Comments of the Natural Resources Defense Council (NRDC) on the History of Energy Efficiency in the *2011 IEPR – Electricity, Natural Gas, and Transportation Energy Preliminary Forecast*

Docket Numbers 11-IEP-1C, 11-IEP-1K, 11-IEP-1L

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I. Introduction and Summary

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer these comments on the California Energy Commission's (CEC) treatment of energy efficiency in the *California Electricity, Natural Gas, and Transportation Energy Preliminary Forecast* (Preliminary Forecast). NRDC is a non-profit membership organization with a long-standing interest in minimizing the societal costs of the reliable energy services that Californians demand. We focus on representing our more than 124,000 California members' interest in receiving affordable energy services and reducing the environmental impact of California's energy consumption. Our comments provide recommendations for how the CEC should address energy efficiency in the 2011 demand forecast, summarize NRDC's concerns with the CEC's 2009 graph depicting historical energy savings, and respond to the questions provided by CEC staff.

In summary, NRDC strongly recommends that the CEC:

1. Retract the inaccurate 2009 IEPR graph of historical energy savings, which misrepresents the sources of those historical energy savings and revises prior energy saving data without sufficient basis.
2. Use a single total estimate of energy savings as a temporary fix in the 2011 IEPR demand forecast, instead of attempting to attribute energy savings to various causes, since the CEC's demand forecast model is not capable of determining the various causes of energy savings.

NRDC provided numerous comments to the CEC over the past several years explaining in detail our concerns with the inaccurate 2009 IEPR graph of historical energy savings, including that it:

- drastically distorts the amount of savings from efficiency programs, cutting savings by more than 75% without a reasonable basis;
- is incommensurate with estimates from the long history of California Public Utilities Commission assessments and from neighboring regions that have similar histories of energy efficiency;
- sends counterproductive signals to policymakers, by asserting that much of the energy savings actually achieved by efficiency programs over time would have

materialized without any efficiency policies or programs, which could undermine the state's and utilities' commitment to energy efficiency.

II. Primary Discussion

NRDC appreciates the CEC staff and Demand Analysis Working Group's (DAWG) efforts over the past several years to examine and discuss in more detail the energy efficiency savings attributable to various efficiency policies. We greatly appreciate the CEC staff and participants of the DAWG for all their hard work and for making themselves available to discuss the problems in the treatment of efficiency in the demand forecast. We actively participated in the numerous working group meetings, worked directly with CEC staff, and recommended changes to their representation of energy efficiency savings in the demand forecast. However, the DAWG has reached an impasse and the CEC staff now needs direction from the Commission on how to represent energy efficiency savings achieved in California for the 2011 Demand Forecast and Integrated Energy Policy Report (IEPR).

1. NRDC strongly recommends that the 2011 IEPR retract the inaccurate 2009 IEPR graph, which misrepresents the sources of historical energy savings and revises prior energy saving data without sufficient basis.

Over the past several years, NRDC raised serious concerns about the 2009 IEPR graph of historical energy savings and asked numerous questions about how the CEC attributed energy savings among the various possible sources, including codes, standards, and utility programs.[1] The current working group process has shared information that reinforces our concerns, and demonstrates that the CEC's demand forecasting model is not capable of determining the sources of energy efficiency among various categories.

The California Public Utilities Commission (CPUC) is the agency responsible for evaluating savings from investor-owned utility programs. Over the years, the CPUC estimated savings from utility programs through evaluation, measurement, and verification

[1] E.g.: NRDC, Comments of the Natural Resources Defense Council on the Committee Draft of the 2007 Integrated Energy Policy Report, Docket Number 06-IEP-1A (October 19, 2007); Comments of the Natural Resources Defense Council on Energy Efficiency and Forecasting, Docket Number 08-IEP-1 (March 6, 2008); NRDC, Comments of the Natural Resources Defense Council on Energy Efficiency and Forecasting, Docket Number 08-IEP-1C (August 19, 2008); NRDC, Comments of the Natural Resources Defense Council on the California Energy Demand 2010-2020, Staff Revised Forecast, Second Edition, Docket Number 09-IEP-1C (November 13, 2009); NRDC, Comments of the Natural Resources Defense Council on the Draft Staff Report "Incremental Impacts of Energy Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast" Docket Number 09-IEP-1C (February 10, 2010).

