September 22, 2023

Shalin Nayak, Senior Policy Advisor
Ontario Ministry of Energy
Conservation and Renewable Energy Division
77 Grenville Street
Toronto, ON
M7A 2C1
Canada

RE: ERO #019-7401; RESPONSE OF ECOBEE AND GENERAC POWER SYSTEMS TO INFORMATION NOTICE SOLICITING FEEDBACK ON THE FUTURE OF ONTARIO'S ENERGY EFFICIENCY PROGRAMS

Dear Mr. Nayak,

ecobee and Generac are pleased to respond to the Ministry of Energy's voluntary Information Notice seeking input ahead of the launch of a new conservation and demand management (CDM) framework in 2025. ecobee is a leading developer of smart thermostat technology for homes and businesses that is headquartered in Toronto, Ontario. Today, ecobee devices are installed in millions of homes across North America and collectively have delivered over 25 TWh of energy savings, which is the equivalent of taking all the homes in Los Angeles, California off the grid for one year. We estimate our customers save up to 26% on their heating and cooling costs.

ecobee is part of the Generac Power Systems family of clean and resilient energy technology solutions, which power a smarter world. Generac is a leading resiliency provider with over 60 years of experience manufacturing and deploying solutions for residential and commercial needs alike. , Generac is creating a cleaner, more resilient grid that is nimble in responding to real-time conditions and resilient in all circumstances. Generac provides batteries, smart thermostats, and software applications that can augment the existing asset base to work better together. ecobee is proud to be recognized as a US EPA ENERGY STAR partner of the year for our leadership, innovation and commitment to environmental protection through energy efficiency.

ecobee's and Generac's responses to select questions from the Information Notice are provided below.

1. How sufficient are the current primary objectives and targets for addressing evolving system and customer needs?

   The existing Framework established a target of 440 megawatts (MW) of peak demand savings and 2.7 terawatt-hours (Twh) of energy savings over four years, with much greater potential savings to be realized in future frameworks.

   The October 4, 2022 ministerial directive instructed the Independent Electricity System Operator (IESO) to enhance the CDM with the delivery of a new residential demand response program, bringing greater focus within the framework to the use of demand-side solutions to avoid traditional infrastructure investments, achieve provincial peak demand reductions and address other local system needs.

   The forthcoming CDM should preserve the residential demand response program and set a higher target for demand response in the new framework period. Setting out a central standard aligns the incentives of utilities to scale programs and automation technology vendors to build product and service offerings that, together, can scale demand response to serve as a truly load-modifying resource that can serve as a cost-effective asset to the grid in response to emerging system needs.

2. Should additional objectives or targets be considered when developing electricity energy efficiency programming? For example objectives and/or targets relating to beneficial electrification, overall grid efficiency including demand flexibility, electricity bill reduction, etc.

   ecobee and Generac Power Systems have been strong proponents of a demand flexibility target issued by any jurisdiction that wishes to align incentives for utilities, demand management technology manufacturers and customers to participate in programs at sufficient scale to realize the full potential of this resource. California's Load Management Standards[1] and the Massachusetts Clean Peak Standard[2] are examples of targets that promote and leverage the value of demand flexibility. We echo Uplight's call for peak demand reduction targets that account for the total system benefits of distributed energy resources (DERs).

   Demand flexibility influences energy consumption up or down to reduce grid strain, consume clean energy and save money for customers and grid operators. It depends on smart technology like software and AI to manage energy continuously, rather than in response to single events. It can be facilitated by not only establishing time-varying customer electricity rates such as the default time of use (TOU) rates currently effect in

[1] https://www.energy.ca.gov/sites/default/files/2022-10/Load_Management_Fact_Sheet_ADA.pdf
[2] https://www.mass.gov/clean-peak-energy-standard

Ontario, but also encouraging automated response to those rates at scale through load management agreements in which consumers are compensated for the grid value of their response. Such agreements are necessary to align utility and customer incentives and attract the investment of vendors so that such rates can scale sufficiently to leverage the full potential of the resource.

