

➤ ***Market Transformation: Building Energy Code Support Pilot***

Public Service proposes to offer this Market Transformation Building Code Support Pilot that has the Company working with the local building community and jurisdictions in adopting and/or improving compliance to International Energy Conservation Code (IECC) 2009. The Company believes that support, including code training and technical support, will enable the participants to accelerate adoption of higher building energy codes and/or increase code compliance.

This pilot will determine if the proposed DOE Building Energy Codes Program (BECP) protocol process of measuring and verifying energy savings is viable and cost-effective.

The pilot will determine energy savings potential for the pilot participants. The subset will not be a statistical representation of the full market. If the pilot determines that the subset of participants have viable and cost effective energy savings, further work with the broader population will be needed which is outside the scope of this pilot. Finally, we will attempt to identify the portion of energy savings attributed to the pilot.

➤ **Market Transformation: Building Energy Code Support Pilot**

A. Description

Objective:

Determine if energy code support for jurisdictions (cities and counties) and their local building communities can result in additional energy savings through adoption of more stringent codes and increased code compliance.

Public Service proposes to offer this Market Transformation Building Code Support Pilot that has the Company working with the local building community and jurisdictions in adopting and/or improving compliance to International Energy Conservation Code (IECC) 2009. **If we are unsuccessful in finding jurisdictions that are willing to considering adopting IECC 2009, consideration will be given to jurisdictions that are considering moving to IECC 2012.** The Company believes that support, including code training and technical support, will enable the participants to accelerate adoption of more stringent building energy codes and/or increase code compliance.

This pilot will determine if the proposed DOE Building Energy Codes Program (BECP) protocol process of measuring and verifying energy savings is viable and cost-effective. This proposed process is described below in section G.

The pilot will determine energy savings potential for the pilot participants. The subset will not be a statistical representation of the full market. If the pilot determines that the subset of participants have viable and cost effective energy savings, further work with the broader population will be needed which is outside the scope of this pilot. Finally, we will attempt to identify the portion of energy savings attributed to the pilot.

This pilot will enable us to gain experience to make a recommendation to the Commission on a full program through a filed application.

Core evaluation period will be from March 1, 2012 through ~~February 28, 2013~~ **March 31, 2013**. We will conduct analysis on this period starting in ~~March~~ **April 2013** with results expected for a July 2013 program filing, if warranted. Training and other pilot activity will continue through December 2013.

Public Service is proposing the following timeframe for this pilot:

- February 2012 - RFPs for code training, technician support and baseline survey and evaluation work.
- March 2012 – Launch Date
 - Survey to establish the baseline participating jurisdiction code levels and compliance processes.
- April 2013

- Survey the participating jurisdictions to determine the changes in code levels and compliance processes.
- May – June 2013 – Evaluation of the results and viability of a full program including method for energy credits.
- July 2013 – If deemed viable, a program plan will be filed with Colorado Public Utilities Commission.
- December 2013
 - Document results and prepare final report for Public Utility Commission
- December 2013 – Pilot Ends.

The pilot will answer the following questions:

Study Questions:

1. Will a tailored approach to code training and technical support help jurisdictions adopt new energy codes? Can we quantify additional energy savings?
2. Will a tailored approach to code training and technical support help improve and accelerate code compliance? Can we quantify additional energy savings?
3. What are the potential and achievable savings for the pilot jurisdictions?
4. Can the DOE Building Energy Codes Program (BECPP) protocol be used cost-effectively to evaluate the Code Support pilot?
5. Can we attribute savings to this pilot?

Pilot Delivery Method to Answer Study Questions:

1. Choose pilot jurisdictions based on needs and interest and building activity.
2. Baseline code compliance processes, and new code adoption plans via a self-assessment. Calibrate self-assessments across pilot jurisdictions.
3. Build a training plan based on needs identified in self assessments and execute code training and technical support.
4. Evaluate, quantify and training impacts by conducting pre- and post-training surveys of participants, plan review, and field verification.

Deliverables:

- Final report detailing answers to the study questions with supporting documentation.
- Recommendations on the viability of a full program including a plan for measuring and attributing energy savings.

