DESIGNING, DEVELOPING AND OPERATING THE ENERGY TRUST OF OREGON'S NEW BUILDING EFFICIENCY PROGRAM – LESSONS LEARNED IN ON-GOING MARKETS

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ABSTRACT

Contained within this paper are the experiences, challenges, and features of the design, development and operation of the Energy Trust of Oregon's $5.1 million New Building Efficiency program. The program's unique characteristics, operations and experiences are described, as well as the response of the program to market needs and how market mechanisms are used to reduce overhead costs. Finally, discover how "hands-on" experiences during the first-year brought about significant results.

SUMMARY

The New Building Efficiency program has had remarkable success in acquiring energy conservation at a low cost during its first year of operation. Aspiring to save 33 million annual kilowatt-hours by June 2005, the program was required to develop and move to market quickly; its inception in August 2003 and the first projects testing the waters in October 2003 required a fast start.

To date, the New Building Efficiency program has exceeded all expectations in both the number of applications, amount of approved incentive dollars and energy saved. A driving principle behind this success has been the facilitation of project participation through minimized procedural rules and burdensome application processes.

In the Beginning…

The Energy Trust of Oregon began operation as a non-profit, charitable organization in March 2002 to fulfill a mandate to invest "public purposes funding" for energy efficiency, conservation and renewable energy resources in Oregon. The mandate emerged from 1999 energy restructuring legislation (Senate Bill 1149) that included a 3% public purposes charge to the rates of the two largest investor-owned utilities. Subsequent action by the Oregon Public Utility Commission encouraged the startup of a new non-profit organization to administer the funds created by the legislation. The state's largest natural gas utility voluntarily decided to participate. A portion of the funding also is dedicated to low-income housing energy assistance and K-12 school energy conservation efforts.

Energy Trust is dedicated to changing how Oregonians use energy by promoting energy efficiency and clean renewable energy for Oregon customers of Pacific Power, Portland General Electric and NW Natural.

The New Building Efficiency program was launched in October 2003 and since then has continued to evolve in response to market input. Science Applications International Corporation, SAIC, is the Program Management Contractor, performing the detailed design and implementation.

PROGRAM FEATURES AND EXPERIENCES

Just What is This Program?

The purpose of the New Building Efficiency program is, in simple terms, to "buy" kilowatt-hour and therm energy savings from commercial consumers. Acquiring energy savings is the leading objective with market transformation and technology development taking secondary levels of importance with the program.

Participants to the program include any new construction or major renovation of commercial, industrial and mixed-use buildings, as well as multi-family housing. The buildings must be located within the participating utilities' service territory.

Who's the Boss?

The entire program and its processes are built for the owner to be the "boss." Each application requires a direct contractual relationship with the building owner or developer. Any decision made on the project that would affect incentive levels requires the signature of the owner and thus drives an interaction with the project team at a higher level than traditional programs. Owner involvement has also led to wider and earlier participation as incentive amounts must be approved by the program prior to the owner purchasing or installing each measure.

This design avoids the potential of having "multiple masters" to be served. In being exactly consistent with how the building design and construction marketplace is structured and operated, clear responsibilities and consistent objectives are created within the existing design and construction teams. While the program agreement is primarily with the owner, it is common that the architect or engineer will act as the owner's representative, consistent with their other professional duties on the project. Furthermore, by making all incentive payments directly to the owner, the program maintains and can even reinforce the owner's relationships with the design and construction teams.

Show Me the Money

Services offered by the New Building Efficiency program include cash incentives for energy-efficient design that exceeds Oregon's energy code requirements. The value of the incentive is dependent upon the amount of energy saved annually. Through three program tracks, the program serves commercial projects of all sizes and types and provides the building owner with a choice for their energy savings commitment.

