EM-Power Europe and ees Europe
EM-Power Europe Conference and ees Europe Conference
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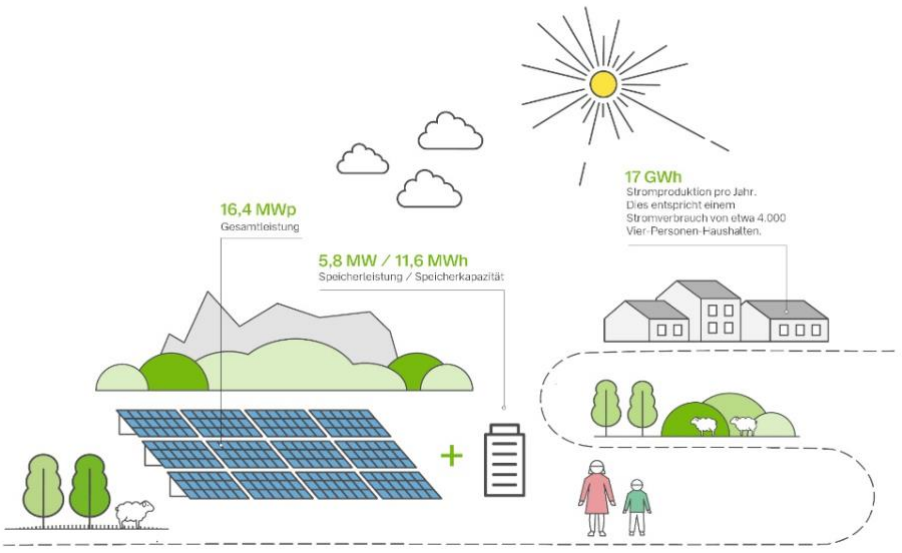
EM-POWER AND EES EUROPE TREND PAPER: STORAGE SYSTEMS AT WIND AND SOLAR PARKS

Munich/Pforzheim, April 2022 – Storage systems are becoming increasingly important as we generate more and more power from the volatile wind and sun. Short-term storage systems located directly at the point where a wind or solar park is connected to the grid offer a solution for tackling fluctuations in power production and will play a key role in the energy transition. When grid feed-in peaks, power can be stored temporarily on site in these systems instead of the plant's output being limited. This stored power is then only fed into the grid when there is spare capacity again and demand is high. In the future, combining power generation plants and storage systems in this way will make a significant contribution to grid stability and supply security. In Germany, solar parks are already being combined with their own storage system today as part of innovation tenders and subsidy-free projects (power purchase agreements). Pilot projects are also being used to gain initial experience in the field of onshore wind energy.

Across Germany, there are many examples of this new trend. For instance, in February 2022, storage system manufacturer Intilion equipped two Maxsolar solar parks in Bavaria with their own storage system. These two large-scale storage facilities are easing the burden on the grid by alleviating fluctuations in feed-in at the two free-standing PV installations, which have an output of around 10 megawatts. The storage system at Hassberge solar park can temporarily store 1.45 megawatt hours (MWh) of energy and feed 1.3 megawatts (MW) into the grid in the space of one hour.

Also in Bavaria, BayWa r.e. is currently planning to construct a solar park with an electricity storage system. The Kreuth solar park is set to have an output of around 16 megawatt peak (MWp) and an electricity storage system with an output of roughly 6 MW. The battery storage system will have a storage capacity of approximately 11 MWh, which is the same as the capacity of around 200 medium-sized electric vehicles.



Source: BayWa r.e. AG

At the Schmölln II wind farm in Brandenburg, Juwi is constructing two wind turbines with an installed capacity of 3,6 MW each and a lithium-ion battery storage system with a capacity of 3 MWh.

Demand-based feed-in to relieve the grid
Although storage technology is already very advanced, it is often not all that economical. Batteries in particular have become much more highly developed in recent years and prices have fallen significantly. However, there's still a need for financial incentives. The projects presented above were all made possible by a Germany-wide innovation tender launched by the German Federal Network Agency.

