Virtual Peaker

EnergyUnited
YOUR LOCAL CONNECTION

North Carolina's Largest Electric Cooperative Saves with DERs and Behavioral Demand Response

Learn how EnergyUnited is leveraging connected thermostats to save their members energy and money using Virtual Peaker's DERMS and Customer Engagement Suites.

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Peak Time Perks

Overview

In July 2020, Statesville-based EnergyUnited, North Carolina's largest electric cooperative and second-largest supplier of residential electricity, partnered with Virtual Peaker to create a new demand response program for its members, Peak Time Perks. This program engages EnergyUnited cooperative members in reducing energy consumption during peak periods, saving the entire cooperative money in the process.

Peak Time Perks program provides incentives—an initial $50 electric bill credit, plus an additional $20 credit for each subsequent year—for members who enroll their Google Nest, ecobee, or Honeywell Home smart thermostat. Leveraging these thermostats' cloud-based IoT technology, members are rewarded for virtually sharing their devices with EnergyUnited. During strategic hours on specific days, the utility makes temporary adjustments to customers' thermostats to curtail the effects of high electricity demand. Participating members receive notifications through text and email when their thermostats will be remotely adjusted, and always have the option to opt out.

"Since we started providing electricity services in the late 1930s, EnergyUnited has grown significantly, now serving almost 130,000 metering points in 19 counties, yet we've always remained committed to delivering reliable energy services at competitive prices," said Thomas Golden, chief executive officer at EnergyUnited. "The Peak Time Perks program is just the latest example of how we strive to improve the quality of life for our co-op members."

The Challenge

EnergyUnited created the Peak Time Perks program to help reduce their power purchasing costs, engage with participants, and help keep rates low for all their members. Reducing peak energy demand through small, temporary adjustments to program thermostats helps reduce "rate pressure" for the utility, allowing it to keep rates lower than they would otherwise be.

The Solution

Using Relay, Virtual Peaker's Customer Engagement suite, customers provide basic information in a mobile-responsive webform and are then guided through their thermostat manufacturer's specific application. Once this application process is complete, the customer care team at EnergyUnited reviews and approves their application and processes the customer's device rebate. This process automatically authorizes and authenticates wifi-enabled devices and gives insight to EnergyUnited on the customer's HVAC energy use and demand response participation.

Once a thermostat is enrolled and approved, the utility can view real-time aggregated device information, and construct peak shaving events using Virtual Peaker's primary software, Shift. Program managers easily log into the secure web-based portal and schedule events ahead of time, allowing them to attach notifications to communicate with participants via email, SMS, or both. Once an event is completed, EnergyUnited can view reporting on the event's performance.

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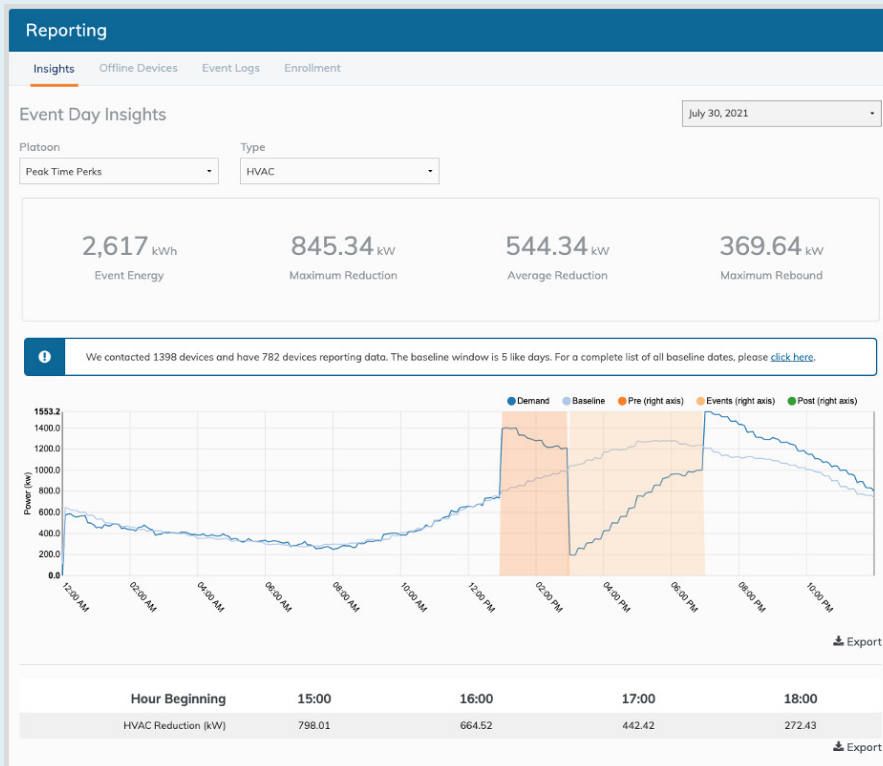
The Outcomes

