October 24, 2011

From: Phil Willems, PWP

To: Sarah Castor, Energy Trust of Oregon

Re: Final Small Commercial Efficiency Pilot Evaluation Findings

This memo summarizes the results of PWP's evaluation of the Small Commercial Efficiency Pilot (SCEP, or the Pilot). To date, the Pilot has enrolled 10 projects and is now closed to further enrollment. With the update in building codes in July 2011, the program is in the process of deciding whether to pay for an update to the Core Performance Guide and continue the program in its current structure. This investigation used review of program data and interviews with program staff and pilot participants (including owners, architects, project managers and mechanical and general contractors), some of whom were involved with other projects that considered participation but chose not to or were unable to. The goal of the evaluation was to develop actionable recommendations of whether and how to continue the pilot as a regular Energy Trust offering.

To complete the evaluation, program materials and documents, including the original proposal, status updates and an internal assessment of the Pilot's success conducted by the staff of the Program Management Contractor, PECI. In addition, interviews were conducted with Earth Advantage and PECI program staff and with SCEP participants, some of whom had also been involved with other projects that they considered enrolling but ultimately did not, to allow us to investigate reasons why potential participants might not have participated. The number of participant interviews conducted by type is presented below.

Exhibit 1
Participant Interviews

Respondents	Number of Individuals	Number of Projects
Program Staff	4	10
Owners	8	10
Architects	8	10
Engineer/contractor	2	2

Evaluation Findings

Program Staff Perceptions

Program staff were interviewed both to gather data on individual projects and to obtain feedback on their perceptions of program strengths and weaknesses and challenges in bringing participants on board that had caused some projects to be excluded from the pilot.

Interviewed program staff provided detailed information about individual projects, including the project and organizational characteristics that appeared to have motivated them to participate.

- Not surprisingly, when the SCEP was first launched, program staff and outreach managers worked hard to identify potential participants. Given the slow new construction market, however, there were not many candidate projects that met the 10,000-70,000 square foot criterion and that were in an appropriately early stage of the design process.

- As a result, some of projects accepted into the Pilot were further along in the construction process than would have been ideal, were somewhat atypical building types (e.g., culinary schools with multiple range hoods, a theater, a school moving into a remodeled commercial space) or were at the upper or lower boundaries of the preferred size range.

This created one of the major challenges faced by program staff in that they had to be continuously involved in providing guidance on how to tailor the Pilot requirements to the specific projects and had to develop numerous "work-arounds." On the other hand, the close and frequent interaction between these participants and program staff helped ensure that Pilot requirements were met and a great deal of knowledge was transferred to participants that could be used in future projects.

Program staff reported that Pilot participants seemed to be motivated both by the potential for higher incentives and the availability of Earth Advantage certification.

- Staff members said the fact the SCEP projects would be eligible for more incentives and would cover additional measures appears to have attracted several participants. Having incentives calculated on a per square foot basis was also thought to have removed some of the uncertainty that surrounds participation in similar programs, particularly when energy modeling is involved.

- In addition, program staff pointed out that owners and architects on many small projects see the benefits of green building certification, but view LEED as a cumbersome, expensive "black box" process that gives applicants little guidance on how to achieve

compliance. The Earth Advantage Commercial certification provided a lower cost alternative to LEED that offers the same benefits. Moreover, some architects were eager to be in the forefront of bringing this alternative, locally based certification to the market. In addition, staff said that participants appreciate the greater interaction between the design team and the program, which most participants utilized extensively, leading to "lots of iterations" in the design process.

It was not only Earth Advantage certification that led to more frequent interaction between program staff and participants. One of the program staff pointed out that "the Guide (the Core Performance Guide for Oregon) is just overwhelming….It's really confusing that there are 17 requirements but some measures may not be applicable." Program staff prepared a series of spreadsheets summarizing program requirements and the possibilities for trade-offs, but even with those, there was a lot of back and forth with participants. Another staff member interviewed noted that the amount of staff time required to manage a SCEP project was at least twice the amount needed for regular new building program participants.

