

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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Order Instituting Rulemaking to Establish Policies,
Processes, and Rules to Ensure Reliable Electric
Service in California in the Event of an Extreme
Weather Event in 2021

Rulemaking 20-11-003
(Filed November 30, 2020)

COMMENTS OF GOOGLE LLC ON RULEMAKING

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In accordance with the directives provided in the above-captioned rulemaking, Google LLC (“Google Nest”) offers its comments with respect to the issues discussed in the new California Public Utilities Commission (“Commission”) rulemaking to ensure reliable electric service in the event of a 2021 extreme weather event (“Rulemaking”). Google LLC, an Alphabet Inc. company, is the maker of Nest devices, including Nest thermostats, sold under the Google Nest brand.

I. INTRODUCTION AND DESCRIPTION OF GOOGLE NEST

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 new Google Nest Thermostat, which are equipped with sensors, Wi-Fi capability, and smart-phone grade processing, to help customers consume less energy. They learn occupant preferences, turn the temperature down when the house is empty, and automatically lower air conditioning (“A/C”) runtime when humidity conditions permit, thereby helping people lower their energy use without sacrificing comfort.

Google Nest thermostats also contribute to reducing peak demand by allowing residential customers to participate in demand response programs run by utilities or third-party aggregators.

Current Google Nest programs include Seasonal Savings (an energy efficiency program) as well as Nest Rush Hour Rewards (a demand response program).

Last summer, Google Nest's utility and third-party partners called seven Rush Hour Rewards events on August 14th and 15th, the two days when the Stage 3 system emergencies triggered rolling blackouts in California. Nest customers enrolled in these utility programs shifted approximately 60 MW of load during this two day grid emergency.

As part of this Rulemaking, the Commission poses a series of questions on how to reduce demand before April 2021. Creating programs and incentive mechanisms to reduce the residential load that has increased as a result of COVID 19 must be a part of the solution. As the Commission notes in its Rulemaking, during 2020:

“While overall demand was lower in the spring, residential demand was higher. This higher residential demand likely resulted in higher energy usage during the "net demand peak" timeframe. Further, the high temperatures from the extreme heat storm extended into the evening hours, causing a sustained increase in load as customers continued using air conditioning units to cool homes, hospitals, and businesses”¹

Google Nest has a significant interest in this Rulemaking given its devices' potential to assist the Commission with ensuring reliable service in future extreme weather events, particularly by reducing peak residential demand. Nest thermostats are an extremely effective and low-cost means for achieving significant energy savings and load reduction.

The comments that follow provide both supporting documentation on the demand response and energy efficiency performance of Nest smart thermostats and specific recommendations on how the Commission can use this proceeding to rapidly unlock the potential of smart thermostats from Nest and other market providers in California. Google Nest offers the following comments

¹ Rulemaking, at p. 5.

on Questions 1, 2, 3, 4, 12, and 16 discussed in the Rulemaking and reserves the right to respond to other parties' responses in the reply comments due December 10, 2020.

II. SUMMARY OF RECOMMENDATIONS AND RESPONSE TO QUESTIONS FROM GOOGLE NEST

According to the American Housing Survey, there are over 7.5 million homes with central A/C in California². Based on third-party estimates and available market data, over one million of these homes currently have smart thermostats already installed³. However, only a fraction of these homes participate in demand response events and take full advantage of thermostat optimization programs. Through coordination with utilities and third-parties, there is the potential to add tens-of-thousands of additional smart devices to California's demand response programs ahead of summer 2021 and deliver between 2x and 3x the load reduction potential as was provided during the 2020 extreme weather events. To that end, Google Nest respectfully makes the following recommendations:

- 1. Unlock the latent EE and DR potential that smart thermostat devices could deliver in California with the appropriate incentives by setting clear, ambitious 2021 enrollment targets for thermostat demand response programs.**
- 2. Encourage the purchase of new smart thermostats and simultaneous enrollment in DR programs ahead of summer 2021 by supporting the expansion of existing IOU thermostat programs and by ordering an additional Demand Resource Auction Mechanism (DRAM) auction before next year.**
- 3. Establish smart thermostats as a new DEER database measure and freeze implementation of changes to smart thermostat savings methodology, which will**

² See, US Census Bureau, American Housing Survey, 2017: https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=00006&s_year=2017&s_tablename=TABLE3&s_bygroup1=3&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1

³ Based on Park Associates estimates of 13% smart meter penetration in January 2018: <http://www.parksassociates.com/blog/article/pr-06142017#:~:text=New%20Parks%20Associates%20research%20shows,by%20the%20end%20of%202017>

reduce deployment rates ahead of next summer when additional resources are needed.

Given the short timeframe between now and Summer 2021, developing entirely new DR programs is unfeasible. Google Nest would like to emphasize that expansion of current DR programs through the above measures can be undertaken in the next few months to enable significant load reduction potential by summer 2021.

