

**Comments of the Natural Resources Defense Council and Sierra Club on the
California Energy Demand 2014 – 2024 Final Forecast
CEC 2013 Integrated Energy Policy Report, 13-IEP-1C**

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I. Introduction and Summary

The Natural Resources Defense Council (NRDC) and Sierra Club appreciate the opportunity to offer these comments on the California Energy Commission’s (CEC or the “Commission”) Staff Final Report, *California Energy Demand 2014–2024 Final Forecast* (Final Forecast). NRDC and Sierra Club are non-profit membership organizations with interests in minimizing the societal costs of the reliable energy services that Californians demand. We appreciate the CEC’s work, along with the California Public Utilities Commission (CPUC) and California Independent System Operator (CAISO), to coordinate on energy efficiency issues throughout the year. Our comments are summarized as follows:

- We commend the CEC for including some Additional Achievable Energy Efficiency (AAEE) in this Final Forecast and appreciate staff’s work to develop the AAEE estimates.
- We also commend the CEC and staff for disaggregating results in order to be used more easily in resource planning processes.
- The Commission should adopt a *single* California system forecast here that can be used for system resource planning, and any possible modifications to these forecasts may occur in other venues for local resource planning purposes as needed.
- If the CEC adopts a Mid baseline forecast, then the CEC should adopt at least the Mid AAEE forecast because the Mid AAEE forecast is already an extremely conservative estimate.
- We recommend that the CEC include all reasonably expected to occur energy savings because failing to do so risks overprocurement of unnecessary power plants.
- If the CEC adopts a Low or High baseline forecast, then the CEC should adopt the Low or High AAEE forecast, respectively, because more energy savings are reasonably expected to occur with high economic growth, and vice versa.
- We urge the Commission to include all reasonably expected energy savings from publicly-owned utilities in estimates of Additional Achievable Energy Efficiency, instead of the current estimate of zero.
- While we are encouraged that the CEC will include future efficiency savings in its final forecast in this IEPR, we recommend that in future proceedings the joint agencies propose a single final forecast and propose a pairing methodology early

in the proceeding to allow for public stakeholder review of that proposed final forecast, which has not yet been proposed in this IEPR.

II. Discussion

1. We commend the CEC for including some Additional Achievable Energy Efficiency (AAEE) in this Final Forecast and appreciate staff's work to develop the AAEE estimates.

We commend the Commission for including some amount of future Additional Achievable Energy Efficiency (AAEE, previously known as “uncommitted”). In previous IEPRs, the CEC had acknowledged that future energy savings (called “uncommitted” then) were reasonably expected to occur.¹ However, this Final Forecast marks a departure from previous California Energy Demands because the Final Forecast 2014-2024 includes three estimates of this additional achievable energy efficiency.² This is a significant improvement from the Revised Forecast 2014-2024, which did not include AAEE forecasts in the Revised Forecast 2014-2024 itself, but rather, had a supplemental document.³ Publishing and adopting estimates of future energy efficiency savings *as part of* the forecast itself is essential to producing a useful forecast. Also, including this reasonably expected to occur AAEE is critical because as the Final Forecast notes, resource and procurement planning require an accounting of not just the CEC’s baseline forecast, but also of the impacts from AAEE savings.⁴ Therefore, we commend the CEC and express our gratitude to staff for including some amount of AAEE savings in the Final Forecast 2014-2024.

¹ “[R]easonably expected to occur initiatives have been split into two types: committed and uncommitted.” CEC, *California Energy Demand 2010-2020 Adopted Forecast*, p. 28 (December 2009). CEC, *California Energy Demand 2012-2022 Final Forecast*, p. 32 (June 2012).

² “CED 2013 Final includes three baseline scenarios designed to capture a reasonable range of demand outcomes over the next 10 years. . . . Staff also developed estimates of additional achievable energy efficiency impacts for the investor-owned utilities that are incremental to (do not overlap with) committed efficiency savings included in the CED 2013 Final baseline scenarios.” Final Forecast, p. 1.

