

Reply 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

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I. Introduction and Summary

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer these reply 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 reply comments provide recommendations based on the new information provided at the May 25th Staff Workshop ("Staff Workshop"), and incorporate by reference, but do not repeat, the information NRDC provided in opening comments on May 20th, 2011.¹

In summary:

1. NRDC strongly recommends that the CEC retract the inaccurate 2009 IEPR graph of historical energy savings, which has been shown to misrepresent the sources of historical energy savings and to significantly discount prior data on the energy savings from programs without sufficient basis.
2. NRDC strongly recommends that the CEC use, exclusively, one 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.
3. NRDC does not agree with using the recently-presented consumption-based estimate of program savings, because the methodology has not yet been meaningfully reviewed, documented, nor vetted, and it suffers from the same inadequacies as the aberrant 2009 method of reducing savings, because it supplants previously-adopted official savings estimates.

¹ NRDC, 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 Number 11-IEP-1C Demand, p.1 (May 25, 2011). Available at: http://www.energy.ca.gov/2011_energy_policy/documents/2011-05-25_workshop/additional/Martinez_Sierra_NRDC_Comments_on_History_of_Energy_Efficiency_in_the_2011_IEPR.pdf. All documents and presentations available at: http://www.energy.ca.gov/2011_energy_policy/documents/index.html#05252011.

4. NRDC disagrees with TURN's statement that the CEC conducted several rounds of EM&V in its reductions of energy savings from utility efficiency programs; rather, the CEC's reductions of historical savings were based solely on staff judgment

II. Discussion

NRDC appreciates the CEC Staff and Demand Analysis Working Group's (DAWG) preparation and participation at the May 25th demand forecast workshop. The staff workshop added valuable information to the record. In particular: numerous parties voiced similar concerns over the inaccurate portrayal of energy efficiency savings in the 2009 Integrated Energy Policy Report (IEPR) ("the 2009 graph").² This growing chorus of parties concerned with the inadequacies of the 2009 graph requires the Commission to provide direction on (1) how CEC staff should represent energy efficiency savings achieved in California in the 2011 Demand Forecast and IEPR and (2) what process should be developed to address these issues in advance of developing the next demand forecast.

- 1. NRDC strongly recommends that the CEC retract the inaccurate 2009 IEPR graph of historical energy savings, which has been shown to misrepresent the sources of historical energy savings and to significantly discount prior data on the energy savings from programs without sufficient basis.**

The additional material presented at the May 25th "Staff Workshop on Historical Energy Efficiency Estimate and Update to the 2009 California Energy Demand Forecast"³ ("Staff Workshop"), confirms that the 2009 IEPR graph misrepresents the magnitude of historical energy savings, misrepresents the attribution from various sources, and in

² See California Energy Efficiency Industry Council, Comments on CEC's Estimates of Energy Efficiency in the Demand Forecast, Docket Number 11-IEP-1C Demand, (May 18, 2011) ("Concerns with Significant Changes to CEC Representation of Historical Energy Efficiency Savings: . . . The revised graphical depiction of the sources of energy savings, which previously showed roughly equal wedges for historic savings from utility programs and codes and standards, is highly misleading in its seeming replacement of the majority of the utility program savings wedge with "naturally occurring savings."). SCE, "Southern California Edison (SCE) EE History Submissions for Discussion at CEC May 25, 2011 Workshop," ("the CEC has incorrectly portrayed IOU EE program savings by increasing the attribution to decay, building codes, appliance standards and naturally occurring conservation by decrementing IOU program savings. This false portrayal infers that IOU EE programs are having a negligible effect on energy reductions in California."). PG&E, CEC IEPR Workshop Presentation, (May 25, 2011) ("PG&E requests that the Commissioners advise Staff that depictions of historic aggregate EE savings be consistent with those that have been filed, reported and depicted previously by IOUs, CPUC, CEC and other State and Federal agencies until such time as those historic savings estimates are revised through a rigorous and independently verified process. Depictions should be consistent with those shown in the 2005 Energy Action Plan in which IOU programs, building standards and appliance standards are all shown on a consistent ex-ante modeled and reported basis."). SDG&E, "SDG&E EE History Submission on Discussion for May 25, 2011 Workshop," ("Therefore the CEC should strongly consider withdrawing the study [referencing the 2009 graph]."). All available at: http://www.energy.ca.gov/2011_energypolicy/documents/2011-05-25_workshop/additional/.

