarding the incidence of including utility energy costs in leases. Fewer than one in three tenants indicated that the costs were covered, yet almost all of the owners or managers who had tenants said that energy costs were covered in leases for at least some of them. This may simply indicate that most owners or managers include energy costs in some leases, but not in others – with the average working out to be about one-third of leases covered. Additional research on this question should include questions about the proportion of leases that do or do not cover utility energy costs.

THE REAL ESTATE MANAGEMENT MARKET

For the survey of nonparticipants, we contacted building owners and occupants but did not contact firms that manage buildings for other owners. Information about this group was obtained from research undertaken in 2007 as part of the evaluation of NEEA's Office Real Estate Initiative.³⁹ This evaluation included a survey of 49 senior-level and property-management staff at 33 medium and large real estate firms that own, manage, and/or develop office buildings in the

³⁹ *Office Real Estate Initiative Market Progress Evaluation Report*. Prepared by Research Into Action, Inc., for the Northwest Energy Efficiency Alliance, January 25, 2008. Source: <http://www.nwalliance.org/research/reports/E08-181.pdf>.



three major Pacific Northwest markets (Seattle, Portland, Boise). Together, the firms in this survey represented approximately 55% of the total square footage of office space in the Pacific Northwest.

The results of the NEEA survey showed an interest in sustainability and energy efficiency at least comparable to, and to some extent exceeding, what we found among tenants and owners – a finding that is not surprising, given that the NEEA survey selected medium-to-large firms responsible for real estate management, which would be expected at least to be aware of a wide range of improvement opportunities, while we surveyed a random sample of building owners and occupants. Responses indicated strong interest in energy efficiency and the use of a variety of energy management practices. Although the questions used in the two surveys differed somewhat, comparisons can be drawn regarding some of the key findings.

First, nearly all respondents to the NEEA survey indicated an interest in energy efficiency for one reason or another. Nearly all (96%) said their firms were interested or very interested in making their office buildings more energy-efficient as a way to improve their financial performance, and two-thirds to three-quarters said there was good or great potential for energy efficiency to improve office building net operating income, net asset value, marketability, and tenant satisfaction. These figures somewhat indicate a somewhat higher level of awareness of the potential for energy efficiency than among the owners and tenants in our survey. For example, while about nine in 10 of our respondents reported their companies made some efforts to reduce energy usage, only slightly more than half indicated belief that there is opportunity to reduce electric usage in their buildings.

Some respondents to the NEEA survey said that the potential for energy efficiency was limited by the fact that tenants do not care about it or are more interested in comfort and amenities. This finding is consistent with our own findings that owners believe that most tenants have not made energy efficient investments, that energy costs have not been a large issue in lease negotiations, and that few tenants had complained about energy costs or asked for assistance with costs. However, given our finding that 37% of tenants actually *had* made energy efficient investments, the fact that owners (our survey) and real estate managers (the NEEA survey) believe they are not interested in energy efficiency says more about tenant-owner and tenant-manager interactions than about tenants' true interests.

Similar to our survey, the NEEA study asked respondents about energy management activities that their firms were engaged in. All 33 firms reported at least one energy management activity from a list the researchers presented. The responses from the two surveys can be compared on three particular items from this list, all of which indicate greater activity on the part of the professional real estate management firms than owners and tenants.

- ➔ First, all but one of the NEEA respondents reported that their firms currently were managing energy through energy efficient retrofits, compared to just under half of our



respondents who had made energy efficient purchases or upgrades within the past two years.

- ➔ Second, nearly three-quarters of the NEEA respondents reported that they had staff trained on energy topics. While we did not ask about current staff training, we did ask respondents what types of Energy Trust service would be most valuable to them, and only 10% listed specialized staff training among the two most valuable services. While this may indicate no need for training because they already provide it or simply that they place higher priority on other services, it may also suggest lack of appreciation of the value of such training.
- ➔ Third, more than one-third of the NEEA sample said their firms had energy efficiency standards for new buildings or major renovations that exceed code. Again, while the data from our study are not directly comparable, we found that about one-fifth of respondents have written energy efficiency standards in operations and procurement and about one-sixth have a written corporate sustainability policy.

Other energy management activities reported by the NEEA respondents for which we do not have comparable data are benchmarking (64%), recognition of staff energy efficiency initiatives (45%), retrocommissioning (39%), commissioning (36%), and pursuing LEED certification (33%).

One interesting comparison is that, while the real estate management firms surveyed by NEEA appear to be somewhat more active than the tenants and owners of our survey, similarly low percentages of both groups (about one-sixth) reported that their companies have specific energy reduction goals.

SUMMARY

Respondents represented a good range of building types and company sizes.

Most respondents were familiar with Energy Trust, although fewer than one-third were aware specifically of the Existing Buildings program. Moreover, knowledge about Energy Trust services was not highly detailed. Energy Trust program contacts and advertising, together with a variety of personal and professional sources, were the most common channels of program awareness. In contrast to the program participants, vendors and contractors were not a key channel of program awareness for these respondents.

A variety of findings converge to indicate that the market represented in this sample is interested in energy efficiency. Energy costs were a chief concern of these respondents. About two-thirds of respondents said that their companies were actively engaged in controlling energy costs or planning to implement cost controls and were able to name at least one thing their company was doing to manage energy.



Of those who had made energy efficiency investments, lack of program awareness was a chief reason for not having participated in EB. If we can suppose that some of those who made no equipment purchases or upgrades were held back by cost considerations – as suggested by the frequency with which cost was mentioned as a barrier to energy management – then greater program awareness could possibly have induced more energy efficiency investment.

In support of this supposition, respondents indicated interest in a variety of program services, as well as a desire to learn more about the program. Nearly eight in ten said that they would participate in the Existing Buildings program if they were to install qualifying equipment.

Responses of tenants indicated that building tenancy is a barrier to making investments in energy efficiency, which underscores the need to develop and market energy efficiency opportunities specifically to that group. Most tenants, however, did not report tenancy as a primary challenge to energy management overall, suggesting that most realize that there are opportunities to control energy costs other than through equipment purchases and building upgrades (e.g., through operations and management practices).

Together, the fact that cost remains a significant barrier to energy management, the fact that many in this sector are not highly familiar with the Existing Buildings program, and the respondents' interest in and desire for information about the program support the conclusion that continued and increased efforts to reach the nonresidential building sector through effective marketing and outreach should produce continued efficiency gains.



7

IMPACT ANALYSIS

An impact evaluation was conducted for the 2006-2007 Existing Building Program. The evaluation combined on-site verification and engineering assessment with statistical billing analysis. Reported gross savings were discounted by verified savings ratios - realization rates – to calculate an adjusted gross savings number. The realization rate was based on verification site visit results and billing analysis, as described later in this Chapter. The adjusted gross savings were then further discounted by a net factor calculated as (one minus the free-rider ratio). The free-ridership ratio was based upon survey and interview self-reports, as described in Appendix A.

Realization rates and free-ridership ratios could not always be calculated at the measure level, and other decision rules were applied and are described in the findings sections. Overall realization rates and free-rider ratios are savings-weighted.

Impact evaluation results are shown by year, and for the two-year program period as a whole. The first section of this chapter describes the participant database and the sampling plan used. The following section describes the engineering verification approach in general, and by specific measures or end uses. The third section presents the results of the engineering verification and the calculation of realization rates. The fourth section describes the billing analysis approach and summarizes the realization rates for the by program year and for the two-year program cycle. The last section shows how the results were integrated with the free-ridership estimates, extrapolated to the population of participants and how the net savings by year and for the two-year program cycle.

PROGRAM ACCOMPLISHMENTS AND SAMPLING STRATEGY

As shown in Table 7.1, the ETO Building Efficiency Program had 1,611 total participants in 2006 and 1,463 participants in 2007, and a total projected savings of over 1.5 million therms and 57 million kWh.

Table 7.1: Program Participation Totals

YEAR	SITES	THERMS	KWH
2006	1,611	985,727	31,326,511
2007	1,463	526,998	26,531,894
Total	3,074	1,512,725	57,858,405



Table 7.2 shows the breakdown of measure types installed by the program for the two-year program period. As the table shows, there was a preponderance of “food service” and “lighting” measures. The former – mostly cooking and pre-rinse spray valves – made up 37% and 27% of all measures installed in 2006 and 2007, respectively, and the latter made up 56% and 65% of all measures installed.

Table 7.2: Measure Category by Program Year

MEASURE TYPE	MEASURES		THERMS		KWH	
	COUNT	PERCENT	SAVINGS	PERCENT	SAVINGS	PERCENT
2006						
Custom Controls	43	1%	213,370	22%	7,959,488	25%
Custom Gas	14	0%	106,602	11%	230	0%
Custom Other	13	0%	3,048	0%	406,124	1%
Food Service	1,271	37%	314,494	32%	1,174,380	4%
HVAC	90	3%	219,752	22%	6,929,074	22%
Insulation	35	1%	115,098	12%	0	0%
Lighting	1,937	56%	-5,229	-1%	10,876,113	35%
Motors	38	1%	12,150	1%	3,981,102	13%
Solar	5	0%	6,442	1%	0	0%
Water Heating	0	0%	0	0%	0	0%
Overall	3,446	100%	985,727	100%	31,326,511	100%
2007						
Custom Controls	26	1%	38,848	7%	1,841,976	7%
Custom Gas	6	0%	41,737	8%	0	0%
Custom Other	42	1%	1,077	0%	2,032,249	8%
Food Service	1,003	27%	170,067	32%	1,162,628	4%
HVAC	144	4%	249,135	47%	4,045,559	15%
Insulation	17	0%	19,429	4%	0	0%
Lighting	2,386	65%	0	0%	15,307,218	58%
Motors	30	1%	0	0%	2,089,470	8%
Solar	10	0%	4,806	1%	52,794	0%
Water Heating	3	0%	1,899	0%	0	0%
Overall	3,667	100%	526,998	100%	26,531,894	100%
Continued						



MEASURE TYPE	MEASURES		THERMS		KWH	
	COUNT	PERCENT	SAVINGS	PERCENT	SAVINGS	PERCENT
TOTAL						
Custom Controls	69	1.0%	252,218	16.7%	9,801,464	16.9%
Custom Gas	20	0.3%	148,339	9.8%	230	0.0%
Custom Other	55	0.8%	4,125	0.3%	2,438,373	4.2%
Food Service	2,274	32.0%	484,561	32.0%	2,337,008	4.0%
HVAC	234	3.3%	468,887	31.0%	10,974,633	19.0%
Insulation	52	0.7%	134,527	8.9%	0	0.0%
Lighting	4,323	60.8%	-5,229	-0.3%	26,183,331	45.3%
Motors	68	1.0%	12,150	0.8%	6,070,572	10.5%
Solar	15	0.2%	11,248	0.7%	52,794	0.1%
Water Heating	3	0.0%	1,899	0.1%	0	0.0%
Overall	7,113	100%	1,512,725	100%	57,858,405	100%

The preponderance of food service and lighting measures suggested that the evaluation approach should consider projects that involved food service or that involved only lighting measures separately from other types of projects. As Table 7.3 shows, of the 1,611 project sites for 2006, there were a total of 220 sites that had only lighting measures and 1,204 that had only food service measures, leaving 187 sites with other project types. Similarly, the 1,463 projects sites for 2007 comprised 384 lighting-only sites, 861 food-service sites, and 218 other types.

Table 7.3: Proposed Sampling Strategy

TYPE OF PROJECT	NUMBER OF SITES	THERMS		KWH	
		SAVINGS	% OF TOTAL	SAVINGS	% OF TOTAL
2006					
Lighting-Only	220	0	0%	7,641,901	24%
Food Service	1,204	300,441	30%	1,156,236	4%
Other	187	685,286	70%	22,528,374	72%
Total	1,611	985,727	100%	31,326,511	100%
2007					
Lighting-Only	384	0	0%	12,933,223	49%
Food Service	861	165,235	31%	1,156,633	4%
Other	218	361,763	69%	12,442,038	47%
Total	1,463	526,998	100%	26,531,894	100%



Based on the above, we decided upon a multi-method approach to evaluation, combining site verification and engineering analysis and billing analysis. We decided to focus the verification and engineering on the largest sites, which contributed the most to annual savings, supplemented with a sample of the “other” projects, that is, those that included measures other than or in addition to lighting and food service measures; we relied on billing analysis to determine savings levels for the lighting-only and food-service projects (except those that were among the largest projects; details below).

For the 2006 program year, the 187 “other” sites represented approximately 70 per cent of the total gas and electric reported program savings. For 2007, the 218 sites also represented approximately 70 percent of reported gas savings, but only about 50 percent of the electric savings. The difference between the two cohorts is the proportion of lighting-only participants. The same proportion of food-service customers participated in 2006 and 2007, but the proportion of lighting-only customers almost doubled in 2007.

The two verification samples were each stratified by total gas and electric savings. We created two strata, “Largest” and “Other”, as shown in Table 7.4. (See process flow diagram, Appendix D.) We proposed conducting a census verification of the 20 largest participants for both gas and electric savings, by year, and a stratified random sample (based on savings) of the “Other” sites, by program year. Note that the “Largest” site category was comprised of the largest savers regardless of the project types, and so it included some lighting-only and food-service projects.

Table 7.4: Verification Sample Strata

STRATUM	N SITES	SAVINGS		PERCENT OF TOTAL SAVINGS	
		THERMS	KWH	% GAS**	% ELECTRIC**
2006					
Largest	34	447,505	14,526,156	65%	64%
Other *	85	146,650	6,502,374	21%	29%
Largest + Other	119	594,155	21,028,530	87%	93%
2007					
Largest	40	281,909	8,307,014	78%	67%
Other *	109	51,590	3,642,033	14%	29%
Largest + Other	149	333,499	11,949,047	92%	96%

* Includes alternates; the target was about 60 “others” for each year.

** Percent of total savings, excluding “lighting-only” and “food service”.

For the 2006 proposed sample, the “Largest” stratum contains only 34 sites because some were the largest in both gas and electric savings. On the other hand, the 20 largest 2007 gas and electric participants were mutually exclusive, so the 2007 “Largest” stratum contains 40 sites.



The core of the impact evaluation is the site verification and engineering assessment presented in the next section.

IMPACT EVALUATION VERIFICATION APPROACH

The primary objective for this impact evaluation was to determine the gross and net electrical and natural gas savings resulting from participation in the program during 2006 and 2007.

The approach for the impact evaluation comprised the following procedural steps:

- ➔ Project documentation (e.g., audit reports, savings calculations, and submitted program requirements) was reviewed for the selected sample sites, focusing on baseline documentation, savings calculation procedures and methodology impacting energy savings.
- ➔ On-site data collection was conducted to review and verify the savings associated with each sample site. Monitoring equipment was used at some sites to gather more accurate real-time data as well as to verify equipment hours of operation.
- ➔ Gross savings were calculated for each sample site using proven engineering techniques and methodology.
 - Analysis of lighting savings was accomplished using the Bonneville Power Authority Lighting Calculator as well as lighting manufacture product catalogs based on lamp and ballast data collected during on site inspections.
 - For HVAC measures, the original savings calculations and parameters used were reviewed and verified using industry standards.
 - Electric and gas billing data were used for sample sites with unverifiable savings.
- ➔ Electric and gas billing data were also used for lighting-only and food-service sites that were not among the largest sites and that, therefore, did not receive on-site verification.
- ➔ Either a telephone or on-site survey was also conducted for the majority of sample participants to gather information regarding their decision-making process, program feedback, and other factors influencing the net-to-gross savings.

Program File Documentation Review

Upon selecting the sample sites within each program year, we performed an in-depth review of pertinent documentation from each file. Within each site's project file, we paid particular attention to collecting baseline data prior to the installation of conservation measure(s), as well as documentation for the equipment changed. Each measure was reviewed for the following information:



- ➔ Baseline data, including model numbers, energy use calculations and assumptions, performance data and operating conditions.
- ➔ Conservation measure data including, model numbers, savings reduction calculations and methodology, hours of operation and correctness of calculations.

On-Site Data Collection Procedure

We collected on-site data relating to the installed conservation measures at each site to calculate the associated savings impacts. For each site, we used a unique data collection form listing the necessary items to review, which was based on the documentation collected from the ETO EB files.

During each on-site visit, the evaluation team accomplished the following:

- ➔ Verified that the installed measure(s), for which the program participants received an incentive payment, was (1) still installed, (2) still operating and functioning, and (3) was in accordance with the number of measures paid on.
- ➔ Collected needed physical data to be further analyzed to determine the energy savings as a result of the installed energy efficient improvements. The pertinent data collected from each site was determined based on the in-depth review of the sites project files and was unique to each measure.
- ➔ Conducted interviews with facilities personal involved with the conservation project to obtain further information, as well as to verify the accuracy of submitted assumptions that related to the energy savings calculations, which could not be verified on site.
- ➔ Used monitoring equipment to gather both real-time data during the on-site inspection and trend data over a period of several weeks. Real-time data were used to verify the conditions of the operating system during the on-site inspection.

Data Monitoring

We performed longer-term monitoring in only one instance. A total of 18 projects (10 in 2006 and 8 in 2007) involved VSDs in very similar applications. While operating conditions were verified at all sites, one was selected for monitoring and logging for a period of two months. Results were then used to adjust engineering estimates at all the sites. Additionally, our evaluation team was able to obtain trend data at a number of sites that currently operate their buildings using a direct digital control (DDC), energy management system (EMS), or another form of computerized control system, which often are a built-in function.



Procedures for Verifying Savings by Measure Type

The engineering procedures and methodology used to verify savings for each project are selected based on the end-use measure type installed. The various types of measures are as follows:

- ➔ Lighting and Lighting Control Measures
 - Custom Controls
- ➔ HVAC Equipment and Control Measures
 - Custom Controls
 - Custom Gas
 - Custom Other
 - Motors
- ➔ Prescriptive Measures
- ➔ Solar

The methodology and procedures used for verifying energy savings from these various measure types are discussed below.

Procedures for Verifying Savings from Lighting and Lighting Control Measures

Verification of lighting projects for the EB program evaluated two types of lighting projects.

- ➔ A lighting retrofit, including the replacement and change out of lamps, ballasts and/or fixtures. These types of measures reduced demand but the hours of operation tended to stay the same.
- ➔ Lighting control strategies, including such technologies as occupancy sensors, daylight dimming controls and automated lighting control systems were also evaluated. These measure types typically involve a reduction of operating hours to more closely match building occupancy.

Analyzing the savings for lighting measures required documentation of the baseline wattage, number of fixtures, and the hours of operation, which was reviewed within each file prior to conducting an on-site inspection.

We verified the energy efficient replacement input wattage using several sources, including the Bonneville Power Authority Lighting Calculator and industry manufacture lamp and ballast product catalogs. Each ballast was verified using an electron ballast tester, which distinguishes between electronic (energy efficient) and magnetic ballasts. We also evaluated the hours of operation for each site and based on the functionality of the buildings' occupants within each differing space.



We also evaluated lighting control systems, including occupancy sensors, daylight dimming controls and automated time clock controlled systems, focusing specifically on functionality and hours of operation scheduling. Occupancy sensors were checked twice per site visit, initially to trigger the sensor activating the lights and again to determine whether the lights were turned off. Lighting automation systems were visually inspected for scheduled operation hour set points and then verified against the claims used in the submitted calculations.

In addition to the parameters listed above, we also conducted on-site interviews with building operators and facility staff to verify the hours of operation and the areas where the fixtures were installed/replaced. The field engineer then calculated the lamp and ballast information for each fixture, counting the number of fixtures installed and organizing those fixtures affected by lighting controls systems, for those facilities that installed this measure.

Procedures for Verifying Savings from HVAC Measures

For sites with HVAC measures, the emphasis of savings verification was on the hours of operation and the operating conditions of the equipment.

On-site inspections included an interview with facility personnel and focused primarily on the hours of operation and proper installation of the energy efficient equipment. The characteristics and operating parameters based on each measure were carefully analyzed and verified.

For sites whose savings were based on building simulation models (e.g. eQuest, DOE 2, Energy Pro), we paid particular attention to file documentation containing the baseline operating equipment, conditions, and assumptions that went into the model. The baseline documentation served as a starting point at which the energy efficiency equipment installed could be measured against and compared to the claimed savings. In the event that the modeling inputs were not available, the impact team attempted to retrieve those documents from the PMC to review the simulation model.

To verify the savings for sites that installed variable frequency drives, any modeling provided in the project documentation was compared against collected on-site data. Verified savings was based on the accuracy of information, assumptions and the methodology used to derive the energy savings. The field verification focused on proper installation of the equipment and verification of the operating conditions.

For sites whose savings were based on a manufactures proprietary software (e.g. TRACE, CarrierHAP), our engineers verified all the input assumptions that were used in the models. Energy savings that were derived from these modeling programs that were deemed technically sound throughout the industry were considered acceptable. It was assumed that the savings calculation procedures within the program were correct, and the gross savings was verified by the correctness of model inputs. When the calculations from the model software could not be verified, the engineers attempted to recreate the associated savings using collected data from the on-site inspection.



For sites where custom control systems measures were installed, the evaluation team gathered several pieces of data to obtain more accurate information of hours of operation and system load shape performance. If possible, the evaluation team verified and reviewed the control system set points, operation schedule and overall programming of the control system, comparing it against the submitted documentation. To verify these parameters, an interview with facility staff was conducted and a visual inspection of the computer control system was inspected.

For high-efficiency motor replacement measures, the parameters for which the savings was based included the efficiency of the old motor, efficiency of the new motor, the load factor, and the hours of operation. The motor efficiencies were compared against existing databases, including manufacturer data and MotorMaster.⁴⁰ Nameplate information for the high-efficiency motor was collected during on-site inspections as well as other technical information provided by the facility contact.

Procedures for Verifying Savings from Prescriptive Measures

For the sites whose projects involved the installation of ETO prescriptive measures, we evaluated the energy savings in the following way. The savings for these measures was evaluated based on the correctness of submitted documentation for which the incentive was paid. The number of units, size, model number, and other pertinent information was collected on site and then verified against the deemed savings values in the file.

The deemed energy savings value used by ETO was not reviewed as part of this evaluation and, therefore, the energy savings credited for each project had to meet two criteria. First, the measure was verified to still be installed and operating properly. Second, the number of installed pieces of equipment and their corresponding model numbers had to match those that were documented and in the ETO database.

VERIFICATION AND ENGINEERING RESULTS

Sample Attrition and Verification Accomplishments

Table 7.5 shows the attrition and disposition of the 2006 and 2007 verification samples. Of the 34 “Largest” sites in 2006, there were eight hard refusals for access despite repeated calls from the evaluators, intervention from implementers, and requests from Energy Trust.⁴¹ Twenty-six

⁴⁰ A tool developed by the U.S. Department of Energy.

⁴¹ At least one refusal was a result of security policy (a justice center). But other hard refusals generally were of two types. One was where the contact perceived the request as being another in a series of site visits related to installation, verification and quality control. Comments such as “How many times do you need to come out here?” were noted. The second more frequent reason was that the individual or individuals most knowledgeable about the project was no longer at the facility, and permission could not be obtained from

continued...



Table 7.5: Sample Attrition and Disposition

CATEGORY	NUMBER OF SITES	TYPE OF SAVINGS		% OF TOTAL SAVINGS	
		THERMS	KWH	GAS	ELECTRIC
2006					
LARGEST					
Proposed	34	447,505	14,526,156	65%	64%
Refused	8	119,905	2,427,154	17%	11%
Site Visits Completed	26	327,600	12,099,002	48%	54%
Site Visits No Baseline	8	13,256	5,105,908	2%	23%
Final Verifiable Savings	18	314,344	6,993,094	46%	31%
OTHER					
Proposed (Target = 66)	85	146,650	6,502,374	21%	29%
Alternate - Not Needed	18	29,620	1,034,416	4%	5%
Refused	12	12,229	710,119	2%	3%
Site Visits Completed	55	104,801	4,757,839	15%	21%
Site Visits No Baseline	17	19,405	2,375,564	3%	11%
Final Verifiable Savings	38	85,396	2,382,275	12%	11%
LARGEST + OTHER					
Proposed	119	594,155	21,028,530	87%	93%
Site Visits Completed	81	432,401	16,856,841	63%	75%
Final Verifiable Savings	56	399,740	9,375,369	58%	42%
2007					
LARGEST					
Proposed	40	281,909	8,307,014	78%	67%
Refused	7	80,473	1,213,180	22%	10%
Site Visits Completed	33	201,436	7,093,834	56%	57%
Site Visits No Baseline	5	53,503	1,313,362	15%	11%
Final Verifiable Savings	28	147,933	5,780,472	41%	46%
Continued					

current management. Energy Trust and PMC staff also intervened on our behalf in several cases but could not change the outcome.



CATEGORY	NUMBER OF SITES	TYPE OF SAVINGS		% OF TOTAL SAVINGS	
		THERMS	KWH	GAS	ELECTRIC
2007					
OTHER					
Proposed (Target = 66)	109	51,590	3,642,033	14%	29%
Alternate - not needed	35	4,896	354,910	1%	3%
Refused	9	8,738	592,677	1%	3%
Site Visits Completed	65	37,956	2,694,446	10%	22%
Site Visits No Baseline	4	2,730	312,266	1%	3%
Final Verifiable Savings	61	35,226	2,382,180	10%	19%
LARGEST + OTHER					
Proposed	149	333,499	11,949,047	92%	96%
Site Visits Completed	98	239,392	9,788,280	66%	79%
Final Verifiable Savings	89	183,159	8,162,652	51%	66%

sites visits were actually completed, but documentation for eight sites lacked detail on baseline conditions and savings calculations. Without these data, the site visits verified installation and current operating conditions but could not independently calculate realization rates. As a result, only 18 of the “Largest” sites had complete verification and engineering calculations replicated.

