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July 16, 2010

Commissioner Dian Grueneich
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Dear Commissioner Grueneich:

By this letter and enclosed comments, the California Energy Commission (Energy Commission) provides its input into the initial phase of the California Public Utilities Commission's (CPUC) Order Instituting Rulemaking to Examine the Commission's Post-2008 Energy Efficiency Policies, Programs, Evaluation, Measurement, and Verification, and Related Issues (Proceeding R.09-11-014). The Energy Commission appreciates your request, as the Assigned Commissioner in this proceeding, for input on how energy efficiency evaluation, measurement and verification (EM&V) activities might be modified in the post-2012 period to make these efforts more useful to the Energy Commission and its demand-side analytic activities.

The Energy Commission shares the CPUC's commitment to energy efficiency as the first resource in the "loading order." Though California is fortunate to have a multiplicity of efficiency programs and efficiency providers, it does make the EM&V analysis more complicated. It is crucial that collectively we are thoughtful in our analytical assessment of the efficiency programs and target future efficiency program efforts on the most promising and effective measures.

As you know, the Energy Commission is not a party to R.09-11-014, however we thought it prudent to provide a copy of this letter to the service list to communicate our perspective and information needs to the parties in the R.09-11-014 proceeding.

We look forward to continuing our productive collaboration.

ROBERT WEISENMILLER
Commissioner and Presiding Member
Electricity & Natural Gas Committee

JEFFREY D. BYRON
Commissioner and Associate Member
Electricity & Natural Gas Committee

Enclosure

cc: ALJ Darwin Farrar
R.09-11-014 Service List
Karen Douglas, Chairman, CEC
Jim Boyd, Vice Chairman, CEC
Anthony Eggert, Commissioner, CEC
Michael Peevey, President, CPUC
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Nancy Ryan, Commissioner, CPUC

Comments of the California Energy Commission to Follow Up Questions on Post-2012 EM&V Issues Assigned Commissioner's Ruling, July 2, 2010 CPUC Rulemaking 09-11-014 July 16, 2010

I. Introduction and Background

The Energy Commission has had a long history of participating in California Public Utilities Commission (CPUC) efforts to guide and shape energy efficiency evaluation, measurement, and verification (EM&V) activities. When the investor-owned utilities (IOUs) principally conducted EM&V, the Energy Commission participated in devising budgets and frameworks for this process. As EM&V became more centralized within the CPUC Energy Division (CPUC/ED), we provided some limited support to this effort. In these comments, we draw upon that experience and suggest that some aspects of EM&V neglected in recent years return to the forms that were in place prior to restructuring. However, the adoption of the total market gross (TMG) basis for energy efficiency goals is the fundamental motivation for the Energy Commission's recommendations regarding changes to the current EM&V framework.

The TMG goals adopted in D.08-07-047 encompass forms of energy efficiency delivery mechanisms beyond IOU programs. The assumptions about successive ratchets of Title 24 building standards, and stringency of these standards, are directly encompassed in the analyses behind the adopted goals. Although "zero net energy" homes are not described in the analytic documents upon which the goals rest as being an Energy Commission standard, it is inevitable that assumptions of 100 percent compliance in future, target years means that early, incentive-based programs are converted to mandatory Title 24 standards.

This example highlights energy efficiency delivery mechanisms that are the responsibility of the Energy Commission. However, there are impacts resulting from federal appliance standards that were assumed in the CPUC's 2008 energy efficiency goals study, and there may well be impacts from programs implemented by other agencies in future cycles of goal setting. In fact, the analyses conducted by CPUC/ED in preparation for establishing the goals relied upon non-IOU delivery mechanisms for the majority of the impacts. The Energy Commission believes that establishing goals that transcend IOU programs means that the EM&V framework itself needs to evolve to transcend mere assessment of IOU programs.

The magnitude and effects of energy efficiency in demand forecasts and procurement decisions require that EM&V efforts properly account for energy efficiency in a manner suited to inclusion in demand forecasts. Indeed, given evolving trends in and attention to

a variety of demand-side resources, it is necessary to focus increased attention toward understanding the effects of these resources in an integrated fashion.

In Section II, the Energy Commission provides its current thinking about topics raised in the Assigned Commissioner Rulings issued on May 21 and July 2 in the form of six recommendations. Section III provides some concluding comments.

II. Recommendations

1. CPUC should coordinate with the Energy Commission to develop aggregate macro-consumption metrics.

09-11-014 CPUC ACR July 2, 2010, Question 4.2A – The NRDC supports and encourages exploration of Macro Consumption Metrics as a supplement to, but not replacement of, the current energy and demand saving metrics. Do parties agree with NRDC?