protocols, reporting requirements, and/or through formal proceedings; the program savings estimated under the CPUC's auspices are commensurate with the CEC's original graph in 2005.[2]

After numerous meetings with CEC staff, it became apparent that there were no substantive reasons for the CEC to revise the CPUC's historical record of savings. The CEC's revisions were not based on new or improved technical information or substantive analyses; instead, adjustments were made based on staff's judgment. Moreover, the CEC did not provide a public record of those revisions nor their rationales, and the detailed revisions were not discussed or vetted through a thorough public process. During the DAWG, CEC staff acknowledged that it made many of the reductions for convenience of the model, but not based on any new technical information about historic savings. For example, 100% of industrial savings were removed from the original graph.[3] CEC staff explained that because those savings did not work with the model, the 2009 graph would represent zero savings from the industrial sector.[4] For residential and commercial savings reductions, CEC staff stated that they simply "assumed" those savings did not occur.[5] These numerous unsubstantiated adjustments resulted in a 2009 graph that dramatically misrepresents the history of energy efficiency program achievements in California. Not only does this do a disservice to the state by providing inaccurate information, it threatens the CEC's excellent reputation as a source of reliable information on California's energy industries. As such, NRDC strongly urges the Commission to disclaim and retract the inaccurate 2009 graph.

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[2] *See infra*, section I.3, "Savings Estimates from 2005 Graph".

[3] "The largest portion of savings presented in the 2003 chart which does not appear in the 2009 chart is the grey area of non res/com savings. These are historic claimed savings in sectors other than residential and commercial sectors and make up about 1/3 of the savings in the 2003 chart. … the sectors covered by these savings estimates are not modeled." CEC Staff, "Draft Memo Prepared By CEC For DAWG ES Pup Discussion Of EE History," p.2, (February 9, 2011).

[4] "It is assumed that these savings estimates are included in the historic trend of consumption and thus not subtracted from the forecast period."*Id.*

[5] For residential reductions: "Some of these savings estimates are assumed to be captured in the historic trend of appliance saturations." No other explanation was given for residential and commercial reductions from savings. *Id.*

2. As a temporary fix, NRDC recommends that the 2011 demand forecast use a single total estimate of energy savings instead of attempting to attribute energy savings to various causes, as the CEC demand forecast model is not designed for - nor capable of - determining the various causes of total energy savings.

For the 2011 demand forecast, the Commission should adopt a simple graph depicting the state's total energy efficiency savings**.** We strongly urge the CEC to use only the total amount of energy efficiency savings, which is the necessary information for a demand forecast, and not claim to determine causes of savings until a further process is developed to specifically address the historical attribution of California energy savings. The present demand forecast model was not intended to determine the various causes of total savings and should not be presented as such. Instead, the demand forecast model was intended to predict future demand as accurately as possible. Given this objective, savings can either be embedded inside the forecast, or incremental to the forecast, so long as future demand is accurately predicted. However, all the savings embedded within the forecast do not get represented in the 2009 graph, only the incremental impacts.[6] Thus, the demand forecast does not intend to depict total savings. Further, the amount of savings attributed to various causes changes depending on the order in which the model is run. Thus, the demand forecast does not intend to determine various causes nor the total amount of savings.[7]

Using a single total estimate of energy savings to adjust the demand forecast will provide a temporary remedy to avoid making the same serious errors made in 2009, but ultimately, we recommend that the CEC establish a process specifically focused on accurately portraying the history of California's energy efficiency policies and savings. Energy efficiency is California's top priority energy resource. Because the CEC is California's official source of information on the state's energy industries and the accomplishments of its energy policies, the CEC should make accurately presenting the state's record on energy efficiency a top priority. This is critical to ensure that energy

[6] Only savings incremental to the model results are considered to have "impacted" the model results, and therefore is the only type of savings that is represented in the 2009 graph (even though the embedded energy efficiency is a significant portion of the overall savings and is worthy of being specifically highlighted). "The bottom four slices [incremental to model results] represent the portion of program savings which impacted the forecast … . The top three slices [possibly embedded in forecast] were reported as program savings in 2003 but had no impact on the forecast and were not reported in 2009." *Id.* at 1.

