

The Load-Impact Estimation and Cost-Effectiveness Protocol Rulemaking in California – Working Towards Recommendations

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ABSTRACT

This paper describes efforts being undertaken in California Public Utilities Commission (CPUC) Rulemaking R.07-01-041 to develop protocols for estimating the Load Impacts (L-I) of Demand Response (DR) programs. When completed, this document would be used to guide the processes and efforts associated with estimating the load impacts of California's demand response programs. The development of appropriate cost-effectiveness methods for assessing DR programs is also part of this proceeding. The estimated load impacts would be one key input into the cost-effectiveness (C-E) assessments. The schedule calls for final recommendations to be submitted to the CPUC by October 2007 with a decision expected in early 2008.

The development of protocols for estimating load impacts from DR has progressed further than have the protocols for examining the cost-effectiveness of DR programs. This paper presents the currently proposed load impact protocols and it outlines some of the issues still remain to be worked on in the cost-effectiveness protocols. It is important to recognize that no decision has been issued by the CPUC in this proceeding and that the protocols still open to interpretation until such a decision is issued. The purpose of the paper is to highlight technical and structural issues that have been addressed in the protocols, and to discuss the regulatory process used to develop these proposals.

Regulatory Process

The California Public Utilities Commission (CPUC) opened Rulemaking (R.) 07-01-041 to address a number of issues related to the CPUC's efforts to develop effective DR programs for California's investor owned utilities.¹ The Order Initiating the Rulemaking set out four objectives:

- 1) Establish a comprehensive set of protocols for estimating the load impacts of DR programs
- 2) Establish methodologies to determine the cost-effectiveness of DR programs.
- 3) Set DR goals for 2008 and beyond, and develop rules on goal attainment; and
- 4) Consider modifications to DR programs needed to support the California Independent System Operator's (CAISO) efforts to incorporate DR into market design protocols.

This paper focuses on the first two objectives of the rulemaking. The regulatory process used to accomplish these first two rulemaking goals involved three aspects:

¹ Documents related to Rulemaking (R.) 07-01-041 can be found at the CPUC website at <http://www.cpuc.ca.gov/proceedings/R0701041.htm>.

First – Scope of Rulemaking.

There was a scoping of the issues and processes to be used in the rulemaking. Joint Staff (California Energy Commission and CPUC Staff) helped define the scope of the effort. This was documented in an initial issues document issues (Summit Blue Consulting 2006) along with a workshop held in the spring 2006. Based these scoping activities, Staff recommended that a formal proceeding to develop load impact protocols for DR programs, develop a cost-effectiveness methodology, and reassess the MW goals for DR programs.² In response to the Order Instituting the Rulemaking, there was a “Assigned Commissioner and Administrative Law Judge’s scoping Memo and Ruling,” April 2007 leading to a workshop was in May 2007 and a final guidance document was prepared by Joint Staff (CPUC and CEC 2007). A subsequent Administrative Law Judge’s ruling clarified aspects of the Joint Staff Guidance based on comments filed by parties to the proceeding.³

Second – Development of Straw Proposals.

The core proposals for both L-I estimation and C-E protocols were to be developed jointly by the IOUs (PG&E, SCE, and SDG&E, i.e., the Joint Utilities) as a collaborative effort among the State’s IOUs and by additional parties if desired. This was to be done in a two-stage process with an initial set of straw proposals filed leading to a workshop and filed comments by the parties. Based on the comments received, revised straw proposals were to be developed by the Joint Utilities and by additional parties if desired.

Third – Comments from Parties.

Comments were solicited from all the parties⁴ on the initial Staff Guidance Document for the straw proposals, and on the initial and revised L-I and C-E Straw Proposals filed by the IOUs and other parties. This included a Joint Staff report on the revised straw proposals with recommendations based on the revised proposals. It was decided to only issue a staff report on the revised L-I protocols provided by the Joint Utilities and also by the a set of “Joint Parties” made up of Comverge, Inc., EnerNoc, Inc., and Energy Connect, Inc. The issues in the C-E straw proposals and in response to requests for evidentiary hearings and based on Staff recommendations regarding areas where further information would be helpful, the Administrative Law Judge issued a ruling extending the period for comments on C-E issues and set fourth a series of questions that would be helpful in drafting a C-E methodology.

