

# EIC INSIGHT REPORT

## ENERGY STORAGE

### Executive summary

The energy storage market has a crucial role to play in the transition to a net-zero carbon emission future, as evidenced by the current projected growth trends across different technologies and markets as well as the ongoing debates on flexibility in energy systems. While a focus in demand has been particularly visible for battery energy storage projects, technologies such as redox flow and metal air batteries as well as longer duration options such liquid air energy storage (LAES) are emerging and gaining a foothold. Projections suggest that the industry will expand from 12GWh in 2018 to over 158GWh in 2024, excluding pumped hydro storage projects, representing an investment of up to US\$71bn. Markets seeing significant developments and company activity include Australia, China, Germany, Japan, South Korea, the UK and the US.

While pumped hydro energy storage (PHES) continues to lead global installations, representing over 90% of operational capacity, battery energy storage technologies are now gaining much of the attention. The sector has seen immense growth in the past five years and is quickly becoming an undisputed leader in terms of deployment and applications. In 2018

alone, battery storage saw global deployment grow by 147% year-on-year. The driving factors of this increase extend beyond the demand in the transmission system or the integration of renewable energy to the growing electric vehicle (EV) market across different countries and regions.

Battery storage technologies, however, are not without their challenges and limitations. This includes issues with the mining and processing of raw materials for lithium-ion batteries -which can be carbon- and energy-intensive, ongoing concerns with the safety of battery units as well as their currently limited duration offering of up to four hours. The increasing recognition and debate of these has opened greater opportunities for longer duration technologies to promote their role and function in the energy system. These technologies eliminate some of the supply chain issues and can provide over six hours of duration, making them a promising answer to concerns over the impacts of high renewable energy penetration in the future energy system.

Despite the recent growth in lithium-ion battery systems, research and development of new technologies as well as continued efforts to improve technological performance has by no means stopped and a 'winner' has not

been picked. There are a variety of compositions, technologies and respective companies to be considered for energy storage as we transition to a low-carbon future, many of which are still at early development and deployment stages. The EIC Insight Report on Energy Storage offers a high-level overview of some of these key technologies securing interest and attention from the industry. The report highlights key project and policy developments in the UK and the European Union as well as portraying the shift to longer duration technologies and providing examples of key companies to look out for in this growing sector. It has become apparent in the past couple of years that, regardless of the technology chosen, energy storage will play a crucial role not only in the future low-carbon energy system, but in society as a whole.

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