³ CEC, Draft Staff Report, *Estimates Of Additional Achievable Energy Savings Supplement to California Energy Demand 2014-2024 Revised Forecast*, CEC-200-2013-005-SD (September 2013).

⁴ “There are also likely additional savings from initiatives that are neither finalized nor funded but are reasonably expected to occur, including impacts from future updates of building codes and appliance standards and utility efficiency programs expected to be implemented after 2014 (program measures). These savings are referred to as achievable. Resource and transmission planners now require an adjustment to the Energy Commission’s baseline forecasts (which include only committed savings) to account for these likely impacts.” Final Forecast, p. 87.

2. We also appreciate the CEC’s and staff’s disaggregating the forecast results in order to facilitate resource planning processes at ISO and the CPUC.

We also appreciate the CEC’s expanding how it reports its forecast in order to facilitate resource planning processes at ISO and the CPUC. Throughout this IEPR cycle, the CPUC’s potential study, and various Demand Analysis Working Group meetings, it became apparent that resource planners required greater granularity in the both the base demand forecast results and the AAEE forecasts: “Stakeholders have expressed a strong interest in a more disaggregated demand forecast to better inform resource and infrastructure-related analyses and decisions. As a first step in this direction, staff developed results at the climate zone level for CED 2013 Final in addition to the usual utility planning area forecasts.”⁵ We appreciate this first step and look forward to working with staff in future venues in order to ensure that resource planners also have disaggregated AAEE forecasts.

3. The Commission should adopt a *single* California system forecast here that can be used for system resource planning, and any possible modifications to these forecasts may occur in other venues for local resource planning purposes as needed.

The Notice to Consider Adoption asks if different forecasts need to be adopted here due to the nuances of system and local resource planning that occurs in other venues.⁶ We recommend that the CEC only needs to adopt a *single* forecast here, as the CEC previously committed to adopting.⁷ The CEC should adopt a single statewide forecast here, which can be used for system resource planning purposes in other venues. The CEC need not force a decision on the nuances of local resource planning at this time primarily because the CEC is not charged with making that particular decision here and now. The CEC is charged with providing a picture of statewide energy landscape under the IEPR. Accordingly, the Final Forecast aims to provide a statewide forecast, as well as forecasts for the five major utility planning areas (PG&E, SCE, SDG&E, SMUD, and LADWP),

⁵ *California Energy Demand 2014-2024 Final Forecast Volume 1*, p. 9 (September 2013).

⁶ “Please provide written or oral comments on the following: . . . Should different combinations of forecast components be used for different long term planning purposes – local versus system-wide planning? If you agree, please explain your rationale for using each single forecast set and the appropriate planning process. If you disagree, please explain why.” CEC, *Notice to Consider Adoption California Energy Demand 2014 – 2024 Final Forecast Publication*, Docket No.13-IEP-1C, p. 3 (November 27, 2013).

⁷ “As noted above, the agencies will work together in each IEPR cycle to arrive at a single recommended forecast that encompasses both the CEC adopted electricity demand forecast and the CEC adopted additional achievable energy efficiency forecast.” B. Weisenmiller, M. Peevey, S. Berberich, *Letter to the Honorable Alex Padilla and the Honorable Jean Fuller*, p. 3 (February 28, 2013).

and for the first time, now provides forecasts by climate zone.⁸ The Commission can, therefore, adopt one single forecast (a baseline paired with an AAEE scenario) for each planning area, which can be combined into a single statewide forecast. We urge the Commission to adopt a *single statewide* forecast here to be used for system resource planning.

4. If the CEC adopts a Mid baseline forecast, then the CEC should adopt at least the Mid AAEE forecast because the Mid AAEE forecast is already an extremely conservative estimate.

While the Notice to Consider Adoption asks for both recommendations on the base forecast in addition to AAEE forecasts,⁹ we do not recommend a specific baseline forecast. Rather, we defer to the Commission on a selection of baseline forecast and focus on the pairing of AAEE forecasts with baseline forecasts: for whichever baseline forecast the CEC selects, we recommend a specific AAEE forecasts to be paired with it.

