

# **Small Buildings, Big Savings: Prescriptive Solutions for Energy Efficiency and Green Certification in Small Commercial Buildings**

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## **ABSTRACT**

Commercial buildings less than 50,000 square feet represent a significant portion of new construction projects. Yet energy efficiency programs have found it challenging to initiate and verify comprehensive energy savings in this market. Several factors make it difficult to engage small commercial developers and contractors: Short project timelines, design-build delivery, and fixed-price contracting limit opportunities to implement energy efficiency because of the additional resources associated with green design.

The Energy Trust of Oregon New Buildings program is piloting a unique approach to increase energy savings penetration in the small commercial buildings market. The pilot has two key components for delivering a straightforward, prescriptive path to energy efficiency and green building. First, the New Buildings Institute (NBI) and Energy Trust adapted the measures in NBI's Core Performance guide to establish efficiency measure packages that exceed Oregon code and developed program incentives that support Core Performance's key strategies: design process, core performance measures, and enhanced measures. Second, in a parallel effort, Earth Advantage Institute developed a new green building certification program for the small commercial market, Earth Advantage<sup>®</sup> Commercial, which includes a package of holistic sustainable design and construction measures addressing, among other items, energy and water use indoor air quality, site and land development, and the use of preferable construction materials. The pilot leverages this program for its certification element, in addition to Earth Advantage Institute's streamlined, high-touch delivery model.

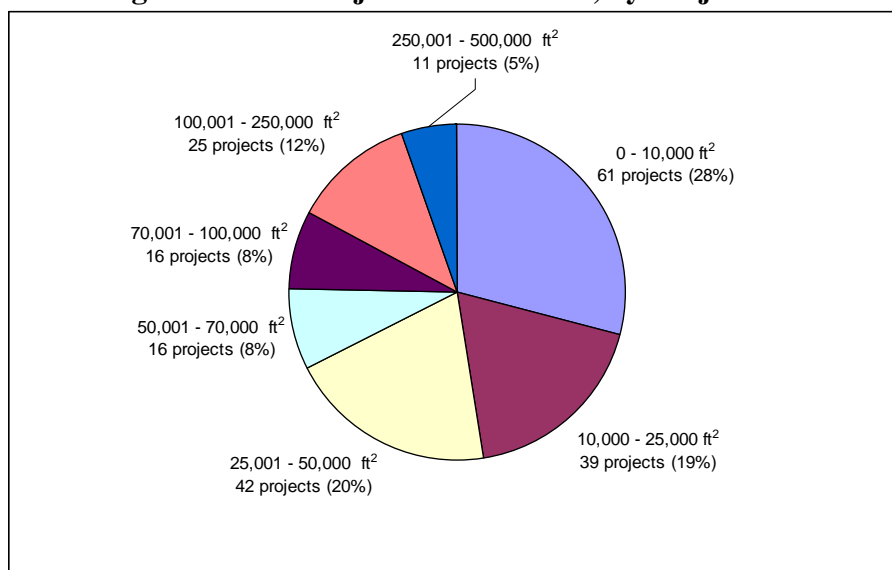
The pilot officially launched at the end of 2009. This paper will share the key observations and findings to-date from the pilot development and initial implementation.

## **Introduction**

Energy Trust is a non-profit corporation administering energy efficiency and renewable energy incentive programs in the State of Oregon for electric or gas utility customers of Portland General Electric, Pacific Power, Northwest Natural Gas, and Cascade Natural Gas. The Energy Trust New Buildings program provides financial and technical assistance for commercial new construction projects throughout its service area. The reach of the program is broad, as commercial structures of any size and type are eligible for financial and technical assistance. Projects include new structures, major renovations, additions, and tenant build-outs. Building types served by the program range from schools to large office and high-rise residential buildings to small tenant build-outs.