For the “Other” sites, 85 were selected for the sample pool, 12 refused to participate, and 55 site visits were completed. Seventeen of the 55 site visit files contained poor or no documentation of baseline conditions and savings calculations. Like the “Largest,” there were savings projections, but without the baseline data, no independent verification of savings could be done and no realization rates calculated. Table 7.5 also contains a category labeled “Alternate – not needed.” This category was included because those remaining sites either did not add anything to the analysis in terms of additional measures or were primarily lighting or were primarily prescriptive.

A total of 81 site visits were implemented for the 2006 participant sample, and 56 comprehensive verification and engineering reviews were completed. As Table 7.6 shows, site visits were carried out at 73% of the proposed 2006 gas sites and 80% of the proposed 2006 electric sites. Site visits were far more likely to yield verifiable results for gas projects than for electric ones.

The 2007 program year verification sample had a much better disposition, and a substantially lower incidence of missing data in the program files. Hard refusals for the “Largest” were still an issue – they occurred at a smaller percentage of sites in 2007 than in 2006, but accounted for a percentages of gas and electric savings – but verification was completed on 33 of the sites, and only five were lacking sufficient baseline information in the program files (primarily in the first part of 2007). A total of 28 sites had verification and engineering calculations replicated. For the



“Other” category, 65 sites visits were completed, and 61 had a full engineering review. Only project files had missing data.

Table 7.6: Relative Success of Site Visits and Verification

COMPARISON TYPE	PROJECT TYPE	
	GAS	ELECTRIC
2006		
Number of Site Visits as % of Number Proposed	73%	80%
Number of Verifiable as % of Number Proposed	67%	45%
Number of Verifiable as % of Number Site Visits	92%	56%
2007		
Number of Site Visits as % of Number Proposed	72%	82%
Number of Verifiable as % of Number Proposed	55%	68%
Number of Verifiable as % of Number Site Visits	77%	83%

A total of 98 site visits were implemented for the 2007 participant sample, and 89 comprehensive verification and engineering reviews were completed. Overall, the success in conducting site visits and performing verification was similar to that for 2006 (Table 7.6); compared to 2006, however, there was less difference between gas project sites and electric ones in the percentage producing verifiable results.

Verification Gross Realization Rates

This section presents the results of the site-visit verification for each program year. Results are presented separately for the “Largest” and “Other” sites, because the extrapolation is done separately for each stratum. For the “Other” category, we found low realization rates for custom controls and “Custom Gas”. There were two main projects in the “custom gas” that significantly affected the savings. Both were in schools, and both had similar issues:

- ➔ Set points as indicated on the claimed savings were significantly different that current operating conditions.
- ➔ The project claimed savings for the installation of CO2 sensors in the gyms, which were not installed and operating.

Table 7.7 (next page) shows the realization rates by measure type for the two strata for the 2006 program. Overall realization rates are high for both strata. Good program engineering procedures and time on site generally result in high realization rates for custom projects. This was the case for all the large projects in the “Largest” category, and the primary reason that they have the highest realization rates.



For the “Other” category, we found low realization rates for custom controls and “Custom Gas”. There were two main projects in the “custom gas” that significantly affected the savings. Both were in schools, and both had similar issues:

- ➔ Set points as indicated on the claimed savings were significantly different that current operating conditions.
- ➔ The project claimed savings for the installation of CO2 sensors in the gyms, which were not installed and operating.

Table 7.7: 2006 Realization Rates by Measure Type

MEASURE TYPE	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
LARGEST						
Custom Controls	120,618	113,504	94.1%	1,280,745	1,272,843	99.4%
Custom Gas	69,718	65,551	94.0%	-	-	-
Custom Other	-	-	-	-	-	-
Food Service	-	-	-	-	-	-
HVAC	84,471	84,471	100.0%	2,845,822	2,845,822	100.0%
Insulation	32,766	32,766	100.0%	-	-	-
Lighting	-5,229*	-5,229*	100.0%	2,735,037	2,645,348	96.7%
Motors	12,000	12,000	100.0%	131,490	131,490	100.0%
Solar	-	-	-	-	-	-
Water Heating	-	-	-	-	-	-
Overall	314,344	303,063	96.4%	6,993,094	6,895,503	98.6%
OTHER						
Custom Controls	24,008	15,947	66.4%	146,970	126,435	86.0%
Custom Gas	19,654	15,475	78.7%	-	-	-
Custom Other	1,148	1,148	100.0%	345,666	345,666	100.0%
Food Service	1,408	1,408	100.0%	472	472	100.0%
HVAC	25,337	25,337	100.0%	485,546	485,546	100.0%
Insulation	9,881	9,881	100.0%	-	-	-
Lighting	-	-	-	84,989	83,182	97.9%
Motors	-	-	-	1,318,632	1,307,309	99.1%
Solar	3,960	3,960	100.0%	-	-	-



MEASURE TYPE	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
Water Heating	-	-	-	-	-	-
Overall	85,396	73,156	85.7%	2,382,275	2,348,610	98.6%

* This is an artifact of interactive effects resulting from the fact that lighting measures were installed at one building together with a campus-wide EMS, which affected all buildings whether they were treated or not.

For the “custom controls” projects, one project received a 0% realization rate, which dropped overall realization rate for the category. The major issues for this site were:

- ➔ A heat pump was installed, and its energy use was not accounted for in the project.
- ➔ Retro-commissioning did not improve or solve any previous air-flow problems and, in fact, increased the customer’s energy usage by 300%, based on observed billing data from NW Natural.
- ➔ Programmable thermostats were installed but not in operation.
- ➔ We observed several areas that were being heated and cooled at the same time. This problem was outlined in the project recommendations and was not fixed.

While some issues may not be noticed during normal quality control inspections and follow-up visits, the issues with these projects should have been noticed during inspections, if inspections were completed. We note, again, that record keeping and quality control improved considerably for the 2007 program year.

The 2007 realization rates for both groups are more in line with prior evaluations (Table 7.8). No unusual findings emerged. Program documentation was more complete, consistent, and organized for the 2007 participant sample.

Table 7.8: 2007 Realization Rates by Measure Type

MEASURE TYPE	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
LARGEST						
Custom Controls	10,654	10,654	100.0%	664,974	631,108	94.9%
Custom Gas	30,159	34,522	114.5%	-	-	-
Custom Other	507	507	100.0%	590,222	538,222	91.2%
Food Service	-	-	-	-	-	-



MEASURE TYPE	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
HVAC	101,599	101,599	100.0%	1,731,696	1,731,696	100.0%
Insulation	5,014	5,014	100.0%	-	-	-
Lighting	-	-	-	2,119,234	2,100,310	99.1%
Motors	-	-	-	674,346	654,066	97.0%
Solar	-	-	-	-	-	-
Water Heating	-	-	-	-	-	-
Overall	147,933	152,296	102.9%	5,780,472	5,655,402	97.8%
OTHER						
Custom Controls	8,295	8,086	97.5%	271,667	268,855	99.0%
Custom Gas	1,128	1,128	100.0%	-	-	-
Continued						
Custom Other	-	-	-	1,303,330	1,300,335	99.8%
Food Service	-	-	-	-	-	-
HVAC	23,301	23,301	100.0%	510,935	493,238	96.5%
Insulation	-	-	-	-	-	-
Lighting	-	-	-	77,336	77,336	100.0%
Motors	-	-	-	218,912	206,238	94.2%
Solar	1,772	1,835	103.6%	-	-	-
Water Heating	730	730	100.0%	-	-	-
Overall	35,226	35,080	99.6%	2,382,180	2,346,002	98.5%

Extrapolation to the Verification Population

The final step in the realization rate analysis was the extrapolation of the sample findings to the eligible population. Extrapolation was done only for the “Largest” category. “Other” category sites that were not selected refused or were lacking baseline data were placed into the billing analysis pool.

For the 2006 sample, the “Largest” contained 34 unique sites and 18 completed verifications. The 2007 sample had 40 unique sites and 28 completed verifications. Realization rates from the verified sites were applied to the remaining sites by measure type. Results for both years are shown in Table 7.9.



Table 7.9. Total Gross Realized Savings

MEASURE TYPE	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
2006						
Custom Controls	159,097	149,714	94.1%	4,685,256	4,656,349	99.4%
Custom Gas	79,804	75,034	94.0%	-	-	-
Custom Other	722	722	100.0%	4,508	4,111	91.2%
Food Service	10,342	10,342	100.0%	13,872	13,872	100.0%
HVAC	151,138	151,138	100.0%	5,649,329	5,649,329	100.0%
Continued						
Insulation	39,481	39,481	100.0%	-	-	-
Lighting	-5,229	-5,229	100.0%	3,223,377	3,117,674	96.7%
Motors	12,150	12,150	100.0%	949,814	949,814	100.0%
Solar	-	-	-	-	-	-
Water Heating	-	-	-	-	-	-
Total	447,505	433,352	96.8%	14,526,156	14,391,149	99.1%
2007						
Custom Controls	27,963	27,963	100.0%	1,016,873	965,085	94.9%
Custom Gas	38,609	44,194	114.5%	-	-	-
Custom Other	507	507	100.0%	675,690	616,160	91.2%
Food Service	-	-	-	-	-	-
HVAC	209,816	209,816	100.0%	2,801,604	2,801,604	100.0%
Insulation	5,014	5,014	100.0%	-	-	-
Lighting	-	-	-	2,119,234	2,100,310	99.1%
Motors	-	-	-	1,693,613	1,642,680	97.0%
Solar	-	-	-	-	-	-
Water Heating	-	-	-	-	-	-
Total	281,909	287,494	102.0%	8,307,014	8,125,839	97.8%

* Custom Other realization rate was extrapolated to 2006 from 2007 sites.

** Food Service component realization rate was assumed to be 100% for top 40 sites.

Overall, the realization rates for the “Largest” (including extrapolations) and verified “Other” sites resulted in confirmation of approximately 80% of the estimated savings for the targeted engineering analysis population. The numbers include all the “Largest” and all the “Other” sites



with complete data. Results are shown in This completes the engineering analysis of realization rates for gas and electric measures. The next section discuss out approach to the billing analysis, which develops realization rates for those measure groups not included in the engineering verification effort.

Table 7.10 (next page).

This completes the engineering analysis of realization rates for gas and electric measures. The next section discuss out approach to the billing analysis, which develops realization rates for those measure groups not included in the engineering verification effort.

Table 7.10. Summary of Extrapolated and Verified Savings

GROUP	GAS			ELECTRIC		
	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE	ESTIMATED SAVINGS	VERIFIED SAVINGS	REALIZATION RATE
2006						
Overall Largest	447,505	433,352	96.8%	14,526,156	14,391,149	99.1%
Overall Other	85,396	73,156	85.7%	2,382,275	2,348,610	98.6%
Overall Largest + Other	532,901	506,508	95.0%	16,908,431	16,739,759	99.0%
Engineering Analysis	78% of 685,286 therms			75% of 22,528,374 kWh		
2007						
Overall Largest	281,909	287,494	102.0%	8,307,014	8,125,839	97.8%
Overall Other	35,226	35,080	99.6%	2,382,180	2,346,002	98.5%
Overall Largest + Other	317,135	322,574	101.7%	10,689,194	10,471,841	98.0%
Engineering Analysis	88% of 371,763 therms			86% of 12,442,438 kWh		

STATISTICAL BILLING ANALYSIS

We conducted a statistical billing analysis for the three participant categories not included in the site verification activities. These categories were: lighting-only sites, food service participants, and the “Other” sites not used for verification. The groups were further broken out by fuel type.



There was significant attrition in the number of sites included in the billing analysis, usually for the following reasons: 1) projected savings were less than 4% or more than 80% of pre-program energy use⁴²; 2) billing data was incomplete, missing or anomalous; or 3) a comparison sample could not be drawn. For these above reasons, three groups were not included in the billing analysis: 2006 and 2007 food-service electric savers and 2007 food-service gas savers.

The population and sample sizes of each of the billing analysis groups are shown in **Error! Not a valid bookmark self-reference.**

Table 7.11. Population and Samples for Billing Analysis

GROUP	POPULATION	SAMPLE SIZE	
		PARTICIPANTS	COMPARISON GROUP
2006			
Gas – Food Service	981	23	46
Gas – Other	74	33	132
Electric – Lighting-Only	220	121	484
Electric – Food Service	1188	0	0
Electric – Other	60	11	44
2007			
Gas – Food Service	503	0	0
Gas – Other	49	13	52
Electric – Lighting-Only	384	148	592
Electric – Food Service	384	0	0
Electric – Other	76	9	36

Comparison groups were selected through a Monte Carlo simulation of pre-program energy use within the same SIC or NAICS code category. Billing histories were obtained from the ETO database. The operating principle was to obtain a comparison group of at least four times the size of the participant analysis group. The exception to this rule was the 2006 food service gas sample, which, because of the diversity of participant types, focused on one particular chain of small food service vendors.

⁴² Regressions were attempted even for those cases, but results were not stable, confirming the original decision to drop the cases.



Fixed Effects Modeling Approach

Two monthly fixed effects ANCOVA type models were estimated, including the matched nonparticipant groups: a Conditional Savings (CSA) model and a Statistically Adjusted Engineering (SAE) model. The models that yielded the most robust estimates were kept as the final models. If the estimates of the two models provided diverging estimates of savings, the average realization rate from the models was used.

SAE Model

The first model specification that was run was an SAE model. This model has the following specification:

$$ADC_{it} = \alpha_i + \beta_1 AVGHDD_{it} + \beta_2 AVGCDD_{it} + \beta_3 EE_t + \varepsilon_{it}$$

where, for each customer i and calendar month t ,

- ➔ α_i is a unique intercept for each participant (or nonparticipant), derived by estimating the relationship using the ANCOVA (fixed-effects) procedure.
- ➔ ADC_{it} is the average daily therm or kWh consumption during the pre- and post-program periods.
- ➔ $AVGHDD_{it}$, is the average daily heating degree days (base 65) based on home location.
- ➔ $AVGCDD_{it}$, is the average daily cooling degree days (base 65) based on home location.
- ➔ EE_t is the average daily engineering estimate of savings in the post-period, and 0 otherwise.
- ➔ β_1 is the average daily therm or kWh consumption per heating degree day.
- ➔ β_2 is the average daily therm or kWh consumption per cooling degree day.
- ➔ β_3 is the average daily therm or kWh net participant realization rate. For example, a coefficient of -0.9 indicates a 90% realization rate.

The SAE model yields the realization rate directly from the coefficient of β_3 .

CSA Model

The second model specification that was run was a CSA model. This model has the following specification:

$$ADC_{it} = \alpha_i + \beta_1 AVGHDD_{it} + \beta_2 AVGCDD_{it} + \beta_3 POST_t + \beta_4 PARTPOST_{it} + \varepsilon_{it}$$

Where, for each customer i and calendar month t ,



- α_i is a unique intercept for each participant (or nonparticipant), derived by estimating the relationship using the ANCOVA (fixed-effects) procedure.
- ADC_{it} is the average daily therm or kWh consumption during the pre- and post-program periods.
- $AVGHDD_{it}$, is the average daily heating degree days (base 65) based on home location.
- $AVGCDD_{it}$, is the average daily cooling degree days (base 65) based on home location.
- $POST_t$ is a dummy variable that is 1 in the post-period, and 0 otherwise.
- $PARTPOST_{it}$ is a dummy variable that is 1 in the post-period for participants, and 0 otherwise.
- β_1 is the average daily therm or kWh consumption per heating degree day.
- β_2 is the average daily therm or kWh consumption per cooling degree day.
- β_3 is the average daily therm or kWh nonparticipant savings
- β_4 is the average daily therm or kWh (adjusted gross) participant savings for the EB measures

From this model, the realization rates can be obtained by dividing the net savings by the engineering estimates of savings.

The pre-program period was the calendar year prior to participation, and the post program period was the calendar year after participation. The actual year of participation was a “dead band.” This approach simplified the matching of weather data and alignment of energy consumption data.

Billing Analysis Results

Billing analysis summary results are shown below for each year separately and pooled for the two-year program time period. A summary of the results of the individual models by year is presented below in Table 7.12.



Table 7.12: Summary of Individual Regression Models⁴³

GROUP	MODEL	DAILY	ANNUAL	REALIZATION RATE	T-TEST	RELATIVE PRECISION*
2006						
Food Service	SAE	0.52	188.98	1.07	-3.81	43%
Gas Other	SAE	4.59	1677.17	0.93	-2.89	57%
Electric Lighting-Only	SAE	38.27	13967.59	0.44	-10.02	16%
Electric "Other"	Combined ⁴⁴	N/A	N/A	1.22	N/A	38%
2007						
Gas Other	SAE	4.16	1516.85	0.92	-2.27	72%
Electric Lighting-Only	SAE	69.32	25300.73	0.86	-20.46	9%
Electric "Other"	Combined ²	N/A	N/A	1.22	N/A	38%
Continued						
POOLED 2006-2007 MODEL RESULTS						
Gas Other	SAE	4.47	1631.81	0.92	-3.61	46%
Electric Lighting-Only	SAE	54.12	19753.93	0.65	-21.4	8%
Electric "Other"	Combined	N/A	N/A	1.22	N/A	38%
Electric "Other"	SAE	141.22	51545.84	1.04	-5.13	0.32
Electric "Other"	CSA	192.22	70160.27	1.41	-3.70	0.44

* At 90% confidence.

Program Realization Rate Summary

The realization rates for each year and for the two-year program cycle were then applied to program tracking estimates. As previously mentioned, the site visit engineering verification results were applied to the major portion of the savings, while the regression results were applied to the remainder, including food service, lighting-only, and other (not included in site visit sample). Table 7.13 shows the savings summary for the 2006 and 2007 program years.

⁴³ Model coefficients are shown in more detail in Appendix C.

⁴⁴ Each model yielded diverging results with similar precision and *t*-tests. The realization rate reported in this Table is a blend of both models for the pooled 2006-2007 sample.



Table 7.13: Savings Summary

GROUP	NUMBER OF SITES	ESTIMATED THERMS	% OF TOTAL	REALIZATION RATE
2006				
GAS				
Engineering Analysis Savings	72	532,901	54%	95%
Food Service	1204	300,441	30%	107%
Lighting Only	220	0	0%	0%
Other	115	152,385	15%	93%
Total Savings	1611	985,727	100%	98.4%
ELECTRIC				
Engineering Analysis Savings	72	16,908,431	54%	99%
Food Service	1204	1,156,236	4%	107%
Lighting Only	220	7,641,901	24%	44%
Other	115	5,619,943	18%	122%
Total Savings	1611	31,326,511	100%	90.0%
Continued				
2007				
GAS				
Engineering Analysis Savings	101	317,135	60%	102%
Food Service	861	165,235	31%	107%
Lighting Only	384	0	0%	0%
Other	117	44,628	8%	92%
Total Savings	1463	526,998	100%	102.6%
ELECTRIC				
Engineering Analysis Savings	101	10,689,194	40%	98%
Food Service	861	1,156,633	4%	107%
Lighting Only	384	12,933,223	49%	86%
Other	117	1,752,844	7%	122%
Total Savings	1463	26,531,894	100%	94.1%

Some decisions on applying realization rates have already been discussed but are repeated here. For food service participants, a gas realization rate using participants and nonparticipants from



the same food service chain was used to calculate the realization rate for the 2006 sample.⁴⁵ This realization rate (107%) was also applied to the 2007 food service gas sample as well as to electric savings for the food service for both years. The billing analysis for the “Other” participants for both years and for the pooled regression produced inconsistent results. The realization rate that was finally selected was an average of the realization rates in the SAE and CSA model for the pooled sample.

The realization rate and program adjusted gross savings for the entire two-year program cycle are shown in Table 7.14.

Table 7.14: 2006-2007 Total Program Gross Savings

GROUP	NUMBER OF SITES	ESTIMATED SAVINGS	% OF TOTAL	REALIZATION RATE
GAS				
Engineering Analysis Savings	173	850,036	56%	98%
Food Service	2065	465,676	31%	107%
Lighting Only	604	0	0%	0%
Other	232	197,013	13%	92%
Total Savings	3074	1,512,725	100%	99.9%
ELECTRIC				
Engineering Analysis Savings	173	27,597,625	48%	99%
Food Service	2065	2,312,869	4%	107%
Lighting Only	604	20,575,124	36%	70%
Other	232	7,372,787	13%	122%
Total Savings	3074	57,858,405	100%	91.8%

Gross savings for lighting-only used a combined weighted realization rate rather than the pooled regression results. The participation rates and savings were very different for the two years, but the sample sizes in the individual year regressions were approximately the same. This tended to weight the pooled regression results down and not reflect the differences in the participants across the years. The realization rate for the pooled lighting-only sample was 65%. This situation did not occur in the other pooled regressions.

⁴⁵ A matched-comparison within a single chain was selected for this group because the amount of energy use attributable to sprayers would vary among chains, making it impossible to isolate the spray-rinse impacts in a comparison between chains. Only one chain provided enough sample elements to make this comparison.



NET SAVINGS

Net savings were calculated by applying free-ridership ratios to adjusted gross savings on a participant-by-participant basis, creating a savings-weighted ratio. The free-ridership ratios were calculated using the ETO/RIA methodology, which estimated a “high” and “low” ratio, primarily depending on the incidence of unresolved “don’t know” responses for the survey self-report scale items⁴⁶. Rather than report a range of savings, we calculated a simple average of the two scores and used those results in the calculation of net program savings.

Application of free-ridership ratios involved a hierarchical process, using the best available information:

- ➔ Measure-specific free-rider ratios were the preferred metric and were applied where possible.
- ➔ If measure-specific ratios were not available, participant-specific ratios were used. This situation occurred where multiple measures were installed but only one ratio was calculated.
- ➔ Where neither measure-specific or site-specific data were available, the average free-ridership score for the measure participant group (food service, “other”, and so forth) was used.

The complete set of measure specific free-ridership ratios is shown in Table 7.15.

Table 7.15: Free-Ridership Rates

MEASURE TYPE	2006		2007	
	GAS	ELECTRIC	GAS	ELECTRIC
Custom Controls	53%	41%	51%	55%
Custom Gas	20%	0%	29%	0%
Custom Other	38%	13%	63%	55%
Food Service	32%	9%	20%	20%
HVAC	27%	43%	49%	45%
Insulation	27%	0%	32%	0%
Lighting	-	28%	0%	29%
Motors	0%	28%	0%	45%
Solar	-	0%	50%	25%

⁴⁶ See Appendix A for a full discussion of the approach and scoring algorithm.



Water Heating	0%	0%	-	0%
Overall	35%	36%	44%	39%

The above averages are not savings-weighted, but are presented to show the range of free-ridership ratios in the participating population on a participant level. The net savings data shown below are all weighted by savings.

Table 7.16 shows net savings for the 2006-2008 program. The “Net Factor” is calculated as “one minus free-ridership.”

Table 7.16: 2006 Program Net Savings

GROUP	NUMBER OF SITES	ESTIMATED THERMS	REALIZATION RATE	ADJUSTED GROSS	NET FACTOR	NET SAVINGS
2006						
GAS NET SAVINGS (THERMS)						
Engineering Analysis	72	532,901	95.0%	506,508	71.3%	361,336
Food Service	1,204	300,441	107.4%	322,605	68.3%	220,287
Lighting-Only	220	-	-	-	-	-
Other	115	152,385	92.5%	141,005	69.6%	98,090
Total Savings	1,611	985,727	98.4%	970,117	70.1%	679,713
ELECTRIC NET SAVINGS (KWH)						
Engineering Analysis	72	16,908,431	99.0%	16,739,759	67.8%	11,350,511
Food Service	1,204	1,156,236	107.4%	1,241,532	89.8%	1,114,756
Lighting-Only	220	7,641,901	43.5%	3,326,672	74.4%	2,475,829
Other	115	5,619,943	122.3%	6,874,137	69.8%	4,798,920
Total Savings	1,611	31,326,511	90.0%	28,182,099	70.0%	19,740,016
2007						
GAS NET SAVINGS (THERMS)						
Engineering Analysis	101	317,135	101.7%	322,574	55.3%	178,499
Food Service	861	165,235	107.4%	177,424	80.4%	142,654
Lighting-Only	384	-	-	-	-	-
Other	117	44,628	91.7%	40,941	55.4%	22,667
Total Savings	1,463	526,998	102.6%	540,940	63.6%	343,819
ELECTRIC NET SAVINGS (KWH)						
Engineering Analysis	101	10,689,194	98.0%	10,471,841	59.1%	6,185,889
Food Service	861	1,156,633	107.4%	1,241,958	80.3%	997,496



GROUP	NUMBER OF SITES	ESTIMATED THERMS	REALIZATION RATE	ADJUSTED GROSS	NET FACTOR	NET SAVINGS
Lighting-Only	384	12,933,223	85.8%	11,101,620	71.9%	7,987,243
Other	117	1,752,844	122.3%	2,144,023	52.6%	1,128,350
Total Savings	1,463	26,531,894	94.1%	24,959,443	65.3%	16,298,977
						Continued

2006-2007 TOTAL						
GAS NET SAVINGS (THERMS)						
Engineering Analysis	173	850,036	97.5%	829,082	65.1%	539,835
Food Service	2,065	465,676	107.4%	500,029	72.6%	362,941
Lighting-Only	604	-	-	-	-	-
Other	232	197,013	92.4%	181,946	66.4%	120,757
Total Savings	3,074	1,512,725	99.9%	1,511,057	67.7%	1,023,532
ELECTRIC NET SAVINGS (KWH)						
Engineering Analysis	173	27,597,625	98.6%	27,211,600	64.4%	17,536,400
Food Service	2,065	2,312,869	107.4%	2,483,489	85.1%	2,112,251
Lighting-Only	604	20,575,124	70.1%	14,428,292	72.5%	10,463,072
Other	232	7,372,787	122.3%	9,018,160	65.7%	5,927,270
Total Savings	3,074	57,858,405	91.8%	53,141,542	67.8%	36,038,993





MARKET PENETRATION

We attempted to estimate the Existing Buildings Program’s penetration into the vendor market, as well as its penetration into the nonresidential building owner/occupant market.

