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Despite geopolitical unrest, the global energy storage system market doubled in 2023 by gigawatt-hours installed. Dan Shreve of Clean Energy Associates looks at the pricing dynamics helping propel storage to ever greater heights.

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2023 is in the books, and early indications are that the global energy storage system (ESS) market may very well have doubled again in terms of gigawatt-hours (GWh) installed. This is a remarkable feat, especially in the face of geopolitical tumult, elevated interest rates and impossibly crowded interconnection queues.

The market has shown reliance and is, indeed, poised for further growth, with a fourfold increase in annual installs possible by 2030. The reason why is simple: pricing.

The primary price driver is universally recognised as a frothy lithium market that suddenly lost its fizz. Lithium carbonate pricing is down more than 80% from its 2022 peak. Supply/demand imbalances are to blame; or rather, how third-party estimates regarding those imbalances developed over the past three years (Figure 1).

To illustrate, in December 2021, S& P Global forecasted 2023 global lithium supply to top 762,000 tons, with a small surplus of 9,000 tons over demand. By the end of 2022, supply estimates for 2023 had grown to 864,000 tons, surpluses were nil and long-term shortages were expected. The market shifted dramatically in 2023, and S& P"s latest estimate pegged global lithium supply at 968,000 tons, corresponding to a market surplus of 95,000 tons. A longer-term lithium carbonate surplus is now the industry consensus.

To be clear, the supply swing caught the entire market by surprise. Most industry pundits misjudged the pace of supply expansion from existing lithium mines, the dwindling electric vehicle (EV) demand dynamics, and the apprehensive buying behaviour in this still-youthful commodity segment.

For example, although supply/demand imbalances drove price volatility from 2021 through 2023, the magnitude of those price excursions was exacerbated by stocking and destocking within the lithium-ion battery value chain. EV battery cell suppliers, especially those in China, have been locked in a heated battle for market share for years. Fears of critical raw material shortages at a time when global EV demand was achieving growth rates of +60% stoked irrational buying behaviour.

The result was a 270% increase in lithium carbonate costs from Q3 2021 to Q4 2022. The removal of China"s New Energy Vehicle incentive in 2023, lingering range anxieties among Western consumers and a global increase in interest rates cast a pall on the EV market, resulting in a "disappointing" YOY growth rate of 31%. As demand slipped, suppliers were left sitting atop mountains of inventory and thus moved aggressively on price to bring their balance sheets back in order.

Savvy ESS developers recognise the critical importance of monitoring the broader EV sector alongside their own market. EVs represent around 80% of global lithium-ion battery demand, and the knock-on impacts to the ESS segment in terms of raw material pricing are meaningful as DC container suppliers generally apply raw material index pricing to their proposals.

Consequently, ESS developers and integrators should be mindful of near- to mid-term EV downside demand risk as they could be leaving money on the table. The next wave of EV adopters will need a rollback of interest rates, rollout of lower-cost EVs and an expansion of charging infrastructure, all of which will take time. BNEF just downgraded its global EV forecast (again) for 2024 by 775,000 vehicles.

ESS market participants entered 2024 with enthusiasm and confidence, under the impression that market conditions had settled down and that they would finally be able to ink purchase orders.

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