research/into/action inc

Final Report

Production Efficiency Evaluation

Funded By:

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Our team consists of Jane S. Peters, Marjorie McRae, Adam Gardels, Anna Kim, and Bob Branick of Research Into Action, and Sergio Dias of Sergio Dias Consulting.

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E EXECUTIVE SUMMARY

This document provides the findings from a fourth process evaluation, as well as a market characterization, for Energy Trust of Oregon's (Energy Trust) Production Efficiency (PE) program, conducted by the evaluation team of Research Into Action, Inc. and Sergio Dias Consulting. The program launched in 2003; this report provides a process assessment of the 2011-2012 program, including some discussion of the preceding years, with the intent of facilitating continual program improvement in the years to follow.

The PE program provides industrial and agricultural sector customers with energy efficiency incentives, technical support, training, and project support. The PE program delivered 29% of Energy Trust's electricity savings and 19 % of its natural gas savings in 2011. Over the past two years, the program has delivered or exceeded the savings goals set by Energy Trust, while solidifying a prior transition in program structure, moving from a third-party contractor to in-house program implementation.

This evaluation describes the effectiveness of the program's strategies, tactics, and processes to deal with these challenges, and offers recommendations to improve and strengthen these efforts.

The evaluation seeks to help the program improve the effectiveness of its program partners' activities, estimate the program's market opportunities, and help the program understand and deal with risks posed by cancelled and stalled projects, by fulfilling the following research objectives:

- Evaluate the strengths and challenges of the program's opportunity development, delivery and project implementation processes carried out by PDCs, ITSPs, and program partners. These processes span the management of project tasks, coordination of project activities with other program partners, and interaction with program participants.
- Describe the experiences and perceptions program representatives have with program components and their ideas and recommendations for improving these components.
- Perform a market characterization of Energy Trust's industrial sector, including a description of the program's role in the market, assessment of the program's overlap with market opportunities, and a summary of the program's progress toward saturation of these opportunities.
- Synthesize the program's strategies and tactics employed to manage risks posed by cancelled, stalled, and slowed projects.
- Identify opportunities for program enhancements.

In pursuit of these objectives, we conducted interviews and surveys with six program staff and 60 program partners.

We organize our conclusions and recommendations around four general areas. For conclusions that identify only program strengths and no challenges, we do not offer any recommendations.

MARKETING AND OPPORTUNITY DEVELOPMENT

- ***Conclusion:*** **The program was effective at developing sales-focused program roles and implementing frameworks to oversee program activities.** Some PDCs mentioned difficulty describing to customers the involvement of ATACs, ITSPs, and trade allies across the program's offerings.

  Recommendation: **The program should develop additional materials to help PDCs explain the organization of the program's offerings around different program partners' roles, especially as offerings change.**

- ***Conclusion:*** **PDCs are effective at expanding the program's sales channel by enlisting trade allies and working with utility account managers**.

- ***Conclusion:*** **The program is effective at involving customers in the initiation of energy projects**, achieved through: the program's market-wide strategy to increase customers' focus on energy through an industrial focused newsletter and support of the Oregon Leaders Award, development of a customer focused sales approaches designed to target customers with the right offering, and implementation of strategic energy management (SEM) components that help drive corporate level involvement down to facility level energy decisions.

SUPPORTING PROJECT IMPLEMENTATION

- ***Conclusion:*** **PDCs are satisfied overall with Custom Capital and O&M tracks' processes, and mentioned a few suggestions**. PDCs rarely mentioned difficulty working with ATACs on these projects; most challenges concerned ATACs timely completion of TASs and PDCs' lack of a mechanism to encourage timely completion. A few PDCs mentioned difficulties identifying which program track measures customers are eligible for.

  Recommendation: **The program may consider revising their contracts with ATACs to include authority of PDCs to oversee timeliness of ATACs' work, and revising materials it uses to describe measure eligibility by program track.**

- ***Conclusion:*** **ITSPs are generally satisfied with the program's support for their activities, and mentioned a few suggestions:** ITSPs value PDCs involvement during project initiation and closeout, and some ITSPs would like additional technical support from PDC. ITSPs associated with natural gas O&M components suggested that some PDCs lack the natural gas background necessary to deliver quality scoping studies of gas opportunities.

Recommendation: **The program should continue restricted PDC technical support of ITSP-led projects to ensure participants are actively engaged in training; the program may consider implementing more detailed natural gas scoping procedures.**

MARKET ASSESSMENT

- ***Conclusion:*** **The program is delivering savings at an aggressive rate compared to its technical potential; at the program's current rate it will deliver 100% of 20 year technical potential in less than 14 years.**
- ***Conclusion:*** **'Low and no cost' O&M and SEM measures are helping industries to overcome financial constraints to energy projects.** Thirty-two percent of program savings during the evaluation period (an economic recession) were delivered by these types of measures. Many of these program components were in pilot phase.
- ***Conclusion:*** **Technical savings potential from high-technology industry is more significant for Energy Trust's service territory (20% of total potential), than it is for the rest of the northwest region (2% of total potential).**
- ***Recommendation:*** **The program may increase activities to assume a stronger leadership role within the region** related to the development and promotion of energy efficiency markets and initiatives focused within the high-technology industry.

INFORMATION AND RISK MANAGEMENT

- ***Conclusion:*** **The program implements effective quality assurance practices**.
- ***Conclusion:*** **The project tracking databases and business intelligence framework used by the program do not fully support the program's needs**.

  Recommendation: **Energy Trust may consider developing data systems specific to the program's needs**; database should include backend structure to port standardized data into Energy Trust's main project tracking databases.
- ***Conclusion:*** **The program is making progress toward moderating risks posed by cancelled projects**, achieved through: improving forecast through assumption based models, developing dashboards summarizing the program's project pipeline, and introducing low cost and program partner implemented offerings, which have lower probabilities of project cancelation.

1 INTRODUCTION

Energy Trust of Oregon, Inc. (Energy Trust) contracted with the team of Research Into Action, Inc. and Sergio Dias Consulting to conduct this fourth process evaluation, including a market characterization, for its Production Efficiency (PE) program, which launched in May 2003. This report reviews the 2011-2012 program, including some discussion of the preceding years, with the intent of facilitating continual program improvement in the years to follow.

Energy Trust was incorporated as an Oregon nonprofit public benefit corporation in March 2001 to fulfill a mandate to invest "public purposes funding" for new energy conservation and to support energy-efficiency market transformation in Oregon. Through state legislation, tariffs and other requirements, Energy Trust is funded by customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas. Customers of all four utilities pay a dedicated percentage of their utility bills to support a variety of energy-efficiency and renewable energy services and programs. The first funding came from Portland General Electric, Pacific Power as a result of a 1999 energy restructuring law (SB1149). Additional funding for electric efficiency came with separate legislation passed in 2007 (SB 838) that allows PGE and Pacific Power to work with Energy Trust on capturing more low-cost electric energy savings.

The PE program provides industrial and agricultural sector customers with energy efficiency incentives, technical support, training, and project support. The PE program delivered 29% of Energy Trust's electricity savings and 19 % of its natural gas savings in 2011. Over the past two years, the program has delivered or exceeded the savings goals set by Energy Trust, while solidifying a prior transition in program structure, moving from a third-party contractor to in-house program management.

This evaluation describes the effectiveness of the program's strategies, tactics, and processes and offers recommendations to improve and strengthen these efforts.

EVALUATION GOALS

Energy Trust requested a forward looking evaluation in its RFP, seeking to understand the extent to which recent program modifications have strengthened the program or created opportunities for improvement with the program's design and delivery, and how it might further strengthen and improve the program.

The evaluation team worked with Energy Trust's Evaluation Manager and the Program Manager to narrow the objectives for this research. Initially Energy Trust wanted the research to identify factors affecting both project completion rates and the overall timeliness of project completion. Additionally, the program has undergone significant changes since its last evaluation, and Energy Trust wanted to understand how its administration of the program and management of its implementation are strengthening its Program Delivery Contractors' (PDC), Industrial Technical

Service Providers' (ITSP) and program partners' activities; and it wanted to know of any opportunities to better support program activities. Lastly, the Evaluation Manager sought a market characterization describing the program's offering in relationship to estimated energy saving opportunities, and an assessment of the program's progress toward saturating market opportunities.

To help the program deal with the challenges and risks posed by cancelled and stalled projects, the evaluation describes the strategies and initiatives the program is implementing to help manage risks posed from such projects. The Evaluation Manager determined, during the course of our research, that the number of active and inactive projects were too few to support an assessment of the factors leading to cancelled and stalled projects. Energy Trust may address this topic in a future study.

In summary, the evaluation seeks to help the program improve the effectiveness of its program partners' activities, estimate the program's market opportunities, and help the program deal with risks posed by cancelled and stalled projects, by fulfilling the following research objectives:

- Evaluate the strengths and challenges of the program's opportunity development, delivery and project implementation processes carried out by PDCs, ITSPs, and program partners. These program representatives engage with customers and implement projects by processes structured by program guidelines, as well as routine and ad-hoc practices fashioned by program partners during the execution of their responsibilities. These processes span the management of project tasks, coordination of project activities with other program partners, and interaction with program participants.
- Describe the experiences and perceptions program representatives have with program components and their ideas and recommendations for improving these components. Program representatives have insights into the markets they serve and have direct experience with program participants. The evaluation summarizes program representatives' perceptions of the program's components alignment with market needs, their estimations of the program's saturation of those market opportunities, and recommendations these representatives have for improving the development and implementation of program components.
- Perform a market characterization of Energy Trust's industrial sector, including a description of the program's role in the market, assessment of the program's overlap with market opportunities, and a summary of the program's progress toward saturation of these opportunities.
- Synthesize the program's strategies and tactics employed to manage risks posed by cancelled, stalled, and slowed projects, with a goal of supporting the program's efforts to engage with Energy Trust's administration and utility sponsors in the strategic management of risks.
- Identify opportunities for program enhancements.

EVALUATION METHODOLOGY

Data Collection

We developed structured interview guides and surveys for data collection with program administration staff, PDCs, ATACs, ITSPs, and trade allies. Table 1 displays our data sources, collection activities, and key research objectives addressed by each data source.

Table 1: Evaluation Data Collection Activities

TARGET	METHOD	DATE	KEY RESEARCH OBJECTIVES
Energy Trust Staff[1] (n = 6) Program Manager Technical Manager ITSP Manager Senior Project Manager Data Specialist Project Coordinator	Interviews	May 29 – December 18, 2012	Gain insight into design and delivery experiences and market response for all program components Document the program's evolution since the last process evaluation Assess current program processes
Program Delivery Contractors (6)	Interviews	June 20 – August 7, 2012	Describe how PDCs use program marketing and incentives in program outreach activities Describe PDCs' experiences with delivering the program, and ideas for improvement Gain insight into PDCs' experiences with project stages and ideas for improving program support for projects
Allied Technical Assistance Contractor (8)	Interviews	August 20 – August 29, 2012	Describe how ATACs manage project studies and identify opportunities for improvement Describe how project hand off is working between ATACs and PDCs
Industrial Technical Service Provider (7)	Interviews	July 2 – July 25, 2012	Document ITSP's involvement with offerings' implementation rollout Describe ITSPs' experiences working with PDCs' and Energy Trust's processes Assess program offerings' strengths and challenges
Small Industrial Trade Ally (10)	Survey	Sept. 6 – Sept. 14, 2012	Document TAs practices for working with customers and developing projects Describe TAs experiences with program calculators and forms

Continued…

[1] Current titles are: Sector Lead (above referenced as "Program Manager"), Program Manager (ITSP Manager), Technical Manager, Sr. Project Manager, Operations Analyst (Data Specialist), Coordinator (Project Coordinator)

TARGET	METHOD	DATE	KEY RESEARCH OBJECTIVES
Lighting Trade Ally (17)	Survey	July 17 – August 1, 2012	Document TAs practices for working with customers and developing projects Describe opportunities for the program to support TAs projects
Motor Service Centers (6) Green Motors Practice Group Manager (1) Service Centers (5)	Survey	Sept. 9 – Oct. 2, 2012	Document motor service center processes Describe opportunities for improvement with program component
Secondary Market Data	Review	June – Dec. 2012	Estimate market opportunities by measure type and industry

Data Analysis

We gathered data primarily through interviews to allow contacts to elaborate on their experiences and suggest insights into program improvement. Collected data are qualitative around topical areas; related topics enable us to compare program experiences and insights between interviews. We used the following analysis approaches to elicit and organize findings from these data:

- **Thematic coding:** We captured interview data in annotated text and audio recordings. Evaluation team members reviewed the data and coded data with emergent themes, and identified quotations we believe add value to the report.
- **Business process maps**: We developed standalone business process maps to document how program partners regularly work with the program.

2 PROGRAM DESCRIPTION

The PE program seeks to help customers reduce energy-related operating costs while also improving productivity, product quality, and environmental performance. [2] The program is available to all industrial and agricultural customers of PacifiCorp, and PGE, and to NW Natural and Cascade Natural Gas customers that pay the systems benefit charge. The program serves both new and existing industrial processes and support systems. In addition to offering incentives for efficient equipment, the program offers engineering and technical services, as well as training and project support, and engages market actors in helping customers reduce energy costs.

This evaluation documents the program as implemented by Energy Trust between June and September of 2012. This program description provides one of the first program summaries since Energy Trust assumed the program's implementation functions in 2009. During our data collection period, the program continued evolving, and program staff suggested that additional program changes might be underway; we do not document tentative program ideas.

The following sections provide a synopsis of the program; present its energy savings achievements for 2010-2011; describe the roles of Energy Trust program staff, program contractors, and trade allies in delivering the program; discusses its recent evolution and response to past evaluation findings; provides a description of the custom and prescriptive offerings and the programs tracks within those offerings; and concludes with a discussion of the way program activities are integrated between program and implementation staffs.

PROGRAM SYNOPSIS

The program's components help participants generate energy savings by reducing costs associated with energy efficient equipment improvements, supporting projects with technical services, and targeting low and no-cost process improvements and energy management opportunities.

PE provides incentives and resources to help participants complete energy efficiency projects and keeps incentive offers stable between program cycles. Project incentives are typically awarded on a per savings basis (kWh or therm) at a rate determined by the program component under which projects are completed; incentive rates are described in greater detail in the Program Track section below. The program also provides free analytical services for detailed technical analysis studies to identify prospective efforts, provided the customer agrees to initiate the project within six months of the study's completion.

[2] Energy Trust of Oregon, 2011 Annual Report to the Oregon Public Utility Commission, April 16, 2012. Page 23.

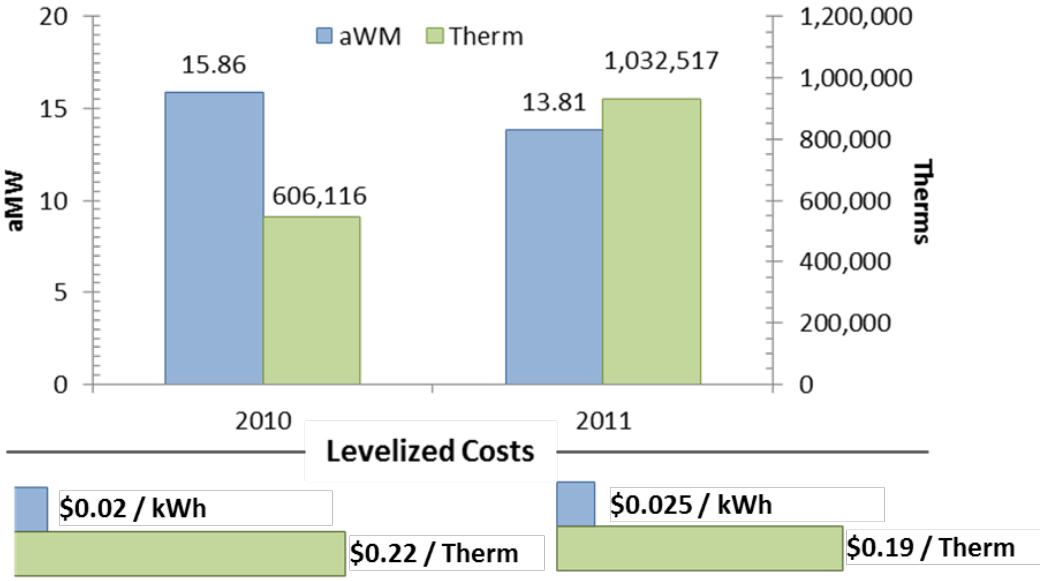
The program has a per-project incentive cap of $500,000—projects referred to as “mega-projects”; and facility cap of $1,000,000 per year. In November 2003 a mechanism was put in place to fund projects over the per-project incentive cap; following the identification of several very large projects with high energy savings potential, Energy Trust’s Board of Directors approved a waiver of the incentive cap on case-by-case basis for certain extraordinarily cost-effective projects. And in 2009 the site cap was raised from $500,000 to $1,000,000 per year, in order to meet the demands of a doubling of planned program savings. Projects that exceed the cap are reviewed for approval by Energy Trust in a process distinct from PE processes. Mega projects are rare, The Energy Trust has had four projects in its history.

PROGRAM RESULTS 2010-2011

From 2010 through 2011, the PE program delivered a combined 29.7 average megawatt (aMW) of electricity savings and secured 1,638,600 therm savings (see Figure 1). These results constitute a 70% increase in natural gas savings from 2010 to 2011; electricity savings were highest in 2010, decreasing by 13%, or 2.05 aMW, in 2011. Over the same period, levelized electricity costs increased 25%, from $0.02 per kWh in 2010, to $0.025 kWh in 2011; natural gas levelized costs remained relatively stable over the same period.

Because of the nature of industrial projects, these figures are best viewed on the aggregate; in which case, these figures demonstrate a strong performance by the program to meets its savings goals. The program delivers very cost efficient savings, and most projects are well below the levelized costs set by the Oregon Public Utility Commission. This explains why program savings vary independently of changes to energy source’s levelized costs. Additionally, industrial projects are often completed, and savings counted in the year following their initiation; this is another reason savings may be viewed in the aggregate between years. On the whole, the program is delivering at or above the rate it needs to achieve its goals.

Figure 1: 2010-2011 Reported Program Electrical (aMW) and Natural Gas (Therm) Savings; Levelized Costs[3]

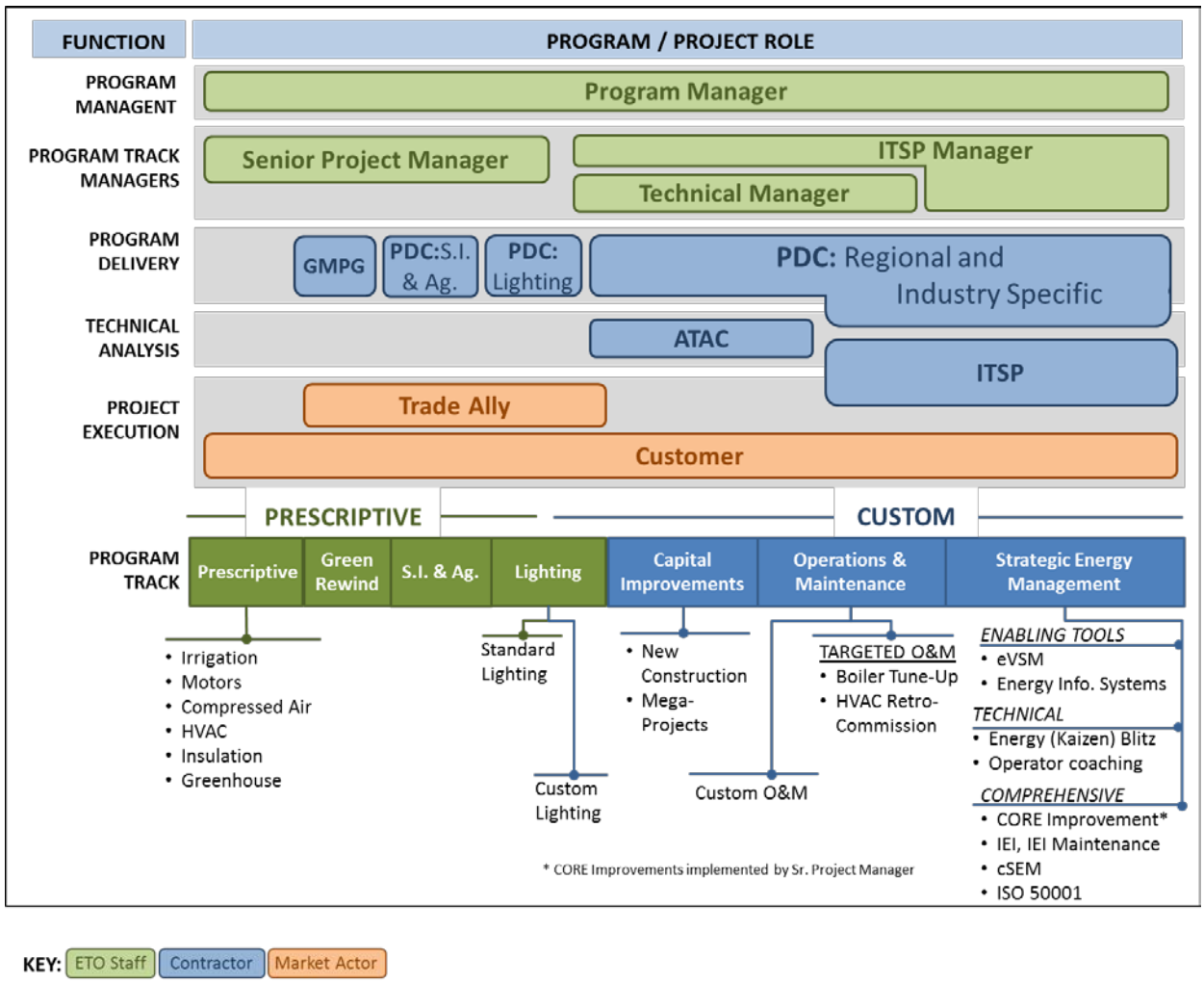


PROGRAM ROLES

Figure 2 describes the program's components and management structure that helps to organize program activities. Four Energy Trust employees comprise the management team and program services are primarily coordinated by and delivered through Program Delivery Contractors (PDCs), with one program track delivered through the Green Motors Practice Group (GMPG). The program contracts with Allied Technical Assistance Contractors (ATACs) to perform technical studies of proposed projects and Industrial Technical Service Providers (ITSPs) to perform on-site engagements with participants regarding process improvements and energy management. The program also relies on trade allies to implement smaller industrial and agricultural projects.

[3] Sources: Energy Trust of Oregon 2010 Annual Report, April 15, 2011; and Energy Trust of Oregon 2011 Annual Report to the Oregon Public Utility Commission, April 16, 2012.

Figure 2: Production Efficiency by Program Component and Program Role[4]



Since 2009, Energy Trust has used in-house staff to manage program implementation. To support program expansion, especially new components added to the strategic energy management track, the team developed additional technical and implementation roles, with some positions performing multiple roles. Each role is described in functional detail below; later chapters describe reporting roles in more detail.

- **The Program Manager**: is responsible for designing the program and managing its administration, which includes program budgets, project forecasting, and program staffing. The Program Manager also coordinates regional energy efficiency activities with regional stakeholders and contributes knowledge and information to industrial energy efficiency initiatives across the country.

[4] Staff roles are noted in this graphic, which are distinct from staff titles.

➡ **Program Track Managers**: are Energy Trust staff members who manage the day-to-day operations of specific program tracks, and consists of the following roles:

- **The Senior Project Manager:** manages the prescriptive category of program tracks, which includes Prescriptive, Green Motor Rewind, Small Industrial (SI), and Lighting program tracks. This role includes coordinating program activities with the SI and Lighting PDCs; consolidating the program's contact with smaller industrial and agricultural customers, and facilitating the program's ability to develop program components and marketing for these customer segments.
- **The Technical Manager:** manages project approvals and contracts for Capital Improvements and Operations & Maintenance (O&M) program tracks. PDCs submit project scoping studies to the Technical Manager, which may lead him to contract ATACs to perform technical studies and further develop scoping studies into projects. The Technical Manager also offers contracts to customers and approves incentives on a per-project basis.
- **The ITSP Manager:** manages the day-to-day operations of the Strategic Energy Management program track, which provides a management level contact for ITSPs and helps to consolidate the program's energy management focus into one role. Additionally, this role involves management of PDC firms', which includes: managing contracts between the program and PDCs, reviewing PDC firms' monthly project pipeline reporting, and monthly meeting with PDC firms' to review project status and progress toward goalsprogress toward goals, and meets with each PDC firm monthly concerning status updates.

➡ **Program Delivery Contractors (PDCs)**: The program is delivered through six PDCs, with the Green Motor Rewind component delivered separately through an industry organization. Two of the six PDCs are dedicated to delivering the SI and Agriculture Program Track and the Lighting Program Track; projects in these tracks are mostly implemented by trade allies. The remaining four PDCs deliver the program through regionally and industry specific territories and tend to focus their efforts on the promotion and development of custom projects. The PDCs, except for the Green Motors Practice Group, both represent the program to the market and provide the program with its primary delivery channel through which the program achieves its goals. In their contracts with the program The PDCs have specific savings goals to deliver.

- **The Green Motors Practice Group (GMPG):** is a standards and training group that certifies motor service centers' motor rewind practices. GMPG codifies motor rewind standards and trains and certifies motor service centers to these standards. GMPG reviews incentive applications from each rewind service performed by these service centers before they are submitted to Energy Trust for payment.
- **One Small Industrial (SI) and Agriculture PDC:** promotes the program to trade allies, who work on smaller industrial projects or projects in the agricultural sector. This PDC explains program processes and incentives to trade allies, supports some

trade allies with project savings calculations, and reviews the quality of trade allies' work.

- **One Lighting PDC:** manages the Northwest Trade Ally Network – a trade organization designed to support and encourage electrical and lighting contractors and distributors to offer ratepayer-supported incentives to their customers throughout the northwest.[5] The lighting PDC explains program process and incentives to lighting and electrical trade allies and works with trade allies to promote program-incented measures to their customers. The lighting PDC reviews the quality of trade allies' work and reports progress on custom lighting projects to the program.
- **Four Regional and Industry Specific PDC firms:** deliver the program across regional territories of Oregon: north, southwest, central, and PGE territory. Additionally, three PDC firms manage industry-specific territories in the food processing and refrigeration, pulp & paper, and high technology industries. PDC firms are selected for their technical expertise and relationships with industrial customers. They operate in technical account manager roles – acting as the primary customer contact for the program, and helping to support some of the technical aspects of initial project development. These PDCs' initiate custom projects through scoping studies or detailed walk-throughs of customers' facilities where potential energy savings opportunities are documented. Additionally, PDCs' serve customers in a key account executive role by sustaining customer's relationships with the program, and help to direct customers to solutions offered by the program.

➡ **Allied Technical Assistance Contractors (ATACs)**: are experts in industrial systems that perform Technical Assessment Studies (TASs) on proposed projects to help identify energy savings opportunities and estimate proposed projects' energy savings.

➡ **Industrial Technical Service Providers (ITSPs)**: are experts in energy management that are focused on behavioral and process improvement. ITSPs work with participants to develop organizational processes, operational practices, and goals focused on energy efficiency.

➡ **Trade Ally**: are often lighting or electrical contractors, vendors, or installation contractors associated with industrial equipment or motor service centers. The program expands its market reach by working with these market actors by incenting energy efficient equipment and service offerings offered by these trade allies.

PROGRAM EVOLUTION

The program continues to evolve in response to challenges posed by Energy Trust leading the program's implementation and the program's expanding view of industrial savings opportunities. The program increased its staffing over the last few years in order to manage its implementation

[5] http://www.northwest-lighting.org/

responsibilities, and developed additional program tracks to help organize staffing resources around related program components. Additional program tracks include SEM, O&M, and the additional of agriculture sector with SI.

New Energy Trust staffing roles include the ITSP Manager and Senior Project Manager roles; a project coordinator role that manages customer inquiries, outreach activities, and facilitate PDCs' access to program information; an operations analyst role designed to evaluate program progress towards its goals and forecast program savings; and expansion of the marketing manager's role.

The program continues to evolve through the development of pilot program components targeting new opportunities, some of which include: Energy Value Stream Mapping, Core Improvements, Refrigerator Operator Coaching, Core Improvements, and ISO 50001.

This current evaluation follows three previous process evaluations of the PE program. The prior studies were a process evaluation conducted at the end of the program's first six months of operation,[6] a second process evaluation and impact evaluability assessment completed at the end of 2005[7] and a process and impact evaluation completed in the early second half of 2008 [8].Table 2 presents the key recommendations of prior evaluations and their implementation status.

[6] Research Into Action. 2005. *Production Efficiency Program: Process Evaluation and Impact Evaluability Assessment.* See. http://energytrust.org/library/reports/051230_2003_2004_PE_Evalution0.pdf

[7] Summit Blue Consulting. 2009. *Production Efficiency Program Evaluation Report.* See: http://energytrust.org/library/reports/Evaluation_2007-2008_Production_Efficiency.pdf

[8] Research Into Action. 2008. *2006 Production Efficiency Program: Process and Impact Evaluation*. See: http://energytrust.org/library/reports/080812_Production%20Efficiency.pdf

Table 2. Status of Prior Evaluation Recommendations

RECOMMENDATIONS	STATUS
Energy Trust should manage the program's implementation and contract directly with the PDCs	Done
Program funds should be managed and accounted for in a way that provides steady, dependable funding for projects	Done. Program has a per-project incentive cap of $500,000, and per site cap of $1,000,000 per calendar year; and mechanism to gain Board approval to go beyond these limits on a per project basis. Program has robust processes for tracking projects under development.
Program staff should take steps to increase program understanding and augment the skills of those expected to market the program, including PDCs, ATACs, and vendors	Both done and ongoing
Program staff should promulgate and implement uniform procedures and standards or guidelines for both the technical studies and the review of those studies, to simplify the program review and oversight function, and to enhance quality control of technical studies	Done
Program staff should conduct a review of program data collection and entry procedures internal to Energy Trust and with program contractors to address data and list discrepancies	Done

PROGRAM TRACKS

The PE components comprise both custom and prescriptive projects.