They have the added benefit of giving the grid operator visibility into the impact of devices currently on the system; Ontario, which is one of ecobee's largest markets, has over a hundred thousand smart thermostats currently optimizing residential HVAC usage around the peak hours. This represents approximately 25 MW of load shift daily from ecobee devices alone, but this impact on the load profile is unknown to the grid operator and left out of planning exercises. Finally, research shows that demand flexibility can unlock billions annually in avoided grid investments and 10-40% savings on customers' bills when implemented.[3]

As with demand response, a standard for demand flexibility will be key to aligning utility and vendor incentives to achieve meaningful scale of this resource. Targets drive incentive offerings that activate new markets for vendors of automation technologies that facilitate flexibility for residential loads. Introducing targets helps "de-risk" investments by technology and software vendors, who are poised to continue offering connected demand-side devices and energy services offerings in jurisdictions where customer value is clear, customer enrollment is streamlined and device or service uptake is incentivized.

The Ministry of Energy should also consider adopting targets designed to increase the penetration of distributed energy resources among low and moderate income (LMI) customer classes. Automation technology that optimizes consumption around TOU, premise occupancy, and other variables can help these customers achieve persistent, incremental savings of 7-23% on home cooling[4]. Setting and achieving such a target would represent a win-win for the Province and the LMI segment, preserving grid reliability and avoiding additional costs, which would fall most heavily on the customers least able to pay.

Finally, a demand flexibility target tied to a provincial climate goal would further unlock the potential of DERs to avoid overbuilding fossil generation, reduce fossil plant runtime and avoid renewable generation curtailment or the need to export renewable energy at a loss.

Holistically integrating demand flexibility into provincial policy objectives like decarbonization, economic development, grid resiliency and LMI access, will ensure that Ontario is positioned to fully leverage emerging technologies and energy services to maximize benefits for ratepayers.

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[3] Conservative estimates of the economic potential of demand flexibility indicate it can help avoid billions of dollars' worth of traditional grid investments annually, while preserving customer home comfort and reducing their energy bills. https://rmi.org/insight/the-economics-of-demand-flexibility/

[4] Customers on time-of-use rates who were most at risk of experiencing higher bills were able to save 7-23% on cooling costs in 2020 by enabling the eco+ suite of software on their ecobee smart thermostat. https://www.ecobee.com/en-us/newsroom/press-releases/new-evaluation-report-proves-ecobee-smart-thermostats-save/

3. Does this CDM definition [for electricity energy efficiency programming] appropriately capture DER, and demand response, and other opportunities arising from new technologies and business models that enable greater customer choice to achieve more electricity savings within CDM? If not, what changes should be made recognizing there may be other revenue options and models that may become available to DERs (e.g., local and wholesale electricity markets) outside of CDM?

   It does not. The definition should distinguish "energy efficiency," "demand response" and "demand flexibility" to emphasize the different capabilities of these resources to serve customers and the grid, and to encourage programs that stack them to realize the full potential of demand-side management.

   A better definition of electricity energy efficiency programming under the forthcoming CDM Framework might be:

   "The IESO shall consider CDM to be inclusive of activities aimed at reducing or shifting peak electricity demand, improving load flexibility, reducing greenhouse gas emissions and reducing economy-wide energy consumption. Examples of CDM include energy efficiency replacements whereby similar output is achieved with less electricity, behind-the-meter consumer generation, load flexibility measures like virtual power plants (VPPs), and demand-side management tools such as demand response, time-varying rates, and emergency grid resiliency programs."

   Further, the definition of "programming" should specify that rates alone are not enough – Ontario has default TOU but no visibility into the actions energy customers in the Province are taking to shift their usage away from peak hours. Creating programs with market incentives to scale automation around default TOU that incent additional participation will further scale the impact of the resource and provide greater visibility and predictability for grid operating and forecasting purposes.

4. Should the definition consider additional elements such as beneficial electrification?

   Yes, the definition should consider "beneficial electrification." For the first time in years, the load on the electric grid is being encouraged to grow rather than shrink. To achieve emissions reductions targets, local and federal governments across North America are encouraging the "electrification of everything."