B. Goals, Participants & Budgets

Goals and Participants:

The Building Community includes:

- Builders – residential and commercial
- Contractors – mechanical, electrical, plumbing, insulator, roofer, etc.
- Building Trade Organizations – HVAC, glazing association, electricians, etc.

- Design Community – Architects, Engineers, and home builders

City and County code stakeholders

- Inspectors
- Planners and administrators
- Colorado ICC Chapter
- Non-profit organizations

Budget:

Category	2012	2013
Program Planning & Design	\$10,000	\$0
Administration & Program Delivery*	\$105,000	\$115,000
Measurement and Verification	\$100,000	\$100,000

* Includes technical training

This total budget of \$430,000 for the pilot will be handled within the 15% flexibility allowance of the total portfolio 2012/2013 electric budget.

Although we will be conducting EM&V for this pilot, we do not plan to claim energy savings and will file as an indirect pilot with a TRC=1.

C. Application Process

Selection Method:

We plan to select a subset of jurisdictions to help us learn how to achieve energy savings. The subset will be representative of the overall jurisdictions group. A typical random sample approach has not been chosen because of the low number of new construction projects currently underway. The economy has slowed construction considerably.

Selection Criteria:

- A single climate zone – Front Range
- New Construction only (residential and commercial buildings)
- Targeting two groups – up to 3 Cities and up to 3 Counties to work with us in the pilot. A screening matrix will be used.
 - First Screen: The aim of choosing pilot participants is to be a good representation of the larger population; however, this subset is not expected to be statistically representative. A single jurisdiction should not be a single data point. Jurisdictions will be selected based on:
 - Current Code Level
 - Interest in moving to higher codes
 - What are their needs and wants for assistance in moving up in code level, and any compliance support.

- Second Screen: Jurisdictions must have significant numbers of residential and commercial permits. Residential over 200 permits in 2010 and Commercial over 10 permits in 2010.
- Third Screen: Jurisdictions must commit to actively participate in the pilot program. This will include: obtaining permit data, permit application documentation and building plans, as well as access to a subsample of buildings for field verification.

D. Marketing Objectives & Strategy

The company will work with pilot jurisdiction to help us identify and approach the building community to participate in code and technical training classes. Training will be in conjunction with multiple jurisdictions if practical and possible.

A survey of participants will be done before and after each class to help us understand what training and support is needed and useful. To help attract the building community and trades to the classes will have our training contractors develop and offer credited classes if possible.

Training and Technical Support will consist of:

- New Codes Training: Classes ranging from 5 to 15 people including code officials, builders, contractors, and designers. Approximately 60 classes offered.
- Technical Training for the Codes: Classes ranging from 5 to 15 people including code officials, builders, contractors and designers. Approximately 60 classes offered.
- Code and Technical Support: Code professionals available to help answer technical questions the pilot jurisdictions may have, such as the cost effectiveness of a potential new code for different types of buildings.
- Field Training: One on One site trips with Code Inspectors. Approximately 40 trips with follow-up meetings.

E. Stakeholder Involvement

Public Service is studying the Building Energy Code Support Pilot as a result of recommendations from a group of interested stakeholders.

F. Rebate Levels

Rebates are not offered as part of this market transformation pilot product.

G. Evaluation, Measurement & Verification

BECP Overview

The pilot will rely on the DOE Building Energy Codes program (BECP) framework and protocol as the basis for verification and evaluation procedures.

BECP develops and recommends processes for helping states measure compliance with their building energy codes, as providing suggestions for improving building energy code compliance. The BECP is designed to baseline and document improvements in energy code implementation, enforcement, and compliance rates. For a more detailed description see Appendix A.

The verification includes two baseline projects:

1. Baseline participating jurisdictions' code compliance processes before and after a full year of the pilot.
2. Baseline participating jurisdictions' residential and commercial code levels before and after a full year of the pilot.

The code compliance process evaluation will include a review of the code compliance approach: Prescriptive, Trade-off, and Performance: documenting the percent of each approach and the level of compliance by each approach, based on a check list of steps in the process.