Section 4.2 of the July 2 ACR asks parties about the desirability and feasibility of developing an aggregate-level metric of efficiency impacts on energy consumption, perhaps through an econometric study. Parties generally responded favorably to this idea presented in the May 21 ACR, although urging that it complement rather than take the place of the more typical disaggregate efficiency measurement techniques

The Energy Commission believes that analyses of electricity and natural gas consumption trends and efforts to explain the impacts of a wide range of demand-side policies (energy efficiency programs, codes and standards, federal stimulus funding, local ordinances, distribution generation on the customer side of the meter, and so on) are necessary. Indeed, energy efficiency arising from a multiplicity of sources must also be understood in the context of the influences of other factors that affect both consumption (for example, structural trends) and demand (for example, distributed generation, price response). It is likely to be impossible to study energy efficiency impacts in isolation from the numerous other forces influencing energy consumption. Aggregate "top down" analyses with a comprehensive suite of explanatory factors converted into indices of effective impact will help to institute discipline and avoid double counting impacts claimed from various specialized communities of interest. Although we cannot be certain what techniques will provide the best specific methodology, the general category of aggregate impact studies should become a permanent feature of EM&V going forward.

The Energy Commission is also interested in *Macro Consumption Metrics* for efficiency as well as other demand-side impacts, and staff at the Energy Commission had planned on developing such metrics during 2010-2011. We understand that funding for a pilot effort exists within the EM&V budget for program years 2010-2012; therefore, we recommend that such a study become a joint effort between Energy Commission and CPUC/ED staff. This would ensure that expertise from both Commissions is brought to

bear, including Energy Commission forecasters and CPUC EM&V experts. In addition, a joint effort would result in both Commissions using the same metric/tool once it has been developed, further increasing the consistency between Energy Commission and CPUC proceedings.

2. EM&V activities should be broadened to encompass Total Market Gross mechanisms and metrics.

09-11-014 CPUC ACR July 2, 2010, Question 4.6.A.a – If the Commission's EM&V should measure energy efficiency initiatives beyond its own programs, how should such activities be coordinated with the CEC?

Section 4.6.A of the July 2, 2010 ACR poses the question of whether existing EM&V activities can adequately determine the impacts of the wide range of energy saving activities, beyond the scope of IOU programs, commensurate with new obligations based on the TMG concept for energy efficiency goals. To the extent that EM&V should be added, it further asks how any new activities should be coordinated with the Energy Commission.

The Energy Commission supports a selective broadening of EM&V to address impacts of energy efficiency programmatic activities that parallel the scope of the goals. The July 2 ACR asks specifically about impact assessment rather than the full suite of EM&V activities, and the Energy Commission agrees that impact assessment ought to be the focus. For example, it does not seem appropriate that the CPUC extend its process evaluation efforts into assessing the delivery mechanisms that are the responsibility of another agency. Further, we note that a number of the efforts funded through various categories of EM&V may already be examining facets encompassed by the energy efficiency program activities of other agencies. For example, examination of new technologies may at least in part be addressing the same technology assessments that the Energy Commission conducts as part of its building and appliance standards programs.

There are at least three ways in which impact assessment might be expanded: (1) tracking efforts of other agencies, (2) augmenting the efforts of other agencies, and (3) developing methodologies, approaches, and data suited to analyses of integrated demand-side resource effects and influences.

It is reasonable that the CPUC track EM&V efforts of other agencies responsible for implementing energy efficiency programs encompassed explicitly within formal CPUC goals or less explicitly in other broad targets for future energy efficiency savings. Impact evaluation itself appropriately may be broadened in selective areas depending upon an initial screening review. Where an initial review finds satisfactory EM&V efforts, limited tracking of those efforts and discussions about coordination of and timing of efforts may be sufficient. Where the initial review does not find EM&V activities comparable to those desired by the CPUC, then some greater effort is obviously warranted. The question

becomes how to "nudge" EM&V efforts of the responsible agency toward the rigor and timeliness desired by the CPUC. The sponsoring agency may desire to do more in some instances, but not have the resources. Suggestions for collaborative efforts might be welcomed. Alternatively, the sponsoring agency may be insensitive to the need for formal impact assessments; for example, if its charter does not encompass other forward planning considerations, then calls for improved EM&V to understand measure decay and replacement may not be of interest. There can be no hard and fast rules about such matters. Finally, given the increasing level of effort devoted to policies and programs that affect demand in addition to energy efficiency (for example, distributed generation), new methodologies, approaches, and data-collection techniques suited to measuring the integrated effects of these resources on energy demand in California must be developed.