ENERGY SAVINGS

After less than a year of customer recruitment, the utility was able to enroll over 1,000 devices into Peak Time Perks. In the summer of 2021, EnergyUnited initiated six demand response events during predicted peak days and hit nine of the ten major peak hours (EnergyUnited's model is based on the top ten hours with Southern Company, a major supplier of energy in the region).

This event also contained a pre-cooling period in the hour before the event window started at 3 pm, which prompted the increased energy consumption of participants' HVAC systems, and created additional comfort during the actual event window. This practice of precooling helps ensure that the strategic hours of the event see the most participation, and slows the rate of customer opt-outs (customer opt-outs are the reason behind the gradual slope upwards of the actual demand seen in this example report).

EnergyUnited: 2021 DR Event Summary
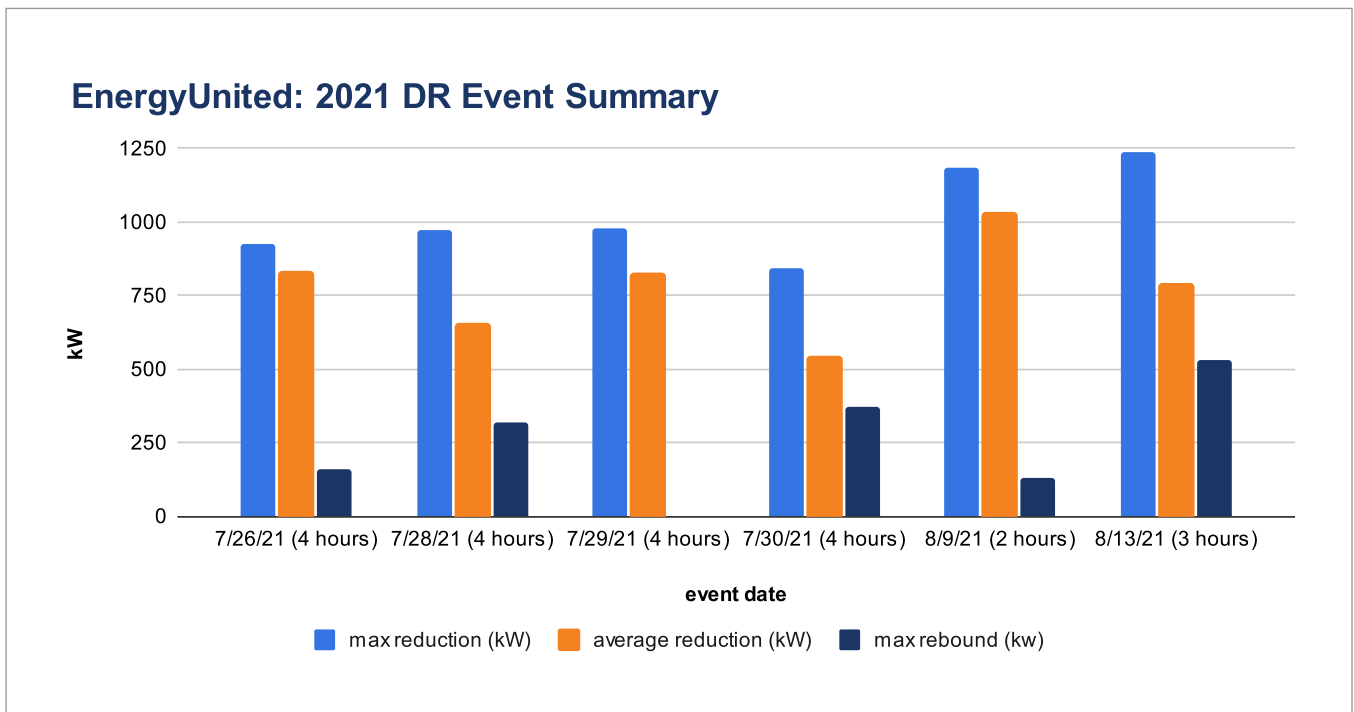
event date	event energy (kWh)	max reduction (kW)	average reduction (kW)	max rebound (kw)	event length (h)	devices contacted
7/26/21	1810	922.67	829.38	160.49	4	918
7/28/21	2885	972.68	652.84	317.02	4	920
7/29/21	2290	979.97	823.37	0	4	806
7/30/21	2617	845.34	544.34	369.64	4	782
8/9/21	997	1184.97	1031.7	130.38	2	1073
8/13/21	2705	1239.36	791.4	529.29	3	1129

