ecobee

Date: April 5, 2019
Re: Comments regarding Commission Staff report on New Hampshire utility grid modernization

Thank you for the opportunity to comment on the Staff report on New Hampshire utility grid modernization. ecobee appreciates this opportunity and is submitting comments to highlight how ecobee smart thermostats provide a number of solutions to objectives listed in the Staff report.

A smart thermostat is a device that regulates a home's temperature by controlling HVAC equipment and allows users to designate a schedule through home and away set points. What distinguishes a smart thermostat from a basic programmable thermostat is that a smart thermostat is Wi-Fi-enabled and connects with an application on a smartphone or tablet, which allows users to monitor and control their heating and cooling remotely. This connectivity enables manufacturers to add and adjust features and user settings.

What distinguishes smart thermostats from WiFi-enabled programmable thermostats is the ability to make automated adjustments to the setpoint of HVAC systems through special features. These features include occupancy sensing, which identifies when a home is vacant, learning algorithms that use machine learning to establish customer temperature preferences, and geolocation, which determines a customer's proximity to home. These features serve to keep customers comfortable when they are home and save them energy when they are away from home.

Smart thermostats have additional features that can further energy savings, such as time- of-use optimization and demand response capabilities. Additionally, smart thermostats can serve as a customer education tool and encourage energy efficient behavior by providing detailed reports on heating and cooling usage with energy saving tips and can identify problems with HVAC systems and provide maintenance alerts. Additional features include voice control, virtual assistants, weather information displays and communication and control abilities for other energy-using devices. Smart thermostats automate achieving energy savings and peak demand reduction.

The Department of Energy's results from 70 smart grid investment grant projects that implemented AMI data and customer system technologies found that pairing enabling technology automation with time varying rates delivers the most customer and system-wide benefits.[1] While advanced meter infrastructure is necessary to inform time-varying pricing, these studies show that in order to deliver the greatest benefits to customers and the grid, this information needs to be paired with enabling technologies that can

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[1] https://www.energy.gov/sites/prod/files/2016/12/f34/AMI%20Summary%20Report_09-26-16.pdf p. 6

automate customer response to time-of-use rates and demand response events, such as ecobee smart thermostats which automate achieving energy savings and peak demand reduction and offer time-of-use optimization.

The Commission and the Grid Mod Working Group laid out the following objectives in the staff report

- Improve resiliency
- Reduce generation, transmission and distribution costs
- Empower customers to use electricity more efficiently and lower their electricity bills
- Keep New Hampshire technologically innovative, economically competitive, in step with region
- Reduce environmental impacts and carbon emissions

Smart thermostats offer a solution to achieve many of these objectives.

Improve resiliency: ecobee smart thermostats can automatically adjust the temperature for time-of-use rates while maintaining a customer's comfort.[2] By pre-cooling a home just before peak times, smart thermostats allow customers to load shift and shape a major driver of energy consumption around time-of-use rates. This can result in significant energy bill savings. The Electric Power Research Institute's pre-cooling analyses have found that smart thermostats can act as energy storage at a fraction of cost.[3]

Reduce generation, transmission and distribution costs: Smart thermostats automate achieving peak demand reduction by allowing customers to participate more easily in utility demand response programs. Studies show that these devices can provide utilities with as much as 1.7kW or more than 50% of whole-house load during the cooling season.[4] Participation in such programs at scale can provide significant peak demand reductions by lowering individual peak load contributions and the system-wide coincident peak. This can avoid the need to run expensive peaker plants on the hottest summer days, reduce the need for capacity procurements, and prevent investments in unnecessary delivery service infrastructure. Smart thermostats are a type of non-wire alternative that can defer or avoid more expensive distribution system investments.

Empower customers to use electricity more efficiently and lower their electricity bills: ecobee smart thermostats automate achieving energy savings resulting in significant electricity bill savings. The US EPA currently has an ENERGY STAR certification specification for smart thermostats. In order to qualify as an ENERGY STAR-certified smart thermostat, the manufacturer of the product has to demonstrate a minimum of

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[2] https://www.ecobee.com/introducing-peak-relief/
[3] The EPRI study can be accessed at https://aceee.org/files/proceedings/2016/data/papers/2_172.pdf.
[4] SGCC Figure 4 and SMUD's Residential Summer Solutions Study 2011-2012, accessible at http://docs.cpuc.ca.gOv/PubiishedDocs/SupDoc/A1712011/1833/248053590.pdf.

10% cooling and 8% heating energy savings by supplying actual performance data from thermostats in the field.[5]

Keep New Hampshire technologically innovative, economically competitive, in step with region: One important advantage of smart thermostats is that manufacturers and service providers can update software to refine existing features, add new ones, or adjust user settings. These updates can have a significant impact on energy performance and keep the product technologically innovative.

Reduce environmental impacts and carbon emissions: This all results in reducing environmental impacts and carbon emissions. To date, ecobee customers have saved an estimated three terawatts of energy which is equal to preventing 2.6 million tons of greenhouse gas emissions. These energy savings are equivalent to taking the city of Pittsburgh off-the-grid for a year.

Lastly, another recommendations in the Staff Report is to identify related dockets and determine how to integrate them in the grid modernization initiative.

Staff identified related dockets as listed in Table ES-1.

Table ES- 1 Dockets Related to Grid Mod

Docket Topic	Docket Number
Distributed Generation Net Metering Tariff (and Time-of-Use Rates, Value of DER, and Locational Value Analysis)	DE 16-576
Interconnection Process	DE 15-271
Energy Efficiency Programs	DE 15-137, DE 14-216, DE 17-136
Peak Demand Reduction Goals	DE 16-714, DE 17-101
Utility DER Ownership/Time of Use Rate Design	DE 09-137, DE 17-189
Least Cost Integrated Resource Plans	DE 15-248, DE 16-097, DE 16-463
Distribution Service Rate Cases	DE 16-383, DE 16-384, DE 09-035
Utility Reliability Enhancement Programs (REPs)/Vegetation Management Programs (VMPs)	DE 16-383, DE 16-384, DE 17-196, DG 06-107, DE 10-055, DE 06-028

As noted above, smart thermostats fit into three of these dockets categories, energy efficiency programs, peak demand reduction goals and time of use rate design. For this reason, a smart thermostat rebate program fits seamlessly into a grid modernization initiative for all of the reasons outlined above.

Thank you,

Tamara Dzubay, Regulatory Affairs Manager, ecobee

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[5] ENERGY STAR. 2017. "Smart Thermostats Key Product Criteria," accessible at https://www.energystar.gov/products/heatmg_cooling/smart_thermostats/key_product_criteria.