BATTERY STORAGE – THE POWERBANK OF THE ENERGY TRANSITION

Munich/Pforzheim, May 2024 – battery storage systems are booming: According to a study by Frontier Economics, the volume of on-grid storage systems in Germany alone could grow to 60 gigawatts (GW) / 271 gigawatt hours (GWh) by 2050 under ideal regulatory framework conditions. That is our current storage capacity multiplied by forty. Their price is expected to fall and their deployment speed to increase, similar to what photovoltaics (PV) has experienced in recent years. Battery storage systems will soon completely change our energy supply.

This growth brings enormous benefits to the energy system and to the economy of the entire country. In Germany, the deployment of large-scale storage systems may drastically reduce the need to invest in new gas-fired power plants by up to 9 GW. This is another way in which storage systems contribute to reducing carbon emissions.

The best part is: This expansion is entirely market-driven and doesn't require any government funding. Mass production, increase in efficiency and technological innovation are driving down costs. New production capacities for stationary battery storage systems are being installed at a rapid pace around the world. Battery storage systems also take up less space than pumped-storage power plants and can be installed wherever they are needed to alleviate regional peaks.

Short-term storage allows system to be transformed

Battery storage systems are true all-rounders for the energy transition and are taking on increasingly important functions for a secure power supply and grid stabilization. Large-scale battery storage systems help maintain voltage stability, provide power system inertia and the ability to perform black starts, and are part of congestion management. They are able to offset fluctuations in the grid caused by disturbances within seconds and can store energy as a buffer for hours or days. The ability to perform black starts, i.e. the ability to restart the system on its own after a power outage without an external power supply, is necessary for emergencies. At present, this task is still being performed by fossil fuel power plants.

Battery storage systems are also a forward-looking alternative to the old power plants when it comes to power system inertia. So far, the spinning reserves of fossil-fueled power plants have served to smooth out rapid frequency changes in the power grid. Battery storage systems are increasingly capable of performing this function and balancing frequency fluctuations. Storage systems can also help mitigate the effects of the delayed grid expansion. Today, grid connections are increasingly becoming a bottleneck for the expansion of renewables. Storage systems help optimize the grid load, allowing more systems to be connected. This paves the way for more capacity and PV deployment despite limited grid connection capacity.

A special – and generally underrated – benefit: Battery storage systems increase the market value of renewable energy. Electricity is only stored when a large part of it comes from renewables and when it is cheap, i.e. when the market value is low or even negative. This green electricity is fed back into the grid when it is needed, such as at night. This is when the market value for renewable energy is high. Through

this “energy shift”, battery storage helps reduce the cost of renewable energy subsidies and make the systems viable. By providing electricity at much lower prices, storage systems are forcing gas-fired power plants out of the market and reducing their summer operating hours to a minimum.

International storage revolution

Battery storage is seeing exponential growth around the world. Experts predict that the global production capacity will reach 500 GWh per year by 2025. For years, tenders for new wind or solar generation capacity in markets such as Australia, the USA or India have been combined with storage systems, for example by defining time-based requirements for guaranteed capacity or the ability of solar power generators to supply power at night. The markets in these countries are skyrocketing. China plans to expand its current capacity of 3 GW to 100 GW by 2030.

Germany’s deployment speed and installed storage capacity are still relatively small compared to other countries. For a long time, the focus of debate was the use of residential storage systems to optimize self-consumption. However, market players are starting to realize the additional potential of battery storage. This year, battery storage in Germany will surpass pumped-storage power plants in terms of installed capacity.

Now is the time to create the right framework

However, regulatory frameworks and political awareness are still lagging behind the market dynamics. The PV Think Tank, an alliance of solar energy experts, recommends an ambitious storage strategy for Germany to unlock the diverse potentials of battery storage systems. Incentives to integrate stationary storage systems that benefit the system are key – as are consistent rules and more boldness. For example, business cases should not threaten to fail due to green electricity turning “gray” when electricity is drawn from the grid. This blocks options such as the temporary storage of wind energy in PV storage systems. The temporary use of power from the grid is also necessary to provide system services.

It also requires a market environment and simple rules to make stationary storage systems of all sizes attractive as part of on-site supply. Last but not least, the market-based expansion must continue to be enabled and improved to ensure that investment in storage pays off. Modern framework conditions for battery storage system should therefore always be taken into account – for example, as part of the grid charge reform, for flexible electricity tariffs or in the introduction of contracts for difference.

EM-Power Europe and ees Europe: Spotlight on grid-stabilizing storage systems

Large-scale storage systems – primarily batteries – are essential to the grid. For this reason, EM-Power Europe, the international exhibition for energy management and integrated energy solutions and ees Europe, the continent’s largest and most international exhibition for batteries and energy storage systems, will shine the spotlight on them in Munich. Every year, leading international players offering products, services and business models for a renewable 24/7 energy supply, including grid-stabilizing storage solutions, meet here. Visitors to the exhibitions and their accompanying specialist conferences will gain insights into improved grid development plans and flexibility strategies. There will also be case studies of successful deployment strategies and business models for the seamless integration of storage, enhanced grid stability and optimized energy management. EM-Power Europe and ees Europe will take place from June 19–21 in Munich as part of The smarter E Europe, Europe’s largest alliance of exhibitions for the energy industry, with the parallel events Intersolar Europe, and Power2Drive Europe.

For more information, please visit:

ees Europe Conference Sessions
Use Cases: New Challenges, New Opportunities - Explore the Potential
Tuesday, June 18 2024, 11:30am – 01:00pm
ICM München, Room 5

Electricity Market Reform (EMR) & More - The State of EU Policies to Support Energy Storage
Tuesday, June 18 2024, 02:30pm – 04:00pm
ICM München, Room 5

A Gigawatt-scale Revolution - Outstanding Energy Storage Projects in Europe
Wednesday, June 19, 2024, 9:00am – 10:30 am
ICM München, Room 5

EM-Power Europe Conference Session
Large, Grid-Scale Storage for More Supply- and Demand-Flexibility
Tuesday, June 18, 2024, 02.30pm - 04.00pm
ICM München, Room 13A

Intersolar Europe Conference Session
Hybrid PV Power Plants I: Providing Flexible Generation for the Energy System
Wednesday, June 19, 2024, 11:00am– 12:30pm
ICM München, Room 14B

ees Forum
European Energy Storage Market & Technology Developments 2024 & Beyond
Wednesday, June 19, 2024, 02:00pm – 04:00pm
Hall C2, Booth C2.230

Themen Pitch Buffer Storage for Charging Infrastructure
Wednesday, June 19, 2024, 04:00pm – 04:50pm
Hall C2, Booth C2.230

ees Europe & EM-Power Exhibitors; Product categories: Energy storage systems for stationary applications:
https://www.thesmartere.de/exhibitorlist

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