First, the Standard Track consists of prescriptive fixed unit incentives for specific pieces of high efficiency equipment and motivates customers primarily through the cash-back offer. The application form is available as a spreadsheet and encourages self-service for defined energy technologies (e.g. lighting, unitary HVAC, VFDs, motors, and natural gas equipment). In addition, applications requesting incentives less than $3,000 are not required to obtain pre-approval of incentives. The Standard Track has a cap of $25,000 per project.

The Custom and High-Performance Tracks require an energy analysis to determine the amount of savings above the energy code. Once determined, the incentive paid is $0.10 per annual kWh saved plus $0.80 per annual therm saved. For a package of multiple measures, incentives are based on the total interactive savings for the package. The Custom and High-Performance Tracks have caps of $100,000 and $200,000, respectively.

A Standard Track application can be combined with a Custom or High-Performance Track application with a resulting project cap of $225,000.

Who Cares Where the Money is Spent…

…as long as the energy savings are installed. By purchasing conservation at fixed rates ($0.10 per kWh and $0.80 per therm through the Custom or High-Performance Tracks), there is no limit on the type of energy efficiency measure adopted as long as its savings can be reasonably supported by calculation or analysis. The payback period of each measure must be one year or greater, but there is no automatic disqualification for high cost. Non-economic measures are effectively eliminated by the application of the Energy Trust's benefit cost ratio (BCR) test (discussed below).

The incentive is also not directed to specific uses, it is simply a payment that is made to the owner. The participant may apply the funding to any internal purpose deemed appropriate. However, if program-supplied resources for engineering studies or commissioning assistance (see EDAC and COC discussion below) are used, the cost for these services are deducted from the maximum eligible incentive amount.

Pass Your Tests

Virtually all engineering projects receive an economic assessment of individual measures as a first screen prior to acceptance by the program. This also serves as the basis for the program's payback test. Energy Trust policies dictate that individual measures must pass a complex benefit cost ratio (BCR) test. This assessment is based upon the present value of the energy savings and cost of the energy efficiency measure, future regional power price increases and future power demands and examines the measure's benefit cost ratio from both a societal and the utility's point of view.

The purpose of the BCR test is to assess that a given energy efficiency measure has positive return to the utility system and to society as a whole. It is not intended to preclude participants from undertaking longer payback, or more expensive energy efficiency measures. While longer payback measures do tend to have a lesser chance of passing the BCR tests, the program is otherwise neutral on what is considered an effective energy efficiency investment, leaving this primary decision to the owner and the design team.

An electronic tool was developed for internal use by the Energy Trust which provided a consistent and prompt method of determining the societal and utility BCR's. However, because the program put the analytical burden at the market level, it was necessary to provide the BCR test tool spreadsheet to all of the engineering firms performing energy analyses. Although still under development, the BCR test tool is available to participants now and allows them to determine in advance whether a given measure qualifies for an incentive. Feedback indicates that the design community appreciates the freedom of this analytical approach and the integration of energy analysis directly into the design process.

It Ain't Just the Money, Honey

More than just dollar assistance, the program offers the services of EDACs and COCs – also known as Energy Design Advisory Contractors and Commissioning Oversight Contractors. For the Custom and High-Performance tracks, the EDAC is available to perform the necessary energy analysis and provide invaluable data for the project team to make decisions on energy-efficient design and equipment, if the participant desires and needs such assistance.

Similarly, COC's are available to oversee the commissioning process in a project. Although they assist with the course of action, these contractors do not provide the actual commissioning. The amount of participation a COC has in a project team is decided by the building owner.

Financial assistance is available for both EDAC and COC services. This comes in the form of a study grant offered for either the program's contracted agents or a contractor of the project team's choosing. In either case, the cost of the effort is deducted from the final incentive. A pre-estimate is done by the program to determine if there is a potential for sufficient savings to support an incentive level that can support the cost of services for the EDACs or COCs. In this manner, investments are not given to studies which will not yield sufficient savings to justify the incentive investment.