Google Nest would also like to also emphasize that undertaking all of the above measures, will reduce the likelihood that backup generators and additional fossil fuel resources are called upon (as suggested by Questions 7 and 8 of the Rulemaking) in an emergency situation. Google Nest believes the State should focus first on meeting reliability needs through increased demand response capacity rather than conventional fossil generation to ensure it meets its goals enshrined in SB100 of 100 percent clean energy supply by 2045.

III. BACKGROUND: GOOGLE NEST'S CURRENT PROGRAMS AND THE ENERGY EFFICIENCY AND DEMAND RESPONSE POTENTIAL OF SMART THERMOSTATS

Google Nest offers two programs -- Seasonal Savings and Rush Hour Rewards -- that are demonstrated to reduce cooling load during critical periods. They do this either by automatically adjusting thermostat setpoints throughout the year or pre-cooling homes before peak period events. Google Nest currently participates in five demand response programs in California, including:

1. Three utility-run Rush Hour Rewards programs with the following utilities:
 - a. Southern California Edison,⁴
 - b. San Diego Electric & Gas,⁵ and

⁴ <https://nest.com/energy-partners/southern-california-edison/>

⁵ <https://nest.com/energy-partners/sdgc/>

- c. L.A. Dept. Water and Power.⁶
- 2. Two third-party run wholesale market programs with the following partners:
 - a. Leap,⁷ and
 - b. OhmConnect.⁸

On August 14 and 15 events, the two peak days when the Stage 3 system emergencies and rolling blackouts were triggered in California, Google Nest’s demand response partners ran 7 Rush Hour Rewards events. The Nest customers enrolled in these programs shifted about 60 MW of load in total during the two day period. However, as mentioned above, not all customers who own smart thermostats enroll in demand response programs. The customers who participated last year are a small fraction of the total residential potential in California, given that over 7.5 million homes rely on central A/C.

Potential of smart thermostats to reduce peak demand at scale

There is significant third-party verified evidence that smart thermostats can deliver reliable load reduction during peak events in California. In a 2017 study, Southern California Edison (“SCE”) examined the load impact potential of smart thermostats that participated in its residential Peak Time Rebates program. The study found that across 6,112 customers with a smart thermostat, an aggregate of 4.6MW of load reduction was achieved during 12 peak time rebate events.

The study also found that, on average, smart thermostats achieved 32.8% load impact per event. Compared to the other demand response programs surveyed (customers with in-home

⁶ <https://nest.com/energy-partners/ladwp/>

⁷ <https://nest.com/energy-partners/leap>

⁸ <https://www.ohmconnect.com/how-it-works/smart-home/nest>

displays and customers who voluntarily enrolled to receive Peak Time Rebate event notifications via phone, email, etc.), smart thermostats achieved the highest load reduction⁹.

The potential for smart thermostats to drop load at scale and reduce the likelihood of future blackouts is immense. For example, in its 2017 study, SCE forecasted that if it could increase smart thermostat enrollment to 130,000 by 2027, smart thermostats could have an aggregate load impact of ~70.3MW under 1-in-10 year conditions¹⁰.

In a 2017 study performed by Lawrence Berkeley National Laboratory to determine California Demand Response Potential in 2025, the authors identified nearly 1100 MW of shed DR potential across PG&E, SDG&E and SCE's service territories, with "Residential AC" accounting for the largest residential savings potential and the authors noting that:

“...targeting Commercial HVAC is in general more cost effective than Residential AC, on an average costs basis. However, the Residential AC end-use is capable of providing more cumulative DR than Commercial HVAC, and the distribution in customer-to-customer cost for DR within the technology are such that it is possible to target a set of very cost-competitive opportunities within the customer base.”¹¹

IV. DETAILED RECOMMENDATIONS

Google Nest supports the Commission's intention to explore new event-based demand response programs and modify existing demand response programs.¹² In Question 1, the Commission contemplates a new marketing campaign for Flex Alerts programs. While we do not oppose this, we think time and resources are better spent on marketing and incentives to encourage

⁹ See, Nexant, *2016 Load Impact Evaluation of Southern California Edison's SavePower Days Program*, April 2017.

¹⁰ *Ibid.*

¹¹ See, Lawrence Berkeley National Laboratory, Energy and Environmental Economics, and Nexant, *2025 California Demand Response Potential Study: Charting California's Demand Response Future*, March 2017, <https://eta-publications.lbl.gov/sites/default/files/lbnl-2001113.pdf> at p. 111.

¹² Rulemaking, at p. 10.

additional enrollment and participation in thermostat demand response programs. Similarly, in its questions about modifying and expanding the Critical Peak Pricing program (Questions 2, 3 and 4), the Commission should also specifically explore opportunities to codify and strengthen residential demand response at scale through the use of the millions of existing energy management devices in the market.