The rulemaking is scheduled to produce a decision in February 2008 on both L-I estimation protocols and C-E methods for DR programs.

² These 2006 materials are on the web at ww.cpuc.ca.gov/puc/hottopics/1energy/_drce.htm.

³ ALJ Ruling Clarifying Staff Guidance on Straw Proposals, June 22, 2007.

⁴ The parties to the proceeding included the three IOUs as respondents to the rulemaking and other entities that sought party status including DR aggregators, customer groups, and the CAISO which provided a broad set of perspectives on appropriate scope of the proceeding and the resulting straw proposals.

Scope of the Proceeding

Demand response (DR) is defined in the rulemaking as “changes in electricity consumption by customers in response to signals in the form of electricity prices, incentives, or alerts during periods when the electric system is vulnerable to extremely high prices or compromises to reliability.”

Developing the L-I Estimation Protocols – Scope and Purpose

For the estimation of load impacts, this definition was interpreted to include two basic categories of DR programs—1) event-based; and, 2) nonevent-based programs.⁵

Event based DR programs includes:

- a) Event-based pricing where customers respond a set of prices based on day-ahead or same-day notice. This includes many pricing variants such as day-ahead critical peak pricing, or any schedule of hourly prices presented in advance that a customer would respond through changes in usage. The common element is that these prices are tied to called events by the utility, DR administrator or another operator.
- b) Direct load control that might focus on cycling of customers’ air conditioners in mass markets and through programs such as auto-DR targeted at larger customers. In each case, the load is controlled by a signal sent from a program operator.
- c) Callable DR is similar to direct load control only a notification is sent out to customers who then take the actions needed to reduce use, often by an amount agreed to in a contract.

Non-event based programs includes:

- a) Non-event based pricing such as TOU or RTP rates that are not based on a called event, i.e., they are put in place for a season or other specified time period.
- b) Scheduled DR where some loads are scheduled to be reduced at regular times. An example would be irrigation customers that are divided into five segments, with each segment agreeing to not irrigate/pump on a different selected weekday.
- c) Permanent load reductions and shifting that might be attained through technologies such as demand controllers or ice storage air conditioning.⁶

An important scoping decision was made in the L-I estimation protocols to focus on the outputs of the estimation process, i.e., what should be estimated and how it should be reported.

⁵ This followed a similar set of definitions tied to dispatchable and non-dispatchable programs set out in the first draft of Estimation Protocol Issues (Summit Blue Consulting 2006). The final sets of definitions were set out in the Joint Utilities Revised L-I Straw Proposal (2007).

⁶ Technology providers of energy storage equipment were parties to the proceeding with the goal of making certain that their technology was not put at a disadvantage in seeking to participate in DR programs.

The number of analytic methods that could be used to address the event-based and nonevent-based DR programs and technologies span such a wide range of potential analytic approaches that it would be impractical to detail all of these methods and require “an unrealistic level of foresight not to mention hundreds of specific requirements” (Joint Utilities, 2007). It might also limit needed flexibility in methods applied and creativity that is important for cost-effective analyses and improving methods as experience is gained in their use. As a result, the straw proposals tried to strike a balance in the discussion of the applicability of estimation methods to specific types of DR programs while focusing on the outputs needed from each method. This led to a statement of purpose for the protocols:

The purpose of this document is to establish minimum requirements for load impact estimation for DR resources and to provide guidance concerning issues that must be addressed and methods that can be used to develop load impact estimates for use in long term resource planning. The minimum requirements indicate that uncertainty adjusted, hourly load impact estimates be provided for selected day types and that certain statistics be reported that will allow reviewers to assess the validity of the analysis that underlies the estimates. (Joint Utilities, 2007)⁷

While the purpose of the protocols focused on the requirements of the L-I estimation, the contribution of the protocols document encompasses a robust discussion of estimation methods and their applicability, innovations in the application of statistics and applications of portfolio theory to examine potential positive and negative synergies across DR programs that might be relevant as inputs to the C-E methods that were being developed separately. As a result, it is also a contribution to the technical literature on L-I estimation for DR programs.