A Case in Point

As discussed, development of measures is typically performed by an analyst on the project's design team or an analyst hired by them, keeping the choice and control with the owner. These analysts are well versed in Oregon energy code requirements and have the technical skills to perform modeling on a building.

The energy budget baseline for Custom or High-Performance Track projects is the version of the code under which the building will be constructed. Measures that are exempt from the state energy code (e.g., historic register buildings), are allowed to be calculated from the existing condition to determine incentive amounts. In October 2003, Oregon's energy code underwent a significant upgrade, the same time as the program was being launched. The new energy code had higher levels of energy efficiency required, thereby placing a greater challenge for achieving higher levels of efficiency to qualify under the program.

The following example demonstrates an exception to the above approach. It occurred after the participant requested energy analysis assistance. The owner was not comfortable with or lacked the knowledge to hire the required specialist and so the program provided him with an EDAC.

The EDAC's can direct projects to the prescriptive path program if that is in the owner's best interest such as they did on this 11,000 SF strip mall building. After discussing the building and some of the alternatives available, the EDAC directed the owner to the Standard Track application with no energy analysis to be performed. The cost of the analysis would have been approximately $2,500, the incentive would have been less than $3,000.

Instead, through the Standard Track, a service cost of $300 was charged by the EDAC and the owner was approved for approximately $1,500. This represents the highest energy savings at the lowest cost while still providing a good level of service to the participant

Watch What You Pay For

The program is designed to direct the majority of funds available to the actual energy efficiency building project. As such, the EDAC and COC study grant amount is limited to $25,000 or one-half the estimated final incentive, whichever is less. This approach requires the owner to financially participate in the energy study or commissioning service, and thus, have a vested interest in its value and application. Repayment is not required if the project dies, but none have endured this fate to date.

Prove It!

Verification that measures are installed is determined using a series of submittals and check points for building components which demonstrate purchase for a specific project. All installations with incentives greater than $25,000 are site verified. Random confirmations are made for those with lesser amounts.

Reach the Market
To promote energy-effective design, high-performance buildings and high-efficiency equipment, the program works directly with builder owners, architects, engineers, contractors, manufacturers, vendors and suppliers. These relationships are leveraged through two market-based outreach efforts.

First, the New Building Efficiency Program Allies group now number over 3,000 and represent a broad cross-section of architects, engineers, state agencies, green enthusiasts, building owners, etc. Regular updates on the program are provided both through an electronic e-newsletter as well as on the program website. In addition, the Program Allies are notified of new press releases, program workshops, special events and award opportunities.

Working closely with distributors of high-efficiency equipment, the program maintains a growing Trade Ally Network. Through their proactive distribution of program materials and support, the New Building Efficiency program has provided added value for their customers and given them recognition in the green building community

Outreach efforts have been tightly focused to maximize value of resources expended. Word of mouth has been a most effective tool as information about the program and the incentive dollars available travels through large trade associations such as the American Institute of Architects or through county and city planning departments.

Get the Word Out
Of the many available channels for program outreach, the most success has occurred through formal presentations at seminars conducted by both the New Building Efficiency program and other organizations and brown-bag lunch presentations to architectural and engineering firms, as well as informal meetings and many follow-up telephone conversations.

Press releases are issued on award of incentives, program achievements, trade ally success and special projects. Typically, the program is also mentioned in any press release generated by the participant.

Advertising has been placed in construction publications specific to the region served. Program articles have appeared in local and professional newsletters subsequent to presentations to these groups.

Take it to the Limit
There is no restriction as to the number of applications approved for a single owner; although there are per project incentive caps for each program track. As a consequence, those owners who adjusted quickly and submitted applications promptly, were assured that their multiple projects would be funded. Many of the Trade Allies have taken this to heart as they utilize the program as a client service to its customers.