With experts predicting that energy storage will become more commercially attractive in Germany in the near future, companies are already installing storage systems or reserving space to add them at a later date at large subsidy-free solar parks. There are several reasons for this prediction:

- There is currently a lack of grid connections and adding new connections takes time.
- Storage systems help grid connections to be made use of more effectively and consistently.
- In the future, balancing group deviations will have more significant financial consequences. This means that there will be a greater incentive to keep the power grid stable by ensuring that there are fewer balancing group deviations and investments in flexible power plants and storage systems will become more financially attractive.
- Particularly interesting here is the short-term balancing in the hourly range by means of flexibility options with a short capacity and performance ratio in order to be able to act as quickly and flexibly as possible.
- There will be more ways of generating revenue through volatility and flexibility options. Feed-in at off-peak times will also become more financially attractive.
- Storage devices will be able to provide system services for ensuring secure and stable grid operation, such as reactive power for voltage stability.

Storage systems have even greater potential to improve grid stability
In order for storage systems to reach their full potential, they need to be installed in wind and solar parks as standard and feature in all tenders. However, German legislation is failing to keep pace with the technological possibilities and the willingness of market players to invest in this technology. Operating storage facilities is often unprofitable and comes with a lot of red tape.

The potential of storage systems to improve grid stability is still largely untapped. In Germany, storage systems installed at a power plant may only be charged with power from the power generation plant to which they are connected and not with power from the grid. The battery is artificially restricted to only delaying feed-in from the plant to which it is connected. They are technically capable of doing much more, but their ability to perform other services that would contribute to grid stability is being wasted. Battery management technology could be used to improve grid stability even further without the need for additional funding.

In the case of the above-mentioned Schmölln II wind farm, power may only be fed into the storage system during periods of negative prices on the energy exchange. The storage system could, however, be used much more flexibly, for example to balance out short-term grid fluctuations caused by incorrect weather forecasts. International projects show what is really possible with batteries. BayWa r.e. for example, already has major projects in operation in the USA in cooperation with Eni

New Energy US Inc.. The "Corazon I" photovoltaic power plant (266 MW DC / 200 MW AC), and the "Guajillo" storage project, with 200 MW of power and 400 MWh of capacity in the US state of Texas, deliver market and systemic flexibility at the same time.

Regulations need to be adapted and modernized quickly in this area. Storage technology offers valuable flexibility potential and will be increasingly important as our energy system becomes more and more reliable on fluctuating green power.

Find out more about energy storage and grid integration and grid stability solutions at EM-Power Europe and ees Europe

This year's EM-Power Europe and ees Europe will be held from May 11–13, as part of The smarter E Europe 2022 at Messe München. The exhibitions and the accompanying EM-Power Europe Conference and ees Europe Conference at Messe München are dedicated to the dynamic field of energy storage, grid integration and grid stability. The EM-Power Europe Conference and ees Europe Conference will start on the day before the exhibition and will take place on May 10 and 11, 2022, in the ICM – Internationales Congress Center München.

Exhibitors at EM-Power Europe / ees Europe 2022

- ABB, B5.453
- BASF New Business GmbH B1.119
- Cellcube / Enerox GmbH B2.256
- DHYBRID Power Systems GmbH, B5.350
- Eco Stor GmbH B2.354
- EDF Store&Forecast B2.139
- GP Joule B2.510
- Intilion GmbH B2.340
- Leclanché SA B1.340
- LG Energy Solution B1.410
- Merus Power Plc B2.137
- Proinsener Energia S.L. B2.520
- Rolls Royce Solutions B2.234
- SAET SpA; B5.130
- SAFT B2.233
- Samsung SDI B1.110
- Socomec B2.130
- Tesvolt B2.110

EM-Power Europe / ees Europe Conference:

- Residential Solar & Storage Aggregation for Grid Services
- Utility Scale Solar & Storage and Grid Integration
- Europe's Main Market Driver, Reloaded? Utility-Scale Standalone Storage
- A Troublesome Marriage in Europe? Utility-Scale Renewables-plus-Storage

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