[7] In addition, the forecasting model shows that there were no savings from the industrial sector from utility programs, as described above. A model that explicitly omits industrial sector savings (a potentially large source of savings and only one example of the incomplete analysis) is clearly not determining all source of efficiency.

efficiency remains a top priority in California and is not undermined by the inaccurate portrayal of the successes of energy efficiency programs over the past several decades.

II. Detailed Discussion

As noted above, NRDC repeatedly called for an explanation of the 2009 graph that we strongly indicated did not accurately represent California's energy efficiency history. Below are the key points from the information that we learned in the DAWG and CEC proceedings over the past few years.

1. **The erroneous 2009 graph drastically discounts the amount of savings coming from efficiency programs, cutting savings by more than 75% without a reasonable basis.**

In 2009, the CEC revised how it portrayed the cumulative amount of energy efficiency savings over the years. In numerous prior publications, the CEC published graphs of, and provided data on, the sources of energy savings: for example, in the Energy Action Plan II of 2005, [8] the CEC Loading Order Staff Paper[9], and even compiled for others, as in the 2002 report: "California's Secret Energy Surplus."[10] But in 2009, the CEC radically changed its graph. We have presented the 2005 and 2009 graphs in comparable formats and timeframes for ease of comparison here. We are also attaching as Exhibit A and Exhibit B for a stand-alone comparison.

[8] California Energy Commission & California Public Utilities Commission, *Energy Action Plan II*, Implementation Roadmap for Energy Policies, at 5 (October 2005). Available at: http://docs.cpuc.ca.gov/word_pdf/REPORT/51604.pdf.

[9] CEC, Implementing California's Loading Order for Electricity Resources, Staff Report, CEC-400-2005-043 (July 2005). Available at: http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF.

[10] "Historic data compiled by CEC staff." Rufo, M., Coito, F., California's Secret Energy Surplus, Figure A-9, Energy Savings Impacts of Energy-Efficiency Programs and Standards (September 2002). Available at: http://www.ef.org/documents/Secret_Surplus.pdf.

Figure 1: Original Graph of Energy Efficiency Savings (Published in 2005 in Energy Action Plan)[11]