Custom

Custom projects require project specific measurement and verification (M&V) of energy savings, and include the Capital Improvements track, the O&M track, the Strategic Energy Management (SEM) track, and some lighting projects requiring M&V. The program's custom activities also include *enabling tools* to monitor energy use and estimate energy savings resulting from process improvement, *technical* program components to drive savings through identifying system energy savings opportunities and training to facility staff to reap those savings, and multiple c*omprehensive* program components that target savings across participating organizations through initiatives designed to focus company goals on energy efficiency:

Capital Improvements

The capital improvement component is a funding mechanism that helps to reduce participants' costs associated with purchasing and installing energy efficient equipment for projects delivering

larger savings. Most of these projects concern equipment used in production. The program assumes a 15-year measure life for capital improvement projects. [9]

Cash incentives are offered on a case-by-case basis for project savings at a rate of $0.25 per kWh or $2/annual therm saved up to 50% of eligible project costs.[10] For self-directed customers that are not paying the public purpose charge,[11] these incentives are reduced by one-half.

Projects come about following an initial scoping study of opportunities by the PDC and, possibly, a further detailed analysis by an ATAC. The program offers an incentive form to be signed by the customer. These projects are generated in one of two ways:

- Following a Technical Analysis Study (TAS) of a proposed project. This is the more common route for projects, and they come about when an ATAC is involved to perform a TAS to estimate project savings. Following the TAS, participants clarify their project plans and commit to program incentives.
- The program offers incentives to customers without a TAS being performed. These projects typically come about when the PDC has sufficient information to estimate project savings. Often, these projects occur when prior program activities help provide PDCs more site information; the measure has less variability, requiring less complicated analysis or the PDCs are able to estimate savings based upon their own technical expertise.

Operations and Maintenance (O&M)

The O&M project track focuses on generating energy savings from process improvements and configuring efficient operating settings for equipment. The program offers free technical assistance to study and identify process and equipment setting opportunities. The O&M track comprises two categories – Custom O&M, and Targeted O&M. The program currently assigns a three-year measure life for these projects.

Cash incentives are offered at $0.08/annual kWh saved, or $0.40/annual therm saved, up to 50% of eligible project costs. The program offers an additional incentive referred to as the *90 by 90 Industrial Operations & Maintenance Offer*, and under this structure incentives reimburse customers for 90% of installation costs for projects completed within 90 days after the program

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9 The measure life is the assumed average length of time energy efficient equipment will continue to yield energy savings.

10 http://energytrust.org/industrial-and-ag/incentives/large-industrial/customized-incentive-solutions/customized-solutions-for-industry/

11 Customers that retain a portion of their public purpose charge to fund Oregon Department of Energy-certified expenditures at their own facilities. http://energytrust.org/About/policy-and-reports/self-direction-FAQs.asp

receives an incentive offer from the program. Incentive levels return to 50% of projects costs for projects completed after 90 days.[12]

Custom O&M projects focus on operational and behavioral activities impacting the efficiency of industrial processes. Following the PDCs' initial scoping studies, Energy Trust contracts with ATACs to perform detailed studies of savings opportunities and develop energy efficient procedures that participants are to use to promote persistence of these operational changes, such as updating their standard operating procedures documentation. Energy Trust expects that PDCs serving as an energy efficiency account manager to participants in their territory will occasionally follow up with those participants to ensure they continue following the recommended O&M guidelines.

Targeted O&M projects involve tuning of equipment or changing equipment settings to ensure equipment operate more efficiently. Following a PDC scoping study of these potential projects, the program contracts an ITSP to study and implement the project. The program does not pay participants incentives for these projects; instead, the program pays the ITSP for work agreed upon in their project contracts. Currently, there are two targeted O&M program components:

- **Boiler Tune-Up**: The program has two boiler specialists with which it contracts on a per-project basis to implement boiler tune-up projects.
- **HVAC Retro-Commission**: The program contracts with one specialist to implement HVAC configuration projects.

Strategic Energy Management (SEM)

SEM projects involve lengthy engagements between participants and ITSPs. Projects focus on either improving energy efficiency through technical aspects of operations or developing organizational goals and practices concentrated on energy efficiency. SEM components have a three-year measure life and can be organized into three sub-categories: *enabling tools, technical, and comprehensive*.

Enabling Tools

Enabling tools program components offer tools to monitor energy use and estimate energy savings resulting from process improvements. Information from these tools provides organizations with custom dashboards of their real-time energy usage by key processes and equipment. These tools support other SEM initiatives and include the following program components: Energy Value Stream Mapping (eVSM) and Energy Information Systems (eIS).

12 http://energytrust.org/industrial-and-ag/incentives/large-industrial/operations-and-maintenance/operations-maintenance-opportunities1/

Technical

Technical program components drive savings through a process of identifying system energy savings opportunities and delivering training to facility staff focused on achieving savings from these identified opportunities. Under these components, ITSPs study processes for savings opportunities, and train systems operators' how to improve the efficiency of the systems they manage. ITSPs work on site with system operators to identify low- or no-costs opportunities. The first operator coaching component delivered through the program was called Refrigerator Operator Coaching (ROC) and focused on training refrigerator operators' in energy efficient practices for the systems they use. The program plans on expanding the component to include coaching for operators of systems other than refrigeration. Energy (Kaizen) Blitz – another technical program component – focuses on process and design improvements made to refrigeration, lighting, HVAC, doorways to conditioned spaces, and battery systems.[13]

Comprehensive

Comprehensive program components target savings across participating organizations through initiatives designed to focus company goals on energy efficiency:

- **Industrial Energy Improvement (IEI) and IEI Maintenance:** ITSPs employ a yearlong cohort approach to delivering training on continuous improvement to energy management. Cohorts bring together participants within a region; participating organizations assign at least two energy champions and one executive to attend cohort meetings. Training occurs in monthly cohort meetings, which include structured peer interactions and individual instruction from ITSPs during on-site visits. IEI Maintenance projects involve ITSPs delivering targeted energy management training to companies that completed their yearlong IEI training.
- **Corporate Strategic Energy Management (cSEM):** ITSPs employ an on-site approach to continuous energy improvement trainings. ITSPs work one-on-one with company executives and energy champion. This setting allows companies in more remote areas of Energy Trust service territory to receive SEM training at their sites rather than travelling to the larger population centers where the cohort meetings are typically held. Corporate SEM is also used when companies with multiple sites in Energy Trust territory would like to approach SEM as their own "cohort". **CORE Improvements:** ITSPs employ a yearlong cohort approach that is similar to IEI; the only difference is that participants are from smaller industrial organizations – with annual utility costs between $50,000 and $500,000. This program component is managed by Energy Trust's Senior Project Manager, who also manages the SI program component.

[13] Navigant Consulting, Kaizen Blitz Pilot: Report One; October 26, 2010. http://energytrust.org/library/reports/101026_KaizenBlitzPilot.pdf

- **ISO 50001 pilot:** the program offered incentives and technical support for 2 organizations to pursue training and accreditation for the internationally recognized ISO 50001 accreditation. Accreditation requirements include establishing, implementing, maintaining, and improving an energy management system, in order to enable accredited organizations to follow systematic approaches to continual improvement of energy performance.

Prescriptive and Calculated

Prescriptive incentives are available to capture lighting savings, small industrial project savings, savings from other measures customers purchase from equipment contractors, such as air compressors, and savings from efficient motor rewinds.

Lighting

The Lighting program track is offered through trade allies who both promote program incentives to customers they work with and implement lighting projects. Additionally, some industrial customers implement their own lighting projects. Standard lighting projects are less technically complex lighting projects, and project savings are estimated using program approved calculators, which involve pre- and post-condition inputs and hours of operation.

Incentives for standard lighting projects may be available for up to 50% of total eligible project costs, not to exceed $0.20/annual kWh saved. Incentives may also be available for the installation of custom lighting equipment for up to 35% of the total approved installed cost. All custom equipment must individually pass a cost-effectiveness test.[14]

Small Industrial (SI)

The SI program track is designed to handle projects of lesser complexity – in cases where estimating project savings can be achieved through the use of program calculator tools, or in order to handle projects for smaller customers, whose annual utility costs are less than $75,000. Projects typically concern energy efficient equipment upgrades and equipment configuration in industrial and agricultural sectors. The program track is delivered to the market through trade allies.

Other Prescriptive

Trade allies or customers may implement a number of measures where the savings have been determined on a per-measure basis. These measures generally fall into one of the following categories: irrigation, motors, compressed air, HVAC, insulation, or greenhouse.

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[14] http://energytrust.org/industrial-and-ag/incentives/manufacturing-and-small-industrial/lighting-and-lighting-controls/LightingLightingControls/

- **Compressed air:** incentives are offered for single-compressor systems of up to 125 horsepower, at a rate of $0.25 per kWh, up to 50% of project costs, when working with an Energy Trust trade ally contractor.[15]
- **HVAC:** incentives are offered for upgrades to energy efficient equipment; incentives are based on utility source and equipment capacity.[16]
- **Insulation:** incentives are offered on a per-square-foot basis, at $0.30 per square foot for building insulation, and $2.00-6.00 per square foot for pipe insulation.[17]
- **Greenhouse:** incentives are offered for greenhouse reglazing.[18]

Green Rewind

Twelve motor service centers in Energy Trust service territory offer the Green Rewind track to their customers. These service centers can perform Green Rewind services on qualified motors to help return motors to a more efficient operating state. Each Green Rewind service is tested for compliance with GMPG standards, and the program compensates service centers $2 per kWh saved. The service center must discount their services to participants by at least $1 per kWh saved.[19]

SCHEMA OF PROGRAM ACTIVITIES

We developed a model or schema to describe program activities from a systemic perspective. The schema (Figure 3) relates program activities to four arenas, including administration (depicted by the vertical line on the far left), implementation (the top horizontal line), delivery (the right vertical line), and fulfillment (the bottom horizontal line).

The program's four major activity areas constitute the graphic's four quadrants, which we label at the cardinal points of the figure. The type of *thinking* or approaches required to complete the activities in each arena is suggested in parentheses. These major activity areas and their approaches are planning (strategic), developing market (operational), implementing projects (tactical), and managing information (evaluative). Within each quadrant, we identify the specific activities comprising the major activity area, grouped into themes, which we illustrate as falling within an oval shown on the graphic. Lastly, we use the graphic's background shading to indicate whether Energy Trust (green) or PDCs (blue) are responsible for various activities.

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15 http://energytrust.org/industrial-and-ag/incentives/manufacturing-and-small-industrial/compressed-air-systems/CompressedAirSystems/

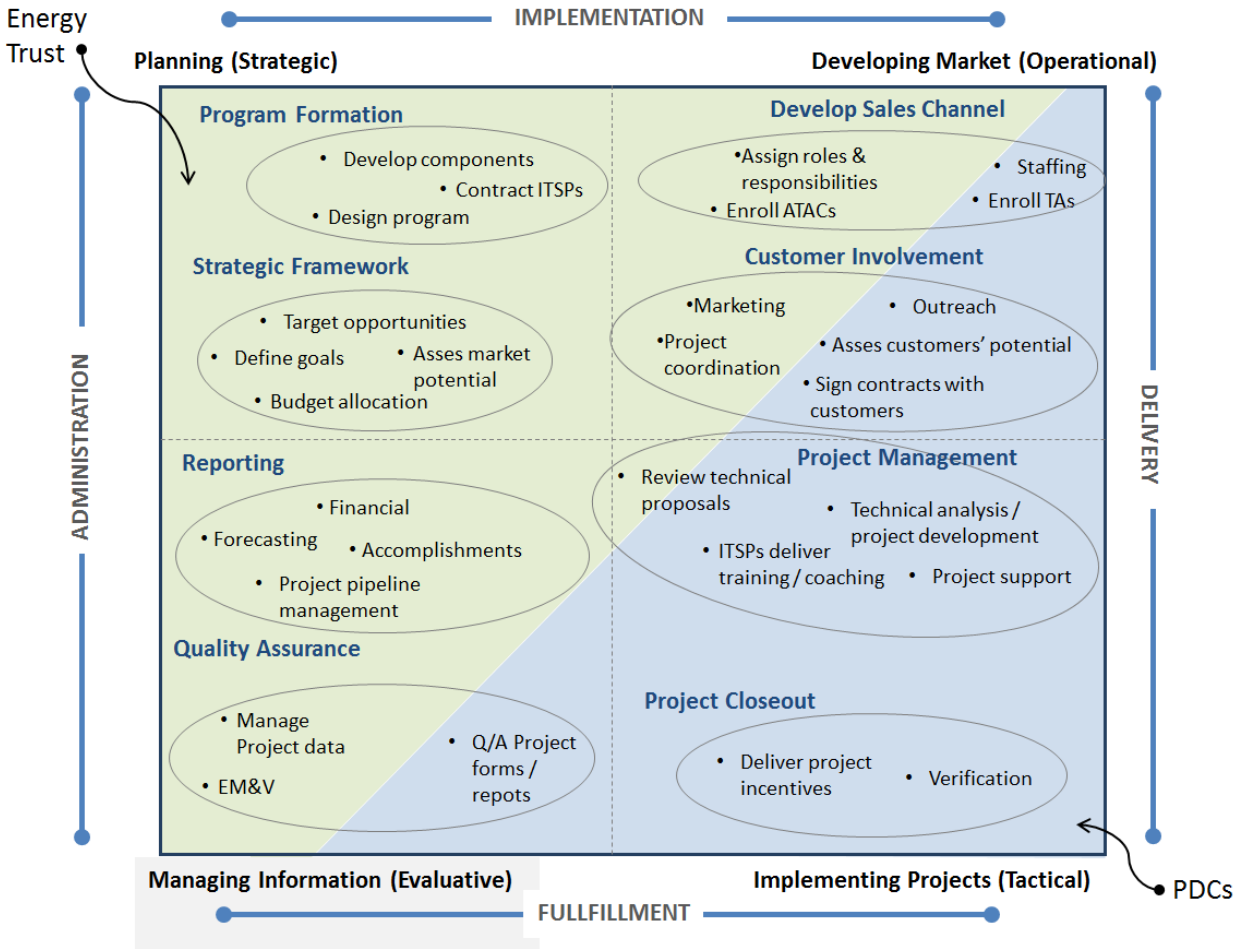
16 http://energytrust.org/industrial-and-ag/incentives/manufacturing-and-small-industrial/heating-and-cooling/

17 http://energytrust.org/industrial-and-ag/incentives/manufacturing-and-small-industrial/insulation/Insulation1/

18 http://energytrust.org/industrial-and-ag/incentives/agriculture/greenhouse-upgrades/greenhouse-upgrades/

19 http://www.greenmotors.org/gmi.htm

Figure 3: Schema of the Program's Systems and Activities



The four major activity areas and their component activities are:

- **Planning (Strategic)**: Planning activities are generally guided by strategic thinking. Staff perform program planning activities at the outset of the program and occasionally throughout the program implementation. When the program develops a *strategic framework* for clarifying program goals, further activities occur during a *program formation* state in which the team develops strategies and tactics for achieving those goals.

  - **Strategic Framework:** These activities are typically associated with the responsibilities of the program administrator and include assessing market savings potential, defining program goals, targeting market opportunities, and allocating program budgets.

- **Program Formation:** As planning activities move toward program implementation, the program designs offerings and organizes resources to pursue the strategic framework. These activities include developing core program components and contracting with ATACs and ITSPs to deliver (and, for ITSPs, develop) program components.

➡ **Developing the Market (Operational):** Following program formation, Energy Trust and the PDCs develop approaches and infrastructure for program delivery. These initial activities involve developing sales channels to drive program participation and coordinating activities to involve customers in the program.

- **Develop Sales Channel**: As the program develops its route to the market, the program assigns program roles and responsibilities, and contracts with PDCs to deliver the program; PDCs staff their teams and enlist trade allies to help deliver the program.

- **Customer Involvement**: The program promotes to customers through marketing campaigns in conjunction with utilities; PDCs perform direct outreach to customers, assess customers' saving potentials through meetings and scoping studies, and help customers commit to projects through signed contracts. Additionally, the program establishes a coordination process for addressing issues related to how projects and customers come into the program.

➡ **Implementing Projects (Tactical):** At the most granular level of the program delivery, the PDCs oversee the implementation of projects through project management and project closeout related activities.

- **Project Management**: The program provides technical support through ATACs to help develop Capital Projects, and these projects are developed into technical proposals which are reviewed by the program. ITSPs deliver energy management training. PDCs are often involved with these projects in an advisory role concerning some technical project aspects, as well as maintaining contact with participants and providing project support as needed to usher the project to completion.

- **Project Closeout:** PDCs coordinate project activities with program staging benchmarks and deliver project incentives to participants.

➡ **Managing Information (Evaluative):** The program and projects both begin and end with some form of information management activity. Energy Trust and the PDCs perform quality assurance activities around project data and reports. Energy Trust engages in reporting activities to inform broader organizational financial needs and evaluate program outcomes and progress.

- **Quality Assurance:** The PDCs review the quality of project reports and forms submitted to Energy Trust; Energy Trust manages project data and data systems.

- **Reporting:** Energy Trust performs summary reporting of its project data to describe program accomplishments and project program obligations.

Table 3 employs the schema illustrated in Figure 3 to describe the key research questions.

Table 3: Research Questions by Program Schema Component

PLANNING		**DEVELOPING THE MARKET**	
Strategic Framework	Is the program targeting the right market opportunities? Are program goals clearly defined throughout the program's operations? Are program resources effectively allocated to achieve its goals?	Develop Sales Channel	Are roles clearly defined? Are responsibilities tied to goals? Do PDCs and TAs understand the program and its components? How well do Energy Trust and the PDCs coordinate between the program implementation and delivery?
Program Formation	How well do strategies align program components with targeted opportunities? Do strategies effectively engage participants in deeper levels of the program? How effectively are ITSPs being used to develop new program components?	Customer Involvement	How effectively does program marketing inform and motivate customers? Are PDCs adequately evaluating customers' potential? Are PDCs and TAs' strategies for selling the program effective? How are customers connected to the right program resources?
MANAGING INFORMATION		**PROJECT IMPLEMENTATION**	
Quality Assurance	How adequately are PDCs performing quality assurance around project reports and forms? Are Energy Trust processes effective for ensuring quality / timely data management?	Project Management	Can PDC and ATAC activities be enhanced to improve project completion rates and customer experience? Are PDCs effectively supporting ITSP led projects? How effectively do TA and Motor Service Centers' practices support customer decisions?
Reporting	Are reporting tools answering Energy Trust's business questions? How adequately does reporting support evaluation of the program's recent and near-term accomplishments?	Project Closeout	Are PDCs contacting customers to help move projects through stages of completion? How do PDCs use program incentives to motivate future projects?

3 MARKETING AND OPPORTUNITY DEVELOPMENT

The bulk of the program's savings come from custom projects that PDCs have worked with customers to develop and usher through the program. Additional program savings come from the activities of ITSPs (custom components) and trade allies (prescriptive components). These activities constitute program "marketing," yet the term marketing connotes a relatively simple process of creating customer awareness to stimulate desire and acquisition that does not do justice to the opportunity development activities the PE program conducts.

Opportunity development begins with infrastructure development activities far preceding that of creating customer awareness (which Table 4 terms "perform program outreach") and, as necessitated by the various custom components the program offers, extends beyond creating awareness. Table 4 sketches the program's key opportunity development activities, distinguishes between activities initiated by program staff and initiated by PDCs, and indicates whether the activity involved direct interaction with customers.

Table 4: Key Opportunity Development Activities by Role

ACTIVITY	PROGRAM STAFF INITIATES	PDCS INITIATE	CUSTOMERS INVOLVED
Develop program roles	✓		
Educate PDCs about offerings	✓		
Oversee PDC activities	✓		
Program marketing	✓		
Direct customer / project leads to PDCs	✓		
Host annual customer performance events	✓		✓
Build qualified team; train technical and marketing teams		✓	
Enlist, train, and motivate trade allies		✓	
Work with utility account managers		✓	
Perform program outreach		✓	✓
Assess customers' abilities / project willingness		✓	✓
Identify customers' saving opportunities		✓	✓
Target customers' energy champions		✓	✓
Offer appropriate program components to customers		✓	✓

This chapter describes the program's opportunity development activities in reverse chronological order, starting with the activities directly involving customers – the activities most commonly thought of as "marketing" – continuing with the PDC activities to prepare for customer outreach,

and ending with program staff activities to create and maintain an infrastructure that supports the efficiency opportunity development.

CUSTOMER INVOLVEMENT

The program necessitates significant involvement from customers whose participation may require them to budget energy efficiency in their capital plans, modify operational processes, revise corporate wide goals, and implement technically complex Capital Projects and management practices. The program endeavors to develop strategies that help customers become more easily involved with energy efficiency opportunities as they pursue other objectives, such as capacity building, or cost reduction initiatives focused on material waste reduction.

The program's customer strategy involves a balanced approach relying on both technical and business assessments of customers' needs and abilities. The program's management team explained this concept to the evaluation team as "targeting the right program offering, to the right customer, at the right time." This concept emphasizes the interplay of PDCs' ability to read both customers' technical savings opportunities and customers' willingness and capacity to participate in program components.

The program deploys two separate strategies for increasing customers' involvement with program offerings: 1) targeting customers with program components consistent with their business and operational contexts (which we subsequently term a "customer-focused sales approach"); and 2) broadening customers' views of their business and operational concerns to more deeply include energy efficiency. Program staff and PDCs believe the first strategy of targeting shapes effective sales tactics, as illustrated by the above quotation. The program attempts to achieve the second strategy through SEM offerings and specific outreach activities designed to emphasize improved energy management.

The following section describes the tactics employed by the program and its partners, which are designed to improve customers' involvement with program offerings.

Customer-Focused Sales Approach

The program's sales function relies on a strategy of targeting customers with program components consistent with their business and operational contexts. The program is working with PDCs to develop sales approaches around this strategy; these PDC activities include performing program outreach, assessing customers' ability to commit to projects, and identifying customers' saving opportunities.

The program's staff described to us the sales approach they would like PDCs to employ when engaging with customers: 1) Work with customers to understand their corporate culture – the approaches companies use to manage their processes, establish and review goals, make decisions toward capital investments and energy management; 2) Determine which departments have authority to make decisions with regard to energy use and energy using processes; 3) Identify

customer staff members who can 'champion' or initiate energy projects in the company; 4) Determine customers' resource capacity for energy efficiency projects; 5) Identify program components aligned with the parameters of customers' corporate culture, departmental authority, energy champions' willingness to promote projects, and resource capacity; and 6) Execute scoping study activities consistent with the above-identified program components.

Some program contacts are concerned that some PDCs' approaches may rely heavily on technical approaches; and these tactics may invert the above sales approach by beginning with scoping studies, which may lead to development of projects outside of customers' business and operational parameters. The program's management explained that a PDC's failures to read key customer parameters might increase the likelihood that its projects become stalled or cancelled. In one example, program staff described to us how a Corporate IEI project was being implemented with a customers' environmental department. During this SEM implementation, it was determined that this environmental department did not have authority over key production processes and capital investment. The project stalled and was nearly cancelled, but was resuscitated when the program interceded and gained the support of a key corporate contact who was able to have the SEM training reinitiated with the company's production department.

Program staff understand the importance of PDC effectiveness in selling the program's evolving suite of program offerings and the program actively works with PDC firms to improve their sales approaches. The program holds quarterly PDC meetings with all the PDC firms to discuss program components and related sales approaches; and the ITSP manager holds monthly meetings with PDC firms to review project statuses and affirm effective sales approaches.

In order to support the program's development of PDCs' sales approaches, we interviewed PDC firms concerning their promotion tactics with their customers. Specifically, our interview concerned the variation in strategies PDCs used "for encouraging different types of customers to participate in the program." We held interviews with a representative from each of the four regionally assigned PDC firms and discussed general approaches. Additional interviews with a sample of project engineers and outreach specialists from each firm may be warranted to fully describe the tactical decisions made by these field operators during their engagements with customers.

We found most PDCs relied on a behavioral schema for differentiating customers, as compared to a context-dependent understanding of customers. Most PDCs described customers' future project motivations in terms of their prior program project volumes. Generally, PDCs characterized three types of customers: customers who have had a high volume of energy projects, those completing a moderate amount of projects, and those completing few to no projects. The PDCs rely on this behavioral schema when they strategize how to reengage customers with the program. PDCs reported helping initiate program activity with companies of medium to low historic project volumes by building trust with those companies through face-to-face meetings, and encouraging smaller projects in the hopes that these projects would lead these customers to perform more projects in the future. One PDC describe his customer engagement practices saying, *"One strategy [to encourage customers' program participation] is to gain their*

trust. We try to build on success. If customer does not know how the program works we try to engage them on a smaller low risk project first."

PDCs operate in a tactical sales capacity whereby they often view customers' commitment to projects as *trust* – in the PDCs, as well as the program. For PDCs, the level of trust customers have in them is foundational to their customer engagement processes. Therefore, PDCs often assume that completing projects with customers leads to increased customers' trust in PDCs, which helps customers to commit to more projects.

However, one PDC firm in particular underscored its commitment to the program's context-based sales approach. The PDC contact quoted above, who described the importance of initiating smaller projects, went on to state that *"we are tasked with taking the wide variety of the program's offerings to the market. There have been more program components in the last two years. We listen to what our customers' needs are and map their needs to the program's offerings."* This particular firm relies heavily on their outreach specialists to initially work with customers and appraise customers' organizational and resource 'readiness' to participate in projects. Their outreach specialists involve project engineers when the specialists determine that customers are ready to participate in various program components.

The remaining PDC firms were more likely to rely on customers' historic program activities when strategizing how to engage customers with the program. One PDC firm explained, of the customers with higher historic project volumes, *"these are 'go-getters;' customers who if you forget to call them in a couple of months, they call you. We like to keep them up to date with the latest program offerings, bonuses, and send them all of the program's marketing collateral and case studies."* For customers with comparatively less historic program activity, this PDC firm moderates its level of activity out of concern that these customers will become fatigued by too much program contact, or confused about the relationship between the PDC's firm and Energy Trust. He reported sending relatively less program marketing material to these customers and involving Energy Trust in cases where he felt the customer was confused about the relationship between Energy Trust and the PDC's firm.

One PDC contact described how new program offerings provide the team with an opportunity to pique customers' interest in meeting again after a hiatus. The contact explained, *"When the program comes out with new offerings, bonuses, or marketing collateral we inform the territory of these updates. We go meet with customers we have not seen in a while and make sure to drop off new case studies and collateral."*

Broadening and Deepening Customers' Focus on Energy Efficiency

The program implements two strategies to improve customers' energy focus: 1) outreach activities designed to enhance customers' energy efficiency commitment; and 2) SEM program components designed to integrate energy management across customers' business and operations departments.

Included in its outreach strategy, the program produces a quarterly newsletter called *The Champion*,[20] which highlights successful program supported projects, covers key energy initiatives and legislation affecting SI and agriculture customers, and promotes program components and events. The program's support[21] for the Oregon Leaders Award[22] represents an additional outreach strategy. The award honors Oregon-based industrial firms for their initiatives and progress toward energy efficiency; additionally, honorees are recognized by the Governor's Office. These outreach initiatives, and customers' participation in SEM projects, helps to increase corporate level interest and involvement in energy efficiency. Corporate involvement in energy efficiency, in turn, may improve facility involvement in energy efficiency; and PDCs often begin customer engagement at the facility level.

PDC OPPORTUNITY DEVELOPMENT FUNCTIONS AND ACTIVITIES

PDC firms developed sales channels through their internal staffing and coordination with existing market resources, which include working with trade allies and utilities.

Build Qualified Team

The program's sales strategy of aligning program components with customers' business and operational contexts has caused some PDC firms to evolve the roles of their staffing resources. The program staff suggested some PDC firms' staffing relied on a heavy technical orientation from staffing comprised almost entirely of project engineers. The program suggested some firms should include outreach roles in their staffing to help PDC firms become more sensitive to customers' business contexts.

PDCs gave estimates for the staffing resources they allocate to the program; Table 5 summarizes PDCs firms' FTE (full-time employee) estimates. The lighting PDC's FTE estimates are not included here because that PDC works across Energy Trust's commercial and industrial programs.

20 http://energytrust.org/news/the-champion/

21 The Oregon Leadership Award is provided through a partnership between the Oregon Department of Energy, the Northwest Energy Efficiency Alliance, the Bonneville Power Authority, and Energy Trust.

22 http://www.oregonindustrialeeleaders.org/

Table 5: PDC Firms' FTE Estimates by Role; Excludes Lighting PDC

PROJECT ENGINEER	PDC MANAGER	OUTREACH SPECIALIST	DATA SPECIALIST	PROJECT ANALYST	TOTAL FTE
8		2	1		11
4	1	1			6
6					6
2.5					2.5
2		1	1	1	5
22.5	1	4	2	1	30.5
74%	3%	13%	7%	3%	100%

Project engineers perform a majority of project work, including scoping studies, coordinating ATAC and ITSP activities, and reviewing technical reports. PDC managers help to prioritize and coordinate project activities and review the quality of their firms' activities. Outreach specialists initially engage with customers and involve project engineers when the opportunities under discussion require more technical development. Data specialists manage PDC firms' reporting responsibilities to the program and support customers' completion of program forms. Project analysts review project savings estimates and review projects submitted by trade allies for completeness.

Of the total 30.5 FTE allocated by PDC firms to the program, 22.5 FTE, or 74%, are project engineer staff; 4 FTE, or 13%, are outreach specialists; and an additional 4 FTE, or 13%, are administrative and support staff from PDC managers, data specialists, and project analysts.

Enlist, Train, and Motivate Trade Allies

The program leverages existing marketplace activity by delivering program components through trade allies; trade allies are equipment vendors and installers, and equipment service outlets, who promote program incented equipment and services to their customers. PDCs manage the three trade-ally driven program tracks SI and agriculture, lighting, and Green Motor Rewind by recruiting trade allies and training them how to offer program incentives to their customers.

A description of the recruitment for each program track follows.