In 2009, the New Buildings program served 210 projects, representing approximately 12 million square feet, and captured 27.5 million kilowatt-hours and 751,326 therms in savings. Of these projects, 75 percent (158) were less than 70,000 square feet, or considered in the small- to medium-size commercial market. From these projects, the program achieved 26 percent of electric savings and 30 percent of gas savings. Figure 1 shows the distribution of the 2009 projects by project size, and illustrates that 100, or nearly half, of the 2009 projects were less than 25,000 square feet. Program data prior to 2009 shows similar trends (Moersfelder 2008).

**Figure 1. 2009 Projects Distribution, by Project Size**



Based on sheer project numbers, the program has shown some success in reaching the small commercial buildings market. However, there is still significant opportunity to expand the depth and breadth of the savings from small- to medium-size projects. Historically, the program has had strong relationships with those firms developing and designing larger-scale projects, but found that smaller-scale developers and design-build contractors are harder to engage. Further, small projects commonly implement efficiency measures related only to one system, rather than looking at the project comprehensively to maximize potential efficiency. Feedback from building owners and design professionals indicate that key barriers for small buildings are typically additional cost and time—for planning, design, energy analysis and modeling, systems commissioning, and green building consultation and certification. The pilot strives to remove these barriers with a more streamlined, prescriptive approach for this market.

Energy Trust also recognizes that, for the long-term success of the New Buildings program, it must be positioned to withstand economic and construction boom-bust cycles and capture opportunities in the small building and major renovations markets. Large projects have historically yielded substantial savings, but the program needs to expand its reach to small and medium size projects that make up most of the total market; approximately 95 percent of new buildings constructed each year in the United States are less than 50,000 square feet<sup>1</sup>.

In 2008, Energy Trust and Portland Energy Conservation, Inc. (PECI), the program management contractor for the New Buildings program, began developing a pilot to address the

<sup>1</sup> Energy Information Administration, 2003 Commercial Buildings Energy Consumption Survey (CBECS)

barriers and deepen savings from the small commercial buildings market. The pilot has two key components for delivering a prescriptive approach to energy efficiency and green building: the New Building Institute's *Core Performance Guide–Oregon Edition* and Earth Advantage Institute's new commercial green building certification program, Earth Advantage Commercial. The pilot, called the Small Commercial Efficiency Pilot, officially launched at the end of 2009. This paper describes the pilot development and offering, and shares the initial challenges and lessons learned in bringing this approach to market.

## **Development of the Small Commercial Efficiency Pilot in Two Components**

### **Component 1: *Core Performance Guide–Oregon Edition***

In seeking a viable, prescriptive approach to achieve deeper per project energy savings in the small commercial building market, Energy Trust engaged the New Buildings Institute (NBI) and supported the development of an Oregon-specific version of NBI's national *Advanced Buildings Core Performance Program*. The product prescribes a set of integrated design strategies and building features. When applied as a package, they result in energy savings of 15 to 30% beyond the performance of a building that meets the prescriptive requirements of the 2007 Oregon Energy Code (Oregon Structural Specialty Code, Chapter 13: Energy Conservation).

The *Core Performance Guide–Oregon Edition* identifies the specific strategies that make up the *Core Performance Program*. The Guide includes four key sections, illustrated in Table 1 below.

While elements of the program can be applied to new commercial construction projects of all types and sizes, the analysis supporting the program was designed for office, school, and dry-goods retail projects from 10,000-70,000 square feet. The pilot specifically targets these building types.

To create the *Core Performance Guide–Oregon Edition*, NBI built on the analysis conducted for the national *Advanced Buildings Core Performance Program* and addressed different climate and code characteristics specific to Oregon. The analysis included evaluations of the three major building prototypes with three to six HVAC system permutations for each prototype and climate variations for five Oregon cities. In conjunction with extensive modeling, all of the measures in the *Core Performance Program* were compared individually and in the original packaged combinations used in the national guide against an Oregon code baseline for each building type, system, and climate configuration, in order to estimate anticipated energy performance. This extensive modeling protocol was implemented with a batch analysis tool for the eQUEST energy modeling software that allowed the project team to consider thousands of different building, system, climate, and measure permutations in a single analysis.

