

BESS: A hotbed of innovation



Jurors had a tough task selecting a battery energy storage system (BESS) award winner in 2025, with more than 60 entrants vying for the prize. Some entrants debuted entirely new approaches to energy storage, while others demonstrated continuous performance optimization, including round-trip efficiency gains, capacity utilization and degradation. This year's winner takes an innovative approach to the C&I segment, with a modular system that breathes new life into second-hand batteries.

Winner

Stabl Energy, high-performance second-life BESS

Stabl's commercial and industrial (C&I) integrated battery storage system combines the benefits of second-life batteries with a novel modular multi-level converter (MMC) technology for increased efficiency and optimized sustainability. The status quo of battery storage systems is to connect multiple battery modules in series. This approach means the chain is only as strong as its weakest link, with performance limited by the weakest module. Stabl's innovative inverter technology enables the individual control and performance optimization of each battery module, allowing each of them to be closely monitored and independently managed.



Overall capacity, uptime and safety are significantly improved as a result.

It's an approach that enables the German manufacturer to use second-life batteries of various types and states of health, saving battery resources and preventing premature scrapping. The technology is particularly attractive for owners of large quantities of end-of-life batteries, such as transport companies. By virtue of MMC, Stabl's system achieves a roundtrip efficiency of up to 94.6% by dynamically connecting and disconnecting battery modules, resulting in a significant performance improvement.

Stabl also brings safety improvements by isolating faults locally, which reduces downtime, and combines safe-to-touch

low-voltage safety with high-voltage efficiency. According to Stabl, the MMC features advanced lossless balancing, optimizing capacity and extending battery life up to 67%. These features, and primarily the product's outstanding roundtrip efficiency, allow for a leveled cost of storage of €0.065 (\$0.075)/kWh to €0.07/kWh, approximately 30% lower than other solutions on the market.

Jury comments

Anna Darmani: We're seeing growing interest in C&I storage, with successful business cases remaining the main challenge. By bringing a second-life product to market, Stabl can potentially offer lower upfront costs, improving the business cases while delivering strong sustainability benefits. It fills a key gap in a market segment that is currently underserved.

Johannes Weniger: In practice, we often see SOC [state of charge] spreads between different modules, so having more advanced technology like a modular multi-level converter is a major advantage because it allows energy flow to be controlled at the module level. It's also a smart approach to pair second-life batteries with multi-level converter technology, as this can ensure longer-lived solutions compared to other second-life systems where modules are simply connected in series.

Hermann Schweizer: A new approach that can unlock future potential by enabling higher roundtrip efficiency and better utilization of batteries. With the multi-level approach, more capacity can be extracted from the same system.

Highly commended

Noon Energy, ultra-long duration energy storage battery

California-based startup Noon Energy aims to commercialize a true ultra-long-energy-storage (100+ hours) solution in a bid to fill the energy grid gap not covered by conventional lithium-ion batteries.

The company has developed a novel carbon-oxygen battery system that aims to provide multi-day to seasonal storage. Its container unit provides 100 kW of power with more than 100 hours of uninterrupted power delivery. The system's high energy density means it has a much smaller physical footprint than other long duration storage technologies, making it well suited for space-constrained locations.

By adding inexpensive storage tanks and naturally abundant storage materials, Noon Energy claims it can scale energy

capacity affordably to serve a wide range of applications – from small commercial systems to utility-scale projects. In so doing, it aims to address two major challenges – load growth and 24/7/365 clean generation. The young company expects its first pilots to get off the ground by the end of 2025.

Jury comments

Anna Darmani: I liked that they are introducing a new design and technology, and if they deliver on what they promise and achieve the cost levels they claim, it could have a huge impact on the market for certain applications and position them as a rather unique player.

Hermann Schweizer: The more renewables we build, the more long-duration energy storage (LDES) we will require. If they can deliver on their promises, Noon

The Jury

Anna Darmani is lead analyst on Wood Mackenzie Power & Renewables' global energy storage team and focuses on storage in Europe, the Middle East, and Africa. She previously worked at EIT InnoEnergy, developing innovation and technology roadmaps and contributing to EU research and advisory projects. She was a founding member of the European Battery Alliance.



Johannes Weniger has been working in the PV industry since 2009 and is a founding member of the Solar Storage Systems Research Group at the University of Applied Sciences HTW Berlin. He initiated the Energy Storage Inspection in 2018 and has reviewed over 90 solar-battery solutions from more than 30 manufacturers. Weniger earned his doctoral degree from the Department of Electrical Energy Storage Technology at the Technical University of Berlin.



Hermann Schweizer brings more than 20 years of experience in the electronics and energy sector. As CTO of sonnen Group for seven years, he led the development of advanced software and hardware solutions and the company's virtual power plant (VPP) technology. Following his time at sonnen, he served as CEO of REPU/Pramac Storage Systems for three years, where he drove the expansion of grid-scale energy storage solutions. Since late 2023, Schweizer has served as CTO and co-founder of green flexibility development GmbH.



will certainly become a strong technology player.

Johannes Weniger: They tackle the critical challenge of Dunkelflaute, and in the long term, this could become a very important technology.