The relative complexity of the Core Performance Guide was seen as a particular barrier to rolling out a full scale version of the SCEP. For staff who worked exclusively or primarily with the SCEP, it was not a huge barrier, but one respondent described another New Buildings Outreach Manager for whom "juggling all these different requirements for different tracks and getting up to speed on the Pilot," made it difficult and time consuming to ensure that the project met the specific demands of the Guide.

On balance, program staff felt that the SCEP approach (i.e., Core Performance plus Certification) had been validated by their experience with the Pilot projects. They all said that both the core performance incentives and the availability of certification contributed to the success of these projects, but they did not believe that a full implementation of the Core performance approach required both to succeed, particularly if there were more candidate projects available in a more active market.

Participant Interviews

As noted above, interviews were conducted with 16 individuals involved in 10 different projects (3 of which had the same owner and design team) to determine which Pilot characteristics motivated their participation and how they might respond to alternate combinations of features and requirements. Not surprisingly, many of the themes outlined by the program staff were confirmed and expounded upon by the SCEP participants.

While most of the questions and responses were qualitative in nature, all participants were asked to rate various program features as not at all important, somewhat important or very important to

their decision to participate in the Pilot. Results are summarized in Exhibit 2, which presents features sorted in their order of importance ratings.

Exhibit 2
How important was each of the following features in your decision to participate?

PROGRAM FEATURES	Very (=3)	Somewhat (=2)	Not at All (=1)	DK or NA	Average
	Number of responses				
Higher incentives than through New Buildings program	12	3	0	1	2.80
Lower cost Green Building Certification	7	3	0	2	2.70
More measures than just lighting and HVAC	11	5	0	0	2.69
Extensive support from program staff	11	4	1	0	2.63
Equipment would undergo functional performance testing	8	6	0	2	2.57
Availability of Earth Advantage Commercial certification	7	7	0	1	2.50
Incentives for design assistance	9	5	2	0	2.44
No need for energy modeling	8	4	2	2	2.43
Multiple onsite inspections	9	3	3	1	2.40
Clearly defined per square foot incentives	5	9	1	0	2.27

For seven projects, we spoke to both the architect and the owner's representatives. Architects and owners agreed on the importance of most scores, but had somewhat different priorities for a few features. While the differences are relatively small and would not be statistically significant as a sample, they basically represent a census of participants and are therefore indicative of differences in the perceived importance. Exhibit 3 compares the mean importance ratings for the two groups. The results show that architects tended to place somewhat greater importance on higher incentives, availability of Earth Advantage Commercial certification and multiple on-site inspections, while owners were somewhat more likely to consider lower cost green building certification, program staff support and incentives for design assistance very important.

Exhibit 3
Differences in Owner and Architect Ratings

PROGRAM FEATURES	Architects	Owners
	Average Ratings	
Higher incentives than through New Buildings program	**3.00**	2.71
Lower cost Green Building Certification	2.40	**3.00**
More measures than just lighting and HVAC	2.86	2.79
Extensive support from program staff	2.57	**2.86**
Equipment would undergo functional performance testing	2.57	2.60
Availability of Earth Advantage Commercial certification	**2.57**	2.43
Incentives for design assistance	2.43	**2.57**
No need for energy modeling	2.43	2.50
Multiple onsite inspections	**2.71**	2.17
Clearly defined per square foot incentives	2.36	2.33

While the ratings indicate that most of the program features discussed were considered important by most participants, these results, in combination with the responses to more open ended questions, suggest some differences in motivations.