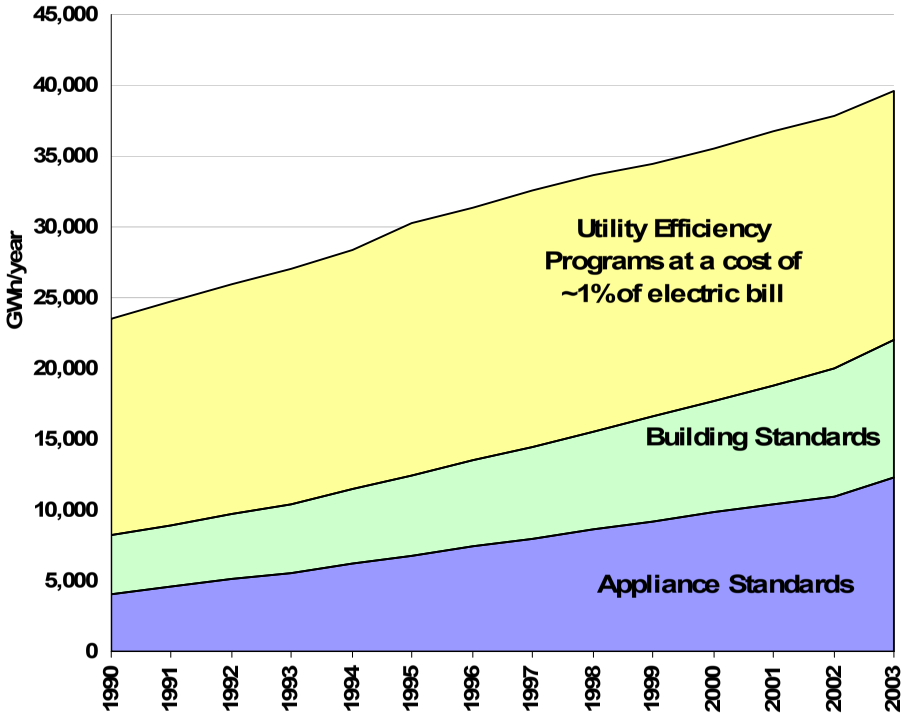
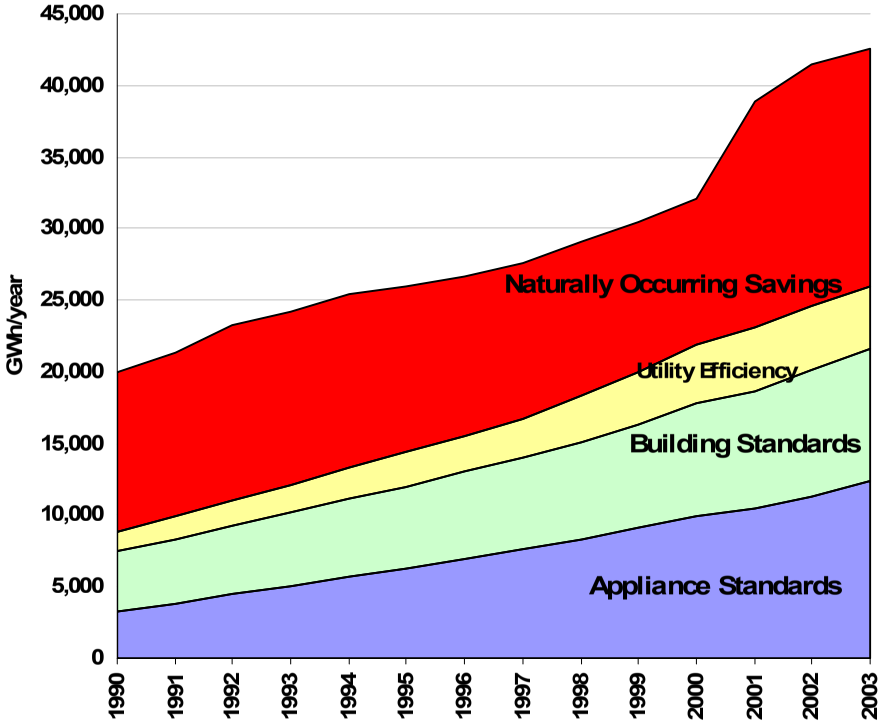


Figure 2: Revised Graph of Energy Efficiency Savings, (Published in 2009 California Energy Demand)[12]



[11] California Energy Commission & California Public Utilities Commission, *Energy Action Plan II*, Implementation Roadmap for Energy Policies, at 5 (October 2005). Source: NRDC Correspondence, Sylvia Bender, CEC Staff, email dated August 8, 2005. Original graph extends back to 1978, but only extended back to 1990 here, for like comparison.

[12] CEC, California Energy Demand 2010-2020 Staff Adopted Forecast, "Electricity Consumption Savings From All Sources," (December 16, 2009). Available at: http://www.energy.ca.gov/2009publications/CEC-200-2009-012/index.html. Original graph extends to 2020, but only extends to 2003 here, for like comparison. Additionally, different colors are chosen here, for like comparison.

It is immediately apparent comparing these two graphs that the CEC's 2009 graph drastically reduced the savings attributed to utility energy efficiency programs ***by over 75%***.[13] In some historical years, the savings attributed to efficiency programs were reduced by 92% (i.e., the CEC only used 8% of the savings that were reported in those years).[14] As discussed above, these revised estimates vary sharply from the CPUC's official record of energy savings during those years. The CEC's extreme reductions were made without a full public process and in the absence of any further evaluation studies by or on behalf of the CEC. Further, the basis for most of the reductions is simply the "judgment" of CEC staff. Although professional judgment is often necessary and valuable in the CEC's work, it should not replace well-documented information that has already been formally adopted by an agency following a thorough public process.

2. The erroneous 2009 graph is incommensurate with estimates from the long history of California Public Utilities Commission assessments and from neighboring regions that have similar histories of energy efficiency.

