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Google Nest Comments on HOMES design

Thank you for the opportunity to comment. Please see attached for comments from Google Nest.

Additional submitted attachment is included below.



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January 26, 2024

California Energy Commission Staff
715 P Street
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Re: Request for Information to inform the CEC's application to the US Department of Energy for the federal Home Efficiency Rebates (HOMES) Program, funded through the Inflation Reduction Act (IRA).

Google Nest would like to thank the California Energy Commission for opening Docket 23-DECARB and inviting comments on the Inflation Reduction Act Home Energy Rebates program design.

INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

In August 2022, Congress passed the Inflation Reduction Act (IRA), which included nearly \$1 trillion in investments in the clean energy industry. A subset of that bill includes direct incentive payments for energy efficiency measures in the Home Efficiency Rebate (HOMES) and High-Efficiency Electric Homes Rebates (HEEHRA) sections. While the legislation laid out the shape of the rebates, it left it to the states and territories to create individual programs to access the funds.

To assist the states, the Department of Energy (DOE) created guidelines to implement HOMES and HEEHRA, which were released on July 28th, 2023. The guidelines include clarifications to the original legislation, including specifically calling out smart thermostats as eligible for HEEHRA incentive payments when paired with heat pumps. Similarly, smart thermostats are eligible for incentives through both the modeled and measured pathways under HOMES.

In December 2023, the CEC issued a Request for Information to inform the CEC's application to the US Department of Energy for the HOMES Program. The goal of California's HOMES program is to advance California's energy and climate goals, including reaching carbon neutrality by 2045, installing 6 million heat pumps by 2030, and prioritizing energy equity. Google would like to support this effort by sharing best practices for including smart thermostats in these programs:

1. **California should require pairing ENERGY STAR® certified smart thermostats with heat pumps given their powerful capabilities to save energy and manage peak demand.** Smart thermostats are an eligible technology for both pathways in the HOMES program as well as the HEEHRA program. Installing smart thermostats alongside new loads like heat pumps lowers the cost of electrification to the grid and helps mitigate future peak demand spikes. Leveraging the ENERGY

STAR[®] standard ensures that the thermostats have been independently certified, based on actual field data, to deliver energy savings.

2. **California should coordinate with utilities to offer pre-enrollment into demand response (“DR”) programs with every smart thermostat installed where possible.** Utilities have expertise in running these types of programs and all efforts should be made to leverage existing channels, such as online marketplaces and enrollment portals, where appropriate. Demand response programs in particular provide potential for residential customers to provide load management support during extreme weather events or during peak loads.

BACKGROUND ON GOOGLE NEST

Google LLC, an Alphabet Inc. company, is the maker of Nest devices, including Nest thermostats, sold under the Google Nest brand. Nest thermostats incorporate numerous features that help customers reduce their energy consumption for residential heating and cooling, which can consequently assist electric and gas utilities and the state of California with achieving core energy efficiency and peak demand reduction goals.

Google Nest is dedicated to making the smart home less complicated and more helpful, where products work together to provide customers safety, security, comfort, and connection with their friends and family. The Nest energy devices include the Google Nest Learning Thermostat, the Google Nest Thermostat E, and the newer Google Nest Thermostat, which are equipped with sensors, Wi-Fi capability, and smart-phone grade processing to help customers consume less energy. These devices are among the leading smart home thermostats available in the United States.

Google Nest thermostats can learn occupant preferences, turn the temperature down when the house is empty, and automatically lower heating and air conditioning (“A/C”) runtime when humidity conditions permit, thereby helping people lower their energy use without sacrificing comfort. Google Nest thermostats can also contribute to reducing peak demand by allowing residential customers to participate in demand response programs, known as Rush Hour Reward (“RHR”) events, run by utilities or third-party aggregators. Customers participating in RHR events agree to let their household temperatures rise or fall a few degrees on selected days when their utility is concerned about system reliability, in exchange for a payment or bill credit to the customer. RHR programs can work with or without AMI and, critically, can serve as an enabling technology that benefits customers regardless of fuel type.

FULL COMMENTS OF GOOGLE NEST

Question 2.a.i: How can HOMES funds that are awarded to deliver residential whole building energy efficiency retrofits, be best utilized to support the state’s decarbonization and electrification goals?

