

Comments of the Natural Resources Defense Council (NRDC) and RMI on the Draft 2022 Climate Change Scoping Plan – Appendix F, Building Decarbonization

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Submitted by: Pierre Delforge, Kiki Velez, Leah Louis-Prescott, and Denise Grab

On behalf of the Natural Resources Defense Council (NRDC) and RMI we respectfully submit the following comments on Appendix F: Building Decarbonization of the Draft 2022 Climate Change Scoping Plan.

I. Introduction

NRDC and RMI appreciate the research and consideration that went into drafting the Building Decarbonization appendix of the California Air Resources Board’s (“CARB”) Draft 2022 Scoping Plan (“Scoping Plan”). The appendix captures very well the rationale for building decarbonization, the barriers to decarbonizing the building sector, and the overall strategy that California must pursue, while providing a comprehensive review of specific policy actions that will drive the transition to carbon-free buildings. NRDC and RMI largely support the proposed approach, with a few recommendations for improvements:

1. The target date of 2035 for new residential appliances to be zero-emission should be 2030, in alignment with the State Implementation Plan (“SIP”).
2. The target date of 2045 for new commercial appliances to be zero emission is too late and should be appliance-type specific.
3. Articulate a strategy for transforming the market for electric appliances to enable targeted electrification and gas system pruning down the line.
4. Clarify that building electrification funding must focus on market transformation, standards-readiness, and incentives for low-income households.
5. Propose implementing a progressive heat pump baseline credit and consider an income-based fixed charge to support building electrification.

6. Clarify that panel upgrades should be targeted to avoid unnecessary customer- and utility-sided infrastructure costs, with funding prioritized for low-income households that need panel upgrades.

II. Recommendations

1. The target date of 2035 for new residential appliances to be zero-emission should be aligned with the SIP.

While the draft SIP proposes 2030 for new space and water heating appliance sales to be zero-emission, the Scoping Plan proposes 2035 for all residential appliance sales to be zero-emission. The difference appears to be a longer timeframe for clothes drying, cooking, and miscellaneous appliances to be zero-emission.

These miscellaneous appliances are responsible for a small share of gas use today. However, extending their sales beyond those of space and water heating systems risks delaying the ability to contract the gas system. As noted in various state agency reports and proceedings,¹ strategically electrifying geographic regions served by gas distribution pipelines that may soon require costly upgrades can enable significant gas system savings. Avoiding gas infrastructure costs is critical to minimizing stranded assets and gas rates through the energy transition and is of particular importance for low-income households, who already experience the highest levels of energy burden in the state.²

¹ See Aas, Dan et al., Final Report: *The Challenge of Retail Gas in California's Low-Carbon Future*, Energy and Environmental Economics, Inc., California Energy Commission at 67 (Apr. 2020) (“*The example gas transition strategy reduces the cost of the gas system by \$4 billion annually in 2050 and \$25 billion cumulatively in net-present value terms*”),

<https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2019-055-F.pdf>; see CEC Proceeding 22-OII-02: Gas Decarbonization Proceeding and CPUC Proceeding R. 20-01-007: Long-Term Gas Planning Proceeding.

² Evergreen Economics, *Needs Assessment for the Energy Savings Assistance and the California Alternate Rates for Energy Programs* at 7 (Dec. 2016) (“one third of low-income households indicated that they struggle with energy bills either often or constantly, and more than half of all low-income households said that they could not lower their energy bills by heating or cooling their homes any less”) available at http://www.calmac.org/publications/2016_LINA_Final_Report_-_Volume_1_of_2.pdf; California Energy Commission, Senate Bill (SB) 350 Barriers Report, Appendix 1 at 12 (*Finding that low-income households pay up to 15 percent of their income on energy bills as opposed to 2 percent for higher income households*).

Moreover, as observed in the Scoping Plan, gas cooking appliances are primarily responsible for gas appliance pollution in homes, since they often vent to the indoors.³ Indoor air pollution from these appliances can cause or exacerbate health problems, especially for low-income households that are also regularly exposed to outdoor pollution in their communities, such as from traffic and industry.⁴

Beyond the compelling reasons to phase out clothes drying, cooking, and miscellaneous appliances on the same timeline as the SIP, there is also no reason to delay the transition of these appliances by five years. Equivalent alternatives are available now and, as with space and water heating, market development initiatives can make them cost-effective compared to gas appliances by 2030. Thus, the Scoping Plan should be revised to set 2030 as the date for all residential appliance sales to be zero-emission.

If CARB believes some of these appliances need an extension, it should make clear in the plan which appliance types will transition by 2030 and which ones need additional time and why.

