pv magazine energy storage+
February 2018

ENERGY STORAGE HIGHLIGHTS

Business models beyond frequency regulation
Redox flow vs. lithium-ion | Flexible sector coupling

Special edition in collaboration with

ENERGY® STORAGE EUROPE

6

Smart Power

Large-scale storage business model in the distribution grid

German EPC Smart Power is working on a promising solution for making large-scale storage systems usable in the distribution grid despite regulatory hurdles. According to the numbers given by the company, this approach can totally make sense. The utility Stadtwerke Trostberg Energieversorgung is charged €113/kW peak load at the transformer station to the 110 kV grid. By peak shaving in the distribution grid in the order of 11%, this payment can be reduced.


Photo: Google, GeoBasis-DE/BKG

For this purpose, Smart Power is installing a 1.5 MWh/1.2 MW storage system on behalf of a retail company. An annual revenue stream of about €59,000 is expected from the peak shaving use case, and an additional €89,000 will be generated from being active on the primary control market.

The tricky point, however, is compensation. The utility compensates 80% of the amount it saves from the peak shaving activity, and 20% will be used to reduce grid surcharge on the electricity bills for consumers in the region. The utility itself cannot draw direct financial benefits from this project because of German regulations. The cooperation is partly driven by idealism, and partly because the trading division of the utility is in favor of it, as it can offer good services to the operating retail company, which is its customer.

The theoretical upper bound for the revenue stream can be calculated as follows: €113 × 1,200 kW × 80% = €108,000. The real peak load reduction is roughly half of this upper bound value. To achieve this revenue peak shaving is necessary only for some weeks of the year. And by pooling several storage systems, the losses from peak shaving for the primary control power revenue stream can be reduced to a single digit percentage.

The jury appreciates the effort to make use of the possibilities storage offers for the distribution networks. However, they say, many other companies already are, or soon will be aiming for multiple revenue streams, so it is not possible to establish a USP with such business models.

Also how well this business model complies with German regulation is still to be proven. There is an intensive ongoing discussion about what is possible and what should be possible. Only by undertaking such projects can one move forward and develop the details. The company emphasizes that the installation is not simply a demonstration project, and that it is planned to be profitable without any subsidies.

Hall 8b / E13

7

Abo Wind

Storage in rural distribution networks stabilized the grid


Photo: Abo Wind

Tunduma, a small Tanzanian town at the border with Zambia, is connected to a 220 kV transmission grid. The grid is characterized, writes Abo Wind, by "large distribution networks at 33 kV supplying thousands of small transformers." The overhead lines are working at maximum capacity, leading to high losses and a drop in voltage of almost 20%. Abo Wind has evaluated how the grid can be stabilized using solar and storage. Now it is in the development stage of a project to realize this potential. The installation will stabilize the voltage level in the 33 kV radial distribution networks between 95% and 105%. This will allow more consumers to be connected and SMEs to profit from better grid quality and fewer blackouts. Typically, the maximum load in Tunduma is about 7 MW in the evening. With the projected PV and battery size, which during the day is charged with about 5 MWh, the maximum load can be reduced to about 6 MW.

The company writes that there have been studies for similar projects, however, they haven't heard of any as far advanced. "Not conceptually new, but a straightforward use of batteries with 'smart' power electronics and control," comments one member of the jury.

Hall 8b / D39