



CASE STUDY

Puget Sound Energy:

Using Real-Time Demand Response Technology to Defer Investments in Fossil Fuels

BACKGROUND

Headquartered in Bellevue, Puget Sound Energy (PSE) is Washington state's oldest local energy company, serving 1.1 million electric and 825,000 natural gas customers in a service area that covers more than 6,000 square miles. PSE is committed to providing great customer service by focusing on safe, reliable, affordable energy service.

PSE has been investigating non-residential demand response since 2001 as a cost-effective method for mitigating peak demand. In October 2017, PSE enlisted Generac Grid Services to begin implementing a winter capacity demand response pilot program. This pilot was designed to prove the value of demand response in PSE's service area. The primary objectives of the pilot were:

- Demonstrate new technology and a program methodology to validate ease of use and participation for customers
- Create a seamless enrollment and participation process for future participants

- Work with hand-selected pilot program customers to explore resource value and dispatch strategies, and then fine tune the program as the winter season progressed

APPROACH AND METHODOLOGY

Generac Grid Services and PSE created communications about the pilot and its benefits to identify and engage two large commercial and industrial customers in PSE's service area: Praxair Ferndale and King County South Treatment Plant. Both customers opted to participate on a voluntary basis to support the pilot and create opportunities for future program deployments.

Generac Grid Services provided a turn-key demand response solution by provisioning the customer sites into its virtual power plant (VPP) software application to monitor, control and optimize capacity curtailment in real-time. This allowed PSE to call demand response events, send automatic event notifications to participating customers and automatically aggregate and curtail capacity from participating sites during demand events.

The VPP's constraint-based control optimization ensured customer operations were not negatively affected by the demand response events – mitigating customer fatigue and attrition.

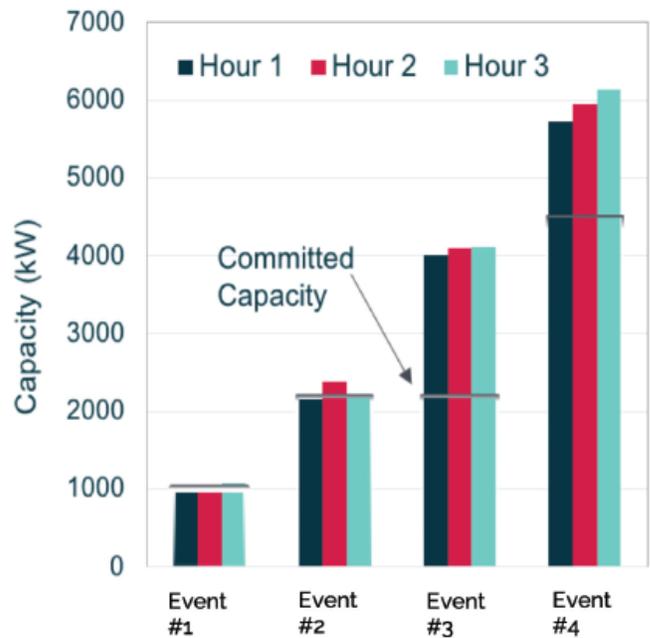
Program Details	
Program Period (Winter)	November 1 – February 28, 29 <ul style="list-style-type: none"> 7 a.m. to 10 a.m. 5 p.m. to 9 p.m.
Dispatch Notification	1 hour
Duration	Up to 3 hours
Event Cadence	Up to 2 events per day, max.
Requirements	Pilot Program is voluntary
Notification Strategy	Email or SMS

RESULTS

PSE called a total of four demand response events and one test event in the winter 2017 peak capacity season. The VPP platform automatically curtailed an average of 4.09 MW in the season, with a maximum capacity of over 6 MW – noticing significant performance improvements over time.



Capacity Performance



MOVING FORWARD

PSE's 2017 IRP identified that energy storage and demand response resources can help push the need for capacity resources out by eight years, to 2025. PSE estimates a need of 103 MW of capacity by 2023. With the success of this pilot, PSE is on its way to providing customers with even more reliable, sustainable and cost-effective energy services.

“Receiving an accurate power signal was a great outcome for Praxair from this project. This signal has streamlined our efforts and now underpins all our energy management planning at the plant.”

- CHRISTIAN LENCI, ASSOCIATE DIRECTOR OF ENERGY & ENGINEERING, PRAXAIR, INC.



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