HOMES funding should include investing in ways to manage newly added load from electrification. Smart thermostats are a simple and proven way to achieve widespread energy reduction and save customers money. Smart thermostats are an affordable product that can be installed in all homes with

central heating and cooling, including an estimated 85% of homes in the United States. Once installed, ENERGY STAR® certified smart thermostats like the Nest Learning Thermostat have been shown to save 10% to 12% on heating costs and 15% on cooling costs.¹

Unfortunately, most thermostats sold today are not smart and do not achieve the level of savings mentioned above. Market estimates suggest that smart thermostats made up around 1/3 of all sales in 2021. The other 2/3rds of sales were for manual and programmable thermostats. This trend will continue unless we take specific policy actions and program designs.

1. California should require pairing ENERGY STAR® smart thermostats with heat pumps given their powerful capabilities to save energy and manage peak demand.

Electrification, without load control, will increase the need for more generating resources. It is critical that as we install new equipment, we have some way to manage the newly created demand. Heat pumps need to be installed with smart thermostats attached. Smart thermostats are an eligible technology for both pathways in the HOMES program. In the modeled pathway, smart thermostats are an approved and included measure in the BPI2400 standard (including the recently proposed Annex E addition) because they provide the required functionality. In the measured pathway, the savings from smart thermostats will be reflected in the whole-home savings approach. Additionally, the DOE guidance from July 2023 specifically mentions smart thermostats as eligible for incentives under the HEEHRA program.

While the vast majority of heat pumps can be paired with smart thermostats, to ensure compatibility the CEC should require thermostats that are ENERGY STAR® certified and have the ability to connect to the grid for load management purposes.

Question 2.a.iii. If funds are provided directly to existing residential efficiency programs, which programs will make the highest impact in terms of market transformation for efficiency and decarbonization technology?

2. California should coordinate with utilities to offer pre-enrollment into demand response (“DR”) programs with every smart thermostat installed where possible.

From a customer perspective, DR pre-enrollment often lowers the upfront cost of the devices by allowing the utility to stack EE and DR incentives into a single discount, thus increasing the rate of adoption. DR pre-enrollment also lowers the barrier to enrollment and ensures that the full DR value of thermostats are realized at the point of sale. This practice is already widespread among utilities in California and should be incorporated into these programs. Pre-enrollment has been proven to increase demand response enrollment numbers - in New York, Orange and Rockland recently reported that since offering instant enrollment, their Bring Your Own

¹ For more information, see the FAQ page on ENERGY STAR®'s website for Smart Thermostats: [https://www.energystar.gov/products/heating_cooling/smart_thermostats/smart_thermostat_faq#:~:text=How%20much%20will%20the%20average,%2Fcooling%20\(HVAC\)%20equipment.](https://www.energystar.gov/products/heating_cooling/smart_thermostats/smart_thermostat_faq#:~:text=How%20much%20will%20the%20average,%2Fcooling%20(HVAC)%20equipment.)

Thermostat DR program realized a 53% increase year-over-year and record growth since this functionality was introduced.²

Pre-enrollment into DR programs also primes the grid for residential Virtual Power Plants (VPPs). According to the DOE, the U.S. will need to support over 200 GW of peak demand between 2023 and 2030.³ The DOE published a report that found large-scale deployment of VPPs (80 - 160 GW) could address this demand increase and rising peaks at lower cost than conventional resources and reduce energy costs for Americans.⁴

Residential VPPs that include heat pumps and smart thermostats provide a cost-effective alternative to manage peak electricity demand at scale. A recent Brattle group study found that a VPP enabled by technologies such as smart thermostats can provide many of the same benefits as generation resources by reducing or shifting load. Brattle modeled a 400 MW VPP with residential thermostats and found it could perform as reliably as a gas peaker plant at 40% of the net cost.⁵

CONCLUSION

We thank the CEC for its attention to developing HOMES program design principles that meet its decarbonization, equity, and affordability goals.

Respectfully submitted,

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² For more information, visit: <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={30298E8B-0000-C541-AA6D-C9512B760A7C}v>

³ For more information visit: <https://www.brattle.com/insights-events/publications/real-reliability-the-value-of-virtual-power/>

⁴ For more information visit: <https://liftoff.energy.gov/vpp/>

⁵ For more information, visit: <https://www.brattle.com/insights-events/publications/real-reliability-the-value-of-virtual-power/>