Key Elements of the L-I Estimation Straw Proposals

Substantive changes made from the initial straw proposal by the Joint Utilities and reflected in the revised straw proposal based on the workshop held on the initial proposal and the comments filed by the parties. The approach of a workshop to resolve issues followed by a set of filed comments seemed to work well for the L-I impact estimation effort and the Joint Utilities revised proposal captured most all of the critical issues that were raised. The revisions to the initial L-I straw proposals focused on four areas:

- 1) Developing protocols for planning the evaluation that could be reviewed prior to undertaking the evaluation effort. There were two reasons for this – first, good evaluations require careful planning; and two, the evaluation plans can be reviewed by the interested parties to ensure that all the appropriate questions are addressed. For example, target levels of confidence and precision are not set out in the protocols but are left to be specified as part of the evaluation planning process when the costs of attaining given levels of accuracy can be examined in the context of the overall evaluation. In addition, there are many issues that may be unique to a specific evaluation such as locational dimensions of some DR programs, pooling of data, and

⁷ The Joint Utilities were assisted by Freeman, Sullivan & Co. in preparing the straw proposals (see references).

- the need to estimate free ridership or impacts from customers that benefit simply from the structure of the program without taking any specific action (structural benefiter).
- 2) A balance among the discussion of the different estimation methods to avoid seeming to favor one method over another simply due to the length and detail of the discussion.
 - 3) The tables and formatting of the outputs of the L-I estimation effort.
 - 4) The regulatory process for the L-I protocols from approving the evaluation plan through to the review of draft impact products and the production of final estimates as well as a process for resolving disagreements for disputes that may come up (Joint Staff, 2007a).

Evaluation Planning. The factors specified in the protocols to be considered in the evaluation planning phase are shown in Table 1 below:

Table 1. Factors to be Considered in the L-I Evaluation Plan

<ul style="list-style-type: none"> ● Statistical Precision and Confidence. ● Ex Post versus Ex Ante Estimation Requirements. ● Need to Address Persistence. ● Geographic Specificity. ● Sub-Hourly Impact Estimates. ● Need for Customer Segmentation. ● Appropriate use of Control Groups. ● Are Estimates for Different Day-Types needed, i.e., typical Peak-Days versus Supra-Peak Days. 	<ul style="list-style-type: none"> ● Are site-specific M&V Activities Needed ● Estimation of Free Riders and Structural Benefiter. ● Need to Assess Causal Factors to Allow Predictions of Future Impacts if Participation or other Program Factors Change (Needed for C-E Analyses and Resource Planning using DR) ● Collaboration across Utilities that may be Implementing Similar Programs for Cost-Effective Evaluation.
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For example, customer segmentation can be important if it turns out that only a few participants are accounting for the vast majority of the program impacts. This can lead to important recommendations for program design and has been found to be true in a number of DR program evaluations. Figure 1 below shows that 5% of the participants contributed about 50% of all program impacts.

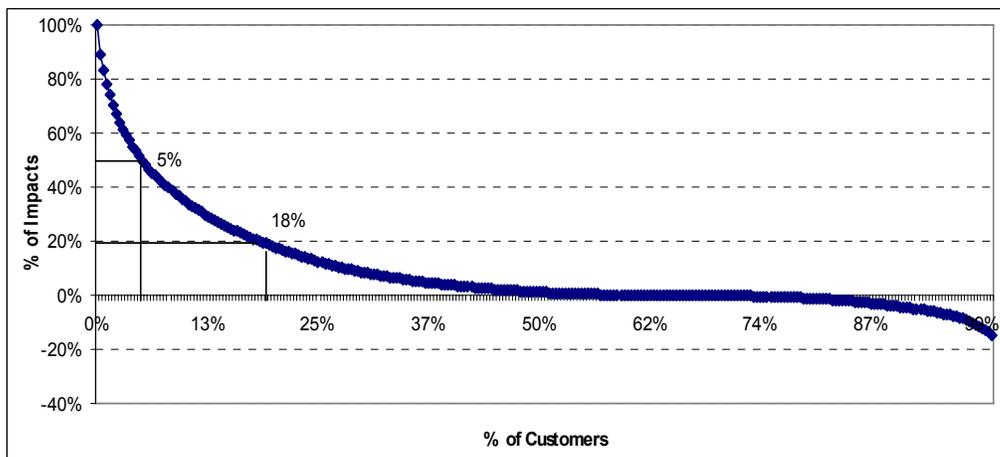


Figure 1. From CEC and Working Group 2 2005 Evaluation Report (2006)

The first three protocols out of a total of 25 in the L-I revised straw proposal pertain to evaluation planning (George 2007):

Protocol 1: A plan must be developed consistent with the requirements of protocols 2 and 3 and must include a budget and schedule.