PENETRATION OF THE VENDOR MARKET

To estimate the extent of program penetration into the broader vendor market, we obtained a count of the firms in Oregon that operate under the same six-digit NAICS codes that the majority of Existing Buildings trade allies use. We identified the NAICS codes of a random sample of commercial trade allies (66 vendors) using the Oregon Labor Market Information System (OLMIS). This produced the following 13 codes: 238160, 238210, 238220, 238310, 333415, 334512, 423440, 423610, 423720, 444190, 541310, 541330, and 811310.

OLMIS lists 8,038 Oregon establishments that operated under one or more of those 13 NAICS codes. Assuming that the mix of commercial vendors is distributed proportionally to the residential market, 93% of vendors – approximately 7,475 establishments – are physically located within Energy Trust service territory. Currently, there are 459 Existing Buildings trade allies, an approximately 6% participation rate from the business standpoint.

There are reasons to suspect, however, that the population of 7,475 firms defined by the 13 NAICS codes is an overestimate of the actual vendor market that Existing Buildings is trying to reach. We found that the distribution of Existing Buildings trade allies across the 13 NAICS codes varied widely. In fact, 6 of the 13 NAICS codes account for about 97% of the trade allies. This is shown in Table 8.1.

Table 8.1: Count of EB Trade Ally by NAICS Code

NAICS CODE	NUMBER OF FIRMS	NAICS CODE	NUMBER OF FIRMS
238160	1	423610	97
238210	54	423720	2
238220	206	444190	1
238310	6	541310	21
333415	1	541330	2
334512	25	811310	1
423440	42		



We also found that the participation rate for Existing Buildings trade allies varied widely among these NAICS codes, suggesting that some of them better represent the Existing Buildings target vendor market than others. When we looked at the six NAICS codes that account for nearly all trade allies, we found an 11% participation rate. This is consistent with our experience with the nonparticipant vendor survey, in which we found a higher proportion of some professions, such as architect, than we found in the Existing Buildings trade ally sample.

It was not possible to estimate participation by trade ally size, as the vendor data that were available did not show number of employees.

PENETRATION OF THE BUILDING OWNER/OCCUPANT MARKET

We also attempted to estimate the Existing Buildings Program's 2006-2007 penetration into the building owner/occupant market.

Penetration as a Percentage of Total Number of Nonresidential Buildings

As a first pass, we calculated the total number of 2006-2007 projects as a percentage of the number of nonresidential buildings in Oregon. Our file of 2006-2007 project sites contains a total of 3,452 records. Of these, 357 represented repeat participation, leaving 3,095 participants. We compared this to the tax assessor list of nonresidential buildings that was one of our sources for the nonparticipant survey (see *Section 6, Nonparticipant Feedback*). The latter contained 22,745 records. Assuming that the percentage of total nonresidential buildings that are within the Energy Trust service territory is roughly equal to the number of residential customers within the service territory (93%), we estimate that there are 21,153 nonresidential buildings within Energy Trust territory, yielding a penetration rate of 15%.

However, there are two reasons that this may not be accurate. First, it does not take the size of buildings into account. It is possible that the average building affected by the Existing Buildings program was larger or smaller than the statewide average. Second, the project sites in our list may have included more than one building. Thus, counting each as a single building could result in an underestimate of penetration.

Penetration as a Percentage of Total Area of Nonresidential Buildings

Because of the above considerations, we attempted to examine the square footage of buildings affected by the Existing Buildings program as a percentage of the total square footage within Energy Trust service territory. We found no definitive source for either of these sums – the area of buildings affected by the program and the total market square footage – but were able to estimate each by two methods.



Estimation of Total Market Square Footage

First, the tax assessor records included building size for most listings. After removing duplicates from this data set, we were left with 20,164 records, of which 20,148 had size information. We multiplied the mean building size for those that provided that data by the total number of records in the set (including those without size data), which yielded an estimate of 977,695,731 total square feet of nonresidential building space for Oregon. Assuming that 93% of total nonresidential building space is within Energy Trust service territory, we estimate by this method a total of 909,257,030 square feet of nonresidential building space within the service territory.

The second source was an assessment of commercial building space in the Pacific Northwest, conducted for NEEA.⁴⁷ This report found that the total commercial floor space in the Pacific Northwest (defined as Oregon, Washington, Idaho, Montana, and Wyoming) in 2001 was 2.4 billion square feet. To estimate the 2006-2007 total, we extrapolated the 1987-to-2001 growth rate that was reported (approximately 2%) to 2006-2007. This yielded a total of about 2.7 billion square feet in 2007. The report did not break out the total square footage by state. Therefore, we estimated Oregon's contribution to the total square footage using the state's contribution to the Pacific Northwest's population as a proxy.

According to data from the 2007 U.S. Census,⁴⁸ Oregon accounted for about 29.6% of the population of the Pacific Northwest in 2006 and 2007. This yields a lower estimate of total nonresidential building space for Oregon: 808,611,224 square feet. Population is an inexact proxy for total square footage of nonresidential buildings: since Oregon and Washington are more highly populated than Idaho and Montana and have a more urbanized populations, it is more likely that the ratio of population to building space also is higher in those states.⁴⁹ Therefore, we regard the estimates derived from this analysis as secondary to those from the MetroScan data.

Estimation of Square Footage of Program-Affected Buildings

To estimate the total square footage of nonresidential building space affected by the Existing Buildings Program in 2006-2007, we had to rely on the subset of project records that had building size data. Unfortunately, only 241 of the 3,095 non-repeat records had this information.

⁴⁷ *Assessment of the Commercial Building Stock in the Pacific Northwest*. Market research report prepared by Kema-Xenergy Inc. for the Northwest Energy Efficiency Alliance, Report #04-125, March 8, 2004.

⁴⁸ U.S. Census Bureau website: <http://www.census.gov>. Accessed on December 18, 2008.

⁴⁹ We also considered using percentage of PNW gross domestic product (GDP) as a proxy for percentage of total building area. Using this percentage (27%) would have resulted in a lower estimate of total building area and, therefore, a higher estimate of penetration, than using the percentage of PNW population. However, we rejected GDP because the states may differ in the proportion of GDP that is generated in buildings (e.g., a larger proportion of the GDP for Montana probably comes from large-scale ranching.)



We first multiplied the mean square footage of these 241 records by the total number of records, to yield a total of 121,922,759 square feet.

The above estimate assumes that the 241 project records with building size data are representative of the entire sample. This may not be the case. We found, for example, that mean building size in the tax assessor data varied by Oregon county. If the presence or absence of building size data in the project file is not the same for each county, then some counties would exert a greater influence on the total, biasing the estimate. We found that this was the case. One solution would be to assign the mean building size for a given county to all records for that county without size data. However, some of the counties were represented by only a few records, so estimates based on those county averages probably would not be accurate. Therefore, we used the following method.

First, we used the tax assessor data to create weights for each county, calculated as the ratio of the mean square footage for that county to the mean across all county means. Thus, a weight of 1.1 for a county would indicate that the mean square footage for that county was 10% higher than the mean of all county means.

Then, for each county in the participant list, we multiplied the overall mean square footage by the weight derived from the tax assessor file. The reasoning was that even if the average size of buildings in the program is different from the statewide average, the distribution of size by county for buildings in the program reflects the statewide data. We then multiplied each county mean by the number of projects in that county and summed the products. This method produced a somewhat lower estimate of 105,272,153 square feet of nonresidential buildings in the 2006 and 2007 Existing Buildings program.

Excluding Pre-Rinse Sprayer Recipients

Approximately 15% of 2006-2007 participants participated only in the free direct install program for pre-rinse sprayers. To estimate the EB program's market penetration excluding this group, we can decrement the above estimated square foot totals by 15%. Although it is likely that the mean size of buildings affected by the free install program was smaller than the mean for the EB program as a whole, the data on building size were very limited for this group of participants. Therefore, to provide the most conservative possible estimate of penetration, we will assume that the mean building size for pre-rinse sprayer recipients is the same as for the program as a whole.

Calculation of Penetration Rate

The various estimates are shown in Table 8.2. Assuming that the sample of 241 project records is representative of all projects would yield a penetration rate of 13% based on the tax assessor data, or 15% based on the NEEA study. Adjusting the data by differences between counties would produce a penetration rate of 12% using the tax assessor data on total square footage, or 13% using the data from the NEEA report.



Table 8.2: Estimates of Penetration into the Nonresidential Building Owner/Occupant Market

TOTAL PROGRAM SQUARE FOOTAGE		TOTAL SQUARE FOOTAGE WITHIN ENERGY TRUST SERVICE TERRITORY		ESTIMATED PENETRATION
METHOD	ESTIMATE	METHOD	ESTIMATE	PERCENT
Assuming 257 Records Are Representative	121,922,759	Tax Assessor Data	909,257,030	13.4%
		(Excluding sprayer recipients)	772,868,476	11.4%
		NEEA Study	808,611,224	15.1%
		(Excluding sprayer recipients)	687,319,540	12.8%
Records Adjusted by County Differences	105,272,153	Tax Assessor Data	909,257,030	11.6%
		(Excluding sprayer recipients)	772,868,476	9.9%
		NEEA Study	738,000,000	13.0%
		(Excluding sprayer recipients)	627,300,000	11.1%

As we noted above, we assume that the tax assessor data are more accurate than the estimates we derived from the NEEA study (because of likely between-state differences in the ratio of population to total floor space of nonresidential buildings). Therefore, we estimate the combined penetration for the 2006 to 2007 Existing Buildings program to be about 12% to 13% of the nonresidential building market, or 10% to 11% if recipients of free pre-rinse sprayers are excluded.





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9

CONCLUSIONS AND RECOMMENDATIONS

The Existing Buildings program continues to be successful from multiple perspectives. Participants are happy with the program, especially with the services they receive from program representatives. During 2006 and 2007, the program had completed about 3,074 projects, estimated to have saved about 58.4 million first-year kilowatt hours of electricity. In that timeframe, it reached about 12% to 13% of the total square footage of nonresidential buildings in Oregon.

Below, we present an integrated discussion of findings from the variety of data sources used in this evaluation: interviews with key contacts; surveys of vendors, participants, and nonparticipants; and inspections of project sites. Following that discussion, we present our conclusions and recommendations.

INTEGRATED DISCUSSION OF EVALUATION FINDINGS

In addition to summarizing program impacts, this section addresses several crosscutting topics, a full understanding of which could not be obtained from any single source of data: the program's marketing and outreach strategies; program communication; data collection, processing, and tracking; customers' relationships with Energy Trust and the program; the role of technical studies; and a characterization of the existing building market.

Program Impacts and Free-Ridership

The ETO Building Efficiency Program had 1,611 total participants in 2006 and 1,463 participants in 2007, and a total projected savings of over 1.5 million therms and 57 million kWh. Across all measure types, our impact analysis yielded realization rates of 98.4% and 102.6% for gas projects in 2006 and 2007, and a realization rate of 99.9% across the two years. For electric projects, we found realization rates of 90.0%, 94.1%, and 91.8% for the same project periods. Adjusting for savings-weighted free-ridership levels yielded net realization rates of about 70% for both gas and electric projects in 2006; in 2007, they were about 64% for gas projects and 65% for electric ones. Net realization rate averaged about 32% across both years for both fuel types. (Table 9.1)



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Table 9.1: Estimated Gross and Net Savings from the 2006-2007 Existing Buildings Program

TYPE	NUMBER OF SITES	ESTIMATED THERMS	REALIZATION RATE	ADJUSTED GROSS	NET FACTOR	NET SAVINGS
2006						
Gas (Therms)	1611	985,727	98.4%	970,117	70.1%	679,713
Electric (kWh)	1611	31,326,511	90.0%	28,182,099	70.0%	19,740,016
2007						
Gas (Therms)	1463	526,998	102.6%	540,940	63.6%	343,819
Electric (kWh)	1463	26,531,894	94.1%	24,959,443	65.3%	16,298,977
2006-2007 TOTAL						
Gas (Therms)	3074	1,512,725	99.9%	1,511,057	67.7%	1,023,532
Electric (kWh)	3074	57,858,405	91.8%	53,141,542	67.8%	36,038,993

There were clear differences in the performance of the 2006 participants and the 2007 participants, particularly in the lighting group. Lighting-only installations contributed significantly more kWh savings in 2007 than in 2006. The 2006 participant group showed only a 44% realization rate, while the 2007 cohort was 86%. An examination of realization rates by participant type (by SIC/NAICS) code did not reveal any significant patterns. Clearly, the 2006 cohort was an outlier. But the 2007 program participants – while showing realization rates in line with other billing analyses – still show realization rates below the site-visit groups. It can also be argued that simple billing analysis could introduce market effects into the results. This might account for the 86% realization rate for the 2007 cohort, but would not explain the 44% realization in 2006.

Savings-weighted ratios range from 15 % to 35% by analysis group. These ratios are within the normal range for similar commercial retrofit programs, but higher than previous Energy Trust evaluations. For example, free-ridership estimates for electric savings were 17.0% in both 2004 and 2005; for gas, they were 35.3% in 2004 and 5.3% in 2005). However, the value of comparing the current free-ridership rates to those found previously is limited somewhat by Energy Trust's having introduced a new method for calculating free-ridership since the last evaluation.

While the current free-ridership rates are higher than those previously found, they are within the wide range of estimates that other evaluations have found.⁵⁰ It is legitimate to question whether the increased free-ridership rate suggests that some revisions should be made to the program,

⁵⁰ W. Saxonis, "Free Ridership and Spillover: A Regulatory Dilemma," Energy Program Evaluation Conference, Chicago, 2007.



such as reducing incentive rates for certain measures. However, there are several reasons to be cautious about making any revisions.

First, the actual meaning of free-ridership estimates continues to be controversial. There is a growing concern over the reliability and validity of free-ridership assessment.⁵¹ It has been argued recently that several psychological theories suggest that current methods (which rely on self-report) over-estimate free-ridership.⁵² This suggests that, even if free-ridership estimates are higher than previously, program influence still accounts for a large majority of the resulting savings.

Second, making frequent or significant changes to the program can have an adverse impact on the program's relationship with trade allies. Trade allies play a key role in marketing the program. However, their ability to market the program effectively depends in part on their having a program that is consistent from year to year.

Third, free-ridership estimates for subgroups (such as by measure type) are particularly unreliable because they are based on smaller samples. For example, the impact evaluation of the 2004-2005 program estimated kWh free-ridership for HVAC at 23% for the 2004 program but only 13% for the 2005 program. For motors and VFD, the comparable estimates were about 5% and 27%. Overall therm free-ridership went from about 35% for the 2004 program to about 5% for 2005. Therefore, using free-ridership estimates to decide what aspects of the program to change is risky.

Fourth, climate considerations as well as other ones continue to make it essential to acquire all the savings possible. Even if the current methods do accurately and reliably estimate free-ridership, the forthcoming Sixth Northwest Electric Power and Conservation Plan, which is expected to establish much higher avoided costs than previous plans⁵³, confirms the cost-effectiveness of the program's savings.

Free-ridership rate varied by a variety of participant characteristics, reasons for installing equipment, and equipment purchased (Table 9.2). It was higher for repeat participants. It also was higher for those whose company has a policy of purchasing energy-efficient equipment and those who bought the energy-efficient equipment mainly to replace failed equipment. Those who reported they bought the equipment to save energy costs had lower free-ridership scores than those

⁵¹ *The California Evaluation Framework*. Prepared for the California Public Utilities Commission and the Project Advisory Group by TecMarket Works (and project team members), 2004.

⁵² J. Peters and M. McRae, "Free-Ridership Measurement is out of Sync with Program Logic... or, We've Got the Structure Built, but What's Its Foundation?" *Proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings*. American Council for an Energy Efficiency Economy. Washington, D.C. August 2008.

⁵³ *Issues for the Sixth Pacific Northwest Power and Conservation Council*. Northwest Power and Conservation Council, Council Document 2007-22. Web URL: <http://www.nwcouncil.org/library/2007/2007-22.pdf>.



who did not report that reason. These latter findings are not surprising and in fact support the validity of the free-ridership measure used.

Table 9.2: Free-Ridership Differences by Subgroup

SUBGROUP DEFINITION	FREE-RIDERSHIP*	
	YES	No
PARTICIPANT CHARACTERISTIC		
Repeat participant*	40.2%	29.4%
Energy efficiency purchasing policy	40.1%	30.0%
REASONS FOR INSTALLING EQUIPMENT	MENTIONED	NOT MENTIONED
Replace failed equipment	46.5%	31.3%
Efficiency is a common feature of the application	26.7%	37.5%
Save energy costs	31.3%	40.4%
EQUIPMENT TYPE	INSTALLED	DID NOT INSTALL
Pre-rinse sprayer	19.6%	31.6%
HVAC	38.1%	27.1%
Motor	40.4%	26.9%
Boiler	44.8%	27.8%
Lighting	20.6%	30.8%

* This is the mid-point of the “high” and “low” free-ridership estimates for each participant, as explained in Appendix A. Mean free-ridership rates per group are averaged over the 2006 and 2007 program years. These data exclude free pre-rinse sprayer participants.

Free-ridership also varied by the measure that was installed: it was higher for those who purchased HVAC, motors, and boilers and lower for those who bought lighting. Notwithstanding these differences, free-ridership estimates topped out at below 50% in all subgroups examined and at below 40% in most subgroups.

A seemingly contradictory finding was that free-ridership was lower for those who said they bought the energy efficient equipment at least partly because efficiency was a common feature of that equipment. *Ad-hoc* analysis revealed that most of the participants who gave that reason had purchased lighting equipment; as seen above, this group had low free-ridership rates. One possible interpretation of this finding relates to the fact, noted in Chapter 4, that there is a very well organized lighting trade ally network. Possibly, this suggests that the lighting trade allies have been very effective at actively promoting Energy Trust incentives for energy efficient lighting. The effectiveness of the trade allies was translated as program influence, resulting in low free-ridership estimates, and produced the perception among participants that efficiency was a common feature of lighting. This bears further investigation.



Spillover Effects

One-third of program participants said that they had purchased energy-efficient equipment in the past two years for which they had not received an incentive. Slightly more than one-fifth of participants did so during or after their participation, when the program could have influenced their decision. The mean program influence on this equipment was 3.0 on a scale of 1 to 5, or a moderate level of influence. Of those, six had bought a total of eight pieces of equipment for which they rated the program's influence as high ("5" on the 1-to-5 scale); two bought HVAC equipment and one each bought lighting, cooking equipment, a water heater, a dishwasher, and an unspecified piece of equipment. Over all, about 3% of participants purchased additional non-incented energy efficient equipment entirely because of the program's influence.

The program had less influence on the purchase of lighting and HVAC equipment – which together accounted for 40% of all non-incented energy-efficient equipment purchased – than it did on the purchase of other types of equipment. Compared to other equipment types, a higher percentage of all lighting and HVAC equipment purchased in the past two years was reported to have been energy-efficient (94% vs. 87%), suggesting a higher level of market transformation for these equipment types.

Program Marketing and Outreach Strategies

The program was conceived to build on existing relationships between contractors and their customers. We found that the PMC continues to work largely through contractors and vendors, and to work effectively with them. Program participants indicated that contractors continued to be their primary source of awareness of the program and the main *person* influencing the decision to undertake the project (although other factors had more influence). Existing Buildings projects represent a substantial portion of trade allies' business and their participation in the program has increased their effectiveness at selling energy efficiency to customers. However, the Existing Buildings brand name has little awareness and the program accounts for substantially less work for nonparticipating vendors than for trade allies, indicating room for additional program reach into the vendor market.

Lighting trade allies are organized into a tight-knit network but mechanical trade allies are not. The PMC's subcontractor has cultivated this network over 13 to 14 years, while the PMC had recently hired someone to promote more networking among mechanical trade allies. Two factors might have promoted network development among lighting trade allies and could potentially work against it among the mechanical allies. First, lighting contractors deal with a more homogeneous array of equipment types, which may result in a greater level of shared equipment and market knowledge among them. Second, customers of lighting vendors are far less likely to approach them about the program, making it necessary for them to take a more active role in marketing it.



Although contractors and vendors continue to be the PMC's primary channel of impact on the existing building market, the PMC began to work directly with end-users in certain sectors – particularly in food service establishments and large commercial buildings – during the 2006-2007 program years. The percentage of participants identifying a contractor as the source of awareness has decreased from 66% in the previous evaluation to 31%, and that of participants identifying program staff has increased from 10% to 19%, reflecting this change in outreach strategy. (The percentage citing a utility has remained relatively flat.)

Whether the main contact and source of program awareness was a program representative or a contractor had little effect on a variety of satisfaction indicators, with one exception. A higher percentage of those for whom a program representative was the main contact said that the contact was very knowledgeable about the Existing Buildings program (92% vs. 76%).

The PMC promotes the program through a range of marketing channels and activities and has coordinated marketing and outreach with other program sponsors. It is reaching into new and underserved markets, such as restaurants and lodging, data centers, and large grocery chains.

Within the food service sector, the PMC carried out a program of free direct installation of energy-efficient pre-rinse sprayers to raise awareness of energy efficiency opportunities. Evidence of the sprayer install program's effect is inconsistent, but on the whole suggests some effect. About half of surveyed recipients said that receiving the sprayer caused them to think more about energy efficiency, and about 70% said it had increased the likelihood that they would install other energy efficient equipment in the future.

Analysis of Energy Trust's *FastTrack* database through 2008, however, showed that only 11% of sprayer recipients later installed additional measures through the program. Together, the number of additional measures they later installed represented a ratio of about 0.26 measures per sprayer recipient, equivalent to 26% of recipients each installing one additional measure. This analysis did not take into account businesses that have multiple locations that participated under different site identification numbers; such an analysis likely would yield a higher percentage of sprayer recipients that later installed additional measures through the program. It also would be valuable to contact participants who received free sprayers to determine whether they purchased additional energy efficiency equipment without an incentive.

While the PMC considers marketing activities to be effective, survey results indicate room for increased program awareness: only about 3 in 10 nonparticipants indicated that they were aware of the program, and trade allies and vendors reported that few of their customers inquired about the program – this has not changed much since the previous process evaluation. Given that lack of awareness was a common reason given for not participating and that cost was cited as a barrier to energy management, it is likely that greater program awareness would induce more energy efficiency investment. Recognizing this, vendors indicated a need for more printed program information to share with customers to increase their awareness of energy efficiency opportunities.



Program Communication

The program and PMC staff reported frequent and effective communication within the PMC, and between the PMC and Energy Trust, other PMCs and program sponsors, ATACs, trade allies, and ODOE. Both program and PMC staff suggested that as the PMC staff continues to grow, it might be necessary to create more formal job definitions and lines of communication.

While PMC contacts viewed communication with ATACs as good, about half of the latter voiced comments about the amount or quality of PMC communication or program information, including that communication was insufficiently frequent or detailed.

Trade allies reported no communication challenges, but encouraged continued transmission of program information. The strongly preferred method of communication was email. The nonparticipant vendors also were likely to request postal mail, related to their desire for printed information to share with customers.

The program website is not a preferred method for getting program information for most respondents, but it is frequently used by a significant group of vendors, more so for trade allies. Therefore, continued efforts to maintain and improve the website are suggested, as well as exploring ways to make the website more accessible to those who do not prefer to use it.

Program Data Collection, Tracking, and Processing Activities

Overall, data collection, tracking, and processing appear to be reasonably good. Program contacts reported that the incentive payment process works as it should and that incentives are paid on time. Only one ATAC of 13 interviewed indicated that any customers had complained about slow payment of the incentive. While the application process was the least satisfactory program component for vendors, half of them nevertheless rated it as either “4” or “5” on a 1-to-5 scale and most of the rest gave it a “3.”

The PMC has made no significant changes to forms, except for developing an alternative Form W-9, to facilitate its completion by customers. The PMC has developed a spreadsheet tool for internal use in managing data from incentive application forms; plans to develop other tools, including an on-line version of the incentive form, are still ongoing.

Some challenges related to data collection, tracking, and processing were reported by contacts or uncovered by the evaluation team.

Contacts reported some challenges with the use of Energy Trust’s database systems and with connection to Energy Trust’s server. At the time that interviews were being conducted for this evaluation, Energy Trust was working to resolve the problems, but some contacts still considered the system difficult to use.

The evaluation team uncovered a relatively high rate of documentation error in 2006 projects. This was traced to the lack of a requirement that ATACs provide detailed electronic



documentation of study results. The PMC addressed this issue, and we did not find a similarly high number of documentation problems in 2007 projects. It is noteworthy, however, that two ATACs suggested stricter reporting standards, including a written handbook.

In developing our estimate of the program's market penetration, we found that only 8% of the records in the program database showed the square footage of the affected building. Lack of data on building size may have limited the reliability of our penetration estimate and prevented us from developing penetration estimates for different end-uses and market sectors.

Finally, in the course of developing the sample for the survey of trade allies, the evaluation team found evidence that the list of trade allies may not be up to date – the list of trade allies supplied by Energy Trust was not consistent with the list on the website, and we were told by some vendors we contacted for the nonparticipant vendor survey that they thought they were trade allies. We also found a large number of cases in which the same trade ally firm was listed multiple times with the name represented inconsistently. While keeping lists is a common challenge for programs, we mention it because it could have an adverse impact on the program, as well as on the evaluation.

Customers' Relationships with Energy Trust and the Existing Buildings Program

The overall quality of program experience was good. Nearly all interviewed participants said that the program contact serves their best interests and that the representative understands their business. A large majority said that they would or already had called the program contact to discuss new purchases or upgrades.

Few participants reported serious uncertainty or confusion about the program. A generally high level of program satisfaction was reported across most facets and for the overall program experience. In particular, high levels of satisfaction were reported with program staff's knowledge and quality of contractor work, supporting other findings indicating that program staff and contractor performance are some of the program's strong components. Nearly all respondents said that they would participate in the program again if they were to install qualified equipment.