Three "bundles": Certification, Efficiency, Assistance

The SCEP appears to have attracted participants with three core motivations that exerted varying degrees of influence in the decision to participate. While most participants said that each of these attributes was at least somewhat important, some were clearly more motivated by one feature than others. The key features are as follows:

1. Certification – some participants were motivated primarily by the desire to obtain certification for their building. In some cases this was because of the perceived marketability of "green" space, in others because of a desire to build a "sustainable" image, and in still others because of a decision or mandate that public sector buildings should attain some sort of green building certification. The fact that the Earth Advantage Commercial certification was simpler and lower cost than LEED, coupled with the more open process and greater interaction with the certifying authority, made certification a key feature in the decision. In addition, a number of participants were drawn to this more

local or regional certification, with some architects in particular expressing an interest in being in the forefront of bringing Earth Advantage Commercial Certification into the market. As one architect explained in speaking about green building certification, "A lot of RFPs are coming out with these type of requirements, and the more you have the better off you are."

2. Energy efficiency – a few participants, typically those with more sophistication and experience, were most impressed by the SCEP's ability to help them achieve a very efficient small commercial building. These participants recognize the importance of tapping other sources of energy savings besides lighting and more efficient HVAC equipment and particularly appreciate the broader range of measures and higher incentives. While no respondents said that Certification was unimportant, participants in this category typically assigned somewhat greater importance to savings than to certification; they like the recognition that certification brings, but are generally less interested in a "green" image than in energy performance. As one owner's representative explained: "The main goal is having more energy efficient buildings; we're not that motivated by certification, although it was of interest."

3. Program support – a third group, including owner representatives in particular, rated the amount of support provided to participants as key factor in their decision to participate. About one-third or those interviewed mentioned the amount of support as the best aspect of their participation. One respondent said that the best aspect of participation was "the fact that we had a person at ETO we could contact to find alternatives or offsets when we could not meet a specific criterion in the pilot." Both the flexibility of the Pilot and the degree of interaction between the design team and program staff were of great importance to this group of projects.

Finally, there were a few participants who clearly wanted all three elements of the SCEP offering and who would not have participated if any one of them were missing.

Timing of Participation

Participants learned about the pilot when their projects were in various stages, ranging from predesign to design documents to already having poured concrete. All respondents agreed that timing is very important, noting that the construction process usually moves quickly once it starts and there is no budget to deal with delays. A few participants, including those who were the first to enroll, recognized that they had started later in the process than they would have liked and may have missed some opportunities as a result, but most said the timing had been appropriate.

The consensus was the "earlier is better, " and it appears that if the design team knows about the possibility of participating in a project like SCEP in advance, they can better anticipate it and perhaps modify their project timeline. This was, of course, difficult with the SCEP because it was not widely known and program staff and Outreach Managers were identifying projects and

informing them about the Pilot one at a time. Having a SCEP-like program in place for specific qualifying projects should make it easier for owners to plan for participation in advance and for architects or design-build contractors to incorporate it into their bids and proposals.

Several projects that dropped out had hoped to participate, but were unable to do so because the design and construction process was too far along or had restrictive deadlines that would have prevented them from going through the extra iterations involved in meeting the Core Performance requirements.

Concerns and Challenges

Especially for projects that were somewhat farther advanced in the design process, the impact of participation on schedule was a significant concern, with the associated worry that costs would be substantially higher as a result. An overall concern was the increased coordination and communication that would be required with an additional party involved, and a few respondents said they had been somewhat concerned that as a pilot, the SCEP requirements might not be well defined. Participants generally said that these concerns proved to be unfounded, particularly with the added support offered by SCEP staff.

One challenge mentioned by several participants related to Earth Advantage Commercial certification was the difficulty of finding locally sourced materials, while others specifically said they had difficulty finding qualifying mechanical equipment. Again, the latter was apparently more of an issue with early enrollees, and additional qualifying models of HVAC equipment are said to have come onto the market in the past year. One project encountered challenges because it was a multi-tenant retail building and some requirements (e.g., assuring that all tenants would install Energy Star qualifying equipment) would be difficult to meet at the time of construction.

