Deployment of large-scale battery-based energy storage in Germany will result in €12 billion of added economic value and accelerate the energy transition, a new study finds

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- By 2030, the volume of battery-based energy storage in Germany is expected to increase fortyfold reaching 57 GWh with a connected capacity of 15 GW.
- Battery storage can generate €12 billion in added economic value and reduce the cost of electricity for end-customers.
- With the deployment of storage, Germany can avoid the need to build an additional 9 GW of new gas-fired power plants by 2030, reducing CO_2 emissions by up to 6.2 million tonnes in 2030.

ERLANGEN, Germany, Jan. 09, 2024 (GLOBE NEWSWIRE) -- A study by Frontier Economics - commissioned by Fluence, BayWa r.e., ECO STOR, enspired, and Kyon Energy - provides valuable insights for advancing the energy transition in Germany. The new analysis underlines the pressing need for the electricity storage strategy recently put forth by the Federal Ministry of Economics and urges its prompt completion and implementation.

Storage is crucial to the advancement of the energy transition.

The recognition of energy storage's role in power systems will increase significantly in the coming years. The analyses conducted by Frontier Economics show that the capacity of storage deployed in Germany will rise to 15 GW / 57 GWh by 2030, if a supportive policy framework is in place. This means a forty-fold increase compared to today.

By 2050, the capacity of large-scale battery-based storage systems in Germany can reach 60 GW / 271 GWh. This increase is driven by the growing demand for flexibility services in the electricity system and falling costs of storage.

Dr. Christoph Gatzen, Director at Frontier Economics, sees the study results as clear indicators for the future role of storage in Germany: "Large-scale battery storage is critical for the energy transition in Germany. Without the flexibility provided by storage, the country will face higher economic costs caused by increasing gas imports and expensive curtailment of renewable generation."

The deployment of storage is expected to follow a growth trajectory similar to the one photovoltaic (PV) technologyexperienced in recent years, both in terms of cost degression and the expansion rate. However, the deployment of storage is purely market-driven, as new projects can be built and operated economically without government funding.

Storage has the potential to generate at least €12 billion in added economic value.

Frontier Economics estimates that using storage to shift the availability of electricity from times of surplus generation to times of electricity shortages can generate a (macro)economic value of around €12 billion by 2050. This value is estimated based on the savings from the wholesale markets alone and will increase further when additional benefits of storage, such as system services, decreased CO_2 emissions, and participation in intraday markets, are taken into consideration.

According to the study, the deployment of large-scale storage systems in Germany has the potential to limit CO_2 emissions by 6.2 million tonnes by 2030 and by approx. 7.9 million tonnes in 2040 compared to an electricity system which uses gas-fired power plants instead of storage.

Furthermore, storage participation in the wholesale market will lower wholesale electricity price by €1/MWh on average between 2030 and 2050 compared to a scenario where no energy storage is built. If no energy storage is built and the missing capacity is not replaced by additional new gas plants, the wholesale prices would rise by 4€/MWh.

Storage can significantly reduce the need for investment in gas-fired power plants.

The forecasted deployment of energy storage systems will further ease pressure to invest in new gas fired power plants. According to the study, Germany needs to develop approx. 26 GW of new gas-fired power plants by 2030. However, without the deployment of storage as forecasted in the model, additional 9 GW of new gas power plants will be needed.

The modelling by Frontier Economics concluded that although storage cannot replace the construction of gas power plants entirely, it will reduce significantly the investment required compared to an increased build out and operation by 2030.

Considering the current budget crisis and the shortage of financing required for hydrogen-ready gas power plants, Dr. Christoph Gatzen stated:

"Grid-scale storage systems can be built without government funding and can reduce the need for construction of new hydrogen-ready gas power plants as well as their fuel usage."

"Ensuring investment security for storage and green generation assets through the introduction of a clear and reliable regulatory framework should be a priority for policymakers."

"We expect the demand for electricity and peak load requirements in Germany to increase significantly in the coming years. There is an urgent need for new large-scale storage systems and other generation assets in addition to the expansion of renewable energies for ensuring security of supply."

Industry expectations from policymakers

The initiators of Frontier Economics' study call on policymakers to ensure investment security for the development of new large-scale battery-based energy storage systems.

Bureaucratic and regulatory barriers in Germany, such as complex approval processes for new storage projects, should be reduced. All markets for energy trading, capacity, and ancillary services should be market-based and open to all technologies, including storage.

The Federal Government should meet the requirements set by the European Commission in the current reform of the European Electricity Market and set indicative storage targets for Germany as quickly as possible. Building on this, the Federal Government should present an expansion strategy for energy storage in Germany. With the recent publication of the electricity storage strategy, the Federal Government has taken the first step that must now be translated into concrete legislative proposals without delay.

About the study

The study on the value of large-scale battery-based energy storage in the power system in Germany[1] was developed by Frontier Economics and commissioned by Fluence Energy GmbH, BayWa r.e. AG, ECO STOR GmbH, enspired GmbH and Kyon Energy Solutions GmbH. The study used the modelling of the European Electricity Market with Frontier's *Combined Investment and Dispatch Model* in three different scenarios: (1) a reference modelling in which the endogenous expansion of batteries and gas-fired power plant is implemented in the model, and two simulation variants in which the expansion of energy storage is not possible in Germany, and the capacity replacement of missing energy storage by the endogenous expansion of gas-fired power plant is permitted (2) or not permitted (3).

About Frontier Economics

Frontier Economics is a microeconomic consulting firm that provides economic advice to public and private sector clients on competition policy, public policy, regulation, business strategy, behavioral economics, and energy and climate change. The Frontier Economics network consists of separate companies based in Europe (Berlin, Brussels, Cologne, Dublin, London, Madrid and Paris) as well as Australia (Melbourne, Sydney and Brisbane) and Singapore.

About Fluence

Fluence Energy, Inc. (Nasdaq: FLNC) is a global market leader in energy storage products and services, and optimization software for renewables and storage. With a presence in 47 markets globally, Fluence provides an ecosystem of offerings to drive the clean energy transition, including modular, scalable energy storage products, comprehensive service offerings, and the Fluence IQ Platform, which delivers AI-enabled SaaS products for managing and optimizing renewables and storage from any provider. The Company is transforming the way we power our world by helping customers create more resilient and sustainable electric grids.

For more information, visit our website, or follow us on LinkedIn or Twitter. To stay up to date on the latest industry insights, sign up for Fluence's Full Potential Blog.

Media Contact

Fluence

Joanna Spirodek
Senior Regional Marketing Manager (EMEA)
Tel.: +49 172 8662155
E-mail: joanna.spirodek@fluenceenergy.com

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[1] 'Wert von Großbatteriespeichern im Stromsystem in Deutschen Stromsystem'