▶ *About the data: The event energy value represents the energy consumed by the units contacted during the event window, and the maximum reduction is the calculated greatest savings between the baseline and the actual consumption over the course of the event window. The average reduction is the calculated savings over every hour of the event in comparison to the baseline. Maximum rebound refers to the energy consumed greater than the baseline in the hour after the event window.*

Reporting

Insights   Offline Devices   Event Logs   Enrollment

Event Day Insights

July 30, 2021

Platoon
Peak Time Perks

Type
HVAC

2,617 kWh	845.34 kW	544.34 kW	369.64 kW
Event Energy	Maximum Reduction	Average Reduction	Maximum Rebound

ⓘ We contacted 1398 devices and have 782 devices reporting data. The baseline window is 5 like days. For a complete list of all baseline dates, please click here.

● Demand ● Baseline ● Pre (right axis) ● Events (right axis) ● Post (right axis)

⬇ Export

Hour Beginning	15:00	16:00	17:00	18:00
HVAC Reduction (kW)	798.01	664.52	442.42	272.43

⬇ Export

▶ *The event report to the left, is from July 30th, 2021. The reduction on the first hour of the event was 798kW, with the following hours' reductions at 664.52, 442.42, and 272.43, giving an average reduction of 544.32.*

▶ *The Virtual Peaker Enrollment Report provides more granular information to help identify why some devices were no longer responsive or present for peak shaving events.*
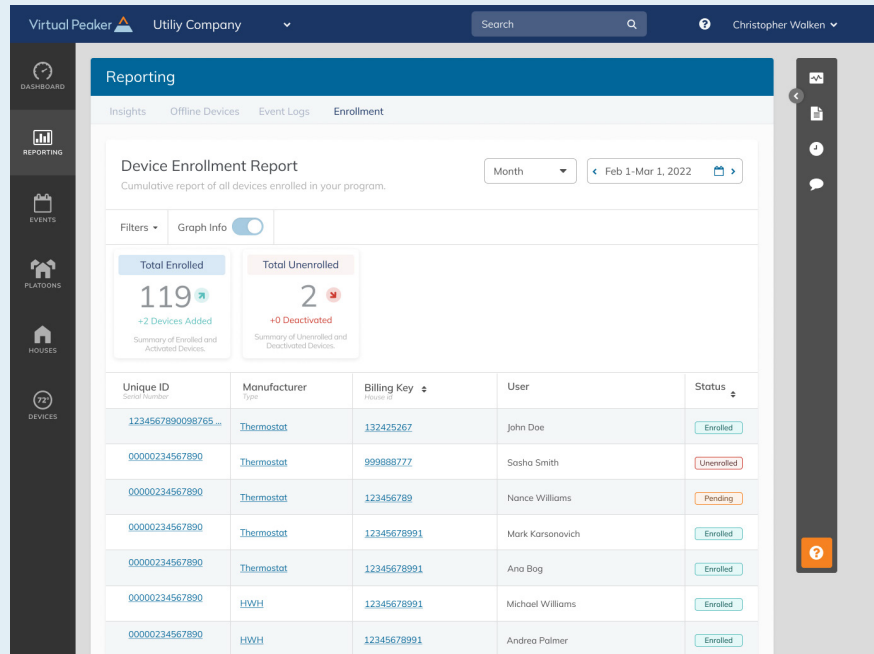
LESSONS LEARNED

The event results for the program provided dependable energy reductions and savings, benefiting all cooperative members. It should be noted that during the post-season analysis conducted independently at EnergyUnited, there were some minor disparities between the utility's real-time AMI data and Virtual Peaker's estimate. Some additional modeling will be necessary to accurately capture the true benefit, and both parties are working to overcome this challenge, with Virtual Peaker incorporating this critical product feedback to allow for customizable, adjustable baselining that may help account for some of these differences.

Additionally, from a customer engagement perspective there were lessons learned around the need to improve member education and reduce attrition from the program. "Some thermostat customers were quick to assume that any adjustments to their thermostat settings were us at the utility," says Nikolai Robles, "but they were not always aware that their devices themselves had learning algorithms and schedules which were making adjustments." The team at EnergyUnited took these initial complaints and points of contact with participating members to provide additional information around energy efficiency, device optimizations, and more, and reminding members that EnergyUnited will always notify them early in the morning on the day the peak event is scheduled.

