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Comment on Developing Next Generation, All Electric Heat Pumps Using Low Global Warming Potential Refrigerant

Additional submitted attachment is included below.

Docket Number: 23-ERDD-01
Project Title: Electric Program Investment Charge (EPIC)
TN #: 253981

The following are my comments on Proposed Electric Program Investment Charge Solicitation on Developing Next Generation, All Electric Heat Pumps Using Low Global Warming Potential Refrigerant. My comments are limited to Group 1: High Efficiency,120V Electric Heat Pump Water Heaters

My responses to the questions are listed below.

1. What type of considerations should CEC consider to encourage participation and achieve project success, and why? Please provide relevant comments regarding other considerations not explicitly listed above.

The project requirements regarding the research, development and demonstration of next generation Low Voltage, High Efficiency Heat Pump Water Heaters with Low GWP Refrigerants should include harmonization with the monitoring protocols used in prior 120V HPWH studies. This will help avoid issues discovered in earlier field trials and allow easy comparison of the relative field performance, customer acceptability and installer experiences with existing products.

See Khanolkar, Egolf, and Gabriel, Plug-In Heat Pump Water Heater Field Study Findings & Market Commercialization Recommendations: Lessons learned on the performance of 120-volt HPWHs from California-wide installations, July 2023. https://newbuildings.org/resource/plug-in-heat-pump-water-heater-field-study-findings-market-commercialization-recommendations/

2. Are the GWP limits of 150 reasonable for the current state of the art systems? If not, why and what should the limit be? Do the three Project Groups in Section IV of this document address the primary objectives of expanding and improving heat pump technology? If not, why? Are there alternative pathways or priorities that should be considered?

The project should include a preference for natural refrigerants, including hydrocarbons. This will help limit costs of the final products and avoid potential future restrictions on current low-GPW refrigerants due to unforeseen environmental issues.

3. What are the near-term and medium-term technical targets (e.g., costs, efficiency, ramp rate, emissions levels) to advance low GWP heat pump technologies to a higher TRL?

a. What should be the starting and target TRLs for these groups?

4. Are the proposed levels of project funding for each group appropriate to achieve the desired outcomes? If not, why?
a. What would be the typical range of costs (e.g., capital costs) for the anticipated projects, and could projects leverage CEC funding to encourage private investments?
b. A minimum 20% match would likely be required with the funding levels listed above, and this requirement would be waived for projects sited in and benefitting Disadvantaged Communities (DACs) and Low-Income Communities (LICs). Is this sufficient to encourage DAC and LIC projects? If not, how could this be improved?

5. Should Group 1 in Section IV also include small commercial? If so, why?

The market for residential size water heaters is large enough. There is no reason to expand the scope of the proposed project to small commercial water heaters

7. Is four years a feasible project timeline? Are there potential barriers or challenges in implementing the proposed projects in that timeframe?

Four years is a longer than necessary timeline, if the respondents follow the protocols and methodologies used in prior 120V HPWH field trials.

8. Which end-use sectors, facilities, or communities are expected to be most positively impacted by these types of projects?

9. How could this solicitation encourage projects to more fully center equity and community engagement?

The solicitation should encourage the use of union apprentices in the installation and testing phases of the project. Also the solicitation should encourage the inclusion of community representatives recommended by the Disadvantaged Communities Advisory Group on any Technical Advisory Committee.