



Fact Sheet:
Innovative electric energy storage
"BigBattery Lausitz"

September 2019



GET

Description

At the site of the lignite-fired power station "Schwarze Pumpe" and as part of the industrial park "Schwarze Pumpe" (ISP) near the city of Spremberg (Brandenburg) occurs Europe's biggest short-term storage battery system - with a capacity of 53 MWh and high-voltage grid connection. The energy company LEAG aims to put in operation the power pack until the summer of 2020. The groundbreaking ceremony took place on 9th July 2019. The costs are expected to be around 25 million EUR, whereby 4 million EUR are funded by the Federal State of Brandenburg. As a LEAG spokesperson told to the radio station Deutsche Welle (DW): "The combination of existing power plant infrastructure and battery storage technology is unique in Europe, and so will be its start-of-life capacity".

In addition, there are several best practice examples for technological comparable battery storage systems in Europe. *Inter alia* the enterprise Aggreko (former Younicos) has already installed a lithium-ion battery of 5 MWh in 2014 ("Battery park Schwerin" / East Germany) with an upgrading to 15 MWh meanwhile. Other good reference objects are the battery storage units in Leighton Buzzard (6 MWh, UK) or Graciosa (4 MWh, Portugal).

Finally, in 2018 the Eneco/Mitsubishi battery storage "Enspire ME" / Schleswig-Holstein (North Germany) with a power of 48 MWh started operation after 8-month construction period. It is up to now the largest battery storage project in the EU consisting of 10,000 single lithium batteries. In this case the electric supplier WEMAG compensates short-term power fluctuations from wind parks around.

Nevertheless, compared with conventional pumped-storage power plants in Germany the power of "BigBattery Lausitz" with its 53 MWh is small: more than 30 pumped-storage power plants with a total electric power of about 7 GW and a capacity of about 40 GWh are installed, the biggest two with an electric power of more than 1 GW.

Achievements

"BigBattery Lausitz" targets to buffer electric energy from the different sources in the electricity grid temporarily, lignite-fired power stations and others as well as renewable energies. It should stabilize/balance the grid by breaking the peak loads in times with a high fluctuation of feeding renewable energies, in particular solar and wind energy.

Hence the system will operate in accordance to the current situation in the grid. The electric energy can be fed into the grid for half an hour on request. At the same time, the system is extremely flexible and activatable for full power supply within 30 seconds.

The battery is based on lithium-ion technology, comparable to your laptop, smartphone or e-car, but in an industrial-scale. An innovative charge management and the utilization of a novel power station control system are important characteristics of the storage module. It consists of 13 containers and will be constructed on an area of 110 x 62 meters beside the cooling towers of the lignite-fired power station. The "super battery" will be connected to the electric grid at a 110 kV connection point.

Challenges

So far "BigBattery Lausitz" is a challenging pilot and demo project for commercial use. The basic technological challenges are solved or can be overcome as other quite similar application examples in the last decade have already shown. However, the economic feasibility of the project in "Schwarze Pumpe" remains to be confirmed.

The same applies to the practical operation of the system, regarding the power control system, charge time, cyclical and calendrical battery lifetime, electricity storage and supply efficiency. For example, for the industrial use the lifetime should be higher than 10 years at least. Both

the dimension of battery and the regulation and control engineering in detail are still challenging.

As compared to other storage technologies the battery approach is considered as quite expensive and the raw materials lithium and cobalt are becoming rare, the eco balance is rather questionable, also the critical social and ethic aspects in the producing countries.

It is unclear, whether the investment by LEAG company - despite good prospects of success - would have been taken place without public subsidies.

Enabling conditions

(1) EGEM s.r.o., a Czech engineering and contracting company, is the main contractor to build the battery. The enterprise is experienced in design, installation, reconstruction, rehabilitation and maintenance of power distribution systems and electrical parts of power systems.

(2) The technical infrastructure of "Schwarze Pumpe" is well developed (media supply, water supply and cleaning, waste disposal, etc.). It is assumed that logistic synergies can be used for the project - besides the close interdependence with the running lignite power plant.

(3) The innovative project "BigBattery Lausitz" links the established power plant infrastructure in "Schwarze Pumpe" with a highly efficient electricity storage technology in a new dimension. The basic lithium-ion technology is sophisticated and has already reached the level for practical application.

(4) It's a real milestone for the stabilization of the whole power grid in times of increasing renewable energies in the region. The trendsetting energy storage technology is another component for fostering green electricity and contributes to the energy transition in the coal intensive region. It is a good example for the employment and re- and upskilling of well-trained professionals arising from the traditional energy sector.

(5) But also "BigBattery Lausitz" is a modular, container-based and turnkey ready concept, suitable for decentralized application at fluctuating and less predictable green power sources, notably wind parks or solar plants.

(6) In that way the battery storage technology adds on less flexible and long-term electricity management systems, like power-to-gas, power-to-heat, pumped storage power plants or compressed air reservoirs.

(7) On-site solutions like "BigBattery Lausitz" (energy production - storage - consumption) reduce the demand for the costly and controversial electricity network expansion on European and national level.

References and further links

<https://www.dw.com/en/how-a-coal-fired-plant-makes-germanys-energy-transition-easier/a-47214749>

https://www.lr-online.de/lausitz/spremberg/die-big-battery-lausitz-nimmt-gestalt-an_aid-37533883

<https://www.leag.de/de/bigbattery/>

<https://www.pv-magazine.de/2018/12/17/leag-will-50-megawatt-batteriespeicher-in-der-lausitz-errichten/>

<https://www.bundestag.de/resource/blob/496062/759f6162c9fb845aa0ba7d51ce1264f1/wd-8-083-16-pdf-data.pdf>

http://www.unendlich-viel-energie.de/media/file/160.57_Renews_Spezial_Strom_speichern_mar13_online.pdf

https://www.aggreko.com/de-de/microgrid-and-storage-solutions?gclid=EAlaQobChMI3O7A-vby4wIVkZAYCh3LNgw3EAAYASAAEgKPJ_D_BwE

<https://www.ffe.de/publikationen/veroeffentlichungen/417-funktionale-stromspeicher>

<https://www.pv-magazine.de/2018/05/31/48-megawatt-grossspeicher-von-eneco-in-schlewsig-holstein-geht-ans-netz/>

<https://www.bundestag.de/resource/blob/496062/759f6162c9fb845aa0ba7d51ce1264f1/wd-8-083-16-pdf-data.pdf>



www.tracer-h2020.eu

Authors

Dirk Knoche, Research Institute for Post-Mining Landscapes (FIB), Germany
Rainer Schleppehorst, Research Institute for Post-Mining Landscapes (FIB), Germany

Editors

Rita Mergner, WIP Renewable Energies, Germany
Rainer Janssen, WIP Renewable Energies, Germany
Christian Doczekal, Güssing Energy Technologies, Austria

Contact

Güssing Energy Technologies GmbH
Christian Doczekal
Email: c.doczekal@get.ac.at, Tel: +43 3322 42606 331
Wiener Straße 49
7540 Güssing, Austria
www.get.ac.at



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 836819. The sole responsibility for the content of this report lies with the authors.