Technical Studies and ATACs

Results of the participant survey indicated that technical studies are a valuable program component. Overall, about one-third of the program participants indicated that the recommendation from a technical study was one of the reasons they did the installation. While rarely cited as the most important reason, the study may be important in helping "close the deal." This interpretation is supported by the finding that, nearly 7 in 10 of those who had a technical study indicated that it had a strong influence on their decision.

The ATACs who carried out the technical studies generally reported high program satisfaction, good communication, reasonable program requirements, a satisfactory job assignment process,



and appropriate pay. However, most ATACs receive little or no training and would welcome training on analysis tools and on the program in general. Moreover, as noted above, most ATACs cited concerns about the quantity or quality of PMC communication.

The interviewed ATACs reported no specific customer questions or concerns about technical studies or the projects that might result from them. Those questions and concerns that were reported were about the program in general, such as program processes, communication, funding, or incentives.

A PMC contact noted the low rate of walk-through surveys that result in projects and reported that the PMC is planning an effort to increase the rate of conversion. However, most ATACs were unaware either of the number of walk-throughs converted to projects or of the PMC's plans to increase the conversion rate. The PMC's effectiveness at communicating such plans to ATACs and implementing them should be examined in future evaluations.

We conducted an analysis of Energy Trust's *FastTrack* database to determine what percentage of technical studies led to a project. For that analysis, we had to assume a connection between any technical study performed at a given location and any subsequent project. We found that about 22% of the technical studies performed from 2003 to 2008 led to a project. The percentage differed by program year, and was lowest in 2007 and 2008. Given the long mean lag between a study and the following project (424 days), it is likely that many technical studies performed in 2007 and 2008 will result in projects that fall beyond the time scope of this evaluation. When just those studies performed up to 2006 were considered, about 30% led to later projects.

The percentage of studies leading to projects varied by study type. About 34% of Level I studies led to projects, compared to 56% of Level II studies but only 15% of walk-throughs.

Lighting measures, including custom lighting constituted about 31% of the measures that resulted from studies. Customer building controls accounted for about 4% of the measures. All other measure types accounted for 3% or less of the measures. A more fine-grained analysis – for example, of measure type by year or an analysis of measure type at the individual project level – is beyond the scope of the present evaluation.

The Energy Trust database does not record what studies recommended. Therefore, we were not able to determine what percentage of technical studies led to the recommended actions.

Market Characterization

Penetration into the Vendor and Building Owner/Occupant Markets

The 459 Existing Buildings trade allies listed at the time of the evaluation represent approximately 6% of the total number of Oregon firms that operate under the same 13 NAICS codes. Examining just the six NAICS codes that account for the large majority of trade allies, the



penetration rate goes to 11% of businesses. Based on the survey of nonparticipating vendors, awareness of the program has penetrated to about 59% of the vendor market.⁵⁴

Completed 2006 and 2007 projects may represent approximately 12% to 13% of the Oregon nonresidential building owner/occupant market – when only those projects with measures other than free pre-rinse sprayers are considered, the penetration rate is may be about 10% to 11%. Awareness of the Existing Buildings program had penetrated to a lower percentage of building owner/occupants than vendors – about 31%, according to the survey of nonparticipants.

Energy Trust's Role in the Market

The Existing Buildings program plays a valuable role in the market. As seen above, vendors are actively marketing the program: 66% of surveyed vendors included qualifying equipment and 61% suggested that customers apply for an Energy Trust incentive in more than three-fifths of their bids. By comparison, in the previous process evaluation 59% of respondents said that they tell their customers about the program, but several did so only “as applicable.”

Nonparticipants indicated interest in a variety of program services – the most frequently mentioned being incentives for energy-efficient upgrades, followed closely by building audits – as well as a desire to learn more about the program. Nearly 8 in 10 said that they would participate in the Existing Buildings program if they were to install qualifying equipment.

More than three-fifths of surveyed participants identified the Energy Trust incentive as one of the reasons they installed the equipment. This represents an increase of nearly 30% over the proportion who cited the incentive in the previous evaluation.

Evidence suggests that the Existing Buildings program's effect on Oregon nonresidential building owners and occupants is about equal to that of the BETC. A total of 1,861 projects received a BETC in 2006.⁵⁵ If roughly the same number received a BETC in 2007, then approximately 3,700 projects received a BETC in 2006 and 2007, compared to 3,452 Existing Buildings projects in the same period. If we discount those 3,700 BETC recipients by the percent that would have gone to Production Efficiency rather than Existing Buildings (about 12%),⁵⁶ we find that the number of remaining BETC projects appears about equal to the total number Existing Buildings projects.

⁵⁴ Although the sample for this survey was drawn from vendors using all 13 of the NAICS codes represented in the trade ally population, including those that account for few trade allies, the final data set represented only those six NAICS codes that account for the majority of trade allies.

⁵⁵ *Economic Impacts of Oregon Energy Tax Credit Programs in 2006 (BETC/RETC): Final Report*. Prepared by ECONorthwest for the Oregon Department of Energy, May 30, 2007.

⁵⁶ Production Efficiency projects accounted for about 12% of the total number of Production Efficiency and Building Efficiency projects completed in 2006 and 2007.



However, about half of the Existing Buildings participants who had applied for a BETC said that the Existing Buildings incentive had more influence than the BETC and the great majority of the remainder said that either they had equal influence or that the combination of the two had more influence than either alone would have. Few indicated that the BETC had more influence than the Existing Buildings incentive.

Importance of Energy Reduction

A variety of findings indicate that the market represented in this sample is interested in energy efficiency. Energy costs were a chief concern: about two-thirds of respondents reported that their companies were actively engaged in or planning cost controls and identified at least one thing their company was doing to manage energy. Thirty percent specifically said their company has policies that incorporate energy efficiency into procurement; this represents a 50% increase over the percentage reported in the previous process evaluation.

These responses are reflected in that fact that just over one-quarter (26%) of interviewed participants said that corporate policy was one of the reasons they made an energy-efficient equipment purchase. However, the fact that only 4% reported this as their top reason indicates that other factors, such as energy cost savings, continue to weigh more heavily than a general corporate policy of making efficiency investments. A large majority (82%) of surveyed participants reported that saving energy was a reason for installing the equipment, about a 14% increase over the previous evaluation.

About two-thirds of survey respondents (participants and non-participants) were convinced of the reality of global climate change and a large minority reported that concern about it had affected the company's operations. However, we found no relationship between belief in global climate change and what respondents said their companies were doing about energy costs or their history of energy-efficient investment. Thus, belief in the reality of global climate change did not seem to induce involvement in energy reduction for 2006 and 2007 program participants, although many respondents appeared to attribute their company's activities to concern about it.

Results indicate that while building tenancy is a barrier to making investments in energy efficiency, it is not necessarily seen as a barrier to energy management through other means, such as through changing operations and management practices. It may be valuable to develop and market energy efficiency opportunities geared specifically to that group.

Other Influences

Other than energy-related reasons or program influence, the most frequently mentioned influences on equipment purchase were reliability (62% of participants), improved comfort or work environment (57%), non-energy savings (40%), improved work efficiency (36%), and safety (16%).



About 41% of program participants said one of the reasons they made their equipment purchase was that efficiency features are part of common practice for that application, indicating that market transformation is occurring and having an impact on equipment purchase. On the other hand, only 4 of 162 said this was their top reason, suggesting that most would have purchased the energy-efficient equipment even if non-efficient options had been easily available.

Codes or regulations did not exert much influence on the decisions of program participants to install energy-efficient equipment. Just 10 (6%) mentioned code requirements as a reason for installation, none of whom said it was the most important reason.

Repeat Participation

About 37% of the interviewed participants (excluding recipients of free pre-rinse sprayers) had participated previously. We found that repeat participants were more likely to have large projects than those who had not previously participated (93% vs. 61%). This leads to the question: does repeat participation lead to larger projects? Or does this relationship mean simply that organizations that undergo large equipment purchases or facility upgrades are more likely to look for ways to offset the cost, leading to repeat participation?

We examined whether projects increased in size with repeat participation. Using data from the Energy Trust *FastTrack* database, we identified 237 participants who had projects⁵⁷ in at least two years from 2003 to 2007, most (199) of whom participated in just two of the five years. We then computed the total project-related energy savings for each of those participants' projects by year.⁵⁸

We carried out a variety of analyses. We asked simply whether the total project-related savings in any participant's first year of participation was lower than the total in that participant's next year of participation. Also, since some participants repeated participation more than a second time, we also compared the first year to the mean of all subsequent years of participation.

The first analysis showed a small mean increase of 3,388 kWh from the first year of participation to the second year, or a mean increase of about 2.8%. The second analysis, comparing the first year of participation to the mean of all subsequent years, showed a slightly greater, but still relatively modest, mean increase of 9,683 kWh, or about 8.1%.

We also examined changes on a year-by-year basis, to see whether the circumstances specific to any of the particular program years may have had an effect on repeat participation. Simply comparing the mean savings for each year would not be appropriate since each year's mean would be based on a different, albeit overlapping, group of participants. We therefore examined

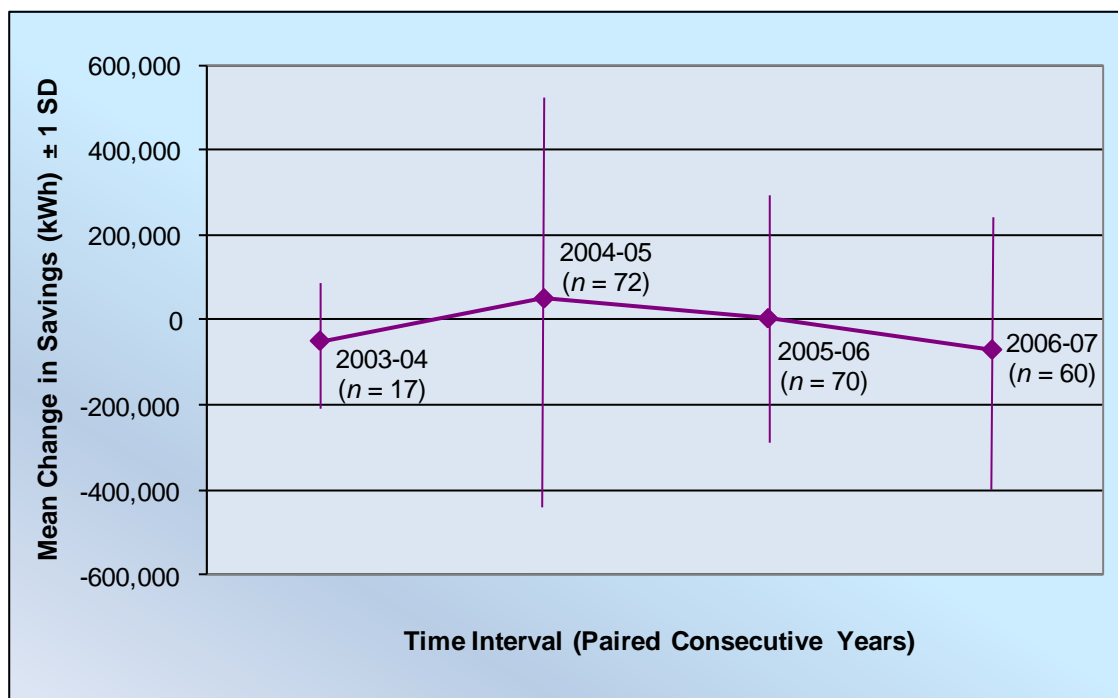
⁵⁷ Excluding technical studies and related activities.

⁵⁸ To establish a common metric, we converted savings for gas projects from therms to kWh.



the mean differences in project-related savings between each pair of consecutive program years. For each pair of consecutive program years, the mean difference was based on all those who participated in both years. The results are summarized in Figure 9.1.

Figure 9.1: Mean Year-to-Year Difference in Total Savings, 2003-2007



Of the repeaters, 190 had projects in consecutive years. Among those with projects in 2003 and 2004 ($n = 17$), there was a mean decrease over time of 48,364 kWh. Mean increases were found between 2004 and 2005 (51,533 kWh, $n = 72$) and between 2005 and 2006 (4,584 kWh, $n = 70$). Savings again showed a mean decrease of 69,090 kWh between 2006 and 2007 ($n = 60$).⁵⁹

The variances were very large in all cases, meaning that there were large increases as well as large decreases from year to year. The number of participants whose savings decreased over time outnumbered those whose savings increased by factors of just over one (2004-to-2005) to nearly two and a half (2006-to-2007).

The above results provide little indication that those who repeat participation tend to undertake larger projects in subsequent participations. Note that the above analyses did not take into

⁵⁹ Some participants provided data for two or more sets of consecutive years, so the total of the n s for the above four comparisons ($n = 219$) is greater than the total number of participants with projects in consecutive years ($n = 190$).



account businesses with multiple locations that participated under different site identification numbers.

CONCLUSIONS AND RECOMMENDATIONS

Program Marketing and Outreach Strategies

1. **Conclusion: Program awareness was low among nonparticipants, and results** suggest that greater program awareness would induce more energy efficiency investment.

Recommendation: The program should increase the amount of general program marketing directed toward the vendor and nonresidential building owner/occupant market. It also should increase the production of marketing collateral to distribute to vendors. This will increase the ability of detailed program information to penetrate to all parts of the market, enhancing program awareness and inducing more energy efficiency investment.

2. **Conclusion: The free pre-rinse sprayer distribution program appears to have been** at least somewhat effective in developing interest in energy efficiency and increasing the likelihood of undertaking energy efficiency improvements.

Recommendation: The pre-rinse spray valve is now required by state and federal standards. Similar activities also should be considered in conjunction with efforts to encourage other improvements.

3. **Conclusion: The increased direct involvement of PMC staff in outreach to end-users** has had little if any adverse impact and participants rated the program staff as more knowledgeable than contractors about the program.

Recommendation: The current approach of having PMC staff carry out direct outreach to end-users in certain sectors should continue. However, future evaluations should attempt to assess the effectiveness of this approach more directly.

Communication with ATACs

4. **Conclusion: ATACs indicated a need for more frequent, consistent, and detailed** communication with program staff, contrasting with what the PMC contact said on the subject.

Recommendation: The PMC should review its procedures for communicating with ATACs and establish guidelines to ensure more frequent, consistent, and detailed communication.

5. **Conclusion: ATACs benefit from training on a variety of topics. While the** discrepancy between their comments and those of program staff was less notable than that



regarding communication, the description of training by PMC contacts differed from that of some ATACs.

Recommendation: The PMC should schedule more regular ATAC training sessions to cover program requirements on analysis, documentation, and reporting; availability and use of analysis tools; and the program in general. We also recommend that the PMC develop a program handbook for use by ATACs.

Program Data Collection, Tracking, and Processing Activities

6. **Conclusion:** While data tracking challenges are being addressed, the system is still described as difficult to use.

Recommendation: Discussion between Energy Trust and the PMC to identify ways to improve the efficiency of data entry and tracking should continue.

7. **Conclusion:** While documentation problems identified in project records from the 2006 program year appear to have been addressed, additional quality control review will help prevent future problems.

Recommendation: The PMC should carry out an additional quality control review of project documentation for a random sample of records from 2007 and 2008.

8. **Conclusion:** The evaluation team found that the list of trade allies may not be up to date and found multiple instances of trade ally firm names being represented inconsistently in the file.

Recommendation: The PMC should carry out a thorough review of the trade ally list to ensure that it is up to date, that it is consistent with the trade ally information listed on the Energy Trust website, and that redundancies are minimized. Ideally, a relational database should be created with one table listing each trade ally once, linked to other tables listing information by trade ally location and program year.

9. **Conclusion:** The evaluation's estimate of market penetration was based on data that may or may not be representative of the market; therefore, the estimate of penetration may not be reliable. The number of records with building size data was far too small to develop estimates of penetration for different end uses and sectors.

Recommendation: The PMC should record building size for all incentive applications.

10. **Conclusion:** It was difficult to use the Energy Trust database to analyze the number of free pre-rinse sprayers that resulted in other energy efficient measure installations. There were many cases in the Energy Trust database in which a given business had different identification numbers for multiple locations.



Recommendation: Add a higher-level identification code field to the Energy Trust database to allow multiple locations of single business to be identified with a single code.

Recommendation: Establish conventions for assigning the same higher-level code to records that have separate site identifiers (for example, whether all divisions of a particular city or county government should be grouped together; whether separately-owned franchises of a given business should be grouped together).

Recommendation: Build the capability into the database to search existing records when a new record is entered, to identify likely matches to the business name entered for the new record.

Recommendation: Establish data-entry conventions to increase the likelihood that a new record for a business or organization will be matched to an existing one (for example, consistent use of abbreviations, punctuation, ordering of the elements of the name – “Corvallis [Restaurant Name]” or “[Restaurant Name] – Corvallis”).

- 11. Conclusion:** The evaluation’s analysis of the result of technical studies could not take the studies’ recommendations into account as they are not recorded in the Energy Trust database.

Recommendation: The Energy Trust database should include fields for recording technical studies’ recommendations.

Program Impact

- 12. Conclusion:** Cohort variation still produces surprises. There are clear differences in the performance of the 2006 participants and the 2007 participants, particularly in the lighting group.

Recommendation: In the future, include a small sample of lighting-only participants in the site-visit sample and develop a correction factor for lighting for the billing analysis.

- 13. Conclusion:** Free-ridership ratios are within the normal range for similar commercial retrofit programs.

Recommendation: Do not make any changes to the program based on free-ridership rates.

- 14. Conclusion:** Hard refusals compromise the integrity of the site-visit approach, especially with the largest participants. Efforts by Energy Trust and PMC staff to intervene did not change the outcome.

Recommendation: In the future, initiate interventions with program participants at the start of the project, rather than after the site engineers attempt to schedule visits.



15. Conclusion: Realization rates for the site-visit group were generally close to 100%.

Where they were less, the decrement was usually a function of problems at a small number of sites, but no systematic engineering issues were found.

Recommendation: Re-examine the program quality control procedures to ensure that more complex sites have inspections and that program behavioral recommendations are implemented. (See also Conclusion 7, above.)

16. Conclusion: Billing analysis results produced large relative precision bands around the point estimates. The 2007 lighting-only sample was the only estimate with a less than 10% precision.

Recommendation: Implement surveys at nonparticipant sites to better account for changes in operation and behavior.

Future Evaluations**17. Conclusion: Most ATACs were unaware either of the number of walk-throughs converted to projects or of the PMC's plans to increase the conversion rate.**

Recommendation: The next evaluation should examine the PMC's reported plan to increase the effort to convert studies to projects. The evaluation should determine whether the PMC put such a plan in place, how it was implemented, and what the ATACs thought of it.

18. Conclusion: There appears to be a trend for an increase in corporate policies related to energy management.

Recommendation: Future evaluations should continue to track corporate energy management policies.





APPENDICES

APPENDIX A: FREE-RIDERSHIP AND SPILLOVER

APPENDIX B: INTERVIEW GUIDES AND SURVEY INSTRUMENTS

APPENDIX C: IMPACT REGRESSION MODEL COEFFICIENTS

APPENDIX D: IMPACT PROCESS FLOW DIAGRAM



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APPENDICES



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FREE-RIDERSHIP AND SPILLOVER

FREE-RIDERSHIP

Overview

For evaluation of the Energy Trust Existing Buildings program, Research Into Action worked with the Energy Trust evaluation staff to develop a set of survey questions and a model for estimating free-ridership at the program level, based on:

- **Budget:** Whether participants' budgets could accommodate the project;
- **Influence:** How influential participants believe the program and its services were in the decision to install the project; and
- **Intention:** Their (retrospectively) stated intentions in the absence of the program.

The free-ridership estimation method used for Existing Buildings is detailed in this appendix. This appendix incorporates a memo prepared by Phil Degens and Sarah Castor of Energy Trust, dated June 4, 2008, entitled *Energy Trust Free-Ridership Methodology*.

Background

The California Evaluation Framework states:

“Free-riders are project participants who would have installed the same energy efficiency measures if there had been no program. How free-ridership is handled is a critical component of making the evaluations cost effective and accurate. Uncertainty surrounding free-ridership is a significant component of net energy and demand savings uncertainty.”

Free-rider rates are also important inputs in program planning and redesign. Free-rider rates provide important information that signals when program changes should be made in such aspects as incentive levels, target markets, efficiency levels, eligibility requirements, or when the program should be terminated. This information helps programs evolve, retain their impacts, and remain relevant in the market.

Methods for calculating and adjusting for free-ridership have changed over time. Estimation techniques vary from simple self reports to elaborate econometric decision models, as well as the use of comparison groups to adjust for, but not directly estimate, free-ridership. With self-reports, the initial, simple *Yes/No* question of *Would you have done it without the program?* has evolved into a battery of questions that attempt to model the nuances of the decision-making process and extract the influence of the program. Multiple questions with a range of answers for each



question require methods for weighting and scoring, as well as an algorithm to arrive at a final estimate of free-ridership.

Energy Trust has utilized an assortment of different methods to estimate free-ridership using participant self-reports. These methods have been shown to have a various weaknesses and biases. Suggested approaches developed in other parts of the country to address these shortcomings have tended to increase data collection requirements.

To address both shortcomings and increased data requirements, Energy Trust staff has developed a method for calculating free-ridership that is simple, transparent, and unbiased. A goal in developing this method was the ability to apply it to all programs and their markets. An added goal was the ability to obtain the self-reported results through a reduced set of survey questions. These questions can be incorporated in a short program feedback survey administered online or on paper at the time of participation. The timing of the survey, as well as its brevity, should increase participant response rates. In addition, having the survey administered at the time of participation may yield more accurate information, since the program is still fresh in the respondent's mind and the chances are greater that the person most directly involved in the project is the survey respondent.

Survey Questions

Table A.1 presents the survey questions used and the abbreviated label for the question shown in subsequent tables.

Table A.1: Survey Questions Related to Free-Ridership and Corresponding Chart Abbreviations

QUESTION ASKED	CHART ABBREVIATION
How influential was the technical study in planning for this equipment installation? <i>(5-point scale)</i>	Influence: Study
How influential was the Existing Buildings Incentive in planning for this equipment installation? <i>(5-point scale)</i>	Influence: Incentive
If the program contact had not facilitated participation in the program, how likely is it that you would have installed the efficient equipment anyway? <i>(5-point scale; reversed for comparability with other influence questions)</i>	Influence: Assistance
Had your firm not been able to get an Energy Trust incentive for the installation, how would your plans have changed, if at all? <i>(Specific alternatives queried, plus "anything else?")</i>	Intention
At that time, could your budget have accommodated the full cost of the equipment installation without the incentive? <i>(Yes/No/Don't Know)</i>	Budget



Methodology

As a starting point for developing the methodology, Energy Trust evaluation staff has used the belief that the key question to be answered is whether the participant was influenced by the program. This is relatively easy to determine if only a few *Yes/No* questions are asked and answers are consistent (e.g., “The program had no influence” and “I would have taken the action if the program had not existed,” or “The program had a critical influence on my decision” and “The action would not have taken place without the program”). If a more nuanced approach is used, such as allowing for degrees of influence, providing a *Don't Know* option, or increasing the number and scope of the questions, the calculation becomes more difficult and requires a set of rules and algorithm.

The set of rules and algorithm that Energy Trust has developed to use as its basis is the *Laplace Criterion*. The *Laplace Criterion* states that “in the absence of any prior knowledge, we must assume that the events have equal probability,” assuming, of course, that the events are mutually exclusive and collectively exhaustive.⁶⁰ This means that if it is not absolutely clear if the program had an influence on the participant’s action/decision, equal odds are given to the outcome that the program had an influence and the outcome that the program did not have an influence. In these cases, the probability of the program having influence is 50% and the probability of it NOT having an influence is 50%. In other words, the participant has a 50% chance of being a free-rider.

The 50% free-rider outcome is an outcome only in a subset of the cases, as both influence and participant intent in the absence of the program might have a range of possible answers. To address all possible outcomes, a set of assumptions was developed that create the framework for calculating unbiased free-rider scores.

→ **Assumption 1: Respondent is truthful.**

- **Implication 1:** Consistent responses have easily calculated free-rider rates of 0% and 100%.
- **Implication 2:** Participants that provide inconsistent or contradictory responses (e.g., participant answers, “Program was critical to the project moving forward” and, “Project would have moved forward exactly the same in absence of the program”) are viewed as having answered questions truthfully. With no additional information,⁶¹ both answers are given equal validity.

⁶⁰ The *Laplace Criterion* is based on *Bernoulli's Principle of Insufficient Reason* which states that if we are ignorant of the ways an event can occur (and therefore have no reason to believe that one way will occur preferentially compared to another), the event will occur equally likely in any way. Keynes referred to the principle as the principle of indifference, formulating it as follows: "If there is no known reason for predicating of our subject one rather than another of several alternatives, then relatively to such knowledge the assertions of each of these alternatives have an equal probability."

⁶¹ Future evaluations will ask participants follow-up clarifying questions when contradictory answers are given.



➔ **Assumption 2:** *It is inconsistencies between stated program influence and stated intentions of what would have happened in absence of the program that need to be resolved.*

- **Implication:** Only data that clearly provides information on either program influence or the participant's intent in absence of the program will be used in the free-rider calculation.
- **Example 1:** Respondent states, "Program was critical in bringing the project about," and also states, "Program had no influence."
- **Example 2:** Respondent states, "Project would not have changed in absence of the program," and states, "Program had critical influence."

➔ **Assumption 3:** *Equal probabilities are given to inconsistent answers.*

- **Implication:** Event probabilities are additive, since the two possible events being considered are "project went through with program influence" and "project went through without program influence."
- **Example 1:** Respondent states, "Program was critical in bringing the project about," and also states, "Program had no influence." The first statement implies that the program had significant influence and the second implies that it did not; therefore, "program had no influence" has a 50% chance of being true and "program had influence" has a 50% chance of being true. Therefore, without additional information, the free-rider probability is 50%.

