

New Battery Storage Network Pioneered for SEPTA

SEPTA's new battery storage system to provide frequency regulation to the PJM grid



DistributedEnergy



Challenge

As the fifth-largest transit system in the nation, Southeastern Pennsylvania Transportation Authority (SEPTA) is constantly seeking innovative ways to use its vast infrastructure of subways, rails and electricity substations to lower its operational budget and pioneer renewable and sustainable technologies for the grid.

In 2012, SEPTA partnered with leading demand response, demand management and battery storage solution provider Viridity Energy, Inc. to trial a battery storage network that served two purposes. First, the network stored braking energy from SEPTA's trains to reduce electricity use; second it generated revenue by participating in the grid operator's Frequency Regulation program. After a successful pilot deployment, SEPTA decided to scale it into a system-wide storage project to broaden the reach of its energy storage efforts.

The Solution

To achieve this scale, SEPTA teamed with Constellation—a leading competitive energy company and provider of integrated energy solutions—to deploy an 8.75MW lithium ion battery storage project throughout the SEPTA transit network. Constellation funded, owns and operates the battery storage systems housed within seven of SEPTA's substations throughout Philadelphia. Working with Constellation enabled SEPTA to focus on its core transit operations rather than the day-to-day operations of a complex energy storage network.

Like the pilot initiative, the expanded battery storage project serves two purposes. As before, it can operate in Frequency Regulation mode to provide stability for the grid operator, PJM. In Frequency Regulation mode, PJM sends a signal to the batteries to charge and discharge throughout the day to help balance demand fluctuations on the grid. The fast-ramp, high power-discharge capability of the batteries allows them to respond to PJM's signals instantaneously, thereby keeping the grid in balance.

The battery network can also facilitate energy savings through regenerative braking. Similar to the technology in hybrid cars, energy is saved by SEPTA when kinetic energy generated from braking trains is stored in the batteries. This stored electricity is then used to launch trains from the station, resulting in energy savings for SEPTA.

The SEPTA energy storage project is one of the largest behind-the-meter battery storage systems in the country, and the project is unique in that it provides operational benefits to both the grid operator and SEPTA. With no required upfront capital investment from SEPTA, the project is a showcase for how Constellation can partner with public sector customers to deliver projects that are both fiscally responsible and operationally successful.



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Highlights

Project

- 20-year contract
- Owned and operated by Constellation
- Funded by Constellation with no costs incurred by SEPTA
- Public-private partnership

Technical

- 8.75MW battery capacity
- Largest behind-the-meter battery storage system in a U.S. transit system
- Lithium Ion fast-ramp, high power-discharge batteries

Work With a Trusted Energy Solutions Provider

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