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NRDC Comments on Demand Forecast Methodological Improvements

Additional submitted attachment is included below.

Natural Resources Defense Council (NRDC) Comments on Methodological Improvements to the Energy Demand Forecast

July 7, 2016

Submitted by:
Kala Viswanathan, Lara Ettenson and Sierra Martinez

I. Introduction

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer these comments on the 2016 Integrated Energy Policy Report (IEPR) Workshop on Methodological Improvements to the Energy Demand Forecast for 2017 and beyond. NRDC is a non-profit membership organization with more than 70,000 California members who have an interest in receiving affordable energy services that reduce the environmental impact of California's energy consumption. We respectfully offer the following comments on the electricity demand forecast.

We support the California Energy Commission's effort to create 8760 load shaped for distributed energy resources (DERs) for the 2017 demand forecast. This is a major step forward that will allow the agencies and resource planners to better integrate clean energy into the state's electricity mix and observe shifts in peak load over the 10-year forecast horizon. By knowing when the electric system needs energy most critically, agencies are better positioned to shape demand-side management portfolios for future grid needs. Furthermore, this information will help inform the implementation phases of our state's goal to double energy savings, as discussed in more detail below.

II. Discussion

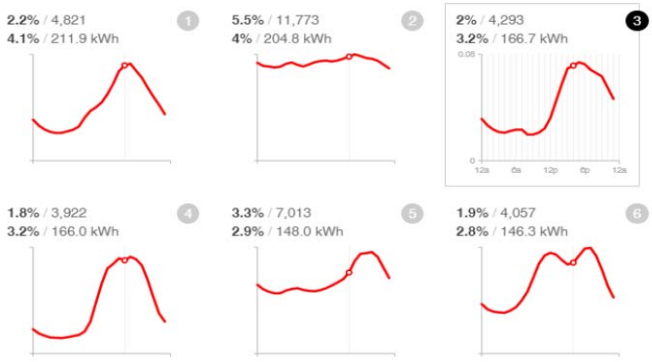
A. NRDC recommends additional stakeholder discussion and transparency before finalizing the methodology to identify hourly load profiles for energy efficiency.

As noted above, the Additional Achievable Energy Efficiency (AAEE) load profiles will include the hourly impacts of energy efficiency for the first time ever, which will greatly aid in the state's planning efforts to meet Senate Bill 350's (SB 350) energy efficiency doubling goal. Energy efficiency is a key resource used to reduce demand and better identify renewable

integration needs.[1] It is critical that the 8760 AAEE forecast accurately represent hourly impacts of energy efficiency savings to effectively inform robust policy and programs, yet there has been very little discussion so far on how the AAEE load profiles were developed by the Energy Commission.

For example, one strong method is the analytics tool Visualization and In-sight System for Demand Operations and Management (VISDOM). This method uses large smart meter data and machine learning algorithms to create load shapes of residential customers' electricity and energy efficiency.[2] Figure 1, below, shows load profiles from six residential customers in one climate zone from the VISOM model. These individual load models could then be aggregated to create an 8760 load profile.

Figure 1: VISDOM Load Profiles for Six Residential Customers for CZ13



VISDOM visualization displaying The top 6 load shapes, or daily energy usage profiles, for customers in California's hot climate zone CZ13.

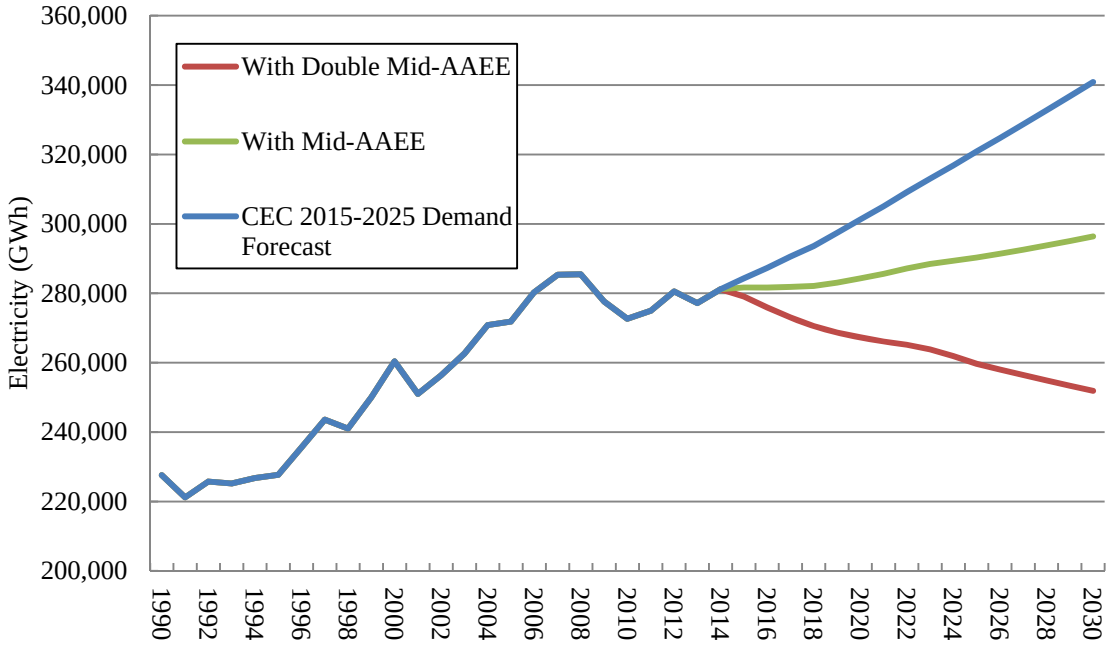
Methods like this to aggregate customer load profiles of energy efficiency will require new data sources and strong collaboration between the joint agencies, technical experts, staff and utilities. NRDC recommends staff spend time and effort improving these data streams and analytical techniques to have the most accurate AAEE load profiles, which will be crucial for plans to meet the state's efficiency doubling goals.