If the CEC adopts a Mid baseline forecast, then we recommend that the CEC pair it with nothing lower than the Mid AAEE forecast. The Mid amount of AAEE is not only reasonable, but is actually conservative. It is a conservative estimate of future energy savings because it (i) assumes that utilities' efficiency programs never improve over time, (ii) excludes all future adopted federal appliance efficiency standards, (iii) does not include the full potential from retro-commissioning of buildings, (iv) only includes a subset of all emerging technologies, and derates the savings of those emerging technologies based on "risk adjustment factors," and (v) assumes that code compliance never improves and removes the Big Bold Energy Efficiency Strategies code compliance enhancements that were included in the CPUC potential study. Furthermore, the experts that developed the models underlying this Mid scenario agree that this estimate "conservative," as stated at the Revised Workshop¹⁰ and the CPUC has already begun its

⁸"The California Energy Demand 2014 –2024 Final Forecast, Volume 2: Electricity Demand by Utility Planning Area describes the California Energy Commission's final baseline forecasts for 2014-2024 electricity consumption and peak demand for each of five major electricity planning areas and for distinct climate zones within those planning areas." CEC, Staff Final Report, *California Energy Demand 2014-2024 Final Forecast Volume 2: Electricity Demand By Utility Planning Area*, p. 1 (September 2013).

⁹ "Please provide written or oral comments on the following: Recommendation of a preferred base case and AAEE scenario to comprise the single forecast set or managed forecast with a rationale for the choices." *Id.*

¹⁰ ". . . I've always considered that the Mid case is a fairly conservative look going forward." CEC, Revised Forecast Workshop Transcript, p. 93 (October 1, 2013).

process to increase the amount of future energy savings.¹¹ Therefore, it is critical that the CEC include the Mid Savings Scenario of energy efficiency, at a minimum, in its single statewide Final Demand Forecast if it uses the Mid baseline forecast.

Mid Savings Scenario Assumes No Improvement in Efficiency Programs Over Time

First, the Mid Savings Scenario is based on Navigant’s potential study,¹² which assumes that utility energy efficiency programs never improve over time. In the potential study, Navigant held three factors constant: i) consumer attitudes; ii) program efficacy and budget; and iii) program priorities.¹³ In Navigant’s words, assuming that none of these factors improve over time: “can suppress future potential.”¹⁴ The overall result of using Navigant’s methodology is that their final estimate “serves as the floor for [efficiency] potential.”¹⁵ Because of the methodological decision to prevent programs from improving over time, the estimates of projected efficiency in the potential study are overly conservative and are more than reasonably likely to occur.

Mid Savings Scenario Assumes No Future Federal Appliance Standards

Second, the Mid Savings scenario assumes that no new federal appliance standards get adopted in the future. This assumption is unrealistic and actual savings are guaranteed to be higher than zero savings from future federal appliance standard. Case in point: the U.S. Department of Energy has already completed three new final federal efficiency standards this year: the 2013 microwave efficiency standard, 2013 commercial air conditioner and heat pump efficiency standard, and the 2013 electric motor efficiency standard¹⁶—yet none of these standards were not included in Navigant’s potential study,

¹¹ CPUC, *Administrative Law Judge’s Ruling Regarding Post-2014 Energy Efficiency Goals*, R.13-11-005 (November 26, 2013).

¹² CPUC/Navigant, *2013 California Energy Efficiency Potential and Goals Study Final Draft Report* (August 2013).

¹³ “Calibration can limit market potential for measures Although calibration provides a reasonable historic basis for estimating future market potential, past program achievements may not perfectly indicate the full potential of future programs. Calibration can be viewed as holding constant certain factors that might otherwise change future program potential, such as: Consumer values and attitudes toward energy efficient measures, Program efficacy in delivering measures, Program budgets and priorities.” CPUC/Navigant, *2013 California Energy Efficiency Potential and Goals Study Final Draft Report*, p. 47 (August 2013).

¹⁴ Navigant, *CPUC Potentials, Goals and Targets (PGT) Study Update*, Presentation to the Demand Analysis Working Group (DAWG) of Preliminary Results, slide 104 (May 2013).

¹⁵ *Id.* at 105.