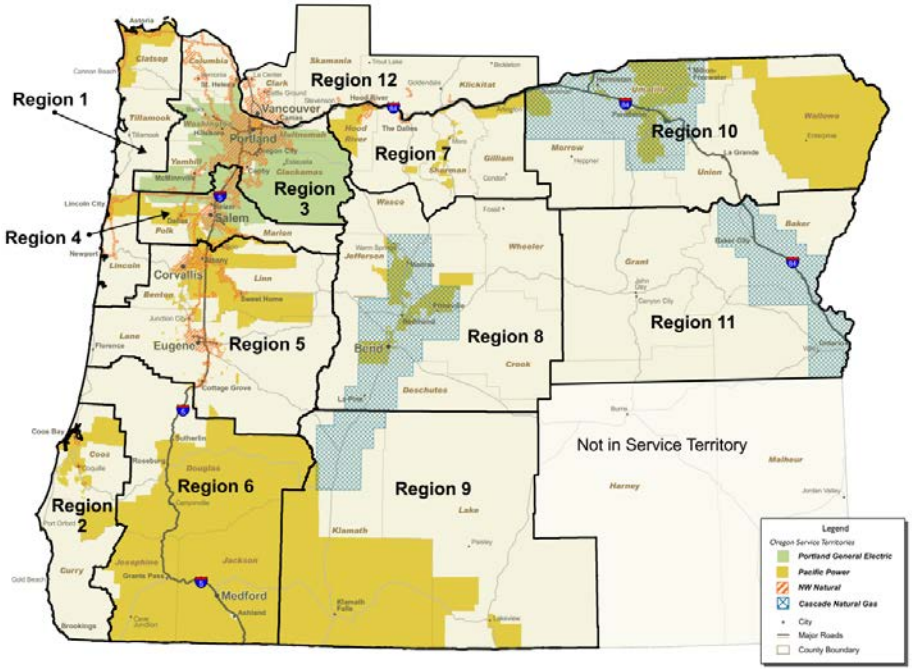
Small Industrial (SI) and Agriculture

The SI and Agriculture PDC recruits trade allies across 11 regions within Oregon, as identified in the map (Figure 3). The PDC targets and recruits vendors associated with measures that are cost effective from a program perspective.

Participating trade allies may choose to be an official Energy Trust trade ally; official trade allies are listed on Energy Trust's website, may use Energy Trust's logo on their marketing collateral,

and are eligible for shared marketing funds, which may help to cover up to 50% of their marketing costs. The SI and Agriculture track has 21 active trade ally firms that each completed five or more projects since 2011; 12 of these trade allies are official Energy Trust trade allies.

Figure 4: Small Industrial and Agriculture Ally Service Region Map



Lighting

The lighting PDC recruits lighting and electrical contractor firms through the Northwest Trade Ally Network. The lighting program track enlisted 228 trade ally firms to offer services in Energy Trust's service territory. These trade allies often work across Energy Trust's commercial and PE programs; and some of these trade allies may work with industrial firms.

Green Motor Rewind

Motor service centers are recruited by the GMPG to offer program incentivized motor rewind services. GMPG trains and certifies service centers to accepted industry standards of motor rewind practices. GMPG has recruited nine motor service centers within range of Energy Trust's service territory.

Work with Utility Account Managers

PDCs described the importance of working with utility account representatives when initially engaging with customers. Utilities often have relationships with their large industrial customers through utility account managers, who also promote energy efficiency with these customers.

PDCs explained that utility account representatives often help PDCs secure initial site visits with customers, and these representatives are often included in these visits.

PROGRAM STAFF OPPORTUNITY DEVELOPMENT FUNCTIONS AND ACTIVITIES

The program performs a largely administrative and strategic role in the development of the sales channel. In this administrative capacity, the program defined a PDC sales role, which it staffed through contracted engineering firms, and contributed to the program's marketing infrastructure.

Develop Program Roles

The program developed roles to assign clear responsibility for functions between program staff and PDCs. The evaluation team interviewed program staff and PDCs to understand how adequately they understood the distinction between their roles at a program level, as opposed to project level roles.

We found that roles were clearly distinct, and communication between PDCs and the program are well understood. The program established the PDC roles as a key account manager function, with PDCs acting as the primary point-of-customer contact for the program. The PDCs are to develop relationships with larger industrial customers and provide program information and resources on behalf of the program; and work with smaller customers through trade allies. In interviews with the evaluation team, all of the PDCs reported a full commitment to the role of the primary point of contact. Some of the PDCs explained their firms are 'the face of the program' to the customers they work with. One PDC elaborated on this point, explaining that PDCs bring customers into the program based on their customers' familiarity with the PDC's firm, and the PDCs answer customers' questions and help them deal with their issues concerning the program, and present their customers with project incentives in the form of a (typically large) check.

Education on Program Components

The program develops and implements pilot components to take advantage of newly identified opportunities. However, program staffs are concerned with the ability of PDCs to scale their scoping study activities to the range of program components in which customers will likely participate. To facilitate PDCs' understanding of new components, the program educates PDCs about these offerings during quarterly, day-long meetings attended by all of the PDCs. In these meetings, the Program Manager reviews progress toward goals, introduces new program components, changes to the program, reviews existing program components, and discusses ways to think about promoting these program components to customers.

To understand how well PDCs understand the program's components, the evaluation team asked the PDCs if they had any challenges identifying opportunities for any components during scoping studies or offering any components to customers. Three PDCs mentioned challenges,

such as explaining program components to customers or new PDC employees. Topics mentioned include:

- Challenges explaining to customers the mix of program components by implementation method, and whether or not an ATAC, SI, or lighting trade ally should be involved
- Difficulty training new PDC staff how to promote the variety of program components
- Some PDC confusions about which program track (Capital Projects or O&M) measures are incented under

Additionally, the evaluation team interviewed ITSPs to determine how effectively PDCs promote their program components. All but one ITSP stated that the PDCs adequately promote their program components. One ITSP indicated that PDCs tend to have a strong electrical background, but often do not understand gas-powered boilers targeted by the boiler tune-up offering. He explained that some PDCs identified gas savings opportunities in their scoping studies, which triggered the program to solicit a proposal from him to implement tune-up projects from these scoping studies. When arriving at these customers' facilities, he quickly assessed the boilers and determined these much older boilers had no controls for him to tune, which meant there were no tune-up savings opportunities.

In general, PDCs are pleased with the variety of program components. Some PDCs explained that the variety of program components helps them to reengage customers with the program or tailor their approach with customers.

Oversee PDC Activities

The program developed key processes to help oversee PDCs' activities, these include:

- Include savings goals in each PDC's program contract. Documented goals help to frame PDCs' activities and provide the basis for the program to measure PDC progress.
- Review monthly PDC project status reports, and meet with PDC firms individually on a monthly basis. PDCs submit project status updates monthly to the program; these reports provide additional clarification about recent and projected project activities for active projects. The ITSP manager reviews these reports and meets with each PDC firm concerning their overall performance. These meetings help the program to affirm positive activities on the PDCs' part and encourage additional activities when necessary.

Program Marketing

We interviewed the program's Senior Marketing Manager to understand the way the program is marketed. The program's marketing is primarily a sales-based strategy, focusing on ways to support PDCs' and trade allies' promotion of program components. The program designs brochures that are either hand delivered by PDCs or trade allies to customers, or the program

mails brochures to targeted customers. Additionally, the Senior Marketing Manager coordinates marketing collateral development with utilities where program components overlap with utility initiatives. Typically, marketing collateral focuses on testimonials from participants and are designed to help assure customers of the effectiveness of program offerings. The program also offers cooperative marketing funds to trade allies, compensating trade allies for up to 50% of their costs for marketing collateral, which includes Energy Trust's logo.

We learned from interviews with PDCs and trade allies that they find the marketing collateral to be very effective in their promotion of the program. Testimonials in new marketing collateral support PDCs in engaging in more program promotion; they provide new stories for the PDCs to take to customers having little program involvement.

The program involves the Sr. Marketing Manager in a timely manner for the launch of new program components and pilot components. Marketing collateral with embedded testimonials improves PDCs' ability to promote new components and enroll participants. According to the Sr. Marketing Manager, the program is timely in its notification of new program components and the need for associated marketing collateral during the initial phases of program component development.

Direct Customer and Project Leads to PDCs

The program developed a Project Coordinator position to help route to PDCs industrial and agriculture customers who initiate contact with the program through the program's website or become involved with Energy Trust through its commercial program. Occasionally, it is difficult for program partners to assign customers to the correct program (PE or commercial); program coordinators from both the commercial and industrial programs work together to help reassign as needed customers to the correct program contacts.

We interviewed the PE's project coordinator to understand how effectively the process for reassigning customers to the PE program is working. We learned that the PE and commercial program coordinators initiated additional training designed to help the commercial program partners more accurately assign customers to the program. The Project Coordinator reported that this helped to reduce the frequency by which industrial and agriculture customers are assigned to the commercial program, and this event is now "very rare." Additionally, the Project Coordinator reported the two programs' coordinators are effective at reassigning customers to the correct program.

4 SUPPORTING CAPITAL PROJECT IMPLEMENTATION

Program supported projects often require coordinated contributions from several different program partners in conjunction with customers' implementation work; and coordination of project tasks and responsibilities affect overall project outcomes. This chapter describes, for custom projects, how project hand-off processes work between program partners, summarizes the way program partners work with customers around project implementation, and explores the extent to which program processes and resources support project implementation activities. An additional focus of this chapter concerns program partners' perception for the cause of stalled and canceled projects and ideas for reducing these occurrences.

The program's Capital Projects track is relatively more mature and detailed, as compared to other program tracks. We collected data for this chapter through interviews and surveys with program staff, PDCs, and ATACs concerning the routines and processes they engage in around project implementation. These program partners explained the stages projects go through, the way they interact with customers and other program partners at each stage, and challenges they observe at various project stages.

We mapped the process detailed by PDCs and ATACs where these program partners deal with similar program processes. These process maps reflect the uniformity and variation in project implementation tactics enacted by program partners and may help the program affirm effective processes and revise processes leading to project challenges. Each process map is informed by contacts from the same program role and do not integrate perspectives across multiple roles; integrated process maps are resource-intensive processes requiring much iteration between the evaluation team and program partners in order to clarify agreement and divergence on specific process items.

In addition, we reviewed project data in order to document the causes for project cancellation and summarized prior market research, commissioned by Energy Trust, in order to describe customers' experiences with the program.

KEY CAPITAL PROJECT STAGES AND ACTIVITIES

Figure 4 (at the end of this subsection) documents the Capital Projects work flow. The figure demonstrates the four key Capital Project stages: 1) a triggering event initiating project activity, 2) a review of customer's program eligibility, 3) a scoping study, and 4) (potentially) a performance of a technical analysis study (TAS). There is one of two potential outcomes from this project flow: the program offers an incentive letter to the customer through the PDC, or the program does not offer incentives for the proposed project.

The following passages provide more detail on the Key Capital Project stages and activities:

1. **Project Triggering Events:** A number of events that set program activities in motion and initiate a project. Opportunities for projects are identified by vendors performing work at a customer facility, customers discovering energy savings potential during their equipment planning and upgrade activities, or by PDCs during their work with customers.

2. **Confirmation of Customers' Program Eligibility:** Once a customer indicates its interest in developing its energy savings opportunities into a project, the PDC contacts the program to confirm the facility's eligibility for program incentives. Customers complete and file a 400R document with the program, which allows the program to view those customers' utility information. The program keeps these forms on file; customers need complete the forms only once per facility regardless of the number of projects the facility completes.

3. **Scoping Study:** The PDC documents processes and facility characteristics associated with the energy opportunity. A scoping study is often a summary review of site characteristics; however, one PDC firm performs data logging during the scoping study in order help the customer get a better sense of rough savings estimates. The PDC inputs all of its scoping studies into a Microsoft ™ Excel ™ workbook, and each facility has its own workbook that aggregates all of the studies and activities the program has performed with each facility.

4. **Technical Analysis Study (TAS):** The studies are conditional on the outcomes of prior steps and follow the Technical Manager review of facility workbooks to determine if a TAS is needed. The Technical Manager issues a Request for Proposal (RFP) to qualified ATACs to perform a TAS and help to estimate savings from potential projects. The program reports that these studies are not required for roughly 30% of proposed projects because enough prior program work exists or the measure is simple enough to effectively estimate project costs and savings potential without a detailed study.. The TAS has key sub-processes, including:

    a. **405F Funding Agreement:** Customers' are required to sign this agreement when the program estimates TAS costs to exceed $5,000; even so, the program covers all of the costs for the TAS. The 405F Funding Agreement is a non-binding agreement between the program and the customer clarifying that the customer is pursuing the project in good faith and intends to complete a project involving energy efficiency.

    b. **Program Issues RFP for a TAS to be Performed:** The program issues an RFP to qualified ATACs to perform a TAS. The RFPs are informed by scoping studies and facility information contained in facility workbooks.

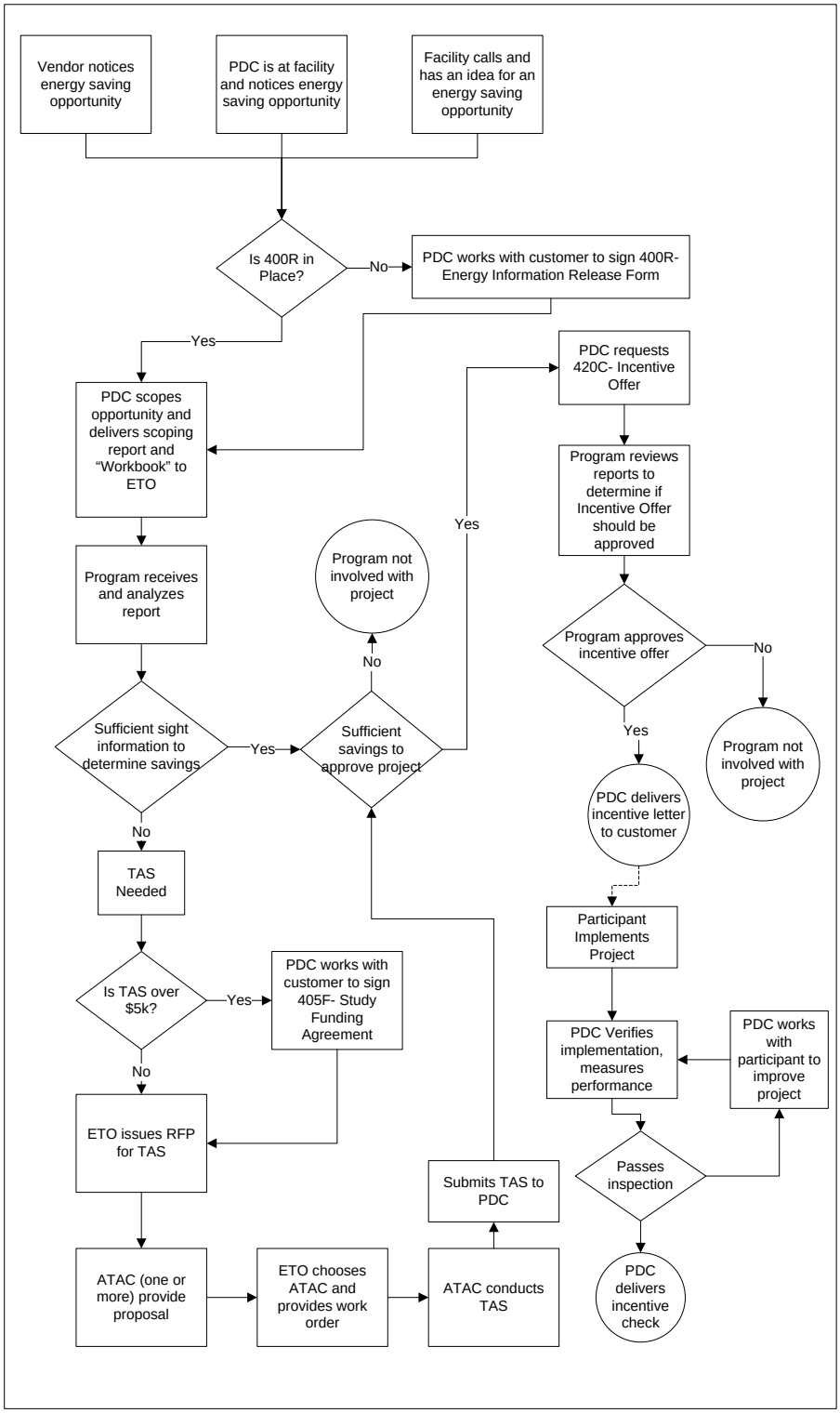
    c. **Work Order Issued to ATACs:** The program issues a work order to the ATAC it selects. The work order includes the scope of work for the ATAC.

d. **ATAC Performs TAS and Writes Report:** The ATAC performs the technical study and writes a report that includes proposed project savings estimates. The PDC reviews the TAS and submits it to the program.

5. **Program Offers Incentive Letter:** Based on the information gathered in the above activities, the program determines whether to commit program incentives and resources to the project. This decision is based upon the PDC's and Technical Manager's estimation of project cost effectiveness and the program's ability to commit incentives and resources to the project. In cases where projects are determined to be cost effective and the customer has expressed willingness to proceed with the project, the PDC issues a 420C incentive request form to the program requesting that the program consider issuing incentives for the project. In the cases where the program commits to a project, it issues an incentive letter to the customer through the PDC. The PDC requests the customer sign the letter and return it to the program. The participant receives incentives once they have completed project implementation.

6. **Verification of costs and savings, determination of final incentive**: PDC verify that relevant equipment was installed, and supports efforts to estimate energy savings from the project. If project savings are significantly below estimates for the project, the PDC informs the customer about issues which may impact project saving, and works with the participant and their contractors / vendors until the issues are resolved. The PDC issues an incentive check to participants when all issues with the project have been resolved.

Figure 5: Program Recognized Capital Projects Process Flow



ATACS' INVOLVEMENT WITH TECHNICAL ANALYSIS STUDIES

The program contracts ATACs to perform detailed TASs to qualify and quantify energy efficiency projects as identified by PDC scoping studies. These studies provide important information to customers, and the program requires detail from the TASs to help it decide whether to approve funds for custom Capital Projects. The TAS supports project level decisions by describing potential project technical feasibility and the customer's return on investment. Our goals for this section are to describe ATACs': 1) experiences with program processes; 2) activities with PDCs and customers; and 3) suggestions to improve the program.

We conducted interviews with eight of the program's 19 ATACs; interviews were typically one hour in duration. Two of the ATAC firms also operate as PDCs for the program; for the purpose of these interviews, we requested that they answer our questions from an exclusively ATAC perspective. Our interview questions concerned ATAC's perspective on their roles and responsibilities, their experiences working with PDCs and customers, and their ideas for improving program processes and resources.

The ATACs we interviewed study the following measures on projects they work on: compressed air equipment, pumps, fans, HVAC, and dryers/boilers/furnaces. These firms operate in the following industries: food/refrigeration/cold storage, pulp and paper, wastewater treatment, high technology, metal casting, wood products, and steel manufacturing.

All but one of the firms employ five or fewer staff dedicated to work on ATAC responsibilities for the program; one firm has more than five employees in this capacity. Four of the firms have been working with the program for three to four years, and four for more than five years.

ATACs explained their program activities in three areas:

1. Project proposal activities,
2. Customer involvement and site activities, and
3. Report activities.

Figure 5 (at the end of this ATAC section) summarizes ATACs' activities from their perspectives, and includes routines that ATACs commonly engage in when securing work from the program and delivering their work product and services. We explore each of these areas below, and include additional summaries of ATAC's perspectives on process strength and challenges and ideas for improvement.

Project Proposal Activities

As indicated in the Capital Projects work flow (Figure 4, above), ATACs become involved in the process when they receive an RFP from the program to perform a TAS. This triggers the project proposal process described in Figure 5, where ATACs who desire the project work engage in the following steps during this TAS sub-phase:

1. The ATAC firm begins by evaluating the RFP and scoping report for project details they can use to draft their proposals for the project.
2. Some ATACs reported taking the following steps to deal with what they perceive as a lack of detail in the RFPs and scoping reports:
    a. Contacting the program or PDC for additional site and project detail.
    b. Adding additional 'contingency' budget to their proposal to help deal with risks posed by unknown technical challenges or poorly described project scope details.
3. ATACs submit their proposal to the program and wait for a contract from the program to perform their TAS work.

Improvements Observed and Challenges Remaining: Project Proposal Processes

Many ATACs explained that the proposal process has been improving over the past five years. Most of this improvement has come from increased details in scoping studies, which are included along with the RFPs the ATACs receive. The scoping studies give ATACs additional technical information they use when developing their TAS proposals. One ATAC also cited the helpfulness of data logging information included in some of the scoping reports they received.

Some ATACS expressed concerns that the RFP makes assumptions about project scope, which may not be warranted, and some scoping studies could include more details. ATACs also suggested that these assumptions about customers' projects restrict the routes ATACs can study during their site visits. One ATAC explained that PDCs are "too prescriptive" in their scoping studies, and are developing and defining the project in advance of the TAS; this ATAC would prefer more site details and less project development in the scoping studies. Additionally, one ATAC explained that some scoping studies identified savings opportunities the ATAC could not verify.

Suggestions ATACs Offered: Project Proposal Processes

ATACs made suggestions on process improvement that would address the issues of risks posed by limited site details and project development assumptions, and allow them to develop studies around site savings opportunities they observe. Suggestions included:

- ➡ Pre-proposal phone conference between ATACs included in the RFP, the program, and the managing PDC; ATACs would be able to ask questions regarding the project and the scoping document and, the PDC would follow up to address questions it is unable to answer in the conference.
- ➡ Increase scoping report thoroughness by providing funding to PDCs to perform data logging, and describe site operations.

- Provide contingency TAS funds that ATACs could use at the program's discretion to cover study work on additional opportunities ATAC's discover that are not indicated by the scoping report or RFP.

Customer Involvement / Site Activities

ATACs reported that PDCs greatly shape the way customers are involved in their studies and the speed by which they can complete their site work. PDCs control the relationships with customers and manage the level of involvement ATACs have with customers.

Figure 5 describes the steps involved in the customer involvement / site work phase of ATACs' TAS work. This phase begins once the program issues a contract to the ATAC. ATACs reported that PDCs typically hold a kick-off meeting with customers to discuss project scope and occasionally invite ATACs to participate.

During the next step in this phase, ATACs perform their on-site study activities, which include working with plant and operations managers in order to document operational parameters affecting energy use, discussing project scope and aggregate energy rate information; contacting vendors to understand technical performance of measures; and installing data logging devices to record energy use information.

Suggestions ATACs Offered: Customer Involvement and Site Activities

Most ATACs suggested process improvements designed to maximize the amount of project savings ATACs can analyze within their budgets by clarifying TAS scope with customers at the outset of their work and developing funding mechanisms that allow ATACs to expand TAS scope for newly identified opportunities. Specifically, ATACs suggestions included:

- **Include ATACs in PDC meetings with customers to initiate the TAS phase** to ensure a common understanding of TAS scope and prevent the customer from generating unrealistic expectations about TAS scope. One ATAC noted that their TAS contracts have slim budgets, and misunderstandings at the outset waste time and budget.
- **On TAS projects for which specific equipment is targeted, PDCs could work with customers to gather quotes from vendors** in support of the ATACs cost projection work; customers can secure quotes more readily than ATACs because they have existing relationships with vendors.
- **ATACs would benefit from knowing customers' rate structures.**
- **Amend project scope and budget when ATACs discover additional site savings opportunities.** Four ATACs reported routinely discovering additional savings opportunities; one of these reported being able to work with the program through the managing PDC to have TAS scope and budget expanded to deal with additional

opportunities. ATACs explained that without additional budget, they do not investigate additional savings opportunities.

Report Activities

ATACs interact more heavily with PDCs during the report work phase. Figure 5 reviews the steps involved in this phase of TAS work. ATACs initial step is to review their data for completeness and contact the PDC or customer if additional information is required; data often include customer's energy rates, operations parameters, and data logging information. ATACs then analyze their data, draft a report, and submit their report to the managing PDC for review of its quality. The PDC returns the report to the ATAC if they determine the report requires additional work; otherwise, the PDC forwards the report to the program's Technical Manager. The Technical Manager may accept the TAS report or return it to the PDC for rework; in which case, the PDC returns the report to the ATAC for rework. This TAS quality assurance process continues until both the PDC and Technical Manager are satisfied with the report. After the Technical Manager accepts the report, he instructs the ATAC to invoice the program.

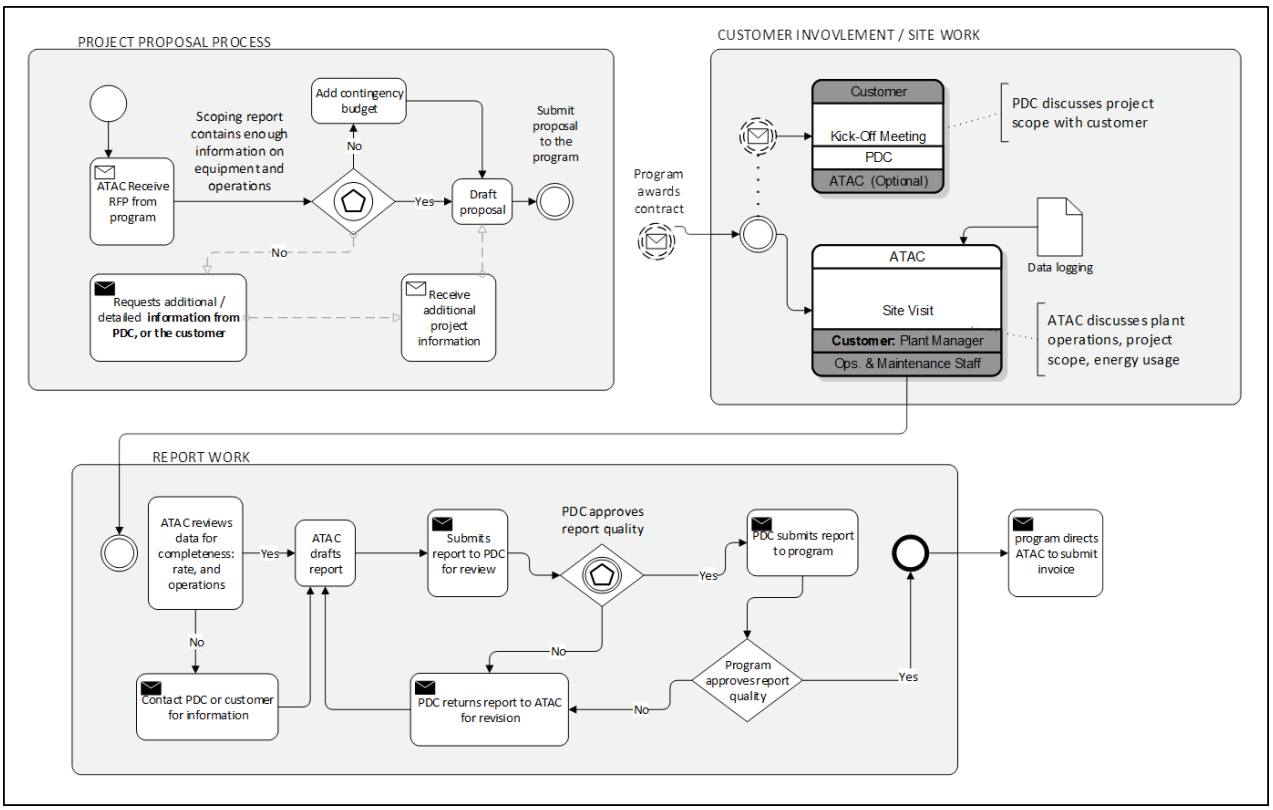
Suggestions ATACs Offered: Report Activities

Generally, ATACs are satisfied with study acceptance procedures and the program's invoicing process. However, ATACs are concerned with situations where their reports require multiple revisions and would like more feedback from the program regarding their TAS work. The ATACs offered the following suggestions to deal with these challenges:

- **Increased PDC involvement with the TAS draft** may help to reduce the number of revisions. A few ATACs indicated their interest in having managing PDCs review their drafts at different stages of completion to help ensure reports are conforming to PDCs' expectations. Such involvement could improve the timeliness of the final TAS and reduce ATAC cost overruns.

- **Feedback from the program regarding customers' use of TAS recommendations**. ATACs are interested to learn how their TAS reports are used, but feel they do not receive this kind of feedback. They would like to hear from the program on the quality of their studies, the outcome of the projects implementing TAS recommendations, and information concerning the accuracy of their TAS estimates compared with operational data.

Figure 6: ATACs' Business Process Map for Bidding on and Completing Technical Analysis Study Projects



PDCS' EXPERIENCES WITH CAPITAL PROJECTS

The evaluation team interviewed PDCs concerning their experiences working on custom Capital Projects and coordinating studies with ATACs for these projects. For the most part, PDCs mentioned positive experiences with Capital Project processes and coordination for studies with ATACs.

PDCs' Challenges with Custom Projects

PDCs shared their concerns and challenges in working with custom projects. Each topic was expressed by only one PDC, possibly indicating broad variation in experience between PDCs. Challenges PDCs have with customer projects included:

- Time lost to administrative tracking activities associated with participants' workbooks. PDCs email these workbooks back and forth with the program, which requires additional time to manage the version control of these workbooks. The PDC suggested the program use a SharePoint ™ site to collaborate on these workbooks rather than emailing them.

- Challenges verifying customers' labor costs on O&M projects because PDC was unsure exactly what types of labor hours are covered by the program. The PDC suggested the program develop a manual describing the labor activities covered by the program's O&M incentives.

PDCs' Challenges with ATACs

PDCs discussed their challenges with coordinating TASs with ATACs. Three of four PDCs mentioned a concern that PDCs lack a mechanism to help ATACs finish their studies on time. They explained that PDCs are generally held accountable by the program when custom projects are delayed, but there is no contractual mechanism to motivate ATACs to complete their studies on time. One PDC also voiced a concern that customers who guard their industrial and process secrets will be concerned with new ATACs having access to their facilities. Another PDC mentioned the need to occasionally check on ATAC studies to help ensure their studies follow the scope set out in the ATAC's proposal so as to "ensure they do not go on tangents."

