



Attn: Dockets Unit,
California Energy Commission (docket@energy.ca.gov)

From: Steve Schmidt,
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Subject: Comprehensive Energy Efficiency Program for Existing Buildings (AB 758)
Scoping Report Staff Workshop (docket 12-EBP-1)

To Commissioner McAllister & staff:

The commission's timing to develop a new cost-effective residential energy efficiency program for California is fortuitous, converging as it does with three significant technological advances:

1. A large majority of California homes now have smart meters;
2. Smart meter data is accessible to third parties;
3. Third party smart meter disaggregation tools are showing excellent results.

Together, these advances enable a revolutionary approach to residential energy efficiency for existing homes that is accurate, cost-effective and highly scalable.

Historically the best way to assess a home's energy efficiency required an in-home HERS audit coupled with detailed and error-prone modeling in EnergyPro. These models represented state-of-the-art prior to the availability of interval data, but they cannot accurately analyze all homes since they exclude the increasing proportion of energy used by plug loads and occupant behavior. In addition, at over \$400 per home, this approach does not scale for the entire state (it would require over \$4B just to provide HERS assessments for California's existing homes).

But now for the first time, a homeowner or contractor can use web-based tools to analyze actual smart meter data and perform a detailed, accurate energy audit of the home without a home visit or installation of any additional hardware. Software can be used to **determine a home's overall heating or cooling efficiency** (BTUs per square foot per degree day), the **impact of the home's plug loads**, and the **impact of occupant behavior**. This gives a truly "whole house" perspective to prioritize various energy reduction strategies, and can be done at large scale for a few dollars per home. Below we provide further details on the three enabling technologies.

1. A large majority of California homes now have smart meters

All three IOUs and a number of other California utilities (SMUD, LADWP) have deployed smart meters to residential customers. Many California residences now have **both** electricity and natural gas smart meters. These new meters provide orders of magnitude more information about household energy use than was available just a few years ago.



2. Smart meter data is accessible to third parties

During the summer of 2011 the CPUC ruled that IOUs must make smart meter data available to third parties when authorized by their customers to do so. This ruling was put to the test with one of the major IOUs in November of that same year when access to such data was inadvertently cut off, but with Commissioner Ferron's strong support the ruling was upheld and data access was quickly restored. Then in January 2012 all three IOUs joined the nationwide Green Button initiative and made smart meter data available to customers in a standard format. And on October 1, 2012 at a DOE-sponsored summit both PG&E and SDG&E embraced the next generation of Green Button -- Green Button Connect -- allowing third parties to directly download data on a continuing basis when so approved by customers. In one experiment, High Energy Audits analyzed plug loads across 1700 anonymized PG&E accounts over a weekend using this new Green Button Connect interface.

3. Third party smart meter disaggregation tools are showing excellent results.

In cooperation with non-profit Acterra, High Energy Audits completed the innovative CEC-funded "High Energy Homes" program in June of this year. The program relied exclusively on detailed analysis of smart meter data to diagnosis areas of wasted energy in 176 high-energy homes in the Bay Area. Homeowners followed simple recommendations provided by the online service and achieved energy savings more than 7 times more per household than requested by the CEC, totaling more than 220,000 kWh/year. A similar but more advanced program is now underway in Mountain View and currently has over 1,000 participants. The program runs through the end of this year and initial results show similar success. Note that in both these projects results are measured based on **actual changes in energy use**, not through deemed or modeled savings.

Other software companies are validating the same approach for commercial buildings. Retroficiency, FirstFuel, and NoesisEnergy provide smart meter based analysis tools that help building owners identify areas of wasted energy at a scale and cost-effectiveness never before possible.

This new type of software is improving rapidly, allows for greatly improved targeting (for specific EE measures), homeowner education (using data specific to his or her home), and detailed analysis of the actual results of EE programs.

In closing, we encourage the commission to take advantage of low-cost smart meter disaggregation and analysis tools to **(1) identify existing inefficient structures, (2) prioritize their energy efficiency improvements, and (3) directly monitor and measure** the resulting energy savings.

Respectfully submitted on Tuesday, October 23, 2012.