



Fact sheet

JenaBatteries' metal-free flow battery – safe, clean and sustainable

General information

The metal-free redox flow battery is an innovative storage solution and alternative to conventional systems – such as lithium-ion batteries or redox flow batteries containing metal. Producing metal-free flow batteries does not require the use of any critical raw materials sourced from unsafe countries. The flow battery from JenaBatteries is entirely produced in Europe. It is non-flammable, non-explosive and requires low maintenance. The flow battery provides clean energy, contributes to the conservation of resources and is highly versatile. A metal-free saline solution is used as the base for the electrolyte so the battery contains no heavy metals or aggressive acids.

Technical data

- Storage capacity: 400 kWh to >10 MWh
- Power: 100 kW to >2 MW
- Charge cycles: at least 10,000
- Power connection: 3 x 400 VAC+PE, 50 Hz
- Planned service life: 20 years
- Electrolyte: metal-free saline solution in water

Areas of application

- Storage of renewable energies
- E-mobility charging points
- Off-grid applications / island mode operation
- Optimisation of private consumption
- Emergency power and uninterrupted power supply
- Grid stabilisation to compensate for fluctuations in the generation of renewable energy
- Industrial application (e.g. PV and wind turbine operators)

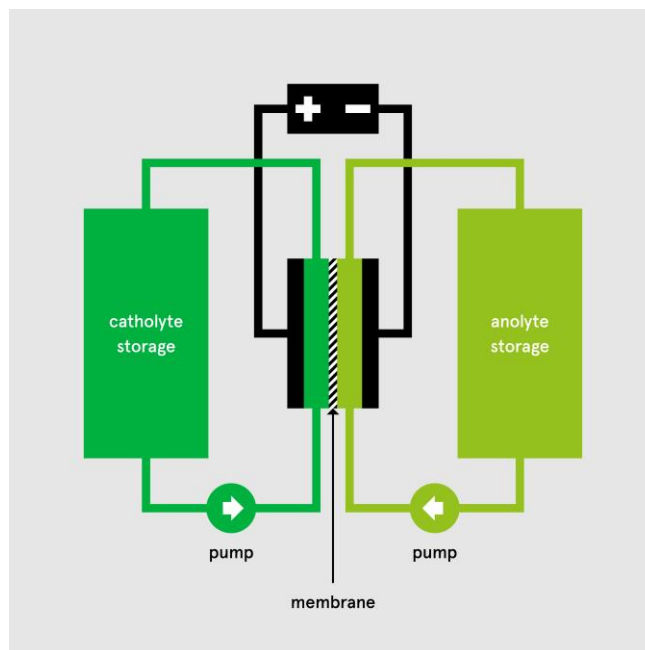
Design and function

Redox flow batteries are electrochemical energy storage systems. *Redox flow* is short for:

Reduction = the gain of electrons

Oxidation = the loss of electrons

Flow = liquid storage medium



1. Two tanks holding a saline solution containing different organic (metal-free) storage materials function as the anode and cathode.

2. Charging and discharging is achieved by pumping the saline solution through a cell.

3. Through this process electrons are bound and released – electricity is stored.

The result: the battery's power and capacity can be scaled independently of one another. The amount of electrolyte determines the capacity of the flow battery, while the surface area and number of the cells determine its power.



Demo project

- A smart grid has been built at the ACRRES test site in the Netherlands as part of the EU-funded “EnergyKeeper” project. The metal-free flow battery from JenaBatteries, with a capacity of 100 kWh, sits at the heart of the grid’s infrastructure.
- The work carried out as part of this project has demonstrated how sources of renewable energy, energy storage, households and industrial consumers can interact in an intelligent way.
- The project receives support from the EU’s “Horizon 2020” programme (grant agreement no. 731239). You can find out more about the project at <http://www.energykeeper.eu/>.

About the company

JenaBatteries GmbH is an innovative company in the field of stationary energy storage systems. Driven by the idea of developing a sustainable and cost-efficient energy storage solution, JenaBatteries was founded in 2013 by an interdisciplinary team of researchers from the Friedrich-Schiller University of Jena and market experts. The company develops large-scale redox flow batteries of 400 kWh and up. Following the successful product development phase, the company is ready to enter the market in 2021. Among stationary storage systems, the metal-free redox-flow battery offers a sustainable, uncritical alternative to conventional Li-ion batteries. Our business partners are Wirthwein AG and Ranft Gruppe. They invest in JenaBatteries and provide support in technological strategy. Find out more at: www.jenabatteries.de.

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