



we make life better®

2311 Wilson Boulevard Suite 400 Arlington VA 22201 USA
Phone 703 524 8800 | Fax 703 562 1942
www.ahrinet.org

July 12, 2024

California Air Resources Board
1001 I Street
Sacramento, California 95814

(Submitted electronically via: <https://ww2.arb.ca.gov/public-comments/zero-emission-space-and-water-heater-standards-may-29-2024-workshop-public-comments>)

Re: AHRI Supplementary Comments to CARB on Zero-Emission Space and Water Heater Standards May 29, 2024, Public Workshop

The Air-Conditioning, Heating & Refrigeration Institute (AHRI) submits this letter to provide input on the two regulatory concepts presented at the California Air Resources Board's (CARB or Agency) Zero-Emission Space and Water Heater Standards Public Workshop on May 29, 2024. AHRI appreciates the opportunity to provide these comments, which supplement its June 26, 2024 comments.

AHRI represents more than 330 manufacturers of heating, ventilation, air conditioning, and refrigeration (HVACR) and water heating equipment. It is an internationally recognized advocate for the HVACR and water heating industry and certifies the performance of many of the products manufactured by its members. In North America, the annual economic activity resulting from the HVACR industry is approximately \$211 billion. In the United States alone, AHRI member companies, along with distributors, contractors, and technicians employ more than 704,000 people.

AHRI and its members are committed to greenhouse gas (GHG) and oxides of nitrogen (NO_x) emissions reductions that support human health and the environment while protecting the jobs and the products that are essential to our society's well-being.

For the reasons discussed below, AHRI has significant concerns regarding CARB’s Draft Zero-GHG Regulatory Proposal (Refined Concept B).

Refined Concept B

Effective Date	Equipment Type	Capacity/Size Limits
2027	Boilers and water heaters	< 75,000 Btu/hr
2029	Central Furnaces	< 175,000 Btu/hr
2029	Boilers and water heaters	≤ 400,000 Btu/hr
2029	Instantaneous water heaters	≤ 200,000 Btu/hr
2029 TBD	Central Furnaces	≤ 2MM Btu/hr
2031	Boilers and water heaters	≤ 2MM Btu/hr
2031	Instantaneous water heaters	≤ 2MM Btu/hr
2031	Pool heaters	≤ 400,000 <u>2MM</u> Btu/hr
2033	High temperature (>180°F) boilers and water heaters	≤ 2MM Btu/hr

I. Discussion – Feedback on May 29 Request for Information Topics

At the May 29th meeting, CARB staff requested specific feedback from stakeholders:

For Rural and/or Under-Resourced Areas, CARB staff asked “What are the special considerations of regulating space and water heaters in rural and under-resourced areas?”

The *California Building Decarbonization Assessment* indicates that several households/businesses and communities throughout the state use alternative fuels, such as propane, to power appliances in commercial and residential buildings.¹ These households and businesses relying on propane, fuel oil, or wood burning have been noted to be in rural areas of the state with low-population density that may not connect to the state’s electric grid.² These communities have limited opportunities for financing options.³ To better understand the impact building decarbonization policies and programs will have on vulnerable communities that rely on propane, CARB is undertaking a research project, the [Regional Propane and Woodburning Utilization in Commercial and Residential Buildings across California](#), to enhance agency understanding of “1) the utilization of propane and woodburning in commercial and residential buildings across California communities; 2) potential solutions to electrification barriers across multiple dimensions, such as technical feasibility, cost, community acceptance, time, and other

¹ Kenney, M., N. Janusch, I. Neumann, and M. Jaske. 2021. "California Building Decarbonization Assessment." California Energy Commission. Publication Number: CEC-400-2021-006-CMF. Available at: <https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment>.

² *Ibid.*

³ *Ibid.*

parameters by region or community type.”⁴ Based on publicly available information, this project was estimated to start in Spring 2024 and be completed within 15 months of the start date.⁵

AHRI recommends for CARB to consider exempting propane appliances, particularly for rural areas of the State, until equitable, cost-effective electrification strategies have been identified and implemented.

