January 21, 2026

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Comments on Zero-Emission Space and Water Heater Standard December 11, 2025 Workshop

Dear CARB staff,

Thank you for the opportunity to comment on the proposed Zero-Emission Space and Water Heater Standard that was presented at the Dec 11th Public Workshop: Zero-Emission Space and Water Heater Standards (workshop slides).

The undersigned organizations have serious concerns about the standard as proposed and are disappointed in the major shift from previous proposals from CARB. This proposal does not align with the goals stated in the workshop slides of addressing equity and affordability, and it falls substantially short of reducing greenhouse gases (GHG) in line with the 2022 Scoping Plan for Achieving Carbon Neutrality (Scoping Plan) and reducing smog-forming nitrogen oxide (NOx) emissions in line with the 2022 State Strategy for the State Implementation Plan (SIP).

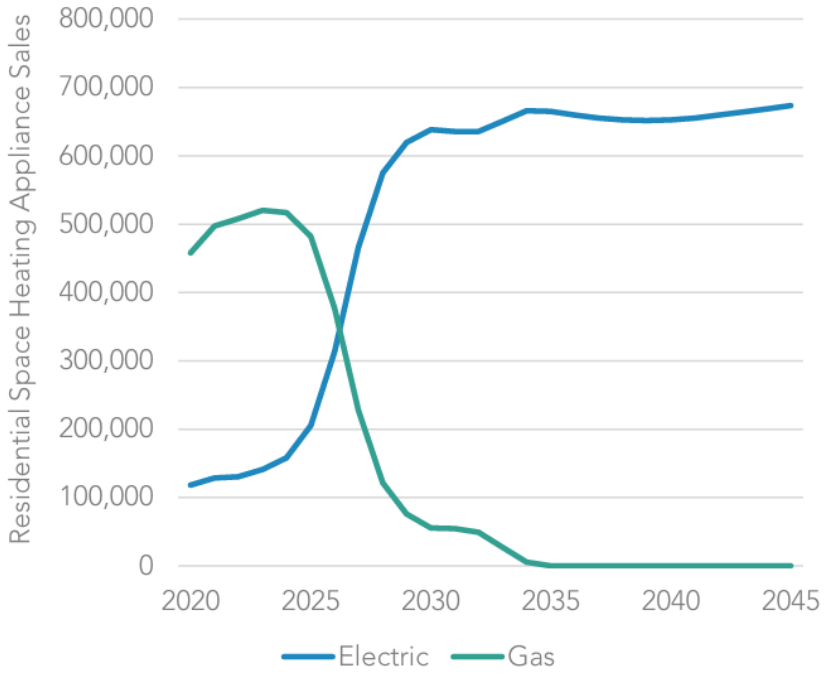
Below we suggest ways that this proposed policy should be improved to meet CARB's stated goals.

Align Sales Targets with the Scoping Plan

Below are suggestions for more closely aligning the emissive sales limit with the emission targets for the building sector in CARB's 2022 Scoping Plan.

The Scoping Plan calls for 90% of residential space heating equipment sales to be electric in 2030, moving to 100% electric in 2035, as shown in the Figure below.

Figure 4-9: Residential space heating appliance sales in the Scoping Plan Scenario



CARB should set emissive sales limits to align with these goals as closely as feasible.

CARB should start this program earlier and set an emissive sales limit to start in 2028 with reporting in 2029. Starting sooner would drive faster market transformation and begin critical data collection on equipment sales in California.

To ease implementation in that short time frame this program could be a simplified version of the policy without credit trading or credit multipliers. Credit trading could then be introduced in 2030. Manufacturers who aren't able to comply with the emissive sales limit in 2028 or 2029 can maintain a credit deficit that can be made up by 2033. Manufacturers who have a surplus of credits in 2028 and 2029 could retain surplus credits to be used in the market that opens in 2030.

The starting emissive sales limit should only allow limited amounts of polluting equipment sufficient to cover buildings that face moderate or extensive challenges to installing non-emissive equipment. These figures should be based on the latest analysis of the California building stock, taking into account the latest equipment and technology available to address these concerns. See "Concerns with CARB's analysis of building upgrades" below.