¹⁶ For recently passed standards, see: Appliance Standards Awareness Project (ASAP), *National Standards, Residential and Commercial sectors* (accessed September 25, 2013). Available at: www.appliance-standards.org/national.

and thus are excluded from the CEC’s Mid Savings Scenario as well. In addition, there are a slew of other standards at various stages of development, for example: commercial refrigeration equipment, walk-in coolers and freezers, battery chargers and external power supplies.¹⁷ Assuming that there will be no new federal appliance standards is beyond conservative—it is unrealistic.

Mid Savings Scenario Omits Significant Amounts of Operational Efficiency Savings

Third, the Mid Savings scenario omits a significant amount of savings from operational savings like retro-commissioning of buildings. The totality of behavioral and operational savings were originally omitted in the Navigant potential study because it was difficult to assess the savings at the individual end use, as well as to understand how they scale across sectors.¹⁸ However, their impacts are significant, as the potential study experts testified at the Revised Forecast Workshop: “I suspect that there’s upwards of 30 percent additional yield in terms of additional efficiency that can be achieved through just better management practices.” Thus, the CEC Mid Savings Scenario plainly does not include the full amount of savings from behavioral and operational programs.

Mid Savings Scenario Assumes Omits Significant Numbers of Emerging Technologies

Fourth, the savings from emerging technologies in the CEC Mid Savings Scenario account for only a subset of the total amount of savings from emerging technologies. (Emerging technologies are energy saving technologies that might have a small portion of market share today but are still maturing; for example, LED technology is the largest emerging technology included in the study.) Navigant was able to study only a limited number of emerging technologies given resource constraints, including savings from only 31 emerging technologies out of a total of 90 “high potential” emerging technologies, and

¹⁷ For future federal standards expected to produce savings in California, see: ASAP, *State-Level Benefits from Potential National Appliance Standards*, Residential and Commercial (accessed September 25, 2013). Available at: http://www.appliance-standards.org/sites/default/files/fedappl_ca.pdf.

¹⁸ “The potential for savings that result from changes in behavior, or how equipment is operated, has only limited representation in this model. Examples of these types of conservation-oriented savings include a resident adjusting the thermostat in their home to reduce the number of hours a heating, ventilating, and air-conditioning (HVAC) system might run, or a re-commissioning activity designed to establish an efficient operating schedule for the HVAC and lighting systems in an office building.” CPUC/Navigant, *2013 California Energy Efficiency Potential and Goals Study Final Draft Report*, p. 13 (August 2013)

out of a total 800 general emerging technologies.¹⁹ In addition to using only a subset of the total amount of savings from emerging technologies, the amount of savings from that subset of selected emerging technologies was further reduced according to a “risk factor” of the likelihood of the technology succeeding.

Mid Savings Scenario Assumes that Code Compliance Never Improves and Removes the Big Bold Energy Efficiency Strategies (BBEES) Code Compliance Enhancements that Were Included in the CPUC Potential Study

Fifth, the codes and standards savings in the Mid Scenario are reduced because the CEC removed the savings associated with the BBEES code compliance enhancements. The CPUC potential study included an assessment of the BBEES initiative to improve code compliance over the next ten years.²⁰ The CPUC/Navigant estimated that this accounts for about eight percent of codes and standards savings,²¹ which the CEC removed from the Mid Savings Scenario, assuming that code compliance never improves over time.

For all of these reasons, the Mid Savings Scenario is an extremely conservative estimate of the likely savings in the IOU territories, and is the minimum the CEC should use in the final demand forecast.

5. We recommend that the CEC include all reasonably expected to occur energy savings because failing to do so risks overprocurement of unnecessary power plants.

