

Concepts for the future

If you would like to find out more about the opportunities large-scale battery systems offer for reliable and efficient power supply, please contact us. We will be pleased to establish/tailor systems for you and with you on any scale you desire. Further information can be found at www.steag-largescalebattery-system.com

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Services related to battery storage



All services along the value chain from a single source

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**All services from a single source:
The STEAG large-scale battery systems**

With its six large-scale battery systems installed in 2016, STEAG is making an important contribution to implementing the energy transition. The batteries are used to compensate frequency variations in the electricity grid which are caused by the increasing feed-in of energy from volatile renewables as well as fluctuations in consumption. They can take up energy from the grid or feed energy in within a few seconds. This primary control power helps to keep the electricity grid stable and ensures security of supply. The six battery systems have a total storage capacity of more than 120 MWh.

All six large-scale battery systems have been in operation continuously since the end of 2016 and their capacity is being successfully marketed. The timetable and budget in this major project with an investment volume of around 100 million euros was not only complied with; the project was completed well before time and under budget. Only one year passed between the decision to invest and the completion of commissioning. The basis of this success is the provision of all services – from design to construction along with commissioning and marketing – from a single source within the STEAG Group. We also offer these services along the value chain to you and your battery storage projects.

**Development and marketing:
Trading & Optimization**

Trading & Optimization (T&O) is the trading unit of STEAG. It offers a wide range of products and services in the field of asset-based energy trading, which are also available to customers and market partners. Moreover, T&O is responsible for the development of asset and commodity opportunities within the STEAG Group, and therefore for the development of the new asset segment of large-scale storage batteries.

The large-scale battery systems are incorporated in T&O's "STEAG OneOpt" virtual power plant, which connects decentralized and centralized plants of STEAG and its customers. The primary control power from the large-scale battery systems is sold on the balancing energy market through T&O. Provision of the marketed control power is ensured by STEAG OneOpt as well as the charging management of the large-scale battery systems.

For the future, STEAG envisages even further commercial uses for storage batteries – both in the provision of system services for grid stability in the context of the energy transition, and for cost optimization and risk management at industrial facilities. T&O is currently reviewing further projects in Germany and abroad, but also opportunities to cooperate with market partners and customers in this asset segment.

**Know-how all around energy:
STEAG Energy Services**

STEAG Energy Services is responsible for all engineering and servicing work within the STEAG Group in all phases of power plant, industrial plant and industrial grid projects. The team took the lead in the technical planning and implementation of the large-scale battery systems. The specialists worked closely together with the main contractor Nidec, the battery cell supplier LG Chem and the construction companies.

**Technical perfection:
STEAG Technischer Service**

STEAG Technischer Service provides an extensive range of technical and commercial services. The company was among the pioneers in the development of large-scale batteries in Germany starting in 2009. In the STEAG large-scale battery project, the team mainly handled issues concerning the technical infrastructure. As a result, STEAG Technischer Service has extensive expertise and experience in services related to energy storage.

The services offered by STEAG:

- Concept development and site studies
- Project and site development
- Feasibility studies and investment planning
- Dimensioning and performance characteristics
- Procurement planning by lots
- Project management
- Project implementation, construction management and commissioning of the
 - ▶ large-scale storage batteries
 - ▶ civil engineering structures, I&C systems and grid connections
- Quality management at suppliers' factory and on site
- Technical planning and authority permission planning
- Grid calculation and integration
- Arrangement planning and basic engineering
- Detailed engineering
- Interface management and integration in existing plants
- Installation of the electrical infrastructure (MV and LV)
- Design and installation of protection systems (grid, transformer, etc.)
- Design and installation of I&C, Scada and communication systems
- Measurement services (grid quality, thermography, equipment monitoring)
- Metering data acquisition and remote control
- Metering data management
- Measuring point operation
- Operation and maintenance, including fault clearance and on-call duty (24/7 control room)
- Simulation and optimization of the battery state of charge management