



October 22, 2021

California Air Resources Board
Clerk's Office
1001 I Street
Sacramento, California 95814

RE: COMMENTS IN RESPONSE TO 2022 SCOPING PLAN WORKSHOP ON SCENARIOS TECHNICAL INPUTS WORKSHOP ON SEPTEMBER 30, 2021

A. O. Smith appreciates the opportunity to submit comments to the California Air Resources Board (CARB) Public Workshop: 2022 Scoping Plan Update - Scenarios Technical Inputs Workshop held on September 30, 2021. Presentations from the workshop included four proposed alternatives that reflect existing laws to reach carbon neutrality by 2035 and 2045 as well as feedback from stakeholders from previous workshops. Our comments focus on decarbonization of the residential and commercial buildings.

As a leading manufacturer of both residential and commercial HPWHs, which play a key role in building decarbonization, A. O. Smith has a keen interest in this Scoping Plan update. The path to achieving carbon neutrality - by 2035 or 2045 - will require a number of changes in California. A. O. Smith appreciates CARB's effort to examine a wide range of options, including scenarios in which the state accelerates meeting its carbon neutrality goal ahead of schedule and potential actions needed to achieve that goal.

Conventional wisdom leads us to believe that California is on the path towards all electric requirements under the state's Title 24 building code standards for new residential and commercial buildings beginning in 2026. However, to attain carbon neutrality across the entire building stock in the state by 2035, or 2045, will require a massive investment from both the public and private sectors given California's current building and electric grid infrastructure. This investment would need to be exponentially larger if a requirement that existing buildings be retrofitted to be all-electric by 2035. Therefore we urge CARB to consider the economics of retrofitting millions of household and commercial buildings and the need for sustained

programs and incentives for property owners and businesses. Furthermore, A. O. Smith recommends a step-wise approach to reach its electrification goals by allowing high efficiency gas condensing equipment to be used as a stepping-stone in commercial replacement applications as part of a managed transition to an electrified built environment. Using hybrid heat pumps with options for gas/electric back-up will be necessary for certain space constrained and larger thermal load applications for at least the next decade in certain areas of the state.

We look forward to working with CARB to achieve its goals and also recommend that CARB look at all factors, including infrastructure and supply chain challenges, that each option entails as it relates to residential and commercial building decarbonization when examining each of the scenario alternatives.

About A. O. Smith

A. O. Smith is a global leader applying innovative technology and energy-efficient solutions to products manufactured and marketed worldwide. Our company is one of the world's leading manufacturers of residential and commercial water heating equipment and boilers, as well as a manufacturer of water treatment and air purification products. Along with its wholly owned subsidiary, Lochinvar LLC, A. O. Smith is the largest manufacturer and seller of residential and commercial water heating equipment, high efficiency residential and commercial boilers, and pool heaters in North America.

Heat pump water heaters (HPWHs) will play a vital role in two key California policy priorities – reducing the carbon footprint of our buildings as the state transitions water heaters from primarily gas-fired to electricity and helping to manage the integration of increasing amounts of renewable energy as HPWHs may shift load and serve as thermal energy storage devices.

HPWHs and electric storage water heaters offer a natural ability to provide forms of thermal storage serving as a battery for the grid in both residential and commercial applications. Flexible demand [or Smart] water heaters, which include grid-enabled electric resistance storage water heaters and HPWHs, have additional controls that allow the utility or third-party aggregator to control their energy use during the course of the day. Within a given local territory, a fleet of water heaters can be controlled to be a flexible energy storage system that can adjust the load on the grid. Given that every home in the state has a water heater, smart water heaters can play a key role in load management and carbon reduction within the built environment.

Comments in Response to the Presentation on Decarbonization of Existing Residential and Commercial Building

As presented at the workshop, the scenario alternatives provide four pathways to reaching

decarbonization goals by retrofitting existing residential and commercial buildings to be all-electric by 2035 and 2045. As CARB examines these scenarios, A. O. Smith recommends that CARB look at all factors, including infrastructure challenges as well as global supply chain issues, that each option entails as it relates to residential and commercial building decarbonization.

