



## LEAD BATTERIES: ENERGY STORAGE CASE STUDY



Exide Technologies / RWTH Aachen University

# Unique Hybrid Battery Energy Storage System

### Aachen, Germany

As the growing demand for renewable energy results in an increased need for battery energy storage, a hybrid project in Aachen has been testing different battery technologies since 2016.

With optimized high current capability and long cycle-life expectancy, Exide Technologies' advanced lead batteries are one of the key storage technologies featured at the 5MW M5BAT project.

With the objective of testing the technical and economic viability of different battery technologies, advanced lead batteries at M5BAT are playing a central role in the

**“Based on an intelligent energy management system and low procurement costs, lead batteries are a good solution for high energy loads.”**

Jeanette Munderlein, Research Associate, RWTH Aachen University

strive to optimize battery performance for grid stability and integrating renewables into the energy market.

### Technical Specification

#### *OCSM system*

The OCSM battery system at M5BAT consists of 600 x 16 OCSM 2320 LA, with a total AC capacity of 1.3 MWh.

OCSM batteries offer maximum performance and cycle stability due to Copper Stretch Metal (CSM) technology.

Long-term efficiency of the battery system is achieved via a water replenishment system and electrolyte circulation.

The OCSM system is divided into two strings which can be operated separately from each other. One string consists of 300 cells, connected in serial.



## Technical Specification

### OPzV system

The second advanced lead battery system installed at M5BAT consists of VRLA gel technology, specifically optimized for high cyclic loads. The electrolyte is fixed in gel, and no maintenance, such as water top-up, is required.

The OPzV system unit is assembled of two strings with a total AC capacity of 1 MWh. The first string consists of 306 x A602 1960C Solar batteries and the second one consists of 616 x A602 1130 Solar batteries.

Both strings can be operated separately from each other. One string is installed within the building and the other in a container.

### Performance

The M5BAT hybrid energy storage project demonstrates that different battery technologies, such as lead and lithium, can operate well together.

The advanced lead batteries used in the system are particularly suited for high energy loads.

The development of an intelligent battery and energy management system (EMS) was necessary to get operation functionality. All operation data is monitored and used to improve the EMS.

### About RWTH Aachen University

RWTH Aachen is the operator of the battery storage system and is participating in the M5BAT project in conjunction with several other institutes. The project is being coordinated by the department of Professor Sauer and is part of the university's Institute of Power Generation and Storage Systems (PGS).

### About Exide Technologies

Established in 1888, Exide Technologies is committed to providing world-class stored energy solutions that lead the industry in quality and performance, drive customer results and make a difference in people's lives.