In all cases, participants said the concerns and challenges were overcome through frequent interaction with SCEP representative and the willingness of Pilot administrators to be flexible in finding alternatives or solutions to potential problems.

Incentives and Incentive Levels

As noted previously, the higher overall incentive levels were rated as very important by more participants than any other Pilot feature in their decision to choose the SCEP. Yet the fact that incentives were clearly defined on a per square foot basis was only somewhat important for the majority of respondents. Surprisingly, very few of those interviewed even knew whether they had pursued the Basic or Enhanced package (all projects but one used the Enhanced), even though the Enhanced path meant significantly higher incentives. Three respondents representing two projects were able to answer definitely that they had chosen the Enhanced path. When asked which path their project had chosen, several owners said, ask the architect; and several architects said, ask the owner. Similarly, few respondents knew for certain whether their project had enrolled in Energy Star benchmarking, which would earn them an additional incentive to offset

the cost of Energy Star certification if performance goals were met after one year. A few said they thought they had, or would within the year.

Participants were split on whether or not they would have pursued Earth Advantage Commercial certification. Most said the incentive was invaluable in helping them to cover much of the cost of certification so that they would not have been able to attain certification without it, but a few said their organization was committed to green building certification, and would still have chosen EA Commercial over LEED because of the lower cost and complexity.

When asked how different the building design would have been if the project had not participated in the SCEP, responses were about evenly divided between those who said the building would have been the same or very similar and those who said major changes had been made. Some said the owners had committed to an energy efficient building and would have pursued that regardless, while others mentioned specific systems that would not have been upgraded (lighting, HVAC, insulation, windows) and a few said the primary change would have been less use of locally sources or sustainable materials. Several commented that the participation process "kept the design team honest" by constantly referring the design back to SCEP requirements and thereby ensuring an efficient building.

Program Requirements and Design Assistance

Program requirements were generally seen as reasonable and attainable for standard buildings that matched the types covered by the Core Performance Guide Oregon Edition. For non-standard buildings (such as a culinary school that included multiple range hoods or the previously mentioned multi-tenant retail project) more adjustments were required, and participants universally praised the SCEP staff's flexibility in working with design teams to tailor program requirements to their projects. A few projects were at the extreme end of the targeted size range, and one of the projects that initially expressed an interest was unable to meet the minimum square footage or savings requirements.

As noted earlier, architects generally were less motivated by the availability of design assistance offered through the SCEP than by the higher levels of efficiency made possible by higher incentives. Most architects said they had used the Guide to develop their design and generally found the Guide helpful and relatively easy to work with. They also found the summaries and spreadsheets offered by SCEP engineers helpful, and one architect reported accessing the New Buildings Institute for additional information. A few mentioned specific limitations with regard to mechanical systems, such as the failure to include variable refrigerant systems and the limited number of qualifying systems available. Most owners had not looked at the Guide and said that program staff had provided them (and others on the design team) with information on qualifying measures and equipment. The one general contractor interviewed said he found the Pilot requirements confusing and said that the biggest challenge was "it cost a lot of money to manage it; a lot of meetings going over the same thing over and over again."

Inspections and Testing

Overall, functional performance testing was recognized as an important factor encouraging participation; multiple on-site inspections somewhat less so. While on-site inspections were seen as somewhat less important by owners, they were considered more important by architect. Several owner representative said they trusted their contractor to do a good job, suggesting that inspections may not be that essential to them, while architects appear to want assurance their design is being built as intended. Respondents with the most experience with functional performance testing were the most likely to value it highly, and several of those said they would have conducted performance testing reported that commissioning is standard practice for projects they work on. Most participants said they were not certain whether data trend logs were provided or would be provided (even though it is a program requirement.) One owner noted that trend logs revealed and helped rectify a serious problem that would have gone undetected otherwise.