➔ **Assumption 4:** *Questions with a range of qualitative answers will have free-rider scores distributed equally across the range.* Questions with a range of quantitative values for answers will use actual values – or if the answer is a range, the midpoint – to calculate the free-rider score.

➔ **Assumption 5:** *In cases where the answer is "don't know," all of the possible answers have equal probabilities of being true.*

- **Implication 1:** This will create a range of possible free-rider estimates for all participants that answer "don't know."
- **Implication 2:** To obtain the range, only scenarios involving the maximum and minimum values need to be run.
- **Implication 3:** If no information is available to any of the questions, the observation is not included in the analysis, as it is deemed equivalent to a participant that was not interviewed and thus not included in the analysis.

Assumption 2 might be considered by some as limiting, in that it only focuses on the inconsistencies around the influence of the program and the stated intentions of how, if at all, the project would have changed in the absence of the program. Factors such as experience with the program, length of time the project was planned, or experience with energy efficiency are often



factored into the free-rider estimation. However, they are not used to resolve inconsistent answers, as their relationship to the project in question is not clear and their inclusion in any weighting scheme or use in adjusting probabilities is not straightforward.

Participation in the program in the past is not sufficient to determine that the project under consideration would have gone through without the program's help, incentives, or studies. Past participation may have involved an end-use technology that has little relevance to the current project. On the other hand, past participation may have involved incentives and other program assistances that were needed to move the current project forward. Therefore, past program participation might be a good predictor of future participation, but cannot be considered a clear indicator of free-ridership. Even past experience with the same technology for which no incentive was received may not be a clear indicator that the participant is a free-rider. To make this assumption, the participant's economic conditions and investment criteria would need to remain unchanged, a reasonable assumption for only a short period of time. Over longer periods, economic conditions and investment criteria both change. Also, "comparable" equipment and technologies might not, in fact, be comparable and past experience with the program may not have been positive. For example, installation of additional VFDs through the program would be a sign of program success if the customer had poor experiences with VFDs in the past. Since past participation and past experience do not have a straightforward interpretation without further investigation, their use in calculating free-ridership is inappropriate.

Application

As stated above, the question that is being answered is whether the program had an influence on the project. The algorithm is quite flexible and can include multiple program influences and allow for a range of answers for the participant's intent in absence of the program.

Program Influence

Participants rated program influence for three major factors:

1. Incentive
2. Technical Study
3. Program Assistance In General



Participants rated each influence on a 5-point scale, from “critical influence” to “no influence.”⁶² The maximum value given for any of these program factors is used as the indicator of program influence. This results in five scores that are equally distributed across a potential range from 0 to 1. Table A.2 provides the schema for scoring program influence.

Table A.2: Free-Rider Scoring of Program Influence

PROGRAM INFLUENCE	FREE-RIDER SCORE	PROBABILITY ASSOCIATED WITH PROGRAM INFLUENCE	FREE-RIDER RATE ASSOCIATED WITH PROGRAM INFLUENCE
5-Critical Influence	0.00	50%	0.0%
4-	0.25	50%	12.5%
3-	0.50	50%	25.0%
2-	0.75	50%	37.5%
1-No Influence	1.00	50%	50.0%

Participant Intention in Absence of the Program

For stated changes in the project in absence of the program, there are three different levels of change:

- ➔ **No change in the project** – would have installed exactly like actual project
- ➔ **Project would have changed, but retained some energy efficiency features**
- ➔ **Project would have made other changes with no significant energy-efficient component**

To determine the level of change, participants were asked how the project would have changed in absence of the program. A variety of answers could be given, from “No change,” to “Change in scope,” to “Postponing the project more than a year.” These answers were then allocated to one of the three options above. Changes that might have retained some of the energy-efficient features of the project were scored at the midpoint, as no reliable information on the efficiency level was available. Table A-3 provides the schema for scoring intent.

⁶² Respondents were asked, “...can you tell me how influential it was on a scale of ‘1’ to ‘5’, where ‘1’ means ‘no influence’ and ‘5’ means a ‘critical influence’ – that is, the installation would not have happened without one?”



Table A.3: Free-Rider Scoring of Stated Intent in Absence of Program

STATED INTENT IN ABSENCE OF PROGRAM	FREE-RIDER SCORE	PROBABILITY ASSOCIATED WITH STATED INTENT	FREE-RIDER RATE ASSOCIATED WITH STATED INTENT
No Change in Project	1.00	50%	50%
Change with Some Energy Efficiency Retained	0.50	50%	25%
Significant Change with Virtually No Program Energy Efficiency Retained	0.00	50%	0%

With the outcomes of being influenced or not being influenced by the program having equal probabilities, the free-rider rates associated with each outcome are additive. The equation below can be used to calculate the free-rider (FR) rate given participant responses and scores:

$$\text{Free-rider rate} = 0.5 * (\text{program influence FR score}) + 0.5 * (\text{stated intent FR score})$$

In cases where information is lacking (e.g., the participant stated that they did not know if they were influenced), all of the outcomes associated with that question have equal probability of being true. This will result in the participant having a range for the free-rider rate. The range is estimated for all respondents with indeterminate answers by calculating the maximum and minimum values for each participant. The resulting high and low estimates will then delineate the range of free-ridership.

Table A.4 shows the various permutations of the free-rider rates that are calculated using the above algorithm. This will result in a range of potential free-rider rates. With a high and a low estimated for the participants answering “don’t know.” To obtain a single value estimate, the mid-point of the range was used.

Table A.4: Weights and Free-Rider Rates

PROGRAM INFLUENCE FR		STATED INTENT FR		SUMMED FREE-RIDER RATE (RANGE)
PROGRAM INFLUENCE	FREE-RIDER RATE	STATED INTENT	FREE-RIDER RATE	
5	0	Change	0	0
4	0.125	Change	0	12.5%
3	0.25	Change	0	25%
2	0.375	Change	0	37.5%
1	0.50	Change	0	50%
Don't Know	0 to 0.50	Change	0	0% to 50%

Continued



PROGRAM INFLUENCE FR		STATED INTENT FR		SUMMED FREE-RIDER RATE (RANGE)
PROGRAM INFLUENCE	FREE-RIDER RATE	STATED INTENT	FREE-RIDER RATE	
5	0	Partial	0.25	25%
4	0.125	Partial	0.25	37.5%
3	0.25	Partial	0.25	50%
2	0.375	Partial	0.25	62.5%
1	0.50	Partial	0.25	75%
Don't Know	0 to 0.50	Partial	25	25% to 75%
5	0	No Change	0.50	50%
4	0.125	No Change	0.50	62.5%
3	0.25	No Change	0.50	75%
2	0.375	No Change	0.50	87.5%
1	0.50	No Change	0.50	100%
Don't Know	0 to 0.50	No Change	0.50	50% to 100%
5	0	Don't Know	0 to 0.50	0% to 50%
4	0.125	Don't Know	0 to 0.50	12.5% to 62.5%
3	0.25	Don't Know	0 to 0.50	25% to 75%
2	0.375	Don't Know	0 to 0.50	37.5% to 87.5%
1	0.50	Don't Know	0 to 0.50	50% to 100%
Don't Know	NA	Don't Know	NA	NA

Budget

Participants that reported having had a sufficient budget to undertake the project without an incentive would have been able to do the project in the absence of the program, but may or may not have chosen to spend the available money on that specific project. No adjustment is made to the above free-rider rates for participants that had sufficient budget.

Participants that reported not having sufficient budget to undertake the specific project would not have been able to undertake the exact project with “no change.” They perhaps would be able to undertake the project “partially” or not at all (“change”). Thus, participants that reported both “no change” and “no budget” were treated for the free-rider calculation as if they had reported “partial” change. So, in Table A.4 above, instead of a free-rider stated intent score of 0.50 (corresponding to “no change”), they were assigned a free-rider stated intent score of 0.25 (corresponding to “partial”). These adjustments are shown in the next section for the Existing Buildings participants.



Application: Sprayer-Only Sites

In program years 2006 and 2007, Existing Buildings initiated a program of free direct installation of energy-efficient pre-rinse sprayers at restaurants and other food preparation facilities. Since neither a technical survey nor an incentive was involved, the only program influence was the fact that the program offered the sprayers at no cost. Therefore, program influence was calculated from this single item.

Furthermore, these respondents were not asked whether the project would have changed if they had not received the program's assistance. This question was not highly meaningful to most of these participants, as a large majority had not been considering installation of an energy-efficient sprayer before Energy Trust offered them one at no cost.

Therefore, if a participant stated that they had not been considering the installation of an energy-efficient sprayer before they were contacted by the program, we concluded that their intention in absence of the program would have "changed." We also asked if their budget could have accommodated the purchase of an energy-efficient sprayer without the program's assistance. If they indicated that their budget could not have accommodated the energy efficient sprayer, we again concluded that their intention in absence of the program would have "changed."

If they stated that they had been considering the installation of an energy-efficient sprayer before they were contacted by the program and that their budget could have accommodated the energy-efficient sprayer (8 of 50 sprayer recipients responded in this manner), we still could not conclude whether their intention would have changed or not. In these instances, we treated their intention as "partial change," following the logic described above.

Existing Buildings Free-Rider Results

Free-ridership results are presented separately for sprayer-only and other sites. Table A.5 presents the results on a case-by-case basis for the surveyed Existing Buildings participants, excluding 50 sprayer-only sites.



Table A.5: Free-Rider Case Assignment for Existing Buildings*

PROGRAM INFLUENCE	STATED INTENT	BUDGET	FREE-RIDER RATE	NUMBER OF SURVEYED PARTICIPANTS
5	Change	(Not applicable to FR scoring)	0	43
4	Change		12.5%	15
3	Change		25%	5
2	Change		37.5%	1
1	Change		50%	2
Don't Know	Change		0% to 50%	0
5	Partial	(Not applicable to FR scoring)	25%	10
4	Partial		37.5%	5
3	Partial		50%	1
2	Partial		62.5%	0
1	Partial		75%	0
Don't Know	Partial		25% to 75%	0
5	No Change	2 said no budget	50% (25% if no budget)	20
4	No Change	2 said no budget	62.5% (37.5% if no budget)	27
3	No Change	1 said no budget	75% (50% if no budget)	6
2	No Change	All had no budget	87.5%	1
1	No Change	All had no budget	100%	3
Don't Know	No Change	All had no budget	50% to 100%	1
5	Don't Know	3 said no budget	0% to 50% (0% to 25% if no budget)	8
4	Don't Know	1 said no budget	12.5% to 62.5% (12.5% to 37.5% if no budget)	9
3	Don't Know	All had no budget	25% to 75%	1
2	Don't Know	(No respondents)	50% to 100%	0
1	Don't Know		50% to 100%	1

* Excludes participants in the pre-rinse sprayer free direct install program



The free-rider simple average across these surveyed Existing Buildings participants ranges from 29% to 34%.

Table A.6 presents the results on a case-by-case basis for the 50 sprayer-only sites.

Table A.6: Free-Rider Case Assignment for Existing Buildings Sprayer Recipients

PROGRAM INFLUENCE	STATED INTENT	FREE-RIDER RATE	NUMBER OF SURVEYED PARTICIPANTS
5	Change	0	25
4	Change	12.5%	6
3	Change	25%	2
2	Change	37.5%	0
1	Change	50%	1
Don't Know	Change	0% to 50%	0
5	Partial	25%	0
4	Partial	37.5%	3
3	Partial	50%	2
2	Partial	62.5%	1
1	Partial	75%	2
Don't Know	Partial	25% to 75%	0
Don't Know	Don't know	50%	8

The free-rider simple average across these surveyed sprayer-only Existing Buildings participants ranges from 12% to 28%.

To determine the estimated free-rider rate range for the Existing Buildings program as a whole, the gross savings of each participant were multiplied by the participant-specific free-rider value (or by the simple average value for participants that were not surveyed). The Existing Buildings estimated 2006 site-specific free-rider rate ranges from a low of 38% to a high of 43%, with a mid-point of 40.4% for sites with electric measures and from 35% to 39% (mid-point, 37.1%) for sites with gas measures. The estimated 2007 site-specific free-rider rate ranges from 38% to 50% (mid-point, 44.0%) for sites with electric measures and 40% to 40% (mid-point, 40.0%) for sites with gas measures.

Next Steps

The methods that are described above are viewed by Energy Trust as providing the framework for arriving at free-rider rates that are not biased in any direction and for providing a guide to a



consistent scoring algorithm. The method also provides a general solution that can be applied to participants in the residential, commercial, or industrial sectors. However, there is still work to be done and improvements to be made, as this analytical methodology evolved after the participant survey had been fielded. In particular, Energy Trust plans to pursue the following in subsequent research.

Wording of Free-Rider Questions

Care must still be taken in developing appropriate questions that are clear in their meaning and for which answers also have a clear interpretation. The current wording of many of the surveys that have been fielded still have room for improvement. Energy Trust anticipates that its evaluation contractors will still have much input into the appropriate wording of survey questions.

Inconsistent Answers

Asking clarifying questions when inconsistent answers are given to free-rider questions has also been suggested as a way to arrive at a consistent result. Incorporating these consistency checks will be considered in the next evaluation survey design. Surveys that are fielded via the telephone or web probably can easily incorporate this type of consistency check, while including such a check effectively in a paper/mail survey may be more difficult.

Greater Range of Answers

The ranges of possible answers for program influence and efficiency level of a project in absence of the program are quite small in many of Energy Trust's evaluation surveys. Providing a greater range of possible answers, such as an 11-point influence scale or a percent efficiency reduction might provide a more realistic, continuous range of free-rider estimates, rather than the step-like distribution found in Table A.3. A greater range might also provide less bias to answers that are provided. These greater ranges will provide more nuance, but care needs to be taken so that the range of possible answers are meaningful to the respondent (e.g., some projects cannot be reduced by a percentage level).

Measure-Specific Free-Rider Rate Estimation

A variety of strategies can be used to estimate measure-specific free-rider rates. Energy Trust's approach has typically been to survey a sufficient number of participants that have installed each of the measures of interest. Instead of repeating the same questions for each type of equipment installed, the free-rider questions are asked once. Reducing the number and frequency of questions will increase the response rate and improve the survey results. In the future, Energy Trust anticipates that it will experiment with a variety of approaches to test what methods best capture measure-specific data.



Surveying Closer to the Date of Project Completion

Energy Trust is planning on surveying participants closer to the time of participation. What that will entail has not yet been determined. A participant satisfaction/feedback survey instrument is being designed that could gather timely data and possibly serve multiple purposes. How surveys would be fielded has yet to be determined and if they can effectively serve multiple purposes needs to be thought through and tested.

Effective Survey Design

Energy Trust anticipates developing surveys with effective designs that can obtain the information needed to estimate free-ridership using a reduced set of free-rider questions. This will help implement many of the steps mentioned above that will increase survey response rates, improve the reliability of survey responses, allow surveys to serve multiple needs, and provide more timely results.

SPILLOVER

Spillover Method

We asked the 212 participants what equipment they had installed in the past two years (other than the equipment for which they received the Energy Trust incentive) and, for each piece of equipment installed, whether it was energy-efficient and, if so, whether they had applied for an incentive. (We did not visit their facilities and verify the purchase, its efficiency, and its scope – i.e., sizes and quantities.) We asked those participants who had installed energy-efficient equipment without an incentive to rate the influence of the program on their decision to install each piece of equipment, using a five-point scale ranging from “low” to “high.”

Spillover Results

Of the 212 participants, 126 (59%) had purchased equipment. Of those who had purchased equipment, 117 (93%) had purchased and installed energy-efficient equipment. In total, 90% of all equipment purchased was energy-efficient.

Seventy-two of the 212 participants (34%) said that they had not applied for an incentive for energy-efficient equipment purchased in the past two years. Of those, 46 planned or purchased the equipment during or after their participation in the program, and so the program could have had an influence on their equipment purchase. Twelve of those 46 did not provide information on program influence, leaving 34 who rated the program's influence on their purchases.

Those 34 respondents had purchased a total of 68 pieces of energy-efficient equipment (Table A.7). Most had bought only one (16) or two (13) pieces. Two bought three pieces, and one each purchased five, six, and nine pieces of energy-efficient equipment. All but one of these



respondents indicated that the program had the same amount of influence on all of the energy-efficient equipment they bought. One of the participants who had purchased two pieces of energy-efficient equipment rated the program's influence as high for HVAC equipment and moderately high (4 on the 1-5 scale) for motors.

Table A.7: Spillover Equipment Installations

EQUIPMENT	RATED INFLUENCE, SCALE OF 1 (LOW) TO 5 (HIGH)						
	1	2	3	4	5	TOTAL	MEAN
Lighting	6	0	4	4	1	15	2.6
HVAC	5	1	2	2	2	12	2.6
Boiler	0	0	0	2	0	2	4.0
Sprayer	0	0	0	2	1	3	4.3
Insulation	1	0	0	2	0	3	3.0
Refrigeration	1	0	1	1	0	3	2.7
Cooking	1	0	2	3	1	7	3.4
Motors	0	0	1	3	0	4	3.8
VFDs	0	0	1	2	0	3	3.7
Water Heater	0	0	2	2	1	5	3.8
Dishwasher	1	1	0	0	1	3	2.7
Other	4	1	0	2	1	8	2.4
TOTAL	19	3	13	25	8	68	3.0

In total, six respondents reported that the program had a high influence on eight pieces of equipment; nine (including one of the previous six) reported a somewhat high influence on 25 pieces of equipment; five said it had a moderate (3 out of 5) influence on 13 pieces of equipment; two indicated a somewhat low (2 out of 5) influence on three pieces of equipment; and 13 reported a low influence on 19 pieces of equipment. The mean rated influence across the 34 respondents (counting each respondent only once) was 2.75 on the 1-to-5 scale. The mean rated influence across the 68 pieces of equipment was 3.0.

As Table A.7 shows, 15 participants indicated they had installed efficient lighting or lighting controls, 12 reported efficient HVAC systems, seven reported cooking equipment, five reported water heaters, four installed motors, three each reported pre-rinse sprayers, insulation, refrigeration (refrigerators and/or freezers), VFDs, or dishwashers, and eight reported other types of efficient equipment.

Boilers and sprayers were the most highly influenced types of equipment, with mean ratings of at least 4.0. Cooking equipment, motors, VFDs, and water heaters had mean influence ratings over



3.5. Lighting, HVAC, insulation, refrigeration, dishwashers, and “other” items had mean influence ratings of 3.0 or lower.

Note that the most commonly installed types of energy-efficient equipment (lighting, HVAC) were least influenced by the program. This suggests perhaps that the market for these equipment types is relatively more transformed than for the others, an interpretation supported by the fact that 94% of all lighting and HVAC equipment purchased was energy-efficient, compared to 87% of all other equipment.

Efficient Equipment Installations Among Nonparticipants

In interviews with 130 nonparticipants, we asked about the installation of non-incentivized energy-efficient equipment in the last two years. In addition, we were interested in finding out about nonparticipants’ awareness of Energy Trust and its energy-efficiency programs, such as Existing Buildings. For the purposes of our survey, nonparticipants were defined as owners and tenants of buildings within the Energy Trust service territory and who had not received any incentives for energy efficiency upgrades from PGE, Pacific Power and Light, Northwest Natural, Cascade Natural Gas, or Energy Trust since 2003; in the case of tenants, the criterion that no incentive had been received applied as well to the building owner.

Forty-seven percent, or 60 of 129 reporting nonparticipants, had purchased energy-efficient equipment in the last two years without applying for incentives. Nonparticipant owners were more than twice as likely as were tenants to report such purchases (69% compared to 31%, respectively). Among owners who installed equipment without incentives almost one-half (22 or 48%) had heard of Energy Trust programs. However, among tenant who had installed equipment, awareness was much lower – less than one-quarter (3 of 10 reporting or 21%) reporting knowing about Energy Trust programs aimed at business and commercial properties.

Nonparticipant responses also provide some corroboration of spillover. About half of respondents from owner or owner-occupied properties answered a question on Energy Trust program influence on their decision to purchase energy-efficient equipment (22 of the 46 that installed equipment in the last two years).⁶³ Among these respondents, roughly equal proportions fell in each category across a five-point scale ranging from “1-no-influence to “5-critical influence.” When combined, six (27%) reported Energy Trust influence at the high end of the scale (choosing either “4” or “5” on the scale). Two contacts reported not knowing.

Among the 162 non-sprayer participants interviewed, 79 (49%) reported installing non-incentivized energy-efficient equipment in the last two years. Thus, both sources of data – participant and nonparticipant – suggest that about one-half of customers have purchased energy-

⁶³ Only 3 of 14 tenants who installed non-incentivized energy-efficient equipment responded to this questions: ” 1 each reporting “1,” “4,” or “Don’t Know.”



efficient equipment without receiving incentives. However, verifying that the equipment was indeed efficient, quantifying its energy savings (including the size or scope of the installation), and assessing the degree to which these purchases have been influenced by the activities of the Existing Buildings program is beyond the scope of this project.





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INTERVIEW GUIDE FOR PMC PROGRAM STAFF

Name:

Title:

Date:

Program Role

1. Please describe your role in the program.
2. What activities occupy the majority of your time?
3. How do you see your program role, and in what ways, if any, has that changed from before 2006?

Communication within the PDC and with Energy Trust

4. Can you describe your communication within the PMC? [Probes: With whom do you most frequently communicate? How often do you communicate? What do you communicate about?]
5. How about with Energy Trust—do you directly communicate with anyone there on a regular basis?
6. What kind of direction do you receive regarding your program activities?
7. Are there any outstanding issues about which you are awaiting Energy Trust input or direction?

Interaction with Customers, Contractors, Vendors, and Other Subcontractors

8. What kind of assistance do you provide to customers?
9. How about participating contractors and vendors?
10. Do you still use ATACs? If so, what kind of assistance do you provide them? If no, when did you stop using them and why?
11. How about other subcontractors, such as Evergreen and PECI?
12. What kinds of interaction does Energy Trust have with participating contractors, vendors, and subcontractors that you have worked with?

Staffing

13. Does the program's current staffing level seem adequate? [If not, why not?]
14. Have any staff changed?

Incentives

15. Do you think that the current incentive structure—that is, the total budget and the incentive levels—is in line with the program's needs? [If not, why not?]
16. How about the way that incentive pay-outs are scheduled and planned?



17. What are the current plans regarding incentives?

Website

18. What are the plans for using the program website? [Probe: will an on-line application or tools be put on the website? Other?]
19. [If there are plans to make changes:] What changes would you recommend?
20. [If there are plans to make changes:] What role do you see Lockheed Martin playing in the process?

Tracking Data

21. Do you review the program and project tracking data? [If so, What challenges are you encountering with tracking and analyzing data? How is the ITAC (Information Technology Advisory Committee) helping with this? What trends are you noticing? Are you concerned about anything?]
22. How do you accommodate the often long planning cycle that big businesses have?

Marketing

23. How is the program currently being marketed? [Probes: What about the focused programs? How is that going? Are you planning on marketing to any other sectors? What are current activities and plans regarding marketing gas measures – what is being done to increase awareness of them? What about key accounts – are there any strategies regarding them?]
24. Have you identified any underserved segments (e.g., tenants)? If so, what is being done in terms of reaching them?
25. Are you planning any changes?

Projects

26. What is the current focus of your efforts? Why? How is this strategy working?
27. Are you seeing the kinds of projects you expected?
28. [If not:] Why do you think that's the case?
29. [If not:] What are you doing about it?
30. How are you serving large institutional customers?
31. Can you describe the process by which new measures are added? How do you interact with Energy Trust in developing new measures? What new measures are being considered?

Conclusion

32. How satisfied are you with program performance?
33. What changes would you like to see for the program? [What opportunities do you see? What do you think is missing from the program?]
34. What challenges or problems does the program face? [Probe: What effect do you think that more than doubling your goals by 2009 will have?]
35. What are you currently doing in terms of coordination with ODOE? How about with utilities?



36. Are there any new program activities planned for 2008?
37. What types of market research is needed to help the program?

Documentation (Follow-Up Questions Asked Later)

38. Can you explain your understanding of the process by which participants document projects? [Probe: How are documentation requirements explained to participants? How has this changed over the course of the project?]
39. We understand that some of the 2006 projects had some documentation issues and that the PMC took steps to reduce such issues in 2007 and afterwards. Can you give me your perspective on why the documentation issues occurred and what has been done to correct that situation?





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INTERVIEW GUIDE FOR ENERGY TRUST PROGRAM MANAGER

Name:

Title:

Date:

Overview

1. Can you give me an overview of how the program is progressing? [Probes: What activities are ongoing?]
2. Were there any new areas of program activity in 2007? [If new areas, why were they added?]

Program Role

3. Please describe the activities you engage in that occupy the majority of your time?
4. Who else at Energy Trust do you work with on BE?
5. How do you see your program role, and in what ways, if any, has that changed from before 2005?

Communication with the PMC

6. Can you describe your communication with the PMC? [Probes: How often do you communicate? Who from Energy Trust communicates with whom from the PMC? What do you communicate about?]
7. What is Energy Trust's process for providing direction to the program?
8. Are there any outstanding issues about which the PMC is awaiting Energy Trust input or direction?
9. How do you get input from the market or feedback about the program?
10. Have you had any interactions with participating commercial firms? Any concerns?
11. How about with participating contractors and vendors? Any concerns?
12. How do you coordinate with the PMC in communicating or dealing with participating contractors and vendors? Any concerns?
13. And how about with other subcontractors, like Evergreen and PECL – what kinds of interactions have you had and how do you coordinate with PMC in dealing with them?
14. What are your quality control activities?

Staffing

15. Does it seem to you the program's current staffing level is adequate? [If not, why not?]
16. Have any staff changed?



Incentives

17. Do you think the current incentive structure—that is, the total budget and the incentive levels—is in line with the program's needs? [If not, why not? Are there any plans to change?]
18. How about the way that incentive pay-outs are scheduled and planned?
19. What are the current plans regarding incentives?