Emissive sales limits beyond 2035 should not be set now, but should be set by CARB after 2032 once the program has had some time to take effect and market conditions at that time can be evaluated. It is hard to predict what market innovations will occur between when this rule is finalized and 2035. Cost compression for equipment, increased labor efficiency and technological innovation that reduces the number of moderates to extensive retrofits could radically shift the market.

Regardless, CARB should be aiming to ramp down the emissive sales limit to the minimum that would allow polluting units to cover only the most difficult installation challenges, by 2035 or 2040 at the latest. Based on CARB's analysis of the number of moderate and extensive challenges, a schedule through 2035 that aligns with these parameters could be as follows.

Year	Space Heating	Water Heating	Pool Heating
2028	40%	40%	40%
2029	35%	35%	35%
2030	30%	30%	30%
2031	28%	28%	28%
2032	26%	26%	26%
2033	24%	24%	24%
2034	22%	22%	22%
2035	20%	20%	20%

For space heating, this aligns with the more stringent alternative CARB presented at the December workshop, which we believe is achievable. For water heaters, installation challenges are becoming easier to overcome with the availability of 120 volt equipment, and cost differentials compared with emissive equipment are moderate such that California should be able to achieve faster market transformation than even CARB's more stringent alternative suggests, and could follow the same schedule as space heating. In CARB's presentation no rationale was given for why pool heaters faced any installation challenges so should also be required to follow this same schedule.

While these limits do not fully align with the Scoping Plan and the State Implementation Plan, they are more closely aligned with meeting those goals.

More specific equipment classes or credits based on equipment size

As proposed, the policy would group all space heating equipment in a single category and all water heating equipment in another category, and pool heating equipment in a third. CARB should consider narrower product classes for setting sales targets and tracking sales and credits, or basing credits on the heating capacity or emissions of the equipment.

It does not make sense to give equal weight to a <=75,000 BTU/Hour residential water heater and a commercial boiler with heat capacity of 2,000,000 BTU/Hour that could create 25 times the pollution. Nor does it make sense to equate a 50,000 BTU/Hour furnace with a 150,000 BTU/Hour furnace which is likely to create 3 times the pollution. Similarly, non-emitting equipment such as a 1-ton window heat pump and a 5-ton unit serving an entire home should not be treated as equivalent.

Narrower classes would mean that only comparable equipment would be included in a single sales target. Otherwise, high sales of clean low-capacity units could allow for high sales of higher-emitting high-capacity units.

In all cases CARB should consider only the capacity of the main heating equipment, not the heat delivery equipment. For example a mini-split system with a 4-ton heat pump and 5 zones should be considered equivalent to a 4-ton heat pump that delivers heat through duct work.

CARB should track sales and set emissive sales limits for products based on industry standards and product classes from other regulations. For example, product classes could be as follows:

Water Heating

- Storage Tank Water Heaters with a Rated Heat Capacity of 75,000 BTU/Hour or Less
- Boilers and Water Heaters with a Rated Heat Capacity of 75,001 to 2,000,000 BTU/Hour
- Gas-Fired Pool/Spa Heaters with a Rated Heat Capacity up to 2,000,000 BTU/Hour

Space Heating

- Space heating equipment with a Rated Heat Capacity of less than 65,000 BTU/Hour
- Space heating equipment with a Rated Heat Capacity of 65,001 BTU/Hour to 120,000 BTU/Hour
- Space heating equipment with a Rated Heat Capacity of 120,001 BTU/Hour to 300,000 BTU/Hour
- Space heating equipment with a Rated Heat Capacity of greater than 300,001 BTU/Hour

Alternatively, CARB could track credits based on the heating capacity of each unit sold such that a 50,000 BTU/Hour device would earn 2 times the credits of a 25,000 BTU/Hour device. But given that emitting equipment often has a higher heating capacity than non-emissive equipment for the same function, an equivalency factor should be considered. For example, a typical heat pump water heater might have a nameplate compressor rating of around 4,200 BTU/Hour, while a typical gas water heater might have a nameplate capacity of 40,000 BTU/Hour for meeting the same water heating need. CARB could define some credit equivalency between emissive and non-emissive products to account for this differential.