Protocol 2: The plan must delineate whether the evaluation will also address needs beyond the minimum requirements and, if so, describe what requirements will be met.

Protocol 3: The plan must also delineate which issues are intended to be addressed (see Table 1).

Ex Post Estimation of Load Impacts for Event-Based Programs. A wide number of methods can be used and may be appropriate for estimating, on a retrospective basis, the impact from an existing event-based DR program for a given time period. However, it is expected that the two most common approaches will be day matching and regression analyses. Both of these methods are designed to produce a baseline for the event day(s) that represents what the hourly electric use would have been if the event had not been called.

For day matching, accuracy is assessed by performing a test. A number of “event-like” days are selected, and the procedure for calculating the day-matching baseline loads is used to compare to what is known to be the loads on the event-like days. Thus, day-matching requires an “out-of-sample” experiment or simulation. While a number of different statistical outputs are specified when day matching is used, (e.g., the highest three days out of the preceding 10 weekdays on which an event was not called), the approach is based on CEC (2003) and is based on Thiel's U statistic as the foundation for comparing day-matching methods to actual data on event like days. This U statistic (Theil 1961) computed as:

$$U = \frac{\sqrt{\frac{1}{n} \sum (X_i - Y_i)^2}}{\sqrt{\frac{1}{n} \sum X_i^2 + \frac{1}{n} \sum Y_i^2}}$$

Theil's U statistic simply compares a forecast (e.g., the projected baseline using some variant of hourly loads adapted from 10 days preceding the event to actual load data for a set of event-like days) to assess the accuracy of the forecast. Roughly, this approach simply compares two sets of time series to see how closely they match.⁸ Here, the two time series in question are (a) the values computed from the a set of loads taken from the 10 days preceding the event, and (b) the value of loads that actually occurred on the event-like day.

The day matching methods allowed for in the protocols can use any number of approaches with additive same-day adjustments to account for weather or customer-activity differences,⁹ Where day matching methods produce estimates of customer-specific impacts, the

⁸ Thiel's U is regarded as an important method of evaluating the fit of forecasts because it indicates how well a forecasting method performs compared with a naïve forecast. (such as using the last period's value as the forecast of the next period). Thiel's U will equal 1 if a forecasting technique is essentially no better than using a naïve forecast. Thiel's U values less than 1 indicate a technique is better than using a naïve forecast; hence, a value close to zero indicates a good fit. Values greater than 1 indicate a technique is actually worse than using a naïve forecast.

⁹ The use of same day adjustments in day matching was strongly supported by L-I straw proposals and comments filed by the “Joint Parties” consisting of Comverge, Inc., EnerNoc, Inc. and Energy Connect, Inc. They cited a number of analyses showing that alternative day-matching approaches were better than what was currently being

use of regression methods as outlined in the protocols may be more accurate in producing program-wide estimates of load impacts that can be used in C-E analyses and for resource planning. Regression methods can allow for the use of an entire season of data, as well as for the pooling of data across all the event days and across customers. These methods can provide more robust overall program estimates of load impacts. They may not be as useful for calculating how much a specific customer shifted their load on a given event day which may be needed for settlements (i.e., payments to the customer), but there are reasons to believe they may provide more accurate program-wide impact estimates and estimates for select groups of customers.

Customer Settlements as Program Design versus DR Program-Wide Impact Estimates.