The Compliance level evaluation will review code compliance documentation and methods used by the jurisdiction at several levels. Both self-reported assessments and verification by the training contractor will be conducted prior to the training.

- 1) Plan Review:
 - a. A sample of projects will be reviewed for compliance with specific code requirements, compliance and noncompliance will be recorded.
 - b. Selected projects will include projects under construction as well as under review.
- 2) Site Inspections:
 - a. A sample of projects will be selected for site visits.
 - b. Review jurisdiction processes for site inspections.
 - c. Trainers will go in the field with building inspectors to observe and record the inspection process.
 - d. Evaluators will conduct site visits with assistance from the jurisdiction, or if not possible document the barriers to evaluation site visits.

As part of the pilot, the evaluators will use the multiple site visit technique described in the BECP report that uses similar building for different inspections, including foundation, framing/rough-in, insulation, and final. We expect that this will be easiest to achieve for residential subdivision permits. An assessment of whether it is feasible for commercial permits will be made for building envelope inspections and additional inspections for heating and air conditioning, electrical and lighting.

The evaluation will use the BECP Evaluation Checklists as the framework for the data collection, modifying for each jurisdiction providing for code levels adopted. The self-assessment step will include documentation of what parts of the code the jurisdiction adopts and whether there are additional code requirements they may be interested in

adding. The compliance verification process can include the full list of IECC or ASHRAE code requirements, such that the verification/evaluation team can identify whether code compliant elements are included in the design and construction, even if not specifically reviewed and inspected by the jurisdiction staff. This information will be included in the estimate of energy savings.

The company understands that the BECP Protocol approach may have limitation. We will use due diligence to understand if and where the limitations occur. This pilot will be used to collect detailed information on code compliance and to determine the overall applicability of the protocol.

The data gathered on jurisdiction code compliance before and after the training will be used to determine changes in energy code compliance due to the training support, and estimated energy savings from those changes.

A review of the results – both improved processes and energy savings – will be conducted to determine if the DOE BECP protocol evaluation approach is cost-effective and viable. Because code training is a new area of focus for utilities throughout the country, monitoring of other utilities programs and pilots will be necessary. We want more insight into the use of the BECP protocol in other parts of the country and an assessment of the most cost effective verification and evaluation protocols before progressing to the development of a full program. Finally, this review will identify energy savings attributed to the pilot.

Appendix A

DOE Building Energy Codes Program

The pilot will rely on the DOE Building Energy Codes program (BECP)¹ framework and protocol as the basis for verification and evaluation procedures.

BECP develops and recommends processes for helping states measure compliance with their building energy codes, as well as providing suggestions for improving building energy code compliance. The BECP is designed to baseline and document improvements in energy code implementation, enforcement, and compliance rates. For a more detailed description see Appendix A.

The overall, long term approach as described in Section 3 of the BECP report includes the following five (5) steps:

1. Establish Compliance Working Group
2. Perform Self-Assessments
3. Evaluate Results
4. Train and Educate
5. Launch Third Party Compliance Verification

The BECP report recommends that states, particularly home rule states, expend initial efforts in measuring current compliance rates via pilot studies and/or self-assessments using local building department staff.

The evaluation approach for the pilot will focus on jurisdiction self-assessments and a limited compliance verification element, due to budget and time constraints, with the following assumptions:

1. The pilot will focus its evaluation on a one year period
2. The evaluation will work with as many of the three (3) city and three (3) county jurisdictions as possible*, relying on self-assessments by the jurisdictions
3. The evaluation will use the BECP Evaluation Checklist formats and approaches by strategy, but use a custom checklist for each jurisdiction based on the codes in effect
4. The custom checklists will focus on the most important code requirements. Evaluated buildings will be assigned a compliance rating (0-100%) based on the portion of the code requirements that each has met.
5. The evaluation will focus on a single climate zone – Front Range
6. The pilot will cover new construction only (residential and commercial buildings)

¹ PNNL, *Measuring State Energy Code Compliance*, for US DOE Building Technologies Program, March 2010.