ANALYSIS OF CANCELLED CUSTOM PROJECTS

The evaluation team analyzed custom project data from projects cancelled from 2010 to 2012. We intend this analysis to give a general understanding of the reason why projects are cancelled and the state of project development at which cancellation occurs. Insights from this analysis may help the program refocus PDC activities to reduce the occurrence of cancelled projects. In addition, the program may use the schema presenting here for coding the causes of cancelled projects in its tracking system. Monitoring the causes of canceled projects will help the program to develop strategies to reduce their proportion.[23]

The project data we received from Energy Trust contains information concerning the last phase of development projects completed prior to cancellation, and reasons for project cancellation indicated by PDCs. Projects move through the following phases of development:

1. Request for Proposal (RFP) – The initial step in a project occurs when the program's Technical Manager issues an RFP to ATACs to perform a TAS. Projects cancelled at this stage had an RFP issued and were cancelled before studies were performed.
2. Technical Analysis Study (TAS) – Projects cancelled at this stage have had a TAS performed by an ATAC.
3. Offer – Following the completion of a TAS and a decision by the program to move forward, the program submit an offer letter to customers declaring the program's commitment to pay participants for savings after completing the specified project.

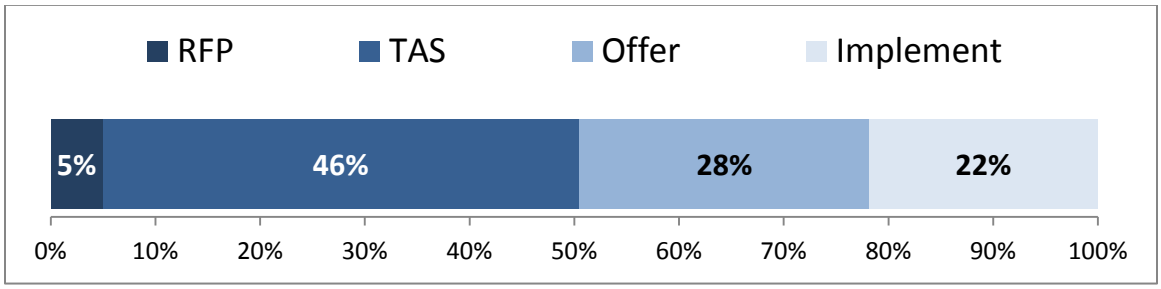
[23] For this analysis, we had anticipated interviewing PDCs to explore reasons for project cancellation. On learning that the tracking system provided a reason for 70% of the cases, we decided not to conduct interviews. We instead analyze the tracking data here and provide a recommendation to further improve the tracking of project cancellation reasons.

Customers are to sign and return these offer letters to the program. Projects cancelled at this stage had an offer letter issued but not returned.

4. Implementation – Projects enter the implementation phase after customers sign and return their offer letters to the program. Projects cancelled at this phase indicate customers have returned their offer letters. Customers may *or may not* have begun project implementation.

We analyzed 87 cancelled projects; Figure 6 summarizes the proportion of cancelled projects by the projects' last phase of development. Nearly half (46%) of all projects were cancelled subsequent to a TAS. For every project cancelled at the TAS phase, there is slightly more than one project cancelled at either the offer or implement phases. Customer cancelation after receiving an offer letter helps the program reduce its exposure to risk, which would occur if the program added these projects to its active projects in the project pipeline.

Figure 7: Proportion of Total Cancelled Custom Projects by Project Development Phase (n=87)



The evaluation team coded reasons for project cancellation from the project notes supplied by PDCs (see Table 6). We organize codes into two primary domains: *business* – business level decisions responsible for project cancelation, and *project* – project cancelation for technical reasons, typically concerning production processes and equipment.

Figure 7 depicts the proportion of project cancellations by project development phase and coded reasons for project cancelation. We color-coordinated the bar chart units coordinated to code domains. Cooler colors – blues and greens –represent projects cancelled for business reasons; warmer colors – reds, yellows, oranges, and violet – represent projects cancelled for project reasons. We include 63 projects in this analysis, omitting the 24 projects whose notation fields lacked descriptions.

Table 6: Coding of PDC-Reported Causes of Project Cancelation

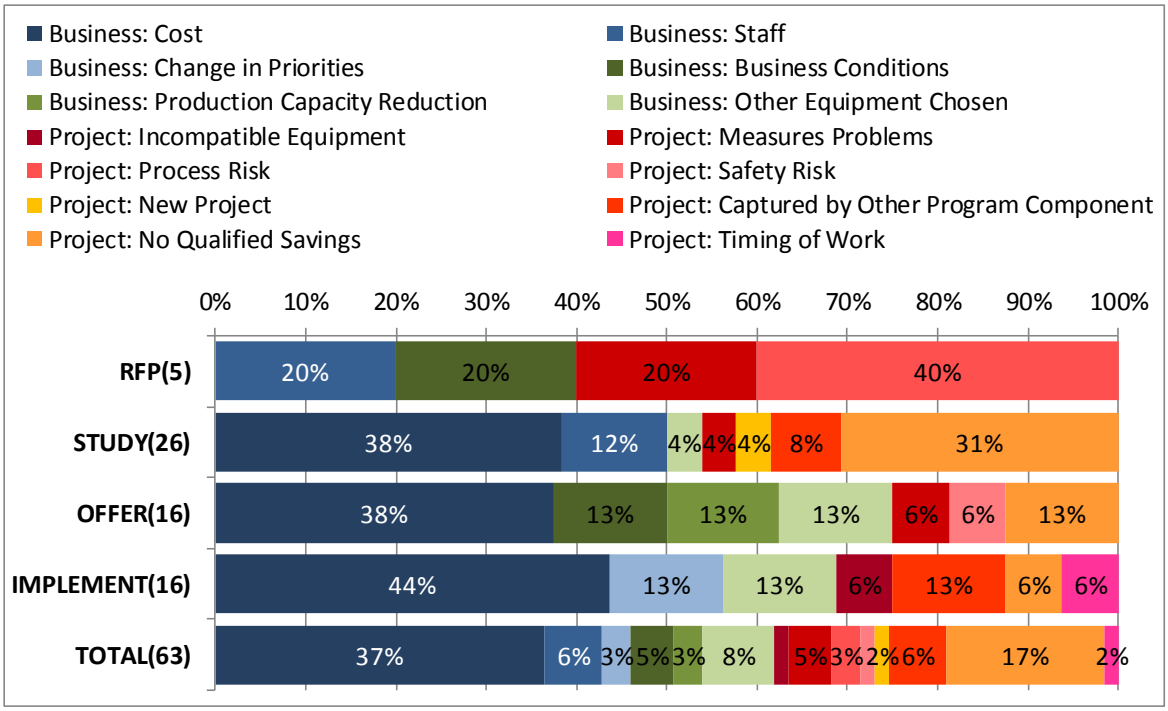
DOMAIN	CATEGORY	CODE	DEFINITION
Business	Economy	Business Conditions	Economic conditions, business health, etc.
		Production Capacity Reduction	Company shutting down plants or lines
	Equipment	Other Equipment Chosen	Company chose less efficient equipment
	Resources	Change in Priorities	Company decided to focus on other activities
		Cost	Inadequate capital allocations or concern over project payback
		Staff	Company did not allocate staff
Project	Equipment	Incompatible Equipment	Chosen equipment was incompatible
		Measures Problem	Chosen equipment does not work as advertised
		Process Risk	Concerns chosen equipment will cause risk to production
		Safety Risk	Concerns chosen equipment will cause safety risk
	New Project	New Project	Project being reformed as a new PE project
	Not eligible	Captured by Other Program Component	Participating in IEI
		No Qualified Savings	No potential cost-effective savings found
	Timing	Timing of Work	Poor timing of project
Unknown	No Detail	Not Enough Data	Unable to assess

The graph illustrates that as projects progress they are at a greater risk of being cancelled for business reasons. Forty percent of projects at the RFP phase, and 54% at the TAS phase, are cancelled for business reasons, compared with 75% and 69% at the offer and implementation stages, respectively. Overall, greater than 60% of projects are cancelled for business reasons. [24]

Customers' cost concerns (capital allocations and/ or concern over project payback) constitute the primary reason for project cancellation. The second most common cause of project cancelation (17%) is the program finding of a lack of program qualified savings. As one might anticipate, most of these cancelations occur after the TAS; 31% of TAS-phase projects cancelled due to lack of qualified savings.

[24] Note that the available project documentation indicates "no qualified savings" as the reason for cancellation of some projects in the Offer and Implementation phases. We did not anticipate this finding and suggest that the program may want to explore further the reasons for the cancellation of these projects.

Figure 8: Reasons for Cancelled Custom Projects



5 SUPPORTING ITSP-LEAD PROJECT IMPLEMENTATION

This chapter looks into the processes and activities that help PDCs and ITSPs coordinate their activities with ITSP-lead projects, identifying opportunities to strengthen program support for these projects. Energy Trust commissioned prior research that evaluated these program components through research, including participant surveys.

We interviewed both PDCs and ITSPs concerning their perceptions of the effectiveness of outreach activities to initiate ITSP projects, and the efficiency by which PDCs and ITSPs hand-off project tasks between each other. Additional questions concerned ITSP program component progress toward market saturation and additional program support for these components.

Customer Outreach and Project Initiation

ITSP program components are primarily initiated through PDCs' outreach activities to customers, often following PDC scoping activities at customer facilities. We interviewed PDCs concerning their ability to adequately promote and engage customers in ITSP-lead projects, and questioned ITSPs concerning the effectiveness of PDCs' outreach activities.

PDCs are responsible for identifying customers eligible to participate in ITSP-lead components and work engaging customers in these components when PDCs discover related savings opportunities at customer's facilities. PDCs reported few challenges promoting ITSP projects to their customers. On occasion, PDCs relied on ITSPs to explain program component details to customers when PDCs where uncomfortable elaborating on these specific applications of these components to customer opportunities. Some PDC firms also operate as ITSPs; in these cases, ITSPs reported providing additional outreach support to PDCs within the same firm.

Most ITSPs reported no issues with the promotion of their ITSP components. One ITSP referenced improved PDC outreach activities after the program allowed PDCs to count ITSP-lead project savings toward PDCs' savings goals.

However, ITSPs associated with components specific to natural gas measures stated some PDCs had engaged customers and initiated projects when there were no opportunities. These ITSPs explained that PDCs may lack adequate training in boiler tuning to effectively promote boiler O&M components.

PDC and ITSP Project Coordination

PDCs' and ITSPs' roles with ITSP-lead projects are mostly distinct, but occasionally overlap during project implementation. The evaluation team learned from interviews that PDCs provide three key functions that ITSPs rely on for these projects – scoping work, customer engagement, and technical support.

Scoping Phase

PDCs identify project opportunities in their scoping reports; these reports describe related facility production systems and processes by which ITSPs gain an initial understanding of how to develop projects. Most ITSPs reported that scoping studies are helpful to their initial project development activities. One ITSP would like check-boxes included on scoping reports that would help PDCs to identify key facility characteristics; this ITSP is working with the program to have check-boxes included.

Customer Engagement

PDCs are responsible for the program's relationship with customers; and as it relates to ITSP-lead projects, PDCs help identify key customer staff to participate in these projects and engage the program at the conclusion of projects. PDCs reported that they set up kick-off meetings between customers and ITSPs at the outset of projects. Some ITSPs stated these initial meetings help orient customers to the ITSPs' role; one PDC believes PDC presence in these meetings are important to ensure ITSPs also target hard to get at savings because *"ITSPs always target the low hanging fruit, and we are running out of low hanging fruit."*

PDCs are also present at the conclusion of ITSP-lead projects. ITSPs whose components have strong energy management elements explained the importance of PDCs involvement at the close of projects. They indicated that PDCs often join them for the presentation of program incentive checks to customers; and during these customer interactions, PDCs are able to review project outcomes and work with customers to identify new program opportunities made possible from these outcomes. Some ITSPs also mentioned that PDCs may occasionally review customers' energy reporting made possible by their participation in ITSP-lead projects, as these reports may help PDCs identify additional opportunities for customers to work with the program.

Implementation

ITSPs implement projects by conducting training with customer staffs or tuning equipment to optimal energy performance. However, ITSPs and PDCs agree that ITSPs often lack the technical background to evaluate project sites or the experiences necessary with customer facilities to adequately implement their projects. PDCs often supplement ITSPs' work by providing some technical insights about customers' systems and processes. Yet PDCs and ITSPs expressed concern over PDCs technical involvement with ITSP-lead projects because their services are not factored into these projects' budgets. According to program staff, the program has recently instructed PDCs to allocate 60 hours of ITSP work per year. The program intentionally limited PDCs to 60 hours of ITSP project involvement to ensure participants perform enough technical work themselves that they will be able to continue energy management activities following the program-supported project implementation phase.

Market Saturation

ITSPs believe market saturation is potentially a concern only for small markets or markets restricted by the component's structure, such as components requiring specific participant characteristics or requiring prior program participation or. ITSP components with higher market saturation include Refrigerator Operator Coaching, which requires refrigeration controls, typically installed or confirmed by prior Kaizen Blitz participation, and IEI, designed for regional cohorts of 10 large customer firms.

Suggestions ITSPs Offered

We concluded our interviews with ITSPs by inquiring about additional resource support or process improvements they would like for their program components. Few ITSPs suggested ideas, and instead took the opportunity to comment about the ease with which they were able to work with the program. One ITSP remarked that working with the program *"has gone pretty smoothly because Energy Trust is flexible and not bureaucratic."* Others praised the support they receive from PDCs who help orient them to customers' facilities and answer customer inquiries about program eligibility. These positive appraisals of the program likely reflect the close working relationship they developed with the program when they developed their components.

One ITSP suggested expanding operator coaching to non-refrigeration systems; the program plans to expand this component to other systems, and took care to name the component "operator coaching," so it could be extended to additional systems. Another ITSP suggested the program could have ITSPs who specialize in boiler tune-ups perform initial site evaluation work on natural gas O&M projects before the program issues RFPs to ATACs; this initial work would help to shore-up any oversights made by PDCs, who often have backgrounds in electrical loads, during the PDCs scoping work.

6 SUPPORTING PRESCRIPTIVE PROJECT IMPLEMENTATION

This chapter discusses small industrial (SI) and agricultural projects, green motor rewind projects, and lighting projects, which comprise PE's prescriptive components.

SMALL INDUSTRIAL (SI) AND AGRICULTURAL PROJECTS

We surveyed 10 trade allies, and each survey call lasted approximately 20 minutes. The sampled trade ally firms have the following characteristics:

- Trade ally firm employee count:
  - Six had less than 10 employees
  - Four had 10-30 employees
- Trade ally firm history with the program:
  - Six worked with the program for more than five years
  - Four worked with the program for less than five years
- Industries trade allies serve:
  - Agricultural (*n* = 7)
  - Metals Manufacturing (*n* = 1)
  - Chemicals Industry (*n* = 1)
  - High Technology (*n* = 1)

Importance of SI and Agriculture Program to Trade Allies

The SI and agriculture track is mutually rewarding for both the program and trade ally firms. Nine trade allies stated that their participation in the program provided them with more work from both existing and new customers. One trade ally stated the program was "critical" in helping to sustain the Trade Ally's firm during a difficult economic period.

Interviewed trade allies identified the following ways in which they became involved with the program:

- Contacted by PDC or program staff (*n* = 4)
- Existing relationship with Energy Trust (*n* = 3)
- Equipment vendor/contractor suggested participation (*n* = 2)

- Program advertising (n = 1)

Selling SI and Agriculture Energy Projects

Most trade allies reported that they typically begin to discuss project incentives with customers after determining if projects qualify for program incentives; trade allies often work with customers on projects that are not related to program activities. Two reasons were generally cited for this approach: avoiding customer disappointment caused by projects not qualifying for incentives; and ability to 'up sell' customers to more energy efficient equipment once trade allies determine projects qualify for program incentives.

Trade allies cited a number of strategies they employ to overcome customers' skepticism or resistance to program participation:

- Discuss payback, and emphasize accuracy provided by program's energy calculators
- In situations that require corporate approval, the trade ally works to identify measures that can be implemented without triggering the approval threshold
- Provides additional program information and brochures
- Informs customer they have paid into the program through a surcharge on their utility bill.

Trade allies described the challenges and barriers they face with selling program-supported projects to their customers:

- Customer concerns over time that is required to apply for incentives
- Trade ally working through layers of management for project approval
- Project payback may not be adequate for facilities running one eight-hour shift
- Customers avoid programs they view similar to having government sponsorship
- Customer resistance to change

Changes to Oregon's Business Energy Tax Credit (BETC) may introduce new challenges to trade allies as they sell energy efficiency projects. Nine trade allies indicated a familiarity with BETC; of which, five trade allies indicated they thought changes to the credit had negatively impacted their sales, but could not quantify the amount. One other trade ally reported changes to the credit had caused a 25% reduction in the firm's sales.

Trade allies most frequently mentioned these factors as leading customers to participate in the program:

- Program incentives

- Consideration of project payback
- Reduced utility bills

Trade allies mentioned the following influential factors, but with less frequency than the above factors:

- Concern for the environment
- Desire to conserve water
- Trade ally advice or program provided technical support
- Recent introduction of more prescriptive measures

Some trade allies discussed their use of marketing material that they find helpful in promoting the program. Trade allies gave three suggestions for improving marketing collateral: more on-demand printing of marketing materials, more advertising in agricultural trade publications, and more marketing to help customers understand the connection between the public purpose charge on their utility bill and Energy Trust.

Project Savings Calculation and Savings Persistence

Most trade allies reported no challenges in working with customers or with the program's method for verifying energy savings, except in the following areas:

- Seasonal/annual rainfall variation introduces complexity in estimating energy savings for some irrigation projects.
- Customer behaviors that lead to changes in equipment set points and configuration affect energy performance, and therefore, savings. Trade allies noted giving equipment owners instructions concerning operational set points; however, in agricultural settings, equipment is often operated by seasonal workers, where language barriers may prevent equipment owners from explaining these set points.

Trade Allies' Experiences Working with PDCs

Trade allies reported a high level of satisfaction with the SI and Agriculture PDC firm. Trade allies reported their PDC firm supports them in working with the energy savings calculator , which they use to estimate project energy savings; with processing and expediting program paperwork; providing program related training to trade allies' staff; and attending trade shows and seminars in support of the program. Eight of the trade allies reported having no challenges working with the SI and Agriculture PDC and offered the general comment that the PDC is proactive and willing to become familiar with trade allies' business contexts.

Only one trade ally offered a suggestion: the PDC firm it worked with could become more familiar with the agricultural conditions in Southern Oregon.

LIGHTING PROJECTS

We surveyed 17 lighting trade ally firms that reported installing program incented lighting in an industrial or agricultural firm. These firms varied in size based upon their employee counts; one firm did not indicate its size out of concern for company policy. Our sample counts are as follows:

- Small – less than 30 employees (n =8)
- Medium – 30 to 100 employees (n =2)
- Large – 100 or more employees (n =6)

Importance of Lighting Program to Trade Allies

We asked lighting trade allies if their association with the program influenced their company in any way. Sixteen of the 17 respondents described strongly positive outcomes from their association with the program; and one firm expressed a neutral outcome from a minor influence to his business. We coded respondent descriptions of the way the program influenced trade ally firms and list them below; multiple mentions are possible. Most mentions emphasized increased customer traffic caused by their association with the program; or increased revenues on a per project basis, driven by program incentives. One respondent expressed the importance of the incentive in driving up the size of their projects by explaining, “Prior to working with Energy Trust a good project for me $500-$600. Now a small project is $3,000.”

- Increased trade ally firm business and revenues through:
  - Broader exposure, referrals, and customer’s trust in the trade ally firm from association with Energy Trust (n=8)
  - Program increases project sizes and revenues (n=5)
  - Added additional revenue by developing lighting installation capacity (n=1)
- Program’s third-party verification helps customers trust project outcomes (n=1)
- Trade ally training important to quality of trade ally firms’ staffing (n=1)

Selling Lighting Projects

Lighting trade allies explained that they employ the same sales approaches when working with commercial or industrial customers, and primarily focus on energy savings for their customer. However, some trade allies encounter industrial sector specific challenges when implementing

projects at industrial sites. Seven trade allies reported these challenges – four reported issues dealing with fixtures located on high ceilings and difficult to access locations; two reported challenges accessing projects sites in remote locations; and one trade ally reported increased project costs from dealing with the aforementioned challenges and being required to implement projects at night when industrial production process are slowed.

Trade Allies' Experiences Working with PDCs

Trade allies commented on their experiences working with PDCs associated with customer sites. Six trade allies had opinions about interacting with PDCs on projects. The remaining respondents either did not recall working with a PDC or had limited experience working with PDCs, as one might expect because PDCs do not work with many small industrial and agriculture sites.

Some trade allies mentioned positive experiences with PDCs. Three trade allies explained they find PDCs to be helpful to their project work by aggregating site information, helping complete paperwork, and occasionally assisting with energy savings calculators. Two trade allies mentioned discussing site savings potential with PDCs during a facility walkthrough and potential ways to employ lighting controls.

Two trade allies mentioned negative experiences with PDCs. One trade ally – also quoted in *Trade Ally Suggestions for Improving the Program* – stated trying to avoid work with PDCs because PDCs misinform customers about lighting project costs and project details; the trade ally stated, *"PDCs do not give customers the right information. They suggest prices that are not right. Some of the products they recommended are bad for the application and have low paybacks. This has happened several times and I try to avoid working with PDC."* Another trade ally described similar dissatisfactions with PDCs discussing lighting project costs with customers, stating that *"PDCs may identify the lights but they will not identify what it takes to install the lighting. They may tell customers a project will only cost $500. I have to go in and spend time to understand the nuances that are involved in the job."*

Trade Ally Suggestions for Improving Lighting Program

Trade Allies shared their ideas concerning additional support from the program that would help them to promote and sell more energy efficiency lighting projects. Seven respondents emphasized their appreciation for the program as it is or suggested increased incentives would lead to increased project volumes. The remaining respondents offered a variety of unique ideas. One respondent suggested increasing the types of electronic pamphlets that could be emailed to customers. Another respondent would like to distribute non-lighting program marketing collateral to its customers to help stimulate more program involvement.

Additional comments concern structural improvements to the program. Three respondents suggested paying incentives on a per kWh savings basis, rather than prescriptively. This would allow the program to incent costly redesigns, rather than target retrofit projects. Another respondent suggested increasing the number of LEDs incented by the program. One respondent

would like the program to address power conditioning issues at manufacturing sites. The respondent noted that power surges more frequently occur at manufacturing facilities, and these surges often damage expensive LED ballasts. Another trade ally would like the program to limit the way PDCs encourage customers' to pursue lighting projects. This respondent believes some PDCs incorrectly influence customers' lighting project expectations, and these assumptions are difficult for the trade ally to deal with. This trade ally elaborated by stating:

> *I do not depend on Energy Trust to open the door with customers. In a number of cases, this has been a problem. I know PDCs have a level of expertise in the industrial sector and with HVAC, but their knowledge of lighting is inferior. I would prefer they would not spout-off to customers about lighting. I have had to correct the assumptions PDCs left with customers, and this can tear down my credibility. It is hard to be an expert in all areas. I have 40 years of experience in lighting and a number of the people out there create more problems for me than help.*

GREEN MOTOR REWIND PROJECTS

We collected data for this evaluation through surveys with five motor service centers – centers offering Green Motor Rewind services – and interviewed the Green Motors Practice Group's (GMPG's) Executive Director. The surveys lasted roughly 25 minutes each; and we held two interviews with GMPG Executive Director lasting approximately two and one-half hours.

- ➡ Motor service center motor rewind employee count:
  - One center has six employees that can offer rewind services
  - Four had 10-16 employees
- ➡ Motor service center history with the program
  - Three worked with the program for three to four years
  - Two worked with the program for five years or more
- ➡ Industries served by the service centers include:
  - Wood products / pulp and paper (n = 4)
  - Agricultural (n = 1)
  - Food processing (n = 1)
  - Wastewater (n = 1)

Importance of Green Motor Rewind Program to Trade Allies

Four of five service centers were able to report how they discovered the program;. One center learned about the program from a customer; the remaining three learned about it from the

GMPG. The GMPG performs outreach to service centers and contacts centers on a one-to-one basis. The GMPG both instructs service centers on correct motor rewind practices and acts as an interface between the program and motor service centers. The GMPG is effective at explaining program responsibilities to service centers, as all five service centers reported they understand their program responsibilities.

The service centers estimated the change in green rewind services they performed over the last three years; two agreed with the statement that their volume of work has stayed about the same, one stated the volume has been increasing, and two stated their volume has been decreasing. For the center with increasing volume, the industry they serve is rebounding from a two-year slowdown. Centers with decreasing project volumes reported either that some local mills had closed or that their green rewind services lead to more stable motors, which reduced the frequency by which their customers require rewind services.

Service centers described how GMPG and program resources support their efforts to offer rewind services. One center mentioned the promotional importance of marketing collateral supplied by the GMPG, and another mentioned the importance of being included on Energy Trust's website. Two centers emphasized the brand value of being associated with Energy Trust and offering incentives. They explained that customers view the incentives – which are not large enough to motivate customer participation – as assurance that the rewind services are effective at generating savings. According to one contact, "The incentives are like a statement that the motor has been repaired to the highest level of efficiency and here is the money to prove it." In addition, one center mentioned that larger customers in their industry view their service center in higher regard because of its association with Energy Trust. One service center stated incentives are financially important to their customers who factor the incentives into return on investment calculations concerning rewind services.

We asked the service centers for their ideas concerning additional resources and support from the program that would help them promote green rewind service; the respondents did not recommend additional resources and stated that the program is currently supporting them well.

Green Rewind Project Processes

Figure 8 (at the end of the Green Rewind section) gives the processes map for Green Rewind illustrating the engagement of motor services centers and the GMPG when promoting and executing green motor rewind services incented by the program. We organize these processes into three expanded sub-processes: 1) qualifying rewind opportunity, 2) performing rewind services and reporting, and 3) GMPG review of rewind quality, as describe subsequently.

Qualify Rewind Opportunity

Service centers begin potential green rewind services when customers contact them for general motor rewind services. Process steps generally flow as follows:

1. Determine applicability of motors' conditions for compliance with GMPG specifications (NEMA horsepower [hp] rated motors with 15 to 5,000 hp and no core damage).
2. Promote Green Rewind services to the customer. One service center indicated a specific customer to whom they do not promote these services because the customer's business involves reselling motors to regions not included in Energy Trust's territory.
3. Determine customer's eligibility for program incentives by verifying that the location of the motors' power source is in Energy Trust's service territory. One service center explained they occasionally have challenges convincing customers to show them their power bill, which the center requires to verify the location of motors' power sources. Customers resistant to sharing their power bill are concerned their competitors may access it and gain a competitive advantage. The service center forwards customers' utility account information to the GMPG for verification of customers' eligibility.

Rewind and Reporting

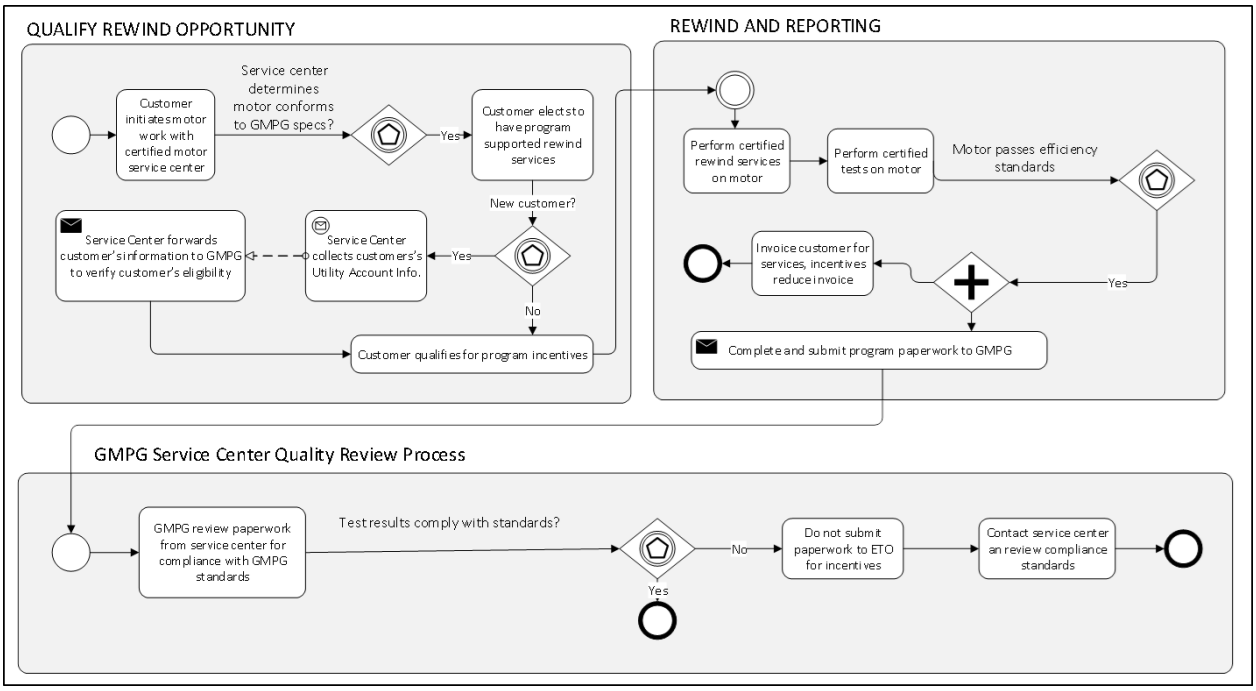
Service centers begin Green Rewind services once a customer's eligibility has been verified. Rewind and reporting steps include:

1. Performing motor rewind services
2. Performing a certified test on the rewound motor to assure the motor performs up to acceptable efficiency standards
3. Invoicing customers for rewind services, minus program incentives, for motors passing the certified test
4. Submitting the completed program incentive paperwork to the GMPG and attaching rewind test results.

GMPG Service Center Quality Review Process

The GMPG reviews the quality of each rewind service performed by reviewing test results attached to service centers' incentive requests to the program. The GMPG forwards incentives requests to the program when tests demonstrate motors perform at acceptable levels of efficiency. The GMPG contacts service centers and reviews rewind standards when those centers submit paperwork demonstrating test results are below standards.