Determining cost-effectiveness for each building prototype in the *Core Performance Guide–Oregon Edition* was in effect a two step process which involved re-ordering the core and enhanced packages established in the national guide into new bundles that were better suited to Oregon. Individual measures were first evaluated for cost-effectiveness by assessing their cost and savings impact on the baseline building prototype. Measures that were found to be independently cost-effective (or very close) were bundled together into core and enhanced packages. These cost-effective core and enhanced bundles were then run through the eQUEST

model again to ensure interactive effects from the individual measures in each package were taken into account. By doing this, cost-effective savings from implementing the bundle of core and/or enhanced measures could be found for each building prototype.

**Table 1. Contents of *Core Performance–Oregon Edition***

<b>Section</b>	<b>Contents</b>
Chapter 1: Design Process Strategies	1.1 Identify Design Intent 1.2 Communicating Design Intent 1.3 Building Configuration 1.4 Mechanical System Design 1.5 Lighting System Design 1.6 Construction Certification (Acceptance Testing) 1.7 Operator Training and Documentation 1.8 Performance Data Review 1.9 Minimum IAQ Performance
Chapter 2: Core Performance Requirements	2.1 Energy Code Compliance 2.2 Air Barrier Performance 2.3 Fenestration Performance 2.4 Lighting Power Density 2.5 Mechanical Equipment Efficiency Requirements 2.6 Demand Control Ventilation 2.7 Domestic Hot Water System Efficiency 2.8 Fundamental Economizer Performance 2.9 Enhanced Supply Air Temperature Reset (VAV) 2.10 Variable Speed Control
Chapter 3: Enhanced Performance Strategies	3.1 Additional Lighting Power Reductions 3.2 Plug Loads/Appliance Efficiency 3.3 Night Venting
Chapter 4: Additional Best Practices	4.1 Premium Economizer Performance 4.2 Heat Recovery 4.3 Daylighting and Controls 4.4 Additional Commissioning Strategies 4.5 Fault Detection and Diagnostics 4.6 Opaque Envelope Performance 4.7 Dedicated Mechanical Systems 4.8 Cool Roofs 4.9 Indirect Evaporative Cooling 4.10 Demand-Responsive Buildings (Peak Power Reduction) 4.11 On-Site Supply of Renewable Energy

This was an essential aspect of the analysis, as measures supported by the pilot must meet Energy Trust’s investment criteria. For all programs, Energy Trust weighs the quantifiable benefits of the energy measures against the costs using three different tests: Utility System Test, Societal Test, and Simple Payback.

The Utility System Test weighs the benefits of the avoided costs that utilities, whose customers Energy Trust serves, would otherwise have to pay to either generate or buy energy on the market, as well as the environmental benefits that result from offsetting energy use, against the value of the incentive that Energy Trust pays for an energy efficiency measure. When the resulting benefit cost ratio (BCR) is greater than 1.0, the measure passes the Utility System Test.

From a societal standpoint, the cost-effectiveness of the measure is evaluated by weighing the benefits of the avoided costs the utilities would otherwise have to pay to either generate or buy energy on the market, as well as the environmental benefits that result from

offsetting energy use and any quantifiable non-energy benefits from the measure (e.g., operation and maintenance savings and reduced sewer charges), against the societal costs of the measure. The societal costs consist of the total cost of the energy efficiency measure, including what the project owner or customer pays to install the measure. When the resulting benefit cost ratio (BCR) is greater than 1.0, the measure passes the Societal Test.