Since the Energy Commission is one of those agencies encompassed within the discussion above, the ACR explicitly asks how improved EM&V efforts should be coordinated with the Energy Commission. An early stage of coordination is communication, and communication about some facets of Energy Commission programmatic activities is already improving, for example, that connected with American Recovery and Reinvestment Act (ARRA) federal stimulus funding efforts. Another is the Energy Commission's efforts to improve publicly owned utility (POU) energy efficiency EM&V, which is not directly linked to IOU service area goals. This is, however, linked to transmission planning, which occurs on a wider geographic scope than generation or resource planning. POU EM&V remains the province of POUs, not the Energy Commission, so we are striving to encourage improvements in their efforts with only limited EM&V activity of our own.

In addition, Energy Commission building and appliance standards are well-known to IOUs and the CPUC. The CPUC has funded the IOUs to conduct pre-standards efficiency programs and standards implementation programs for some time. It is no secret that the IOUs, with CPUC approval, have financial resources that the Energy Commission cannot match. To date, formal EM&V impact assessments have not been undertaken on any sort of collaborative basis. The Energy Commission is open to such collaboration, especially since there is a wealth of expertise embodied in the CPUC/ED staff and in the team of EM&V contractors funded by CPUC/ED.

3. Existing saturation survey activities should be substantially enhanced and should serve as a keystone for assessing Total Market Gross impacts and factors affecting energy demand in general.

09-11-014 CPUC ACR July 2, 2010, Question 4.6.b – Are there additional analytical efforts which could be undertaken to better support the integration of projected energy savings into California's demand forecasts?

The Energy Commission believes that existing large-scale customer surveys could be substantially enhanced to provide a wealth of valuable information pertaining not only to the direct and indirect impacts of all energy efficiency initiatives, but also to energy

savings occurring through naturally occurring means (including price response), and effects of other demand-side resources, such as distributed generation. To this end, the Energy Commission recommends that the CPUC EM&V process emphasize expansion of existing appliance and equipment saturation studies in the residential, commercial, industrial, and agricultural sectors (RASS, CEUS, IEUS, and AEUS). These enhanced studies should incorporate larger sample sizes, onsite inspections, integration of advanced metering and traditional sub-metering data, and longitudinal analyses and behavioral components. In short, it is crucial for these studies to move beyond "counting widgets" to soliciting comprehensive information on decision making related to efficiency technology adoption, conservation, appliance and equipment saturations, electricity and natural gas rates, and other factors affecting energy consumption.

In fact, per *Recommendation 1* above, it is likely to be impossible to study the impacts of energy efficiency in isolation from the numerous other forces influencing energy consumption. Appropriately designed consumption surveys are another means of performing the "top down" studies discussed in *Recommendation 1*, using the respondents to saturation surveys as the basis for disaggregated analyses. "Conditional demand" studies have mined saturation surveys for years by linking observed billing data with survey responses and performing econometric assessments of consumption variations using saturation survey responses as explanatory variables. The progress toward internal metering data for all customers is another justification for substantially improving existing saturation surveys to enable more robust analyses.

An EM&V framework grounded in an overarching effort to understand the effects of multiple influences on energy demand is the most effective path to understanding program effects over time. CPUC staff should work with Energy Commission staff on developing a comprehensive approach of this type, and should order the IOUs to work with the Energy Commission to develop a multi-year schedule and expanded scope for conducting these enhanced surveys.

4. An EM&V study should be conducted to construct a longitudinal record of historic energy efficiency accomplishments and to facilitate continuation of such tracking into the future.

09-11-014 CPUC ACR July 2, 2010, Question 4.6.B.b – Are there additional analytical efforts which could be undertaken to better support the integration of projected energy savings into California's demand forecasts?

In the course of developing the *California Energy Demand 2010-2020 Adopted Forecast* (2009), the Energy Commission and CPUC sought to obtain a time-series of IOU program impacts over the last 10 years. This exercise revealed that historical records do not exist in a complete, consistent, comprehensive format. Indeed, it was difficult and time-consuming to reconstruct a record of program accomplishments for just a few years, even at a high level of aggregation. Given the intensity of program reporting and EM&V efforts since the inception of the programs, an enormous amount of data exists

regarding program accomplishments and the nature of those accomplishments. However, this information is distributed throughout hundreds of EM&V reports and hundreds of regulatory documents – the information has not been compiled in a manner that facilitates comprehensive longitudinal analyses.

Assembly of these program data into a form that reflects accomplishments over time is an important step in improving demand forecasting efforts with respect to energy efficiency. Although preparing an historical record of this type would require an initial, non-trivial level of effort, having such a record would enable the energy efficiency and demand forecasting communities to realize a significant source of untapped value in measuring efficiency impacts.

