

Consideration of Energy Efficiency in the California Energy Demand Forecast

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Purpose

This paper is meant to provide the reader with a brief overview of how the Energy Commission proposes to account for energy efficiency in the demand forecast. The efficiency analysis required for the 2011 IEPR forecast (CED 2011) is in its preliminary stage, so the proposals described here should not be considered final. Over the course of this forecast cycle, these proposals may change or be eliminated and new ones may be added as discussions evolve between CEC staff and stakeholders.

Background

The Energy Commission relies on survey data, manufacturer specifications and engineering estimates to populate its end-use models with average UECs. Those UECs are updated periodically to reflect gradual changes in technology efficiency and consumer behavior over time. In recent years, California has seen a flurry of activity—new policy initiatives, more stringent standards, and heavy program spending/participation—aimed at stimulating rapid changes in efficiency and behavior. The cumulative effects of these activities on energy demand can be significant and must therefore be given special consideration in the forecast. Energy Commission staff models the impacts of efficiency initiatives through changes in UECs or through post-processing of model results.

Committed vs. Uncommitted Activities

In previous forecasts, the CEC has distinguished between committed and uncommitted demand-side management activities. Committed activities are those which have already been implemented or have a specific program plan and firm funding. Uncommitted activities, on the other hand, are those for which detailed implementation plans or funds are not yet available or for which there is still some question as to whether the planned activity will be carried out successfully. The effects of committed activities are considered directly in the forecast. The CEC conducts a separate, incremental scenario analysis to examine the impacts of uncommitted activities.

Building and Appliance Standards

The CEC models building and appliance stock by vintage. As new buildings and appliances are added, their associated energy use characteristics are assumed to comply with the current efficiency standards. In addition, there are some standards that

affect existing buildings. Over a ten-year forecast period, it is likely that new standards will be implemented. However, the changes to future standards are unknown and the impacts are therefore uncommitted.

Policy Initiatives

Often, new legislative/policy initiatives will be enacted well before an accompanying implementation plan has been developed. This makes a rigorous quantitative analysis impractical, and so long-term policy goals tend to be considered in the CEC's uncommitted analysis. Once a sufficiently detailed plan is in place, however, staff may consider the impacts of a particular policy initiative as committed. The Huffman Bill, for example, was included as part of the 2009 Incremental Uncommitted analysis. In preparation for CED 2011, however, staff has integrated the Huffman Bill into its models as a revision to Title 20 appliance standards.

Utility Programs

The effects of future utility programs are included as part of the committed forecast provided that funding has already been approved and detailed implementation plans are in place for the programs. The residual effects of past programs are also included in a four step analysis:

1. Staff compiles utility-reported, first-year program performance data.
2. Program impacts are separated into end-use categories by sector.
3. Staff applies net-to-gross ratios and realization rates derived from the CPUC's evaluation studies.
4. Each end use category is assigned an expected useful life which is used to project residual savings over the forecast period.

Future Utility program goals are included as part of the incremental uncommitted analysis.

Proposals

Energy Commission Staff intend to leave the basic structure of the efficiency accounting methodology (described above) intact. The following proposals build on that structure.

Natural Gas

The same analysis used in CED 2009 to evaluate electricity efficiency savings will be applied to natural gas as well. Staff will compile a history of utility-reported first-year savings figures and, using the results of measurement and evaluation studies, develop and apply net-to-gross ratios and realization rates. Cumulative savings will be determined by projecting first year savings over the forecast period.

Incremental Uncommitted Analysis

Staff will once again be conducting an analysis of uncommitted efficiency activities using Itron's Scenario-based Energy Savings Assessment Tool (SESAT.) Many of the assumptions used in the previous uncommitted analysis will remain unchanged as no new Goals Study or major policy initiatives have been issued since. Staff will remove assumptions concerning the Huffman Bill and the 2010 Title 24 revisions, which are now considered part of the committed forecast.

Staff also plans to conduct a parallel uncommitted analysis for the LADWP and SMUD service territories.

Measurement and Evaluation Results

Since CED 2009, the CPUC has produced a very thorough and detailed set of measurement and evaluation results. The 2006 – 2008 Evaluation Study indicates that the net-to-gross ratios and realization rates used in CED 2009 were too high. Staff will adjust the 2006 – 2009 assumptions downward to agree with the evaluation study. Staff will not adjust assumptions for program years prior to 2006.

Committed Scenarios

Staff intends to retain its practice of forecasting high, medium and low energy demand scenarios corresponding to high, medium and low projections of economic growth, respectively. For the high demand scenario, staff will assume a low level of efficiency savings. Similarly, the medium scenario will include a moderate level of efficiency and the low demand scenario will include high savings.

Because the CPUC's 2006 – 2008 Evaluation Study cannot definitively answer the question of what adjustments should be made to estimated savings during the committed portion of the forecast period, staff will vary the adjustments in order to generate low, medium and high efficiency scenarios. For example, the low scenario may assume that the net-to-gross ratios and realization rates identified by CPUC's evaluation study will persist through the committed period. Alternatively, the high savings scenario may assume that the original utility estimates of net savings will be achieved. The medium scenario will fall somewhere in between (for example, staff may use assumptions from CED 2009.)

The figure below illustrates what these efficiency scenarios would have looked like for PG&E, had they been used in CED 2009.

