

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

**SOUTHERN CALIFORNIA EDISON COMPANY'S COMMENTS ON THE DRAFT
DEMAND RESPONSE IMPACT EVALUATION PROTOCOLS**

**MICHAEL D. MONTOYA
JANET S. COMBS**

Attorneys for
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-1524
Facsimile: (626) 302-7740
E-mail: Janet.Combs@SCE.com

Dated: **May 2, 2006**

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

**SOUTHERN CALIFORNIA EDISON COMPANY'S COMMENTS ON THE DRAFT
DEMAND RESPONSE IMPACT EVALUATION PROTOCOLS**

I.

INTRODUCTION

Pursuant to an April 12, 2006 email from the California Public Utility Commission's Energy Division to the Demand Response Cost-Effectiveness Distribution List, Southern California Edison Company (SCE) provides these comments on the April 3, 2006 draft demand response load impact protocol document prepared by agency staff ("Draft Protocols").

The Draft Protocols are an excellent first draft that meets the two requirements of Ordering Paragraph 8 of D.05-11-009: to prepare a set of draft protocols for demand response (DR) program impact evaluations and a list of additional cost data that should be collected. The Draft Protocols provide a strong foundation of good methodology for impact evaluation while also highlighting the issues that need to be decided for a final set of protocols. In these comments, SCE offers a proposal on how to proceed with the further development of the protocols for demand response program impact evaluation and the list of additional cost data. SCE provides in Attachment A hereto responses on various specific issues raised by the Draft Protocols.

II. RECOGNIZING THE DISTINCTION BETWEEN IMPACT EVALUATION AND PROGRAM TRACKING/REPORTING

SCE wishes to clarify that the protocols being developed are for DR load impact evaluation only, not for regular reporting of load reductions or for calculations used for customer payments. Load impact evaluation is an entirely separate activity from regular monthly and annual program tracking and reporting of load reductions. The methods used to calculate load reductions for reporting purposes and for customer payment purposes are much simpler than the methods used for impact evaluation, for good reason. Load impact evaluation is a post-season research activity intended to develop the best possible estimates of the load reductions actually achieved for each event during the demand response season. It is a time-consuming activity that is performed once every one to three years, and generally requires six to nine months after the end of the season for the study.

The results of a load impact evaluation study provide a check on the accuracy of the current reporting methods. The load impact evaluation can be designed to include analysis of alternative simple calculation methods to identify ones that may enable more accurate results reporting. SCE recommends that the workshops and the final report to the Commission on the protocols address how the load impact evaluation studies can be fashioned to support the development of improved simple calculation methods for use in meeting program tracking and reporting requirements, which would address the concerns of stakeholders about the accuracy of the regularly reported load reductions.

III. RECOMMENDATIONS ON FURTHER DEVELOPMENT OF THE EVALUATION PROTOCOLS

As the Draft Protocols suggest, there is significant but not complete overlap between the issues that need to be covered for demand response program impact evaluation and energy efficiency program impact evaluation. The process of developing the demand response program

evaluation protocols can maintain consistency with the energy efficiency protocols and also be simplified by taking advantage of the development work already done for the energy efficiency protocols, just approved by ALJ Gottstein's April 25, 2006 Ruling issued in the energy efficiency rulemaking. Rather than developing parallel materials, the demand response evaluation protocols can simply refer to the energy efficiency evaluation protocol chapters as a base and lay out the additions or variations appropriate for the special issues of demand response program evaluation. The topics that can be treated this way include sampling and uncertainty, process evaluation, measurement and verification, reporting requirements and some of impact evaluation.

SCE proposes a two-phase or two-track approach, one completing the development of the demand response impact evaluation protocol, and the second dealing further with the protocol section on classifying cost data and recommending methods for collecting additional data on incremental costs. Furthermore, before developing detailed requirements for cost data collection, it is essential that a clear statement of the intended use of the data be developed.

SCE's perspectives and recommendations on specific issues raised within the draft protocols are provided in Attachment A hereto.

IV. CONCLUSION

SCE appreciates the opportunity to provide these comments.