Measures that provided consistent, cost-effective savings when evaluated individually, and that were considered market-ready, were included in the core package, or Chapter 2 of the *Core Performance Guide—Oregon Edition*. Measures with significant potential savings that did not meet all of the consistency or were on the margin of cost-effectiveness as individual measures, but were still found to be cost-effective when bundled together with other measures, were designated as enhanced strategies, for consideration by projects targeting increased levels of savings with longer paybacks or other characteristics. Measures that can be applied under certain circumstances by certain projects, but that do not show consistent savings for the Oregon market and were clearly not seen as cost-effective from using the Energy Trust criteria were designated as additional best practice options.

The extensive analysis conducted by NBI and Energy Trust provides a distinct advantage for participants in the Small Commercial Efficiency Pilot. Small projects typically do not complete energy modeling, so for these participants the modeling work has already been done and a package of efficiency measures has been vetted for cost-effectiveness. However, Energy Trust acknowledged a need for a delivery framework to bring *Core Performance* to the market. For this, Energy Trust and PEGI engaged Earth Advantage Institute, an Oregon nonprofit organization that works with the building industry to implement sustainable building practices.

## **Component 2: Earth Advantage Commercial**

Earth Advantage Institute is best known for its residential green building certification offerings that encompass high performance homes, remodels, and sustainable communities. Earth Advantage Commercial is the newest addition to the suite of programs, and it offers third-party green building certification and a benchmark for the design, construction, and operation of high-performance small commercial buildings. Like Earth Advantage Institute's residential certification programs, the commercial program recognizes performance in five key categories: Energy, Water, Health, Materials, and Land. For each category, the program uses prescriptive measures that are considered best practices for commercial construction. To ensure a standard based on best practices and "state-of-the-shelf" availability for small commercial projects, Earth Advantage engaged industry experts to gather market feedback through a series of progressively detailed stakeholder workshops, which in turn informed the development of the program, its measures and processes.

In parallel with NBI and Energy Trust, the Earth Advantage Commercial program relies on the *Core Performance Guide—Oregon Edition* for the energy efficiency requirements for certification. Completion of specific sections of the Guide corresponds directly to the levels of Earth Advantage certification: Silver, Gold, and Platinum. Complete Earth Advantage Commercial certification requires the implementation of specific measures from all program categories in addition to energy. Table 2 summarizes the requirements for the energy category for certification and illustrates how the *Core Performance Program* fits in, while Table 3 outlines a sample of measures from the other Earth Advantage Commercial program categories.

**Table 2. Energy Category Overview for Earth Advantage Commercial Certification**

Certification Levels	Measures
Silver	<i>Core Performance Guide–Oregon Edition</i> , Core Requirements <i>Core Performance Guide–Oregon Edition</i> , Acceptance Testing Energy Star Portfolio Manager and Data Sharing Plus one elective measure
Gold	<i>Core Performance Guide–Oregon Edition</i> , Enhanced Performance Strategies <i>Core Performance Guide–Oregon Edition</i> , Operator Training and Documentation Energy Management Plan Plus two elective measures
Platinum	Whole Building Energy Modeling and Simulation <i>Core Performance Guide–Oregon Edition</i> , Additional Best Practices Section 4.4 Additional Commissioning Strategies System-level monitoring Plus three elective measures

Note: Elective energy measures target energy savings (i.e. envelope enhancements), renewable contributions (i.e. 2/5% on-site renewable energy), or ways to address occupant effects on building energy use.

