Residential Home Upgrades in California

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Presentation Outline

• Introduction
• Home Upgrade Program
  Issues, Process & Solutions
• Home Upgrade Program
  Accelerator Metrics & Results
• Timeline
• Goals
Introduction

BuildIt Green is a non-profit green building standards development, training and program implementation services organization.
is implementer for the Home Upgrade program, under the statewide Energy Upgrade California ‘programs umbrella’, in the Pacific Gas and Electric (PG&E) service territory, as well as the service territory that PG&E shares with the Southern California Gas Company (SoCal Gas).
Introduction

The Home Upgrade Program (HUP) participation consists of:

- **150 Participating Contractors**
- **3,000 – 5,000 Upgrade Project Rebates Issued Annually**
- **2 Program pathways**
  - Home Upgrade pathway is prescriptive measures based
  - Advanced Home Upgrade pathway requires energy modeling (Pre- and Post-Installation)
Home Upgrade Program Issues

- Program is **complicated** and requires ongoing training and mentoring
- Initially, the Advanced program had **only one approved energy modeling software tool**
- Program requires a significant amount of **time-consuming data collection and document submission**
- Rebate application **process is lengthy and (initially) unnecessarily complex**
- Job-submission **staff turnover can cause delays** during ‘learning-curve’
- Modeled energy **savings is not as accurate as desired**
Home Upgrade Program Issues

Biggest initial pain-point:

- Rebate application process is lengthy and (initially) unnecessarily complex

Focus on:

Information Systems
(i.e., the thing we had the most control of)
Home Upgrade Program Process
2011-2014

- Semi-Custom Online Project Portal
- Project QA and Field Verification [Online Portal]
- Program Data File
- Energy Savings Data File
- Semi-Custom Rebate Processing Database & Admin Review
- Upload Files to Utility for Rebate Payment [PG&E]
Home Upgrade Program Issues

Process advantages for ‘Semi-Custom’ portal/database solutions:
• Off-the-shelf solution to launch Program

Process drawbacks for ‘Semi-Custom’ portal/database solutions:
• Difficult to update features without significant impacts on users
• Difficult to track application documentation updates (good notes required!)
• Design included significant amount of manual aggregation of data in order to move to next step in process
• Reporting capabilities were not as flexible as needed
• More steps = More potential for data errors in transfer
Home Upgrade Program Process

2015-Current

Custom Online Project Portal [Salesforce]

Project QA and Field Verification [Salesforce]

Upload Files to Utility for Rebate Payment [PG&E]
Home Upgrade Program Issues & Solutions

Process advantages for fully ‘Custom’ integrated portal/database solutions:

• Regular, flexible feature updates built on stable, standardized platform (Salesforce) minimize impacts on users and increases efficiency
• Iterative application documentation tracking (good notes still recommended!)
• Automated data aggregation speeds move to next step in process significantly
• Reporting capabilities are as flexible as needed (design for standardization of data where possible)
• Fewer steps = Limited potential for data errors in transfer

Process drawbacks for fully ‘Custom’ portal/database solutions:

• Initial Cost
Home Upgrade Program Solutions

Addressing other Pain-Points:

• Reduce unnecessary and/or manual data entry and documentation
  – Parse data and ‘auto-populate’ from transparent, standardized energy modeling output (HPXML)
  – Online, dynamic, database-integrated ‘test-measurements’ form to minimize manual data transfer and user-error
  – Choice of ‘less-detailed’ software options

These solutions can increase efficiency and save time/money, but might they help reduce staff turnover as well?
HPXML Standard/Structure Maintained by DOE (NREL)
HPXML Structure Based on BPI & DOE Standards

BPI-2400-S-2012
Standard Practice for Standardized Qualification of Whole-House Energy Savings Predictions by Calibration to Energy Use History

BPI-2100-S-2013
Standard for Home Performance-Related Data Transfer v2.1.0

BPI-2200-S-2013
Standard for Home Performance-Related Data Collection v2.1.0

The Building Energy Data Exchange Specification (BEDES) facilitates the exchange of information on building characteristics and energy use.
Test Measurements Form
At-a-Glance Software Comparison Guide

Advanced Home Upgrade Software Modeling Options

Find out which is right for your business!
Home Upgrade Program Solutions

Addressing other Pain-Points:

- Increase energy-modeling accuracy for better Program energy savings and satisfaction
  - Launch mechanism for comparison of energy-modeled predictive savings results with pre- and post-installation customer bill data (CalTRACK)
  - Provide realization-rate feedback to energy modeling software vendors to improve tools
  - Provide realization-rate feedback to contractors to target areas that need improvement with more specific training and mentoring (potentially introduce ‘contractor scores’)
Is the Program Delivering Savings?

Actual (billing analysis) vs. Projected Gas Savings
CalTRACK: Delivery of Predicted Savings

California Data-Driven Tracking and Analysis

• Upgrade projects tracked by software version used
• Savings predictions compared to weather normalized post retrofit billing data
• If inaccuracies identified at the software level, vendor can revise software or an adjustment factor can be applied to reconcile future model predictions
CalTRACK: Contractor Feedback

Avg. Gas Realization Rate (2010-2012 Data): 34%
Home Upgrade Program Accelerator Metrics

1. Reduce administrative time to review rebate applications by 25% (per project)
2. Expand contractor choice of energy modeling software tools
3. Reduce the reporting burden on contractors by 25% (per project)
4. Improve contractors’ satisfaction in the program by 20% (based on surveys)
5. Benchmark predictive accuracy of modeled energy savings and reduce average difference between predicted and actual savings by 10%
Home Upgrade Program Accelerator Results

1. Reduced administrative time to review rebate applications by 48%
2. Expanded contractor choice of energy modeling software tools to 3
3. Reduced the reporting burden on contractors by 27% in avg. application submission time and 20% in avg. energy modeling time
4. Improved contractors’ satisfaction in the program by 28%
5. Benchmarking of predictive accuracy of modeled energy savings is in progress; reducing average difference between predicted and actual savings by 10% is next (upon completion of benchmarking)
HUP Improvements Timeline - 2015

- HPXML Launch: April 2015
- Partner with DOE: May 2015
- Begin Automation Improvements: October 2015
- Move to Salesforce Portal: January 2015
- Begin Bill Data Analysis System Integration Development: December 2015
HUP Improvements Timeline - 2016

HPXML Required
February 2016

Begin Development on HPXML & HES to MLS Registry
April 2016

Initial Bill Data Access via Green Button (Share My Data)
June 2016

Initial Bill Data Analysis Delivery/Access via CalTRACK
September 2016
Long-Term Goal: Market Transformation

Indirect benefits that HUP improvements can facilitate:

• Driving demand/quantifying value of energy efficiency work
  ✓ Home Energy Score via HPXML
  ✓ Bringing green building data to the MLS via HPXML

• Designing better, more cost-effective programs
  ✓ Less risk (greater predictability) for investors
  ✓ Better environment for private capital and industry investment
  ✓ Standardized (HPXML) data sharing and comparative analysis between other states, organizations and industries
Questions and Comments

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Thank You