Respectfully submitted,

MICHAEL D. MONTOYA
JANET S. COMBS

By: **Janet S. Combs**

Attorneys for
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-1524
Facsimile: (626) 302-7740
E-mail: Janet.Combs@SCE.com

May 2, 2006

Attachment A

ATTACHMENT A

SCE'S RESPONSES TO ISSUES RAISED IN THE DRAFT PROTOCOLS FOR IMPACT EVALUATION OF DEMAND RESPONSE PROGRAMS

SCE understands that the Draft Protocols are essentially an attempt to canvas methodological issues for consideration by interested parties. Therefore, some of our comments go to whether or not an issue (raised in the Draft Protocols or not) should be addressed in the Protocols, while others are substantive responses to the particular issues raised.

A. Section 1: Purpose of the Demand Response DR Load Estimation Protocols

1. Impact Issue #1: Retrospective vs. Forecasted Load Impacts

SCE agrees that the methods used should be capable of providing not only an accurate retrospective assessment, but also a basis for forecasting impacts under different mixes of conditions than those comprised in the particular event-days included in the evaluation. We strongly endorse a guideline encouraging the capability of reliably estimating impacts observed (or to be expected) on extreme days, and another guideline ensuring that load impacts outside of the event period are modeled in the impact evaluation.

B. Section 2: Types of Demand Response Programs

The two-way typology of program types defined on page 3 as dispatchable or non-dispatchable is useful, however SCE would suggest replacing “price responsive programs” with “day-ahead programs” and “reliability programs” with “day-of programs.” SCE is not familiar with the term “load responsive,” and understands it to mean “load control.”

1. Impact Issue #2: Education and Marketing Programs

SCE agrees with the Initial Thought for Comment on this issue. However, impact estimation protocols need not be developed here for education and marketing programs. They are already provided in the Evaluator Protocols for energy efficiency programs, and they can be incorporated by reference. There is no need for separate protocol development in this particular area. However, it would be useful for the Draft Protocol’s discussion regarding education, marketing, and audit programs to include the following principles:

- unless such programs explicitly claim energy savings/load reductions, as part of their logic/rationale, the estimation of gross and net savings is not required;

- the first focus of such evaluations should be on whether the “mediating variables” of altered customer attitudes/cognitions, altered behavior, and participation in other programs are affected by participation in the education program;
- the evaluation should determine whether energy savings or load reductions are the consequence of a causal path that includes the program theory’s expected alterations in behavior and co-participation, but this should not be required unless that theory claims an energy/load outcome.

C. Section 3: Demand Response Impacts To Be Estimated

1. Impact Issue #3: MW Impact Estimates for Event-Based Programs

Because it should be possible to estimate load impacts for each hour of each event, this should be the expectation. If this is done, then the data are available to provide average hourly impacts and impacts under most extreme conditions. It is of value, but not of equally great importance, to estimate load impacts outside the event period, for programs where such effects seems probable. For small programs, the extra effort involved is probably not worthwhile.

2. Impact Issue #4: Other Influential Factors to be Estimated

SCE agrees with the additional factors that should be considered for or in estimation. We note, however, that the first bullet does not list outcome variables as do the remaining bullets, but input parameters that influence the outcome variables. This distinction should be clarified.

3. Impact Issue #5: MW Impact Estimates for Non-event-based Programs

SCE agrees with the list of factors that should be considered for the estimation process.

4. Impact Issue #6: Other Influential Factors Need to be Estimated for Non-event-based DR

SCE agrees with the list of factors that should be considered for the estimation process, with the same caveat as in Issue 4.

5. Impact Issue #7: Estimating Loads for Settlements vs. Estimating Load Reductions for Benefit-Cost Analyses and Resource Planning

The Initial Thought for Comment reflects SCE’s perspective on this issue.

D. Section 4: Estimating Impacts from Demand Response Programs

This section is an admirable draft, providing an excellent basis for the final protocol. It describes the methods for performing impact evaluations of the demand reductions actually achieved by a program, building on and referring to appropriate sections of the Evaluator Protocols for energy efficiency program evaluation. It can be made clearer and more complete by making the changes described below.