**Table 3. Non-Energy Category Overview for Earth Advantage Commercial Certification**

Category	Certification Level	Measures
Water	Silver	High Efficiency Flushing Fixtures, Low-flow Lavatory Faucets/Showerheads Track Whole Building Water Use in Portfolio Manager High-efficiency Irrigation System Stormwater Pollution Prevention-During Construction
	Gold	Automatic Faucets (sensors or metered faucets) Increased Efficiency Irrigation System Stormwater Quality Mitigation
	Platinum	Greywater Reuse No-Potable Water for Irrigation –OR- No Permanent Irrigation Increased Stormwater Quality Mitigation
Health	Silver	Indoor Air Quality Plan During Construction Low-emitting Interior Paints, Coatings, Adhesives, Sealants, Carpets/Pads
	Gold	Eliminate/Limit Infiltration from Garages, Janitor Closets, Copy/Print Rooms Low-Emitting Insulation Products Occupant Access to Daylight + Glare Reduction
	Platinum	Reduce Urea Formaldehyde Wood Products
Materials	Silver	Environmentally Preferable Materials Construction Waste Management Built-in Recycling Center
	Gold	Environmentally Preferable Materials and Construction Waste Management (increased requirements over silver level) Build for Durability and Minimize Material Use
	Platinum	Environmentally Preferable Materials and Construction Waste Management (increased requirements over gold level)
Land	Silver	Use Native and Adaptive Plants Stockpile Topsoil Minimum Bicycle Storage
	Gold	Transportation Plan with Survey/Commuter Information Minimum Walk Score™- OR- Show Score Improvement
	Platinum	Enhanced Site Ecology Enhanced Placemaking

Note: This is a sample list of measures. The full program requirements, plus additional elective measures, can be found in the Earth Advantage Commercial Reference Guide.

Integrating the *Core Performance Guide–Oregon Edition* directly into the Earth Advantage Commercial program presents a unique opportunity for the delivery of the Small Commercial Efficiency Pilot. The *Core Performance Guide–Oregon Edition* provides the prescriptive methodology for achieving more comprehensive, deeper energy savings in small buildings, while Earth Advantage provides a holistic green building certification process and a high-touch, streamlined delivery model tailored for the small buildings market. Specifically, Earth Advantage Commercial:

- Appeals to owners who are interested in green building certification, but may not have the resources for exploring new design options or conducting energy modeling and other analyses;
- Reduces the costs of green building certification by providing on-the-ground assistance and field verification; and
- Provides direct and continuous assistance to project teams throughout the certification process—from early design through construction.

The pilot will test the functionality of both central program components, the *Core Performance Guide–Oregon Edition* and the Earth Advantage Commercial program, and assess the benefits of each element. First, the pilot will determine whether the *Core Performance Guide* is a viable prescriptive approach to achieving energy savings in the small commercial buildings market, while simultaneously testing the functionality of the delivery method and measures imbedded in the Earth Advantage Commercial program. In addition, the pilot will assess the integration of the *Core Performance Guide* with the Earth Advantage Commercial program and test the premise that a holistic green building certification can help sell greater efficiency in the small commercial buildings market.

In 2010, the pilot aims to enroll 7-10 projects that will pursue Earth Advantage Commercial certification, and an additional 3-5 that will implement only the *Core Performance Guide–Oregon Edition*.

## **Pilot Program Structure and Process**

To be eligible for the Small Commercial Efficiency Pilot, projects must commit to following the process outlined in the *Core Performance Guide–Oregon Edition* and design and construct a building that, at a minimum, completes the Design Process Strategies (Chapter 1) and Core Performance measures (Chapter 2) defined in the Guide. In addition, an ideal project is between 10,000 and 70,000 square feet, is a school, office, or retail new construction project, and is early in the design process (schematic design or earlier).

The pilot supports projects through six key phases:

- Recruitment/ Screening
- Enrollment
- Early Design
- Pre-construction
- Construction
- Project Completion/ Post-occupancy