There is a need to distinguish between two different the ex ante estimation problems. One is a payment issue which can be viewed as part of the program design, i.e., how much do you pay a customer for reducing load on an event day. Day matching methods can be quickly calculated allowing the customer to be paid promptly. This might be important for overall program participation. However, there is a second estimation problem and which involves the estimation of accurate program-wide load impacts. This estimation problem might best be addressed by regression analyses across a season of data. This approach may be inappropriate for customer settlements since the customer would have to wait months to be paid as a full season of data is analyzed. However, this approach may produce the most accurate impacts for the program. Some parties argued in comments that customer payments for DR participation should be viewed as similar to incentives for participating in an energy efficiency program and, therefore, they are part of appropriate program design. The best approach for estimating load impacts for settlements would then be addressed when the program design is presented to the CPUC for approval, as opposed to it being a dominant issue in the L-I estimation protocols.. Obtaining the most accurate estimates of a DR program's load impacts is viewed by some parties as a different estimation problem than settlements, but this issue has not been entirely resolved by the parties and the CPUC. There are six protocols in the revised Joint Utilities straw proposal that pertain to ex post estimation of load impacts for event-based DR programs:

Protocol 4: Impact estimates must be provided for each hour for each of the day types identified in Protocol 8.

Protocol 5: The change in energy use for the year must also be estimated.

Protocol 6: Uncertainty adjusted impacts must be provided for at least the 10th, 30th, 50th, 70th and 90th percentiles.

Protocol 7: The impact estimates must be reported in specific tabular form delineated in this protocol for each day type.

Protocol 8: Impact estimates must be provided for each event day and the average event day.

Protocol 9: Lists the statistical tests and measures that must be reported if day matching methods are used for impact estimation.

used by the IOUs to calculate settlements (i.e., payments to participating customers). There were proposals requesting that the CPUC recognize these improvements at this time and rule that changes be made now in the manner in which settlements are calculated for certain existing event-day programs. However, the purpose of the protocols is not develop a specific calculation for a subset of programs, but to set out process for how these calculations can be made going forward. It remains to be seen how the CPUC will treat these comments. Clearly, a lot of useful information about the accuracy of different day-matching methods was provided by the Joint Parties in their straw proposals and comments.

Protocol 10: Lists the statistical tests and measures that must be reported if regression methods are used for impact estimation.

The revised straw proposal contains a thorough set of outputs and tests in Protocols 9 and 10 (above) for day matching methods and regression methods that address both bias and accuracy.

Ex Ante Estimation of Load Impacts for Nonevent-Based Programs. These protocols are quite similar to the event-based programs with the primary difference being in the baselines for the relevant day types – average day versus a peak day. Recall, that these programs tend to be TOU or RTP pricing, scheduled DR, or permanent load reductions/shifting such as one might get from an ice storage unit for air conditioning. Six protocols again apply to these programs:

Protocol 11: Impact estimates must be provided for each hour for each of the day types identified in Protocol 15.

Protocol 12: The change in energy use for each month and for the year must also be estimated.

Protocol 13: Uncertainty adjusted impacts must be provided for at least the 10th, 30th, 50th, 70th and 90th percentiles.

Protocol 14: The impact estimates must be reported in a specific tabular form delineated in this protocol for each day type specified in Protocol 15.

Protocol 15: Impact estimates must be provided for an average weekday and for the monthly system peak day for each month in which the DRR option is in effect.

Protocol 16: Lists the statistical tests and measures that must be reported if regression methods are used for impact estimation.

Ex Ante Estimation of Load-Impacts – Using Available Information from Ex Post Evaluations. The estimation of future load impacts from a DR program should, whenever possible, be informed by past estimates of what the same or similar DR programs have achieved. Ex ante estimation requires development of a model that relates changes in demand response to changes in the exogenous variables that drive demand response.

- Ex ante estimation may require developing estimates for values of key drivers that are outside the boundaries of historical experience (e.g., for extremely hot days that might not have occurred over the historical period);
- Ex ante need to address how demand response might evolve over time as participants if it is being used as input into a longer term resource planning framework;
- Ex ante estimates are subject not only to the uncertainty associated with ex post impact estimates (e.g., due to sample selection, model specification and the like), but also to the additional uncertainty associated with the exogenous variables used in the estimation (e.g., uncertainty in weather, participation levels and customer characteristics, etc.).

The protocols for ex ante estimation of impacts are generally extensions of the protocols for the ex post estimation presented above. The protocols in this section apply to all DR programs, even new DR programs. Seven protocols are contained in the current proposal:

Protocol 17: Inform all ex ante estimates using available information from ex post evaluations (including analysis of resources from other utilities if necessary).

