



ENERGY STORAGE: EXECUTIVE SUMMARY

- ❑ Driven by the increasing penetration of (intermittent) renewable energy generation and electrification (heat, transport), cost-effective energy storage (ES) promises huge value upside for the energy sector, via energy arbitrage, ancillary services, reduced CapEx ...
- ❑ Estimating the long-term ES market size is challenging; BNEF estimates 45GW / 81GWh installed base by 2024 (USD\$44bn investment)
- ❑ Utility-scale ES projects are increasingly fundable with debt, confirming certain technologies' perceived maturity (as well as utility offtake pricing visibility)
- ❑ Germany is currently leading in residential deployments, with the US (esp. CA) leading utility-scale; other geographies (China, UK ...) are rolling out projects
- ❑ Lithium-ion (LIB) has emerged among the newer technologies as dominant in both stationary – residential (behind-the-meter) and utility-scale – as well as mobile (Transport) applications; commodity prices/availability remain a cyclical risk for LIB
- ❑ LIBs' strong cost curve as well as relative (parent company) bankability may shut out alternatives (e.g. flow batteries) even for larger capacity (energy-centric) deployments
- ❑ In time there is likely to be a large overlap between 'stationary' and 'mobile' ES capacity, in the form of vehicle-to-grid (V2G) capacity
- ❑ The ES, PV and DRM segments are increasingly merging, to represent virtual power plants ('prosumers'); this will pressure utilities and single-silo (PV/ES/DRM) vendors, while presenting opportunities for innovative newcomers
- ❑ Heat storage has seen limited uptake, due mostly to a lack of suitable offerings
- ❑ Investing successfully in ES companies remains challenging; business model plays and LIB-enhancement technologies are seen to be the most promising businesses
- ❑ Corporate interest in the ES sector is increasing markedly, as its likely transformation of the Power/Energy sectors becomes less disputed