Figure 9: GMPG and Motor Service Center Green Motor Rewind Project Processes



7 OBTAINING AND MANAGING INFORMATION

This chapter focuses on the program's ability to monitor its project pipeline and includes a description of the program's data systems and the quality assurance processes affecting project data entered into those systems; reviews the approaches the program has for monitoring and tracking projects' development; and summarizes the program's activities it uses to evaluate its progress toward its goals. Insights from this chapter may help Energy Trust understand how to improve organization wide data systems to help support the program's analysis and reporting activities.

We gathered data for this chapter primarily from interviews with program staff, and reviewed interviews with PDCs for additional context. Interview questions concerned the way program staff review project data and entered them into databases, how the program's data management needs interact with Energy Trust IT protocols, and the way Energy Trust uses the program's savings forecasts.

QUALITY ASSURANCE AND DATA SYSTEM MANAGEMENT

The program's project pipeline is contained in FastTrack, Energy Trust's organization wide project database. Data on active, completed, and cancelled projects are located in this database. The database contains data for project measures, costs, savings, and program. Energy Trust's IT department manages FastTrack.

In addition, the program relies on two parallel information streams to assess projects' status and level of development. The program uses project information tracked by PDCs in Excel workbooks, and monthly project status reports summited by PDCs. The workbooks track projects stages of development and the PDCs' monthly reporting provides qualitative information describing projects' progress. The program also manages paper-based files comprised of project documents and customers' program enrolment forms. Occasionally the program references these documents to update project statuses.

Quality Assurance Processes

The program developed procedures for reviewing the quality and completeness of project data entered into the FastTrack database. Project forms go through a triple review process. The program's assistant typically conducts the first review activity, receiving faxed or mailed project forms, PDFs, and PDCs workbooks, and entering the data into FastTrack. The program's coordinator and the operations analyst then compare the data entered into FastTrack with the information in the source documents before submitting these documents to program managers for approval. Many of these documents are project completion forms which, when approved by program managers, trigger the release of incentive funds to participants. Additionally, Energy

Trust's finance department audits all projects with incentive payments over $2,000. These quality assurance reviews reinforce prior project review activities carried out by the program's partners, which includes PDC review of custom projects reports, and PDC and trade ally review of project completion forms from trade ally driven projects.

Data System Management

Program staff report FastTrack's structure and organization limits its usefulness to them; FastTrack uniformly manages project data across Energy Trust's program portfolio and thus is not designed to meet the specific needs of PE. Program staff described the key characteristics of its project data that differ from non-industrial project data:

- **Project duration** – Industrial projects have relatively longer implementation timelines, sometimes greater than a year. Program staff explained the database is better at tracking completed projects, but lacks the functionality they require to estimate projects' development.
- **Grouping of data elements** – FastTrack data are differentiated at the 'program level' and thus categorizes measures categorized at a program level. Yet the PE program could be considered from a data management perspective as an umbrella program; PE has program tracks that are further divided into program components. Program staff explained the database's relational structure is fixed around the program level and it makes it difficult for the program to track activity at the program track and component levels.
- **Lack of implementer focus** –Energy Trust staff described that FastTrack is tailored to tracking completed projects delivered by the other programs' third-party implementers and that the Goldmine CRM (customer relationship management) did not meet their needs. They did not comment on the CRM that Energy Trust had recently implemented (fall of 2012), yet they spoke of needing tools to help them track customers' activities around identified savings opportunities in scoping reports.

REPORTING

The program's reporting system greatly affects its ability to manage risks posed by canceled and stalled projects; we explain these management tactics in detail in Chapter 9. The program and Energy Trust's planning department rely on the program's savings forecasts to regulate program activity and better ensure delivered savings are in line with quarterly savings goals. These decisions are partly constrained by reliance on the forecast's precision, a precision estimated by a program staff to be accurate for utility-specific quarterly savings at plus or minus 50%.

Program staff described how these decisions to regulate program activity may have reduced the potential of the program to deliver savings. One example they sited was a program decision to reduce program activity in a specific utility territory, where they instructed the PDC to scale back

activities in that territory. The program made the decision out of a concern that the program would overreach its savings target for that utility territory. The program ended up delivering fewer savings than targeted, and as one program staff described it, the decision to reduce program activity was scaled by program staff with the "the most in-depth and comprehensive view of the industrial sector," and their insights are further informed by forecast estimates from the project pipeline and insights they gain from their customers, contractors and other market contact.

Staffs describe the decision to alter program activities in a territory as a high risk decision because it is an intervention with possibly mid-term impacts used to moderate near term outcomes. Often, industrial projects require two years to complete from idea stages—when the program may first be involved, to project iimplementation; and a change in program activities may affect program project and savings volumes for up to the next two years. However, the program's decision may only target savings volumes for the next 6 months to a year.

Reporting Challenges

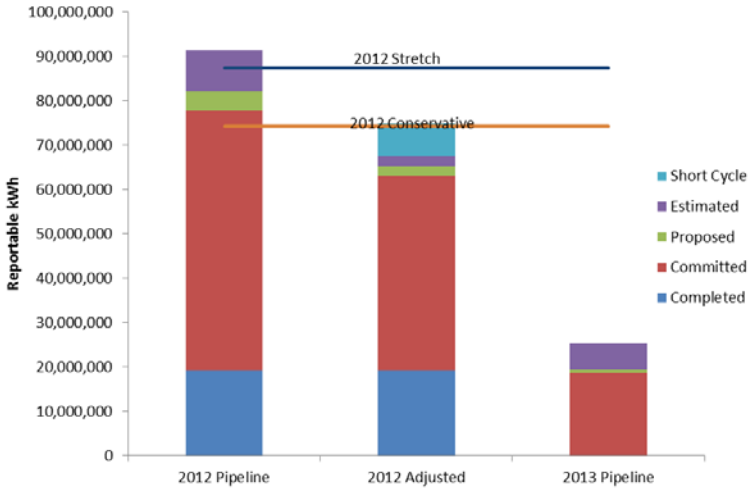
To support forecasting activities Energy Trust has implemented an organization-wide business intelligence (BI) system. Program staff expressed to us the challenges they have with using the BI system. They explain issues stem from high-level assumptions made in the design of the platform, which is organized to support the tracking of program implementer activities rather than PDC activities. Tracking program activities at an implementer level is likely important to Energy Trust's residential and commercial programs, but is not helpful to the PE program. These database assumptions make it difficult for the program to enter program data into the BI platform and analyze data for trends.

Reporting Improvements

The program has been developing forecasting tools and dashboards to help support planning decisions. The program is refining a forecasting tool that uses factors aggregated from PDC reporting to help estimate cancelation rates for active projects; and the data analyst is working with PDCs to improve the detail and accuracy of the project information they report.

Figure 9 is an excerpt from the program's forecasting dashboard. The program creates separate dashboards for each utility territory reflecting savings based upon the level of project development (projects proposed to customers, committed to by customers, or completed projects). The dashboard helps to monitor progress toward stretch and conservative goals, increasing the program's ability to regulate the savings it delivers within targeted boundaries.

Figure 10: Example of Program's Utility Territory Forecasting Dashboard



CUSTOMER SATISFACTION AND EXPERIENCE RESEARCH

The program engages in other self-evaluative practices designed to improve customers' satisfaction with the program. The program executes quarterly Fast Feedback surveys with participants that which helps the program compare satisfaction levels on a quarterly basis. The survey measures participants' satisfaction with program representatives, incentive amounts, performance of installed equipment, ease of applying for incentives, and timeliness of incentives.

In addition, the program commissioned a qualitative phone survey of 35 of its customers, fielded between December 2011 and January 2012. The survey focused on the way companies make decisions about energy efficiency projects, barriers the program faces in attempting to increase program participation and the types of experiences customers have with the program. The research found that:

- Customers are "overwhelmingly" satisfied with the program
- Customer's decisions to proceed with energy projects are heavily shaped by concerns for return on investment
- Some customers believe they may have exhausted easily achievable energy projects and are having difficulty identifying new savings opportunities
- Energy champions – customers' employees who promote energy projects –have a difficult time promoting energy projects because their time is frequently occupied by other activities.

8 MARKET ASSESSMENT

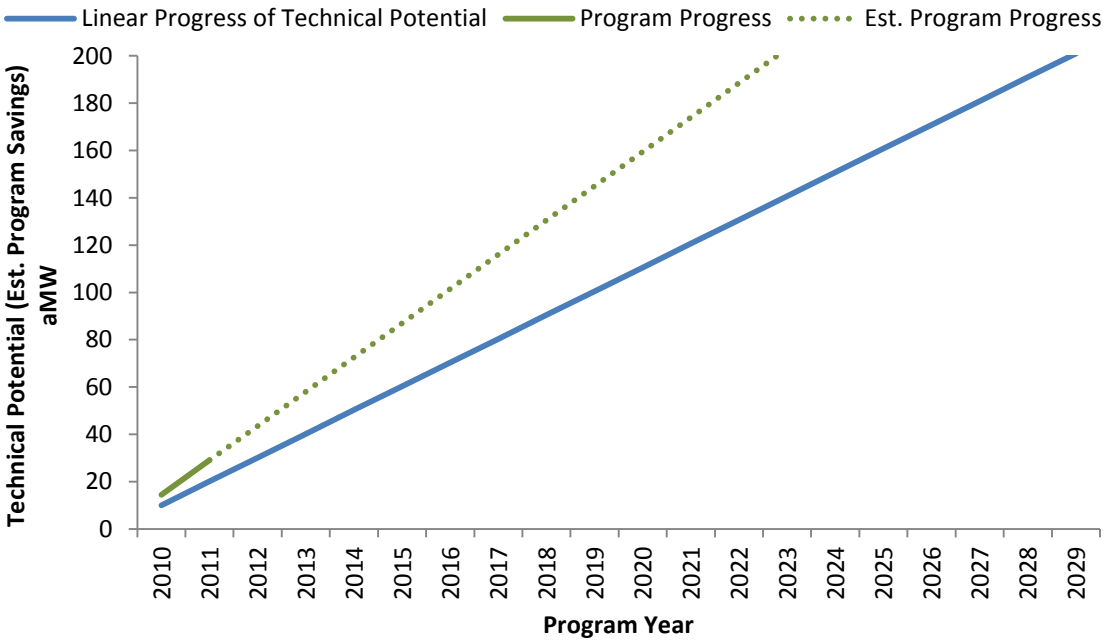
This chapter describes how well program activities align with identified opportunities within targeted industries. This section provides the program with a means to measure its progress within industries—each of which has industry-specific technical needs, market structures, and economic cycles the program must deal with. This section offers the reader three sub-sections: 1) summary of the program's overall progress; 2) program progress within the eight key industries in the sector; and 3) a detailed summary of each industry concerning the program's opportunities and progress toward technical savings potential on a measure category basis. We include supplemental market assessment information in Appendix A, including insights into market trends driven by code changes to industrial motors and pumps.

OVERVIEW OF SAVINGS IN RELATION TO POTENTIAL

The program is delivering savings at a substantial rate compared to its 20 year technical potential of 201 aMW (see Figure 11). Between 2010 and 2011 the program delivered 29 aMW of energy savings; and at that rate the program will yield 201 aMW of savings within 13.9 years (see Figure 11). Program savings delivered from O&M and SEM training accounted for 9.3 aMW of the delivered 29 aMW—or 32% of the programs savings; many of these components were in pilot phases between 2010 and 2011. These delivered program savings were also achieved during a financial downturn across most of Oregon's Industrial sector.

Figure 11 graphically depicts the accelerated progress made by the program as it relates to the market's technical potential. The *blue* line describes the 20 year technical potential estimate for the industrial market; these figures are adapted from the Energy Trust's 2010 Conservation Resource Assessment, which considered savings from equipment upgrades, O&M, and SEM measure categories. For comparison purposes, we depicted the 201 aMW of technical potential as if obtained through a linear growth pattern of 10.05 aMW per year. The program delivered 29 aMW in its first two years, which equates to 14.5 aMW of savings per year. Similar to the technical potential depiction, in Figure 11we used a linear progression of 14.5 aMW per year to extrapolate the savings delivered by the program. This figure illustrates the relatively aggressive nature by which the program operates in the market; we do not suggest that the program will obtain savings at a linear rate.

Figure 11: 20 year Forecast of Industrial Sector Technical Potential for Energy Trust's Service Territory[25], and Projections of Production Efficiency's Delivered Savings



INDUSTRIAL SECTOR TECHNICAL POTENTIAL

In this section we compare the technical potential of the industrial sector across the Northwest Region and within Energy Trust's territory. Additionally, these comparisons assess the technical savings potential of the eight primary industries[26] served by the program. Relative comparisons of technical savings opportunities between the region and Energy Trust's service territory help to demonstrate alignment between Energy Trust and the Region as it relates to priorities. Significant difference in the proportion of opportunities between the region and the program may indicate variation in priorities between the program and the rest of the region's efficiency efforts.

Roughly a quarter of the Northwest region's industrial sector technical savings potential, or 201aMW of the region's 728 aMW, is located in Energy Trust's service territory. Figure 11 summarizes the region's and Energy Trust's technical potential by industry. And while Energy Trust's territory is a sub-territory within the region, some of the savings estimates for Energy Trust's territory exceed those for the region because the Energy Trust discovered additional savings potential by performing deeper technical analyses within selected industries. Estimates

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25 Energy Trust of Oregon. 2010. *Conservation Resource Assessment*.

26 Nearly 80% of the program's savings are generated from projects in the following industries: High technology, pulp and paper, wood products, food processing, transportation, chemical production, metals manufacturing, and agriculture.

for the region's technical potential are reported from the Northwest Power Conservation's Power Plan; and Energy Trust's technical potential is adapted from the Trust's Conservation Resource Assessment plan, which primarily relies on figures reported from the Power Conservation's Plan with some estimates derived from some industry specific technical analyses commissioned by Energy Trust.

Figure 12: Estimated 20 Year Industrial Sector Technical Savings Potential by Industry for Northwest Region, and Energy Trust's Territory[27]

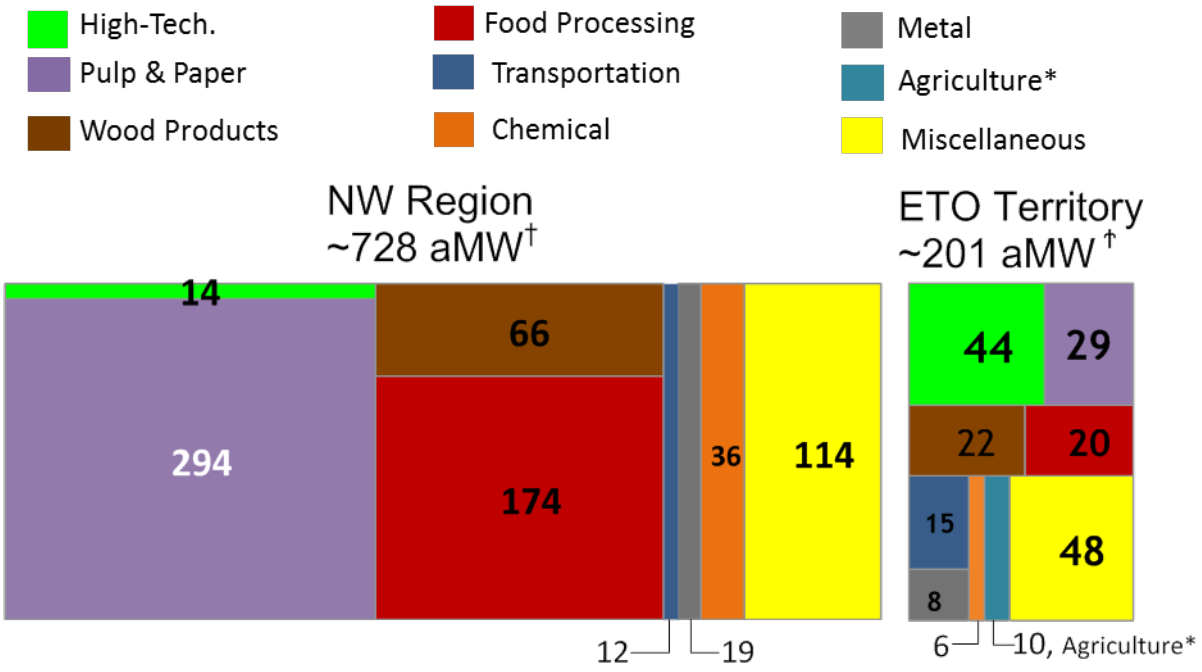


Figure 11 indicates a few significant industry specific difference between the region's and Energy Trust's technical potential. High-technology—which is primarily comprised of silicon chip manufacturing for use in computers, is the most significant industry for Energy Trust in terms of technical potential—this industry controls over 20% of the program's technical potential, or 44 aMW of Energy Trust's total 201 technical potential. However, regional estimates of the high-technology industry's technical savings potential account for roughly 2% of the region's total savings potential. Conversely, 40% of the region's technical potential—or 294 aMW, are located in the pulp and paper industry; this industry's savings potential only accounts for roughly 14% of program's total savings. These differences in relative savings opportunities between the region and Energy Trust's territory may lead to divergent priorities between the program and other energy efforts across the region. In industries where Energy Trust's technical

[27] Data sources: †Northwest Power and Conservation Council. 2009. *6th Power Plan Industrial_tool_040609.xls*. † Energy Trust of Oregon. 2010. *Conservation Resource Assessment*.

* Agriculture data is not included in the Northwestern Region's savings opportunities.

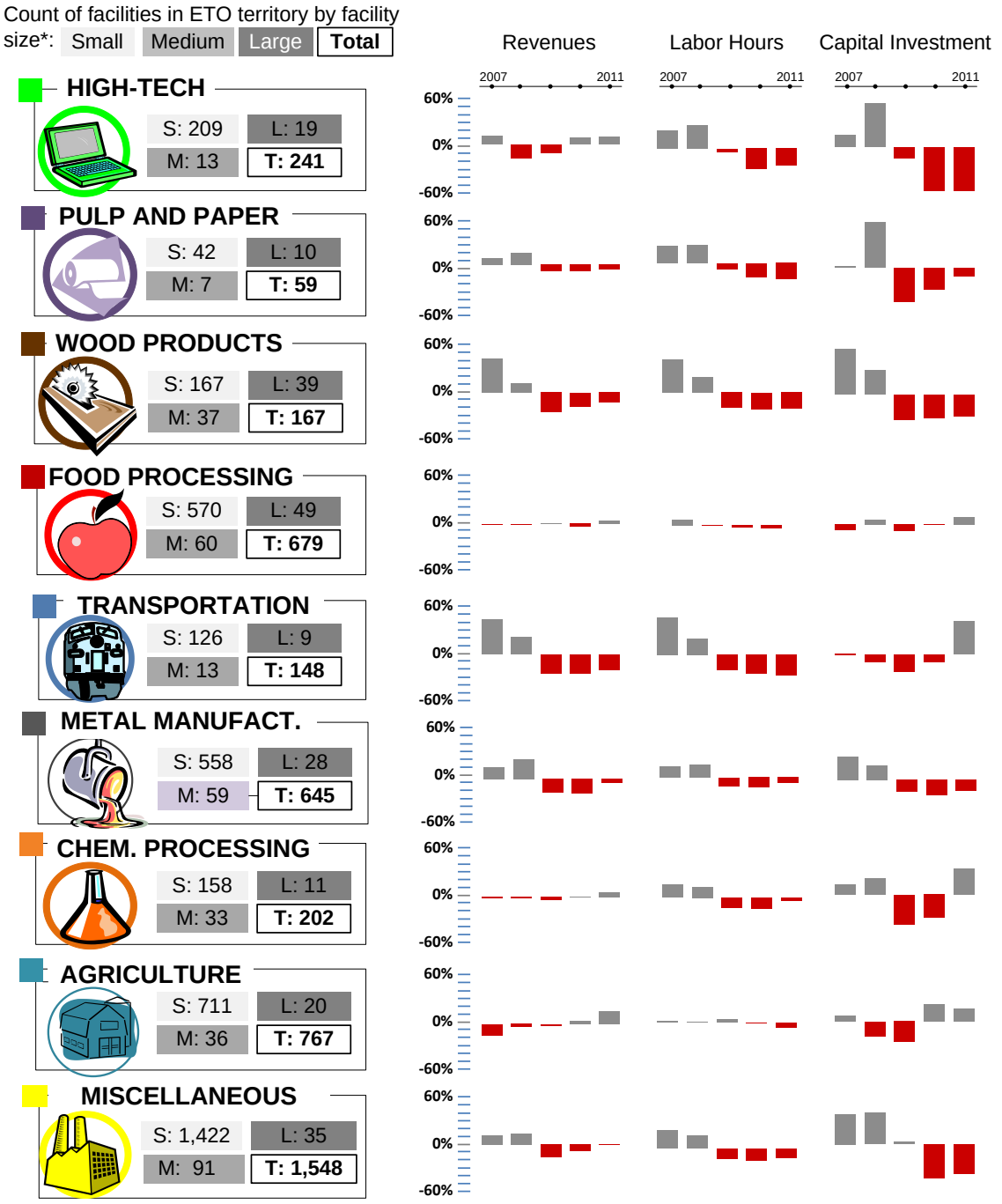
opportunities is relatively greater than the rest of the region—such as the high-technology, transportation, and wood products industries—the program may elevate its role within the region to help build initiatives and markets around energy efficiency opportunities for these industries.

PROGRAM PROGRESS WITHIN INDUSTRIES

This section concerns the program's progress toward saturating identified technical opportunities by industry, because program activities within industries are partly limited by industry specific barriers. One common barrier across industries is financial constraints for energy projects caused by a general economic downturn across Oregon's industrial sector. Capital projects for energy efficiency are often funded by industrial firms' capital investment allocations; and firms are better able to commit to O&M and SEM training when they have available labor for these trainings. Figure 12 reflects the capital investment and labor constraints industrial firms in Oregon were operating under between 2009 and 2011. And while there was variation in these levels between industries, on the whole most industries reduced their capital and labor allocations between 2009 and 2011.

The program delivers savings in each industry through three different measure categories: *equipment*(capital projects), O&M training and support, and SEM training and support. Figure 13 is adapted from the Energy Trust's Conservation Resource Assessment (2010) study which reflects the technical potential by measure category within each industry. Over half of the identified technical potential comes from O&M or SEM training opportunities—some equipment upgrades are performed as part of O&M and SEM activities and therefor this figure may overestimate the distribution of savings between equipment upgrades and training.

Figure 13: Industry Structure: Count of Industry Facilities by Size[28], and Economic Indicators[29]



28 Northwest Energy Efficiency Association Industrial Database, estimated facility count: Small= less than 40 employees, Medium =40- 100 employees, Large= 101 or more employees.

29 US Census: *Annual Survey of Manufacturers (2007-2011),* analysis restricted to Oregon data: Revenues adapted from Total Shipment values, Labor Hours adapted from Production worker hours, Capital Investment adapted from Total capital

Figure 14: Estimated 20 Year Industrial Sector Technical Savings Potential for Energy Trust Service Territory by Industry and Measure Category[30]

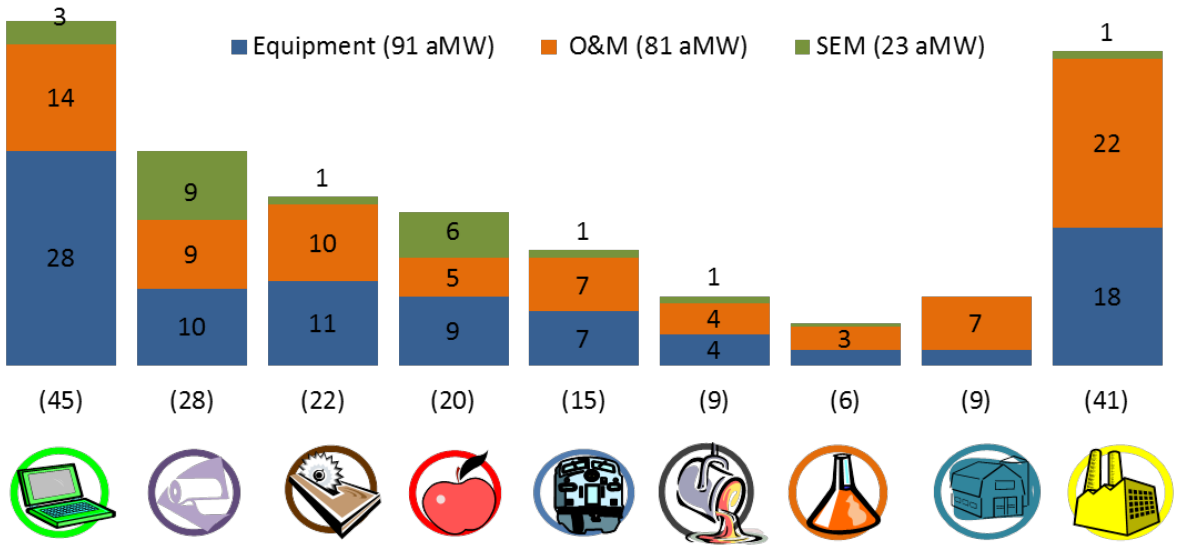
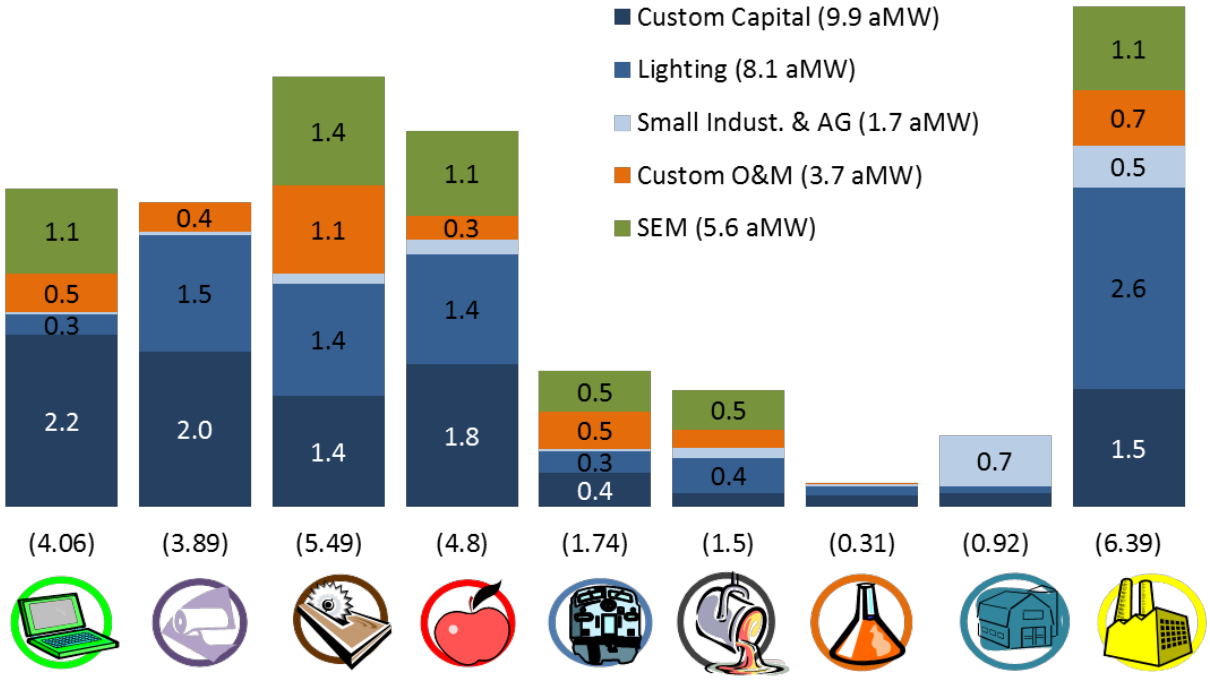


Figure 15: Production Efficiency Program Reported Savings by Measure Category, 2010-2011



[30] Energy Trust of Oregon. 2010. *Conservation Resource Assessment*.

The following sub-sections concern the program's progress delivering savings within each industry when industry specific technical potential and economic constraints are considered.

High-Technology

Two-hundred and forty one high-tech facilities control roughly 45 aMW of savings potential within the Energy Trust's service territory—which is the greatest savings potential of any industry in the service territory. Program savings from this sector were likely moderated by industry wide cut-backs to capital investments and labor hour allocations (see Figure 11); the program generated 14% of its savings—or 4.06 aMW, between 2010 and 2011, which is less than the 23% of the program's technical savings potential for this industry. A high proportion of savings from this industry, 46%, were generated from O&M and SEM trainings. Uptake of these program components by the high-tech industry demonstrates the suitability of these 'low and no cost' program components to deal with financial barriers posed by economic downturns.

Pulp and Paper

Fifty-nine pulp and paper facilities control roughly 28 aMW of technical potential, or roughly 14% of the industrial savings potential in the territory. Capital investment allocation between 2009 and 2011 were reduced across this industry within Oregon; labor hours were slightly reduced over the same period. Thirteen percent of the program's savings were delivered from projects in the pulp and paper industry, similar to the proportion of savings potential for this industry. Ten percent of savings from this industry came from O&M training and support; while 64% of this industry's technical potential is located in O&M and SEM measure categories. The pulp and paper industry is noted for its relatively high level of savings potential from relatively fewer facilities. These conditions are favorable for SEM trainings.

Wood Products

One-hundred and sixty seven facilities control 22 aMW of technical potential—half of which are located in equipment measure category projects. Beginning in 2009 this industry reduced its capital investment and labor hour allocations in response to reduced revenues across the industry. The program generated 5.49 aMW, or 19% of its savings; which is greater than the industry's 11% of technical potential share within the program's service territory. The high volume of savings generated by projects from this industry were driven in large part by 'low and no cost' O&M and SEM projects which accounted for 45% of the savings from this industry. Additionally these project volumes were delivered through long-term customer relationships the program's PDC has with the wood products industry.