   As a result, the load and flexible capacity on the demand side has become a critical factor in ensuring resource adequacy as the clean energy transition and beneficial electrification roll out. Including a definition and a target or standard will help all the stakeholders on the supply, delivery, demand and demand optimization spectrum of energy generation and consumption to align incentives that drive, for example, the adoption of heat pumps and other emissions-saving and reliability-bolstering measures.

This should also highlight the need for distributed energy resource (DER) management to help shift and shave electricity demand as beneficial electrification grows, reducing the strain on grid infrastructure while avoiding the need for new or continued reliance on fossil baseload generation. Because beneficial electrification contemplates so many types of connected devices that can be aggregated to provide significant reliable capacity in the form of virtual power plants (VPPs), or that can interact bidirectionally with the grid, defining the various types of DERs, VPPs and DER management and setting targets and standards related to them is equally important. Program architectures should be built around technology-specific approaches designed to maximize the capabilities of the devices in question, and a unique definition and use cases for each asset type is an important starting point.

8. In the context of the energy transition and growing electrification needs, how can electricity energy efficiency programs be better integrated into electricity distribution and transmission system planning as well as resource procurements?

Resource procurement should consider the roles DERs can play in obviating the need for incremental distribution and transmission capacity. DERs can help make the electrification journey more affordable and reliable – in many cases by leveraging devices that are already impacting the load shape in Ontario. Harnessing these and others through incentive programs that drive down to operational programs could put significant downward pressure on the resources required to supply load.

As Ontario grapples with an impending resource shortfall, it would do well to model California's flexible load goal and incent load-serving entities to leverage demand-side resources alongside traditional supply-side ones to keep the grid clean and functional.

DERs can also be effective as non-wires alternative (NWA) solutions to defer grid investments. One such program in Canada, the York Region Non-Wires Alternatives Demonstration Project[5], is innovating just such a solution. The white paper[6] informing the program suggests that DERs provide stackable values – both network infrastructure and transmission-connected resources. With large fleets of connected devices already installed in its service territory, Ontario would do well to leverage their value as NWA.

12. What additional support is needed to get customers to undertake more energy efficiency?

The policy frameworks to enable successful energy efficiency programs include government-funded incentive and installation programs that discount the price of smart thermostats to end consumers in exchange for their pre-enrollment into demand response programs.

[5] https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/IESO-York-Region-Non-Wires-Alternatives-Demonstration-Project

[6] https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Innovation-and-Sector-Evolution-White-Paper-Series

The most successful programs have set ambitious budgets and goals and have invested heavily in marketing, such as the Green Ontario Fund's investment of tens of millions of dollars into a free smart thermostat with free installation program[7] that deployed over 135,000 smart thermostats to Ontario residents in a matter of months. The program was quickly over-subscribed within 72 hours of launch and reached its cap.

In the US, Commonwealth Edison set a goal to deploy 1 million smart thermostats to its customers in 5 years through a smart thermostat rebate program that in total would dedicate $100 million to achieve this objective.

These programs have been highly successful and can serve as a model for the MOE as it seeks to incentivize cost-effective solutions to coming resource needs. The key elements of a successful program are:

- A free device offer, which increases customer adoption in ecobee's experience by 10x;
- Pre-enrollment in a demand response program;
- Simple access to the program;
- Complimentary direct installation, which also increases adoption and ensures that devices are installed promptly so they can immediately contribute to grid stability; and
- A reasonable investment in marketing awareness.

The key is to deploy technology that can intelligently automate customer usage in response to grid conditions to maximize energy savings while maintaining customer comfort to minimize customer opt-outs and program attrition. Ecobee devices do this through advanced personalized optimizations that adjust for customer comfort, humidity, occupancy, energy prices and grid conditions.

Finally, there is an opportunity to leverage anonymized data to drive smarter policies and programs in the future.

13. What should the government consider when communicating the benefits and motivations behind energy efficiency programs to encourage participation and improve public awareness?