1. The Concept of Baseline:

In the introductory section, the protocol should develop the concept of baseline in terms of expected usage/load absent an event, absent a tariff, or absent a program. The reader should be comfortably convinced that the calculation of a baseline is always present in an impact evaluation – in the form of comparison/control groups, deviations of observed energy values from regression expectations, etc., and that the methodological issues here are no more complicated than those in energy efficiency program evaluation, despite the many variations on baseline calculation presented.

2. Establishing Regression Analysis as the Primary Impact Evaluation Method:

The primary focus of Section 4 should be on regression analysis as the generally preferred method for impact evaluation of demand response programs. Representative day approaches should be presented more briefly as a reasonable alternative in certain circumstances. These include small programs with low levels of demand reductions that may not justify more intensive and expensive analysis and difficulty in getting large quantities of cleaned interval data combined with tight time requirements for analysis. (These reasons plus a strong utility interest in comparing alternative representative day approaches help to explain the primary focus on representative day approaches in the evaluations of the 2004 and 2005 large customer demand response programs.)

It should be clear, however, that the representative day approach is not identified in any impact evaluation literature as the preferred method for estimating program impacts. By its very nature, the representative day approach sets parameters for how many days to use and what days qualify, what adjustments can be made, and in what form. It does not make use of all the data and statistical power available for estimating the causes of variations in load in order to develop the most accurate possible baselines.

The protocol should also describe the representative day approach as a settlement method for event-based programs and a method for programs to track their impacts over the program period. In this developmental stage of the protocols, it is understandable that the authors want to show the bridge from the known 2003 KEMA study that focused on assessing alternative approaches to determining individual customer load reductions for settlement purposes. It will also be important to have some context-setting material in the final protocols as well. However, the final protocols should more often simply reference the major dimensions of baseline calculation: provisional baseline calculation method, day selection, adjustment to event day – dimensions upon which all the methods can be described compactly.

It might be helpful to have the protocol set forth:

- the types of methods expected to be primary candidates for impact evaluation vs. settlement calculation,
- within cells of a concept table defined by program features – features at minimum including dispatchability/load vs. price response as well described in the draft.

This would focus the discussion of appropriate methods through the later text.

The protocol should emphasize the distinction between settlement calculations and a program evaluation’s load reduction estimation. As in the energy efficiency world, there *should* be a tension, meriting different measurement approaches, between what is done to fairly reward a customer during program operation, and what is done to determine what the program accomplished vis-a-vis the paid-for “provisionally estimated” accomplishments.

Furthermore, it is important that the protocol call for the evaluation to determine how and why settlement procedures lead to over - or under - statement of reductions relative to the method used for the impact evaluation. This might include evidence of the effects of changes in behavior outside the event time: shift-cancellation prior to events, pre-cooling, gaming, susceptibility of the chosen settlement calculation method to a particular level of load variability, etc.

In other words, the protocol should encourage an understanding of why settlement and evaluation impact differ, not just an estimate of the difference.

Page 23 of the Draft Protocols partially misrepresents KEMA’s Baseline 2003 report. KEMA indicated that, counterintuitively, a regression based on a full season of data may in certain situations be less accurate in providing an expected load value (baseline) for an event hour, than a regression based on a shorter time interval, which limits the role of unobserved or difficult-to-model customer changes. This may be a counterintuitive result that extends to impact evaluation, not just settlement calculation.

3. Impact Issue #8: Estimating Program-Wide Impacts vs. Customer-Specific

Impacts:

The purpose of these protocols is to estimate program impacts, for multiple uses: assessing program effectiveness, providing input to cost-benefit analysis and resource planning, providing a strong foundation for forecasting future program effects. Clearly, estimation of program impacts is the primary focus. Estimation of customer-specific impacts for purposes of assessing the accuracy or fairness of a settlement method and exploring the qualities of alternative settlement methods is a useful secondary goal that can be added when it is felt to be needed.