The CEC staff determined the current estimate of utility program energy savings by making adjustments to program saving results that were reported by the CPUC, or by the utilities to the CPUC using established CPUC evaluation, measurement, and verification (EM&V) protocols and reporting requirements. The CPUC has supported and required EM&V of efficiency programs for many years. The CPUC historically evaluated efficiency program savings and determined energy savings estimates following rigorous ex-post evaluation through its Annual Earnings Assessment Proceedings.[15] In addition, the CPUC has a long history of protocols for reporting and evaluating savings, as well as requirements for ex-ante assumptions used in reporting. The California Measurement Advisory Council (CALMAC), established to assess savings, provided over 800 research

[13] The 2005 Energy Action Plan II estimates of cumulative utility program savings were 17,579 GWh for the most recent year, 2003. The 2009 IEPR reduced the amount attributed to utility programs to 4,273 GWh. This amounts to a 76% reduction. 2009 data from: CEC, California Energy Demand 2010-2020 Adopted Forecast, p. 241 (December 2009). Available at: http://www.energy.ca.gov/2009publications/CEC-200-2009-012/index.html. 2003 data provided by CEC, Sylvia Bender.

[14] Demand Analysis Working Group, Historical and Committed IOU Energy Efficiency Program Impacts – Data Sources and Assumptions for the 2009 IEPR Forecast, Pre-1998 Efficiency Program Savings by Category (February 24, 2011).

[15] "[In 1993] by Decision (D.) 93-05-063, the Commission established the AEAP as the forum for evaluating earnings claims for utility energy efficiency (EE) and low income energy efficiency (LIEE) programs. The Commission also designated the AEAP as the proceeding for the utilities to submit annual reports on EE and LIEE accomplishments, and measurement and evaluation activities." CPUC, Opinion Addressing 2005 and 2006 Annual Earnings Assessment Proceedings, D-06-09-038, at 1 (September 21, 2006). Available at: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/60064.pdf.

studies of savings that date back to 1990.[16] Savings estimates at the CPUC were adopted following formal public proceedings and it is inappropriate for the CEC to drastically reduce and rewrite those savings estimates, particularly without a transparent and thorough public process.

Furthermore, these newer CEC estimates are incommensurate with how our neighbors in the Pacific Northwest estimate savings from efficiency programs. The Northwest has implemented similar efficiency programs over a similar period of time as California. The Northwest Power and Conservation Council (NPCC) estimates cumulative savings from codes, standards, and efficiency programs. The NPCC transparently and publicly provides the data for historic EE savings on their website, from which we obtained the data. We present it below, in comparable fashion to the CEC's original graph, and also in Exhibit B.

[16] "More than 800 MA&E research reports dating from 1990 can be found in our Searchable Database." CALMAC, CALMAC website, (last visited May 11, 2011), available at: http://calmac.org/default.asp.

Figure 3: Original Graph of Energy Efficiency Savings (Published in 2005 in Energy Action Plan)[17]