[1] Martinez, S. and Sullivan, D., Using Energy Efficiency to Meet Flexible Resource Needs And Integrate High Levels of Renewables Into The Grid, ACEEE Summer Study on Energy Efficiency in Buildings (2014).
[2] Borgeson, S. et. al. *Learning from Hourly Household Energy Consumption: Extracting, Visualizing and Interpreting Household Smart Meter Data*. Design, User Experience, and Usability: Interactive Experience Design Lecture Notes in Computer Science (2015).

B. NRDC recommends using a full, cumulative, doubling of Mid AAEE from the 2015 Revised IEPR Forecast (including POUs), as defined by SB 350, for the default forecasting scenario.

NRDC strongly supports using SB 350's goal to double energy efficiency in the "Mid AAEE" scenario for the 2017 IEPR forecast. Achieving a cumulative doubling of statewide, economy–wide energy efficiency by 2030 is a significant goal that should be the Default Scenario. This is shown in *Figure 2* in the red line "with Double Mid-AAEE." This full accounting of the doubling goal required under SB 350 achieves 89,000 GWh in annual efficiency savings by 2030.[3]

Figure 2: Impact of Efficiency Doubling Goals on the Demand Forecast[4]

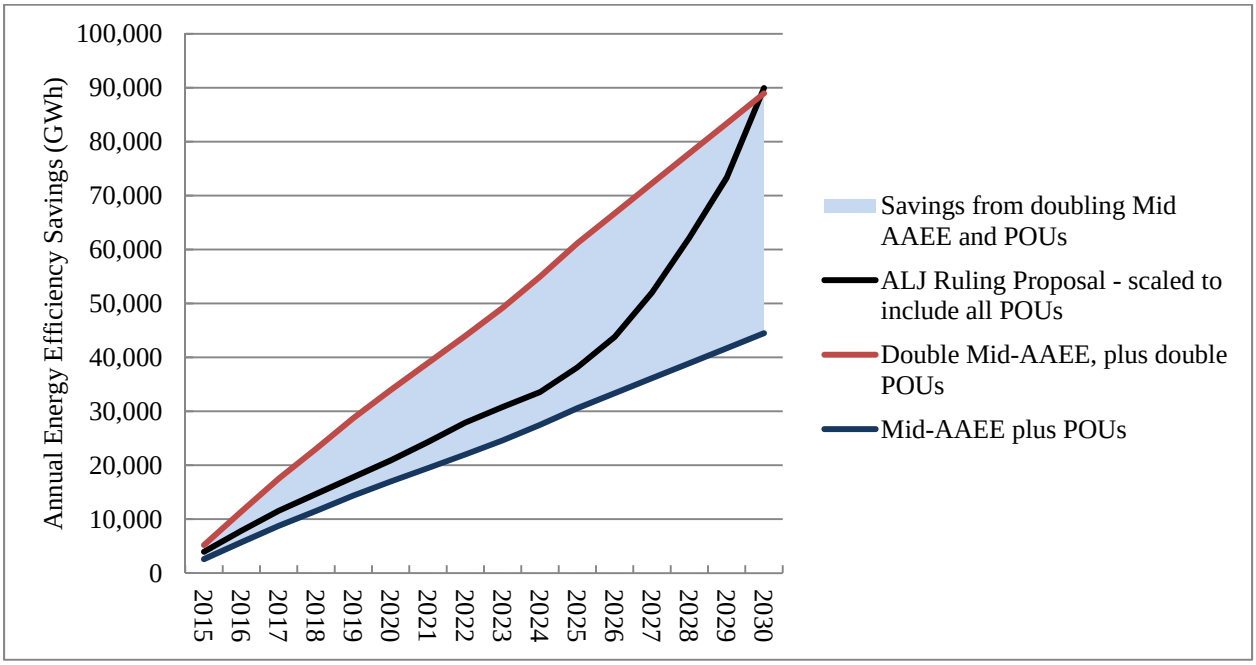


[3] "[The commission] . . . shall establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a ***cumulative*** doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030. The commission shall base the targets on a doubling of the midcase estimate of additional achievable energy efficiency savings, as contained in the California Energy Demand Updated Forecast, 2015-2025, adopted by the commission, extended to 2030 using an average annual growth rate, and the targets adopted by local publicly owned electric utilities pursuant to Section 9505 of the Public Utilities Code, extended to 2030 using an average annual growth rate, to the extent doing so is cost effective, feasible, and will not adversely impact public health and safety." Cal. Public Resources Code § 25310(c)(1) (emphasis added).

[4] CEC, Form 1.1c – Statewide, California Energy Demand Updated Forecast, 2013 - 2025, Mid Demand Baseline Case, Mid AAEE Savings, Electricity Deliveries to End Users by Agency gigawatthours (GWh) (2015); CEC, Form 1.1c – Statewide, California Energy Demand Updated Forecast, 2013 - 2025, Mid Demand Baseline Case, No AAEE Savings, Electricity Deliveries to End Users by Agency gigawatt-hours (GWh) (2015).

It is important that the doubling goal is not interpreted as only reaching a doubling of savings in 2030 by quickly ramping up efficiency in the last year, as incorrectly defined in the Administrative Law Judge's (ALJ) proposal in the Transmission Planning Process at the California Public Utilities Commission (CPUC), Rulemaking 13-12-010. This "hockey stick" approach, shown in Figure 3, assumes a significant ramp up in the eleventh hour and misses a large amount of energy savings over the total fifteen-year planning horizon for SB 350. Specifically, the area under the CPUC ALJ scenario would only achieve around a third of the full cumulative doubling goal, required by SB 350.[5]

Figure 3: Efficiency Savings Doubled by SB 350