**Table 4. Key Program Activities, by Pilot Phase**

<b>Recruitment / Screening</b>	<b>Enrollment</b>	<b>Early Design</b>
<p>Target current participants of Energy Trust programs with active applicable projects</p> <p>Focus outreach to design-build and small architecture firms</p> <p>Conduct initial meeting with potential participant to explain program requirements and to determine eligibility for the pilot</p> <p>Complete project screening process, including use of screening tool to ensure applicability of Core Performance</p>	<p>Obtain project team buy-in for Earth Advantage Commercial and implementation of <i>Core Performance</i></p> <p>Provide support to project team in transition to appropriate alternative program track if project team is unable to participate</p> <p>Create and execute customized service agreement between EAI and participant</p> <p>Enroll participant in Energy Trust New Buildings program</p>	<p>Assist with workshop preparation, facilitation and reporting from high performance building workshop</p> <p>Discuss design strategies for specific program measures</p> <p>Determine list of measures to be pursued and define what must be integrated into the design/ construction documents</p> <p>Conduct ongoing communication about design elements, assist with required program documentation</p> <p>Pay High Performance Building Workshop incentive</p>
<b>Pre-Construction</b>	<b>Construction</b>	<b>Project Completion / Post Occupancy</b>
<p>Review design documents for compliance with program requirements and respond with findings</p> <p>Meet with design team to discuss any changes to design</p> <p>Finalize targeted measures to be pursued and anticipated certification level</p> <p>Establish plan for on-site verification during construction</p> <p>Review final construction documents and issue comments</p> <p>Pay Design Process Strategies incentive</p>	<p>Conduct ongoing communication with project team on project scheduling and progress on program measures</p> <p>Resolve any measure issues or changes, as necessary</p> <p>Conduct at least three on-site inspections for measure verification: (1) at rough framing (2) at insulation (3) permit final</p> <p>Support completion of Acceptance Testing or Commissioning requirements</p>	<p>Finalize verification of program measures</p> <p>Assist project with final program documentation</p> <p>Issue Earth Advantage Commercial certification letter and plaque</p> <p>Ensure project enrollment in Energy Star Portfolio Manager account (energy and water) for benchmarking</p> <p>Support owner in development of tenant and occupancy guidelines</p> <p>Pay Measure Implementation, Commissioning, and Earth Advantage incentives</p>

In addition to receiving program support in assessing, reviewing, and verifying measures, pilot participants are eligible for financial incentives at various points in the process (shown in Table 4). To develop the incentive offering for the pilot, the program:

- Surveyed other *Core Performance*-based programs, including programs through Efficiency Vermont, Bonneville Power Administration, Puget Sound Energy, the Energy Center of Wisconsin, National Grid, and NSTAR;



- Set the incentive payment points to align with the current New Buildings program process as closely as possible; and
- Analyzed how the incentives would compare to other New Buildings program offerings, primarily to ensure that pilot participants, appropriately, receive a higher incentive overall for carrying out a more comprehensive process.

**Table 5. Pilot Incentive Offering**

Phase	Alignment with Core Performance	Incentive Amount
Early Design	Chapter 1: Design Process Strategies Section 1.1 (High Performance Building Workshop)	\$2,500
Design	Chapter 1: Design Process Strategies Sections 1.2-1.6	\$0.10/ square foot
Measure Implementation	Chapter 2: Core Performance Requirements	\$0.30-0.50/ square foot
	Chapter 3: Enhanced Performance Strategies	\$0.30-0.50/ square foot
Commissioning	Chapter 4: Additional Best Practices, Section 4.4	\$0.10/ square foot
Earth Advantage Commercial certification	Completion of key sections that align with certification level attained	\$0.10/ square foot

Note: Based on NBI's analysis, *Core Performance Guide—Oregon Edition* has the potential to produce the most savings in retail buildings, followed by office buildings, then schools. The Measure Implementation incentive range accounts for the overall expected savings; therefore, retail projects are eligible for \$0.50/ square foot, offices \$0.40/ square foot, and schools \$0.30/ square foot.

### Pilot Status

The Small Commercial Efficiency Pilot launched at the end of 2009. The program aims to enroll 10-15 projects by mid-year and, at the time of finalizing this paper, six projects were officially enrolled. Early recruitment activities have included targeting active participants in the Energy Trust New Buildings program and educating the architectural and engineering community on the two components of the pilot, which are both new offerings in the market. While the pilot is in its early implementation stages, it has already engaged a wide range of projects, presented requirements to various audiences, and screened several projects for applicability and commitment to *Core Performance*.