Another concern raised from this first summer's experience centered around customer attrition. During the first year of the program, EnergyUnited noticed that some devices were no longer responsive or present for peak shaving events, and struggled to identify the reason behind this "unenrollment." The challenge is identifying which specific reason for this absence - whether a customer potentially unenrolled directly with their OEM, disconnected the device from wifi, or otherwise removed the device from being cloud-connected. In response, Virtual Peaker has worked to provide more granular information in our new Enrollment Report.

A positive lesson learned was the realization that the most important factor for initially engaging customers in the program was the upfront incentive to enroll that was offered. This specifically was the main drive behind members' interest in participating, and potentially increasing this upfront incentive.

The Conclusion

Overall, the first full summer curtailment season resulted in impactful energy savings, and helped lay the foundation for increased education and engagement with cooperative members. "We're having success and seeing savings with our members on the thermostat program and our next step for the thermostat program is to engage with our customers, even more, to show them specifically how much money - not just energy - they are saving the cooperative through their efforts," says Nikolai Robles, Energy Services Project Engineer at EnergyUnited, "now we're looking to integrate more technologies into the program, like electric vehicle chargers and energy storage systems."

▶ Learn how one of Virtual Peaker's suites can empower your operations. Reach out to **sales@virtual-peaker.com** and one of our experts will work with you to develop your program.

"

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- NIKOLAI ROBLES, Energy Services Project Engineer

About Virtual Peaker

Virtual Peaker is a cloud-based distributed energy platform that empowers modern utilities to build the grid of the future and meet global decarbonization goals. The SaaS company's platform suites unify all aspects of DER management, from DERMS to customer engagement and load forecasting. Virtual Peaker is a remote-first company based in the United States.

For more information, visit **www.virtual-peaker.com** and follow the company on LinkedIn and Twitter (@VirtualPeaker).

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