A third alternative would be to account for the sales of emissive equipment multiplied by the expected emissions of each unit, based on its BTU/Hour capacity of the unit and its expected duty cycle given a typical installation. Non-emissive equipment could be credited based on how much emissions they would be displacing from an emissive unit that would serve the same function in a typical installation. Emissive sales limits would then be based on “total expected emissions from emitting equipment / (total expected emissions from emitting equipment + total emissions avoided from non-emitting equipment)”.

Limits on Credit Value Multipliers

The proposed credit multipliers for certain products sold is an unnecessary complication that has the risk of undermining the goals of this program. If too many “extra credits” are allowed via these multipliers then excessive emissive equipment will be allowed to be sold, which means higher emissions and higher impact from pollution.

CARB should not generally include credit multipliers in this program, or should delay adding them to the program until the system is in place and can be evaluated, perhaps when setting emissive sales limits for 2036 and beyond.

If CARB does decide to include credit multipliers, they should be used sparingly, limited only to sales of equipment that decrease emissions compared to average non-emissive equipment, or address equity considerations. “Innovation” credits that inherently don’t lower emissions compared to average non-emissive equipment are not warranted. Moreover, there is data to suggest that at least two of your proposed credits are no longer needed because products are no longer innovative, as they are already saturating the market.

Below are suggestions for each of the credit multipliers proposed by CARB:

- **Equitable decarbonization programs -** The most positive credit multiplier would be for donations to equitable decarbonization programs to support low-income installations. We would support such credits because they could provide significant support for installations in low-income households.
- **Ultra-low global warming potential (GWP) refrigerants -** Credit multipliers for units with ultra-low global warming potential (GWP) refrigerants could be an effective way to reduce climate emissions, but should be carefully calculated based on GHG emission reduction equivalent compared to credits for other zero-emission equipment, based on standard refrigerant leakage rates. We do note that credit multipliers for ultra-low GWP should not be allowed to lead to greater emissions of other air pollutants and therefore should be capped. Credit multipliers for ultra-low GWP units should be phased out in 2035.
- **Reclaimed refrigerants -** Credit multipliers for reclaimed refrigerants should not be included. Refrigerant reclamation should be the norm and guided by other policies, so does not need additional incentives in this program.
- **Innovative equipment -** Credit multipliers for "innovative equipment" should not be included. This type of equipment, such as 120 volt water heaters and cold climate heat pumps, should not require additional incentive in this program as they are often the most affordable and appropriate solution. Data from TECH shows that 98% of heat pumps installed in the last half of 2025 in single family homes were cold climate heat pumps. For water heaters, 21% of heat pump water heaters installed in TECH have been 120 volt. If there are other reasons to encourage certain products, such as reducing peak grid load, then those incentives should come from utility efficiency programs or other programs. As such, battery enabled units should not receive extra credits in this program.
- **Larger capacity rooftop units -** For larger capacity rooftop units, these should not be given extra credits but should be tracked as a different product class as noted above.

If credit multipliers are included in this program, sales limits should be adjusted to factor in any credit multipliers so that actual emissive sales still align with the scoping plan targets. For instance, if CARB estimates that in a given year X% of the non-emissive equipment sales would receive double credits, then the emissive sales targets should be reduced by X% for that year. This would allow certain equipment to be incentivized while still allowing overall sales and emission targets to be met. Additionally, CARB should consider sunsetting credit multipliers when future emissive sales targets beyond 2035 are set (see above).

Penalties

Any regulatory program is only as strong as the penalties for non-compliance. Penalties for not meeting targets should be set at least as high as the social costs of carbon, NOx and other pollutants that would be emitted over the lifetime of any emissive equipment sold beyond the emission sales limit.

Market Transformation Support

Ultimately the progress of statewide building decarbonization will depend on the success of the market transformation in providing for the installation of non-emitting heating equipment at scale throughout the entire state.

While emissive sales limits can potentially be part of the solution, these sales limits should be supported with consumer, contractor, and workforce education, incentives, permit streamlining, and other strategies to encourage market uptake of these technologies. CARB should work holistically with other state and local agencies to facilitate the transition to non-emitting equipment and not rely solely on manufacturers' actions to meet these sales limits.