The CEC's Building Energy Efficiency Action Plan correctly defined the doubling goal as a doubling of the area of the savings, not just the endpoint.[6] However, this Action Plan defined

[5] The ALJ Ruling proposal accounts for only 91,119 GWh of additional electricity savings, cumulatively over the 2016-2030 time period. The correct accounting of the full cumulative doubling goal in ISO jurisdictional entities identifies 259,991 GWh of additional cumulative savings over the 2016-2030 time period. It is important to note this calculation only includes POUs in the ISO jurisdictional entities (i.e. it does not include LADWP and SMUD) and does not represent the total additional cumulative savings over the 2016-2030 time period that NRDC estimates to be around 376,000 GWh.

[6] CEC, Building Energy Efficiency Action Plan, (September 2015). Available at http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-05/TN205919_20150828T153953_Existing_Buildings_Energy_Efficiency_Action_Plan.pdf.

the goal as only using the building residential and commercial sectors of AAEE, rather than a full economy-wide doubling. We strongly urge the Energy Commission to adopt the correct definition of doubling statewide savings so the state energy and climate agencies can properly plan and ramp up to meet the total doubling of economy-wide efficiency savings.

C. We recommend the inclusion of energy efficiency savings from all publically owned utilities (POUs), which is required under doubling energy efficiency goal in SB 350.

To meet the full doubling goals stated by SB 350, it is very important that the Energy Commission include efficiency savings from all POU programs. As defined in SB 350, energy savings from POUs are included in the statewide total to be doubled: "The commission shall base the targets on a doubling of the mid-case estimate of additional achievable energy efficiency savings…[using] targets adopted by local publicly owned electric utilities pursuant to Section 9505 of the Public Utilities Code."[7] Currently the AAEE forecast includes savings from only the largest POUs (i.e., LADWP and SMUD). As the energy saving goals for the mid-sized POUs are available, these savings goals should be included in the 2017 IEPR forecast as well. POU savings reported in the 2015 CMUA/NCPA/SCPPA's annual efficiency report includes goals that estimate total energy savings of 6,770 GWh for POUs from 2015-2023.[8] By including mid-sized POUs, the AAEE Forecast will correctly plan for the efficiency doubling goals required by SB 350.

III. Conclusion

NRDC thanks the CEC for the opportunity to comment on the IEPR workshop on Methodological Improvements to the Energy Demand Forecast for 2017 and beyond. We look forward to continuing to work with the Energy Commission next cycle to implement SB 350's goal of doubling AAEE savings statewide by 2030. We thank you for considering our recommendations.

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[7] Supra note *3*

[8] CMUA/NCPA/SCPPA, *Energy Efficiency In California's Public Power Sector A 2015 Status Report*, Appendix B: 10-Year Energy Savings Targets, All POUs – Annual Targets (MWh), 2014-2023, B-1 (March 2015). Available at: http://cmua.org/wpcmua/wpcontent/uploads/2015/03/2015-FINAL-SB-1037-Report.pdf