### Lessons Learned To-date

The development of the Small Commercial Efficiency Pilot raised several important program design considerations. A few of the questions that the pilot seeks to address include:

- Can small- to medium-size commercial projects respond to a whole building, prescriptive approach?
- In practice, how frequently can the complete package of *Core Performance* measures be implemented?

- What pilot eligibility requirements are necessary and where can the program be flexible?
- In this market, how receptive are project teams to an integrated design process?
- Does delivering *Core Performance* as a component of Earth Advantage Commercial increase its marketability and result in deeper savings?
- Are the pilot's requirements for documentation and verification appropriate?
- Is this approach cost-effective and scalable?

Thus far, the pilot has gained some valuable insight into the challenges and opportunities with this approach and begun to answer some of these questions. This section explores key observations and findings.

**Prescriptive approaches must be customizable.** One of the key implementation challenges facing the pilot is finding projects that align with the specifications analyzed for the *Core Performance Guide—Oregon Edition*. Projects engaged early in the pilot recruitment include one mixed office retail project, two resale retail stores, a community center, a community theater, and a charter school. Two of these are renovations and the other four are ground up construction with sizes ranging from just under 10,000 to 25,000 square feet. While the overall project descriptions fit with the building prototypes behind *Core Performance*, each has its unique characteristics that fall beyond the scope of the prototype analysis.

As a result, some projects have not been able to commit to implementing the full *Core Performance* process or implementing every element of the entire package of energy efficiency measures that make up the *Core Performance* requirements (Chapter 2). Sometimes this is due to system type constraints; for example, very small packaged HVAC equipment may not be available with economizers. In other cases it is due to special uses for the project which vary from the expected energy use profile; for example, a culinary school project with extremely high ventilation rates.

To address these circumstances, the program developed an Excel®-based screening tool that weighs the relative importance of each measure in a given building and system type to understand the overall energy impact if one or more of the measures cannot be implemented. When a potential project is identified, the screening process includes an in-depth discussion of the project's capability and willingness to implement all requirements in *Core Performance* with the project owner and team. Each project is assessed using the screening tool to show what percentage of expected savings will be produced by each measure and what energy savings may be lost if a particular measure is not implemented. This tool helps to guide program decisions in selecting buildings that are most suitable for the pilot. Projects that are excited about certification and the *Core Performance* process, but are not able to meet the *Core Performance* screening criteria are given the option to produce a whole building energy model to show savings.

**Reaching the small commercial buildings market does require a high-touch delivery model.**

Early experience has shown that it is vital to have program staff deeply involved with each project. The small commercial buildings market is traditionally not as well served by utility efficiency programs and does not achieve the high per-square foot energy savings seen in larger, more sophisticated projects, as the market often lacks familiarity with energy efficiency strategies and the integration of green features into building designs. Recruitment for the Small Commercial Efficiency Pilot relies heavily on participant education, as the pilot entails two new approaches that must be introduced to the market. In addition, once a project owner and team are

on board, an advocate is needed to ensure that the goals are being met and to ensure that measures, once designed and specified, survive through “value” engineering.

In order to both engage and inform the project team, Earth Advantage acts as a third-party consultant and verifier, working with the client to meet requirements during the construction process. Earth Advantage works with the full project team to agree on sustainability and energy efficiency goals, creates a list of requirements to meet those goals, and works with specifications and plans to ensure that these requirements are captured in the project design. The program and Earth Advantage have developed tools and templates to help projects meet program requirements, such as formats for Design Intent documents, energy management plans, and operator training manuals. Earth Advantage’s staff is active in answering questions and coordinating with design professionals, contractors, and suppliers to meet certification requirements.

The relationship between Earth Advantage and the Energy Trust New Buildings program helps to bridge an information gap, providing high touch interaction at critical junctures and ensuring that requirements are met. In the end, the hope is that the program will verify that significant design decisions were changed for the better via the high-touch process.

