June 24, 2022

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

RE: COMMENTS IN RESPONSE TO DRAFT 2022 SCOPING PLAN UPDATE

A. O. Smith appreciates the opportunity to submit comments to the California Air Resources Board (CARB) Draft 2022 Scoping Plan Update that was released on May 10, 2022. The Draft 2022 Scoping Plan Update identifies a pathway to achieve carbon neutrality by 2045 or earlier and lays out strategies for meeting the state's ambitious climate goals. The Proposed Scenario – achieving carbon neutrality by 2045 – will require deployment of clean energy and technologies in every sector including buildings, transportation, manufacturing and natural working lands. As a leading manufacturer of heat pump water heaters (HPWHs), our comments here focus on the residential and commercial building decarbonization.

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 electric 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-interactive 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 within the built environment.

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 subsidiaries , 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.

Comments in Response to Appendix F: Building Decarbonization

A. O. Smith appreciates CARB staff in putting together a very comprehensive Draft 2022 Scoping Plan Update. Appendix F provides the issues and recommendations for building decarbonization. The Proposed Preferred Scenario establishes three main goals for buildings to reduce emissions for both GHGs and air pollution:

- Energy efficiency aligned with the mid-high (electric) and mid-mid (gas) scenarios from the 2019 Integrated Energy Policy Report;
- New construction would be zero-emission starting in 2026 for residential buildings and 2029 for commercial buildings through alignment of state and local authorities; and
- All new appliances sold in California would be zero-emission by 2035 for installation in homes and by 2045 for installation in commercial buildings.

California is on a path towards an all-electric requirement for new buildings by 2026. However, new building construction makes up a small percentage of all the building stock in the state. In California, about 75 percent of 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] As stated in the Draft 2022 Scoping Plan, Appendix F, retrofitting an existing building may require infrastructure upgrades that would increase costs and may not be financially feasible. 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.[2] 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.

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

[2] Building Decarbonization Coalition. *Towards an Accessible Financing Solution*. June 2020, pg 14.

Development Of Prioritization For Replacements In Existing Building Stock

A. O. Smith recommends a pragmatic approach to reach electrification goals, and we look forward to working with CARB and other state agencies in this regard. As noted in the Draft 2022 Scoping Plan Update, the age and characteristics of some of the existing building stock can prove challenging to completely electrify. In addition to a panel upgrade, space constraints of an older home can make it difficult to install a HPWH. Most gas water heaters are placed inside a small closet, whereas a HPHW requires more space for the appliance to function efficiently and as intended. Given that some homes may lend themselves to a cheaper, faster, and overall easier transition to electrification, A. O. Smith recommends a system of prioritization to help target homes that are immediately ready for replacement while continuing to develop plans for buildings that are harder to electrify. In the State of New York, for example, some local jurisdictions are pursuing a step-wise approach for building electrification by completing energy audits of buildings (residential and commercial) as a first step to identify, tier, and prioritize which buildings can transition to all-electric end-uses ahead of others.

Alignment of State and Local Building Decarbonization Policies

A. O. Smith recommends alignment of state and local building decarbonization policies. The Draft 2022 Scoping Plan Update Proposed Scenario sets a goal for all new appliances sold to be zero-emission by 2035 for residential buildings and 2045 for commercial buildings. As CARB is aware, there are more than 50 local ordinances that exceed state regulations to require new construction to be all-electric. There are local air districts with rules pending that would require installation of zero-emission NOx space and heating equipment to begin by 2027. And in the 2022 Draft SIP, CARB proposes to develop a measure to require 100 percent of sales of new space heaters and water heaters sold in California to meet the zero-emission standard by 2030. As a manufacturer, A. O. Smith respectfully requests that at minimum, CARB align the implementation dates for its proposed rules regarding new construction versus existing buildings. This would provide greater certainty and predictability which businesses like ours rely on for planning purposes.

A Stepwise Approach to Reducing the Carbon-Intensity of Water heating Systems in Existing Buildings

The CEC assumes a turnover rate of 7 percent in water heaters in existing single-family homes and multi-family units, which equates to 861,000 water heaters being replaced annually.[3] To capture even 10 percent of this market means installing 86,000 units per year. The number of HPWH units sold annually across the entire country in 2020 was approximately 100,000.[4] To

[3] CEC Draft 2021 Integrated Energy Policy Report Volume I: Energy Efficiency and Building, Industrial, and Agricultural Decarbonization, pg 16.

[4] ENERGY STAR® Unit Shipment and Market Penetration Report Calendar Year 2020 Summary, pg 6.

convert the entire annual California market of water heaters to HPWHs would require a 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. Therefore, having a 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.

A. O. Smith built an analytical tool that can assist decision makers, as well as our customers, in understanding water heating solution scenarios based on state and local energy data, and site conditions when contemplating or navigating building decarbonization policies. Based on our analytic tool, A. O. Smith recommends 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.

Transitioning to Low Global Warming Potential Refrigerants in HPWHs

Today's typical HPWHs currently use a small amount (i.e., "charge") of refrigerants that are used in refrigerators, air-conditioners, and space-heating heat pumps. A. O. Smith, like many appliance manufacturers that utilize heat pump technology, continue to evaluate next generation refrigerants, including hydrofluorocarbon (HFC) technology, as well as lower-GWP natural refrigerants such as CO2 and propane. We agree that we must do all we can to lower the GHG emissions profile of equipment. The marketplace for broad-based and cost-effective low-GWP refrigerants for water heating continues to evolve - driven primarily by international agreements, such as the Montreal Protocol, the American Innovation and Manufacturing (AIM) Act of 2020 at the federal level, California's action directed by Senate Bill (SB) 1383, and the regulations promulgated by CARB, as well as larger users of refrigerants such as the space cooling and automobile industry. We request that CARB examine refrigerant regulations to reduce the allowable GWP of refrigerants over time, in consultation with HPWH manufacturers and other market actors. Given the implications of the AIM Act on the refrigerant supply chain, A. O. Smith respectfully asks for adequate time to plan, source, build and test any new products designed to meet or exceed California's HFC regulatory requirements.

Conclusion

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. 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. O. Smith appreciates the opportunity to provide comments on these important matters. We look forward to collaborating with CARB as the Draft 2022 Scoping Plan Update process moves forward.

Sincerely,

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