DOCKETED

Docket Number:	15-IEPR-05
Project Title:	Energy Efficiency
TN #:	205439
Document Title:	Nest Comments on Governorâ€™s 2030 Energy Efficiency Goals
Description:	N/A
Filer:	System
Organization:	Nest Labs/Rick Counihan
Submitter Role:	Public
Submission Date:	7/20/2015 4:41:58 PM
Docketed Date:	7/20/2015

Comment Received From: Rick Counihan
Submitted On: 7/20/2015
Docket Number: 15-IEPR-05

07/20/15 Docket No IEPR-05 Nest Comments

Additional submitted attachment is included below.

Docket No. 15-IEPR-05

Joint Agency Workshop Re: Governor's 2030 Energy Efficiency Goals
July 20, 2015

COMMENTS OF NEST LABS

I. BACKGROUND

The purpose of this workshop was to discuss the development of strategies to achieve Governor Edmund G. Brown, Jr's 2030 energy efficiency goals including doubling the efficiency of existing buildings and lowering greenhouse gas emissions to 40 percent below 1990 levels by 2030. The fact that this workshop had representatives of the Governor's office, the California Energy Commission, the California Public Utilities Commission and the Department of Community Services and Development is because achieving these ambitious goals will require further coordination across multiple state agencies, as well as coordination between public entities, private entities, and non-governmental organizations.

II. DESCRIPTION OF NEST LABS

Founded in 2010, Nest Labs is dedicated to reinventing home products like the thermostat and smoke alarm to provide customers with simple, beautiful and thoughtful hardware, software and services helping them reduce energy consumption and keeping families comfortable and safe. Nest man**u**factures the Nest Learning Thermostat, which is equipped with sensors, Wi-Fi capability, and smart-phone grade processing, to help customers consume less energy: it learns their preferences, turns the temperature down when the house is empty and automatically lowers AC runtime when humidity conditions permit, helping people lower their energy use without sacrificing comfort. Nest also has service offerings for utilities to help address load management needs. Today, Nest products are sold in the U.S., U.K. and Canada and are installed in more than 120 countries. Based in Palo Alto, Nest is a wholly-owned subsidiary of Google Inc. and employs approximately 700 people in California.

III. MODERN SMART, COMMUNICATING THERMOSTATS CAN HELP ACHIEVE THE AMBITIOUS POLICY GOALS THAT ARE THE SUBJECT OF THIS WORKSHOP

Traditional programmable thermostats ("PTs") allow customers to set up a pre-programmed schedule for raising or lowering the temperature in the home, but have neither internet communications capability nor built-in intelligence to modify the schedule due to changing conditions or customer preferences. While the ability to pre-program thermostats can be a convenience feature and save energy for some households, there are challenges and difficulties with PTs. For many people they are not intuitive and hard to program; therefore many people never do program them. In that case, they are used just like manual thermostats with people turning them up or down when they remember. Even if a PT is programmed initially, it is often overridden at some point in the future and then not reprogrammed. This override could happen for any number of reasons; such as a house full of guests or unusual weather.

The United States Environmental Protection Agency originally had an Energy Star designation for PTs to encourage their use compared to non-programmable thermostats but dropped it in 2009 because of the lack of evidence that actual energy savings and/or environmental benefits resulted from their use. As noted on the Energy Star website, "Manufacturers were required to cease using the ENERGY STAR name and mark in association with all products manufactured on or after December 31, 2009. While EPA recognizes the potential for programmable thermostats to save significant amounts of energy, there continue to be questions concerning the net energy savings and environmental benefits achieved under the previous ENERGY STAR programmable thermostat specification."[1, 2]

Smart, communicating thermostats ("SCTs"), such as those provided by Nest, also allow setting predetermined schedules for temperature. However they have several advantages over traditional programmable thermostats. They are smart in the sense that they learn a household's habits and preferences and combine that information with environmental data like

[1] Energy Star Programmable Thermostats Specification; see: https://www.energystar.gov/index.cfm?c=archives.thermostats_spec.

