

MUNICIPALITIES AS ENERGY DISTRIBUTORS

Grid management with battery storage systems



PROFILE

Client:
West Sussex County

Industry:
Grid management, local energy supply

Special characteristics:
First municipal battery storage system project in the UK

Region, country:
West Sussex, United Kingdom

THE BACKGROUND

Even in the United Kingdom the sun does shine – and nowhere more so than in the southern county of West Sussex. In the light of current tough economic circumstances and the falling costs of solar modules, photovoltaics is becoming increasingly attractive, and not only for private use. Public authorities faced with having to grapple with ever tighter budgets are also on the lookout for sustainable, inexpensive electricity.



THE CHALLENGE

How can individual regions benefit from the sun's energy beyond covering self-consumption for public infrastructure such as street lights or fire stations? In the United Kingdom, the energy market is largely deregulated and many companies have established new business models over the last few years. Generators of solar power have proven to be particularly interested in demand and price-oriented control models with a connection to the energy market and corresponding transactions.

In view of this background and in line with their own energy strategy, the West Sussex County Council built a business case for a municipal solar farm with battery storage. A former landfill site in Westhampnett proved to be a suitable location for the 7.4-megawatt solar farm which was subsequently installed there. A load control contract was concluded with utility company nPower, enabling it to generate arbitrage revenue and capacity market income on the county's behalf.

For the county to use load control to buy and sell power at optimum prices, the solar farm needs an efficient and, more importantly, high-speed storage system. Given that the municipal project is also designed to generate long-term returns, only a robust lithium-ion storage system with a long service life is up to the task.

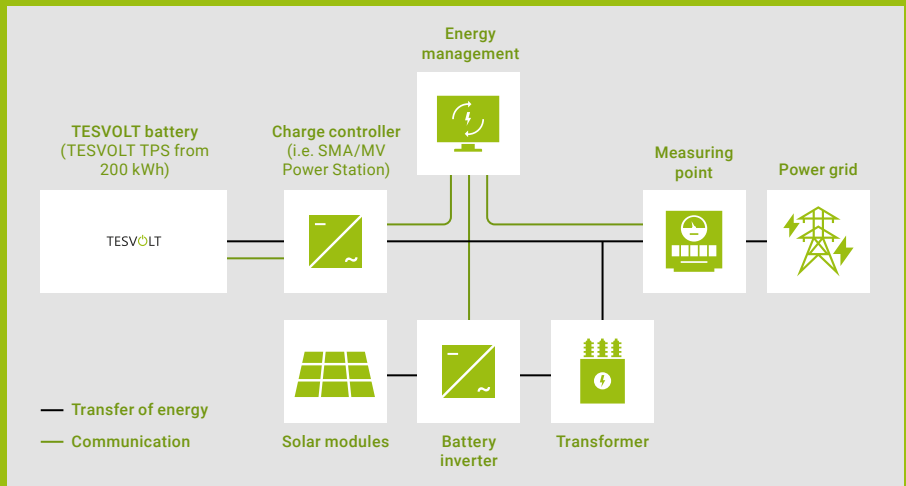
Requirements for a storage solution:

- efficiency and high speed to ensure reliable grid management
- long service life for long-term returns



THE SOLUTION

The County Council identified TESVOLT products as potentially suitable for the project sometime before the company won the tender. Installed by specialist partner Arun Construction Services, two TPS 2000 high-performance battery storage systems located in close proximity to the solar modules and local grid connection are now providing reliable service at the Westhampnett solar farm.



“Although it was expected, we were pleasantly surprised by the excellent engineering, power and performance of the TESVOLT TPS system we installed.”

Kevin Keiley, Director of Solar PV Projects at Arun Construction Services Ltd.

“As one of the first solar farms to be built with battery storage and free from government subsidy, we are blazing a trail among local authorities and demonstrating that councils have a role to play as local leaders on energy.”

Louise Goldsmith, Leader of West Sussex County Council

THE ADVANTAGES

In conjunction with the 7.4 MWp solar park, the county has already generated substantial revenues and is already examining additional sites to expand its activities. The initial investments made by Westhampnett will start paying off in just a few years on account of the load control contracts and optimized self-consumption. The TESVOLT storage system comes with the following advantages:

- **High-speed charging and discharging times (1C)**

To provide operating reserves to the public power grid, the county needs a high-speed storage system. 1C means that the TPS 2000 can be fully charged or discharged in one hour.

- **Long service life**

Built for decades with 5,000 guaranteed full cycles. Thanks to robust Samsung battery cells and one of the most advanced battery management systems on the market.

- **Reliable operation**

Internet-based monitoring of storage health down to the cellular level offers a high level of security for the long-term investment of taxpayers' money.

- **Very high efficiency levels**

Low self-consumption due to efficient balancing of the batteries of 5 W.

PROJECT: FACTS AND FIGURES

Storage system	2x TPS 2000
Energy content	4 MWh
Discharge power	4 MW
Cell	Lithium NMC prismatic (Samsung SDI)
Efficiency (battery)	up to 98 %
Cycles	6.000–8.000 (0,5C- to 1C at 23 °C +/-5 °C with 100 % depth of discharge)
Operating temperature	-20 to 45° C
Battery inverter	SMA Sunny Central Storage
Installer	Arun Construction Services