The CEC should include all reasonably expected energy savings in its final demand forecast because it impacts the decisions in long term infrastructure planning, as the CEC recognized in its February 2013 commitment: “[The joint agencies] agree that it is crucial to appropriately and consistently consider energy efficiency savings in energy forecasting, electricity procurement planning, and transmission planning to avoid over- or under-building the electricity infrastructure”²²

¹⁹ 31 emerging technologies shown Navigant’s appendix on emerging technologies: CPUC/Navigant, *2013 California Energy Efficiency Potential and Goals Study Final Draft Report*, Appendix A: Emerging Technologies, Table A-6. Measure-Level Details of ETs Included in the 2013 Potential and Goals Study (August 2013). 90 high potential ETs and 800 general ETs presented in Navigant’s previous survey of ETs: “To assess the potential of emerging technologies, Navigant examined 800 possible emerging technologies and identified and assessed 90 technologies as ‘high potential.’” CPUC/Navigant, *Analysis To Update Energy Efficiency Potential, Goals, And Targets For 2013 And Beyond*, p. 9 (May 8, 2012).

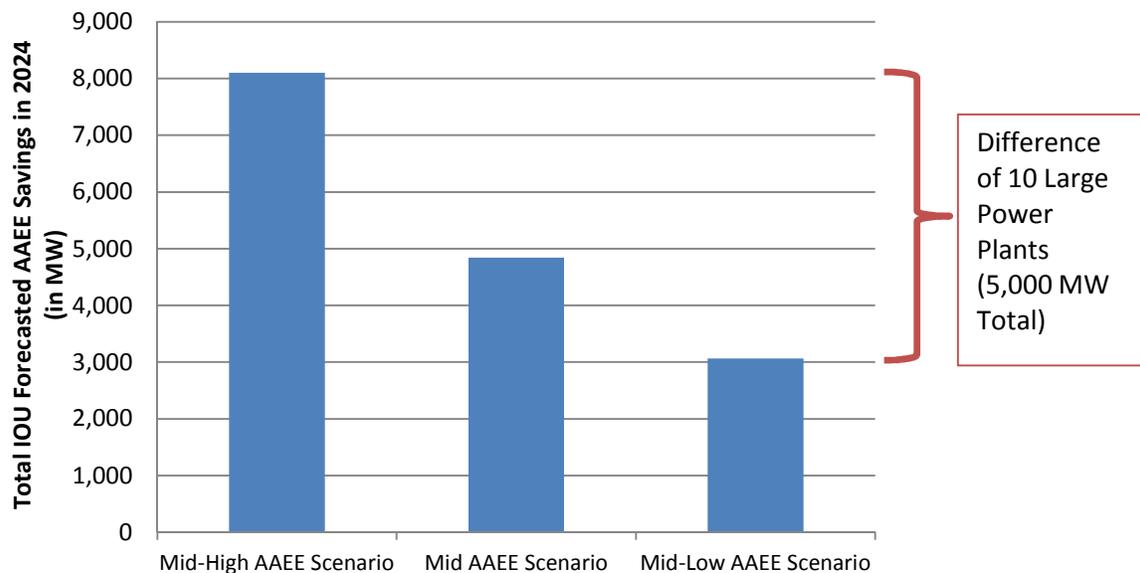
²⁰ CPUC, Potential Study, p. 29 (2013).

²¹ *Id.*

²² B. Weisenmiller, M. Peevey, S. Berberich, *Letter to the Honorable Alex Padilla and the Honorable Jean Fuller*, p. 1 (February 28, 2013).

As shown in Figure 1, the difference of estimated needs among the investor-owned utilities due to the differences in the CEC’s various AAEE scenarios could be the equivalent of ten large power plants (500 MW each). I.e., using the “Low-Mid” AAEE Scenario (which is effectively just a “Low” AAEE Scenario) instead of the Mid AAEE Scenario creates about 4 large power plants (2,000 MW) worth of additional demand, and about 10 power plants (5,000 MW) worth of additional demand compared to using the Mid-High AAEE Scenario. Additionally, as explained in Section II.7, the CEC omits about 1,300 MW of POU energy efficiency savings over the next ten years. The scenarios have significant variations and the POU omission is an egregious omission, both of which greatly increase the risk of overprocurement of power plants. Therefore, it is critical that the Energy Commission select at least the Mid AAEE Scenario (which is already conservative) to be paired with the Mid baseline forecast in order to avoid the risk of building unnecessary power plants in California.

