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**NRDC and 13 Organizations Joint Comments on Jan 26 2021
Workshop on Single-Family Electrification**

Additional submitted attachment is included below.



Dear Commissioner McAllister and Energy Commission Staff:

Re. Comments on the January 26, 2021 Workshop on Heat Pump Baselines for Residential Buildings in the 2022 Title 24 Building Code

On behalf of the Natural Resources Defense Council (NRDC), AIA California, Beyond Efficiency, Inc., Building Electrification Institute, City of Berkeley, Environmental Entrepreneurs (E2), Ecotope, Inc., EHDD Architecture, IDeAs Consulting, Integral Group, Guttman & Blaevoet, LEDDY MAYTUM STACY Architects, Sacramento Municipal Utility District, and US. Green Building Council Los Angeles (USGBC-LA), who are advocating for affordable and equitable building decarbonization and clean air policies to help mitigate the climate crisis and advance a sustainable economy, we respectfully submit the following comments in response to the California Energy Commission’s (CEC) January 26, 2021 workshop on residential heat pump baselines under consideration for the 2022 Title 24 Standards.

We appreciate the CEC’s continued efforts to establish heat pump baselines in Title 24 that shift the market toward pollution-free electric construction in the code’s performance path. These efforts are critical to accelerating building decarbonization in alignment with California’s broader emissions reduction goals. Building electrification combined with clean electricity is a critical strategy for meeting the state’s emissions and air pollution goals. It also has a lower first cost than gas construction and is cost-effective for consumers. We are already seeing the

devastating effects of climate change accelerating, such as the massive and widespread wildfires that are becoming the new normal. 42 California cities and counties have already adopted local “reach” codes that require or encourage clean electric new construction. It is therefore critical that the 2022 Title 24 standards strongly discourage continued reliance on gas in new buildings.

The co-signers support the inclusion of electric appliances in the baseline for new residential construction. CEC’s January 26 proposal to switch the smaller of the two major gas appliances, furnaces and water heaters, to electric in the performance baseline is insufficient to shift the new construction market to efficient electric heat and hot water across the state.

In climate zones where the space and water heating energy loads are comparable, it does create a significant policy signal by disincentivizing, but still allowing, to continue to build with gas for space and water heating cost-effectively. This approach provides builders with three options: 1) Build all-electric, and save the most on both construction costs and homeowner energy costs; 2) Switch one of space or water heating to electric, at the same construction costs and lower energy costs than the 2019 code; 3) Continue to use gas for both space and water heating, with additional efficiency measures to offset the higher emissions, while still saving on energy costs. This portfolio of options provides flexibility for builders to transition to electric when they and their subcontractors are ready to do so, while discouraging the all-gas construction status quo.

However, in climate zones where either the space or water heating load is significantly higher than the other, CEC’s proposal to switch the smaller of the two major gas loads to electric fails to provide a meaningful incentive for electrification. This would leave areas representing more than half of the new housing starts in the state to continue to build all-gas for another three years and would also not yield meaningful energy and carbon reductions.

For example, in CZ7 (San Diego), space heating is only about one fifth of the water heating load in terms of source energy. The compliance disincentive to continuing to use a gas furnace can be overcome with little effort, or even no effort at all when there is a small compliance margin. In CZ9 (Burbank), space heating is only about one quarter of the water heating load, and it requires minimal effort to offset the compliance disincentive. The same is true in all the Southern California climate zones, as well as in the colder climate zones (1, 2, and 16) where space heating dominates gas use and CEC proposed to switch only water heating to electric.

To make this proposal work effectively throughout the state, not just in half the state, while continuing to provide flexibility to builders, the proposal should be adjusted as follows:

1. Strengthen the source energy requirements in the baseline

To provide a meaningful incentive for electrification AND disincentive for continued gas use, CEC should set the largest of the two main gas appliances to electric in all climate zones. Southern California and colder climate zones should have an electrification signal equivalent to the Bay Area and Central Valley. This is critical for driving adoption of heat pumps in new construction statewide.

If this cannot be done in the 2022 code in some climate zones like 16 (Mountains) due to cost-effectiveness, modeling limitations or other constraints, CEC should strengthen the source energy stringency of the baseline, so that it requires additional energy efficiency measures for builders who want to continue to build all-gas, including: 1) moving the cookstove and dryer into the code compliance budget and setting them to electric in the baseline; and 2) adding compact hot water distribution to the baseline where not currently included.

2. Require full HPWH readiness including a reserved suitable space with electrical and plumbing services

The code currently requires gas water heaters to be tankless, and those tankless heaters are typically installed on exterior walls, in locations which are not suitable for a HPWH. The current and proposed HPWH-readiness requirements only cover electrical requirements, leaving a significant barrier standing in the way of homeowners when the time comes to replace their gas tankless heater by a HPWH.

Where builders choose to install a gas water heater, the code should require full HPWH-readiness, including both electrical (already required in 2019), and plumbing services at a designated space suitable for a HPWH.