2. The target date of 2045 for new commercial appliances to be zero emission is too late and should be appliance type specific.

While some commercial end uses may require more time than residential ones due to their higher complexity and cost, some applications can be ready for all-electric standards by 2030. For example, rooftop heat pump units (RTUs) and variable-refrigerant flow (VRF) can replace gas/AC RTUs and Variable Air Volume (VAV) systems in small and medium-size commercial buildings in the same timeframe as residential buildings. These represent the majority of gas use in commercial buildings and would be a major contributor to 2030 GHG and air pollution reduction goals. Service hot water can also be electrified cost-effectively within the same timeframe.

Requiring commercial appliances to be zero-emission when feasible by 2030 is critical to gas system transition efforts and will reduce the total cost of the clean energy transition. We recommend that the Scoping Plan set appliance-specific end of sale targets informed by the

³ Scoping Plan, Appendix F at 3 (“Of all building end uses, cooking with natural gas has the largest impact on indoor air quality because the kitchen range is the only combustion appliance whose emissions may not be directly vented outdoors.”)

⁴ Scoping Plan, Appendix F at 4.

technical and economic readiness of different technology options, starting with 2030 for equipment types that can be cost-effective by then with appropriate market development support.

3. Articulate a strategy for transforming the market for electric appliances to enable cost-effective targeted electrification and gas system pruning down the line.

The Scoping Plan rightly calls for redirecting resources away from investments that incentivize gas demand and toward aligned public investments that accelerate building electrification, including the phase-out of line extension allowances for new construction. The Scoping Plan also rightly calls on state agencies to develop a statewide gas plan and to include the goal of trimming back the existing gas infrastructure.

It is additionally critical to articulate a strategy, or “theory of change,” for enabling targeted electrification and gas asset retirement in a cost-effective manner. NRDC and RMI strongly support pilot projects that will pave the way for targeted electrification when cost-effective to do so, but we recommend the Plan sets clear priorities and timelines. Gas infrastructure pruning can only be scaled once economic and legal pre-conditions are met: equipment and installation costs must come down so they are competitive with incumbent gas solutions in retrofit situations, and legal barriers such as “obligation to serve” must be resolved by the CPUC or legislature.

The priority focus of this decade should be on market development, cost reductions, and regulatory reforms needed to enable large-scale gas infrastructure pruning. The short-term focus of gas infrastructure activities should be on planning and on pilot projects to learn how to decommission gas infrastructure cost-effectively. The goal of targeted decommissioning should not constrain or slow down heat pump market development, including incentivizing partial electrification in some cases if that allows faster customer adoption.

Overall, this “theory of change” can enable the state to unlock the cost-savings that can be achieved by targeted electrification in a cost-effective manner, since market development and incentives for low-income households in the near-term will reduce the cost of transitioning entire neighborhoods to be all-electric in the mid-term. The Scoping Plan is an ideal place to articulate this vision and align other state agencies and the Legislature around this least-cost pathway to building electrification and gas system contraction.

4. Building electrification funding must focus on market transformation, standards-readiness, and incentives for low-income households.

Related to the section above, the Scoping Plan should clarify the “theory of change” surrounding electrification incentives. Market transformation incentives are critical to enabling electrification on the timeline required by state climate goals. And current incentives are not adequate to transform the market: building electrification will require investment at least on the scale of the statewide, \$2 billion California Solar Initiative.

However, California cannot afford to incentivize our way to 100 percent electrification. The focus of these incentive programs should be to transform the market for electric appliances, ready the state for all-electric appliance standards, and to support and prioritize electrification in low-income households.

Standards are the best tool for scaling to 100 percent electrification cost-effectively, and building electrification funding should be seen as standards-readiness and a means to prioritize low-income households through the transition. The Scoping Plan should clarify and articulate this vision to help guide investment and planning across California’s state agencies and Legislature.

5. Propose implementing a progressive heat pump baseline credit alongside an income-based fixed charge to support building electrification.

The Scoping Plan rightly calls for reforming rates to support building electrification and points to higher fixed charges as an approach to do so. Income-based fixed charges may be one promising approach to avoid penalizing customers who upgrade to a heat pump by reducing volumetric charges. The state should consider implementing this rate structure.

However, while this approach is critical to make the cleaner energy source more affordable, it alone is insufficient to bring heat pump operating costs down enough to create the level of energy savings needed to spur mass adoption.

The rooftop solar market took off because the savings from rooftop solar were large enough to attract private capital and support a financing business model such as leasing. This created an industry that drove market growth and customer adoption. For the same to happen with heat pumps, it is not enough that they break even with incumbent gas technologies—they must provide large enough energy cost-savings to enable financing models.