Figure 1: Underestimating Energy Savings Risks Over-Procurement of Power Plants in IOU Service Territories²³



²³ Data from: CEC, Staff Final Report, *CED Final Forecast 2014-2024*, Vol. 1, Table 28: Combined IOU AAEE Savings by Type, 2024, p. 91 (December 2013).

6. If the CEC adopts a Low or High baseline forecast, then the CEC should adopt the Low or High AAEE forecast, respectively, because more energy savings are reasonably expected to occur with high economic growth, and vice versa.

We recommend that the CEC pair each baseline forecast with the AAEE forecast that is most likely going to be paired with the underlying conditions of the baseline forecast. Analyzing the conditions assumed in the baseline forecasts, as well as the empirical evidence regarding savings achievements, the Energy Commission should pair the High baseline forecast with the High AAEE Scenario, and the Low baseline forecast with the Low AAEE Scenario.

The economic factors used in the baseline forecasts and the realistic ways in which energy savings are achieved require pairing the High baseline forecast with the High AAEE Scenario, and Low baseline forecast with Low AAEE Scenario. As the most recent economic downturn has exemplified, under slow economic growth conditions, codes and standards energy savings measures achieve relatively less energy efficiency savings than they would in times of high economic growth. Low economic growth conditions result in lower building construction rates and overall energy consumption, creating fewer opportunities to capture savings. Customers have less disposable income to invest in energy efficiency upgrades, and access to capital or credit can be limited. In contrast, high economic growth results in building codes and appliance standards achieving relatively greater savings because relatively more buildings are constructed and relatively more appliances purchased. Customers have more disposable income to invest in energy efficiency.

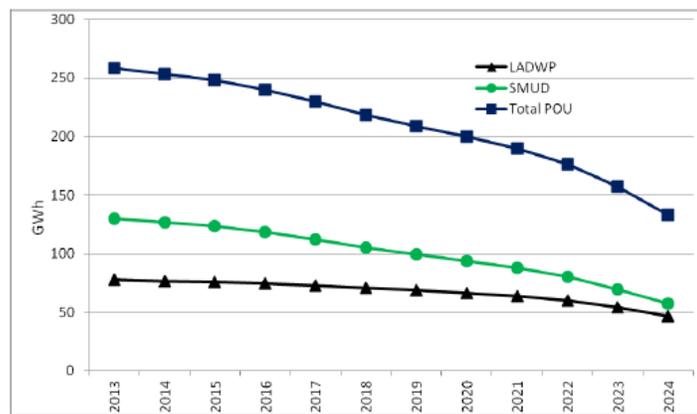
While there are theoretical arguments about pairing the High baseline forecast with Low AAEE savings, and vice versa, the reality of how energy efficiency savings are achieved is that High baseline forecasts are correlated with higher energy savings. Because the final forecast uses relatively high economic and demographic growth assumptions in the High baseline forecast while the low baseline forecast incorporates lower economic and demographic growth,²⁴ we strongly recommend pairing the Low AAEE forecast with the Low baseline forecast and the High AAEE forecast with the High baseline forecast.

²⁴ CEC, *California Energy Demand 2014-2024 Final Forecast*, p. 1 (December 2013).

7. We urge the Commission to include all reasonably expected energy savings from publicly-owned utilities in estimates of Additional Achievable Energy Efficiency, instead of the current estimate of zero.

We strongly recommend the Commission include Additional Achievable Energy Efficiency savings from publicly-owned utility programs. Specifically, the Mid Savings Scenario should be changed to include the POU's ten-year targets, which are reasonably expected to occur. Currently, the CEC Mid Savings Scenario excludes the vast majority of savings from future POU efficiency programs, including only one out of ten years' worth of program savings.²⁵ The CEC assumes that POU energy efficiency programs stop after 2013, which is clearly wrong. Using the CEC's assumptions about POU efficiency programs stopping after 2013 significantly distorts and reduces future energy savings from the POU's, see Figure 2.