Solar and Solar-Ready

While none of the buildings in the Pilot actually installed solar, all but one of the projects were either designed to be solar ready or (in cases where construction had not yet begun) were planning to be solar ready. Participants said relatively minor changes are needed to make a building solar-ready, and several noted the desirability of being ready to adopt solar if the regulatory/economic climate changes or additional incentives are offered.

Applicability to the Broader Market

All the architects interviewed believed the SCEP approach would be widely applicable to other small commercial projects and said they would try to use a similar approach. A few said they already had a strong focus on efficiency and green building, and that the lessons learned participating in the Pilot would help them refine and improve their own standard practices. Unfortunately, neither architects or owners anticipate a significant recovery in the small commercial construction market within the next two years.

Conclusions and Recommendations

As an attempt to demonstrate the applicability to a comprehensive approach to the small commercial new construction market, the SCEP clearly succeeded. Representative of all the projects we spoke with believed they ended up with more efficient, more sustainable designs than would have been likely using the regular New Buildings program, and all were pleased with the participation process. Similarly, all believed that the same comprehensive approach would be more widely applicable and should be offered in a full scale program.

However, because different participants appear to have been motivated by different underlying fundamental interests in SCEP attributes (i.e., efficiency, certification, support), it may not be

necessary to offer a single program that addresses all three core motivations. With the new construction market expected to languish for several more years at least, Energy Trust should have time to develop several alternative approaches to bringing a more comprehensive approach to the small commercial market. The following recommendations and suggestions are offered based on the results of this evaluation.

1. Use Certification as a point of leverage to ensure maximum efficiency gains are achieved by offering an incentive to projects that, for example, achieve somewhat higher efficiency levels than specifically required by Earth Advantage.

2. Because there are some customers who highly value the combination of certification, efficiency, and support, continue to offer a package that includes all of those even it means, for example, specifying that more assistance from program staff will be offered with a slightly reduced incentive level.

3. Develop a strategy to gradually reduce the amount of support needed to design and construct efficient small commercial buildings, including, for example, offering training and seminars specifically targeted to small business owners, architects and engineers through NEEA's BetterBricks initiative.

4. As an alternative to Earth Advantage Commercial certification, which recognizes overall sustainable design, consider a certification label that focuses exclusively on energy efficiency. Something like an "Energy Advantage" label could recognize the achievement of teams who design buildings that incorporate all the features of efficient design embodied in the comprehensive approach but are less interested in local content, water usage, and other aspects of green building certification.

5. Recognize that the slow commercial construction market will continue for several years; in that time, build the infrastructure to enable participants to rapidly implement efficient design for more typical small commercial buildings (e.g., office, retail, schools) so that a program and supporting resources are in place when the market recovers.

6. Similarly, it may be necessary to limit participation in whatever offering follows SCEP to more standard buildings. This will reduce the number of projects that are able to participate, but without the need to enroll projects for the Pilot, that should not be a major concern. The reduction in the amount of tailoring and adjustments would reduce the need for interaction with program staff.

7. Train Outreach Managers and design-build contractors in the basics of any comprehensive small commercial program so that they conduct some of the basic analysis and make decisions regarding appropriate trade-offs. This would accelerate the participation process to keep pace with the rapid design and construction cycle typical of

many small commercial projects – particularly those in retail and small offices. As is often done with program training, group sessions could be used to hold down costs.

8. Make verification of building performance for one year after completion mandatory for all participants in a comprehensive program. This is important to help verify that the assumptions underlying a comprehensive approach are accurate – just as it is necessary to verify the assumptions and savings results from energy modeling runs.

9. Work with other organizations to develop and maintain a current list of regionally available equipment that meets comprehensive program standards.

10. Functional performance testing or commissioning should remain a requirement of any program offering higher incentives for a more comprehensive package of measures. Similarly, collecting trend data on equipment usage is vital to ensure that all measures are operating as intended. Both activities also provide valuable feedback to all members of the design team.