**Each targeted building type requires a nuanced approach.** In targeting particular building types (office, retail, and school), it was vital to establish a flexible, yet clear framework for the program. As with any pilot program, engaging projects is critical to learn what works, what elements need to remain flexible, and how particular types of buildings challenge the pilot’s initial assumptions. Some of these assumptions included: a linear process for design of whole buildings from start to finish, the belief that design teams would be accessible and available to be engaged in the program, and projects would have flexibility to change designs. In the real world, these assumptions have thus far proven true only part of the time.

For example, in many retail projects, the process follows a core and shell with subsequent tenant improvement model. If tenants are known or identified during design, whole retail buildings can be built in a single process. In speculative retail development, however, this is frequently not the case. As a result, the *Core Performance* measures may not be addressed by the initial builder, but by a future tenant. This presents a real challenge to whole building energy savings. To address this, the program has created the flexibility to allow retail shell developers to enroll projects while waiting to identify tenants. In order to make this work, the participants do their part in three ways. First, they must be willing to commit to achieving as much of the full package as possible in the shell buildings. Second, they must be willing to engage tenants to meet the program requirements. And third, they must be willing to wait for their final incentives until the building is completely built out.

National retail chains also present a challenge for the program as designed. Many national chains have centralized branding and design requirements to maintain brand image and “look and feel” for their locations while also taking advantage of bulk purchasing and national account discounts that go with national-scale buying power. As a result, these chains are often hard to influence. The strategy the program has employed to address this is to target projects that are developer driven or franchised in local jurisdictions that are interested in seeing projects achieve a green certification or some level of green building enhancements. This allows the program an opportunity to leverage regulatory framework and community interest in green initiatives to drive greater energy efficiency since these policies often exclude explicit requirements for enhanced energy efficiency beyond Oregon Energy Code.

**There is a market for green building certification in small commercial buildings.** The pilot's outreach thus far has focused on the design community, including small and large architectural firms, engineering firms, and design-build contractors. There seems to be widespread agreement among design professionals within the small commercial market that having another certification option puts green building certification within reach. Design firms that have experience in green design provide positive feedback on their experiences, although their focus is on the benefit of another tool to serve clients.

For some designers it has become standard practice to steer small buildings away from certification due to cost, but design to "equivalency." For these projects, the advent of a new certification system creates both an opportunity and a dilemma. Many designers have standardized specifications to meet green building goals, but no verification mechanism exists to ensure levels of commitment or to ensure that construction practices and equipment meet original design assumptions. In these cases, the response to a new green certification system is mixed. Often, the architect has sold the client on green design but explained certification as an unnecessary expense. In these cases it can be difficult to reframe the client's expectation that certification will work in their interest and help ensure savings and green features.

## Conclusions

So far, the Small Commercial Efficiency Pilot has seen a high level of activity and interest. At the time of this paper draft, more than 35 projects have been formally screened to some extent for pilot enrollment and six projects have been enrolled. Feedback from the field has affirmed the appeal of a prescriptive approach to achieving more comprehensive savings in the small to medium commercial market, and that Earth Advantage Commercial certification may fill an important gap in green certification. In addition, demand from sectors outside of the targeted office, retail, and school markets suggest that a prescriptive system to capture more building types could be a useful addition in the future.

Early in the pilot implementation, it is still unknown to what degree this approach will be replicable to other building types or scalable to have a broad reach in the small commercial buildings market. Clearly, the key implementation challenge to-date is applying a prescriptive, packaged approach to highly customized and variable market. Though, the New Buildings program team is finding ways to adapt the packaged approach and delivery model to meet the needs of individual projects. And through the pilot implementation, the key assumptions behind the packaged measures, as well as the allowances made on a project-level basis, will continue to be tested and used to inform future implementation strategies.

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