Food Processing

Six-hundred and seventy nine food processing facilities control 20 aMW of technical savings potential, which accounts for roughly 10% of the program's savings potential. The program

generated roughly 17% of its savings from projects in this industry, which far outpacing the relative proportion of technical savings contributions from this industry. Roughly 70% of savings from projects delivered by this industry came from equipment measure category projects. The relatively high volume of savings contributed may have resulted from the even economic performance of this industry between 2009 and 2011. Additionally, project volumes were also driven by activities and initiatives by the North West Food Processors Association and the Northwest Energy Efficiency Alliance focusing on energy efficiency in the food processing industry.

Transportation

One-hundred and forty eight facilities control 15 aMW of technical savings potential; and 60% of this savings potential are associated with O&M and SEM measure categories. Between 2009 and 2001 this industry experienced reduced labor hour allocations, and reduced capital investments through 2010. Projects in this industry delivered 1.74 aMW of savings, or 6% of the program's savings. Most of these savings, 57%, came from 'low-cost and no-cost' O&M and SEM projects, and this proportion is consistent with both the industry's constrained economic contexts and relatively higher proportion of O&M and SEM savings opportunities.

Chemical Processing

Two-hundred and two chemical processing facilities control six aMW of technical savings potential, and 60% of these savings are associated with O&M and SEM measure categories. The industry reduced its labor hour allocations slightly between 2009 and 2011, and reduced its capital investments between 2009 and 2010 before increasing them in 2011. Savings delivered from this industry totaled 0.31 aMW, and all of these savings came from equipment measure category projects.

Metals Manufacturing

Six-hundred and forty five metal manufacturing facilities control nine aMW of technical savings potential, or less than 5% of the program's total savings potential. Savings potential from O&M and SEM measure categories account for 60% of the potential for this industry. Relative to other industries, reduced labor and capital investment allocations were more moderate between 2009 and 2011; and projects located in this industry generated savings consistent with its proportion of technical savings potential. This industry contributed 1.5 aMW of savings, or 5% of the programs savings; and 50% of these savings came from O&M or SEM projects.

Agriculture

Seven-hundred and sixty-seven facilities control nine aMW of technical savings potential, and roughly 75% of this savings potential are associated with O&M measure category projects. This industry was relatively unaffected by the overall economic downturn of Oregon's industrial

sector, which is similar to the food processing industry. The program generated nearly one aMW of savings from this industry, and most of these savings came from small industrial and agriculture projects.

9 CONCLUSIONS AND RECOMMENDATIONS

The program is actively meeting the challenges it faces in its implementation of a program that previously was implemented by a third-party contractor, its development and delivery of new and innovative program components, and its management of risks posed by cancelled and stalled projects. This is a forward-looking evaluation that describes the effectiveness of the program's strategies, tactics, and processes to deal with these challenges, and the evaluation offers recommendations to improve and strengthen these efforts.

The following discussion organizes our conclusions and recommendations around three general areas related to program coordination, which is affected by the way the program develops the market, project coordination, and information and risk management. The tables at the end of this chapter summarize topics in greater detail.

MARKET AND OPPORTUNITY DEVELOPMENT

This evaluation documented key activities performed by program staff and PDCs to develop the market in terms of broadening the program's promotional and sales channels, and the tactics implemented to ready customers to participate in the program's offerings. Activities at this level improve the ability of the program to coordinate between the program's implementation and delivery and successfully drive project volumes.

- ***Conclusion:*** **The program was effective at developing sales-focused program roles and implementing frameworks to oversee program activities**, achieved through: well-defined PDC roles, savings goals specified in PDCs contracts, and program supplied marketing collateral. Continued program oversight is effective at maintaining and improving PDCs sales approaches. This oversight is evident in the specialized PDC outreach roles recommended by the program to PDC firms, and monthly meetings between the ITSP manager and PDC firms to review project status and progress toward goals. Some PDCs mentioned difficulty describing to customers the involvement of ATACs, ITSPs, and trade allies across the program's offerings.

  Recommendation: **The program should develop additional materials to help PDCs explain the organization of the program's offerings around different program partners' roles, especially as offerings change.**

- ***Conclusion:*** **PDCs are effective at expanding the program's sales channel by enlisting trade allies and working with utility account managers**; PDCs enlisted 21 SI and agricultural trade allies, 228 lighting trade allies, and nine motor service centers to help deliver the program; additionally, PDCs leverage existing relationships between utility account managers and industrial customers.

➡ ***Conclusion:*** **The program is effective at involving customers in the initiation of energy projects**, achieved through: the program's market-wide strategy to increase customers' focus on energy through an industrial focused newsletter and support of the Oregon Leaders Award, development of a customer focused sales approaches designed to target customers with the right offering, and implementation of SEM components that help drive corporate level involvement down to facility level energy decisions.

SUPPORTING PROJECT IMPLEMENTATION

This evaluation documented the strengths and issues experienced by program partners who implement projects, and the practices involved in projects hand-offs between program partners. The strengths and weaknesses of the project hand-off processes affect the overall timeliness of projects.

➡ ***Conclusion:*** **PDCs are satisfied overall with Custom Capital and O&M tracks' processes, and mentioned a few suggestions**. PDCs rarely mentioned difficulty working with ATACs on these projects; most challenges concerned ATACs timely completion of TASs and PDCs' lack of a mechanism to support timely completion. A few PDCs mentioned difficulties identifying which program track measures customers are eligible for.

Recommendation: **The program may consider revising their contracts with ATACs to include authority of PDCs to oversee timeliness of ATACs' work, and revising materials it uses to describe measure eligibility by program track.**

➡ ***Conclusion:*** **ITSPs are generally satisfied with the program's support for their activities, and mentioned a few suggestions:** ITSPs value PDCs involvement during project initiation and closeout, and some ITSPs would like additional technical support from PDC. ITSPs associated with natural gas O&M components suggested that some PDCs lack the natural gas background necessary to deliver quality scoping studies of gas opportunities.

Recommendation: **The program should continue restricted PDC technical support of ITSP-led projects to ensure participants are actively engaged in training; the program may consider implementing more detailed natural gas scoping procedures.**

MARKET ASSESSMENT

The evaluation documented the progress the program is making relative to the technical potential of the industrial sector and key industries within this sector.

➡ ***Conclusion: The program is delivering savings at an aggressive rate compared to its technical potential; at the program's current rate it will deliver 100% of 20 year technical potential in less than 14 years.***

- ***Conclusion:* 'Low and no cost' O&M and SEM measures are helping industries to overcome financial constraints to energy projects.** Thirty-two percent of program savings during the evaluation period (an economic recession) were delivered by these types of measures. Many of these program components were in pilot phase.

- ***Conclusion:* Technical savings potential from high-technology industry is more significant for Energy Trust's service territory (20% of total potential), than it is for the rest of the northwest region (2% of total potential).**

- ***Recommendation:* The program may assume a strong leadership role within the region** related to the development and promotion of energy efficiency markets and initiatives focused within the high-technology industry.

INFORMATION AND RISK MANAGEMENT

The program's management and analysis of information helps it to moderate its exposure to risks posed by cancelled and stalled projects. The evaluation investigated the information systems used to track project and customer data, the forecast reporting made from these systems, and the decisions made from these reports.

- ***Conclusion:* The program implements effective quality assurance practices**, achieved through: triple review of project information entered into project databases, and review of project information by program partners.

- ***Conclusion:* The project tracking databases and business intelligence framework used by the program do not fully support the program's needs**, caused by data-systems that are not designed to track customer level opportunities, PDC activities, and program track data, which the program needs to make implementer level judgments of the programs progress.

  ***Recommendation:* Energy Trust may consider developing data systems specific to the program's needs**; database should include backend structure to port standardized data into Energy Trust's main project tracking databases.

- ***Conclusion:* The program is making progress toward moderating risks posed by cancelled projects**, achieved through: improving forecast through assumption based models, developing dashboards summarizing the program's project pipeline, and introducing low cost and program partner implemented offerings, which have lower probabilities of project cancelation.

Table 7: Marketing and Opportunity Development

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
	DEVELOPING SALES CHANNELS		
Program's Sales Channel Development Activities	Program roles clearly defined and understood Program marketing effectively supports sales processes Program oversees PDC activities, gives feedback to help improve	PDCs have difficultly explaining program partners' involvement to customers across different offerings PDC confusion over which program track (O&M versus capital) measures are incented under	Program may consider developing materials to help PDCs when they describe program tracks to customers Program may consider developing spreadsheet tools that help PDCs understand which program component measures are incented under
PDC Sales Channel Development Activities	Diversified PDC staffing to include outreach capabilities Enlisted 21 SI & agriculture TAs, 228 lighting TAs, and 9 motor service centers Engaged utility account managers to help promote program to large customers	No challenges noted	
Customer Involvement Activities	Program implemented market-wide strategy to increase energy focus via: industrial newsletter and Oregon Leaders Award SEM components drive corporate level involvement in energy down to facility level Program developed customer-focused sales strategy targeting program components to customers' business and technical situations	PDCs in process of adopting customer-focused sales strategy; however, some PDCs are less discriminating in targeting customers with the right program component	Program should continue reaffirming strategic sales approaches with PDCs in quarterly meeting and in monthly meetings with ITSP manager

Table 8: Supporting Project Implementation

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
PDCs' Experiences with Custom Capital and O&M Projects	PDCs report most projects' coordination with ATACs going well	PDCs lack mechanism to ensure ATACs deliver TAS on time Challenges determining types of customers' labor costs covered by O&M incentives Site level opportunities difficult to fund under program's incentive structures Use of email to send participants' workbooks and track activities causes PDCs to spend additional administrative time Some PDCs unsure which types of labor hours incented by program; have challenges verifying customers' labor costs Some PDCs interpret that measure cost-effectiveness must be calculated in relation to a single system and so ignores benefits to additional systems, effectively penalizing projects with interactive effects	Program may consider revising contracts with ATACs to include provision allowing PDCs to oversee ATACs TAS timelines Program may consider producing documents explaining the labor costs covered by O&M incentives Program may review cost-effectiveness test formulas to help capture site level opportunities Program could use SharePoint to manage participants' workbooks and administrative tasks Program may consider publishing standardized labor hour rates (ex: journeyman electrician) or caps to rates Program should clarify the estimation of cost-effectiveness when interactive effects are present and the required documentation in these situations

Continued

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
ATACs' Experiences Implementing TAS	Implementation process well defined and understood ATACs appreciate technical expertise PDCs offer during review of TAS report	ATACs concerned RFPs and scoping studies prevent them from targeting additional savings ATACs concerned over multiple TAS report revisions ATACs concerned they are not receiving feedback from program concerning uptake of recommended measures ATACs sometimes not included in PDC meetings with customer to initiate the TAS phase; concerned customers' expectations sometimes inappropriately set in these meetings ATACs have difficulty receiving equipment quotes from vendors—vendors more responsive to customers ATACs need customers' utility rate schedules for their analyses work ATACs occasionally discover savings opportunities not included in TAS scope; believe program lacks funding mechanism to pursue additional savings opportunities	Program may consider allowing ATACs to contact PDCs for additional information when ATACs draft their TAS proposals PDCs may review TAS drafts to ensure reports developing correctly Program may develop reporting to inform ATACs on uptake of recommended measures Program may consider including ATACs in PDC meetings with customers to initiate the TAS phase, to minimize potential for inappropriate expectations and customer dissatisfaction On TAS projects for which specific equipment is targeted, PDCs could work with customer to obtain vendor bids in support of ATACs' cost projection work Program could provide ATACS with customers' utility rate schedules Program may consider providing contingency funds, and process for accessing funds, for ATACs to study savings opportunities not specified in TAS scope

Continued

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
Small Industrial and Agricultural	Program component very important to TAs' businesses Program incentives important to selling projects Program marketing material very helpful to TAs PDCs very helpful promoting program and maintaining savings calculators	BETC changes slightly impacting half of TAs' project volumes Seasonal variation in rainfall causes difficulty estimating irrigation energy savings TA concern over energy persistence from O&M processes relying on seasonal employees, language barriers	Program may work with TAs to develop sales and marketing strategies addressing BETC changes Program may revise energy calculators to control for variations in rainfall Program may consider producing language-independent signs, or pictograms, demonstrating O&M procedures
Lighting	Program significantly helps to sustain TA businesses by increasing project sizes Program's marketing and referrals drive additional business for TAs	LEDs ballasts damaged by surges from poor power conditioning by industrial customers A few TAs concerned PDCs' work with customers lead to misunderstandings about project costs and work for complex projects	Program may investigate prevalence of industrial power surges effects on program incented measures Program may train PDCs how to advise customers about potential lighting projects without indicating specific project costs or technical routes
Green Motor Rewind	Association with Energy Trust brand elevates service centers' brands Service centers value interaction with Green Motors Practice Group	A few services centers have decreased project volume, caused by economy and increased motor longevity from Green Motor Rewind services	No suggestions offered
ITSP Lead	Some PDCs overseeing project development to ensure hard-to-get savings included PDCs heavily involved during project initiation and closeout Program restricts PDC technical assistance in order to ensure participants learn to perform O&M	A few ITSPs concerned that important site information is not captured on scoping reports Some ITSPs suggested increased technical support from PDCs would be helpful Some ITSPs noted inadequate scoping by PDCs of natural gas O&M opportunities	Program may consider including 'check-boxes' or similar uniform elements in scoping reports targeting key ITSP lead project Program should continue restricted PDC technical support to help ensure participants learn O&M procedures Program may consider training PDCs so they can more adequately scope natural gas O&M projects

Table 9: Market Assessment

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
Overall Program Savings Progress	Program delivering savings at an aggressive rate; at current rate will deliver 100% of 20-year technical potential in less than 14 years Program delivering high volume of savings during economic downturn affecting most of Oregon's industrial sector	No challenges noted	
SEM Pilots	'Low and no cost' O&M and SEM pilots delivering savings in industries experiencing financial difficulties; 32% of program were delivered by these types of measures	No challenges noted	
Industry Specific Program Progress	Program achieved relatively high proportion of savings from wood products and food processing industries; SEM and O&M projects delivered 45% of savings from economically constrained wood products industry	Savings delivered from high-tech relatively lower than potential (has highest technical potential and third highest savings delivered); industry had significant financial constraints High-tech industry more significant to Energy Trust service territory (20% of technical potential) than to rest of northwest region (2% of technical potential)	Continue 'low and no cost' O&M and SEM strategies with financially constrained high-tech. Program may act in strong regional leadership role to help develop energy efficiency market in high-tech; may help to overcome possible region-wide lack of focus on this industry

Table 10: Information and Risk Management

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
Quality Assurance	PDCs and trade allies review data quality Program employs triple review process of each project's data Energy Trust's accounting department audits all projects over $2,000	No challenges noted	
Data Systems	Standardized system supports planning and budgeting activities across the organization	Standardization incompatible with program track level data used by program team Lack functionality to adequately track project development and staging Systems do not track savings opportunities from scoping reports, needed by program for customer level strategy Current database documentation of reasons for project abandonment are weak Available project documentation indicates "no qualified savings" as the reason for cancellation of some projects in the Offer and Implementation phases	Energy Trust may consider developing a separate database focused on the program's implementation needs; database should include backend structure to port standardized data into FastTrack Program may want to add a multiple-choice field and a notation field to capture reasons for project abandonment for subsequent analysis Program may want to explore further the reasons for the cancellation of Offer and Implementation projects recorded as "no qualified savings"
Forecast Reporting and Analysis	Employing dashboards to monitor progress toward goals Improving forecast accuracy through use of factor-based assumption modeling Enhancing forecast assumption models through improved PDC project status reporting	Business Intelligence framework incompatible with program's needs. BI system tracks implementer's activities; program needs to track PDCs Energy Trust reliance on forecast estimates of necessarily low accuracy increases risks to program from decisions informed by these estimates	Energy Trust may consider development of custom BI platforms for the program Program and Energy Trust may want to include supplemental information and indicators to frame their decisions concerning regulation of program activities toward goals

Continued

AREA	KEY STRENGTHS	CHALLENGES	SUGGESTIONS
Risk Reduction Strategies	Introduced low/no-cost program components overcoming customers' capital instability Added program components with shorter timelines Increased components implemented by ITSPs, as compared to heavy reliance on customers' staffs Offered incentive bonus for timely O&M project completion Integrated offerings targeted at customers with prior program experience	Economic contraction threatens stability of project pipeline through facility closures, reduced customer capital allocations, and industrial employee layoffs Difficult for program to understand causes of project cancelation because data elements used to track reasons for cancelation lack rigorous structure or consistent input from PDCs	Program may consider implementing pilot components in industries with more stable economic contexts To help program track and manage causes for project cancelation, program may require PDCs to use a standardized code list in project tracking systems to indicate reasons for project cancellation
Measuring Customers' Program Experiences	Quarterly Fast Feedback survey measures customer satisfaction Funded market research describing market barriers and participants' program experiences	No challenges noted	

APPENDICES

A MARKET ASSESSMENT SUPPLEMENTAL & MARKET TRENDS

READER'S NOTE

Many of the data sources we used to estimate system and industry potential have some biases. We were careful to call out these biases wherever possible. In many instances, regional initiatives undertaken to estimate energy usage were influenced by industry or system specific research needs.

STRATEGIC FRAMEWORKS

This section describes the program's market potential by industry, key industry factors that may impact the program's implementation, savings opportunities by measure category, and broader changes to regulatory initiatives and industry standards influencing market decisions toward energy efficiency.

Market Potential by Key Industries

Over the past seven years, the industrial sector has become more important to utilities and sponsors of energy efficiency programs throughout the northwest. The Council estimated that industrial energy efficiency potential grew from 350 aMW in the 5th Power Plan, to nearly 730 aMW in the 6th Power Plan.[31] Despite national decreases in industrial output,[32] Pulp and Paper facilities continue to dominate the northwest industry in terms of both energy consumed and energy efficiency potential. Similarly, energy savings potential in Energy Trust territory increased from an estimated achievable potential of 189 aMW in 2008, to 201 aMW in 2012.

In addition to demonstrating the significant savings contributions the program can make to the region's industrial efficiency efforts, the figure also demonstrates markedly different proportions of savings potential between the same industries in Energy Trust's territory and the rest of the region. This difference can be explained by the dominant presence of 'chip fabs' (computer microchip fabricators), as well as a high concentration of metal manufacturers and foundries. The high consumption of energy from chip fab manufacturers led Energy Trust to perform additional technical potential studies in the high-tech industry and it included these findings in its resource assessment. Energy Trust included more chip fab measures in its resource assessment than were included in the 6th Power Plan.

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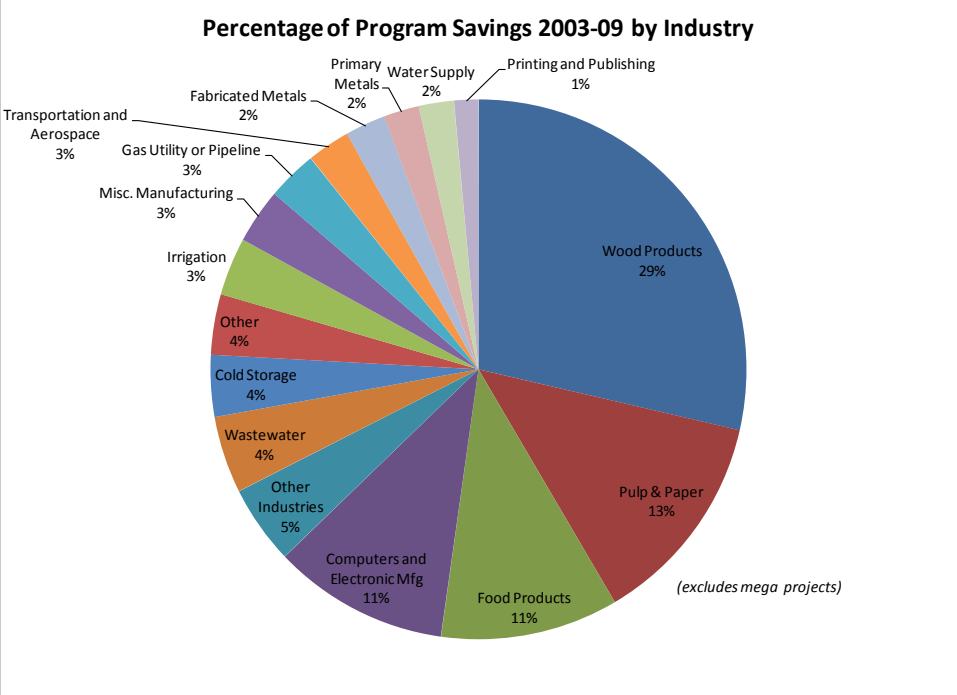
31 Grist, C. 2010. *Commercial Sector Opportunities 6th Power Plan*, Presentation to NEEA.

32 Russell, C., & Young, R. 2012. *Understanding Industrial Decision-Making*. ACEEE.

Energy Trust's key industries are high-tech chip fabrication, pulp and paper, wood products, and food processing; these industries control over half of Energy Trust's industrial savings potential and have a combined 115 aMW of technical potential. Figure 18 demonstrates the proportion of the program's historic savings by contributing industries; the proportion of savings is greatest from the wood products, pulp and paper, food processing, and computer and electronics industries.

Figure 16: Percent of Program Savings by Industry, 2003-2009[33]



Key Market Factors

Industrial companies are particularly sensitive to broader economic trends and often react to these trends in ways that affect their ability to participate in energy efficiency initiatives. In the face of economic downturns, these companies often respond by reducing their levels of production, which in turn leads them to reduce their labor hours and defer capital investment plans. However, the ability of industrial companies to implement energy efficiency projects often requires additional staffing and capital outlays.

Nationwide industrial capital investment in new equipment has varied significantly by industry over the past 10 years,[34] based on a survey conducted by the U.S. Census Bureau. Table 11 provides a list of industries that are relevant to Energy Trust programs.

[33] Crossman, K. E. 2010. *Industry and Agriculture Sector 2011-2015 Planning Summary.*

Table 11: National Average Annual Percent Change in Capital Investment by Industry, 1998-2009

INDUSTRY	CAPITAL INVESTMENT, NEW EQUIPMENT
Hi-Tech	-9.3
Pulp and Paper	-6.6
Primary Metals	+5.1
Fabricated Metal Products	-2.6
Wood Products	-2.1
Food/Beverage/Tobacco	+3.2
Transportation Equipment	-3.6
Chemicals	-0.7
Misc	+6.6

Savings Opportunity by Measure Categories

For this chapter, we categorize energy efficiency measures into three categories, using definitions outlined in the 6th Power Plan:

- Capital Projects – includes discreet equipment upgrades
- Operations and Maintenance (O&M) Improvements– includes lower cost equipment replacement/improvements done in conjunction with demand side management and retro-commissioning improvements
- Strategic Energy Management (SEM) – includes improvements made by the systematic adoption of management practices

Although Capital Projects and some O&M have been included in Energy Trust's conservation assessments for many years, 2010 marked the first conservation assessment that included energy management measures for the industrial sector.

Capital Projects

Capital Projects include the replacement of discrete components, including motors, fans, pumps, and chillers. It does not include the optimization or tuning of systems or changes in the operating conditions of equipment or systems. The 6th Power Plan categorizes measures by 'cross cutting,' meaning that they apply to many industries, and 'industry specific,' meaning that measure applies to only one industry. One example of a cross cutting measure is lighting, which is found in any type and size of industrial plant; while an example of an industry specific measure is mechanical pulping, found only in the pulp and paper industry. This section summarizes the

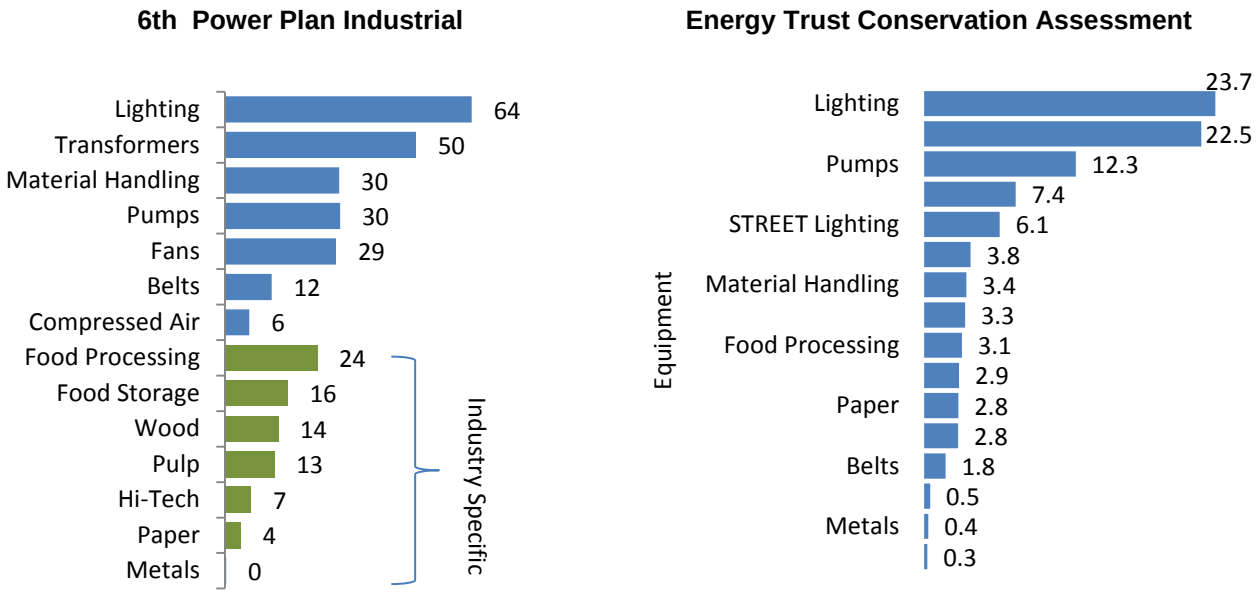
[34] Russell, C., & Young, R. 2012. *Understanding Industrial Decision-Making. ACEEE.*

savings potential from capital measures across the region and within the program's service territory.

Savings Potential

Across the region, the 6th Power Plan lists lighting, transformers, material handling, pumps, and fans as the highest potential cross cutting equipment types. Food processing and food storage control the highest industry-specific savings potential, largely because of refrigeration equipment measures. Energy Trust's 2010 Conservation Assessment lists lighting, as well as hi-tech specific equipment upgrades, as the top measures by far, with over 20 aMW of potential by 2030. Pumps, fans, and compressed air comprise the next largest capital measures. Comparisons between these figures demonstrate variation in the types of Capital Project potential between the region and the program's service territory. Industry specific measures for high-tech figure more prominently in the program's service territory.

Figure 17: Comparison of 6th Power Plan Industrial Capital Measures Potential With Energy Trust's Conservation Assessment Industrial Capital Measures Potential (aMW)



Code Changes

In the short term, Energy Trust's industrial offerings could be affected primarily by upcoming changes to national motor codes; this evaluation did not address changes to federal efficiency standards for light fixtures. Although the motor code changes do not represent a significant modification to Energy Trust's program, they set a precedent for possible future changes in other equipment that Energy Trust should watch.

The US DOE is expected to make updates to motor standards covered by the Energy Independence and Security Act of 2007. These updates will most likely be completed in 2013 and take effect in 2015. US DOE is expected to follow the recommendations of a group of joint stakeholders, including ACEEE, the Appliance Standards Awareness Project (ASAP), Earthjustice, Natural Resources Defense Council (NRDC), Alliance to Save Energy (ASE), NEEA, Northeast Energy Efficiency Partnerships, and Council.[7] In the short term, this legislation will seek to remove the "loopholes" that exist in the current motor standards (such as the exclusion of larger motors, advanced motors and "special purpose" motors). In the future, the standard could look at "extended products" (systems), modeled on European standards. Below are the short-term updates recommended by the group of joint stakeholders.

Table 12: Anticipated Motor Code Changes[35]

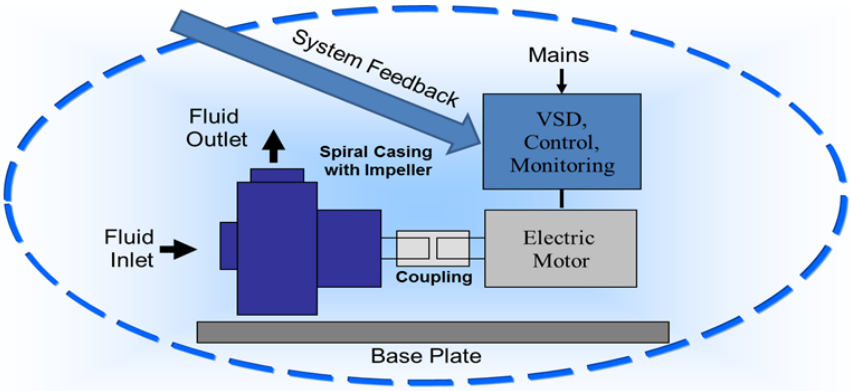
MOTOR TYPE	EISA-2007 STANDARDS	JOINT STAKEHOLDERS' RECOMMENDATIONS
General Purpose Electric Motor Subtype I (EPAct 1992 motors) 1- 200 hp	NEMA MG-1, Table 12-12	Unchanged (but extend the application of Table 12-12 standards to motors up to 500 hp)
Fire pump electric motors 1-500 hp	NEMA MG-1, Table 12-11	Unchanged
General Purpose Electric Motor Subtype II (EISA 2007 configurations) 1-200 hp	NEMA MG-1, Table 12-11	Except for U-frame motors, increase efficiency to NEMA MG-1, Table 12-12 (and extend the application of Table 12-12 standards to motors up to 500 hp)
U-frame motors	NEMA MG-1, Table 12-11, as included in Subtype II	Unchanged, but would now include U-frame motors up to 500 hp
NEMA Design B General Purpose motors, 201 – 500 hp	NEMA MG-1, Table 12-11	Increase efficiency to NEMA MG-1, Table 12-12
Other single-speed polyphase continuous duty (MG1) or duty type S1 (IEC), squirrel-cage (MG) or cage (IEC) induction electric motors previously excluded, including definite purpose, special purpose, '56' frame size motors that are not "small electric motors," 1-500 hp	Excluded and not regulated	Would now be covered at NEMA MG-1, Table 12-12.
Liquid-cooled electric motors; submersible electric motors; air-over electric motors; integral brake electric motors	Excluded and not regulated	Would remain excluded and not regulated

[35] Hydraulic Institute et al. 2011. *US DOE Docket No. EERE-2010-BT-STD-0027.* Retrieved November 29, 2012, from Regulations.gov: http://www.regulations.gov/EERE-2011-BT-STD-0031

Capital Measures Voluntary Standards

Pump voluntary standards have the potential to affect Energy Trust's program significantly, as pump measures represent nearly 13% of Energy Trust's Capital Project potential in the industrial sector. Voluntary standards for pumping equipment being developed by the Hydraulic Institute are being modeled after European standards[36] and could, in the long term, form the basis for a US mandatory standard on pumps. We learned from market interviews that this standard is focused on broadening the definition of pumping equipment into a concept called the "extended product." The extended product is not only the pump itself, but includes the pump's motor and drive, as well as the feedback loop. According to estimates from the British Pump Manufacturers Association,[37] the extended product accounts for nearly 50% of the savings potential in pumping systems across Europe. The Hydraulic Institute is collecting data to come up with a clear definition of the extended product and how it relates to energy savings. This approach can form a bridge from pump Capital Projects to pump O&M projects, which, combined, have a potential of 33 aMW.