Application Form

20. Have any changes been made to program application forms? [If so, what? Have they been changed to be more consistent with BETC form?]

Website

21. What are the plans for using the program website? [Probe: will an on-line application or tools be put on the website? Other?]

Tracking Data

22. What challenges are you encountering with tracking and analyzing data? How is ITAC helping with this?
23. What trends are you noticing? Are you concerned about anything?
24. How is the long planning cycle that big businesses often have being accommodated?

Marketing

25. What is your understanding of how the program is currently being marketed? [Probes: What about the focused programs? How is that going? Are there plans to market to any other sectors? What are current activities and plans regarding marketing gas measures – what is being done to increase awareness of them? What about key accounts – are there any strategies regarding them?]
26. Are you satisfied with the current marketing efforts and results?
27. Have any underserved segments been identified (e.g., tenants). If so, what is being done to reach them?
28. Have you asked the PMC to make any changes?

Projects

29. The PMC currently seems to focus a lot of effort on large building owners with less emphasis on contractors and trade allies. What do you think of this strategy?
30. Are you seeing the kinds of projects you expected?
31. [If not:] Why do you think that's the case?
32. [If not:] What are you doing about it?
33. Can you describe the process by which new measures are added? How do you interact with the PMC in developing new measures? What new measures are being considered?



Conclusion

34. How satisfied are you with PMC and program performance?
35. What changes are you contemplating for the program? [What opportunities do you see? What do you think is missing from the program?]
36. What challenges or problems does the program face?
37. What are you currently doing in terms of coordination with ODOE? How about with utilities?
38. Are there any new program activities planned for 2008?
39. What types of market research is needed to help the program?

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INTERVIEW GUIDE FOR ENERGY TRUST MARKETING STAFF

Name:

Title:

Date:

Program Role

1. Please describe your role relating to the BE program.

Website

2. What are the plans for using the program website? [Probe: will an on-line application or tools be put on the website? Other?]
3. How will the changes be carried out?

Marketing – If Role Encompasses More than Website

4. How is the program currently being marketed? [Probes: What about the focused programs? How is that going? Are you planning on marketing to any other sectors? What are current activities and plans regarding marketing gas measures – what is being done to increase awareness of them? What about key accounts – are there any strategies regarding them?]
5. Have any underserved segments been identified? If so, what is being done to reach them?
6. Do you know of any planned changes?



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INTERVIEW GUIDE FOR ACTIVE ATACS

Name:

Company:

Title:

Date:

1. How many jobs have you done for Energy Trust's Building Efficiency program in the past two years? How many walk-through, how many level 1, how many level 2?
2. What kinds of questions or concerns have you heard from those who have received studies about the studies and/or projects that might result from them?
3. How much effort is put into converting walk-throughs into projects? Has this changed over the past two years? How much potential do you think there is for getting more projects this way?
4. Can you describe your communication with Lockheed Martin? Have there been any communication challenges or concerns?
5. Can you describe the reporting that you are required to do for completed studies? Have there been any challenges in meeting them?
6. How are jobs assigned to you? Would you like to see any changes in how it's done?
7. Is the level of pay appropriate for the different types of study? Is there any study level for which the pay is not appropriate?
8. What kind of training does Lockheed Martin provide? Is it adequate? Would you like to see any changes to training?
9. Over all, how satisfied are you with the program?
10. What changes, if any, would you like to see made?



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INTERVIEW GUIDE FOR INACTIVE ATACS

Name:

Company:

Title:

Date:

1. Have you done any jobs have for Energy Trust's Building Efficiency program in the past two years?
2. If yes:
3. How many walk-through, how many level 1, how many level 2?
4. Can you describe the reporting that you are required to do for completed studies? Have there been any challenges in meeting them?
5. How were jobs assigned to you? Would you like to see any changes in how it's done?
6. Is the level of pay appropriate for the different types of study? Is there any study level for which the pay is not appropriate?
7. What kind of training does Lockheed Martin provide? Is it adequate? Would you like to see any changes to training?
8. Can you describe your communication with Lockheed Martin? Have there been any communication challenges or concerns?
9. Over all, how satisfied are you with the program?
10. What changes, if any, would you like to see made?



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PARTICIPANT SURVEY

Contact Information

ID
 Interviewer
 Date
 Business
 Contact
 Master Site ID
 BE Project Number

Enter Info before interview

P1. Measure installed (From Data file)

Introductory Statement

Hi, my name is . I am calling on behalf of Energy Trust of Oregon. In 2006 your business received an incentive through its Building Efficiency Program to install [measure]. As part of its commitment to continuous improvement and providing value to Oregon ratepayers, Energy Trust is evaluating the program and has hired my company to conduct a survey of selected participants.

S1. Are you familiar with this measure [...with this installation]?

- Yes [SKIP TO S4]
 No

S2. Can you tell me who would be familiar with the measure and the incentive [sprayer] that your business received?

[IF NOBODY IS AVAILABLE WHO IS FAMILIAR WITH THE MEASURE OR INCENTIVE, THANK AND TERMINATE]

S3. Can you transfer me or give me the phone number?

[IF TRANSFERRED, GO BACK 1 PAGE, AND RESTART INTERVIEW FROM INTRO]

[THANK AND TERMINATE]

S4. Is now a good time to discuss your equipment [sprayers] and your satisfaction with the program?

- Yes [SKIP TO Q1]
 No

S5. SCHEDULE A TIME, AND TERMINATE.

Awareness

My first set of questions concerns program awareness.



1. First, were you aware that it was an Energy Trust program that provided the incentive your business received for the [measure]? [Sprayer recipients: ...that provided the sprayer?]

- Yes [SKIP TO Q2]
- No, not sure, don't know

1a. Who did you think provided the incentive [sprayer]?

- Utility
- Not sure, don't know
- Other (please specify)

If you selected other, please specify:

[IF Q1=NO NOT SURE Don't know, SKIP TO Q3]

2. Were you aware that the program was called the Building Efficiency program?

- Yes
- No, not sure, don't know

2a. About how long have you been aware of this program [...the Building Efficiency program, the program that provided the sprayers?] Would you say...?

[CLARIFY: THE PROGRAM THAT PROVIDED THE INCENTIVE/SPRAYER]

- Up to about 2 years or so [2006-2007]
- 2-4 years [2004-2005]
- 5 years or more, [BEFORE 2004]
- ANSWER REFERS TO A 'UTILITY PROGRAM'
- Don't know

Additional comments:

3. Do you recall how you first heard about the program to get the incentive you received for the [measure] [...that provided the sprayer]?

[DO NOT READ, BUT PROBE TO CODE]

- Program representative
- Contractor
- Utility (PGE, Pacific Corp)
- Industry association
- Architect
- Someone you work with or a colleague
- Government agency/official
- Don't know
- Other (please specify)

If you selected other, please specify:

Additional comments:

[QUESTION 4 WAS NOT ASKED OF SPRAYER RECIPIENTS]

4. Who persuaded you that participation in this incentive program would be a good idea?

[CLARIFY: ALTHOUGH IT ULTIMATELY WAS YOUR DECISION, WHO WAS MOST INFLUENTIAL IN HELPING YOU COME TO THIS DECISION?]

[DO NOT READ, BUT PROBE IF NECESSARY TO CODE]



- Program representative (Lockheed Martin, Evergreen Consulting, Energy Trust)
- Contractor
- Utility (PGE, Pacific Corp)
- Industry association
- Architect
- Someone you work with or a colleague
- Government agency/official
- Don't know
- Other (please specify)

If you selected other, please specify:

Additional comments:

5. Once you decided to participate, who was your main point of contact for information about the Building Efficiency program (the incentive program)?

[DO NOT READ, BUT PROBE IF NECESSARY TO CODE]

- Program representative (Lockheed Martin, Evergreen Consulting, Energy Trust)
- Contractor
- Utility (PGE, Pacific Corp)
- Industry association
- Architect
- Someone you work with or a colleague
- Government agency/official
- Don't know
- Other (please specify)

If you selected other, please specify:

Additional comments:

6. Regarding any contractor who provided equipment for which you got an incentive, would you say that the contractor [...the person who installed the sprayer] was...?

- Very knowledgeable about the BE program
- Somewhat knowledgeable
- A little knowledgeable
- Not knowledgeable
- DIDN'T WORK WITH A CONTRACTOR
- NO OPINION

Additional comments:

[QUESTION 7 WAS NOT ASKED OF SPRAYER RECIPIENTS]

7. Did you apply for an Oregon Business Energy Tax Credit (BETC—"betsy") on the equipment you installed through the Building Efficiency Program?

- Yes [SKIP TO Q8]
- No
- Don't know/Not sure

- 7a. Why didn't you apply?

[DO NOT READ, BUT PROBE TO CODE]

- Didn't know about BETC
- Didn't think of applying



- Didn't know my equipment might qualify
- Knew equipment didn't qualify
- Thought BETC not available for municipalities, nonprofits
- BETC application seemed too difficult or time consuming
- Was too late to apply
- For reasons internal to your company that don't pertain to the program
- Don't know
- Other (please specify)

If you selected other, please specify:

Additional comments:

8. Are you aware that your business can get BETC tax credits for natural gas efficiency?

- Yes
- No

Additional comments:

9. Are you aware that your business can get BETC tax credits for renewable energy projects, such as solar and wind?

- Yes
- No

Additional comments:

[QUESTION 10 WAS NOT ASKED OF SPRAYER RECIPIENTS]

10. When considering the influence of the BETC and the Energy Trust incentive on your decision to install the energy efficient equipment, which had more influence, or did they have equal influence?

[DO NOT READ, BUT PROBE TO CODE]

- BETC had more influence
- Energy Trust incentive had more influence
- BETC and Energy Trust incentive had equal importance
- It was the combination of BETC and Energy Trust incentive that was so influential
- Don't know

Additional comments:

Past and Ongoing Program Interactions

The next set of questions concerns interactions you've had with the Building Efficiency Program.

[IF P2=NO, SKIP TO Q12]

11. Has your business has previously participated in the Building Efficiency program?

- Yes
- No
- Don't know

Additional comments:

12. Has your business ever started to participate in the Building Efficiency Program but did not continue for some reason?

- Yes
- No [SKIP TO Q13]



- Don't know [SKIP TO Q13]

12a. When was that?

[DO NOT READ, BUT PROBE TO CODE]

[IF A RANGE IS GIVEN, CODE MOST RECENT DATE]

- Prior to 2004, UTILITY PROGRAM
- 2004
- 2005
- 2006
- 2007
- Don't know

Additional comments:

12b. Why didn't you continue? Would you say...?

[CHECK ALL THAT APPLY]

- Equipment didn't qualify
- Incentive wasn't sufficient for project to meet your business's investment criteria
- Incentives were not available at that time
- Participating in the program would take too long
- Participating was too much of a hassle
- Reasons internal to your business that don't pertain to the program
- Don't know
- Other (please specify)

If you selected other, please specify:

Additional comments:

[IF Q12b~e, SKIP TO Q13]

12c. You said, 'participating was too much of a hassle'. Can you describe how it was a hassle?

[QUESTION 13 WAS NOT ASKED IN FIELD INTERVIEWS]

13. Based on your participation in the program, would you consider calling your program contact when you are contemplating an equipment purchase or facility change?

[CLARIFICATION: 'PROGRAM REP' IS SOMEONE FROM THE PROGRAM ITSELF, EITHER ENERGY TRUST OR THE IMPLEMENTER, LOCKHEED MARTIN (USED TO BE ASPEN)]

[DO NOT READ, BUT PROBE TO CODE]

- DIDN'T WORK WITH PROGRAM REP (ENERGY TRUST OR IMPLEMENTER)
- Yes, and have called them [SKIP TO Q14]
- Yes, and plan to call them soon [SKIP TO Q14]
- Yes, but have no immediate plans to call them [SKIP TO Q14]
- Never thought of it, but might do so [SKIP TO Q14]
- Would rather they contacted me periodically [SKIP TO Q14]
- No, see no reason to call/wouldn't want to call
- Other (please specify) [SKIP TO Q14]

If you selected other, please specify:

Additional comments:

13a. Please describe why you think 'there is no reason to call or wouldn't want to call'?



[QUESTION 14 WAS NOT ASKED IN FIELD INTERVIEWS]

14. Please rate how well you think your program contact understands the challenges you face in operating your business?

[READ LIST, EXCEPT LAST OPTION]

- Excellent understanding
- Understands quite a lot
- Moderate understanding
- A little understanding
- Does not understand very well
- Don't know/no comment [only if won't give other response]

Additional comments:

[QUESTION 15 WAS NOT ASKED IN FIELD INTERVIEWS]

15. Do you feel your program contact was always serving your business's best interests?

[IF INTERVIEWEE ALREADY SAID THEY DIDN'T WORK WITH PROGRAM REP, CONFIRM THAT, CHECK THE APPROPRIATE BOX, AND SKIP THIS QUESTION]

- DIDN'T WORK WITH PROGRAM REP
- Yes [SKIP TO Q16]
- No
- Don't know

- 15a. Please explain why you answered that way.

Decision-Making

The next set of questions addresses the decisions your business made regarding the equipment installation.

16. What reasons did you have for installing the equipment for which you received an incentive [...installing the sprayer]?

[READ LIST, CHECK ALL THAT APPLY]

- 16a. You said, [READ LIST OF CHECKED ITEMS]. Among them, could you tell me the most important reason?

	Q16	Q16a
Code or regulations [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>
Safety [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>
Improved reliability [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>
Replace failed equipment [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>
Improved comfort / work environment	<input type="checkbox"/>	<input type="checkbox"/>
Improve efficiency of people working in building	<input type="checkbox"/>	<input type="checkbox"/>
Energy cost savings	<input type="checkbox"/>	<input type="checkbox"/>
Other cost savings (labor, O&M, improved scheduling)	<input type="checkbox"/>	<input type="checkbox"/>
Contractor / contractor recommended	<input type="checkbox"/>	<input type="checkbox"/>
Program representative recommended	<input type="checkbox"/>	<input type="checkbox"/>
Technical study recommended [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency features are part of common practice for this application [Did not	<input type="checkbox"/>	<input type="checkbox"/>



- ask sprayer recipients]
- Corporate policy
- Energy Trust incentive [Sprayer recipients: Energy Trust gave you...]
- Other
- Don't know

17. About when did you first consider this project? Would you say...?

- Sometime in the past 2 years or so [2006-2007]
- 2-4 years [2004-2005]
- 5 years or more [BEFORE 2004] [UTILITY PROGRAM]
- Don't know

Additional comments:

[QUESTIONS 18-18b WERE NOT ASKED OF SPRAYER RECIPIENTS]

18. I'd like to know how your plans would have changed, if at all, if your business had not been able to get an Energy Trust incentive for the installation. I'll read a list of things you might have done, and would like you to tell me which ones you think you would have done.

[CHECK ALL THAT APPLY] "Would you have...

- a. Postponed the project to another year
- b. Cancelled the project altogether
- c. Installed standard efficiency equipment
- d. Scaled back the project in scope
- e. Changed the project design
- f. Used less expensive equipment
- g. Reduced the energy efficiency features
- h. Done something else
- i. [IF NONE OF THE ABOVE CHECKED] done just as you did, and installed the identical equipment within that same year

[IF Q18 CHECKED a]

18a. You said, 'you would have postponed the project to another year'. How long would you have postponed?

[IF Q18 CHECKED d OR e OR f OR g OR h]

18b. You said you would have [scaled the project back / changed the design / used less expensive equipment / reduced the energy efficiency features / done something else]. Can you tell me in as much detail as possible what changes you would have made?

19. If the program contact had not facilitated participation in the program, how likely is it that you would have installed the efficient equipment anyway?

[IF THE INTERVIEWEE ALREADY SAID THEY DIDN'T WORK WITH PROGRAM REP, CONFIRM HERE, CHECK BOX, AND SKIP QUESTION]

[DO NOT READ, BUT PROBE TO CODE]

- DIDN'T WORK WITH PROGRAM REP
- Definitely would
- Probably would
- Not sure



- Probably would not
- Definitely would not
- Don't know

Additional comments:

I'd like to find out how influential certain factors were in planning for this equipment installation. For each of the following, can you tell me how influential it was on a scale of 1 to 5, where 1 means no influence and 5 means a critical influence--that is, the installation would not have happened without one?

[QUESTION 20 WAS NOT ASKED OF SPRAYER RECIPIENTS]

20. First, how influential was the technical study, if you had one, in planning for this equipment installation?

[REPEAT SCALE IF NECESSARY]

- DID NOT HAVE A TECHNICAL STUDY
- 1 - No influence
- 2
- 3
- 4
- 5 - Critical influence, the installation would not have happened without this
- Don't know

Additional comments:

21. Using the same scale, how influential was the Building Efficiency incentive [...was the fact that Energy Trust provided the sprayer at no cost] in planning for this equipment installation?

[REPEAT SCALE IF NECESSARY]

- INSTALLATION WAS PLANNED BEFORE WE CONSIDERED THE INCENTIVE
- 1 - No influence
- 2
- 3
- 4
- 5 - Critical influence, the installation would not have happened without this
- Don't know

Additional comments:

[IF P2=NO AND P4=YES, SKIP TO Q23]

[IF P2=NO AND P3=YES AND P4=NO, SKIP TO Q24]

[IF P2=NO AND P3=NO AND P4=NO, SKIP TO Q27]

22. Using the same scale, how influential was your previous experience with the Building Efficiency program in planning for this equipment installation?

[REPEAT SCALE IF NECESSARY]

- 1 - No influence
- 2
- 3
- 4
- 5 - Critical influence, the installation would not have happened without this
- Don't know

Additional comments:



[IF P4=NO AND P3=YES, SKIP TO Q24]

[IF P3=NO AND P4=NO, SKIP TO Q27]

23. Has your business previously participated in another Energy Trust program (PE, NBE, renewables)?

- Yes
- No
- Don't know

[IF Q23=YES, SKIP TO Q24]

23a. Using the same scale as before, how influential was your previous experience with other Energy Trust programs in planning for this equipment installation?

[REPEAT SCALE IF NECESSARY]

- 1 - No influence
- 2
- 3
- 4
- 5 - Critical influence, the installation would not have happened without this
- Don't know

Additional comments:

27. At the time that you were planning the equipment installation, could your budget have accommodated the full cost of the equipment installation without the incentives?

- Yes
- No
- Don't know

Additional comments:

28. What other equipment, such as lighting, heating, air conditioning, boilers, kitchen equipment, and so forth, has your business installed in the past 2 years?

[FOR ITEMS CHECKED IN Q28]

28a. Did you specify that equipment to be energy efficient or did the vendor tell you that any of the equipment was more energy efficient than some of the other models you could have purchased?

[FOR EACH ITEM CHECKED IN Q28a]

28b. Did you receive an incentive?

[IF Q28a=checked AND Q28b~=checked]

28c. On a scale of 1 (low) to 5 (high), Please rate how influential your experience participating in the Building Efficiency (BE) Program was on your decision to install this energy efficient equipment (that you did not receive an incentive for).

[IF EQUIPMENT WAS PLANNED BEFORE LAST PARTICIPATION, ENTER 0]

	Installed	Efficient	Incentive	Influence-Q28c					
	Q28	Q28a	Q28b	0	1	2	3	4	5
Lighting (incl. occupancy sensor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sprayer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refrigerator / freezer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooking equipment (oven fryer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VFDs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28c. Other 1

28c. Other 2

28c. Other 3

Program Experiences

We're about three-quarters of the way done. The next set of questions focuses on your experiences as a program participant.

29. If you were to install equipment that qualifies for an incentive, would you choose to participate in the program again?

- Yes
- No
- Don't know/Not sure

29a. If anything, what would you want to have happen differently?

29b. Why not?

30. Can you think of any information or assistance that your program contact might have provided that would have made it easier to obtain your management's approval for the project?

[IF INTERVIEWEE ALREADY SAID THEY DIDN'T WORK WITH PROGRAM REP, CONFIRM HERE, CHECK BOX, AND SKIP QUESTION]

- DIDN'T WORK WITH PROGRAM REP
- No, can't think of anything
- No, not really relevant as I was the final decision-maker
- Yes, they could have

Additional comments:

30a. Could you describe what they are?

31. Please rate your satisfaction with the following items, where a rating of "1"=very unsatisfied, "3"=neither unsatisfied nor satisfied, and a rating of "5"=very satisfied.

	1	2	3	4	5	DK/NA
Overall program experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performance of equipment installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electricity / gas savings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incentive amount [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application process [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Interaction with program staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consistency of information received from program staff and contractors [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accuracy of information received from program staff and contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of the work conducted by contractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program staff's knowledge [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any program issue that needed resolution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Length of time to receive check [Did not ask sprayer recipients]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[IF ANY ITEM RATED "1" OR "2"]

32. What exactly were you dissatisfied with?

[PROBE FOR CLEAR EXPLANATION]

[QUESTION 33 WAS NOT ASKED OF SPRAYER RECIPIENTS OR IN THE FIELD INTERVIEWS]

33. Did you ever experience uncertainty or confusion about any of the following things?

[READ LIST, CHECK ALL THAT APPLY]

- Whom to call about a program issue
- The areas of expertise of different program contacts
- Program policies and procedures
- Availability of Energy Trust incentives for that year
- Who was capable of making application decisions
- The incentive amount Energy Trust was paying for estimated electricity savings (\$/kWh)

Additional comments:

34. Overall, how much uncertainty or confusion did you have about the program? Would you say...?

- No confusion
- Some confusion, not at all a problem
- A small problem
- A medium problem
- A significant problem
- Problem so significant it nearly stopped the project from going forward

Additional comments:

Conclusion

I have just a few concluding questions.

35. Which of the following policies or procedures does your business have in place regarding energy efficiency improvements at the location where the installation took place?

[READ LIST, CHECK ALL THAT APPLY]

- Informally managing energy costs through behavior changes such as turning off the lights and turning down the heat
- A written corporate or company sustainability policy
- Staff member responsible for energy and energy efficiency
- Corporate policies that incorporate energy efficiency in operations and procurement
- A written energy management plan



- Numerical energy savings goals
 - Other (please specify)
- If you selected other, please specify:
Additional comments:

35a. Can you explain the energy savings goals your organization has?

[QUESTIONS 36-41 WERE NOT ASKED IN FIELD INTERVIEWS]

36. How convinced are you that global warming is happening? Would you say you are...?

- Completely convinced
- Mostly convinced
- Not so convinced
- Not at all convinced

36a. Has the issue of global warming in any way affected the way you operate your facility?

[IF NEEDED: the type of equipment you purchase, your energy usage habits]

- Yes
- No
- Don't know/not sure

Firmographics

I'd like to conclude by asking just a few short questions about your business.

37. Which of the following best describes the type of building where the [measure] was installed?

- Office
 - Retail
 - Manufacturing
 - Warehouse
 - Grocery
 - Hospital
 - Other health
 - College/university
 - Institution/government
 - Lodging
 - Restaurant
 - School K-12
 - Apartment building (hi-rise resident)
 - Church
 - Assembly
 - Other (please specify)
- If you selected other, please specify:

38. Does your company own or rent this building?

- Own
- Rent

39. Please indicate which of the following best describes your role in your organization.

- Plant or corporate engineer



- Plant manager
- Facility manager
- Owner/President
- CEO, COO
- CFO, other financial executive
- Other (please specify)

If you selected other, please specify:

40. Does your company have facilities in more than one location in Oregon?

- Yes
- No
- Don't know

41. Approximately how many locations are there?

42. It helps us to understand people's concerns about the market conditions that affect their business's success. What are some of the concerns that are on your mind currently?

43. Do you have any final comments on the Building Efficiency Program that might be useful to Energy Trust?

Questions Asked Only of Sprayer Recipients

Have you ever heard of the Oregon Business Energy Tax Credit (BETC -- "betsy"), a tax credit for energy efficiency equipment purchases?

- Yes
- No
- Don't know/Not Sure

Had you been considering installing any energy efficient pre-rinse sprayers before Energy Trust offered them at no cost?

- Yes
- No [SKIP TO Q15c]
- Don't know/Not Sure [SKIP TO Q15c]

How many energy efficient pre-rinse sprayers did you have installed?

Is/are the sprayer(s) installed on a cold, hot, or mixed cold and hot water source?

- Cold
- Hot
- Mixed Cold/Hot
- DON'T KNOW

Is/are the sprayer(s) still installed?

- All are still installed [SKIP TO Q22]
- Some are still installed
- None are still installed [SKIP TO Q21b]
- DON'T KNOW [SKIP TO Q22]

How many were uninstalled?

Why were they uninstalled?



I'd like to know how having the sprayers has affected your thoughts or plans about energy efficiency. First, compared to before you installed the sprayers, would you say that the amount of thought you give to energy efficiency measures is...?

- Much greater than before
- Somewhat greater than before
- The same as before
- Somewhat less than before
- Much less than before
- Don't know

Based on your experience with the sprayers, would you say that the likelihood that you will install other energy efficiency measures has...?

- Increased a lot
- Increased somewhat
- Not changed
- Decreased somewhat
- Decreased a lot
- Don't know

Based on your experience with the sprayers, would you say that the likelihood that you will work with Energy Trust if you install other energy efficiency measures has...?

- Increased a lot
- Increased somewhat
- Not changed
- Decreased somewhat
- Decreased a lot
- Don't know



NONPARTICIPANT SURVEY

Contact Information

ID
 Name of Contact
 Name of Organization
 Building Address
 Phone Number
 Interviewer

S1. Category

- From D&B file
- From MetroScan file: owner-occupant
- From MetroScan file: absent owner
- From MetroScan file: out of state

Introduction 1

Hello, my name is _____. I'm calling on behalf of Energy Trust of Oregon, which provides energy efficiency and renewable energy services to rate payers of several Oregon utilities.