4. End Use Metering:

The protocol should also emphasize the issue of how and whether to end use meter, what level of savings concentration in large customers would trigger this, and suggest any other factors to consider when deciding whether a program or a particular customer within a program may merit end use metering. (The authors may note that the statistical issues relating to baseline calculation are similar whether end use metering or premise load analysis is conducted, although variability.

5. Evaluation for Small Programs:

The protocol should make explicit the potential costs of “hyper-evaluation” of small, startup programs, where, for example an inexpensive, low key process evaluation that identifies design issues may be much more useful to planners or administrators than an impact evaluation over a miniscule population.

6. Description of Pooled vs. Individual Customer Regressions:

The Draft Protocols (and the preceding KEMA Baseline 2003 effort) appear to strongly favor individual customer regressions and baseline vs. observed load calculations as opposed to pooled models. Unless the authors rule the latter out entirely on merits (which may be reasonable), they may want to point up situations in which pooled models, or simpler aggregation procedures like the “duty cycle” approach, may be more appropriate.

7. The Use of Non-Participant Load Data:

The Draft Protocols do not appear to allow for the possibility that in evaluation of mass market DR programs, non-participant load may be helpful in the development of a baseline or comparison load estimate. The conditions under which this might be reasonable ought to be outlined.

8. Discussion of Disaggregating Load Reduction Estimates:

The capability of producing disaggregated reduction estimates is mentioned.

It could be important to provide for this on a customer segment and/or climate zone basis.

Based on a review of program attributes and resource planning needs, later drafts should discuss the balance between disaggregation at a reasonable level of precision and the cost of the increased sample sizes enabling the disaggregation.

9. Discussion of Customer Load Variability:

Distinctions are made in the recent literature on DR baseline, between customers who are characterized by high- vs. low-variability load, or by high vs. low sensitivity to

weather. If these distinctions are to be introduced into the protocol, then the protocol should then provide guidance on the basis for the categorizations, which in the recent past have been essentially ad hoc (California Energy Commission’s Baseline 2003 study by KEMA, for example).

10. Impact Issue #11: Sub-Metering

The discussion of sub-metering of premise loads requires (1) clarification in terms of how sub-metering can solve the “problem” of highly variable premise loads, and (2) conversion into language giving guidance on when there are gains from sub-metering (*i.e.*, if the high variability is established to be associated with premise loads other than the subject end use).

11. Impact Issue #16: Spillover

This repeats some of the material in the earlier enumeration of “Impacts to be Estimated.” The protocol would be well served by an early definition of gross and net reduction, spillover, free ridership, and so forth. The discussion here, for example, suggests that “intra-customer spillover” in the form of pre- and post-event effects may be captured by dummy variables tailored to that task. An obvious extension includes impacts upon other dependent service accounts at a location: for example, load drops on relatively ancillary accounts due to a shutdown of the subject account.

12. Impact Issue #17: Use of Post-Event Day Load Data in the Construction of Baselines:

These would be good points if representative day approaches were a recommended method of impact evaluation. Since they are not, this discussion should be dropped.

It’s not a statement that needs to be made for regression analysis – as the later text says, there it is routine and expected to use pre- and post-event data.

13. Impact Issues # 18, 19, 20, 21: Statistical Accuracy and Representative Day Baselines:

Issue 18 is one of the reasons why representative day approaches are not an acceptable methods of impact estimation. Because they are not, Issues 19, 20, and 21 need not be addressed.

14. Impact Issue #22: Time Period Used in the Regression Model:

If less than a full season of data is used, the reasons why this is necessary or preferable must be compellingly explained.

15. Impact Issue #23: Event-Specific vs. Average Event Impacts:

It is important to include estimation of event-specific impacts and understand how impacts can vary across event types. This is critical to use the evaluation results for forecasting purposes. It is fairly easy with dummy variable specifications to produce both event-specific and seasonal average event impact specifications.