Figure 18: European Definition of Pump Extended Product[38]



Program Market Structure

Energy Trust offers Capital Project resources through three internally defined tracks: Custom Track, Calculated Track, and Prescriptive Track.[39]

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36 Chittum, A., Rogers, E., & Tromley, D. 2012, September 5. *How National Codes May Affect Industrial Energy Efficiency Programs*. (S. Dias, Interviewer).

37 Schofield, S. 2010. *Product, Extended Product and Systems Approach Developments within the Pump Industry across Europe*. Retrieved November 29, 2012, from Motor Summit: http://motorsummit.ch/data/files/MS_2010/ms_int_10/13_schofield.pdf

38 Ennenbach, F. 2011. Presentation @ EEMODS 2011 - "*A general approach for motor driven products – Efficiency evaluation of pump units*".

39 Crossman, K. E. 2010. *Industry and Agriculture Sector 2011-2015 Planning Summary*.

- Custom Track
- Calculated Track
- Prescriptive Track

Table 13 summarizes the program delivery approaches and related sales approaches structuring each of these three program tracks.

Table 13: Program's Market Structure by Program Track

	CUSTOM TRACK	CALCULATED TRACK	PRESCRIPTIVE TRACK
Offering			
Incentive	√	√	√
Technical resources	√		
Assessments	√		
Primary Outreach and Sales Approach	PDCs	Trade Allies	Trade Allies
Consultant Base	30 FTE PDCs, 22 ATAC Firms	21 Trade Ally Firms	21 Trade Ally Firms
PE Program Role	Provide technical expertise and project funding to companies	Provide support to trade allies and project funding to companies	Provide support to trade allies and project funding to companies

Discussion

The expected upcoming changes to motor standards may slightly erode the program's savings potential in the Capital Projects category. However, since motors historically make up 1% of total savings, the change is not likely to be significant.

The concept of an 'extended product' enables Capital Projects to set up enhanced O&M processes. Although the standard has not been released, Energy Trust has an opportunity to either engage in its development or use the concepts to provide program support or incentives. For example, Energy Trust could work with the Hydraulic Institute or NEEA to provide data or expertise in the development of the standard. Energy Trust could also arrange its offerings using the terminology and concepts as a way to recruit broader participation and savings in the Capital Projects category.

OPERATIONS AND MAINTENANCE (O&M) IMPROVEMENTS

In the past, O&M improvement measures in energy efficiency programs were typically limited to simple discrete improvements, such as fixing compressed air leak or installing a lighting control system. Recently, more complicated O&M measures, such as system optimization and retro-commissioning, have become more commonplace and have been included in both the 6th Power

Plan and Energy Trust's Conservation Analysis. For the purposes of this report, we used the 6th Power Plan's designation for O&M (see Table 14).

Table 14: O&M Definitions Based on 6th Power Plan

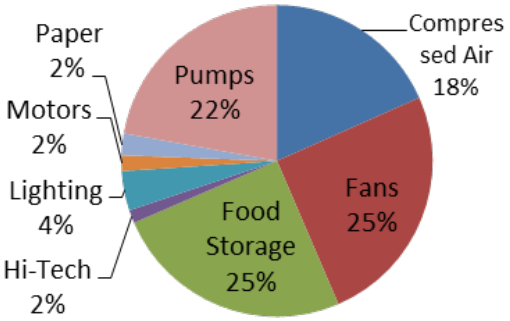
[SYSTEM] ENERGY MANAGEMENT[40]	EQUIPMENT OPTIMIZATION	SYSTEM OPTIMIZATION
A structured system O&M program that relies on well-defined protocols for O&M, demand-side assessments, properly trained system operators, and, where appropriate, adherence to industry standards or certification.	Builds upon the energy management tier by including equipment replacement during times of major repair or shutdown, such as proper equipment sizing, impeller trimming, control valve replacement, and VSD control. Moreover, these improved systems would be assessed and managed in accordance with recognized standards.	The coordinated application of technology-based measures and system design to most effectively match system service to production needs in the most efficient manner possible.

According to the 6th Power Plan, O&M measures make up about 183 aMW, or 25% of the industrial energy efficiency potential in the northwest, with the majority of the potential applying to fans, food storage, pumps, and compressed air. (see Figure 21). represents the aMW savings potentials for O&M activities across the region and within the program's service territory, respectively. Top measures are compressed air demand reduction, pump system optimization, pump energy management, and fan system optimization. Comparisons between these figures demonstrate a relatively larger potential for the program from the compressed air measure, when compared to the rest of the region.

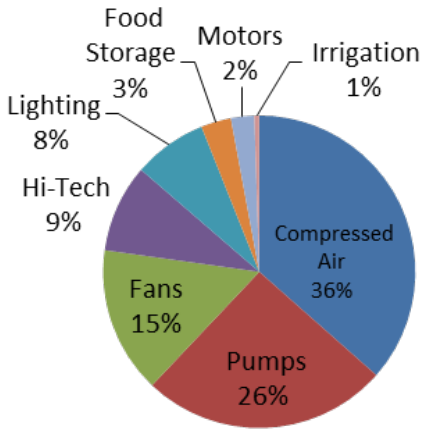
[40] The word "system" was added to the 6th Power Plan's definition by the authors of this report to delineate from "facility" energy management for the purposes of this report.

Figure 19: Comparison of O&M Savings Potential between NW Region and the Program's Territory by System

Northwest Region



Program's Territory



Additional technical studies by Energy Trust concerning compressed air O&M demand reduction led to the greater savings estimate for this measure in the program's territory, as compared to opportunities at the region level. However, higher market concentration around this O&M measure may result in greater collaborative efforts and improved economies of scale within the program's service territory.

Figure 20:- Northwest O&M Potential (aMW)

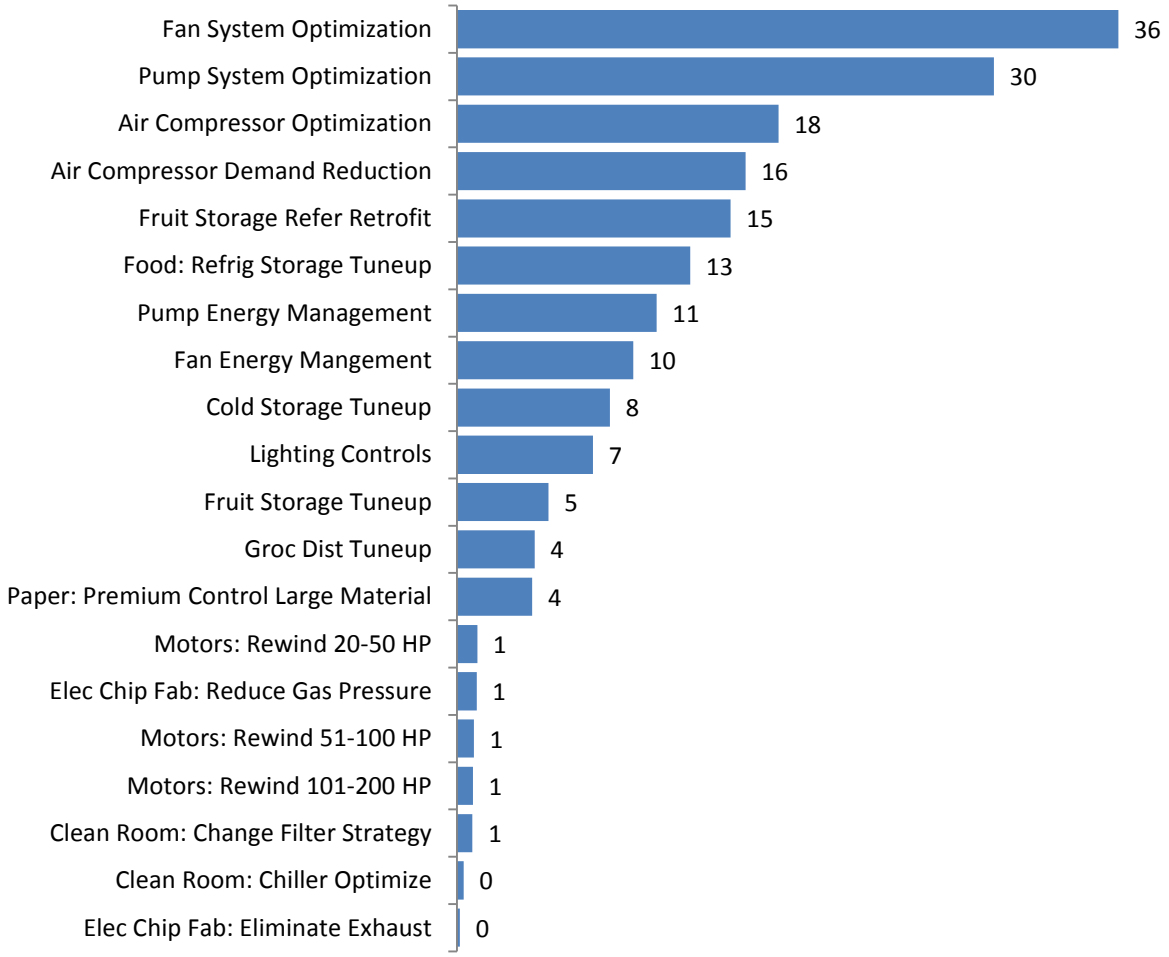
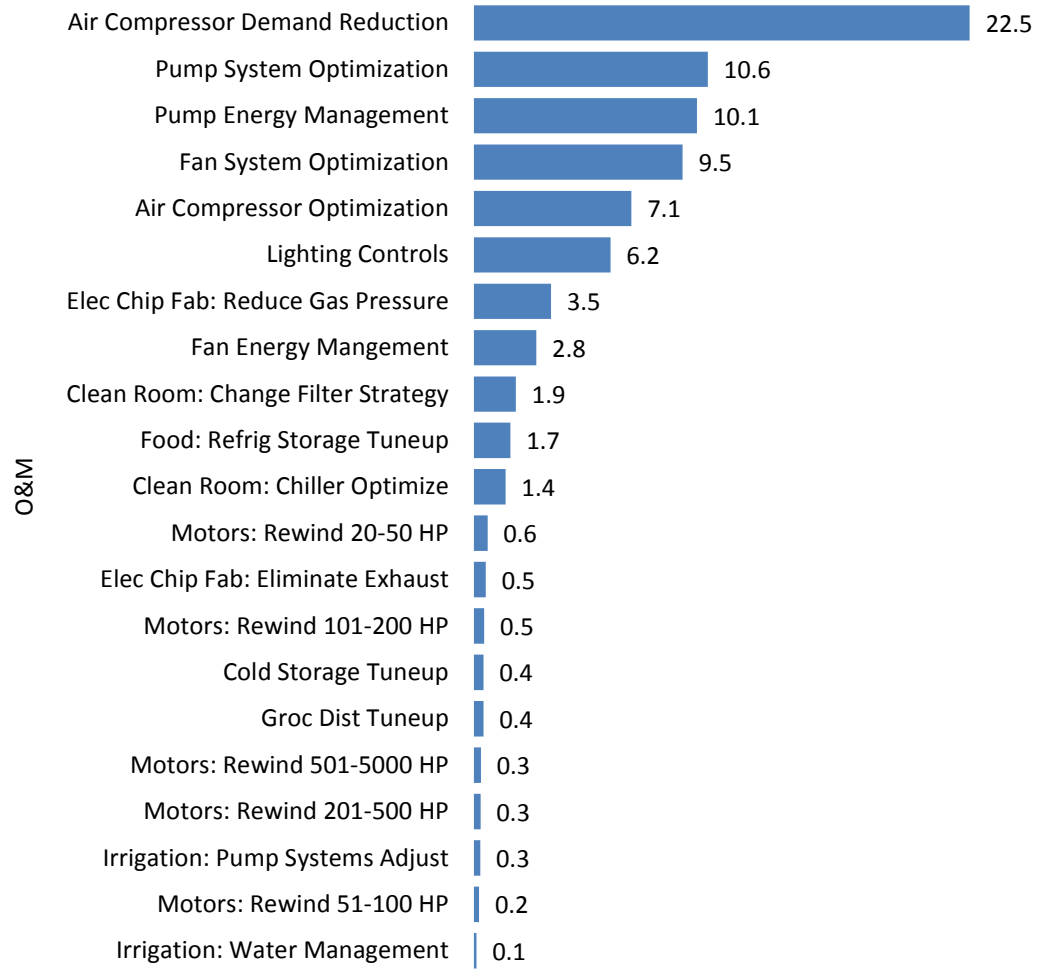


Figure 21: Program O&M Savings Potential (aMW)



In order to see which O&M measure strategies had the highest potential, measures in Energy Trust's Conservation Assessment were classified as one of the following five types: optimization, demand reduction, management, controls, and maintenance and operations. Optimization and demand reduction made up nearly 70% of the O&M potential.

Program's Market Structure

Energy Trust has two internally managed tracks to support these types of improvements, the Custom O&M Track and the Targeted O&M Track. The program's Custom O&M projects are typically recommended by the PDC or the customer. The projects follow processes similar to the custom capital track, but differ in measure life (3 years versus 10 years for capital), incentive ($0.08/kwh versus $0.25 for capital), and maximum incentive (90% of eligible project costs versus 50% for capital).

Compared to Capital Projects, Custom O&M projects tend to have additional challenges: requiring more involvement from customer during project implementation; and defining projects is typically more complex in terms of measuring improvements and the interaction required between the customer and the program.

The program's Targeted O&M track includes support for system assessment and diagnosis, structured protocols for system energy management, and operator training. These projects are pre-defined by the program and customers are recruited by the PDCs. In addition, the program provides coaching and technical support through the implementation of the Targeted O&M project.

Energy Trust currently offers:

- Retro-Commissioning,
- Boiler Tune-up
- Operator Coaching
- Energy Blitz (also known as Kaizen Blitz)

Voluntary Standards

The Hydraulic Institute is also developing a voluntary standard for Pump System Optimization, based largely on its past development of Pump System Optimization Best Practices book. The Institute is targeting the end of 2013 to have the framework for the standard developed, as well as a draft. Because of the large amount of materials already developed, the institute is working primarily on formatting it to be compatible with a standard. The British Pump Manufacturer's Association estimates that a systems approach to energy efficiency accounts for nearly 50% of the energy saving potential in a pumping system.[41]

STRATEGIC ENERGY MANAGEMENT (SEM)

Strategic Energy Management (SEM) is a category recently named by the three organizations currently offering SEM programs in the northwest: Bonneville Power Administration, Energy Trust, and NEEA. SEM is a category that builds on the Council's definition for energy management as "a structured system/plant O&M program that relies on well-defined protocols for O&M, demand-side assessments, properly trained system operators, and, where appropriate, adherence to industry standards or certification," but applies it to facility-level, or whole-plant, programs.

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[41] Schofield, S. 2010. *Product, Extended Product and Systems Approach Developments within the Pump Industry across Europe*. Retrieved November 29, 2012, from Motor Summit: http://motorsummit.ch/data/files/MS_2010/ms_int_10/13_schofield.pdf

The 6th Power Plan defines whole plant measures as:

Table 15: SEM Definitions Based on 6th Power Plan

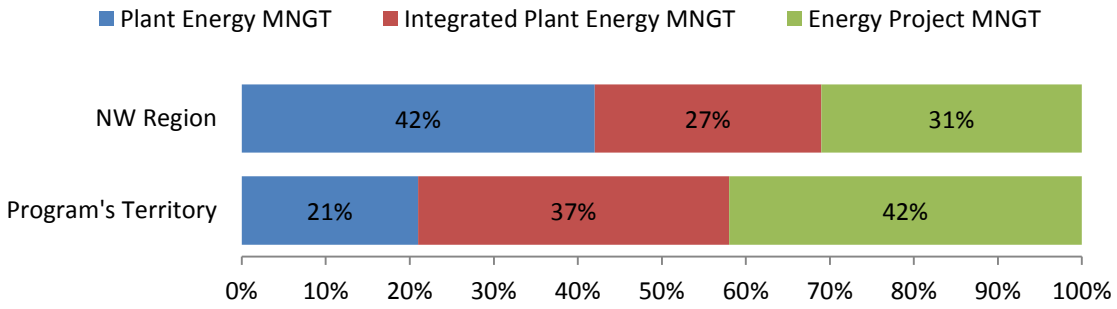
PLANT ENERGY MANAGEMENT (GOOD)	ENERGY PROJECT MANAGEMENT (BETTER)	INTEGRATED PLANT ENERGY MANAGEMENT (BEST)
Includes low/no cost energy efficiency projects for multiple systems that are supported with comprehensive demand-side assessments and good preventative maintenance practices. Maintenance and operations are based on system-specific guidelines and supported by system operator training as noted in the system optimization measure descriptions. This measure also includes low/no cost equipment upgrades for some of the systems.	Is based on a package of optimized equipment improvements, but also includes the assignment of an energy engineer (or equivalent capability), tracking energy costs, identification and prioritization of Capital Projects, application of systems optimization tools and practices on the key systems in the facility. Energy waste is readily identified and mitigated by the energy engineer and his/her team, and the equipment installed under this measure is optimized. From a program perspective, the energy engineer function could be accomplished through other approaches including external support.	Is based on the combination of best practices equipment improvements and a comprehensive plant management program including development and implementation of an energy management plan (policy, accountabilities, goals, department/system level targets and measurements, etc.) to support sustainable improvement of energy intensity and productivity, and independent verification of energy savings. The American National Standard for energy management, or equivalent standards, provides a point of reference for the level of management activity assumed by this measure bundle. This measure bundle could entail plant modernization in order to approximate the performance of higher performing plants currently competing in the international markets. In addition, the management practices increase the likelihood of best practices-based plant upgrades and the persistence of these savings over time. Therefore, the savings are derived from the effective application and operation of the high efficiency technologies, and this is enabled by the management practices.

According to the 6th Power Plan, whole-plant measures make up about 245 aMW, or 30% of the industrial energy efficiency potential, with the majority of the potential coming from Energy Project Management.

SEM Savings Potential

In the program's territory, the technical potential from SEM opportunities is roughly 22 aMW, or 10% of all the technical savings potential in the territory. Figure 24 contrasts proportion of SEM savings potential by measure source between the northwest region and the program's territory. The figure demonstrates that the program will target more savings through SEM measures focused on energy project management than it would if it relied on strategies consistent with regional opportunities targeting plant energy management measures.

Figure 22: Proportion of SEM Energy Savings Potential between NW Region and Program's Territory



The Energy Trust Conservation Assessment uses a similar methodology, but shows facility-level energy management as only 11% of its 20-year potential. This is likely due to the fact that Energy Trust's Conservation Assessment followed the 6th Power Plan's protocols for these measures, which only applied integrated plant energy management and energy project management to the pulp and paper and food processing industries, and was not applied to the chip fab industry, which consumes over a third of the energy in Energy Trust territory.

Program's SEM Market Structure

Energy Trust's SEM components are part of its Custom Project track, and include two types of SEM offerings: SEM offerings and SEM enabling tools.

SEM offerings include:

- The Industrial Efficiency Initiative (IEI)
- Corporate SEM (cSEM)
- IEI Maintenance
- ISO50001

In addition, the program is piloting an SEM initiative, called CORE Improvement, targeted at smaller manufacturers. SEM enabling tools include:

- Energy Value Stream Mapping (eVSM)
- Energy Information Systems (eIS)

B ENERGY TRUST STAFF INTERVIEW

ROLE

1. What is your role in the program? How long have you held this role?
2. What are your principal responsibilities?
3. What activities do you spend the most time on?

PROGRAM COMPONENTS

4. We'd like to confirm our understanding of the program components, how they relate to each other (the tree diagram), terminology for referring to the different types of components (ex: "component," "pilot," "initiative," "offering"), roughly when it launched, and briefly what stage of maturity the component is in. Our understanding of the current set of offerings is:

    - Custom Projects (PE implementer-driven)
        - Custom Capital (implemented by PDCs, using ATACs; comprise majority of program savings) – Mature program
        - Custom O&M (Implemented by PDCs, using ATACs) – Early program (not pilot)
        - Targeted O&M
        - SEM (Strategic Energy Management) (implemented by ITSPs, coordinating w PDCs)
    - Trade-ally Driven, (Mostly) Non-custom
        - Lighting (supported by NWLTAN) – Mature program
        - Small Industrial – Early program (pilot complete)
        - Prescriptive – Electric: mature program; gas: early program
            - ☐ Calculated – Electric: mature program; gas: early program
        - Green Rewind (delivered through participating motor service centers) – Early program
        - Some custom, including O&M – Mature program

5. What were the key takeaways from the evaluations of KB, IEI, and SES, and what changes, if any, did you make (are you planning to make) to these components?
6. Let's talk about the market response to the components – your brief general assessment of whether participation is meeting your expectations, and what the market (customers, trade allies) likes or doesn't like about it.

a. Capital
b. O&M
c. IEI
d. KB
e. Corporate SEM
f. Boiler tune-ups
g. SES
h. Prescriptive
i. Calculated
j. Small industrial
k. ISO 50001
l. SI SEM
m. Retrocommissioning
n. ROC

7. What changes are you considering/ embarking on?

   a. Consolidations/ Revisions?
      i. Capital
      ii. O&M
      iii. IEI [if not discussed]
      iv. KB [if not discussed]
      v. Corporate SEM
      vi. Boiler tune-ups
      vii. SES [if not discussed]
      viii. Prescriptive
      ix. Calculated
      x. Small industrial
      xi. ISO 50001
      xii. SI SEM
      xiii. Retrocommissioning
      xiv. ROC
   b. New pilots?

8. O&M was mentioned in the kick-off meeting as worthy of documenting its history. Is there anything we haven't covered that is pertinent to this?

9. Tell me about how the Ag Initiative is shaping up? In the kick-off meeting, reference was made to "the entire Ag touch is different than for non-Ag."

PROGRAM DESIGN / ROLLOUT ACTIVITIES

10. We understand that last February the team launched eight pilots. What was your role in these?

11. Can you describe the design and launch activities generically – the basic outline? Then we can delve into differences by pilot. [If not addressed, ask:]

    a. What are sources for your ideas?
    b. How do you decide what to go forward with?
    c. How do you involve, if at all, the PDCs and ITSPs during the conceptualization phase?

12. Once you have the concept, what needs to be done to create an offering? [Probe as relevant]

    a. Target market / customer eligibility
    b. Defining the efficiency measure / action (what is "it"?)
    c. QA/QC needed
    d. How will it be delivered in the market / who will deliver it / how inform the market
    e. Website support
    f. Marketing collateral

13. How is staff organized to do this? (ex: matrix organization? If yes, what are the rows and columns?)

14. Very roughly, what have you experienced as the timeframe (or time range) needed to go from the sparkle in your eye to a customer offering?

15. What are the most difficult aspects of creating an offering?

16. What worked well about your pilot development approach (your activities, not market response)?

17. What lessons did you learn about what not to do, or in what ways are you planning to do it differently?

18. Have you had a chance to consider the findings of the March market research report and, if so, what do you consider to be the key takeaways, if any?

    a. How might these findings inform your activities?

19. Are there any sectors or project types or whatever for which you are currently trying to garner increased efficiency uptake?

PROGRAM PARTICIPATION STEPS

Custom Program

20. Briefly, what are the steps for custom program participation? What are the names of things? (scoping study, ATAC study, Form 421(?)…) *[interviewer to prep by reading 2007 PE process evaluation*

21. Are there recurrent problems with any of these steps, in terms of accuracy, completeness, ease of getting the step accomplished?

22. What would you say are the decision points of customers throughout the participation process, from first contact (or renewed contact) with the program through a completed project through multiple and comprehensive projects? We will be exploring these decision points in our survey of custom project participants, and so want to be consistent with your thinking.

Prescriptive, Calculators

23. Briefly, what are the steps for prescriptive and calculated savings measures? What are the names of things?

24. Are there recurrent problems with any of these steps, in terms of accuracy, completeness, ease of getting the step accomplished?

Energy Management Pilots, Initiatives

25. I understand each of the pilots has its own steps and activities. Let's discuss the most important. What commitment do customers make to IEI and KB *[interviewer to prep by reading pilot evaluations]?*

    a. Have any customers backed away from their commitments?
    b. [If yes] How have you responded?

26. Are there recurrent problems with any of these steps, in terms of accuracy, completeness, ease of getting the step accomplished?

27. What are the objectives of, and the steps for:

    a. Small Industrial
    b. SI SEM
    c. ISO 50001

28. IEI, ROC, RCx:

    a. How is each working?

b. What are you considering in terms of mainstreaming them?
c. What hand off currently occurs with PDCs, and what do want to see happen?
d. Have you taken any steps with PDCs to foster this?

29. In the kick-off meeting, the comment was made that "IEI is a year-long trust building exercise; demonstrating success with other facilities. It takes a long time within a firm and across firms. Many years." Do you have metrics – quantitative or qualitative – that you are using to assess the success of this trust-building exercise?

    a. Explore metrics both collectively for IEI and individually for each participant.

30. Are there any other pilots we should be discussing at this point?

ACCOMPLISHMENTS OF SELECTED PILOTS, NEW INITIATIVES

31. How has been the market response to:

    a. Small Industrial
    b. SI SEM
    c. ISO 50001

32. What are you considering for data centers?

    a. Where are you in the program planning process?
    b. What are the next steps?
    c. Who has what roles in this process?

PROGRAM EVOLUTION AND CURRENT STATUS

In-House Implementation (and Some Delving into Implementation Contractor Activities)

33. There have been many changes in the program since the last PE process evaluation in 2007. Let's discuss the organizational changes before discussing the program components and pilots. You transitioned from outsourcing overall program-wide implementation to in-house implementation. What's the current configuration of your team?

    a. When was your most recent hire, into what position?
    b. Do you feel a need for additional staff at this time?
        i. (if yes:) To serve what role?
        ii. Are you free to hire?

34. Were you on the team when it took the program in-house, or did you join subsequent to that?

a. [if on team then] In hindsight, what challenges with the transition stand out in your mind, and how did the team address them?

35. What are the advantages to managing the program in-house?

a. What are the ongoing challenges, if any?

PDCs

36. What is your involvement with PDCs, if any?

37. Is our understanding correct on the PDCs, as follows?

a. Cascade Energy – Small Industrial; Pulp and Paper
b. Nexant – High Tech (microchips and other fabs); Bend area
c. RHT – Southern Oregon up to PGE service territory
d. PGE – ??
e. Evergreen – Lighting
f. (water and wastewater have been dispersed; do not have a PDC or in-house person)

38. What is the length of the PDC contracts?

39. Have you contracted with new PDCs in the past two-to-three years? [PDCs in 2007: Cascade Energy, PGE Energy Services, RHT, and a pulp & paper specialist.]

a. [If yes] Are they still ramping up in terms of your expectations?
b. What was the process for selecting the PDCs (RFP?) and how well did that work?
   i. Sufficient number of qualified of applicants?
   ii. Ease of contracting with the applicants?
   iii. Any other issues?

40. Are you anticipating adding any PDCs to the program?

41. What is the nutshell job description for a PDC currently?

a. [Probe as needed] What are the key skills or experience or whatever necessary to be successful as a PDC?
b. Does each firm fully meet your basic expectations? Explain if “no”. (“basic” is used because all firms and individuals have different strengths and weaknesses, and program needs are evolving)

42. How, if at all, would you like to see the PDC role evolving?

a. [If evolution:] What steps are you (considering) taking to foster this evolution?

43. Who at Energy Trust manages the PDCs? (Ray?)

44. How do you manage the PDCs? Requirements, templates, tools for:

    a. Oversight?
    b. Quality assurance steps?
    c. Program reporting?
    d. Custom-project-specific reporting, QC, M&V?
    e. Are there any all-hands meetings?
    f. Are there any variations across the PDC contracts in requirements?
    g. Is there any standardization of the reports they provide to customers?

45. How do you assess customer experience with the PDC, if at all?

    a. [Probe as necessary] How do you know how well the PDC's customers perceive the PDC to be meeting their needs? [And what do you know about this?]
    b. How do you know how well the PDC is "harvesting" the opportunities at each facility? [And what do you know about this?]
    c. How do you know how well the PDC is reaching all customers in its market? [And what do you know about this?]

ITSPs

46. What is your involvement with ITSPs, if any?

47. Is our understanding correct on the ITSPs, as follows?

    a. Cascade Energy – Kaizen Blitz; ROC; Corporate SEM
    b. SEG – Corporate SEM
    c. TriplePoint – Small Industrial IEI; IEI maintenance
    d. ERS – Retrocommissioning
    e. ECOS – BSM
    f. RHT – Boiler Tune-Up (pulled; in re-design)
    g. Steam specialists – Boiler Tune-up (in re-design)

48. What is the nutshell job description for an ITSP?

    a. [Probe as needed] What are the key skills or experience or whatever necessary to be successful as an ITSP?
    b. Does each firm fully meet your basic expectations? Explain if "no". ("basic" is used because all firms and individuals have different strengths and weaknesses, and program needs are evolving)

49. How, if at all, would you like to see the ITSP role evolving?

    a. [If evolution:] What steps are you (considering) taking to foster this evolution?