This is needed to protect homeowners from expensive plumbing work when the time comes to replace their gas water heater with a HPWH, as will be required in all or most California homes within the next decade or two, as the gas system needs to be pared down for both climate and economic reasons. As gas use declines due to a warming climate, energy efficiency, and electrification, gas rates will start increasing rapidly as shown by the CEC's study on the Future of Gas Distribution in California.¹

Requiring HPWH-plumbing-readiness is a commonsense measure that costs much less at construction time than as a retrofit.

3. Extend the minimum capture efficiency requirements for kitchen ventilation to single-family homes

Workshops and the docket have provided ample evidence of the harmful health effects of indoor gas use and the ineffectiveness of current ventilation requirements. The ventilation requirements proposed for multifamily are a significant improvement and should apply to all homes, per this docketed [Statewide Utility Codes and Standards Team proposal](#).

4. Ensure no disincentive to all-electric

CEC is proposing to move from two independent baselines for gas and electric as in the 2019 code for low-rise residential, back to a single baseline for all energy sources. This approach must be thoroughly assessed to ensure it doesn't backslide on the 2019 code and penalize all-electric construction. The 2019 code included separate, same-fuel baselines for space and

¹ <https://www.ethree.com/at-cec-e3-highlights-need-for-gas-transition-strategy-in-california/>

water heating. That is to say that an electric space or water heating system is compared to an electric baseline system, not with a gas system, to avoid the time-dependent valuation (TDV) penalty for electric appliances. This doesn't encourage electrification, but it does level the playing field for all electric buildings. While the CEC has proposed to move to a single, partially electrified baseline in 2022 by switching one end-use in each climate zone to an always electric baseline, this proposal would default the other appliances to gas. The effects of including these gas appliances in a single baseline must be thoroughly assessed before moving forward.

Specifically, we are concerned that electric space heating, cooking, and drying appliances might again be penalized against this gas baseline, backsliding from where we are today and hindering electrification efforts, contrary to the CEC's stated goals. It is unclear from the materials presented at the 2019 Compliance Metrics workshops or the January 26, 2021 workshop, how mainstream electric space and water heating fare compared to gas baseline equipment when using the TDV 2022 metric.

If electric appliances are still penalized vs. their gas baseline in the 2022 code, we request that the CEC maintain independent baselines for electric and gas for whichever end-use is not fully electrified. This will ensure that the CEC's goal of gradually transitioning to an electric baseline is met while not hindering local electrification efforts. The same concern and request apply to multifamily and non-residential building types.

5. Standardize on all-electric for the reference design

Staff proposed to standardize the Reference Design Building on a mixed fuel building. We understand that this Reference Design Building is used only to set the EDR baseline in a consistent manner with RESNET, and not for compliance. However, it does not make sense to use a mixed fuel building that is obsolete and being phased out as a baseline. Why not use the all-electric version of the same building instead?

Other comments on topics other than the regulatory language:

Strong support for variable capacity and low-temperature performance heat pumps modeling improvements

We strongly support staff's work to improve the modeling of heat pumps in the compliance software to appropriately credit variable capacity and low-temperature performance.

Currently the software models do not fully reflect the performance of variable capacity heat pumps, in particular ductless and short-ducted models, and are unable to model heat pumps with superior cold climate performance, making the assumption that all heat pumps switch to electric resistance mode around freezing temperatures. These may be the minimum requirement for federal energy efficiency standards but they're not the technology that Californians need to transition to clean heating while saving money on their bills. CEC cannot require more efficient heat pumps due to federal preemption but can encourage them by appropriately modeling their performance and allowing builders who choose them to get credit for their choice. This critical modeling enhancement should be a top priority for the 2022 code update.

Cost of heat pumps vs. gas furnaces and AC alternatives

The electric space heating baseline presentation showed heat pumps costing \$100 to \$450 more than AC and gas furnace alternatives. We urge staff to be clearer that higher costs are only for dual-fuel heat pumps, not for standalone heat pumps for which best available data clearly shows lower equipment costs.

NRDC submitted cost data to the docket on Nov 12, 2020 to support this, including both online wholesale and distributor prices that are representative of equipment costs available to builders.² As noted in those comments, a study conducted by CBIA similarly found that electric space heating has a lower first cost than gas heating.³

This is an important data point in supporting the market transition to all-electric. NRDC has spoken with several builders, and they confirmed that heat pumps either cost less to install once trade partners are familiar with them, or that the higher bids represent a learning curve premium from trade partners who are not familiar with them and price the extra training time and risk of call backs for installation mistakes. Once HVAC contractors have become familiar with them, their prices reflect the lower equipment and installation costs relative to combined AC and gas furnace systems.

In addition, heat pumps for space heating are no different in installation complexity to central air conditioners. HVAC contractors are already familiar with central AC installations as those systems are standard in most new construction units. This means that HVAC contractors will become familiar with heat pumps very quickly once they have been trained and the first few installations have demystified heat pumps.

We appreciate the opportunity to submit these comments and the hard work of CEC staff in developing the proposed changes.

Sincerely,

² <https://efiling.energy.ca.gov/GetDocument.aspx?tn=235580&DocumentContentId=68513>

³ *California Building Industry Association Comments – Impacts of Residential Appliance Electrification*, Docketed 9/20/2018, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=224761>

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