460 kWh commercial energy storage

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SolarEdge Technologies, a smart energy company that develops and markets solar inverters, has introduced its Commercial Storage System (CSS), which is expected to be commercially available in the second half of 2024.

Designed for small-to-medium commercial PV installations, the DC-coupled CSS provides 58 kWh of battery capacity and is suitable for indoor use. Able to connect up to eight batteries per inverter, it will deliver up to 460 kWh of storage capacity and offers the ability to synchronize solar battery and site-level energy management.

The DC-coupled battery architecture eliminates the triple-conversion penalty, with two less AC-to-DC power conversions compared to AC-coupled alternatives, delivering industry-leading round-trip efficiency and higher PV oversizing.

The CSS is designed to integrate with SolarEdge"s Energy Management ecosystem, enabling system owners to further reduce payback periods by utilizing more stored energy for peak shaving, leveraging higher PV self-consumption and capitalizing on Time-of-Use rates, grid services and support for EV charging.

Lightweight, compact and modular, the CSS is designed for easy transportation and installation; it can be handled by a two-person team. Small and medium-sized enterprises will also have the flexibility to scale-up their storage capacity by adding more batteries as their needs increase.

The battery will feature SolarEdge"s multi-layered suite of embedded safety features, which includes arc detection, and is expected to be certified for UL 9540A for indoor use.

Today, the power sector is responsible for one third of domestic emissions. Successfully decarbonizing requires a transition from fossil-fuels-based generation assets to carbon-free power sources such as renewables (e.g., wind, solar) and nuclear. Since variable renewables cannot be turned on and off to meet peak demand in the same manner as fossil-fuels-based generation assets, the grid will need a new way of providing flexibility and reliability.

Long Duration Energy Storage (LDES) is a key option to provide flexibility and reliability in a future decarbonized power system. LDES includes several technologies that store energy over long periods for future dispatch. The Pathways report organizes LDES market by duration of dispatch into four segments: short duration, inter-day LDES, multi-day / week LDES, and seasonal shifting. This report focuses on those two intermediate duration market segments--inter-day and multi-day / week LDES.

While meeting this requirement requires significant levels of investment, analysis shows that, by 2050,

net-zero pathways that deploy LDES result in $10-20B in annualized savings in operating costs and avoided capital expenditures compared to pathways that do not.

The focus of this commercialization effort is to understand the challenges, solutions, and potential long-run benefits of LDES achieving technology "liftoff" by 2030. "Liftoff" is defined as the point where the LDES industry becomes a largely self-sustaining market that does not depend on significant levels of public capital and instead attracts private capital with a wide range of risk.

Improvements in technology performance and cost curves, market and regulatory mechanisms, and supply chain development and planning are needed in the immediate and near term to achieve commercial liftoff.

To be competitive with alternative options, LDES technology costs should come down by 45-55% by 2028-2030 relative to costs reported by leading technologies today, and both the performance (measured by roundtrip efficiency - RTE) and the working lifetime of LDES technologies would also improve.

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