S2. Have you heard of Energy Trust of Oregon?

- Yes
- No
- Don't know

Good. I work for a firm that Energy Trust has hired to assist in its continuous improvement efforts. Your responses to a short survey will enable Energy Trust to better serve Oregon's utility rate payers.

Energy Trust is a public-purpose organization that supports energy efficiency and renewable energy generation. I work for a firm that Energy Trust has hired to assist in its continuous improvement efforts. Your responses to a short survey will enable Energy Trust to better serve Oregon's utility rate payers.

S3. Can you tell me if you or your company owns the building in which you work or do you lease your space?

- Owns [Owner-occupant]
- Leases [Tenant]

IF QUOTA IS MET, THANK AND END CALL

Introduction 2

Hello, my name is _____. I'm calling on behalf of Energy Trust of Oregon, which provides energy efficiency and renewable energy services to rate payers of several Oregon utilities. Our records show that your company owns a building located at [BUILDING ADDRESS] in Oregon. Your responses to a short



survey will enable Energy Trust to better serve Oregon's utility rate payers, including your tenants at that building.

S4. May I speak with the person who knows the most about how your company deals with energy costs and other energy issues?

IF THIS IS THE PERSON:

I need about 10 minutes of your time. Is now a good time?

WHEN THE PERSON IS REACHED:

[RESTATE THE INTRO STATEMENT]

I need about 10 minutes of your time. Is now a good time?

IF NO: ATTEMPT TO SCHEDULE A TIME AND RECORD TIME ON EXCEL SPREADSHEET

IF YES:

All of my questions are about the energy practices your company or organization follows in the building located at [building address]

Screener Questions

1. First, can you tell me what you've heard about Energy Trust?

[DO NOT READ RESPONSES. CHECK ALL THAT APPLY.]

- Offers energy efficiency programs for residential customers
- Offers energy efficiency programs for all utility customers/rate payers
- Offers cash incentives available for installing energy efficient measures
- Provides CFLs
- Provides home energy analysis / assessment and recommendations
- Offers incentive/promotes Solar electric (PV)
- Offers incentive/promotes other renewable programs (wind, biopower, etc.)
- Other
- Refused
- Don't Know

2. How did you first hear about Energy Trust of Oregon and its programs?

[DO NOT READ RESPONSES. CHECK ALL THAT APPLY.]

- Contractor
- Energy Trust
- Retailer/Salesperson
- Gas Utility
- Electric Utility
- Colleague/peer
- Trade organization
- Friend/neighbor
- Bill insert/Utility Newsletter/Brochure
- Email
- Event
- Letter or mail



- Magazine
- Mass transit
- Newspaper
- Radio
- Sales call
- Sign
- Television
- Website
- Yard sign
- From participating in Home Energy Solutions program
- Refused
- Don't know
- Other

3. Does the building receive electricity service from either Portland General Electric or Pacific Power?

[IF NOT FAMILIAR WITH "PACIFIC POWER", EXPLAIN THAT IT IS ALSO KNOWN AS PACIFICORP, PACIFIC POWER AND LIGHT, AND PP&L]

- Yes
- No
- DK

4. Does the building receive gas service from Northwest Natural or Cascade Natural Gas?

- Yes
- No
- Do not use natural gas

5. To your knowledge, has your company or the owner of the building at [BUILDING LOCATION] received any incentives for energy efficiency upgrades from any of the utilities mentioned or from Energy Trust above since 2003?

[IF DK, PROBE FOR A "YES" OR "NO" ANSWER]

- Yes
- No
- Don't know/Not sure

Corporate Energy Management

Again, all of the following questions refer to your company or organization's energy practices at [BUILDING ADDRESS]

6. How much opportunity do you believe there is to reduce natural gas energy usage at your company in the coming years? Would you say...

- Significant opportunity
- Some opportunity
- Little opportunity
- Do not use natural gas
- No opportunity (all other reasons)



- Don't know
7. How much opportunity do you believe there is to reduce electric energy usage at your company in the coming years? Would you say...
- Significant opportunity
 - Some opportunity
 - Little opportunity
 - No opportunity
 - Don't know
8. How concerned are you with your company's energy costs? Please answer on a scale of 1 to 5, where 1 = not concerned at all and 5 = very concerned?
- 1 – Not at all concerned
 - 2
 - 3
 - 4
 - 5 – Very concerned
 - Don't Know
9. Is your company either actively engaged in controlling energy costs or planning to implement cost controls?
- Yes
 - No
 - Don't know
10. Which of the following policies or procedures does your company have in place regarding energy efficiency improvements?
- [READ LIST, RANDOMIZE]
- Informally managing energy costs through behavior changes such as turning off the lights and turning down the heat
 - A written corporate or company policy for sustainability
 - Staff member responsible for energy and energy efficiency
 - Written corporate policies that incorporate energy efficiency in operations and procurement
 - A written energy management plan
 - Numerical energy savings goals
11. For the specific building that I have been asking about, does your company pay its own electricity bills or are they covered in the lease?
- Pay its own
 - Covered in lease
 - Don't know
12. For that building, does your company pay its own gas bills or are they covered in the lease?
- Pay its own
 - Covered in lease
 - Don't know
13. Do you have an annual true-up or pass-through?



- True-up only
 - Pass-through only
 - Both
 - Neither
14. Have you negotiated a lease within the past 2 years?
- Yes
 - No
 - Don't know
15. How important were utility energy costs in the negotiation of your lease agreement? Please answer on a scale of 1 to 5, where 1 = not at all important and 5 = extremely important
- 1 – Not at all important
 - 2
 - 3
 - 4
 - 5 – Extremely important
16. Are you currently negotiating a new lease or do you expect to negotiate one within the next 2 years?
- Yes
 - No
 - Don't know
17. How important are utility energy costs, or how important do you expect them to be, in the negotiation of your lease agreement? Please answer on a scale of 1 to 5, where 1 = not at all important and 5 = extremely important
- 1 – Not at all important
 - 2
 - 3
 - 4
 - 5 – Extremely important
18. Have you ever asked the building owner or manager for assistance with energy costs?
- Yes
 - No
 - Don't know
19. How, if at all, has the building owner or manager assisted with energy costs?
- Installed energy efficient equipment
 - Subsidized my purchase of energy efficient equipment
 - Other
 - Nothing
20. What did the building owner or manager do?
21. On a scale of 1 to 5, where '1' is 'not at all satisfied' and '5' is 'completely satisfied', how satisfied are you with what the building owner or manager has done regarding your energy costs?
- [IF RESPONDENT SAYS THAT OWNER/MANAGER HAS NOT DONE ANYTHING, ASK HOW SATISFIED HE/SHE IS WITH THAT]
- 1 – Not at all satisfied



- 2
 - 3
 - 4
 - 5 – Completely satisfied
22. Do you have tenants at the building located at [BUILDING ADDRESS]?
- Yes
 - No
23. For the specific building that I have been asking about, do your tenants pay their own electricity bills or are they covered in the lease?
- Pay their own
 - Covered in lease
 - Don't know
24. For that building, do your tenants pay their own gas bills or are they covered in the lease?
- Pay their own
 - Covered in lease
 - Don't know
25. Do your tenants have an annual true-up or pass-through?
- True-up only
 - Pass-through only
 - Both
 - Neither
26. In the past two years, have any of your tenants at that location complained to you about their energy costs?
- Yes
 - No
 - Don't know
27. In past two years have any tenants have made their own energy savings improvements?
- Yes
 - No
 - Don't know
28. To improve your company's/organization's energy efficiency, which two of the following types of external support would you find most valuable?
- Specialized technical training in for building operators/equipment techs
 - Additional training in other aspects of energy efficiency
 - An audit of your building or the portion that your business [organization] occupies
 - Information on energy management best practices in your type of business
 - Incentives for tune-ups of existing equipment
 - Incentives for energy efficient building upgrades
 - Tax credits for energy efficient building upgrades
 - New information on energy efficient technologies
 - A resource for information on energy efficiency opportunities
29. Is there any external support I did not mention that you would find valuable?



30. How convinced are you that global warming is happening—would you say you are completely convinced, mostly convinced, not so convinced, or not at all convinced?

- Completely convinced
- Mostly convinced
- Not so convinced
- Not at all convinced
- Don't know

31. Has the issue of global warming in any way affected the way you operate your facility?

[CLARIFICATION: THE TYPE OF EQUIPMENT YOU PURCHASE, YOUR ENERGY USAGE HABITS]

- Yes
- No

Awareness of ETO, BE, AND BETC

I have a few questions about your awareness of Energy Trust and energy efficiency programs.

32. Have you heard of any of Energy Trust of Oregon's programs aimed at business and commercial properties?

- Yes
- No
- Don't know

33. About how long have you been aware that Energy Trust had those kinds of programs?

[DO NOT READ, PROBE TO CODE]

- The past two years or so [2006-2007]
- Two to four years [2004-2005]
- Five years or more, or answer refers to "a utility program" [Before 2004]
- Don't know

34. Do you recall how you first heard of Energy Trust's programs for business and commercial property?

[DO NOT READ, BUT PROBE TO CODE]

- Program representative
- Utility company representative
- Equipment vendor or contractor
- Architect, engineer or energy consultant
- Firms that had participated in the program
- Professional association, friend or colleague, word of mouth
- Other

35. Energy Trust offers technical assistance, incentives for energy efficiency, installation and project management, and post-installation inspections. Based on what you have heard of the programs for business and commercial properties, what questions or concerns come to mind regarding potential participation?

36. If you were to install equipment that qualifies for an incentive, would you choose to participate in an Energy Trust program?



- Yes
- No
- Don't know

37. Have you heard of Oregon Business Energy Tax Credits (BETC), or 'Betsy'?

- Yes
- No
- Don't know

BETC PROVIDES TAX CREDITS FOR NATURAL GAS AND ELECTRIC EFFICIENCY AND RENEWABLE ENERGY IMPROVEMENTS

38. Are you aware that your firm can get Oregon BETC ['BETSY'] tax credits for renewable energy projects, such as CHP—combined heat and power—and solar electric?

- Yes
- No
- Don't know

39. Are you aware that your firm can get Oregon BETC tax credits for natural gas efficiency improvements?

- Yes
- No
- N/A – Don't use gas
- Don't know

Energy Efficiency Upgrades

40. Which of the following is true regarding your company's equipment purchases and building upgrades?

- A. My company has purchased energy efficient equipment or made other energy efficient building upgrades in the past two years
- B. My company purchased equipment or made other building upgrades in the past two years, but they were not energy efficient
- C. My company has not purchased energy efficient equipment or made other energy efficient building upgrades in the past two years
- D. Don't know

41. What is the reason that your company has not made energy efficient upgrades in the past two years?

[CHECK ALL THAT APPLY. DO NOT READ LIST. PROMPT IF NECESSARY]

- haven't made any equipment purchases
- energy efficiency was not a priority
- was not aware that energy efficient options were available for the equipment
- didn't think energy efficient options would work for the application
- Don't know
- Other

42. What kind of energy efficient equipment did you purchase or energy efficient building upgrades did you make?

[DO NOT READ RESPONSES. CHECK ALL THAT APPLY.]



- Lighting (including occupancy sensor)
- Windows
- Insulation
- Other envelope improvements
- Heating system (gas)
- Heating system (electric)
- Heating system (other)
- Cooling system (gas)
- Cooling system (electric)
- Cooling system (other)
- Controls
- Recommissioning
- O&M improvements
- Procurement
- Water heating
- Refrigerator/freezer
- Cooking equipment (oven, fryer)
- Motors
- VFDs
- Other
- Don't know

43. Did the contractor or vendor that sold you the equipment mention that incentives or tax credits were available for high efficiency equipment?

[PROBE TO FIND OUT WHICH ONES WERE MENTIONED]

- Incentives
- Tax credits
- Both
- One or the other or both (not sure)
- Neither
- Don't know

44. Why didn't you apply for a financial incentive on the equipment you purchased?

[DO NOT READ LIST. PROMPT IF NECESSARY]

- thought financial incentive likely was too little to bother with
- thought incentives were not available at that time
- participating in the program would have resulted in an unacceptable delay
- reasons internal to your company that don't pertain to the program
- DID APPLY FOR AN INCENTIVE
- Don't know
- Other

45. On a scale of 1 to 5, where '1' means 'no influence' and '5' means 'critical influence', how much influence did Energy Trust's programs have on your decision to purchase energy efficient equipment?

- 1 – No influence
- 2
- 3
- 4



- 5 – Critical influence

46. Did you apply for a BETC on any of the energy efficient equipment that you bought in the past 2 years?

- Yes
- No
- Don't know

47. Why didn't you apply for a BETC on that equipment?

[CHECK ALL THAT APPLY. DO NOT READ LIST. PROMPT IF NECESSARY]

- Thought tax credit likely was too little to bother with
- Thought tax credit was not available at that time
- Other

48. What other actions you have taken in the past two years to reduce energy costs?

[DO NOT READ RESPONSES. CHECK ALL THAT APPLY.]

- Installed lighting controls
- Reduced lighting
- Increased refrigerator temperature
- Reduced hot water temperature
- Used heating less (did not heat on weekends, reduced heating times)
- Used cooling less
- Reduced heating temperature
- Increased cooling temperature
- Bought energy efficient equipment
- Made energy efficiency upgrades to building/space
- Turned off equipment more
- Put equipment in standby mode
- Negotiated lower utility rates
- Switched fuels
- Had an energy assessment
- Other

49. In general, what do you see as the primary challenges to improving energy management practices in your company?

[DO NOT READ RESPONSES. CHECK ALL THAT APPLY.]

- Upfront cost or length of payback
- Staff awareness/understanding of energy efficiency/getting staff to change behavior
- Management awareness of energy efficiency options
- Management policies/priorities
- Availability of trained staff
- Difficulty in implementing energy efficiency measures (size/complexity of system)
- Availability of appropriate energy efficiency technology
- Availability of time to implement energy efficiency
- Other



Partial Participation

50. Has your firm ever started to participate in a Energy Trust program but did not continue for some reason? And by "starting to participate", I mean anything from seeking out information about the program to planning an equipment purchase.
- Yes
 - No
 - Don't know
51. When was it that you tried to participate but did not? [PROBE TO CODE]
- Sometime in the past 2 years or so [2006-2007]
 - 2-4 years [2004-2005]
 - 5 years or more
 - Don't know
52. Why did you not continue? Would you say...
- Equipment didn't qualify
 - Incentive wasn't sufficient to meet your firm's investment criteria
 - Incentives were not available at that time
 - Participating in the program would have resulted in an unacceptable delay
 - Participating was too much of a hassle
 - Reasons internal to your company that don't pertain to the program
 - Don't know
 - Other (please specify)
53. You said you didn't continue because "participation was a hassle". Could you explain specifically which element was a hassle to you?

Firmographics

54. Does your company have facilities in more than one location in Oregon?
- Yes
 - No
 - Don't know
55. Approximately how many locations are there?
- One
 - Two to five
 - Six to ten
 - More than ten
56. Which of the following best describes the type of building(s) you are responsible for?
[CHECK ALL THAT APPLY FOR MULTIPLE BUILDINGS]
- Office
 - Retail
 - Manufacturing
 - Warehouse
 - Grocery
 - Hospital



- Other health
- College/university
- Institution/government
- Lodging
- Restaurant
- School K-12
- Apartment building (hi-rise resident)
- Church
- Assembly
- Other

57. Please indicate which of the following best describes your role in your organization.

- Facilities manager
- Owner/President
- CEO, COO
- CFO, other financial executive
- Plant or corporate engineer
- Plant manager
- Other

Conclusion

58. It helps us to understand people's concerns about the market conditions that affect their business's success. What are some of the concerns that are on your mind currently?



MOST ACTIVE TA SURVEY

Vendor and Survey Information

Name

Firm

Interviewer

Date

Hi, my name is _____. I am calling on behalf of Energy Trust of Oregon. As part of its commitment to continuous improvement, Energy Trust is evaluating its energy efficiency program aimed at commercial businesses and buildings and has hired my company to conduct a survey of participating vendors. Our records indicate you have worked on projects that have received incentives under this program.

Do you have time right now to answer some questions about your experience with and thoughts about the program?

- Yes
- No
- REFUSED

Try to reschedule and close survey form.

BE Program Awareness

1. Energy Trust is interested in how familiar people are with the program's name. Can you tell me the name of the energy efficiency program you've worked on aimed at commercial businesses and buildings?

DO NOT READ LIST. CHECK ONLY ONE.

- Building Efficiency
- Efficient Buildings
- Building Operations Efficiency Program
- Food Services Initiative
- Hospitality Industry Initiative
- Don't know/Not sure
- Other (please specify)

If you selected other, please specify:

2. Do you recall how you first heard of the Energy Trust program for business and commercial properties?

DON'T READ LIST. CHECK ALL THAT APPLY.

- contact
- program website
- vendor/contractor
- don't know
- Other (please specify)

If you selected other, please specify:



Vendor Marketing

3. What are the main energy efficient products and services that you provide?

DON'T READ LIST. CHECK ALL THAT APPLY.

- HVAC
- chillers
- lighting controls
- food preparation equipment (ovens)
- custom building controls
- walk-through surveys
- Other (please specify)

If you selected other, please specify:

4. What energy efficient equipment, if any, have you sold that did not qualify for an Energy Trust incentive?

IF "NONE", RECORD "NONE"; IF "DON'T KNOW." RECORD "Don't know" OR "DON'T KNOW"

5. Why didn't it qualify for an Energy Trust incentive?

DON'T READ LIST. CHECK ALL THAT APPLY.

- Not in Energy Trust territory
- Gas projects
- EE option was part of the specification
- EE bid was already accepted without incentive
- Don't know
- Other (please specify)

If you selected other, please specify:

6. Over the past year about what percent of your bids or proposals have included energy efficient equipment?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

7. Over the past year when you were first discussing a project idea with a customer, about what percent of the time did you know whether or not it is likely to qualify for incentives?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused



8. Over the past year, of the projects you did within Energy Trust service territory, for about what percent did you recommend equipment that could qualify for an Energy Trust incentive?

DON'T READ RESPONSE OPTIONS. PROMPT IF NECESSARY (E.G., SAYS 'A FEW' OR 'MOST')

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

9. For those projects in which you have not recommended equipment that could qualify for an Energy Trust incentive, what are the reasons you have not?

DON'T READ LIST. CHECK ALL THAT APPLY.

- Did not know what would qualify for an incentive
- Difficulty in obtaining equipment that would qualify for an incentive
- Did not think the customer would want it
- Applying for an incentive is too much of a hassle
- Recommended equipment that was better suited to the customer's needs
- Did not think it was in my interest
- Don't know
- Other (please specify)

If you selected other, please specify:

10. You said you didn't think the customer would want it. Why is that?
11. You said that applying for an incentive is too much of a hassle. In what way?
12. You said that you recommended equipment that was better suited to the customer's needs. In what way was it better suited?
13. You said that it wasn't in your interest. In what way was it not in your interest?

Customer Response

14. Over the past year about what percent of your customers have asked about the program for business and commercial properties?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

15. Over the past year in about what proportion of projects has a customer revised the project plan to qualify for an incentive after discussing it with you?



- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

16. Over the past year, in about what proportion of projects has the customer decided not to use energy efficient equipment that could have qualified for Energy Trust incentives?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80%
- All
- Don't know/Refused

Concerning those times when a customer decided not to use energy efficient equipment that could have qualified for Energy Trust incentives...

17. ...in about what percent of the cases did you bring it up with the owner but the owner didn't want it?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

18. ...in about what percent of the cases did the owner first bring it up but after discussing it didn't want it?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

19. ...in about what percent of the cases did neither you nor the owner bring it up?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%



- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Vendor Preferences and Program Effects

20. What, if anything, would you change about the types of projects or equipment that qualify for incentives? [RECORD EVEN IF "NOTHING" OR "DON'T KNOW."]
21. What training or tools for estimating the energy savings of efficient equipment would you like Energy Trust to provide to you? [RECORD EVEN IF "NOTHING" OR "DON'T KNOW."]
22. Has there been any Energy Trust training or outreach that you have found not to be particularly useful?"
23. What is your preferred method for receiving information about Energy Trust programs?
- Web
 - Email
 - Postal mail
 - Through professional associations (e.g., newsletters)
 - Group presentations by Energy Trust representative
 - Telephone
 - Other one-on-one
 - Other (please specify)
- If you selected other, please specify:

24. In the past year, how often have you used the Energy Trust website to obtain program information?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- Never
- One to five times
- Six to 10 times
- More than 10 times
- Don't know

Other Programs

25. Are you aware Energy Trust provides incentives for renewable energy projects such as solar hot water (thermal) or solar electric (photovoltaics)?
- Yes
 - No
 - Don't know
26. Is your firm interested in promoting and selling renewable energy products/services?

DON'T READ RESPONSE OPTIONS. PROBE TO CODE.

- Already doing it
- Planning to do it soon
- Yes, but not yet doing it or planning it
- No



Don't know

27. Over the past year, about what percent of your customers have asked about renewable energy or expressed interest in participating in Energy Trust's renewable energy program?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know

28. What information/support regarding the renewable energy program do you and your customers need from Energy Trust?

BETC

29. Are you aware of the Business Energy Tax Credit (BETC, or "betsy")?

- Yes
- No
- Don't know

30. Did you know that it applies to renewable energy projects?

- Yes
- No
- Don't know

31. Did you know that it applies to gas?

- Yes
- No
- Don't know

32. Of all your bids that would have qualified for BETC over the past year, in about what percent have you included it?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know

33. In those cases in which you have not included it, why didn't you?



34. When considering the influence of the BETC and the Energy Trust incentive on your customers' decision to install energy efficient equipment, which generally has had more influence, or have they had equal influence?

DO NOT READ RESPONSE OPTIONS, BUT PROBE TO CODE

- BETC had more influence
- Energy Trust incentive had more influence
- BETC and Energy Trust incentive had equal importance
- It was the combination of BETC and Energy Trust incentive that was so influential
- Don't know

35. Additional comments

36. Over the past year, about what percent of your customers have asked about tax credits for energy efficiency?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know

Questions/Concerns/Confusion/Problems

- 37-42. How satisfied or dissatisfied are you with each of the following aspects of the program for business and commercial properties? Please answer on a scale of 1 to 5, where 1 = not at all satisfied, 3 = moderately satisfied, and 5 = completely satisfied

DON'T GIVE 'DON'T KNOW' AS AN OPTION. CODE ONLY IF THEY DON'T GIVE ANOTHER RESPONSE.

- 37. ...the information you receive from Energy Trust about the program
- 38. ...the range of equipment for which incentives are available
- 39. ...the application process
- 40. ...your program contact
- 41. ...your ability to get answers to questions about the program
- 42. ...the program overall
- 43. ...what was the cause of your dissatisfaction?
- 44. Over the past year, about what percent of your customers have called you with comments or concerns about their program participation?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%



- >40% to 60%
- >60% to 80%
- >80% to 99%
- Add
- Don't know

45. What comments or concerns have they expressed?

Spillover

46-50. I'd like to know what effect, if any, participation in Energy Trust programs has had on certain aspects of your business. On a scale of 1 to 5, where 1 = greatly decreased, 3 = no change, and 5 = greatly increased, what effect has participation had on...

DON'T GIVE 'DON'T KNOW' AS AN OPTION. CODE ONLY IF NO OTHER RESPONSE GIVEN.

- 46. ... on the number of your customers?
- 47. ...on your ability to identify opportunities to improve the energy efficiency of equipment systems?
- 48. ...on how often you discuss energy efficient options with customers when developing project plans for equipment?
- 49. ...on how often you include energy efficiency in your sales approach/pitch?
- 50. ...and on how often you include the BETC in your bids?
- 51. What other effects, if any, has your participation in the program had on your business?

Firmographics

52. Please indicate which of the following best describes your role:

- Owner
- Business Manager
- Engineer
- Contractor
- Sales Manager/Business Development
- Other (please specify)

If you selected other, please specify:

- 53. How many people are employed by your firm?
- 54. What percent of your total business do Energy Trust projects represent?

DON'T READ RESPONSE OPTIONS. PROBE IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know

55. What business sectors or other organizations do you serve?



DO NOT READ LIST. CHECK ALL THAT APPLY. FOR EACH ONE CHECKED, ASK:
 "Approximately what percent of your business does that represent?"

	Building Type	Percentage of Business						DK
	yes	0%-20%	21%-40%	41%-60%	61%-80%	81%-100%		
Office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Retail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Manufacturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Warehouse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Grocery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
College/university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Institution/government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Lodging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Restaurant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
School K-12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Apartment building	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Church	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Assembly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

56. Specify Other

57. What do you think works best about the Energy Trust program for business and commercial properties?

58. What would you most like to change about the program?

59. Do you have any other comments about the program?





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LEAST ACTIVE TA SURVEY

Vendor and Survey Information

Name

Firm

Interviewer

Date

Hi, my name is . I am calling on behalf of Energy Trust of Oregon. As part of its commitment to continuous improvement, Energy Trust is evaluating its energy efficiency program aimed at commercial businesses and buildings and has hired my company to conduct a survey of vendors that have participated in the program. Our records indicate your company has worked on projects that received incentives under this program.

S1. Do you have time right now to answer some questions about your experience with and thoughts about the program?

- Yes
- No
- REFUSED

Try to reschedule and close survey form.

BE Program Awareness

S2. Are you aware of Energy Trust?

- Yes
- No
- Don't know

ASK IF THERE IS SOMEONE WHO WOULD BE FAMILIAR WITH ENERGY TRUST AND THE PROGRAM FOR BUSINESS AND COMMERCIAL PROPERTIES, AND ASK TO SPEAK WITH THAT PERSON. IF NECESSARY, RESCHEDULE.

IF NO ONE IS FAMILIAR, TERMINATE.

S3. Anyone familiar and available now?

- Yes
- No

S4. Are you aware of Energy Trust's programs for business and commercial properties?

