



CASE STUDY

Urban Outfitters:

Using a Virtual Power Plant to Enable Grid Resiliency and Sustainability at The Philadelphia Navy Yard

BACKGROUND

The Philadelphia Navy Yard is a 1,200-acre, centrally-located, waterfront business park, developed and managed by the Philadelphia Industrial Development Corporation (PIDC), a non-profit organization founded by the City of Philadelphia and the Greater Philadelphia Chamber of Commerce. In 2006, Urban Outfitters Inc. joined the Navy Yard, identifying the business park — with its commitment to smart energy innovation — as the ideal place to streamline its multiple retail brand offices into a single location. Comprised of 14 buildings, 280,000 square feet and more than 2,000 employees, the Urban Outfitters Corporate Campus is one of the Navy Yard's largest tenants.

THE CHALLENGE

PECO supplies the Navy Yard with electricity as a single account, and PIDC then bills individual building owners and tenants, including Urban Outfitters, for their electricity use. The increasing use of renewable generation and distributed energy resources

(DERs) such as solar and energy storage, along with business customers' changing energy usage patterns, are leading to greater uncertainty and variability in the electric grid. To help manage peak demand and mitigate risks associated with these uncertainties, PECO has implemented demand time-of-use (TOU) tariffs.

PIDC is considering changing the fixed or block rates currently billed to their tenants in order to better reflect the TOU charges they are incurring. As an alternative, the Navy Yard tenants have the opportunity to participate in capacity relief programs to protect themselves from potential electricity cost increases.

THE SOLUTION

Utilities implement capacity relief programs to incentivize customers to reduce load during peak demand. This encourages reductions in energy waste and prevents rising costs while also allowing utilities to increase the reliability and economics of renewable energy initiatives. A new generation of communication

and control technologies such as virtual power plants (VPPs) allow utility customers to enable their loads to continuously respond to peak demand forecasts, changing renewable supply levels and other applicable market signals in order to save on their energy bills.

After identifying flexible assets at Urban Outfitters, Generac Grid Services installed an onsite gateway at the campus that communicates with the cloud-based, real-time control and optimization platform. The platform's implementation focused on PJM Demand Response (DR) and reduction of PJM Peak Load Contribution (PLC) — both of which are dispatched by PIDC to generate DR revenue and reduce PLC costs for the entire Navy Yard.

The solution takes local constraints into account, allowing Urban Outfitters to provide automatic capacity relief to realize bill savings while minimizing impact to their employees and operations.

RESULTS

After identifying demand-side flexibility at Urban Outfitters, nine buildings were integrated into the Concerto platform using a robust API. Local communication gateways were integrated with the building automation system to dispatch over 1,000 HVAC assets, including chillers, air handling units, heat pumps, chilled water distribution pumps and chilled water system cooling towers.

The Concerto VPP platform has been in operation at the Urban Outfitters campus since January 2018. To date, the Urban Outfitters' Corporate Campus has responded to nine DR events of two-to six-hour duration, curtailing an average of 230 kW per event.



THE BIG PICTURE

Concerto allows PIDC to cost-effectively and reliably manage dynamic changes in the grid by leveraging DERs, while maintaining the quality of service Urban Outfitters depends on for their business operations. The successful results of this project provide a clear direction for managing emerging energy generation and consumption patterns with the use of VPPs. This approach to integrating flexible loads and DERs into the grid could replace up to 4.5 GW of spinning reserve (i.e., generation capacity on stand-by in case of outages and unforeseen intermittency) throughout the United States, valued at \$3.3 billion per year. Concerto's real-time control and optimization approach can help assimilate at least 50% of renewable generation, while also providing grid reliability and resiliency.