Protocol 18: Impact estimates must be provided for each hour for each of the day types identified in Protocol 22.

Protocol 19: The change in energy use for each month and for the year must also be estimated.

Protocol 20: Uncertainty adjusted impacts must be provided for at least the 10th, 30th, 50th, 70th and 90th percentiles.

Protocol 21: The impact estimates must be reported in a specific tabular form delineated in this protocol for each day type specified in Protocol 22.

Protocol 22: Impact estimates must be provided for a typical event day for event based resources and for an average weekday and the monthly system peak day for non-event based resources for each month in which the resource is in effect.

Protocol 23: Lists the statistical tests and measures that must be reported if regression methods are used for impact estimation.

The proposed protocols also presents and recommendations on applications of methods in an ex ante setting with examples from other studies making this a useful reference document.

Sampling Protocols. Sampling should be performed to minimize bias and achieve the targeted confidence and precision from the Evaluation Planning effort (Protocols 1 through 3). Sampling is an important task that sometimes does not get the attention it deserves and appropriate methods should be applied throughout the data collection tasks. Protocol 24 addresses the issues that arise in sampling:

- a) The population(s) under study must be clearly identified and described.
- b) The sample frame(s) used to sample the population(s) under study must be carefully and accurately described along with any measures used to correct for differences between population and sample frame.
- c) A digital snapshot of the population and initial sample from the sample frame must be preserved.
- d) The sample design must be described in detail, including the distributions of population and sample points across sampling strata (if any)
- e) The “fate” of all sampled observations must be tracked and documented throughout the data collection process.
- f) If significant sample attrition is found to exist at any stage of the research process (i.e., recruitment, installation, operation), a study of its impact must be undertaken.
- g) If selection bias is suspected, the evaluator must describe it as well as any efforts made to control for it.

The proposed protocols also provide guidance for appropriate sampling covering issues such as different sampling methods, stratification, sampling for ratio estimation and sampling for regression estimation.

L-I Reporting Protocols. The final protocols pertain to the reporting of information from the L-I estimation methods used. This protocol number 25 calls for Evaluation Reports that shall include, at a minimum, the following sections:

- a) Cover
- b) Title Page
- c) Table of Contents
- d) Executive Summary - this section should very briefly present an overview of the evaluation findings and the study's recommendations for changes to the DR resource
- e) Introduction and Purpose of the Study - this section should briefly summarize the resource or resources being evaluated and provide an overview of the evaluation objectives and plan, including the research issues that are addressed. It should also provide a summary of the report organization.
- f) Description of Resources Covered in the Study - this section should provide a detailed description of the resource option being evaluated in enough detail that readers can understand the DR resource that delivered the estimated impacts. The description should include a history of the DRR program or tariff, a summary of resource goals (both in terms of enrollment and demand impacts), tables showing reported progress toward goals, projections of future goals and known changes and other information deemed necessary for the reader to obtain a thorough understanding of how the resource has evolved over time and what changes lie ahead.
- g) Study Methodology - this section should describe the evaluation approach in enough detail to allow a repetition of the study in a way that would produce identical or similar findings.
- h) Validity Assessment of the Study Findings – this section should include a discussion of the threats to validity and sources of bias and the approaches used to reduce threats, reduce bias and increase the reliability of the findings, and a discussion of confidence levels.
- i) Detailed Study Findings - this section presents the study findings in detail.
- j) Recommendations - this section should contain a detailed discussion of any recommended changes to the resource as well as recommendations for future evaluation efforts

Additional guidance is provided in the proposed protocols regarding the construction of the Study Methodology section, Validity Assessment, and the Detailed Findings.

Portfolio Effects. The proposed L-I protocols also contains recommendations for addressing possible synergies and overlaps across DR resources. The protocols call for identifying correlations, synergies, and overlaps across resource options as a path to move forward in developing portfolio impacts at some future time. At present, a number of parties were not comfortable with the assumptions needed to use the Monte Carlo approaches proposed for examining portfolio impacts (examples of such methods are included in the proposed L-I protocols), but believed a judgmental determination of “material” synergies be reported and magnitude of the adjustments likely to be required to address the synergies be estimated at this point. This will help dimension the issue and help work towards portfolio impacts in the future.