This can be achieved without massive subsidies: today, customers who upgrade to a heat pump pay up to three times the marginal cost of the extra electricity they consume.⁵ This extra charge puts downward pressure on rates for everyone else, but it poses a barrier to widespread heat pump adoption. If heat pump customers got a **heat pump baseline credit** sized for the typical energy use of a heat pump, so the cost of the electricity used by the heat pump is closer to marginal electricity costs, the heat pump would provide significant energy cost savings without any cross-subsidy from other customers. The credit could be modulated by income to prioritize low-and-middle income customers and more strongly reduce energy costs for those who need it most, while still driving market growth for other customers and putting downward pressure on rates for everyone else. We recommend that the Plan include this approach as a complementary solution to income-based fixed charges.

6. Clarify that panel upgrades should be targeted to avoid unnecessary customer- and utility-sided infrastructure costs, with funding prioritized for low-income households that need panel upgrades.

The Scoping Plan should clarify the need to define specific criteria for when panel upgrades are necessary, support the deployment of technologies to avoid panel upgrades, and encourage the state to focus any funding for necessary panel upgrades on low-income households who need it the most.

It is not feasible for the state to pay for a panel upgrade for every household in California. Panel upgrades can significantly increase the cost of building electrification, and they may have the cumulative effect of increasing total electric infrastructure costs. For example, if many customers served by the same electric service line opt to upgrade their electric panel from 100 amps to 200 amps—even if they never utilize an additional 100 amps—the local electric utility may need to upgrade the electric service line, transformer, and associated infrastructure serving the community to ensure safe electrical service. This will unnecessarily increase electric

⁵ Severin Borenstein, Meredith Fowlie, and James Sallee, *Designing Electricity Rates for An Equitable Energy*, Next10 (Feb. 2021) (Finding that “the state’s three largest investor-owned utilities (IOUs)—PG&E, SCE, and SDG&E—charge residential electricity customers much higher prices than are paid in most of the country—prices that are two to three times higher than the actual cost to produce and distribute the electricity provided”). Accessed at <https://www.next10.org/publications/electricity-rates>.

infrastructure costs at a time when keeping electric rates low is imperative to achieving decarbonization goals.

Moreover, panel upgrades may not be necessary for all households. In fact, there are technologies and methods currently available that can mitigate the need for a panel upgrade to accommodate building electrification. Technologies include low-amp vehicle charging and appliances, which the state should continue to promote through incentive programs. For example, Level 1 EV charging may provide a low-amp alternative to Level 2 charging for small vehicle types, and low-amp electric appliances are already being deployed through pilot programs such as the TECH 120 volt heat pump pilot. Another alternative to panel upgrades might be circuit-sharing devices, which enable a household to connect two devices that do not need to be operated at the same time (such as an EV charger and an electric stove) to the same circuit.

For many homes, electrification may be possible on the existing 100 amp panel. The state should work with stakeholders to identify criteria for when a panel upgrade is strictly necessary and continue to advance innovative solutions for avoiding panel upgrades where possible. Decreasing the cost of innovative technologies, such as low-amp appliances, will remove or lessen a major barrier to electric appliance adoption and increase access to electrification for low-income households.

Where panel upgrades are necessary, incentive money to support them should be prioritized for low-income households, who are least able to pay the upfront cost of a panel upgrade (or access financing for the project) on their own. Minimizing the costs associated with panel upgrades – including both customer and utility-sided infrastructure costs – will be critical to decarbonizing the building sector in a cost-effective and equitable manner. The Scoping Plan should clarify that the state must 1) outline clear criteria for determining when panel upgrades are necessary and 2) prioritize any funding for panel upgrades for low-income households.

III. Conclusion

NRDC and RMI appreciate the opportunity to comment on CARB's Building Decarbonization Appendix of the Draft 2022 Scoping Plan. We look forward to continuing to work with CARB to further California's climate goals in an effective, affordable, and equitable manner.

Pierre Delforge

Director, Clean Buildings
Natural Resources Defense Council
111 Sutter Street, 21st Floor San Francisco,
CA 94104
Email: pdelforge@nrdc.org

Leah Louis-Prescott

Senior Associate, Carbon-Free Buildings
RMI
1901 Harrison St, Ste 200
Oakland, CA 94612
Email: llouisprescott@rmi.org

Kiki Velez

Schneider Fellow
Natural Resources Defense Council
111 Sutter Street, 21st Floor San Francisco,
CA 94104
Email: kvelez@nrdc.org

Denise Grab

Principal, Carbon-Free Buildings
RMI
1901 Harrison St, Ste 200
Oakland, CA 94612
Email: dgrab@rmi.org