K&L GATES

May 11, 2015

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Via Hand Delivery

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Bldg., 2nd Floor
400 North Street
Harrisburg, PA 17120

Re: Implementation of the Alternative Energy Portfolio Standards Act of 2004 Standards for the Participation of Demand Side Management Resources - Technical Reference Manual 2016 Update
Docket Nos. M-2015-2469311

Dear Secretary Chiavetta:

Enclosed for filing in the above-referenced matter please find the comments of Nest Labs on the Technical Reference Manual 2016 Update, along with the four attachments referenced in the comments. If you have any questions regarding this filing, please call or email the undersigned.

Very truly yours,

Daniel P. Delaney
Counsel for Nest Labs

Enclosures

c: Megan G. Good (w/comments only)
Kriss Brown (w/comments only)

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Implementation of the Alternative Energy Portfolio Standards Act of 2004	:	
Standards for the Participation of Demand Side Management Resources - Technical Reference Manual 2016 Update	:	Docket No. M-2015-2469311

COMMENTS OF NEST LABS ON TECHNICAL REFERENCE MANUAL 2016 UPDATE

Introduction

Nest Labs is responding herein to the request for comments on the "2016 TRM ANNUAL UPDATE Tentative Order" entered March 26, 2015, in Docket No. M-2015-2469311.

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. Today, Nest products are sold in the U.S., U.K., Ireland, Canada, France, Belgium, and the Netherlands, and are installed in more than 120 countries. Nest is a wholly-owned subsidiary of Google Inc. and is based in Palo Alto, California.

Nest manufactures 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 similar to those required under Act 129.

Nest's interest in this proceeding is that its thermostat could be a measure used by utilities to achieve their goals in Phase III of Act 129 but not being included in the TRM may create a barrier to utility adoption.

Questions about these comments can be directed to:

Rick Counihan
Head of Energy Regulatory and Government Affairs
Nest Labs
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Summary of Request

The Commission should require the Bureau of Technical Utility Services (TUS), in collaboration with the Statewide Evaluator (SWE), to add an additional new residential EE&C protocol to the TRM for smart, internet connected thermostats (SICTs). Failing that, the Commission should allow an update process so that new technologies, such as Nest Thermostats, do not have to wait until 2021 to be included in the TRM.

Background

Since the 2009 TRM, the Commission determined that the TRM would be updated on an annual basis.[1] This annual update allowed new measures and technologies to be added to the list of approved energy efficiency measures which could be included in the EDC's Energy Efficiency and Conservation (EE&C) plans.

Now, the Commission has proposed that the 2016 TRM be applicable for the entirety of Phase III, unless a mid-phase update was deemed necessary by the Commission.[2] The Commission also proposes to implement a five-year Phase III of the Act 129 EE&C Program that would operate from June 1, 2016 through May 31, 2021.[3] The combination of these two proposals means that new measures or technologies might have to wait until 2021 before they can be considered for inclusion in the TRM. Together, these proposals would eliminate the annual update at a time when technological innovation is, if anything, accelerating with new lighting technologies, and particularly new smarter appliances. As shown below, Nest learning thermostats can provide energy savings today and should not have to wait five years to be included in the TRM.

Traditional Programmable Thermostats

Traditional programmable thermostats (PTs) are currently included in the TRM.[4] These thermostats allow customers to set up a pre-programmed schedule for raising or lowering the temperature in the home, but do not have 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 a non-programmable thermostats with

[1] 2016 TRM Annual Update Tentative Order; p. 2.

[2] *Id.* at 2.

[3] Tentative Implementation Order; Docket No. M-2014-2424864; March 11, 2015; p. 16.

[4] *Proposed* Technical Resource Manual; Pennsylvania Public Utility Commission; June 2016; pp 77-79.

people turning them up or down when they remember. Even if a PT is programmed initially, they are often overridden at some point in the future and then not reprogrammed. This override could happen for any number of reasons; a house full of guests, unusual weather, whatever. The U.S. EPA originally had an Energy Star designation for PTs to encourage their use compared to non-programmable thermostats but dropped it in 2009 because it was not clear that they really saved energy in the field.[5]

Smart, Communicating Thermostats

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

Recent Studies Show that SCTs Can save 10 to 15% of HVAC Energy

The SWE included "Smart Thermostats" in its EE Potential Study which the Commission is using 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.[6]

The Energy Trust of Oregon (ETO) recently released a study of Nest thermostats used with electric heat pump heating. The Energy Trust runs the energy efficiency programs for all the utilities in Oregon and as such is the implementer of the Oregon equivalent of Act 129. The ETO found that the thermostats saved 12 % on heating electricity use.[7] (Copy attached)

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.[8]

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[5] Memo to Stakeholder—Notification of Specification Suspension of Energy Star Designation for Programmable Thermostats"; U.S. EPA; May 4, 2009; https://www.energystar.gov/ia/partners/prod_development/revisions/downloads/thermostats/Spec_Suspension_Memo_May2009.pdf?8676-39e5

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

[7] Energy Trust of Oregon Nest Thermostat Heat Pump Control Pilot Evaluation, by Apex Analytics, Oct. 10, 2014, p.1-1

[8] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Vectren Corporation; prepared by Cadmus Group, January 29, 2015, p. 3.

The Vectren study also showed significant savings, in the 10 percent range on the heating side in natural gas heated homes, even thought Act 129 only covers electricity such savings would be a benefit to citizens of the Commonwealth. (Study attached)

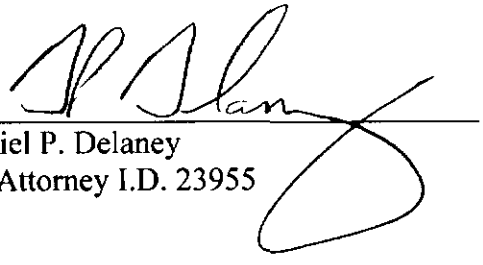
NIPSCO, another electric and gas utility in northern Indiana did a similar study with similar results: 16% savings on air-conditioning electric usage.[9] (Study attached)

Finally, Nest has done its own study on Nest users across the country and found an average 17% savings on air-conditioning electric usage.[10] (Study attached)

Conclusion

Smart, communicating thermostats from Nest Labs and other manufacturers are becoming more popular across the country and the Commonwealth. Several recent studies indicate that they can save customers 10-15% on their heating and cooling usage. The proposed 2016 TRM already includes traditional Programmable Thermostats which are likely to save less energy that SCTs. The Commission should require the Bureau of Technical Utility Services, in collaboration with the Statewide Evaluator, to add an additional new residential EE&C protocol to the TRM for smart, communicating thermostats. Failing that, the Commission should require an update process so that new technologies, such as SCTs, do not have to wait until 2021 to be included in the TRM.

Respectfully submitted,



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Dated: May 11, 2015

[9] 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

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

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Implementation of the Alternative Energy Portfolio Standards Act of 2004 Standards for the Participation of Demand Side Management Resources - Technical Reference Manual 2016 Update	:	Docket No. M-2015-2469311

VERIFICATION

I, Richard H. Counihan, hereby state that I am Head of Energy Regulatory and Government Affairs for Nest Labs, I am authorized to make this Verification on behalf of the Company in this matter, that the information set forth in the foregoing Comments On Technical Reference Manual 2016 Update are true and correct to the best of my knowledge, information and belief and that I expect to be able to prove the same at any hearing held in this matter. I understand that the statements in this Verification are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Date: May 11, 2015

Richard H. Counihan