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# SUPPORTING THE UTILITY GRID

Battery storage systems make solar farms more economical

## PROFILE

**Client:**
Green Energy 3000 GmbH

**Business:**
Energy infrastructure

**Special characteristics:**
First project worldwide with the TPS-E battery storage system, one of the first PPAs with a storage system in Germany

**Region, country:**
Großschirma, Saxony, Germany

## THE BACKGROUND

Based in Leipzig, the Green Energy 3000 group is an international project developer, general contractor and operator of solar, wind and battery storage system installations. Since it was founded in 2004, the group of companies has completed over 60 installations and holds some of these in its own portfolio. As a developer, Green Energy 3000 is always on the lookout for new sites. In the town of Großschirma between Leipzig and Dresden, a five-hectare commercial site presented an opportunity for innovative use as a solar farm.

## THE CHALLENGE

In order to meet its ambitious climate targets, the German federal government regularly puts out funded quantities of renewable energy production for tender. The government's latest tendering model, called "innovation tendering", aims to improve the grid and system security of the German utility grid through combinations of installations. In practice it is clear that the most economical way to do this is by using battery storage systems.
The operators receive an increased feed-in tariff and can at the same time capitalise on the storage system's output and capacity, for example through arbitrage trading or participation in the operating reserve market. The development of hybrid installations of this kind therefore benefits both the installation operator and the grid operator.
Green Energy 3000 made an application in the second round of the innovation tendering scheme and was one of 16 bids to be selected by the Bundesnetzagentur (Federal Network Agency). A 5.1 MWp PV installation with bifacial solar panels was planned for Großschirma – enough to power 1,800 households.
For the innovation tendering scheme, the output of the storage system must equate to at least a quarter of the total installation output. It must be possible to maintain this output over at least two hours – and this must remain the case throughout the 20-year funding period. Otherwise, the feed-in tariff may be discontinued. A long-lasting and efficient battery storage system is therefore crucial in this situation.

**Requirements for a storage solution:**

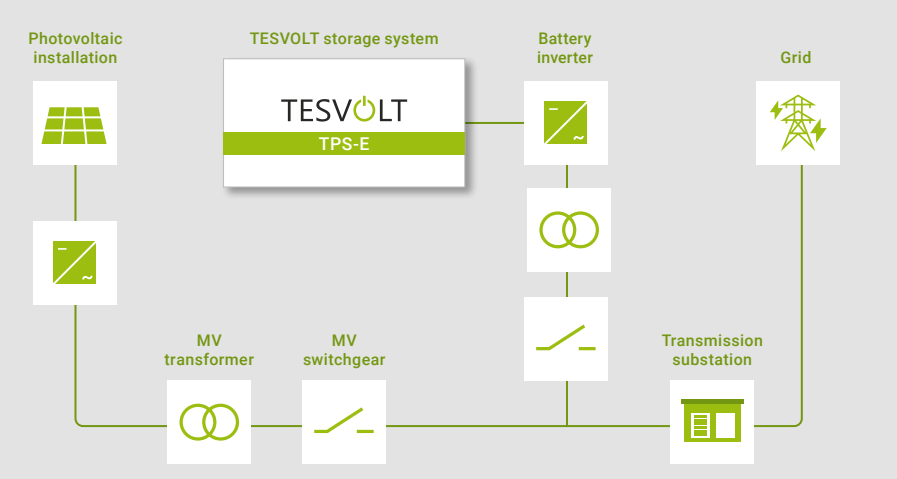
- Long service life with many guaranteed cycles for sustainable power delivery
- High availability due to highest quality standards for hardware & software
- Straightforward installation and compatibility with the PV components

DIRECT MARKETER INTERFACE

ANCILLARY SERVICES

## THE SOLUTION

For their choice of battery storage system, Green Energy 3000 opted for the TPS-E from TESVOLT in a 45-foot container. The TPS-E is the largest product in the new E series from TESVOLT and features the newly developed dynamic balancing system (DBO). With 3.84 MWh of energy, it could supply a typical single-family home with electricity for a year with just one charging cycle. Thanks to its robustness and redundant air conditioning, it's equipped to handle both the coldest of winters and the hottest of summers.




"It was a lot of fun developing the project together. We were impressed by the concept of the TPS-E and the product really delivers excellent quality. We already have more joint projects in the pipeline."

Lukas Mogg, technical manager for the Großschirma project, Green Energy 3000 GmbH

"We've been familiar with TESVOLT for a long time and they were on the shortlist for our innovation pilot project from the start. We're delighted that we found a regional partner who we could work with constructively and extremely efficiently to implement the project. This is an excellent basis for future collaboration between our companies."

Andreas Renker, managing director of Green Energy 3000 Holding

## THE BENEFITS

- Optimised charging and discharging with very high availability & performance through dynamic balancing (DBO). The DBO is a brand new balancing system with no dead times. Balancing occurs in parallel with charging and discharging of the storage system and achieves greater efficiency and lower operating costs than comparable systems
- Multi-layer protection of each individual cell and functional safety at system level with TÜV certificate
- Very wide range of applications including black start capability
- 100% depth of discharge (DoD)
- High level of resilience against failure of master/slave systems
- AI ready – prepared for automated AI error diagnosis
- Three different container sizes available (20, 40 or 45 foot)
- Easy transportation by water and land thanks to ISO container
- Optimised for challenging applications (temperature range -25 to +50°C possible)

## FACTS AND FIGURES

| | |
|---|---|
| Storage system | TPS-E |
| Energy/output | 3.84 MWh/1.7 MW |
| Cell | Lithium NMC prismatic (Samsung SDI) |
| Efficiency (battery) | up to 98% |
| Cycles | 6,000 to 8,000 (0.5C to 1C at 23°C +/−5°C with 100% depth of discharge) |
| Operating temperature | -25 to 50°C |
| Battery inverter | SMA Sunny Central Storage 2475 |
| Installer | Green Energy 3000 GmbH/ TESVOLT GmbH together with FM Elektrotechnik & Photovoltaik GmbH |



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