

## Case study

Energy storage system  
for grid stability - Dresden, Germany

### Dresden's electric utility adds energy storage to stabilize grid

#### Project Summary

**Client:** DREWAG public utility

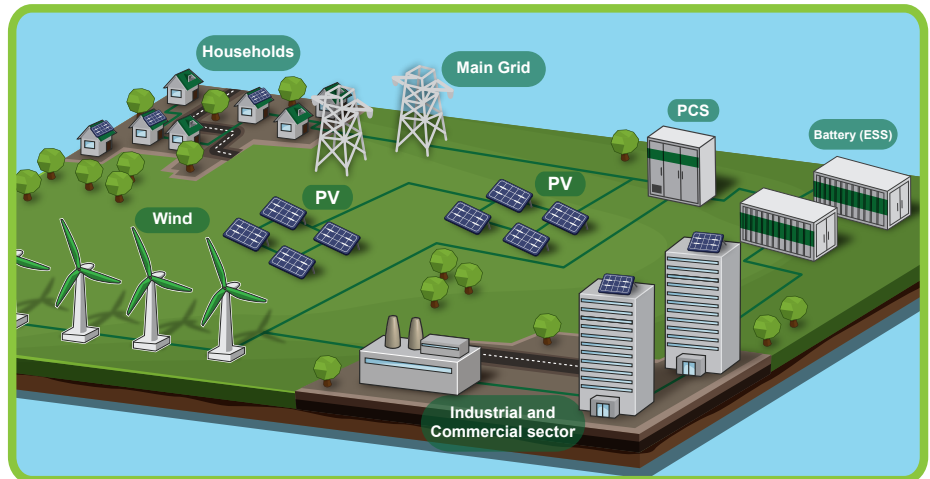
**Project execution time:** 9 months (from order to final acceptance)

**Application:** Primary regulation control (PRL)

**Grid components:** 2.7 MWh/2MW storage system with 2.4 MVA Active Front End AC/DC converter

**Load Peak Demand:** 2MW

**Battery type:** LG Chem JH2 pouch cells, working in SOC range of 10%-80% with a performance of more than 6000 full load cycles with 1C/1C @DOD 80%



#### Nidec ASI's role

After working with DREWAG to define its needs, Nidec ASI provided electrical engineering services for the design of the Power Conversion System, which stabilizes the network by providing up to 2 MW primary control power to the grid. Nidec ASI manufactured and supplied both the PCS components as well as the battery containers and integrated the power management system software used to operate the system that was developed by a German sub-supplier under the leadership of Nidec ASI.

#### The challenge:

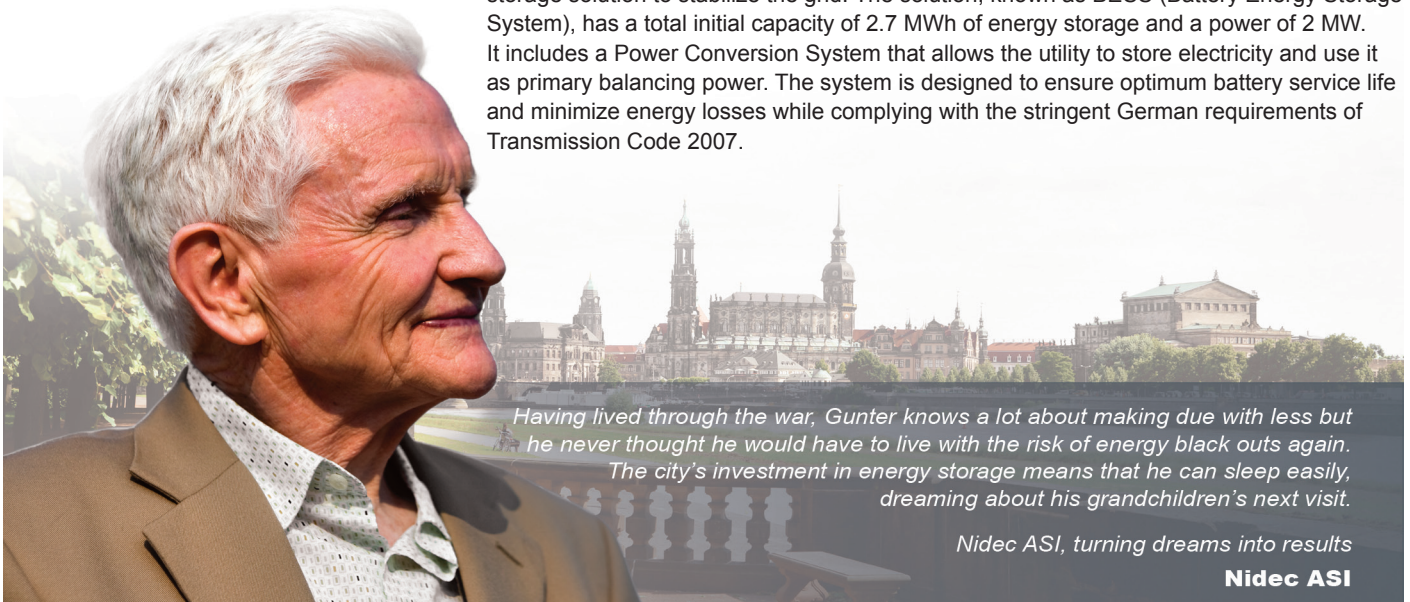
##### To improve the reliability of a municipal power utility

DREWAG is the municipal utility responsible for bringing electricity, gas and water services to the more than half a million residents of Dresden, Germany. In recent years, the grid has seen a sharp increase of renewable energy such as solar and wind, which created some instability in the city's power supply and the need for fast responding energy storage systems able to substitute the "must run power plants" for primary regulation. DREWAG sought a solution that would stabilize its power supply and reduce long-term energy costs while increasing the amount of energy produced by clean, renewable sources.

#### The solution:

##### Battery Energy Storage Systems (BESS)

Working with Nidec ASI, DREWAG chose to develop and implement an innovative energy storage solution to stabilize the grid. The solution, known as BESS (Battery Energy Storage System), has a total initial capacity of 2.7 MWh of energy storage and a power of 2 MW. It includes a Power Conversion System that allows the utility to store electricity and use it as primary balancing power. The system is designed to ensure optimum battery service life and minimize energy losses while complying with the stringent German requirements of Transmission Code 2007.



*Having lived through the war, Gunter knows a lot about making due with less but he never thought he would have to live with the risk of energy black outs again. The city's investment in energy storage means that he can sleep easily, dreaming about his grandchildren's next visit.*

Nidec ASI, turning dreams into results

**Nidec ASI**

## System components supplied by Nidec ASI

- Storage system for the lithium-ion batteries
- Low voltage transformers
- Level 1 automation system
- Main and sub-distribution units for the LV switchgear cabinets for each system
- Cabling and cable way extension
- External cooling unit with free cooling mode including piping

Power Conversion System Converter technical data		
	Grid Side (AC voltage)	Battery Side (DC voltage)
Voltage	20kV	714-987 dvc
Power	2500 kVA	2000 kW
Cooling System	Water Cooled	

## Requirements for primary regulation

- Power regulation acting on network frequency deviations
- Full power activation within 30s
- Maximum time of 15 minutes to be bridged for a single fault event
- Operation range: 50Hz +/-200mHz with the option to use the deadband of 50Hz +/-20mHz
- Precisely defined qualification tests to be performed
- Meet transmission system operators (TSO) specifications for regulator settings