Equality for All Projects
The program does not attempt to determine the intent of the owner. If the building incorporates energy conservation measures above the energy code, then incentive dollars will be paid. This may allow a certain amount of “free-ridership”, however, it eliminates the issues in which two identical buildings can be treated differently under a given program.

Play Well With Others

The New Building Efficiency program is just one of nine Energy Trust of Oregon programs and shares a participant base with them, as well as state conservation programs and certification programs.

The Energy Trust program most closely associated is the Building Efficiency program. Although similarly named the New Building Efficiency program and Building Efficiency program have major differences in their rules and applications. Because the New Building Efficiency program includes major renovations (two or more energy affecting systems changed), there can be confusion about where a given project should reside. There are other significant differences in the programs as well. For example, the Building Efficiency program bases incentives on a percentage of a project's cost, the New Building Efficiency program incentive is based upon annual energy savings.

The Oregon Department of Energy (ODOE) is the other primary player on the state conservation stage. The Energy Trust initiated general working agreements with ODOE and the program established protocols to work with specific state programs. Included were the Business Energy Tax Credit (BETC), State Energy Efficient Design (SEED), State Energy Loan Programs (SELP) and the High-Performance Schools programs. The relationships varied in detail, and include joint promotions, form completion assistance to participants, rule relaxation for specific programs, acceptance of cost verification data, etc. The agency relationship is good and both sides continue to work to improve it.

Leadership in Energy and Environmental Design (LEED™) requires an analysis for energy related points. The LEED™ baseline analysis uses ASHRAE 90.1-1999, the program uses the Oregon energy code, which has higher energy efficiency requirements in some areas. The differences can make either baseline more conservative. While the program is working to develop a simple way to allow use of either baseline, presently it is necessary for the participant to include both in the model. Typically, the energy code baseline is used initially, then the model adjusted for the ASHRAE requirements and the individual measures run. This allows determination of measure values relative to the state energy code baseline.

Those areas of the state served by public utility districts and the participating natural gas company, consumers have access to the Trust's gas incentives but not electrical ones. Frequently, however, the PUD has a vigorous conservation program. In those cases where the electrical utility follows the older paradigm of providing the supporting analysis, they have been extremely cooperative in modifying the analytical approach to allow assessment of individual measures, which was the primary difference in presenting results.

PROGRAM RESULTS

The program has identified just under 20 million kWh and 700,000 therms of conservation associated with about 70 projects. The estimated incentives for these projects are about $2 million. There are another 50 projects in the "pipeline" which do not have quantities defined as yet. Extrapolating this data indicates that the program has recruited some 30 million kWh and 1 million therms.

Because of the length of the construction process, the "landing" of the energy savings will be spread out over the next several years.

LESSONS LEARNED AND CONCLUSIONS

General
The minimalist approach described above has been well received and the program cost benefit ratio is higher than comparable programs. It is likely to continue to increase as the program continues.

Incentive Limits
The incentive caps appear to be appropriately set. Only two Standard Track applications have exceeded the $25,000 limit and only one High-Performance Track project has exceeded the $200,000 limit, although several projects have come close.

Number of Tracks
The division of the non-prescriptive tracks was not necessary. The Custom and High-Performance Tracks have become blended in the marketplace practices so that differential is not needed.

Program Hired Consultants
These appear to be superfluous as the participants understand that this is not an added benefit. The added cost of administration lowers the program's cost effectiveness. There has been little demand for EDAC and COC services. Participants have either had their own resources, or have used the Standard Track.

Simplification
The program has gotten good reviews for the on-going effort to clarify and simplify procedures, such as the self-approval of smaller Standard Track applications. Simplification has also been beneficial when it is considered that the owner and his design team absorb the cost for analysis and application in the program.

Input
The program has gotten good reviews for soliciting input from design professionals on how to handle specific analytical questions (e.g., treatment of individual measures for purposes of the BCR test).

Reaction Times
Because the program is relatively simple, it has been able to respond quickly to unanticipated technical and marketing conditions within known Trust policy.