Google Nest respectfully proposes three sets of recommendations to meaningfully grow the number of smart thermostat devices enrolled in demand response programs, and double or even triple the amount of load reduction potential ahead of Summer 2021:

Recommendation 1: Unlock the latent EE and DR potential that smart thermostat devices could deliver in California with the appropriate incentives by setting clear, ambitious 2021 enrollment targets for thermostat demand response programs.

These enrollment targets should empower both IOUs and third-party providers to add customers as quickly as possible into programs such as utility-run Rush Hour Rewards. Historically, IOUs have had difficulty taking full advantage of DR and EE incentives for smart thermostats. Despite the many synergies between energy efficiency and demand response resources, utility program administrators typically approach and implement these programs separately. Many factors contribute to this including silos within utilities, and energy efficiency resource standards driving energy efficiency portfolio construction, which does not take into account the DR benefits of EE measures.¹³ This lack of integration has meant that only a small fraction of all smart thermostats in California have been enrolled in utility DR programs. To overcome these barriers, Google Nest has two additional recommendations:

¹³ See, Dan York, Grace Relf, and Corri Waters, Integrated Energy Efficiency and Demand Response Programs, ACEEE, September 2019, <https://www.aceee.org/sites/default/files/publications/researchreports/u1906.pdf>.

Recommendation 1.1: consider new incentives for smart thermostat enrollment and participation in demand response programs, including a temporary emergency incentive level for utilities and third-parties to enroll smart thermostat devices by May 2021.

Recommendation 1.2: increase IOU marketing funds (as asked in Question 4) and allow these funds to be used for enrollment in IOU residential demand response programs as well.

Recommendation 2: Encourage the purchase of new smart thermostats and simultaneous enrollment in load management programs ahead of summer 2021

Google Nest specifically proposes three concrete actions that the Commission could take to encourage thermostat purchase and simultaneous enrollment:

Recommendation 2.1: Support the expansion of programs that offer no/low-cost thermostats that are pre-enrolled in demand response programs, such as Rush Hour Rewards. This model currently exists in other states. In Michigan, for example, Consumers Energy recently partnered with Google Nest to offer up to 100,000 customers a free thermostat for enrolling in its Peak Power Savers Smart Thermostat Program¹⁴.

Recommendation 2.2: Support the ability of third-party providers to enroll additional customers in residential demand response programs by ordering an additional Demand Response Auction Mechanism (DRAM) auction before next summer (as asked in Question 16).

Recommendation 2.3: Consider additional incentives for any program that results in the automatic enrollment or opting-in of smart thermostats in demand response programs at the point of sale (i.e. through a utility-run marketplace).

¹⁴Consumers Energy, News Release, May 19th, 2020: <https://www.consumersenergy.com/news-releases/news-release-details/2020/05/19/consumers-energy-providing-100k-google-nest-thermostats-to-michigan-households-during-pandemic>.

Recommendation 3: Establish smart thermostats as a new DEER database measure and freeze implementation of changes to smart thermostat savings methodology, which will reduce deployment rates ahead of next summer when additional resources are needed.

IOUs have not used consistent methodologies to value the EE and DR benefits of smart thermostats. This has led to conflicting and inconsistent valuations of smart thermostats and an inability to create sustained, long-term incentive programs. Smart thermostats are a mass-market technology which provide stipulated HVAC saving percentages based on predefined climate zones, housing types, and conditioning loads

In response to Question 12, Nest strongly supports establishing smart thermostats as a new DEER database measure as soon as possible. By making smart thermostats a deemed savings measure, the Commission will standardize thermostat savings and give California program administrators the confidence and ability to create multi-year smart thermostat programs that will help drastically increase the number of devices in the market.

Currently, ad-hoc changes to thermostat savings methodologies are being made through workpapers¹⁵. These workpapers are using biased evaluation methods and old DEER prototype models to extrapolate savings. These workpapers have also generated different heating and cooling savings values in identical climate zones based on the program administrator. If implemented, these workpapers will create a significant barrier to new smart thermostat deployment at a time when we need additional EE and DR resources in the market.

V. CONCLUSION

Google Nest thanks the Commission for its attention to these comments and appreciates its efforts to ensure the electricity reliability in the coming year in the event of heat storms or other

¹⁵ Including CALMAC ID:CPU0205.01

catastrophic events. We believe that if the Commission were to put in place new incentives and processes that Google Nest, working with both utilities and third-party providers, could drastically increase the number of smart thermostat devices enrolled in DR programs and deliver between 2x and 3x the load reduction potential as was provided during the 2020 extreme weather events. Google Nest stands ready to work with the Commission in achieving these goals.

Respectfully submitted,



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