USES FOR UTILITY-SCALE BATTERY STORAGE ARE INCREASING

According to a recent report by Platts, the combined power rating of installed electricity storage in the U.S. grew 181.5 MW over the past year, to a new high of 585.5 MW at the end of the second quarter of 2017, based on reports filed with the U.S. Federal Energy Regulatory Commission. This means that almost one-third of the current installed electricity storage has come on line in just the last 12 months.

One of the reasons for the rapid growth in utility-scale electricity storage is the fact that prices for storage units continues to decrease. Another is that the technology is improving such that storage is lasting longer and is more reliable.

According to the report, 22 companies own and operate 45 grid-connected storage facilities in 12 states, all of which are battery storage systems, with the exception of two flywheel units.

Of the installed power rating, approximately half (276.8 MW) are used for frequency regulation. The remaining are in place to provide ancillary services, and allow for the integration of additional renewables.

However, there is a new use for utility-scale battery storage that seems to hold promise for a number of utilities in certain situations - providing an alternative to costly grid infrastructure upgrades (eg: installing storage units in lieu of having to upgrade distribution lines in areas of growing power demand).

Arizona Public Service (APS) is one of the first electric utilities in the nation to opt for battery storage for this reason. Instead of rebuilding/upgrading about 20 miles of transmission and distribution poles and wires in the small rural community of Punkin Center, APS will install two battery storage systems there, using batteries in place of traditional infrastructure upgrades.

The two 4-megawatt-hour (MWh) Advancion batteries are made by AES Energy Storage. Construction on the project will begin in fall 2017. The storage systems are expected to be operational in early 2018.

This is the first time that APS has used energy storage as an alternative to traditional infrastructure upgrades, but it will not be the last. “This project is a crucial step in the right direction for Arizona’s energy future,” said Scott Bordenkircher, APS’s director of transmission and distribution technology innovation and integration, in a press release. “Over the next 15 years, APS has plans to add 500 megawatts of storage capacity. This project is indicative of the type of smart grid APS envisions for customers, one that enables people to have more technology in their own homes.”

Prior to this new project, APS has only been using batteries to store excess solar power for use after the sun goes down, for storing energy to use at peak times, and for other functions such as voltage support.

This project is unique in that the primary function of the battery system is basic grid operation. To reliably serve new customers in the growing community of Punkin Center, APS was faced with rebuilding 20 miles of 21-kilovolt power lines over hilly, mountainous, and rough terrain. APS considered this option, but realized it would involve considerable expense, as well as local disruption.

A review of the community's needs showed that adding battery storage would provide what was needed at less cost than rebuilding the lines. "We are watching as the prices come down on battery technology," said Bordenkircher. "Thoughtful implementation of battery storage is key to its future success. For a community like Punkin Center, the rural location, reduced implementation costs, and added technological benefits make it the perfect candidate for this technology." The existing lines that now serve Punkin Center will feed electricity to the batteries at night when demand is low.

However, it is important to note that this project does not signal a shift in APS's overall strategy, such that storage will displace every future infrastructure upgrade for the utility. APS actually considers the Punkin Center scenario to be somewhat of an "outlier," in that there currently aren't a lot of other similar scenarios or needs in its service territory. That is, most other transmission and distribution upgrades, especially in flat and easily-accessible terrains, will be inexpensive enough that battery storage would not make economic sense.

The batteries at Punkin Center will increase power reliability to serve the community of 600 residents, located roughly 90 minutes northeast of downtown Phoenix. Currently, APS estimates that the batteries will be pulled into service for between 20 or 30 peak demand days each year in order to provide the load that would have been served by the distribution upgrade. During the rest of the year, the batteries will be available for voltage regulation, peak shaving and to provide capacity.

In addition, the capacity of the batteries can be scaled if the needs of Punkin Center continue to grow. This will allow APS to build battery storage in a modular way, covering three to five years of need, and adding storage resources incrementally.

But what if demand diminishes? Another benefit of the battery storage that would not exist with the line upgrade project is that if, in future years, the load growth falls short of expectations and the wires aren't strained, APS can remove the battery storage units from Punkin Center and move them somewhere where demand is growing.

This is not APS's first foray into battery storage. Last December, APS installed two AES battery storage units in the West Valley as part of the Solar Partner Program. And, as regards the future of battery storage in general for APS, the utility reported that it will add battery storage to its "toolkit" as part of its overall comprehensive planning process.

About the Author

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