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NRDC Comments on Doubling Energy Efficiency Workshop (7/6/2018)

Additional submitted attachment is included below.

**Comments of the Natural Resources Defense Council (NRDC) on the
2018 Integrated Energy Policy Report (IEPR)
Commissioner Workshop on Doubling Energy Efficiency Savings
Docket Number 18-IEPR-07
June 7, 2018
Submitted by: Mohit Chhabra
mchhabra@nrdc.org**

I. Introduction and Summary

The Natural Resources Defense Council (NRDC) appreciates the opportunity to offer these comments on the 2018 IEPR Staff Workshop on Doubling Energy Efficiency Savings. NRDC is a non-profit membership organization with more than 95,000 California members who have an interest in receiving affordable energy services while reducing the environmental impact of California's energy consumption.

II. Discussion

NRDC appreciates the Energy Commission staff's efforts to establish a thorough and transparent process to develop SB 350 compliant energy efficiency savings targets. NRDC's comments are in response to the material presented at the staff workshop on June 7th. NRDC's comments focus on:

- *Closing the gap between SB350 targets and current statewide energy efficiency efforts:* CEC leadership, guidance, and partnership with other agencies are necessary to understand how to effectively close the gap between SB350's doubling energy efficiency target and the current statewide energy efficiency efforts' trajectory. The recommendations made by the CEC in the 2017 IPER Doubling Energy Efficiency report should be tracked against program plans & accomplishments to determine how program planners are applying CEC's recommendations, and gather feedback from program planners to refine these initial recommendations.
- *Fuel Substitution:* NRDC recommends that the CEC: (1) develops long-run marginal emissions factors that better represent the GHG emissions benefits of California decarbonization policies, including vehicle and building electrification, grid decarbonization, storage, and the solar mandate in the 2019 building code.; and (2) set

ambitious fuel substitution targets for new construction and determine how fuel substitution potential in existing construction can be unlocked.

A. Closing the Gap Between SB350 Targets and Current Statewide Energy Efficiency Efforts

The CEC has successfully completed the challenging task of accurately defining what SB350’s target doubling energy efficiency means, and how it compares with the current trajectory of forecasted savings from these existing efforts in California. The CEC’s analysis shows that the state is currently not on track to meet the SB350 target, the state’s current energy efficiency efforts (electric and gas combined) will fall 10 percent short of the SB350 goal in 2030.¹

NRDC urges the CEC to build upon the recommendations in the CEC “*Senate Bill 350 Doubling Energy Efficiency Savings by 2030*” report and provide actionable recommendations to program planners. A good starting place for this investigation is to analyze the difference between economic and market potential estimates in the IOU and POU potential studies. The economic potential estimates for energy efficiency programs in both studies are much greater than estimates of achievable potential in these territories.

The CEC should also compare existing statewide energy efficiency program plans (and future programmatic accomplishments) against the recommendations in the CEC doubling energy efficiency report. This will enable the CEC to understand how their recommendations are being applied by program planners and gather feedback from program planners to refine these initial recommendations.

B. Fuel Substitution

Set Ambitious Fuel Substitution Targets for New Construction and Provide Guidance on Unlocking Fuel Substitution Potential in Existing Construction

The CEC’s current fuel substitution estimate relies on the assumption that 10 percent of all residential and commercial new construction customers in the state of California (starting with 1 percent in 2020) will adopt standard or high efficiency electric space or water heat

¹ Pages 2 - 4; “*Senate Bill 350: Doubling Energy Efficiency Savings by 2030* (8/28/2017)” available [here](#).

equipment over corresponding gas space or water heat equipment.² The analysis also considered the possibility of modeling a more ambitious scenario with a 30 percent adoption rate of the list of standard and high efficiency technologies for new construction but did not present the results from that scenario.

NRDC recommends that due to the uniquely high GHG reduction potential³ of space and water heating fuel substitution technologies, these technologies be given special consideration in by the CEC for SB350 analysis.

