



October 15, 2021

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

RE: COMMENTS IN RESPONSE TO 2022 SCOPING PLAN UPDATE WORKSHOP ON SHORT-LIVED CLIMATE POLLUTANTS

A. O. Smith appreciates the opportunity to submit comments to the California Air Resources Board (CARB) Public Workshop: 2022 Scoping Plan Update - Short-Lived Climate Pollutants (SLCP) Workshop held on September 8, 2021. Presentations included a status update on progress towards the current targets for SLCP with CARB staff requesting feedback on pathways that promote SLCP reductions in support of carbon neutrality by 2035 or 2045. Our comments focus on hydrofluorocarbons (HFC) and heat pump water heaters (HPWHs).

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. A. O. Smith looks forward to working with CARB to achieve its goals and recommends 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 options.

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.

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 within the built environment.

Comments in Response to the Presentation on HFCs

Today's typical HPWHs currently use approved HFC refrigerants just like the compressors in refrigerators, air-conditioners, and space-heating heat pumps. Common HFCs used today have high global warming potential (GWP) and HFC reductions will be integral to achieving California's long term climate goals. A. O. Smith, like many appliance manufacturers that utilize heat pump technology, continue to evaluate next generation technology for use in their equipment, including transitioning to low-GWP refrigerants. At A. O. Smith we agree that we must do all we can to lower the greenhouse gas 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 recently enacted 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.

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 request that CARB examine refrigerant regulations to reduce the allowable GWP of refrigerants over time, in consultation

with 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 product that will meet California's regulatory requirements. **Specifically, A. O. Smith recommends lowering the refrigerant GWP limit for HPWHs starting with a GWP of 750 or less by 2025. We also believe that further reductions may be appropriate by 2030 and beyond.**

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.¹ To 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. 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.

As CARB looks forward to future actions to limit or tighten GWP in new and existing sources, A. O. Smith recommends that CARB considers the following:

1. **Performance & Reliability** (match what we have today): It is imperative that any new product design provides the same, if not better, performance and reliability. Although some lower GWP refrigerants can be considered as drop-in replacements, they do have slightly differing performance levels to the refrigerants used today in terms of capacity and/or efficiency (COP). Therefore, the design, engineering and testing phases take time and will ensure that any unit that comes to market will deliver the same performance and reliability expected by consumers.
2. **Economics** (cost and availability): As mentioned above, the marketplace for refrigerants are driven by the demand by other manufacturers in the air conditioning and auto industries in addition to the state and federal regulations and international compacts. These factors impact cost and availability, which may be passed down to consumers. As California begins to decarbonize its buildings by requiring the use of more HPWH over

¹ Advanced Water Heating Initiative Unitary Heat Pump Water Heaters Working Group Report 2020. [Building Demand for Heat Pump Water Heaters](#). pg 14.

gas alternatives, it is critical that costs remain affordable for the end-user. Low GWP refrigerants cost more. Additionally, HPWHs that use CO₂ - which has GWP of 1 - would require significant system design changes that may be cost prohibitive for the customer. For comparison, a 50-gallon A. O. Smith HPWH retails for \$1,699 at Lowe's. The Sanden CO₂ HPWH currently retails for about \$3,600² - which is a little more than double the cost of the A. O. Smith product.

3. **Safety** (flammability and toxicity): With the mandating of low GWP refrigerants, flammability becomes a concern that needs to be addressed. Aside from CO₂, most of the lower GWP refrigerants are classified as A2 or A2L which are considered as flammable. Hydrocarbons, such as propane, have some of the lowest GWPs, but are classified as A3 with the highest level of flammability.³

Conclusion

A. O. Smith appreciates the opportunity to provide comments on these important policy matters. We very much look forward to working with CARB as the Scoping Plan process moves forward and collaborating together 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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² <https://accelerate24.news/regions/u-s-sanden-reps-buy-its-co2-heat-pump-water-heater-business/2020/>

³ ASHRAE Fact Sheet. [Update on New Refrigerants Designations and Safety](#). April 2020