³ Comments, presentations, and materials available at: http://www.energy.ca.gov/2011_energypolicy/documents/index.html#05252011.

particular drastically decreases savings from efficiency programs without a sufficient basis. Staff presentations and materials show that (1) reductions to energy savings from programs in the 2009 IEPR graph relative to earlier CEC graphs rely solely on internal staff judgment;⁴ (2) revisions to utility program savings were not made according to CPUC protocols or decisions;⁵ (3) revisions were not made based on any new evaluation studies for those historic years;⁶ and (4) revisions reduced savings attributed to utility programs by 85%-93%, on average.⁷

The staff presentation also confirmed that the 2009 graph does not purport to represent total energy savings because it omits the entire industrial sector, as well as agriculture, transportation, and other sectors.⁸

More importantly, the staff presentation confirmed that the *nature* of the 2009 graph is entirely different than the Energy Action Plan (EAP) of 2005 graph, and previous CEC graphs, see Figures 1 and 2. While the graph included in the 2005 EAP represents the total amount of energy efficiency achieved over time, the 2009 graph merely represents the amount of efficiency that impacts the CEC's model, not the total amount of energy efficiency. The CEC model is impacted by efficiency in two ways: through post-processing of model results and through the model itself, but mostly through the former.⁹ The first type of efficiency, post-process of the model results, is used as a calibration factor to true-up the back-cast.¹⁰ The second type of efficiency occurs within in the model itself,

⁴ “[S]avings included in forecast out of the total considered . . . is a result of staff judgment at the time.” Kavalec, Energy Commission Staff Approach to Estimating Historical Efficiency Program Impacts, p. 11, (May 25, 2011). Available at: http://www.energy.ca.gov/2011_energypolicy/documents/2011-05-25_workshop/presentations/Estimating_Historical_Efficiency_Program_Impacts_Chris_Kavalec.pdf.

⁵ Kavalec, *supra* note 4.

⁶ The table shown on slide 4 highlights the various sources of energy savings adjustments, but for the historic does not show any new evaluation studies. Kavalec, *supra* note 4, p.4.

⁷ “The percentage of 2009 IEPR savings out of the total claimed is very low, averaging around 7 to 15 percent.” Kavalec, Chris and Schultz, Don, “2011 Efficiency Programs: Historical Activities and Incorporation in Energy Commission Demand Forecasts,” Staff Paper, CEC-200-2011-005-SD, p. 8 (May 2011). Available at: <http://www.energy.ca.gov/2011publications/CEC-200-2011-005/CEC-200-2011-005-SD.pdf>.

⁸ “[Historical] Program savings for sectors other than residential and commercial [were] not reported in 2009 IEPR.” Kavalec, *supra* note 2, p. 6. : “Staff’s typical practice in past IEPR forecasts has been to report historical program savings *only in the commercial and residential sectors*.” Kavalec, Schultz, *supra* note 5, p. 6. In addition , the CEC staff report states that the other noted sectors were embedded within the industrial forecast and not represented in the 2009 graph: “[T]he industrial and agricultural models, and the street lighting, transportation, communications, and utility model operate off of actual historical consumption and therefore incorporate all historical load impacts from . . . programs No specification of historic program savings is required to produce a forecast.” Kavalec, Schultz, *supra* note 7, p. 6.

⁹ “Program impacts are accounted for in the forecast mainly through post-processing of model results, although some program effects are calculated within the models.” Kavalec, Schultz, *supra* note 7, p.2.

¹⁰ “The amount of efficiency program impacts specified in the residential and commercial models affects the forecast through the calibration process.” Kavalec, Schultz, *supra* note 7, p.2.

is “embedded,” and is used to adjust energy consumption values in the end-use model.¹¹ However, the actual total amount of the embedded efficiency is not just the amount that impacts the values selected in this particular end-use model. The values of average energy consumption for various end uses already incorporate the effects of many efficiency programs. To only use the amount that changed the model’s original values is, by nature, to underestimate the amount of embedded efficiency savings. Further, the amount of efficiency should not be the amount used to true-up the back-cast. Both of these estimates are determined by the particular model being run. Rather, the total amount of efficiency should be what was estimated by professional evaluators and officially adopted by the CPUC, or estimated according to official reporting protocols at the time. Because the 2009 graph, by its nature, does not measure total savings, it is a misrepresentation to hold it out as the documentation of historical energy savings in California.

