Broadening the Allowable Software for
Energy Upgrade California (EUC)

Technical PHASE II Proposal

This proposal is to reach agreement to move forward on a technical vetting of an empirical calibration approach to broadening the allowable software for the Energy Upgrade California advanced path. It's based on the input from a wide range of stakeholder interviews conducted in November and December 2012. This includes over 50 calls and meetings with individuals representing contractors, raters, software vendors, financing firms, program managers, utilities, technical experts, CEC, and CPUC.

All stakeholder groups recognized the need to diversify allowable software in the EUC program, while improving predictive accuracy and lowering transaction costs for participants.

After conducting research and weighing the options currently available in the market to evaluate software, this project has resulted in a general approach that now needs to move into a technical process. This technical process will include defining an initial acceptance process for software to assure a baseline for predictive accuracy and minimum modeling functionality as well as an on-going empirical calibration of each software product's predictions based on historical realization rates (energy bills). Further, the software will need to be able to interface with the EUC program.

Initial Software Acceptance Process
This first step will leverage existing testing protocols as a minimum baseline for accepting software into the EUC program. Due to limited existing options available to ascertain software performance through upfront testing, this step will be designed to screen for basic functionality and relative accuracy, but is not a sufficient as a stand-alone screen to ensure better performance overtime.

This process will likely leverage an iteration of the NREL BESTEST in conjunction with minimum functional standards in terms of ECM coverage, reporting, and minimum modeling features. There is also an option to leveraging a performance bonding approach to allow software tools that may not pass BESTEST due to built in limitation to a simulation stress-test that may exclude potentially valid modeling approaches such as regression.

After initial screening software will enter a pilot period to validate predictive accuracy against weather normalized actual AMI data. This process will be designed to be as fast as is statistically valid, with a minimum number of data point (both in terms of projects, and AMI data) to enable a statistically valid first assessment of performance and calibration. By coupling existing testing protocols and evaluation of the predictive accuracy of the software will set the foundation for a long-term, market oriented solution towards broadening the allowable software for the program.

EUC Program Integration

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The process will define integration requirements for software vendors with the EUC program. It will include data transfer standards, security, report content minimums, and QA requirements.

On-Going Empirical Calibration

The empirical calibration system will track the relationship between a software's predictions of future savings, compared to actual energy bills (normalized for weather), in terms of both average accuracy and variance levels. This data will then be used to calibrate prediction levels, creating a level playing field and accountability to actual performance. For example, software that consistently overestimates savings would have a discount applied to it. This "discount" would not only normalize its results with other software, but would influence software company and software users to change their modeling algorithms and behavior to achieve more accurate results.

It will be necessary to develop the specific calculation methodology that will be used to measure realization rate and variance, and how this data will then be used to calibrate predicted results for a given model. The design of this system will ensure that data is reliable and is aligned with best practices in M&V.

This proposal is to agree to move forward with the Phase II of this project to develop the empirical calibration process into an operational model for EUC software and answer the following list of outstanding technical questions:

PHASE II – Empirical Calibration Technical Process

The following outline highlights some of the key known technical decisions that will be covered in Phase II of this project:

Initial Software Acceptance Process

Accuracy Assessment Testing

- RESNET Publication No. 06-001, section 4.2 testing protocol
- NREL BESTEST
- Empirical Test Protocol (using actual house data)
- Performance bonding
    - Amount
    - Forfeiture rules
    - Administration

Pilot Empirical Testing Protocol

- Minimum dataset for initial calculation

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- - Number of jobs, post install data, heating / cooling seasons, AMI, weather data
- Variance level max for participation (root-mean-squared)
- Average predictive accuracy calibration
- General issues to be addressed
    - What to do if there is Solar PV on a house (we can only see net)?
    - How do we ensure that all ECM types are accounted for in empirical dataset?
    - Are there required or minimum ECMs for participation?
    - How do we ensure we are testing for all CA climate zones
    - Do we have to account separately for behavior, or major changes?

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EUC Integration Requirements

- Program data integration
  - HP-XML
- Security requirements
- Model QA requirements
- Consumer reporting requirements

Ongoing Empirical Calibration System

Operational Rules

- When will calibrations occur
- What dataset will be analyzed (rolling average, period average, etc.)
- Penalties for over/under prediction
  - How will penalties change over-time?
- Contractor level tracking and disclosure
- Security and privacy rules for results of test
  - Contractor / software feedback
  - Public data
- General issues to be addressed
  - How do we managing risk in the pilot? What is program exposure?
  - Should there a limit to the number of tools to avoid complexity or oversaturation?
  - Is there a way to value variance other than just capping allowable amount?
  - Should the flex or advanced basic path be calibrated in the same system?

Technology and Platform Requirements

- Ability to import in XML
- Ability to handle AMI data
- Security to handle use data
- Data sharing rules for software company feedback

Phase II Technical Team

In this Phase of the project, IOUs, with input from the CEC and CPUC, will help choose a core technical team to help answer the questions listed above (and any additional issues that will emerge). The Phase II Team will be assembled and confirmed with input from stakeholder and particularly the IOUs, CEC, and CPUC. This may also include M&V resources that are already under contract with IOUs and bring their specialized and relevant knowledge to this process.

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We will also circle back with key stakeholders from each major group interviewed during Phase I prior to completion of the Phase II technical process, to consult and provide feedback based on recommendations made by the core team.