[2] Nevertheless, PTs continue to be included in DEER. *See*, DEER 2014 Update Draft, July 17, 2013 (D03-073, p. A-4 and D03-401, p. A-9.

temperature and humidity to create schedules appropriate to that home and the environment, even if they are not pre-programmed. However, SCTs are also easier to program and modify than traditional PTs if the homeowner desires. SCTs also can be accessed through the internet so that a homeowner can raise or lower the temperature remotely from a mobile device or let the thermostat know the homeowner will be away for an extended period.

A number of recent studies in other jurisdictions have demonstrated the significant energy efficiency benefits provided by SCTs. For example:

- The Pennsylvania Statewide Evaluator ("SWE") included ""Smart Thermostats" in its Energy Efficiency Potential Study which the Commission used to inform its decisions on what level to set energy efficiency goals for Phase III. The SWE found that such ""smart thermostats" saved about 11% on electric heating and cooling.[3]

- The Energy Trust of Oregon ("ETO") recently released a study of Nest thermostats used with electric heat pump heating. The Energy Trust, which runs the energy efficiency programs for all the utilities in Oregon, found that the thermostats saved 12 % on heating electricity use.[4]

- Vectren, an electricity and gas utility in southern Indiana, recently released a study of Nest thermostats and found that they saved 14% on air-conditioning electric usage.[5] The Vectren study also showed significant savings, in the 10% range, on the heating side in natural gas heated homes.

- NIPSCO, another electric and gas utility in northern Indiana did a similar study with similar results: 16% savings on air-conditioning electric usage.[6]

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[3] Energy Efficiency Potential Study for Pennsylvania; Pennsylvania Public Utility Commission; February 2015; Appendix D; Original Measure #2077; p. D-7.

[4] Energy Trust of Oregon Nest Thermostat Heat Pump Control Pilot Evaluation, by Apex Analytics, Oct. 10, 2014, p.1-1; http://energytrust.org/library/reports/Nest_Pilot_Study_Evaluation_wSR.pdf.

[5] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Vectren Corporation; prepared by Cadmus Group, January 29, 2015, p. 3; http://www.cadmusgroup.com/papers-reports/evaluation-2013-2014-programmable-smart-thermostat-program/

[6] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Northern Indiana Public Service Company; prepared by Cadmus Group, January 22, 2015, p. 3; https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.aspx?DocID=0900b631801c5039.

- Nest has done its own study on Nest users across the country and found an average 17% savings on air-conditioning electric usage.[7]

Nest wishes to acknowledge the excellent work being done by all four California investor-owned utilities,[8] in partnership with the California Technology Forum, to study energy savings from the Nest Learning Thermostat in California's varying climate zones. Those studies should continue and Nest looks forward to supporting them to generate a statewide work paper based on savings found throughout California.

IV. CONCLUSION: SMART, COMMUNICATING THERMOSTATS ARE RELEVANT TO THE MISSIONS OF ALL THE AGENCIES PARTICIPATING IN THIS WORKSHOP.

While there are thousands of Nest thermostats already installed in California, and presumably many more from our competitors, the ability of SCTs to reduce energy is a largely untapped source of energy efficiency in California's millions of homes. If every residence in California were to have an SCT, and if, on average, they each saved only 10%, that would be a significant step toward the goal of doubling the energy efficiency of the residential sector. Moreover, once installed, SCTs provide the opportunity for customers to participate in load management or demand response programs to help shape the load profile of the utilities in the state.

This capability is relevant to all the agencies present at the Joint Workshop. The CEC has jurisdiction over building codes in new construction and should consider the inclusion of SCTs in Title 24 Building Codes so that new homes in California will get this new technology. The CPUC has jurisdiction over the utility demand-side management programs which can help improve the efficiency of existing homes. CSD has a suite of programs to help low-income Californians with their energy consumption and Nest is optimistic that our thermostats can help reduce energy consumption in low-income households, particularly in disadvantaged communities in the hotter areas of the state.

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[7] Energy Savings from the Nest Learning Thermostat: Energy Bill Analysis Results, Nest Labs, February 2015, p. 6.

[8] Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and San Diego Gas & Electric Company.

Nest stands ready to work with all three agencies to help achieve the ambitious, but critical, goal of doubling the energy efficiency of Californian's homes.

Respectfully submitted,

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