Elements in the Cost-Effectiveness Revised Straw Proposal

A cost-effectiveness framework was submitted by the Joint Utilities (2007b) along with many of the parties to the proceeding as a way to move this effort forward. There remain some issues that are being examined by Joint Staff at the CEC and CPUC, but the C-E framework proposal addresses a number of key issues:

Avoided Generation Costs. This would use the annualized capital cost of a new combustion turbine (CT) with two adjustments – 1) these costs would be reduced to reflect gross margins that could be earned by selling energy from the CT; and, 2) these costs would also be adjusted to represent the availability of the DR program using a ratio of Loss of Load Probability (LOLP) in those hours in which the DR program is available to the LOLPs in the hours in which the DR program would not be available (but a CT would be available in those hours).

These adjustments can be viewed as reasonable if the proxy unit CT assumption really represents the group of units that are on the margin during peak hours. It is difficult to reconcile a sizeable adjustment in the avoided costs resulting from sales of electricity, if that unit really is the marginal unit. By definition, the marginal unit should not be producing profits or margins from sales. At the time this paper is being written, Joint Staff is seeking some additional information is being sought on what constitutes the marginal unit and the size of the adjustments that are contained in the current revised straw proposal for the C-E framework.

Other C-E Framework Issues. Overall, the revised straw man C-E framework provides a useful structure for C-E assessments of DR programs. Many issues were addressed in the framework and there is a need to clarify some aspects of the proposal. One issue relates to the assumed lifetimes of the DR programs, e.g., are they tied to the regulatory funding cycle or should they represent typical lifetimes for that type of DR program. The proposal provides for avoided transmission and distribution costs based on “right place” and “right certainty” criteria but methods for setting these criteria have not been discussed. There are also issues around other benefits that may be hard to quantify now, but that might exist and could influence future C-E assessments. Some parties believe that there should be places in the framework for these values so that they can be included when and if they are determined to be meaningful.

Many issues are viewed as being treated in an appropriate manner including the role of DR as system reserves and its relationship to planning reserves. Also, program costs are treated in a way that seems acceptable in the near term with respect to the allocation of joint costs that, for example, may represent marketing for a wider range of customer services. Treatment of environmental mitigation costs is consistent with precedents set in other applications.

It was anticipated from the outset that issues in the development of load impact estimation protocols would prove easier to address than would be many of the issues in the C-E framework. In the Administrative Law Judge’s scoping memo and ruling, it states that “If further work is needed to develop satisfactory inputs, the Commission may consider relying on interim values or methodologies (e.g., estimates used in other proceedings) until additional work can be undertaken. If this appears necessary, parties should address what further work is needed. The Joint Staff guidance document suggested that the in for the estimation of avoided costs, that an interim method only be developed as a place holder until there is an appropriate time and venue to more fully develop the avoided cost methodology. The current revised straw proposal for the C-E framework does contain an avoided cost estimation method. Some consideration

will be given regarding whether the time and information available in this proceeding only allows for the establishment of interim placeholder avoided cost method, and on some other hard to quantify benefits and costs.

Conclusions

The process of having the Joint Utilities collaborate on straw man proposals for both load-impact protocols and cost-effectiveness framework development has been successful in producing considerable insights and information. The straw proposals developed by the Joint Utilities and other parties, along with the extensive participation of parties in the workshops and comment periods has been constructive. The load-impact estimation protocols seem to have been developed in more detail than has the proposed cost-effectiveness framework. That is likely due to the considerable past industry experience in evaluating energy-use programs. There is less experience in generating estimates of many of the benefits and costs that need to be dimensioned and quantified for a cost-effectiveness analysis of DR programs. This makes the development of the cost-effectiveness framework more challenging.

The straw man proposals for both the load-impacts and cost-effectiveness methods embody a lot of thought and will certainly prove useful in moving ahead on these issues in California, and may provide other jurisdictions with some processes and starting points for their efforts on these important DR issues.

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Website Links to Rulemaking Documents:

- 1) 2006 documents and materials are at: www.cpuc.ca.gov/puc/hottopics/1energy/_drce.htm .
- 2) 2007 documents and materials are at: www.cpuc.ca.gov/proceedings/R0701041.htm.