50. Is the upcoming hire referred to in the kick-off meeting on-board and managing the ITSPs?

51. [If yes, ask both new person and Ray, who formerly did this:] How do you manage the ITSPs?

    a. Oversight?
    b. Quality assurance steps?
    c. Program reporting?
    d. Custom-project-specific reporting, QC, M&V?
    e. All-hands meetings?
    f. Are there any variations across the ITSP contracts in requirements?

52. How do you assess customer experience with the ITSP, if at all?

    a. [Probe as necessary] How do you know how well the ITSP's customers perceive the ITSP to be meeting their needs? [And what do you know about this?]
    b. How do you know how well the ITSP is "harvesting" the opportunities for each customer it works with? [And what do you know about this?]
    c. How do you know how well the ITSP is reaching all customers in its purview? [And what do you know about this?]

ATACs

53. What is your involvement with ATACs, if any?

54. How many ATACs are there now?

55. [Ask Kim or Ray:] The Evaluation Manager told us that some contractors – such as for compressed air – that were ATACs early in the program are no longer in that role, because they wanted to be able to sell and install the equipment as well. You accept custom projects from these contractors with which the program has a long history. Who are they? [Phil said: Rogers Machinery, Compression Engineering, Kaiser ("keezer"), "1 or 2 refrigeration, a steam guy from Vancouver"]

56. When did you last add ATACs? What was the process for selecting the PDCs (RFP?) and how well did that work?

    a. Sufficient number of qualified of applicants?
    b. Ease of contracting with the applicants?
    c. Any other issues?

57. What is the nutshell job description for an ATAC?

    a. [Probe as needed] What are the key skills or experience or whatever necessary to be successful as an ATAC?

b. Does each firm fully meet your basic expectations? Explain if "no". ("basic" is used because all firms and individuals have different strengths and weaknesses, and program needs are evolving)

58. How, if at all, would you like to see the ATAC role evolving?

a. What steps are you (considering) taking to foster this evolution?
b. [If evolution:] What steps are you (considering) taking to foster this evolution?

59. [Ask Ray, who manages the ATACs] How do you manage the ATACs? [Explore processes for, and any standardized reporting]

a. Oversight?
b. Quality assurance steps?
c. Program reporting?
d. Custom-project-specific reporting, QC, M&V?
e. All-hands meetings?
f. Are there any variations across the ATAC contracts in requirements?

60. How do you assess customer experience with the ATACs, if at all?

a. [Probe as necessary] How do you know how well the ATAC's customers perceive the ATAC to be meeting their needs? [And what do you know about this?]
b. How do you know how well the ATAC is "harvesting" the opportunities for each customer it works with? [And what do you know about this?]

Gas Measures

61. About when did you start offering incentives for gas measures?

62. Are there any challenges associated with custom gas measures?

a. Are the number and size of custom gas projects meeting your expectations?
b. Do your program contractors (PDCs, ATACs) give adequate support to gas measures, in your view?

63. What about prescriptive and calculated gas measures – what are the challenges for each of these?

a. Are the number and size of prescriptive / calculated gas projects meeting your expectations? (ask for each)
b. Do customers' contractors (trade allies) give adequate support to gas measures, in your view?

64. Since offering gas incentives, have you introduced any innovations or special efforts to promote gas savings?

a. Are you considering any innovations to promote gas measures?

Utility Interface

65. What are your goals for communicating and working with the utilities?

    a. How is your relationship different with PGE, given that it contracts as a PDC?

66. What utility staff – by role – do you interact with?

67. What communications do you have with them?

68. To what extent, if at all, do you work together, problem solve, etc.?

69. Do you hear from the utilities about their responses to your initiatives? [If yes] What are their concerns?

FINAL COMMENTS

70. What are you hoping to learn from this process evaluation? .

C PDC INTERVIEW

INTRODUCTION

This interview concerns your firms' experiences with Energy Trust's Production Efficiency program. We will discuss the types of activities you perform for the program, people you interact with, and the program's strengths and improvement areas.

Your responses will remain anonymous. Most responses will be reported in the aggregate with responses from other PDC firms we interview.

INTRODUCTORY QUESTIONS

I'd like to begin by understanding a little more about your company and your role as it relates to the delivery of the Production Efficiency program.

1. Please tell me about your firm's responsibilities as a PDC.

2. How long has your firm been a PDC?

3. Please tell me about the activities that occupy the majority of your time, also note what proportion of your typical week is spent on those activities.

4. How does your organization divide the program's delivery activities among staff? And how are activities prioritized?

   [Explore details about any key roles beyond informant's responsibilities]

Program Outreach

We would like to know how your customers learn about the program and its components.

5. First, please tell me about the activities performed by Energy Trust and your firm that you find effective at:

   - Driving new customers to the program [probe: Are customer lists used? How?]
   - Re-engaging customers whose program activities have lessened?
   - Continuing to engage with active customers?

6. What strategies does your firm have for encouraging different types of customers to participate in the program?

   - What program resources and strategies do you use? [Probe: how leverage ITSPs]
   - How does your firm differentiate or target customers?

- How do(did) you use program bonuses? [probe: Kick-Start, 90 by 90, lighting]

7. Energy Trust has several different program components. When you are encouraging customers to participate in the program, would you say there are times when:

   - The variety of program components becomes challenging to explain to customers? [probe: What does PDC do to simplify for customer]
   - There are times when the variety of offerings has been helpful in engaging customers?
   - How do customers with facilities in Energy Trust and BPA territories understand and choose from the variety of program components?

8. Do you interact with any utility companies concerning Production Efficiency?

   - If yes= How do you interact with utilities?

Custom Capital Projects

I would like to know more about your experience with Custom Capital projects.

9. Roughly, what percentage of your firms scoping studies end in completed projects?

   - How is this figure tracked?
   - Are there things your firm does to improve the percentage of scoping studies ending in completed projects?

10. Please describe your interactions with the customer around the ¬¬scoping study report? How do you discuss possible projects and next steps?

11. …And your customer interactions after TAS has been completed?

12. What interactions do you have with the customer when they receive the incentive offer?

13. Once all the program's offers have been made, what do you see is your role? How do you continue to communicate with customers on these projects?

14. Please describe the reasons why projects are stalled or aborted at each of the following phases. Also, share any ideas you might have for additional program resources that might get these projects going again:

   - After customer receives scoping report
   - After TAS has been completed
   - After program incentives have been offered
   - After customer accepts incentive offer

15. At which of those phases do "good" or cost-effective projects most often become delayed or aborted?

16. Custom Capital projects make sense for projects of a certain size. Other than prescriptive measures, do you feel there are ways to reduce some of Custom Capital's processes to capture savings from smaller opportunities?

Custom O&M Projects

We would like to know about your experiences with Custom O&M projects, and any thoughts you might have for improving the program.

17. What are the PDCs role with Custom O&M projects?

18. Please tell me how Custom O&M projects come about?

    - What types of things generate initial discussion about possible projects?
    - Who are typically involved in these discussions?

19. What challenges do you typically face in moving identified Custom O&M opportunities to become a program supported project?

    - Challenges with customers:
      i. Who do you work with? / Who do you need to work with?
      ii. What are customers' typical concerns? / How do you address these concerns?

    - Any challenges with Energy Trust processes?

20. What are your responsibilities at customer sites participating in Custom O&M?

    - How frequently do you engage with these customers?
    - Do you verify that customers are continuing with O&M activities

21. How does the program detail the types of O&M activities program participants should be implementing?

22. How consistently do customers maintain O&M activities? Is there anything the program can do to help sustain savings from O&M activities?

23. At participating customer facilities, have you noticed that they have added O&M activities in addition to those activities prescribed by the program?

24. Can you think of any additional program resources that would help you convince more customers to participate in Custom O&M?

Small Industrial Projects

[Phil, we will schedule the SI interview later. We will send you those interview questions in a couple of days. We are scheduling the PDC interviews so I would like to finalize all the questions except for the SI, at this time.]

Working with Customers

We would like to know more about the types of activities your firm performs with customers related to project development, and any ideas you might have for additional program resources to advancing those projects to completion.

25. There are various ways to think about customers. When you think about Energy Trust's industrial customers, how do you gauge customers' level of:

    - Focus on energy efficiency;
    - Ability to drive projects to completion

26. What do you think affects those levels? [examples: staffing levels, sustainability initiatives, availability of capital, etc.]

27. Do you approach companies differently based upon those assessments? If so, how?

28. Has the loss of the BETC (Business Energy Tax Credit) affected the way you interact with customers?

Working with other PDCs, ATACs and ITSPs

We would like to know about your experiences working with other PDCs, ATACs, and ITSPs.

29. Are there times when another PDC firm works on projects in your services territory?

    - On what types of projects does this occur?
    - How does the project hand off work?
    - What is your role on projects like these managed by other PDC firms?
    - Are there any challenges or issues with these types of projects?

30. How do you typically interact with ATACs?

    - Does your firm conduct ATAC work?
      i. If "Yes" = How does your firm and your customers keep the ATAC and PDC roles distinct? If so, how?

31. Do PDCs have any challenges working with ATACs?

    - Please describe the most critical challenges?

- How well is the project hand off going between you and the ATACs you work with?

32. Are there any issues or challenges that come up when ATACs are interacting with customers?

- Do you anticipate what these challenges will be?
- How do you responded to these challenges

33. Who recruits customers for ITSP led projects?

- Are the PDC's involved? If they are, what strategies and resources you use to recruit a customer?
- How do you decide which customer is ready for these offerings?

34. When an ITSP is working with a customer, does it change the role you play with that customer? [probe: does it make it better or worse]

- How does the project hand off work as it moves back and forth between PDC and ITSP?
- How is the process different if you are working with an ITSP from your firm?

35. How effectively do you feel ITSPs are at working with customers to develop strategic energy management and O&M processes at participating customer facilities? [Probe: If there are issues: How do you think things could be improved?]

Energy Trust Program Processes

We would like to know about your experiences working with Energy Trust's program's and processes and learn about any ideas you may have to improve them.

36. What direct interactions does your firm have with Energy Trust?

- Who do you work with?
- What kinds of meetings take place? What topics / strategies are discussed?
- How do you learn about program updates or changes?

37. Typically what problems come up when working with Energy Trust?

- Any issues with decision making around projects?
- Any issues with the time required to respond to a customer request?
- How are problems resolved?

38. Please tell me how your firm's contract with Energy Trust structures its program activities and any of the goals your organization sets for itself.

- How does your firm measure and monitor those goals?

- How does your firm discuss goal progress with Energy Trust?

39. I will list some Capital project activities. Please elaborate how well Energy Trust's processes and protocols support these activities, and any ideas you have for improving or streamlining them. [probe for specific programs when necessary: Prescriptive, Calculated, Custom]

    - Allocating ATACs
    - Generating Incentive Offers
    - Measurement and verification
    - Project completion reporting

40. …And O&M (rCX, Boiler Tune Up, ROC)…

41. … Now again, for Strategic Energy Management …

42. What kinds of feedback does your firm receive from Energy Trust concerning the ATAC studies, and project completion reports? [Probe: What does your firm do with the feedback?]

43. As you see it, do any program components have aspects that are poorly defined or need further development? [Probe: Please describe the issue more fully. How could these issues be developed better for you?]

44. What are the key program changes between the 2010-2011 program and the 2012-2013 program? [Probe: How effectively are those changes meeting their objectives? Any need for further improvements?]

45. Are you aware of energy savings opportunities at customer facilities that are difficult or impossible to get at through the current portfolio? [Probe: What are those opportunities / how can the program get at them?]

46. What are the most important challenges facing the program right now? [Probe: How should the program deal with these challenges]

47. If you have experiences with other efficiency program in the region, how would you compare Production Efficiency with those programs in terms of its ability to achieve its goals and work with customers?

48. Any final comment…

D ATAC SURVEY

INTRODUCTION

Hi this is _____ from Research Into Action. We are working with Energy Trust to conduct a review of their Production Efficiency program. This survey should take about 30 minutes to complete. Your responses are important to helping Energy Trust improve their programs. Your responses to this survey will remain anonymous. Is now a good time to continue with the survey?

If "No": When would be a good time to schedule the survey?

If "Yes": Great! The following survey questions concern your experiences this year and last year with Energy Trust's Production Efficiency program. Additionally, most questions will concern customers eligible for Energy Trust programs unless I indicate otherwise.

FIRMOGRAPHICS / PROGRAM HISTORY

First I'd like to start by getting a little background information on your company.

1. How many employees do you have that work directly with Energy Trust customers?

2. How long have you been working with Energy Trust?

   - o Less than 1 year
   - o 1-2 years
   - o 3-4 years
   - o 5 years or more
   - o Don't know

3. Typically what Industrial or agricultural sectors do most of your customers operate in?

   _____

Project Management

I'd like to know about your experiences managing Energy Trust projects beginning with the RFP all the way through to the completion report.

4. First, we understand that Energy Trust issues you tasks orders, do you work on any Energy Trust ATAC projects that do not start with a task order?

   - o Yes [Probe:] How do these projects come about?_____
   - o No

5. Please tell me about your experiences with task orders to perform Technical Analysis Studies. _____

   - o Do you receive enough information? _____
   - o Do you have enough time to respond? _____
   - o How can process be improved?_____

6. Once you receive the task order, please tell me what happens all the way through to completion of the technical analysis study report?

   _____

   Probes:

   - o Does the PDC do anything at this stage of the project? _____
   - o Do you interact with customers? How so? _____
   - o How are scoping studies used? How helpful are they? _____

7. [If not addressed] Do you work with the PDC on the technical analysis study report?

8. Please tell me what type of feedback, if at all, you receive on projects where the customer would like to move forward with a project, but with project alterations that differ from the recommendations in your technical analysis studies. _____

   - o Are there ways the feedback could be improved?_____

9. Now walk me through your activities on projects that move forward with recommendations from your technical analysis studies. Please describe your activities and who you work with all the way through the finalization of the completion report.

   _____

   Probes, if not addressed:

   - o What are the PDCs doing with the project? _____
   - o Do you interact with the customer? _____

10. Do you have timelines or deadlines to complete these projects? _____

11. [If Q10 = Yes] Does the program or PDCs do anything to make sure projects are completed on time? _____

12. Do you feel there are times when ATACs could be more involved with customers so as to better explain potential projects, and help sell more customers on program incented projects? _____

    - o What could the ATACs be doing? _____

Working with PDCs

I'd like to know about your interactions with PDCs on the projects you work on.

13. Other than the activities you have already discussed, are there any other key activities the PDCs perform that support your projects? _____

14. Are you aware of additional activities the PDCs could be involved with to improve the project hand off between ATACs and PDCs? _____

15. Overall, how would you characterize the effectiveness of the PDC role at identifying savings opportunities, completing scoping studies, working with customers, and supporting projects?

    - o Identify opportunities: _____
    - o Complete scoping studies: _____
    - o Work with customers: _____
    - o Support projects: _____

Market Assessment

I would like to know a little more about the energy efficiency trends you are seeing with the customers you work with in general in Oregon, and the equipment manufacturers and distributors you work with.

16. Over the past few years have you noticed an increased interest by your customers in the energy efficiency on the project you work on? _____
    What do you think lead to this increased interest? _____

17. Are there any key codes or industry standards, or changes to codes and standards that make it easier for you to recommend energy efficient equipment or process in your technical studies, or with the customers you work with?

    - o What codes or changes? _____

18. Concerning the equipment you install on your projects, have you noticed any increased energy efficiency focus or messages by the equipment manufactures or distributors you work with? ___

    - o How is energy efficiency being discussed? What messages? _____

19. Have the changes to the Oregon Business Energy Tax Credit impacted energy efficiency projects? [If Yes:] How so?_____

Working with Energy Trust

We would like to know about your experiences with the program and experiences working with Energy Trust. And it would be helpful if you shared any ideas to improve the program and its processes.

20. In which industries or end use equipment or services (i.e. Compressed air) do you see the greatest potential for energy efficiency savings? _____

21. What direct interactions does your company have with Energy Trust? _____

    - o Who do you work with?_____
    - o What activities and decisions are made in these interactions?_____
    - o How do you learn about program updates, changes or opportunities? _____

22. Are there any problems/issues that come up when working with Energy Trust?

    - o Any issues with decision making around projects?_____
    - o Any issues with the time required to respond to a customer request? _____
    - o How are problems resolved? _____

23. Do you feel your company receives enough feedback from Energy Trust and PDCs about your work product? _____

    - o What kind of feedback would you like? _____

Conclusion

24. This is the end of the survey. Do you have any ideas important to improving the program's process for ATACs, or thought on how the program could increase its number of projects or savings? _____

E ITSP SURVEY

INTRODUCTION

This interview concerns your firms' experiences with Energy Trust's Production Efficiency program. We will discuss the types of activities you perform for the program, people you interact with, and the program's strengths and improvement areas.

Our reporting will protect your anonymity when possible. In instances where you suggest improvements specific to the program you manage, your comments will be attributed to a "program contact" in our reporting. However, it is likely that persons with knowledge of your program could infer your identity.

Most of your interview comments will concern your interactions with Energy Trust and PDCs. To protect your anonymity, we will report your comments to these topics in the aggregate with those comments from the other ITSP firms we interview.

During the interview I will refer to "the program" in reference to [IEI, ROC, Kaizen Blitz, …].

INTRODUCTORY QUESTIONS

I'd like to begin by understanding a little more about your company and your role as it relates to the delivery of the Production Efficiency program.

1. Please tell me about your firm's ITSP responsibilities.

Program Design

I would like to learn more about the program's theory, and the program's design.

2. What opportunities does the program focus on, and how does the program propose to achieve savings from those opportunities?

Program Staging

I'd like to have a better understanding of how far along your program's implementation is, where you see the program going, and any ideas you have to improve the program.

3. Please take a moment to describe the program's roll-out, its current phase, and how many participants you feel should be participating at any given time when the program is fully implemented.

    - [If still in roll-out phase, no participants]

i. What challenges do you face in moving the program to the next phase where the first participants are enrolled?
ii. When would you expect the program will enroll its first participants?
iii. Are there additional Energy Trust resources that could assist the program in making it to the next phase?

- [If only has a few initial participants]
  i. What challenges do you face in moving the program to the next phase where the participation levels are equal to the fully implemented target?
  ii. When would you expect the program will reach its target participation level?
  iii. Are there additional Energy Trust resources that could assist the program in making it to the next phase?

- [number of participants = near / fully implemented]
  i. What challenges do you face in maintaining or increasing the number of program participants?
  ii. Are there additional Energy Trust resources that could assist the program in maintaining or increasing the number of participants?

4. Given the challenges faced by the program so far, and those you expect to face, how has the program's implementation changed from the program design to overcome these challenges? [probe: incentive levels, verification plans]

5. Do you anticipate a need to further modify the program design in the future? Why?

Working with PDCs

I'd like to know about your interactions with PDCs.

6. First, what is the PDCs role with the program? [probe: connecting customers with the program]

7. Are you aware of additional activities the PDCs could be involved with to improve the program?

8. [Ask if program fully implemented] How does the project hand off work as it moves back and forth between you and the PDCs?

   - Are there any challenges with the process?
   - Do you work with PDCs from your company (Cascade)? How does the project hand off differ with these PDCs?

Energy Trust Program Processes

We would like to know about your experiences working with Energy Trust's processes and learn about any ideas you may have to improve them.

9. What direct interactions does your firm have with Energy Trust?

   - Who do you work with?
   - What kinds of meetings take place? What topics / strategies are discussed?
   - How do you learn about program updates or changes?

10. Typically what problems come up when working with Energy Trust?

   - Any issues with decision making around projects?
   - Any issues with the time required to respond to a customer request?
   - How are problems resolved?

Closing [If program in roll-out or initial phase]

Those are all the questions I have.

11. Do you have any final comments or ideas for program improvement?

Thank you very much for your time in this interview.

Program Outcomes [Full implementation phase]

I'd like to learn more about the program's outcomes at participant facilities.

12. What are your responsibilities at participating customer sites?

   - How frequently do you engage with these customers?
   - Do you verify that customers are continuing with energy management activities?

13. Please characterize how well participants have learned energy management procedures and principles offered through the program?

14. Are there ways the program can improve the way participants learn about energy management?

15. Does the program detail the types of energy management activities program participants should be implementing? How? [If = "No"; skip to #28]

16. What proportion of activities do customers implement?

17. How do customers choose which activities to implement? Are there certain types of activities that tend to get over looked?

18. How consistently do customers maintain energy management activities?

19. Is there anything the program can do to help sustain savings from energy management activities?

20. Have you noticed instances, at participating facilities, where the program has increased awareness of energy efficiency in employees that the program is not directly working with?

    - How so?
    - How frequently?

21. Have you noticed instances where the program has influenced, either directly or indirectly, participating organization's goals and strategic planning?

    - How so?
    - How frequently?

22. At participating customer facilities, have you noticed instances where customers have added energy management activities in addition to those activities prescribed by the program?

    - How so?
    - How frequently?

Market Characterization

I'd like to learn more about the program's market opportunities, and what it could do if it saturates existing market opportunities.

23. Considering the current customers and systems targeted by the program, how much of the addressable market opportunity has the program enrolled?

24. Are there certain market opportunities that will be very difficult for the program to get at?

    - What are the barriers to those opportunities?
    - Where those opportunities included in your figure for addressable opportunities?
    - [If ="Yes"] What proportion of addressable opportunities would you include in this hard to get at category?
    - Can you think of any Energy Trust resources or support that would help you get at these opportunities?

25. When do you believe the program will saturate the addressable opportunities that are not too difficult to get at?

26. Once those opportunities have been saturated, how do you see the program evolving to target new opportunities?

Closing

Those are all the questions I have.

27. Do you have any final comments or ideas for program improvement?

F SI AND MOTOR TRADE ALLY SURVEY

INTRODUCTION

Hi this is _____ from Research Into Action. We are working with Energy Trust to conduct a review of their Trade Ally Driven [Small Industrial / Green Rewind] program. This survey should take about 20 minutes to complete. Your responses are important to helping Energy Trust improve their programs. Your responses to this survey will remain anonymous. Is now a good time to continue with the survey?

If "No": When would be a good time to schedule the survey?

If "Yes": Great! The following survey questions concern your experiences this year and last year with Energy Trust's [Small Industrial / Green Rewind] program. Additionally, most questions will concern customers eligible for Energy Trust programs unless I indicate otherwise.

FIRMOGRAPHICS / PROGRAM HISTORY

First I'd like to start by getting a little background information on your company.

1. How many employees do you have that work directly with Energy Trust customers?

2. How long have you been working with Energy Trust of Oregon?

   - o Less than 1 year
   - o 1-2 years
   - o 3-4 years
   - o 5 years or more
   - o Don't know

3. [Ask if Motors TA] What areas does your company work with Energy Trust? [recode / multiple answer]

   - o Green rewind services
   - o Variable frequency drives (VFDs)
   - o "Premium" or high efficiency motors
   - o Other: _____

4. Typically what Industrial or agricultural sectors do most of your customers operate in? [recode responses / multiple]

   - o Agricultural
   - o Irrigation
   - o Greenhouses

- o Metal Manufacturing
- o Wood products
- o Pulp and paper
- o Chemical Processing
- o High Technology (only select if specifically stated, there are numerous High Tech Companies)
- o Food processing
- o Other: _____

Vendor Recruitment

We would like to know more about how your company became involved with Energy Trust's [Small Industrial / Green Motors] program.

5. How did your company first learn about Energy Trust's [Small Industrial / Green Rewind] program? [code response]

   - o From a customer
   - o Energy Trust staff
   - o At an event
   - o From a Cascade Energy employee
   - o Other _____

6. Do you feel you clearly understand program's goals and your company's obligations as a trade ally?

   - o Yes
   - o No: [Probe:] What could be described better for you? _____
   - o Other: _____

7. Are there things the program does that you find helpful to complying with program requirements? _____

8. If not identified as an official trade ally in the database: Our records indicate that you are not an official Energy Trust trade ally. Are there any reasons why you are not an official trade ally?_____

9. Do you feel working with Energy Trust has helped your company?_____ [If "Yes"] How so?_____

10. Could you recommend some ways to make the [Small Industrial / Green Rewind] program easier for you and other contractors to participate in? _____

Working with Customers

I would like to know a little more about the work, [SI TA = "or projects"; Green Rewind = "motors"], you work on where Energy Trust incentives are involved.

[IF Green Rewind skip to Q16]

11. First, at what point is your company involved when these projects get started? [Recode/multiple]

    o Energy Trust / Cascade contacts TA
    o TA begins working with customers
    o Customer contacts TA
    o Other:_____

12. When you work with your customers, what topics or concerns are most influential at causing your customers to consider energy efficient options covered by program incentives? _____

    [Recode responses/ multiple]

    o Energy savings in general
    o Reducing environmental impacts
    o Saving money on utility bills
    o Equipment longevity
    o Energy Trust Incentives
    o Technical support
    o Technical confirmation of estimated savings
    o Energy codes and standards
    o OTHER _____

13. How do you discuss these topics with your customers? [Probes:]

    o Who typically brings the topics up?
    o How are customer concerns addressed?

14. With projects that qualify for Energy Trust incentives, when do you typically begin to discuss options covered by the program with your customers? [recode / multiple]

    o One of the first topics discussed
    o Wait to see if project details will qualify for incentives
    o Bring it up only if the customer mentions
    o When discussing project costs
    o When discussing different technical options
    o Other:_____

15. Have you ever had projects were you did not discuss Energy Trust incentives, even though you felt it might qualify for Energy Trust incentives?

    o Yes
    o No
    o Can't recall / Do not know

16. If Q14 = "Yes": What are some reasons why you did not discuss incentives on these projects? _____

17. What are some reasons customers give you for not going with options supported by Energy Trust's incentives?:_____

18. Do you try to overcome these concerns? _____ If so, how? _____

19. Are there industrial sectors you work with where it is more difficult to promote energy efficient options? _____

    o Which sectors? _____
    o What are the challenges?_____

20. Do you use any Energy Trust marketing materials?_____

    o What kinds of materials? _____

    o Do you have any suggestions on how to improve the marketing materials? _____

21. Aside from Energy Trust marketing and program incentives, can you think of any other influences that cause your customers to consider energy efficient options?

22. Are you familiar with the Oregon Business Energy Tax Credit?

    o Yes
    o No

23. [Ask if Q22 = "Yes"] Have changes to the Oregon Business Energy Tax Credit had an impact on your volume of projects involving energy efficient options? _____How so?_____

24. On projects where your customers are considering energy efficient options do they calculate the costs and benefits of these options? _____ [If Yes]:

    o What factors are typically considered in these calculations? _____
    o Who are performs the calculations? [Customer, TA, Cascade]_____

25. Overall, which Energy Trust resources are most influential to encourage your customers to choose options incented by the [Small Industrial / Green Rewind] program?

[IF Green Rewind TA skip to Q41]

[Ask section only if SI TA] Calculator Tools, QA/QC, Working with Cascade

I would like to know about your experiences with program forms and working with Cascade Energy.

26. First, do you use any program supported calculators or Excel tools to estimate project savings?

- o Yes : Which Calculators? _____
- o No [Skip to …. Q32]
- o Do not know [Skip to ……. Q32]

27. Did you receive any training from Cascade or Energy Trust on how to use the calculator(s)?

- o Yes
- o No
- o Do not know

28. [If Q24 = "No"] Could you use the calculator more effectively if you received training?

- o Yes [Probe: Specifically, what kind of training would you like?] _____
- o No
- o Do not know

29. [If Q24 = "Yes"] How adequately do you feel the training was at preparing your company to use the calculator? [Probe to recode]

- o Very adequate
- o Adequate
- o Somewhat adequate [Probe: What was lacking from the training?] _____
- o Did not prepare company at all [Probe: What was lacking from the training?] _____

30. On what proportion of your program projects do you consult with Cascade Energy on how to complete the calculator tool? _____

31. I would like to know a little more about the effectiveness of the calculators and how you use them.

- o First, how would you characterize the level of trust customers have in the estimates produced by the calculators? _____
- o Do you use the calculator to help sell projects? _____
- o Can you think of any other strengths or weakness with the calculators? _____

32. Other than the calculator tool, are there any other project forms you must submit to Cascade or Energy Trust?

- o Yes
- o No [skip to Q33]

33. Have you experienced any issues with project forms or their processing? _____

- o Which forms? _____
- o Are there issues with the forms? _____
- o What processing issues? _____

34. I would like to know a little bit about your working relationship with Cascade. Please describe the types of project interactions you typically have with them? _____

35. How is it to work with the program's managers? _____

36. Is there anything they could improve? _____

[ask for Small Industrial] M&V

I have a few questions about the way the program confirms the energy savings on your projects.

37. On the equipment and systems you work with on program incented projects, are equipment or system settings essential to achieving energy savings?

- o Yes
- o No

38. [If Q34 = "Yes"] Are there times when it is difficult to determine and or document the equipment or system settings necessary to optimize systems? _____ If yes: What issues make it difficult?_____

39. Are there times when it is difficult to estimate the energy savings on equipment or systems you work on? _____ If yes:

- o What issues make it difficult?_____
- o How can the program be modified to work with these challenges? _____

40. Have you experienced any issues with the way the program verifies energy savings from the projects you work on? _____ If yes:

    o What are the issues?_____
    o How do you think savings should be verified? _____

41. Those are all the questions I have. Before I go, can you think of ways that Energy Trust could improve its program to help increase the number of customers you work with? _____

[Thank respondent]

[ask for Green Rewind]

42. [Ask if offer Green Rewind services] Would you say the number of motors your company has worked on through the Green Rewind program over the past two years have been…

    o Increasing Why has it been increasing?_____
    o Decreasing Why has it been decreasing?_____[Probe: market saturation?]
    o Or stayed about the same

43. [Ask if sells VFDs or other program incented motors] Would you say the number of program incented motors your company has sold over the past two years have been…

    o Increasing Why has it been increasing?_____
    o Decreasing Why has it been decreasing?_____[Probe: market saturation?]
    o Or stayed about the same

44. What have been the benefits of working with Energy Trust?_____

45. Any challenges in working with Energy Trust's program? _____

46. Do you have any ideas how to eliminate or reduce these challenges? _____

47. Those are all the questions I have. Can you think of ways that Energy Trust could improve its program, or how it supports you ? _____

[Thank respondent]