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## Cremzow BESS: Fact Sheet

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<p><b>Market</b></p>	<p>The quality of an electricity supply system is driven principally by the stability of the frequency. Primary Control Reserve (PCR) is required to stabilise the balance. As it needs to be provided in seconds in both directions, a Battery Energy Storage System is a valuable asset to contribute to PCR. Fast frequency control is today one of the most attractive markets for Electrical Energy Storage Systems (EESS). Combining the PCR markets of Switzerland, Austria, Netherlands, Belgium and Germany, results in the largest PCR market in Europe, with total current demand amounting to nearly 1,470 MW.</p>
<p><b>Project Partners</b></p>	<p>ENERTRAG and Leclanché (LSA) started to develop the project in April 2015. Leclanché proposed and secured an equity involvement from ENEL Green Power, (EGP), who was willing to participate in the project's execution and management in order to acquire further expertise in BESS technology. An Exclusivity Agreement was signed in January 2017 by the three partners, followed by a Joint Development Agreement at the start of 2018. Today LSA has executed the construction work on a full turn-key EPC base and the owners of the storage plant include EGP with a 90% stake and ENERTRAG with a 10% stake, through the Enel Green Power Cremzow GmbH &amp; Co. KG.</p>
<p><b>Off-taker 50 Hertz</b></p>	<p>PCR is currently tendered on a weekly basis; the results of the tender process are publicly available (<a href="http://www.regelleistung.net">www. regelleistung.net</a>). Payments for won bids are issued by the connecting TSO – in our case 50 Hertz, located in Berlin.</p>
<p><b>11x 2 MW/ 3.1 MWh</b></p>	<p>The aggregate energy capacity is 34.8MWh (11 x 3,165 MWh) to fulfil the current requirements of the TSO. The storage plant has been built in (close) proximity of an existing transformer station of ENERTRAG and is now connected to it. For the 2MW PCR Pilot project that came into operation in May 2018, an existing medium voltage switchgear was used within the substation Cremzow. The commercial 10 x 2 MW PCR project is connected via two additional 20kV medium voltage switchgears to the substation Cremzow and is operational since February 25<sup>th</sup>, 2019. Since April 1<sup>st</sup>, 2019 the EESS is prequalified with 20 MW on the PCR market.</p>
<p><b>Multifunctional Technical Lay- out</b></p>	<p>The technical layout of the system provides a multi-functional approach, whereas the Lithium-Ion batteries are capable of running continuously double power (2CP/2CP). This allows us to either increase installed power or reduce installed capacity should the market need to adapt to new regulations. Moreover, the Energy Management System operating the entire plant includes a rich library of ancillary services, which allow us to shift and adapt the use case of all single units to the most economical and optimized application.</p>

### Data Highlights

Type of project	Electrical Energy Storage System (EESS)
Location	Cremzow, Germany
Modularity (Power / Energy Capacity)	1 BESS of 2.6 MW / 3.165 MWh 10 BESS of 2.84 MW / 3.165 MWh each
Aggregate Power / Energy Capacity	31 MW / 34.8 MWh
Aggregate Marketable PCR Power	22 MW
Aggregate Energy Capacity	34.8MWh (11 x 3,165 MWh)
Global Investment	€17m

### Key Dates

Exclusivity Agreement	Jan 11, 2017
Joint Development Agreement	Feb 18, 2018
2 MW pilot site COD	May 15, 2018
2 MW 1 <sup>st</sup> participation to PCR market	July 16, 2018
20 MW EPC signature	June 18, 2018
20 MW Site Opening	Sep 13, 2018
20 MW Storage Plant COD	Feb 25, 2019
20 MW 1 <sup>st</sup> participation to PCR market	April 1 <sup>st</sup> , 2019

### Companies & Equipment

Leclanché	Design, Engineering and Project Management
Greensmith	Energy Management System
LG Chem	Battery Racks, BMS
Horlemann	Battery Enclosure, MV switchgear and Auxiliary Power Supply
WSTECH/Siemens	Power Conversion System and Transformers

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