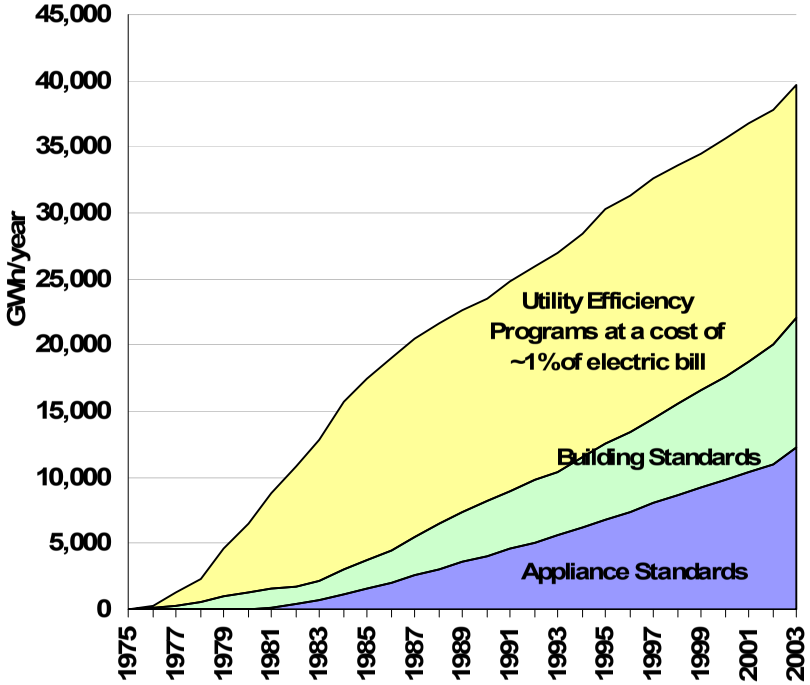
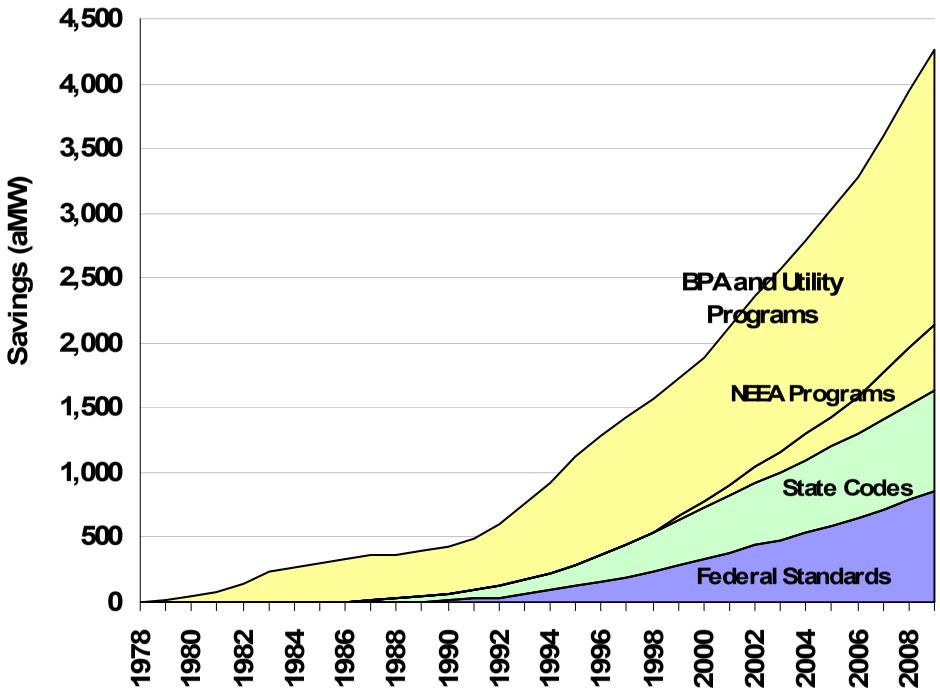


Figure 4: Graph of Energy Efficiency Savings, (Published in NPCC's 2010 6th Power Plan)[18]



[17] CEC, *supra* note 11. No modifications here.

[18] NPCC, 2009 Utility Conservation Achievements Report, Summary data file (September 2010). Available at: http://www.nwcouncil.org/energy/rtf/consreport/2009/Default.asp. Original graph presented in "bar" format, but for like comparison presented in "wedge" format here. Colors were selected for like comparison with CEC graphs.

The NPCC estimates about half of the energy savings are attributed to utility programs, similar to the CEC's original graph from 2005. However, the CEC's 2009 graph uses drastically lower values, as described above, which are incommensurate with how our neighboring region estimates efficiency. We recommend that the CEC consult with the NPCC to compare methodologies and assumptions to discuss possible improvements to how California accounts for the impacts of efficiency program.

3. The erroneous 2009 graph sends counterproductive signals to policymakers, by asserting that much of the energy savings actually achieved by efficiency programs over time would have materialized without any efficiency policies or programs, which could undermine the state's and utilities' commitment to energy efficiency

The misleading 2009 graph could undermine California's ability to meet its energy and climate goals. California has made remarkable progress over the last 40 years at improving energy efficiency through an integrated effort of public interest research and development, energy efficiency programs, and the CEC's building codes and appliance standards. Each of these key policies has worked in tandem with the others to move markets toward more efficient products and services. State law and the CEC's policy made cost-effective energy efficiency the state's top priority energy resource and enabled customers to realize significant and long-lasting benefits. Yet the CEC's inaccurate 2009 graph of energy savings could give policymakers the false impression that much of the state's historical progress would have been made even in the absence of the state's energy efficiency programs. This could undermine the state's commitment to continue to improve energy efficiency and jeopardize the state's ability to meet AB 32's emissions limit, which relies heavily on energy efficiency to achieve both greenhouse gas reductions and economic benefits for California.