16. Impact Issue #24: Use of Prior Estimates of Hourly Impacts in a Regression

Model:

The discussion of this issue makes use of an incorrect assessment of SAE models to support the concept of including bid amounts as regressors in load reduction estimation models. There are studies that show SAE approaches yield inferior results with higher variance, due to the nature of the errors in the engineering estimates. Dummy variable approaches -- in which savings or demand reductions are calculated from the calibrated regression (by calculating expectations with and without various program- or event-related terms in force), and *then* comparing the outcome to a prior claim or estimate -- are often more effective. This does not mean that comparing bids to net outcomes is not an important impact evaluation goal.

17. Impact Issue #25: Developing Program-Wide Confidence and Precision Levels from Customer-Specific Impact Estimates:

This impact issue considers program-wide precision/confidence versus precision of individual impacts. The point being made here is essentially that the overall variance (variance of the estimate for the population) need not be the sum of its parts (variances of estimates for individual customers), and some unease is expressed about getting to the former from the latter because of possible inter-customer correlation of estimates (presumably positive). The overall variance of a composite is always lessened to the extent that the elements are positively correlated, and the protocol (or an appendix) might be improved by allaying the concern with an empirical demonstration, or simply a sensitivity test.

18. Impact Issue #26: Current Energy Efficiency Evaluation Protocols:

The energy efficiency Evaluator Protocols do cover many of the issues involved in the use of regression methods. Wherever that document's coverage is complete, it can simply be referenced. However, there are some issues more important for demand reduction impact estimation that are not fully addressed in the Evaluator Protocols, which are more focused on energy savings. These are the issues that should be covered in the demand response evaluation protocols.

19. Impact Issue #27: Ratio and Difference Estimation Procedures:

Stratified ratio estimation and related techniques need to be discussed with respect to sample design and the weighted estimation of population results from reductions estimated for sample members. The protocol should guide evaluations toward ratio estimation or similar approaches, particularly among large and very large commercial/industrial segments, but allowing for the possibility that such designs and techniques may hamstring the evaluation with respect to providing good disaggregate estimates (over climate zones or possibly commercial/industrial segments).

20. Impact Issue #28: Estimation of Impacts Other than Customer Load Impacts:

Methods for estimating other impacts, such as effects on market prices, can be considered for later addition to a more complete set of demand response evaluation protocols. The need for them should first be identified and fully described in other processes, such as the development of cost-benefit tests for demand response programs.

E. Section 5: Tracking Demand Response Program Costs

As we have stated earlier, revision of this section should come after a record has been established to explain what additional cost data are needed and why. It is difficult to address the cost issues raised until the specific needs for each piece of cost data are clearly defined.

That said, there are a few simple changes that can be made for clarification.

First, the title of the section and several subsections should be changed from “tracking” DR program costs to “collecting” DR program costs. Tracking can be done only with data, such as program data, that are routinely collected as part of program operation.

Other data must be collected by expensive methods, usually on a sample basis. Customer data of the types listed is not routinely available. While it may be feasible to put all program data in a single database, this is unlikely to be true for much of the customer cost data, which will be developed in studies based on participant and non-participant samples.

Second, the Tables 5-1 and 5-2 may be useful if the terms “direct” and “indirect” are defined.

CERTIFICATE OF SERVICE

I hereby certify that, pursuant to the Commission's Rules of Practice and Procedure, I have this day served a true copy of **Southern California Edison Company's Comments on Draft Demand Response Impact Evaluation Protocols** on all parties identified on R.04-04-025 and Cost Effective Distribution Lists. Service was effected by one or more means indicated below:

- Transmitting the copies via e-mail to all parties who have provided an e-mail address. First class mail will be used if electronic service cannot be effectuated.
- Placing the copies in sealed envelopes and causing such envelopes to be delivered by hand or by overnight courier to the offices of the Commission or other addressee(s).
- Placing copies in properly addressed sealed envelopes and depositing such copies in the United States mail with first-class postage prepaid to all parties.
- Directing Prographics to place the copies in properly addressed sealed envelopes and to deposit such envelopes in the United States mail with first-class postage prepaid to all parties.

Executed this May 2, 2006 at Rosemead, California.

Meraj Rizvi
Project Analyst
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770