Based on the information provided by CEC staff at the workshop, and from parties’ opening comments,¹² NRDC recommends that the 2011 IEPR retract the inaccurate 2009 IEPR graph through an errata acknowledging: (i) the fundamentally different nature of the 2009 graph, compared to the numerous graphs issued previously, such as the 2005 Energy Action Plan graph, and (ii) that the 2009 graph did not intend to represent, nor does it represent, the total amount, nor amounts from various sources, of historical energy savings achieved in California.

¹¹ “[T]he impacts of residential lighting and certain retrofit programs are estimated within the Residential and Commercial end-use models through changes in average energy consumption.” Kavalec, Schultz, *supra* note 7, p.2.

¹² [Supra note 1.](#)

Figure 1: Original Graph of Energy Efficiency Savings,
(Published in 2005 Energy Action Plan)¹³

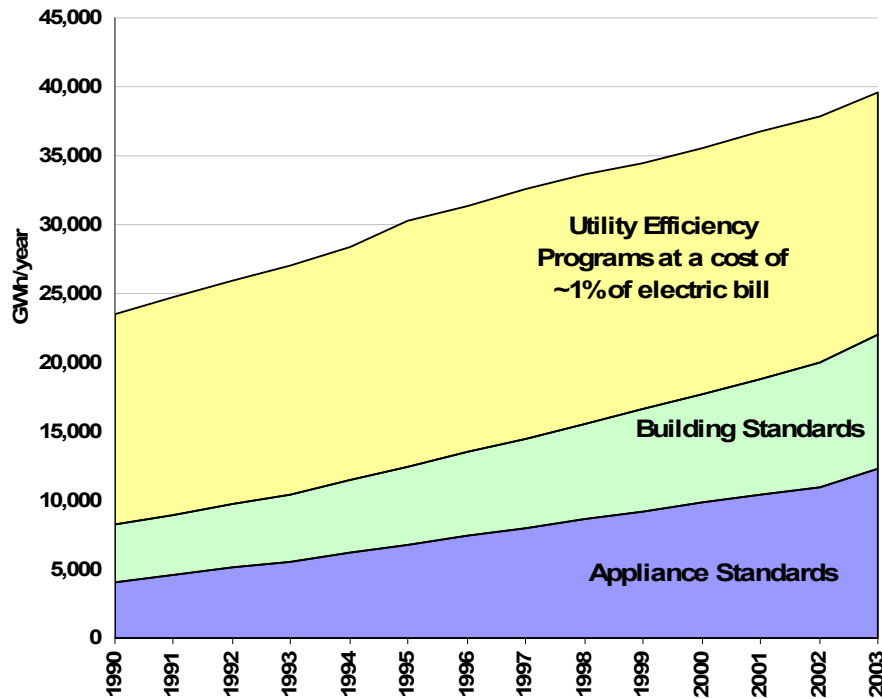
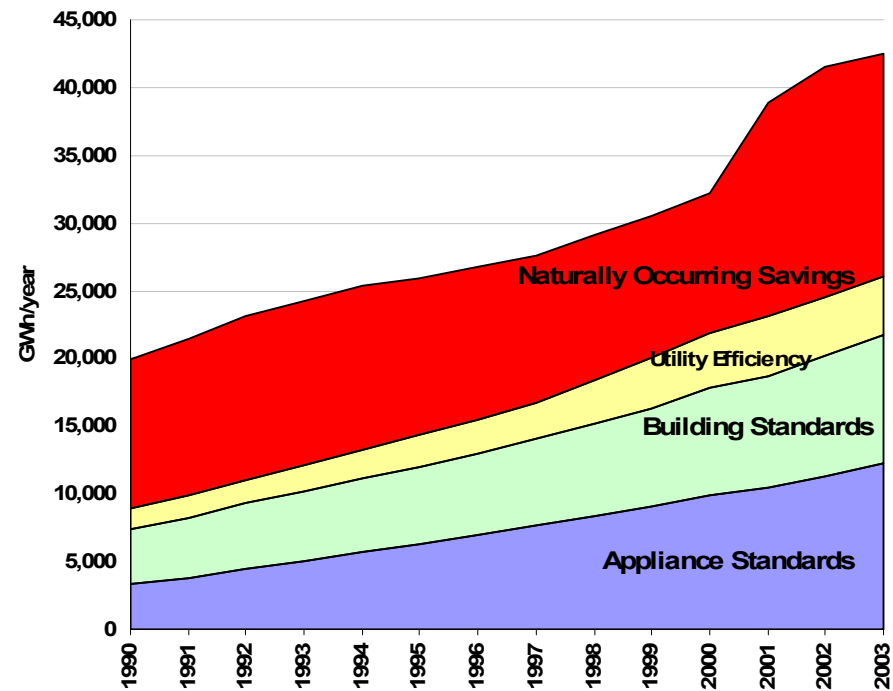