Specific actions that CARB can take to help with this transition include:

- Advocate that state agencies communicate the overall goals and approach of building decarbonization more effectively and find pathways to encourage widespread socialization of electrification and other measures.
- Advocate that state agencies, including the Labor Board, encourage contractor and workforce support for building decarbonization projects and to outline the opportunities for the labor sector in an emerging clean energy economy.
- Advocate for state agencies and the legislature to develop standards that streamline permitting and inspection requirements for building decarbonization and ensure better consistency statewide.
- Advocate to the State Treasurer's Office to strengthen the Green Bank's response to the needs of building decarbonization by seeking larger amounts of external capital to be used to finance projects at zero or low interest.

Support for low-income households

The emissive sales limit approach does not really address the needs of low-income households in covering the upfront costs of upgrading their homes to clean and efficient heating equipment. Allowing the continued sales of polluting equipment does not at all address the needs of low-income households, either in making the transition or eliminating the burden of pollution from this equipment.

CARB should work holistically with other state and local agencies, utilities, and other entities to develop mechanisms to address up front costs including supporting direct install programs for low-income households, incentives and rebates,and zero-interest financing.

CARB should support the proposal from the The Building Energy, Equity & Power (BEEP) Coalition to create an interagency taskforce focused on equitable building decarbonization.

CARB should also work with other agencies to drive down costs of installations through contractor training and education, permitting streamlining, and consumer education.

CARB should consider supporting legislation that would allow CARB to levy mitigation fees for emitting equipment as a source of funding for such programs. CARB should also support legislation that directs funding from other sources to such programs.

Concerns with CARB's analysis of building upgrades

We have significant concerns about CARB's analysis of the cost of installing non-emissive equipment in California. CARB's figures grossly overstate the need for upsizing electrical panels, service lines, and wiring. Recent data demonstrates that these issues affect a smaller number of homes than previously estimated and that in many cases low-cost solutions exist to address these issues.

SPUR analyzed TECH program data (2024) including 1,764 actual homes with 100-amp panels, and found that 96% could accommodate a heat pump water heater, heat pump HVAC system, or both without panel upsizing. TECH data may skew toward projects without some of the trickiest electrical infrastructure barriers. But other data points to widespread availability of electric load on existing 100 amp panels. Home Energy Analytics smart meter data collected from 22,000 California homes found that 86% have peak loads under 50 amps. This and other data shows that most homes—including single-family residences with 100-amp panels and multifamily units with panels under 60 amps—utilize less than 50% of their panel's electrical capacity during peak demand periods. Further data from UCLA shows a very small number of panels with under 100 amps in single family homes (3 percent) and below 60 amps in multifamily units (10 percent).

When electric load limitations are encountered, many of the solutions reduce cost, are neutral cost, or add very low cost compared with average cost of non-emissive equipment. 120 volt products allow for building owners to avoid hitting their panels capacity, and cost less to install than 240 volt models. Inexpensive circuit controllers ($450-$600) can avoid expensive upgrades for many residents. Furthermore, new National Electric Code provisions set for implementation in California in 2029 will allow installers to better leverage the existing capacity on panels by accounting for the rarity of "coincident loads," or households turning on all their electric equipment at the same time.

CARB should re-evaluate the need for expensive electrical upgrades based on the latest data available. As noted above, emissive sales limits should be set to allow only the minimum amount of emissive equipment to cover buildings that face moderate or extensive challenges to installing non-emissive equipment. Therefore it is critical that CARB have accurate figures for how many buildings truly face these challenges.

Conclusion

Reducing emissions from buildings in California is critical to improving our air quality and meeting our climate targets. It's imperative that CARB align this policy with the Scoping Plan

and State SIP to put us on track to meet our climate and air quality goals. We hope that you will consider our recommendations for how to improve the Zero-Emission Space and Water Heater Standard so that it better aligns with those goals. We look forward to seeing the next revision of this policy proposal.

Thank you for all your work safeguarding and improving the air quality and climate in California.

Sincerely,

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