There are two categories of reward that should be marketed to customers to encourage their participation in energy efficiency, demand response and demand flexibility programs: individual household energy bill savings, and direct financial incentives for participation in these programs.

However, in their marketing, utilities often describe customer incentives and bill savings in vague, high-level ways. To earn trust and to improve public awareness through word of mouth, it is essential that these be explained in specific terms so that the value proposition is

[7] https://news.ontario.ca/en/release/47504/helping-families-save-money-and-fight-climate-change-at-home

immediately apparent – and to avoid unpleasant surprises that follow a customer's failure to understand the terms of participation in a demand-side management program.

It has also been a key feature of ecobee's marketing to ensure customers that they are always in control of their devices and their comfort in their home; ecobee customers can opt their devices out of demand events at any time and will never lose control of their device to a third party. This again helps ensure that we remain a trusted guest in the customer's home and ensure that customers are not afraid or reluctant to enroll and participate to the greatest extent possible.

Finally, Ontario ought to continue to spread awareness that there is a coming resource shortfall, and that, by pulling together in intentional, convenient energy management programs, we can ensure a reliable grid for all.

14. Are there best practices from other jurisdictions on improving customer engagement in energy efficiency, particularly for the hard-to-reach segments?

Involving IQ customers in DR programs can help bolster their potential to improve the grid for everyone, especially those most impacted by energy inequality. There are four important considerations to bear in mind when it comes to conducting outreach to IQ customers.

First, ease of enrollment is paramount. Requiring enrollees to provide a utility account number, scan a QR code, or leave a program enrollment flow to fill out a separate form can mean that as many as twenty times fewer otherwise willing participants ultimately enroll in programs, dramatically limiting their effectiveness. Ensuring that customers can enroll with a single click during device set-up resolves this risk. This may mean that customers sign terms and conditions allowing ecobee to act as their agent to their utility and connect them to eligible rates and programs using information such as residential premise address to match device owners with rate information "behind the scenes."

Second, only, about 50% of IQ customers have internet access at home, so digital marketing efforts may not be effective in reaching them. Instead, utilities should partner with community organizations and stakeholders who are trusted by members of their community. The US EPA points to the example of DTE Energy in Michigan, which partnered with more than 30 agencies and organizations to successfully expand its Energy Efficiency Assistance Program.

Third, utilities must engage closely with service providers handling installation of EE resources and DR-enabling technology for IQ customers. In Illinois, Ameren Illinois' Smart Savers Initiative contracts with local HVAC and contractor small businesses, many of which are diverse, woman- or veteran-owned to install free devices in low-income residences and multifamily properties. They also partner with a non-profit packaging provider that employs disabled and challenged local residents to package and ship Smart Savers thermostats. Utility engagement with contractors should include expectations and guidelines that improve program accessibility, such as scheduling longer installation appointments to show customers how to use their new devices or scheduling outside of standard working hours to accommodate those working night shifts.

Finally, ensure single-family homeowners, tenants in multifamily buildings[8], and owners of multifamily properties all benefit from cost savings and grid resiliency by ensuring that utilities provide accessible information to drive program participation. That means translating information into the language commonly spoken in certain areas or considering readability for senior citizens. The program explanations must be clear and free of jargon, while any program incentives are simply articulated and easy to redeem.

15. How can we make better use of technology to achieve our electricity energy efficiency goals?

In the rapidly approaching future of renewable energy generation and the electrification of everything, customer participation through demand-side management will be a key component of ensuring grid reliability. And, as residents and businesses increasingly demand green electrons to power their homes and businesses, they will require automation solutions to allow them to respond to congestion or GHG signals on the grid.

Even the most sophisticated energy consumers will not be able to manually optimize their usage in response to constantly changing grid conditions or generation mix proportions. Enabling automation technology vendors to enroll their customers easily and seamlessly in programs such as time of use, demand response, or real-time pricing will maximize participation in these programs and drive significantly greater load reduction impacts from automating responses rather than relying on behavioral responses[9] – but the customer experience is key.