Regarding “Dual-Fuel” System, CARB staff asked: What data or references can identify the fraction of heat pumps sold in California that are installed alongside other heating sources, such as gas furnaces? How often are these used to meet heating needs?

AHRI recommends reviewing dual-fuel space heating systems by climate zone and to account for net emissions, not just site emissions. Electrification with fuel backup provides resiliency to the energy grid, particularly where the grid is designed to accommodate summer peaking loads. Moving the thermal load from gas to electric will result in a significant increase in electric peak in winter.⁶ Load increases on the grid may limit energy reliability and availability in certain jurisdictions. A blackout during a winter peak event could be truly devastating for a community.

For water heating systems, “dual fuel,” which might mean a larger commercial system with the primary heat pump water heater coupled with a gas-fired water heating for temperature maintenance,⁷ may be desired for several reasons, primarily space available for water heating and system cost. Heat pump water heaters (HPWHs) are larger and more expensive than electric or fossil fuel counterparts. HPWHs may also need to be sized larger than a traditional electric or fossil fuel water heater due to slower recovery rate.

Regarding High Temperature Technology, CARB staff requested feedback on: What building types and use cases incorporate high temperature water heaters that produce steam or heat above 180°F? Any data and references related to cost, use, performance, and typical applications?

Commercial kitchens, laundry facilities, dry cleaning facilities, sanitation facilities, and process facilities all require high temperature water heating technologies. Sections 501.111-112 of the 2022 *Food Code*, requires high temperatures (171-180 °F) for mechanical (i.e., handwashing) and machine sanitizing.⁸

⁴ *Regional Propane and Woodburning Utilization in Commercial and Residential Buildings across California* | California Air Resources Board. (n.d.). https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/project-solicitation/propane-woodburning-buildings#_ftn2

⁵ *Ibid.*

⁶ Dichter, N., & Aboud, A. (2020). Analysis of Greenhouse Gas Emissions from Residential Heating Technologies in the USA. U.C. Davis Western Cooling Efficiency Center <https://wcec.ucdavis.edu/wp-content/uploads/GHG-Emissions-from-Residential-Heating-Technologies-091520.pdf>.

⁷ Ecotope. (n.d.). Solutions And Tools For Designing Central Heat Pump Water Heater Systems In Multifamily And Other Commercial Buildings. In *CENTRAL HEAT PUMP WATER HEATER DESIGN GUIDE* [Book]. https://www.energytrust.org/wp-content/uploads/2023/04/New-Buildings_Design-Guide-for-Central-Heat-Pump-Water-Heaters.pdf

⁸ U.S. Food and Drug Administration. (2023, January 18). 2022 *Food Code*. FDA.gov. <https://www.fda.gov/media/164194/download?attachment>

Regarding Additional technologies, CARB staff asked: Are there other technology types that should be included in the modeling? If so, please share data on usage, performance, and costs.

AHRI notes that:

- 120-Volt heat pump water heaters are readily available on the market but do have lower first hour ratings and recovery rates than same size 208/240V HPWHs.
- Regarding zero-emission alternatives for pool heaters, there are heat pump pool heaters and solar pool heaters currently available on the market; however, solar pool heaters include gas or electric backup and both alternatives are multiple times more costly to purchase and install.
- Cold climate heat pump technology is newly emerging for water heaters, and not ready for inclusion in the near term.
- Commercial Heat Pump Water heating (CHPWH) systems are also still emerging in the marketplace. Additional time is needed to understand market adoption and technology shifts for CHPWHs.
- Flexible demand standards are still in development for commercial space heating systems and not ready for inclusion currently.
- Lastly, regarding technology modeling assumptions, AHRI recommends that CARB include the impacts of the refrigerant transitions and account for the increased use of HFC's for water heating.

II. Conclusion

AHRI appreciates the opportunity to provide these supplementary comments.

Sincerely,



Laura Petrillo-Groh, PE
Senior Director, Regulatory Affairs
Direct: (703) 600-0335
Email: LPetrillo-Groh@ahrinet.org