Figure 2: Projected Energy Savings From 2013 POU Programs-Mid Demand Case in Cumulative GWh²⁶



In reality, robust long-term energy efficiency potential studies demonstrate that energy efficiency programs will continue beyond 2013. Not only are POU programs projected to provide savings in years beyond 2013, but in the long run, these *annual* savings even increase. The results of these potential and goals studies were submitted to the CEC in March 2013. The studies project over 4,000 GWh and 1,300 MW²⁷ of savings from efficiency programs over the next ten years, see Figure 3. Whereas the Final

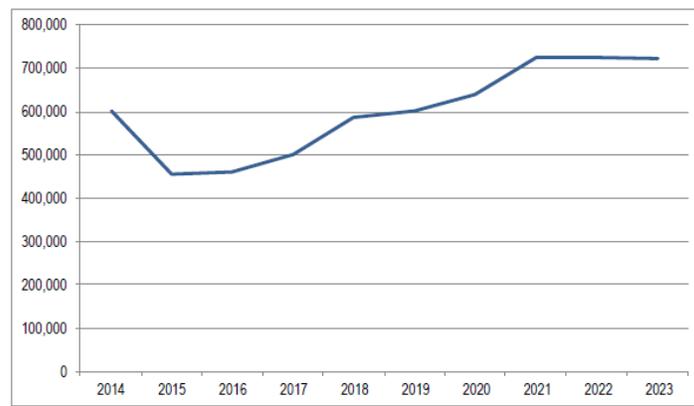
²⁵ Staff only assumed that POU programs would extend to 2013 and would achieve the same level of efficiency savings as reported in 2012 because 2012 is the most recent year estimated savings are available. CEC, *California Energy Demand 2014-2024 Final Forecast*, p. 82 (December 2013).

²⁶ CEC, *California Energy Demand 2014-2024 Final Forecast*, p. 83 (December 2013).

²⁷ These estimates are conservative as they are based on POU programs collectively achieving less than half of available cost-effective savings. POU's estimated that the total amount of cost-effective savings were over 3,300 MW over ten years. CMUA/NCPA/SCPPA, *Energy Efficiency In California's Public Power Sector - A 2013 Status Report* (March 2013).

Forecast projects less than 150 GWh over the next ten years, see Figure 2. Including savings from only one year of a ten-year long period is unreasonably low. Furthermore, the 150 GWh projection is not commensurate with historical POU achievements, which yielded about 440 GWh in 2012 alone, and over 2,000 GWh over the past seven years.²⁸ It is critical that the CEC include reasonable estimates, and for the full ten years of future POU program energy savings, in the Mid Savings Scenario of Additional Achievable Energy Efficiency savings estimates.

Figure 3: POU Annual Energy Savings Targets, 2014-2023 in Annual MWh²⁹



- 8. While we are encouraged that the CEC will include future efficiency savings in its final forecast in this IEPR, we recommend that in future proceedings the joint agencies propose a single final forecast and propose a pairing methodology early in the proceeding to allow for public stakeholder review of that proposed final forecast, which has not yet been proposed in this IEPR.**

We are encouraged that the CEC is considering adopting some amount of AAEE in this Final Forecast. However, we note that a proposal for a single forecast has not yet been proposed for stakeholders to evaluate and recommend changes. Rather, the CEC has produced multiple scenarios of AAEE and multiple baseline forecasts. While it is helpful to observe and evaluate the difference between high and low forecasts, the Commission has not yet identified which baseline forecast and which AAEE scenario it is proposing for adoption. At the October Revised Forecast Workshop, the CEC did not propose a single forecast. Instead, the Revised Forecast offered six different possible forecasts, one of which contains zero future energy efficiency (just the “Base Forecast”). The Final Forecast released in December does not propose a single forecast either. It includes five

²⁸ *Id.* at 2.

²⁹ *Id.* at 3.

scenarios for AAEE and three baseline forecasts. Without proposing a single forecast, it makes it difficult to receive meaningful stakeholder feedback. Consequently, we urge the CEC and the joint agencies to propose a single demand forecast that includes a reasonable amount of future energy efficiency savings as soon as possible in the subsequent IEPR proceedings.

III. Conclusion

NRDC and Sierra Club thank the CEC for the opportunity to comment on the *California Energy Demand 2014–2024 Final Forecast* and for considering our recommendations.