Figure 2: Revised Graph of Energy Efficiency Savings,
(Published in 2009 California Energy Demand)¹⁴



¹³ 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.

¹⁴ 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.

2. NRDC strongly recommends that the CEC use one single total estimate of energy savings as a temporary fix in the 2011 IEPR demand forecast, because the demand forecast model is not capable of determining the various causes of energy savings, and establish a process to address the unresolved issues that will arise in the next demand forecasting cycle.

Information presented at, and provided in advance of, the May 25, 2011 workshop provides further support for NRDC's recommendation provided in our May 25, 2011 opening comments that the Commission should adopt a single graph for the 2011 demand forecast and in the 2011 IEPR, depicting the state's total energy efficiency savings. The Commission should use that graph exclusively and not publish the graph according to the preliminary forecast, which would attribute savings to various causes, and which repeats the same errors of the 2009 IEPR.¹⁵ There is also clearly a need to develop a process to resolve the remaining concerns in advance of the next demand forecasting process in 2013.

Since there is significant overlap between the categories in the 2009 graph and the 2011 Preliminary Forecast, Staff proposed to use a single graph showing total savings with no attribution among various causes.¹⁶ NRDC strongly agrees with this proposal; however NRDC strongly opposes Staff's recommendation to produce additional graphs that purport to determine attribution, since the estimates of program savings in particular are extremely inaccurate.¹⁷

In addition, the Staff presentations also confirm that nearly the entire "naturally occurring" wedge in the 2009 IEPR graph was determined simply by using price elasticities,¹⁸ however, the CEC cannot provide a documented source for their estimate of price elasticities, has not considered other estimates of price elasticities, has not conducted sensitivity analyses of price elasticities, and it is widely-acknowledged in the literature that i) there are significantly divergent estimates of price elasticities, ii) electricity demand is generally quite inelastic, and iii) there are numerous non-price market barriers to efficiency that programs and codes and standards are specifically designed to overcome.¹⁹ Lastly, the

¹⁵ NRDC Opening Comments, *supra* note 10, p. 1.

¹⁶ "Because of possible significant overlap among different sources of savings, staff should first show total savings (the sum of the three sources) without individual attribution whenever reporting savings." Kavalec, *supra* note 2, p. 17.

¹⁷ "Staff should then present estimates of savings by type with full qualification of these estimates and discussion of overlap and other uncertainties." Kavalec, *supra* note 2, p. 17.

¹⁸ "Naturally occurring savings are simulated [nearly entirely] by application of price elasticities within the forecasting models." "Price effects (by far the dominant source of naturally occurring savings in Energy Commission forecasts) . . ." Kavalec, Schulz, *supra* note 7, pp. 2, 11.

¹⁹ Sweeney, "Deconstructing the Rosenfeld Curve," Draft, Precourt Institute for Energy Efficiency, Stanford University (June 1, 2008). Sweeney comments on the unreliability of using price elasticities to determine

amount of savings attributed to various categories changes depending on how the model is run. For all these reasons, the CEC's demand forecast model was clearly not intended to determine the various causes of total savings and should not be presented as such in any CEC documents.

We therefore strongly urge the CEC to use, exclusively, a single graph of the total amount of energy efficiency savings, which is the necessary information for a demand forecast, and not attempt or claim to determine causes of savings until a further process is developed to specifically address the historical attribution of California energy savings. Using a single total estimate of energy savings to adjust the demand forecast will provide a temporary remedy and will avoid making the same serious errors made in 2009. We also recommend that the CEC establish a process specifically focused on accurately portraying the history of California's energy efficiency policies and savings. Accurately presenting the state's record on energy efficiency is critical to ensure that energy efficiency remains a top priority in California.

