Denmark solar energy storage

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According to theInternational Renewable Energy Agency (IRENA), nearly one-third of global energy generation comes from renewable sources – and the rate continues to climb every year. However, increasing our share of renewable energy generation can be fraught with challenges – especially when it comes to integrating these Distributed Energy Resources (DERs) with existing grid infrastructure.

One potential solution? The humble battery. Battery energy storage systems (BESS) allow utilities and other energy generators to capture excess energy and safely store it for future use. The effective use of BESS will be critical to the clean energy transition, the stabilization of the electrical grid and will continue to evolve to be a large part of the future energy system.

An ongoing super battery project in Denmark is a case study for using battery storage as a way to implement aggressive decarbonization strategies that work. Developed and installed by BattMan Energy with Hitachi Battery energy storage systems (BESS), the super battery is one technology for trying to fulfill the country’s climate change goals.

The gateway between the North and Baltic Seas, Denmark generates nearly 60% of its energy from wind – the highest rate among International Energy Agency (IEA) members. The combination of wind, bioenergy and solar drives the share of renewable energy generation up to 81% – allowing the country to nearly phase out coal power plants and meet its goal of ending fossil fuel production entirely by 2050.

While integration typically isn’t a problem for areas where renewables still represent a small share of total generation, countries that have been aggressive in their decarbonization strategies and are farther along their decarbonization maturity are finding it hard to flatten the production curve and maintain reliable service for customers – simply because a larger share of their energy generation is inconsistent.

Grid modernization helps, of course – providing visibility into and control over distributed assets spread across an increasingly decentralized grid. But all the optimization in the world can’t make up for the fact that solar panels don’t produce energy at night and wind turbines cease to spin when the weather is calm.

The fast, seamless integration of renewable energy generation into our electrical grids is crucial to meeting decarbonization and climate change goals around the world. BESS allows utilities to capture excess energy (when the sun is shining or the wind is blowing) and safely store it for future use (when the sun sets or the wind dies down). This helps enable a smooth transition to renewable energy, stabilizes grid performance and allows organizations to create new revenue opportunities by selling excess energy on the open market.

Knowing the impact battery storage could have on their decarbonization efforts, the Danish government

tapped BattMan Energy to build three battery parks across the country in Toftland, Olstykke and Soro to handle excess production of wind, solar and biomass energy generation.

By the middle of 2025, the battery parks will be able to store 36 MW / 72 MWh of electricity at any time – the equivalent energy of powering 6,000 Danish households. BattMan has also begun development on a fourth battery park in Denmark – a BESS that will provide an additional 500 MW / 1.5 GWh of backup electricity to the national grid.

Transitioning to renewable energy generation is the only way the world is going to meet its decarbonization and climate goals before we cross the point of no return. But, seamless transition from dirty energy to renewables like solar and wind is going to be more difficult than anyone imagined.

As we have seen in Denmark, battery storage is central to the clean energy transition – providing a smooth path for the transition to renewable energy, stabilizing the national grid and providing additional revenue opportunities through the sale of excess electricity.

Pea sized stones heated to 600?C in large, insulated steel tanks are at the heart of a new innovation project aiming to make a breakthrough in the storage of intermittent wind and solar electricity.

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