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TECH Clean California Comments on Refrigerants Workshop

Additional submitted attachment is included below.

TECH CLEAN CALIFORNIA

September 9, 2021

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Docketed in 21-IEPR-06

Re: TECH Clean California Comments on Commissioner Workshop on Building Decarbonization: Refrigerants (Docket No. 21-IEPR-06)

Dear Commissioners:

VEIC, a member of the TECH Clean California ("TECH") implementation team, appreciates the opportunity to provide comments on the August 26, 2021 Commissioner Workshop on refrigerants. TECH is a statewide market transformation initiative that aims to help California achieve its greenhouse gas reduction and climate neutrality goals by driving market adoption of low-emissions space and water heating technologies. VEIC is a third-party administrator of leading energy efficiency and renewable energy programs. Through our work managing energy efficiency portfolios and implementing energy efficiency projects in the commercial and industrial sectors, VEIC has developed expertise in refrigerant management strategies for heating, ventilation, air-conditioning, and refrigeration systems – particularly with respect to the advancement of technologies that use low global warming potential ("GWP") refrigerants.

Numerous studies have shown that in order to meet California's ambitious – and critically necessary – greenhouse gas reduction goals, the transition to highly efficient heat pump space and water heating needs to start immediately.[1] At the same time, a complementary greenhouse gas reduction strategy is transitioning air conditioners, refrigeration, and heat pumps across all economic sectors from the hydrofluorocarbon ("HFC") refrigerants used today to low-GWP refrigerants. Policy makers have a dual imperative to both jump-start the nascent heat pump space and water heating market and to simultaneously encouraging an economy-wide transition to forthcoming low GWP refrigerants.

VEIC has three main recommendations for how California can encourage this transition to low GWP refrigerants while supporting market growth for residential heat pump space and water heating technology:

1) Support workforce development programs that teach best practices for installation and refrigerant leak detection and repair.

Refrigerant leakage is not a concern for heat pump water heaters ("HPWHs"), which are factory-sealed and typically do not leak significantly during their operating life. Most HPWHs do not have a service valve where refrigerant could be added, as such valves are a source of leakage.

[1] *See, e.g.* Shuba Raghavan *et al., Scenarios to Decarbonize Residential Water Heating in California,* Energy Policy 109 (2017), pp. 441-451, at 449 (finding that meeting California's 2050 greenhouse gas reduction goals without forced retirement of units with remaining useful life requires all water heater replacements to be electric by 2020).

However, for split system HVAC equipment, like traditional air conditioners or heat pump space conditioning, refrigerant leakage can occur and should be addressed through quality installation and by contractor training in leak detection and repair. Focused trainings can educate contractors and technicians to support application of known but underutilized best practices for refrigeration leak detection, including the use of advanced diagnostic equipment. Such trainings can decrease refrigerant leakage and increase energy efficiency and equipment reliability, and also build technical confidence and support for using heat pump HVAC systems while further developing a workforce critical to California's climate goals. The TECH program is engaged in supporting ongoing workforce education and training efforts and is investigating how we can facilitate these types of trainings.

2) Use both regulations and targeted incentives to accelerate the transition to low-GWP and natural refrigerants.

In California, residential heat pump HVAC systems using low-GWP refrigerants do not yet exist. There is a single HPWH product that uses carbon dioxide as a refrigerant, but the technology has an outside condensing unit and is not suitable for all applications. The Energy Commission, Air Resources Board ("CARB"), and other state agencies have a crucial role to play to shift the appliance market to low-GWP refrigerants by removing regulatory barriers to the use of lower-GWP refrigerants, enacting rules that phase in their mandatory use over time, and offering additional incentives to reward early deployment before their use is required.

The first step the CEC should take is facilitating a change to the California Building Code to permit A2L refrigerants, such as R-32 and R-454B. These refrigerants have significant greenhouse gas benefits over R-410A, the most commonly used refrigerant today: The GWP of R-32 is only one third of that of R-410A. Manufacturers are already developing air conditioners and heat pumps that use A2L refrigerants, but the California Building Code does not permit their use -- even though they have been deemed safe after extensive testing by both Underwriters Laboratories and the American Society of Heating, Refrigeration, and Air Conditioning and are in use in many other states and countries. In Japan, for example, R-32 has been the dominant refrigerant used in residential air conditioning for many years, and accounted 25 percent of all residential units in 2018. The CEC should coordinate with other state agencies to eliminate this regulatory hurdle and allow these technologies to enter the California market.

The IEPR should also support the role of the regulatory process at CARB to enact refrigerant regulations that reduce the allowable GWP of refrigerants over time, in consultation with manufacturers and other market actors. VEIC supports the recent CARB regulations for residential and commercial air conditioning and heat pump systems, which begin to take effect in 2023. The IEPR should also recommend CARB consider setting similar low-GWP standards for HPWH, through a process that includes stakeholder consultations on the feasibility, timeline, and cost of such a transition, and which does not delay the near-term roll-out of HPWHs and market growth of this sector.

In addition, offering additional kicker incentives for products using mid- or low GWP refrigerants before regulations require them can help spur technology development. Natural refrigerants like carbon dioxide have drastic greenhouse gas benefits over HFC options, but carry an incremental cost. Developing new technologies that incorporate them can take multiple years. TECH and other heat pump incentive programs could provide additional incentives to technologies using low-GWP refrigerants as

they become available. Incorporating the savings from using low-GWP refrigerants into the considerations for energy efficiency programs can also help these products enter the market.

3) Plan for refrigerant capture and recycling at appliance end of life.

The IEPR should direct CARB, the CPUC and other state agencies to work in coming years to develop robust policies to encourage the capture and recycling of refrigerants at the end of an appliance's life. CARB reported that if all refrigerant in currently installed appliances in California were leaked into the atmosphere, it would be equivalent to 60% of CA's total annual GHG emissions.[2] In order to get ahead of this problem before this equipment reaches the end of its life, the IEPR should direct state agencies to be at the forefront of developing refrigerant capture and recycling programs and incentives. There is an opportunity and a need for partnerships between municipal solid waste facilities and HVAC technicians to establish a process for safe disposal at the end of equipment life, similar to programs that exist for window AC units and residential refrigerators.

Thank you for considering these comments and for addressing the important issue of refrigerants in this year's IEPR.

Sincerely,

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[2] California Air Resources Board, *Scoping Plan Update – Short Lived Climate Pollutants Workshop* (Sept. 8, 2021) at slide 38. https://ww2.arb.ca.gov/sites/default/files/2021-09/carb_presentation_sp_slcp_september2021_0.pdf