3. NRDC does not agree with using the recently-presented consumption-based estimate of program savings, because the methodology has not yet been meaningfully reviewed, documented, nor vetted, and it suffers from the same inadequacies as the aberrant 2009 method of reducing savings, because it supplants previously-adopted official savings estimates

Staff presented an econometric estimate of program savings presented at the May 25th Staff Workshop. However, it would be inappropriate to adopt this estimate because it is has not even been reviewed yet and it has nearly all of the same inadequacies as the inaccurate 2009 IEPR graph. Because the econometric estimate was presented for the first time ever at the May 25th workshop there has not been any meaningful review of the consumption-based metric. The only documentation that has been provided are a few slides²⁰. The methodology has not been documented, nor have any of the assumptions and their sources. To create a thoroughly new history of California efficiency program savings warrants more explanation, documentation, and vetting. Plainly, the econometric estimate of program savings should not be adopted because it has not been meaningfully reviewed nor vetted.

savings: "The response of consumers to price changes in California is difficult to estimate. [T]here remains considerable debate about how consumers respond to price changes . . . [Consumers are heterogeneous] with most consumers exhibiting very low price elasticity." *Id.* p.12-13.

²⁰ Kavalec, *supra* note 4, slides 20-23.

Further, the estimates of this consumption-based metric would overwrite previously-adopted official estimates of the CPUC, which is the same error of the 2009 graph. The revisions made according to the consumption-based metric are not made in the presence of any new evaluation studies for those historic years; the revisions have not been approved independently or by CPUC, which has decades worth of protocols for evaluating and reporting program savings; and the reductions are only applied to utility programs, not to codes and standards. The CPUC plans to pilot a macro-consumption metrics, and in that context, parties agree that such a top-down approach should supplement, not supplant, the traditional bottom-up estimates of energy savings from programs. The econometric estimation is preliminary in nature and should not be used to supplant the official record of California's historical energy efficiency achievements.

4. NRDC disagrees with TURN's statement that the CEC conducted several rounds of EM&V in its reductions of energy savings from utility efficiency programs; rather, the CEC's reductions of historical savings were based solely on staff judgment.

In TURN's opening comments, it states that: "The CEC has already conducted several rounds of EM&V on the various program cycles and this information should be used to inform the estimates of savings from those and other program cycles."²¹ In the two years of DAWG meetings, the CEC has not published any document showing it has conducted any, let alone several, rounds of EM&V on program savings. Rather, the CEC has stated that they reduced the amount of savings according to "staff judgment."²² If TURN is referring to the CEC's internal work as "EM&V", the reductions in program savings conducted by staff without a public process, without citing sources, and not according to CPUC protocols, does not amount to "EM&V."²³ In fact, in the CEC's own documentation of the history of EM&V, the table entitled "Energy Efficiency Programs and Evaluation Approaches by Era," the CEC does not mention any, let alone several, EM&V studies conducted by the CEC.²⁴ Thus, NRDC disagrees that the CEC conducted

²¹ TURN, Responses to Stakeholder Questions EE History Document: May 16, 2011, p. 1. Available at: http://www.energy.ca.gov/2011_energypolicy/documents/2011-05-25_workshop/additional/TURN_Response_Stakeholder_Questions_EE_History_Document_Request.pdf.

²² "Energy Commission staff in the 1980s and 1990s relied heavily on judgment to adjust reported program savings." Kavalec, Schulz, *supra* note 7, p. 6.

²³ For definition and use of EM&V, see California Public Utilities Commission, Decision 07-09-043, Interim Opinion on Phase 1 Issues: Shareholder Risk/Reward Incentive Mechanism for Energy Efficiency Programs, Rulemaking 06-04-010, (September 20, 2007). Available at: http://docs.cpuc.ca.gov/published/FINAL_DECISION/73172.htm.

²⁴ Kavalec, Schulz, *supra* note 7, p. 5.

any rounds of EM&V, but rather, the CEC has stated that it reduced energy savings from utility efficiency programs based on “staff judgment.”

IV. Conclusion

NRDC appreciates the opportunity to offer reply comments on the history of energy efficiency in the 2011 Preliminary Demand Forecast. 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. Yet the CEC’s inaccurate 2009 graph of energy savings gives 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. We greatly value the efforts and extensive task undertaken by the staff and working groups and thank you for considering our recommendations.