Costs Impacts for Building Electrification

In A. O. Smith's comments to the 2022 Scoping Plan Update - Scenario Concepts Technical Workshop held on August 17, 2021, we urged CARB to look at the cost impacts of electrifying existing residential stock.

About 75 percent of California homes (or 9.75 million) were built before 1990 and older homes are less likely to have adequately sized electric panels to accommodate all electric appliances.¹ An electric panel upgrade may cost between \$2,500 - \$4,000² which would be borne by the home or property owner. In a scenario in which every house built before 1990 requires an electric panel upgrade, it would cost approximately \$25 - \$40 billion dollars. Another study on building electrification by the not-for-profit organization, [Pecan Street](#), found that it would cost approximately \$100 billion to upgrade electric panels in the residential sector across the country. Regardless of the exact amount, it's important to note that just one component of electrification, updating the main electrical panel of a home, will require a tremendous financial investment. The figures shared here do not even account for the cost of upgrading electric appliances that in many cases are more expensive than their gas counterparts. According to the Building Decarbonization Coalition, the cost to electrify low-to-moderate income (LMI) households in California would require investments in the magnitude of \$72 - \$150 billion over the next several decades.³ Consistent and long-term funding for GHG reduction financial programs and incentives are going to be essential in aiding consumers in understanding how to make different purchasing decisions and accept new technologies.

In order to meet CARB and California's GHG reduction goals, we need consistent programs and incentives to provide the value proposition to property owners and businesses. A report by the Advanced Water Heating Initiative estimates that the California statewide market for unitary water heaters, including both new construction and retrofits, is around 800,000 units per year. To capture even 10 percent of this market means installing 80,000 units per year. 80,000 units per year is approximately the amount of HPWHs units sold annually across the entire country.⁴ To convert the entire annual California market of water heaters to HPWHs would require a

¹ California Energy Commission. *California Building Decarbonization Assessment - Final Commission Report*, August 13, 2021, pg 109.

² Ibid. pg 85.

³ Building Decarbonization Coalition. [Towards an Accessible Financing Solution](#). June 2020, pg 14.

⁴ Advanced Water Heating Initiative Unitary Heat Pump Water Heaters Working Group Report 2020. [Building Demand for Heat Pump Water Heaters](#). pg 14.

ten-fold increase of nationwide HPWH manufacturing capacity. These figures are meant to illustrate that meeting California's demand for HPWHs at even a modest pace would require significant ramp up of manufacturing and have vast impacts on the supply chain. This sort of increase takes time to orchestrate as new manufacturing capacity and production lines must be created. A pragmatic, clear and reliable policy scheme will be necessary to provide manufacturers with the business certainty needed to make the massive investments required to increase manufacturing capacity at this unprecedented scale.

GLOBAL SUPPLY CHAIN AND LOGISTICAL BARRIERS

Many did not foresee the devastating impacts that COVID-19 would have on the global supply chains and continue to reverberate. Many manufacturers are experiencing challenges due to global supply chain related issues that must be taken into consideration over the next 12 to 18 months, which may impact the HPWH market nationally. The delay and supply shortage may also have cost impacts to consumers. Recognizing the supply chain and related issues, Governor Newsom issued Executive Order N-19-21⁵ which directs state agencies to continue coordinating with the Biden-Harris Administration Supply Chain Disruptions Task Force to address state, national and global supply chain challenges. We anticipate that the global supply chain issues will be resolved by the time that the Scoping Plan Update is complete. Nevertheless, we remain cautious and urge CARB to keep global supply chain issues in mind during this process.

Conclusion

A. O. Smith appreciates the opportunity to provide comments on these important policy matters. Any transition away from utilizing natural gas for space and water heating, to electricity exclusively, presents significant challenges from physical infrastructure and electricity grid modernization to consumer awareness and acceptance. We look forward to working with CARB as the Scoping Plan process moves forward and collaborating with CARB and other stakeholders to design a program that helps achieve our GHG reduction goals as effectively as possible.

Sincerely,



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⁵ <https://www.gov.ca.gov/wp-content/uploads/2021/10/10.20.21-N-19-21-Supply-Chain-Resilience.pdf>