Customers should not be required to provide a utility account number, scan a QR code or navigate the cumbersome Green Button Connect program to securely and seamlessly enroll in the rates and programs described here. Experience has shown that the customer enrollment funnel collapses at the point at which a customer is distracted from the enrollment flow by having to collect a data point they do not have memorized or fill out a separate form. The California Energy Commission issued a report describing how EnergyHub enrolled just 3% of the eligible customers it targeted for a demand response auction mechanism – due exclusively to the fact that customers experienced barriers to enrollment such as those described here.

These barriers are also having a dramatic adverse impact on ecobee's ability to enroll customers in its CAISO-integrated Cali ecosave program, since customers find it overly burdensome to complete the Share My Data process to complete program enrollment. This

[8] ComEd Illinois now allows its energy efficiency thermostat rebates to be accessed by multifamily building owners as part of its initiative to install 1 million smart thermostats in their service territory. They found there was a limitation in the original program rules that limited the rebate to one purchase per account and developed a tool for multifamily building owners to access rebates in bulk which helped drive multifamily energy efficiency programs. See https://www.utilitydive.com/news/comed-targets-1m-smart-thermostats-by-2020/407083/ and https://www.washingtonpost.com/news/energy-environment/wp/2015/10/08/chicagos-top-power-company-wants-to-install-a-million-smart-thermostats-in-homes-by-2020/ and https://energynews.us/2015/10/08/chicago-program-aims-for-1-million-smart-thermostats/.

[9] https://www.utilitydive.com/spons/3-reasons-why-automation-technology-is-key-to-time-based-pricing-success/588837/ and www.ecobee.com/ecoplusEMV

will potentially leave tens of megawatts of flexible capacity on the table in California's hot zones, places that would greatly benefit from every additional kilowatt of flexible capacity.

Additionally, it is critical to ensure that a portfolio of rates and programs are stackable and allow demand-side technology to maximize the customer's value creation for the grid. Noncomplementary programs, such as California's NEM 3.0, Time of Use, and Demand Side Grid Support programs, mean that aggregators must make choices about where they participate. It is difficult to explain to customers that their devices need to sit out of certain eligible programs to maximize their bill savings, meanwhile the grid operator is failing to realize full value from the technology on the grid. Successful program roadmaps will drive programs that capture the full potential of emerging technologies, ranging from capacity to energy and ancillary services. And they will leverage the full capability of technology, recognizing that use cases differ by asset.

Finally, device runtime data should be used to inform and manage programs. The telemetry data from ecobee and Generac products is near revenue-grade quality, and, importantly, available in near-real time for measurement, verification and settlement purposes. Device owners consent to terms and conditions that allow ecobee and Generac to share certain information with their load-serving entity, allowing vendors to share valuable insights with grid operators as well.

19. The IESO's MidTerm review of the 2021-2024 CDM Framework, including programming, was released in December 2022. Please share any further feedback on any of the existing programming, including opportunities for improvement or lessons learned from other jurisdictions.

Ideal models for any future programming should include the Smart Meter Texas Program, California Market Access Program, the Connecticut Energy Storage Solutions Program, and the Massachusetts Clean Peak Standard.

- The Smart Meter Texas Program is a model for effective customer enrollment. It maintains a database of customer rate identifiers that allow ecobee to identify eligible rates for its device owners by using their residential premise address, which is collected during device setup, to locate their applicable utility rates and programs in the SMT database. Customers can easily enroll with a single click, eliminating the enrollment-based barriers to program scale described above.
- The California Market Access Program offers a "total system benefits" approach that encompass avoided costs, GHG emissions and the value tied to specific times when demand-side resources support the grid.
- The Massachusetts Clean Peak Standard sets clean energy requirements for peak demand periods and issues credits with seasonal multipliers for summer and winter that are based on device telemetry data.

Thank you for the opportunity to provide these comments about the future of Ontario's energy efficiency and conservation programs. We look forward to additional participation in the process.

Respectfully,

Kahryn Riley
Senior Manager, Policy & Regulatory Affairs
Kahryn.Riley@generac.com