To provide one specific example, the inaccurate graph could undermine the CEC's own work with the POUs on energy efficiency. The state and the CEC have rightly encouraged the POUs to achieve more energy efficiency. The state's loading order requires that POUs acquire all cost-effective energy efficiency as the first resource to meet demand, and state law requires POUs to set aggressive long term goals and to report annual efficiency gains. The CEC has made laudable efforts to support and provide policy direction for POU efficiency programs. However, these ongoing efforts could be undermined if the CEC continues to send a contradictory message by retroactively diminishing its record of the accomplishments from efficiency programs that were already

evaluated by the CPUC. To support the state's efforts to improve energy efficiency and make it the top priority resource, the CEC should accurately track the state's progress at capturing energy savings through various policies.

III. Responses to Staff Questions

1. Introduction – EE History: Why is the issue important? – All

See Section II, above.

2. Which version of the "program history" information should be used for IOU programs (ex ante reported, ex post evaluated, an estimate of ex post evaluated prepared by CEC, other?).

For IOU program history for the years leading up to 2003, NRDC recommends that the CEC use the CPUC's officially adopted energy savings. In many cases, the CPUC evaluated the utilities savings and adopted final numbers in the Annual Earnings Assessment Proceedings (AEAP). For years where formally adopted CPUC savings figures are not available, the CEC should use the savings reported by utilities according to the CPUC's formal reporting requirements. For 2004-2005, NRDC recommends using the Energy Division's (ED) evaluated numbers for IOU programs. For 2006-2008, NRDC recommends using a range of savings to reflect the ongoing disputes over the accuracy and magnitude of savings during this period that the CPUC has not yet resolved. For the low end of the range we recommend the use of the Energy Division's 2006-2008 evaluation report, which have not been adopted by the CPUC.[19] For the high end of the range, we recommend using the final savings estimates the CPUC formally relied upon in D.10-12-049.[20]

3. The traditional EE categories for the historic period are: building codes, appliance standards, program effects, and naturally occurring conservation. How specific should the write-up be about attribution between these categories and why?

As a temporary fix for the 2011 IEPR demand forecast, we recommend representing historical energy efficiency savings as a single comprehensive total in one graphical wedge and in one tabular column, as opposed to multiple wedges for which specific attribution is implied,. NRDC is supportive of working towards a categorical

[19] The Commission chose not to rely on the Energy Division's recommended savings numbers in D. 10-12-049 citing the "substantial controversy surrounding their accuracy, and their magnitude," and the CPUC has not yet resolved those disputes. CPUC, Decision Regarding The Risk/Reward Incentive Mechanism Earnings True-Up For 2006-2008, R.09-01-019, D.10-12-049, (December 16, 2010).

[20] CPUC, Alternate Proposed Decision of Commissioner Peevey, R.09-01-019, p.6 (December 16, 2010).

approach for future IEPR reports through a more in-depth and transparent analytical process. If the CEC does not adopt our recommendation to use one aggregate graph of energy savings and chooses to include some categorical attribution in near-term publications, we recommend that these categories be commensurate with the original efficiency history as depicted in Figure 1: (1) Utility Program Effects, (2) Building Standards, and (3) Appliance Standards. It is unreasonable to replace well-documented "efficiency program savings" with "naturally occurring savings". Price elasticities, which were used to determine nearly all of the 2009 graph's "naturally occurring savings" might be helpful for forecasting future demand, but they do not determine causation of past savings. For any graphs with categorical attribution that are published in CEC formal documents, NRDC strongly urges the CEC to include the underlying assumptions relating to the categories and the confidence intervals of uncertainty associated with the categorization. These should also be explicitly stated within the publication near the figures, with links to any other sources, so as to maximize transparency.