- Yes
- No
- Don't know

ASK IF THERE IS SOMEONE WHO WOULD BE FAMILIAR WITH THE PROGRAM FOR BUSINESS AND COMMERCIAL PROPERTIES, AND ASK TO SPEAK WITH THAT PERSON. IF NECESSARY, RESCHEDULE.



IF NO ONE IS FAMILIAR, TERMINATE.

S5. Anyone familiar and available now?

- Yes
- No

S6. Do you recall having worked on any projects in business and commercial properties that received incentives from Energy Trust of Oregon?

- Yes
- No
- Don't know

ASK IF THERE IS SOMEONE WHO WOULD BE FAMILIAR WITH THE COMPANY'S PARTICIPATION IN THE PROGRAM, AND ASK TO SPEAK WITH THAT PERSON. IF NECESSARY, RESCHEDULE.

IF NO ONE IS FAMILIAR, TERMINATE.

S7. Anyone familiar and available now?

- Yes
- No

Q1. About how many nonresidential (that is, commercial or industrial) projects have you done since the beginning of 2007 that received Energy Trust incentives?

Q2. Would you say that the total amount of Energy Trust incentives paid on projects that you've done since the beginning of 2007 is... [READ OPTIONS]

- Under \$1000
- \$1000 to \$5000
- More than \$5000

Q3. Do you recall how you first heard of the Energy Trust program for business and commercial properties?

DON'T READ RESPONSES. CHECK ALL THAT APPLY.

- a .program contact (Lockheed Martin, Aspen, Evergreen Consulting, Energy Trust)
- b. program website
- c. another vendor/contractor
- d. trade association
- e. don't know
- f. Other (please specify)

If you selected other, please specify:

Q4. Over the past year, about what percent of your customers have asked about the Energy Trust program for business and commercial properties?

DON'T READ RESPONSES. PROMPT IF NECESSARY (E.G., RESPONDENT SAYS "MOST" OR "A FEW")

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%



- >80% to 99%
- All
- Don't know/Refused

Vendor Marketing

Q5. What are the main energy efficient products and services that you provide?

DON'T READ LIST. CHECK ALL THAT APPLY.

- a. HVAC
- b. chillers
- c. lighting controls
- d. lighting (and ballasts, not controls)
- e. daylighting
- f. food preparation equipment (ovens)
- g. custom building controls
- h. walk-through surveys
- i. Other (please specify)
- j. If you selected other, please specify:

Q6. What energy efficient equipment, if any, have you sold that did not qualify for an Energy Trust incentive?

IF DIDN'T SELL ANY, ENTER "NONE" or "none"; IF DOESN'T KNOW, ENTER "Don't know" OR "dk".

Q7. Why didn't it qualify for an Energy Trust incentive?

DON'T READ LIST. CHECK ALL THAT APPLY

- a. Not in Energy Trust territory
- b. Gas projects
- c. EE option was part of the specification
- d. EE bid was already accepted without incentive
- e. Don't know
- f. Other (please specify)

If you selected other, please specify:

Q8. Over the past year about what percent of your bids or proposals have included energy efficient equipment?

DON'T READ RESPONSES. PROMPT IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Q9. For those bids or proposals that did not include energy efficient equipment, what are the reasons you did not include it?



DON'T READ LIST. CHECK ALL THAT APPLY.

- a. Did not know what equipment was energy efficient
- b. Difficulty in obtaining energy efficient equipment
- c. Did not think the customer would want it
- d. Recommended equipment that was better suited to the customer's needs
- e. Did not think it was in my interest
- f. Don't know
- g. Other (please specify)

If you selected other, please specify:

Q10. You said you didn't think the customer would want it. Why is that?

Q11. You said that you recommended equipment that was better suited to the customer's needs. In what way was it better suited?

Q12. You said that it wasn't in your interest. In what way was it not in your interest?

Q13. Of the projects you have done within Energy Trust service territory that have included energy efficient equipment, what percent of the time have you suggested that your customers apply for an Energy Trust incentive?

DON'T READ RESPONSES. PROMPT IF NECESSARY.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Q14. Again, just talking about projects within Energy Trust service territory, when you have not recommended that your customers apply for an Energy Trust incentive, what are the reasons you have not?

DON'T READ LIST. CHECK ALL THAT APPLY.

- a. Did not know what would qualify for an incentive
- b. Difficulty in obtaining equipment that would qualify for an incentive
- c. Did not think the customer would want it
- d. Applying for an incentive is too much of a hassle
- e. Recommended energy efficient equipment that did not qualify for an incentive
- f. Did not think it was in my interest
- g. Don't know
- h. Other (please specify)

If you selected other, please specify:

Q15. You said you didn't think the customer would want it. Why is that?

Q16. You said that applying for an incentive is too much of a hassle. In what way?

Q17. You said that you recommended energy efficient equipment that did not qualify for an incentive. Why was that?

Q18. You said that it wasn't in your interest. In what way was it not in your interest?



Q19. What, if anything, would you change about the types of projects or equipment that qualify for incentives?

[RECORD EVEN IF "NOTHING" OR "DON'T KNOW."]

Q20. What training or tools for estimating the energy savings of efficient equipment would you like Energy Trust to provide to you?

[RECORD EVEN IF "NOTHING" OR "DON'T KNOW."]

Q21. What else might Energy Trust change about the program to make it easier for you to work with?

[RECORD EVEN IF "NOTHING" OR "DON'T KNOW"]

Q22. If the changes you suggested were made, how likely is it that you would become more actively involved with the program? Please answer on a scale of 1, meaning 'not at all likely', to 5, meaning 'extremely likely'.

- 1
- 2
- 3
- 4
- 5
- Don't know

Q23. Why wouldn't you be more likely to become more actively involved?

Q24. What is your preferred method for receiving information about Energy Trust programs?

DON'T READ LIST. CHECK ALL THAT APPLY.

- a. Web
- b. Email
- c. Postal mail
- d. Through professional associations (e.g., newsletters)
- e. Group presentations by Energy Trust representative
- f. Telephone
- g. Other one-on-one
- h. Other (please specify)
- i. If you selected other, please specify:

Q25. In the past year, how often have you used the Energy Trust website to obtain program information?

DON'T READ LIST. PROMPT IF NECESSARY.

- a. Never
- b. One to five times
- c. Six to 10 times
- d. More than 10 times
- e. Don't know

Other Programs

Q26. Are you aware that Energy Trust provides incentives for renewable energy projects such as solar hot water (thermal) or solar electric (photovoltaics)?

- Yes



- No
- Don't know

Q27. Is your firm interested in promoting and selling renewable energy products/services?

PROBE TO CODE

- Already doing it
- Planning to do it soon
- Yes, but not yet doing it or planning it
- No
- Don't know

Q28. Over the past year, about what percent of your customers have asked about renewable energy or expressed interest in participating in Energy Trust's renewable energy program?

DON'T READ RESPONSES.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Q29. What information/support regarding the renewable energy program do you and your customers need from Energy Trust?

BETC

Q30. Are you aware of the Business Energy Tax Credit (BETC, or "betsy")?

- Yes
- No
- Don't know

Q31. Did you know that it applies to renewable energy projects?

- Yes
- No
- Don't know

Q32. Did you know that it applies to gas?

- Yes
- No
- Don't know

Q33. Of all your bids that would have qualified for BETC over the past year, in about what percent have you included it?

- None
- 1% to 20%
- >20% to 40%



- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Q34. In those cases in which you have not included it, why didn't you?

Q35. Over the past year, about what percent of your customers have asked about tax credits for energy efficiency?

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Firmographics

I just have a few questions about your company.

Q36a. Please indicate which of the following best describes your role at your company:

- Owner
- Business Manager
- Engineer
- Contractor
- Sales Manager/Business Development
- Other (please specify)

Q36b If you selected other, please specify:

Q37. How many people are employed by your firm?

Q38. What percent of your total business do Energy Trust projects represent?

DON'T READ RESPONSES.

- None
- 1% to 20%
- >20% to 40%
- >40% to 60%
- >60% to 80%
- >80% to 99%
- All
- Don't know/Refused

Q39. Within the commercial and industrial sector, what are the most common business types that you serve? (such as restaurant or office)

DO NOT READ LIST

- a. Office



- b. Retail
- c. Manufacturing
- d. Warehouse
- e. Grocery
- f. Hospital
- g. Other health
- h. College/university
- i. Institution/government
- j. Lodging
- k. Restaurant
- l. School K-12
- m. Apartment building
- n. Church
- o. Assembly
- p. Other (please specify)
- q. If you selected other, please specify:

Q40. What do you think works best about the Building Efficiency Program?

Q41. What would you most like to change about the program?

Q42. Do you have any other comments about the program?



NONPARTICIPANT VENDOR SURVEY

Vendor and Survey Information

ID Number:

Name:

Firm:

Interviewer:

Phone:

Hi, my name is . I am calling on behalf of Energy Trust of Oregon, which provides energy efficiency and renewable energy services to vendors and contractors who sell and install equipment for rate payers of several Oregon utilities.

May I speak with _____?

[IF NOT AVAILABLE, TRY TO SCHEDULE A TIME TO CALL BACK; RECORD CALL BACK INFO BELOW]

[IF THIS PERSON IS NO LONGER THERE, ASK:

May I speak with the person who would know the most about how your firm addresses the energy efficiency needs of your customers?]

[WHEN YOU HAVE THE CORRECT PERSON ON THE LINE, PROCEED]

Comments/callback info:

S1. Have you heard of Energy Trust of Oregon?

- Yes
- No
- Don't know

Energy Trust is a public-purpose organization that supports energy efficiency and renewable energy generation.

I work for a firm that Energy Trust has hired to assist in its continuous improvement efforts. Your responses to a short survey will enable Energy Trust to better serve Oregon's utility customers and vendors and contractors like you who serve them.

S1a. Is there anyone there I can speak with who would be familiar with Energy Trust?

- Yes
- No

[If someone else, try to transfer or reschedule. Record info in "Comments" field.]

Comments:

Good. I work for a firm that Energy Trust has hired to assist in its continuous improvement efforts. Your responses to a short survey will enable Energy Trust to better serve Oregon's utility customers and vendors and contractors like you who serve them.



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S2. Do you have time right now to answer some questions about your experience with and thoughts about energy efficiency and renewable energy services?

- Yes
- No
- Refused

IF 'NO', TRY TO RESCHEDULE, MAKE NOTES IN 'VENDOR INFORMATION' AND/OR CALL LIST, AND EXIT SURVEY FORM.

Screening Questions

S3. First, about what proportion of the work you do is for clients who are served by PGE, PacifiCorp, NW Natural, or Cascade Natural Gas?

PROBE TO CODE -- TRY TO AVOID 'DON'T KNOW'

- None or very little
- Less than half
- About half
- Most or all
- Don't know

IF 'NONE OR VERY LITTLE', THANK AND TERMINATE

S4. And about what percent of the work that you do is for commercial businesses—that is, not industrial and not residential?

PROBE TO CODE -- TRY TO AVOID 'DON'T KNOW'

- None or very little
- Less than half
- About half
- Most or all
- Don't know

IF 'NONE OR VERY LITTLE', THANK AND TERMINATE

BE Program Awareness

1. Are you aware of Energy Trust's programs for existing commercial buildings?

- Yes
- No
- Don't know

2. Is there anyone that I could speak with who would be familiar with Energy Trust's program for existing commercial buildings?

- Yes
- No

Comments:

3. Do you recall how you first heard of the Energy Trust program for existing commercial buildings?

DON'T READ RESPONSES. CHECK ALL THAT APPLY.



- program contact (Lockheed Martin, Aspen, Evergreen Consulting, Energy Trust)
- program website
- another vendor/contractor
- utility
- trade association
- worked with previous utility programs
- don't know
- Other (please specify)
- customer
- media
- Other (please specify)

If you selected other, please specify:

3a. Are you personally familiar with other firms that are working with Energy Trust?

- Yes
- No
- Don't know/Not Sure

3b. What have you heard about Energy Trust from them?

4. In total, since the beginning of 2007, about how many projects have you worked on in existing commercial buildings for which the customer applied for an Energy Trust incentive?

- None
- 1 to 5
- 6 to 10
- 11 to 25
- 26 to 50
- 51- 100
- > 100
- Don't know/Refused

5. And about what percent of your total business did those projects represent?

DON'T READ RESPONSES

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

6. How would you describe the Energy Trust program for existing commercial buildings to one of your customers?

7. Over the past year, about what percent of your customers have asked about the Energy Trust program for existing commercial buildings?

DON'T READ RESPONSES. PROMPT IF NECESSARY

- None



- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

Vendor Marketing

8. What are the main energy efficient products and services that you provide?

DON'T READ LIST. CHECK ALL THAT APPLY.

- HVAC
 - chillers
 - lighting controls
 - lighting fixtures, lamps, and ballasts (not controls)
 - daylighting
 - food preparation equipment (ovens)
 - custom building controls
 - walk-through surveys
 - motors
 - water heaters
 - plumbing
 - Other (please specify)
- If you selected other, please specify:

9. What energy efficient equipment, if any, have you sold that did not qualify for an Energy Trust incentive?

IF DIDN'T SELL ANY, ENTER "NONE" or "none"; IF DOESN'T KNOW, ENTER "Don't know" OR "dk".

10. Over the past year, about what percent of your bids or proposals have included energy efficient equipment?

DON'T READ RESPONSES. PROMPT IF NECESSARY.

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know

11. For those bids or proposals that did not include energy efficient equipment, what are the reasons you did not include it?

DON'T READ LIST. CHECK ALL THAT APPLY.

- Did not know what equipment was energy efficient
- Difficulty in obtaining energy efficient equipment



- Did not think the customer would want it
- Customer has specified the cheapest option
- Recommended equipment that was better suited to the customer's needs
- Did not think it was in my interest
- Don't know
- Other (please specify)

If you selected other, please specify:

12. Of the projects you have done within Energy Trust service territory that have included energy efficient equipment, what percent of the time have you suggested that your customers apply for an Energy Trust incentive?

DON'T READ RESPONSES. PROMPT IF NECESSARY.

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

13. What are the main reasons you have not signed up as a trade ally for Energy Trust's program for commercial businesses?

- Too much of a hassle
- Don't sell enough energy efficient equipment
- Not enough benefits to participating
- Wasn't familiar with it
- Don't know
- Other (please specify)

If you selected other, please specify:

14. What might Energy Trust change about the program to make it easier for you to work with?

[RECORD EVEN IF "NOTHING" OR "DON'T KNOW"]

15. If the changes you suggested were made, how likely is it that you would become more actively involved with the program? Please answer on a scale of 1, meaning 'not at all likely', to 5, meaning 'extremely likely'.

- 1
- 2
- 3
- 4
- 5
- Don't know

16. Why wouldn't you be more likely to become more actively involved?

17. In the past year, how often have you used the Energy Trust website to obtain program information?

DON'T READ LIST. PROMPT IF NECESSARY.

- Never



- One to five times
- Six to 10 times
- More than 10 times
- Don't know

18. Would you be interested in receiving information about Energy Trust programs?

- Yes
- No
- Don't know

18a. What information would be valuable to you?

19. What would be your preferred method for receiving that information?

DON'T READ LIST. CHECK ALL THAT APPLY.

- Web
- Email
- Postal mail
- Through professional associations (e.g., newsletters)
- Group presentations by Energy Trust representative
- Telephone
- Other one-on-one
- Other (please specify)

If you selected other, please specify:

20. Why not?

Other Programs

We're almost done. I've got just a few questions about your interest in and experience with renewable energy and tax credits for energy efficiency.

21. Is your firm interested in promoting and selling renewable energy products/services?

PROBE TO CODE

- Already doing it
- Planning to do it soon
- Yes, but not yet doing it or planning it
- No
- Don't know

22. Are you aware that Energy Trust provides incentives for renewable energy projects such as solar hot water (thermal) or solar electric (photovoltaics)?

- Yes
- No
- Don't know

23a. Over the past year, about what percent of your customers have asked about renewable energy? (IF FAMILIAR WITH ENERGY TRUST: ...or expressed interest in participating in Energy Trust's renewable energy program)?

DON'T READ RESPONSES.



- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

23b. Over the past year, about what percent of your customers have asked about renewable energy?

DON'T READ RESPONSES.

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

24. What information/support regarding the renewable energy program do you and your customers need from Energy Trust?

BETC

25. Are you aware of the Business Energy Tax Credit (BETC, or “betsy”)?

- Yes
- No
- Don't know

26. Did you know that it applies to renewable energy projects?

- Yes
- No
- Don't know

27. Did you know that it applies to gas?

- Yes
- No
- Don't know

28. Of all your bids that would have qualified for BETC over the past year, in about what percent have you included it?

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All



- Don't know/Refused

29. In those cases in which you have not included it, why didn't you?

30. Over the past year, about what percent of your customers have asked about tax credits for energy efficiency?

- None
- 1% to 20%
- 21% to 40%
- 41% to 60%
- 61% to 80%
- 81% to 99%
- All
- Don't know/Refused

Firmographics

Finally, I have just a few questions about your company.

31. Please indicate which of the following best describes your role at your company:

- Owner
- Business Manager
- Engineer
- Contractor
- Sales Manager/Business Development
- Other (please specify)
- Other (please specify)

If you selected other, please specify:

32. About how many people are employed by your firm?

- Five or fewer
- Six to Ten
- 11 to 20
- 21 to 50
- More than 50
- Don't know

33. Within the commercial sector, what are the most common types of business that you serve?

DO NOT READ LIST. CHECK ALL THAT APPLY.

- Office
- Retail
- Manufacturing
- Warehouse
- Grocery
- Hospital
- Other health
- College/university
- Institution/government
- Lodging



- Restaurant
- School K-12
- Apartment building
- Church
- Assembly
- Other
- Other (please specify)

If you selected other, please specify:

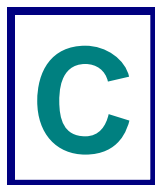
34. Finally, how long has this firm been in business?



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IMPACT REGRESSION MODEL COEFFICIENTS

TABLE C.1: INDIVIDUAL MODELS

INDEPENDENT VARIABLE (DEPENDENT VARIABLE = AVERAGE DAILY KWH OR THERMS)	PARAMETER	STANDARD ERROR	T-TEST
2006 GAS FOOD SERVICE SAE (R2=0.83)*, ‡			
Average Intercept (alpha)*	1.151	0.333	3.46
Engineering Estimate Realization (EE)	-1.074	0.282	-3.81
Average Daily HDD (AVGHDD)	0.154	0.005	33.63
Average Daily CDD (AVGCDD)**	N/A	N/A	N/A
2006 GAS OTHER SAE (R2=0.87)*, ‡			
Average Intercept (alpha)*	9.489	7.214	1.39
Engineering Estimate Realization (EE)	-0.925	0.320	-2.89
Average Daily HDD (AVGHDD)	2.042	0.066	31.12
Average Daily CDD (AVGCDD)**	N/A	N/A	N/A
2006 LIGHTING ONLY SAE (R2=0.97)*			
Average Intercept (alpha)*	527.713	32.836	16.18
Engineering Estimate Realization (EE)	-0.435	0.043	-10.02
Average Daily HDD (AVGHDD)	1.900	0.206	9.21
Average Daily CDD (AVGCDD)	14.650	1.225	11.96
2007 GAS OTHER, (R2=0.79)*, ‡			
Average Intercept (alpha)*	6.804	6.090	1.26
Engineering Estimate Realization (EE)	-0.917	0.404	-2.27
Average Daily HDD (AVGHDD)	1.523	0.087	17.50
Average Daily CDD (AVGCDD)**	N/A	N/A	N/A
2007 LIGHTING ONLY, (R2=0.98)*			
Average Intercept (alpha)*	563.570	31.568	18.53
Engineering Estimate Realization (EE)	-0.858	0.042	-20.46
Average Daily HDD (AVGHDD)	0.528	0.189	2.80
Average Daily CDD (AVGCDD)	11.831	0.992	11.93

* This is a fixed effects model specification. We are reporting only the average intercept across the building specific intercepts. The R² value is misleading.

‡ Gas only model. No cooling parameter.



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TABLE C.2: POOLED MODELS

INDEPENDENT VARIABLE (DEPENDENT VARIABLE = AVERAGE DAILY KWH OR THERMS)	PARAMETER	STANDARD ERROR	T-TEST
2007-2007 GAS OTHER (R2=0.86)*			
Average Intercept (alpha)*	8.658	6.880	1.37
Engineering Estimate Realization (EE)	-0.924	0.256	-3.61
Average Daily HDD (AVGHDD)	1.895	0.053	35.66
Average Daily CDD (AVGCDD)**	N/A	N/A	N/A
2007-2007 LIGHTING ONLY (R2=0.98)*			
Average Intercept (alpha)*	546.761	32.0563	17.48128
Engineering Estimate Realization (EE)	-0.64557	0.03016	-21.4
Average Daily HDD (AVGHDD)	1.19607	0.13939	8.58
Average Daily CDD (AVGCDD)**	13.43771	0.76893	17.48
2007-2007 ELECTRIC OTHER SAE (R2=0.94)*			
Average Intercept (alpha)*	741.001	104.600	8.59
Engineering Estimate Realization (EE)	-1.036	0.202	-5.13
Average Daily HDD (AVGHDD)	13.978	1.524	9.17
Average Daily CDD (AVGCDD)	48.071	8.926	5.39
2006-2007 ELECTRIC OTHER CSA (R2=0.94)*			
Average Intercept (alpha)*	733.747	105.316	8.50
Participant Average Savings (daily – PARTPOST)	-192.220	49.695	-3.87
Trend Value (POST)	24.806	20.646	1.20
Average Daily HDD (AVGHDD)	14.016	1.527	9.18
Average Daily CDD (AVGCDD)**	48.469	8.950	5.42

* This is a fixed effects model specification. We are reporting only the average intercept across the building specific intercepts. The R² value is misleading.

For the conditional savings (CSA) model specification, the realization rate is calculated as the model based annualized daily participant savings divided by the average annual engineering estimate: 70,160 kWh / 49,750, kWh = 141%.





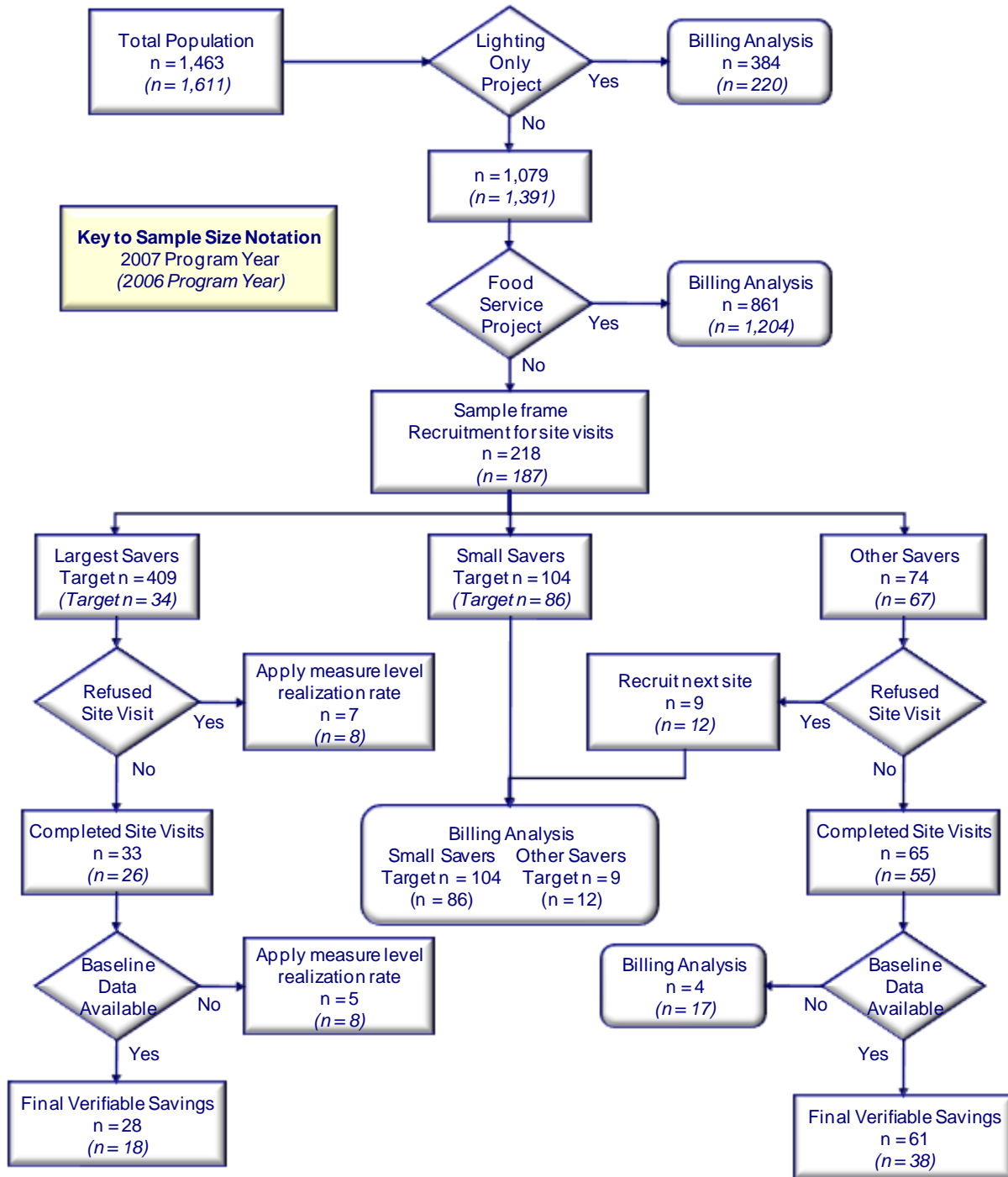
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IMPACT PROCESS FLOW DIAGRAM





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