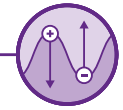

Electricity storage

Flexibility

Electricity storage is necessary across all our net zero pathways to help balance the grid and ensure security of supply.

Different durations of energy storage offer different benefits. Two to four-hour storage can meet short variations in demand and supply, provide short-term reserve and help manage the network. Long-duration storage can help secure the system over longer periods of high or low renewable generation output. The electricity storage sector is a rapidly developing one. In our modelling, we have considered battery storage, pumped hydro storage (PHS), compressed air energy storage (CAES) and liquid air energy storage (LAES).

Other emerging technologies, such as iron air batteries and gravitational storage, are not yet included in our analysis. As these develop, it is possible they may displace some of the capacity and volume currently allocated in our modelling to other storage technologies. We will continue to review our assumptions as more market information becomes available.

Between 23–30 GW of electricity storage is now expected to connect into the system by 2030. Our pathways reflect this increase and also consider the relevant supply chain issues, planning considerations and connection delays.

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Electricity

Battery storage in our pathways

Flexibility

Great Britain currently has 4.7 GW of operational battery storage capacity. Longer-duration batteries have been introduced onto the distribution network this year, with a shift from one-hour to two-hour batteries.

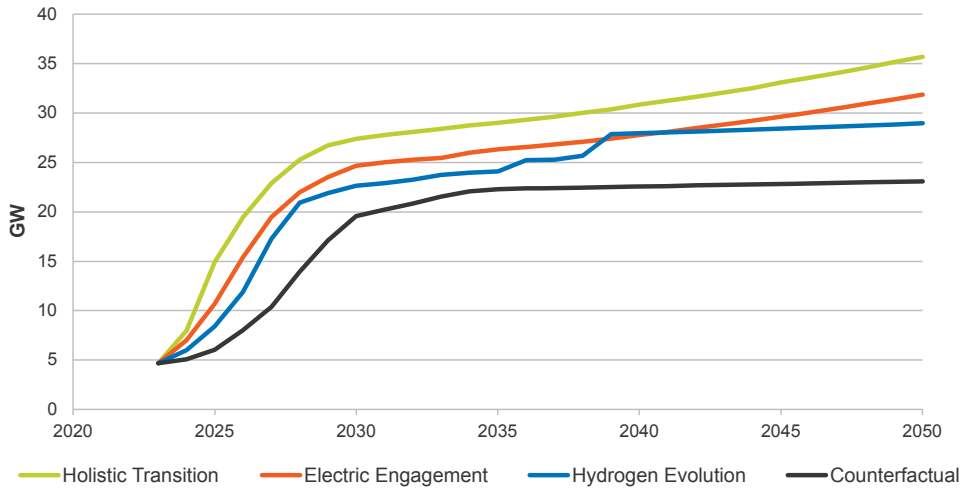
There has also been a shift towards longer-duration batteries due to changes to the de-rating factors (availability) for battery storage projects in the Capacity Market (CM). Nonetheless, challenges may remain around the supply chain and aligning battery growth with the lithium reserves available.

Holistic Transition and **Electric Engagement** are the pathways with the highest levels of renewable capacity and, therefore, require more flexibility. We expect to see 28 GW of battery storage by 2030 in Holistic Transition, reaching 36 GW in 2050.

Hydrogen Evolution meets flexibility requirements primarily through higher levels of hydrogen storage. As a result, this pathway sees the lowest levels of installed battery storage deployment, reaching 29 GW by 2050.

The **Counterfactual** requires less flexibility and, therefore, has the lowest volume of battery capacity by 2050, reaching just under 23 GW.

Figure ES.16: Battery storage installed capacity (excluding vehicle-to-grid)



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