4. **Should there be additional effort to compile a more refined EE program history beyond that contemplated by CEC staff and described to the DAWG? If yes to 4a how should the information be compiled if it does not already exist?**

As described in Section II, we recommend that ultimately, the CEC establish a process specifically focused on accurately portraying the history of California's energy efficiency policies and savings, and that any determination of how such information should be compiled be discussed in that context. However, given the CEC's desire to complete the 2011 demand forecast soon and that numerous issues related to historical attribution of energy savings remain unresolved, we recommend that the CEC utilize one total amount of savings in the 2011 IEPR. The demand forecast model was not designed to attribute savings; this has become abundantly clear through the discussions in the DAWG process For example, the magnitude of savings attributed to utility programs and "naturally occurring savings" is dependent upon the order in which they are included in the model; no savings from industrial programs are counted; and the 2009 graph excludes all the savings embedded within the model.

5. **The CEC's proposal is to characterize the effects of the 2006-2008 programs using the CPUC/ED's ex post evaluated results. Should the CEC use the ex post evaluated results or some other characterization of 2006-2008 programs? If some other characterization is proposed, please describe the characterization and the rationale for using it. -- All**

NRDC proposes the use of high and low cases to characterize the effects of the 2006-2008 programs, since the CPUC has not yet formally adopted final savings estimates for those program years, and the Energy Division's recommendations remain hotly contested and unresolved. Indeed, as noted above, the CPUC explicitly chose not to rely on the Energy Division's recommended savings numbers in D.10-12-049 citing the "substantial controversy surrounding their accuracy, and their magnitude." Therefore we recommend that the savings estimates based on ex-ante values used in D.10-12-049 should be used to represent the high case, and the Energy Division's savings estimates should be as the low case. The CPUC has not yet resolved the remaining disputes surrounding the 2006-2008 results, so the CEC's representation of those years should acknowledge that uncertainty.

NRDC proposes using the following cases to represent the 2010-2012 program cycle:

- **Low EE impacts:** 2009 IEPR adjustments to 2010-2012 programs, which applied the CPUC-adopted interim verification report results to 2010-2012 plans.[21]
- **Mid EE impacts:** CPUC goals for 2010-2012
- **High EE Impacts:** Utilities' projected savings approved in their compliance filings for 2010-2012[22]

6. Forecast results for energy efficiency are sensitive to assumptions about "decay" – how energy efficient measures are replaced at the end of their useful life. What percent are replaced with non-efficient technologies? With equally efficient technologies? With more efficient technologies? CECs current proposal is to use the assumption, per CPUC, that 50% of measures are replaced with equally efficient measures during the forecast period. Is this value appropriate or should a different value be used? Which value(s) and why? How shall additional information about what actually happens be developed? -- All

NRDC recommends that the CEC use the CPUC's assumptions at this time, and continue to work with the CPUC to determine if better approaches are available (for example, through discussions with the NWPCC).

IV. Conclusion

[21] 2009 California Energy Demand, *supra* note 13, p. 247 (citing to CPUC, Energy Division, *Energy Efficiency 2006 - 2007 Verification Report*, (November, 2008) for realization rates for 2010-2012 savings, in addition to Energy Division recommendations).

[22] IOU 2010-2012 Compliance Filings, A.08-07-021 et al, November 23, 2009 (PG&E Advice Letter 3065-G and 3562-G, SCE Advice Letter 2410-E, SDG&E Advice Letter 2127-E/1903-G, SoCal Gas Advice Letter 4041).

NRDC appreciates the opportunity to comment on the history of energy efficiency in the 2011 Preliminary Demand Forecast. It is crucial that the CEC publish accurate estimates of the cumulative impact of the state's numerous efficiency efforts to document progress towards the state's goal of capturing all cost-effective savings and ensure continued strong support for key energy efficiency policies that offer significant bill savings to customers, invigorate our economy, and reduce pollution. Without an accurate representation of the state's historical accomplishments, the state's top priority energy resource could be jeopardized. We greatly value the efforts and extensive task undertaken by the staff and working groups to date and thank you for considering our recommendations.