The compilation of historical information should seek to reflect, at a minimum, grid impacts of the programs and presumably other metrics such as program costs, information at the measure and/or end-use level, number of installations, and so on.

5. CPUC should devote EM&V resources to studying the implications of cumulative savings metrics.

09-11-014 CPUC ACR July 2, 2010, Question 4.6.B.a – Are there additional analytical efforts which could be undertaken to better support the integration of projected energy savings into California's demand forecasts?

The CPUC should devote EM&V effort specifically for the purpose of studying measure decay and informing the implementation and understanding of cumulative savings goals. Per CPUC D. 09-09-047[1], IOUs are expected to make up 50 percent of savings decay in order to achieve cumulative savings goals articulated in a series of CPUC decisions.[2] Assessment of savings decay is important to understand from both an analytic and policy perspective, as the inter-relationship between decay and cumulative goals affects both energy efficiency savings goals for the IOUs and assessment of energy efficiency savings for purposes of demand forecasting and procurement decisions.

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[1] CPUC D. 09-09-047. September 24, 2009. http://docs.cpuc.ca.gov/PUBLISHED/GRAPHICS/107829.PDF

[2] D. 09-09-047". . . until EM&V results inform better metrics, utilities may apply a conservative deemed assumption that 50% of savings persist following the expiration of a given measure's life. This reflects our expectation that our energy efficiency program efforts are in fact resulting in market transformation, changing consumption habits and preferences, while acknowledging that measure uptake in the absence of program support may not be universal. Given the exclusion of 2004-2005 from cumulative savings calculations in D.09-05-037, measure life drop off is expected to have a relatively minor effect on utility goal achievement for the current cycle, hence the appropriateness of a deemed assumption. However, we understand that the scope of this issue will grow over time as cumulative savings obligations increase and a larger swath of measure lives expire. Therefore, this is an important analytical issue critical to our understanding of savings persistence over time, and demands greater attention in our EM&V work. D.09-05-037 directed Energy Division to study specific assumptions around efficiency measure savings to take this up for further examination in R.06-04-010, or its successor rulemaking." p 38-39.

6. EM&V resources should be made available for IOUs to employ in improving their efforts to quantify integrated demand-side resource impacts, including energy efficiency, in demand forecasts

09-11-014 CPUC ACR July 2, 2010, Question 4.6.B.a – Are there additional analytical efforts which could be undertaken to better support the integration of projected energy savings into California's demand forecasts?

In recognition of the CPUC's decision to defer to the Energy Commission's demand forecasts and Integrated Energy Policy Report (IEPR) process for purposes of long-term procurement (D. 07-12-052)[3], it is important that IOUs are able to contribute meaningfully in quantifying energy efficiency impacts affecting demand analyses prepared during the biennial IEPR process. CPUC Ruling R. 08-02-007[4] emphasized the need to "develop standardized resource planning practices, assumptions and techniques, based on an integrated resource planning framework." EM&V activities that enable the IOUs to improve their assessment of energy efficiency impacts for use in demand forecasting and, ultimately, procurement should be undertaken by CPUC.

III. Concluding Comments

Several of the topics addressed above require collaborative efforts between or among the CPUC/ED, Energy Commission staff, IOUs, and perhaps others. Energy Commission staff established a working group in 2008 in response to the issues raised about demand forecasting and quantification of energy efficiency programs in D.07-12-052. The working group represents a group of stakeholders dedicated to improving energy efficiency analysis for forecasting and procurement purposes. We found this effort to be a useful mechanism for eliciting input about quantifying energy efficiency in demand forecasts and related topics, and we urge that this group or some equivalent be preserved as a forum for pursuing the topics we have identified herein.

In addition, the Energy Commission urges continued cooperation and increased collaboration between the two Commissions directly on matters related to forecasting and demand side resources. Energy Commission forecasting work has become much more integrated with proceedings at the CPUC, including those related to EM&V and long-term procurement. The results of EM&V studies feed our load forecasts, which in turn are used directly in the portfolio assessments for the long-term procurement planning process. Our shared statutory authority and mutual interests make collaboration beneficial to both agencies.

The Energy Commission appreciates the opportunity to provide input for these proceedings.

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[3] CPUC D. 07-12-052, December 20, 2007. http://162.15.7.24/PUBLISHED/FINAL_DECISION/76979.htm

[4] CPUC R. 08-02-007. February 14, 2008. http://docs.cpuc.ca.gov/proceedings/R0802007.htm