Specifically, NRDC recommends that the CEC:

- Set ambitious fuel substitution targets for new construction: New buildings are the easiest to electrify: all-electric buildings cost less to build than mixed fuel building, because they can avoid the gas connection and in-building infrastructure, and can use a single heat pump instead of a separate gas furnace and AC unit. They will also last the longest, so are the most important to electrify to minimize carbon lock-in. The CEC should analyze the potential of fuel substitution under two ambitious scenarios of 50% electrification of water and space heat technologies for new construction residential and commercial buildings by 2023, and 90% electrification by 2026 (these analysis timelines are aligned with new construction code update cycles). This analysis should include details on the cost-effectiveness of fuel substitution to understand and demonstrate the importance of new construction fuel substitution relative to other efforts to meet the state's GHG reduction targets.
- Help determine how fuel substitution potential in existing construction can be unlocked: The CEC should estimate the cost-effectiveness of fuel substitution⁴ in existing buildings. This will help the efficiency community understand the barriers to fuel substitution adoption in current buildings (e.g., equipment cost, efficiency). This exercise will also help determine how to better target cost-effective fuel substitution

² Page 111, of the NORESO document developed for and published by the CEC “*Attachment A SB 350 Energy Savings Potential Development Plan (9/14/2017)*”

³ Water heating fuel-substitution would entail replacing existing inefficient gas fired water heaters with highly efficient heat-pump water heaters powered by an increasingly GHG free electric grid. This GHG reduction potential is further exacerbated when natural gas fugitive emissions are considered.

⁴ Any such analysis should include the GHG impact of fugitive emissions and consider marginal long run emissions.

(climate zone, building efficiency, etc.). Future SB350 targets should then incorporate this cost-effective level of fuel substitution in existing buildings.

Develop Estimates of Long-Run Marginal Electric Fuel Mix to Estimate Electric Source Emissions

NRDC recommends that a long-run marginal greenhouse gas (GHG) accounting methodology inform CEC's analysis to determine the GHG reduction impact of SB350's doubling energy efficiency target (and thus to the GHG reduction estimates of fuel-substitution). Long-run marginal emissions accounting, as defined by Hawkes⁵ represents the change in emissions resulting from a unit change in electricity demand, where the change in the generation mix (caused by the evolving demand, and long-term planning goals) is considered. This differs from short-run marginal emissions accounting which assumes that the increased demand causes little or no change in grid resources. When a policy, such as ambitious building decarbonization target⁶, has the potential to induce large enough changes in demand that utilities must procure new resources, short-run marginal emissions do not represent the impact of such policy.⁷ Instead, the marginal emissions factor should reflect the resources that need to be added to the mix to serve the new load.

The difference between short-run and long-run emissions factors can be significant, and affect policy decisions in terms of the level of electrification required to achieve building decarbonization targets, and how this electrification is done, i.e. how much efficiency and flexibility need to be bundled with electrification. Long-run marginal emissions factors are essential to informing state policy on this matter. Finally, any fuel substitution analysis should fully account for the green-house gas potential of natural gas leakage from well to site.

⁵ Hawkes A.D., "*Long-run Marginal CO₂ Emissions Factors in National Electricity Systems*", Applied Energy, April 2014, www.elsevier.com/locate/apenergy

⁶ [AB3232](#), if adopted, would require an assessment of the potential for the state to reduce the emissions of greenhouse gases from residential and commercial building stock by at least 40% below 1990 levels by January 1, 2030.

⁷ For example, the marginal emissions impact from electrification of one home will come from the slightly increased operation of the existing marginal plant, which may be a gas plant, and therefore the short-run emissions factor will reflect that gas plant. But the marginal emissions impact from large-scale policy changes and market trends leading to doubling of additional achievable energy efficiency (per SB350) and tens of thousands of homes being electrified should be represented by new generation that needs to be built to serve this new load. This new generation is required to comply with the state's RPS.

Determining an accurate source-to-well leakage rate and accounting for this leakage rate is essential because natural gas (methane) has 84 to 87⁸ times the global warming potential of CO₂ over a 20-year horizon.⁹ Not accounting for this benefit would lead to sub-optimal GHG reduction strategies.

III. Conclusion

Thank you for your commitment to energy efficiency and for the opportunity to comment on the 2018 IEPR Workshop on Doubling Energy Efficiency Savings.

⁸ <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>

⁹ A 20-year horizon is more appropriate than a 100-year horizon for SB 350 given the SB 350 planning timeframe and the need to reduce GHG emissions within the next decade in order to achieve the Paris Accord targets.