

Lithium

10-year forecast

Q1 2024



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Executive summary

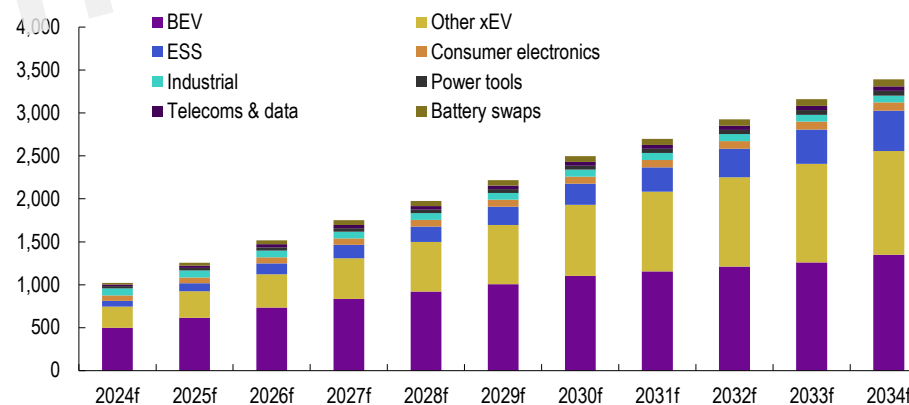
Fastmarkets' long-term analysis of the lithium market has identified four key takeaways:

1. Robust demand – 3.4 million tonnes of LCE by 2034
2. Supply-chain diversification efforts focus on hydroxide
3. Tightness expected to ease, but no room for complacency in the long-term
4. Current price environment has potential to sow seeds for next rally

1. Robust demand: 3.4 million tonnes of LCE by 2034

- Fastmarkets forecasts demand from BEVs to increase at a CAGR of 10% to 1.35 million tonnes of LCE in 2034 from 498,000 tonnes of LCE in 2024.
- Demand for lithium-ion batteries from battery swapping terminals, ESS, CE, power tools, and telecoms and data are expected to add an additional 754,000 tonnes of LCE demand by 2034.
- Li-ion batteries are forecast to contribute 97% of total lithium demand by 2030.

Lithium demand forecast
'000 tonnes LCE



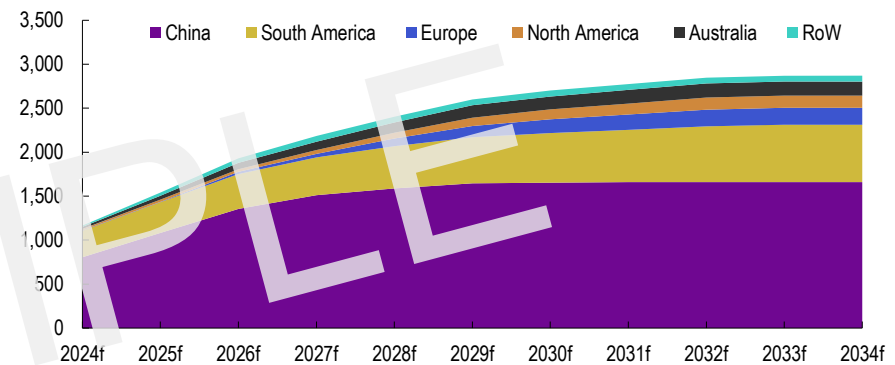
Source: Fastmarkets

Executive summary

2. Supply-chain diversification efforts focus on hydroxide

- We still expect China to dominate processing capacity, increasing its salt production to 1.66 million tonnes of LCE in 2034.
- Production of battery-grade salts, especially hydroxide, is a priority for the United States and Europe to reduce their reliance on external supply chains, especially China.
- We forecast ex-China processed production to reach 1.21 million tonnes of LCE in 2034, 43% of which will be hydroxide; this figure will rise to 59% in North America and 75% in Europe, supported by an increased focus on recycling.
- Many factors could delay planned processing capacity outside of China, including feed source, environmental permitting and parts shortages.

Regional processed production
'000 tonnes LCE



Source: Fastmarkets

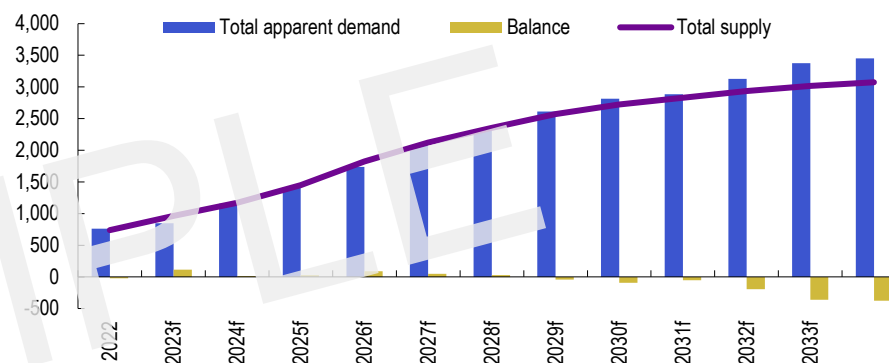
Executive summary

3. Tightness expected to ease, but no room for complacency in the long-term

- Fastmarkets expects the market to be relatively balanced until the end of the decade, with a peak surplus of 90,000 tonnes of LCE (5% of demand). This could change relatively easily should demand exceed our expectations and supply expansion disappoint to the downside.
- We have witnessed a stream of projects — incentivized by the current price regime and backed by government policy support — begin to come online. In conjunction with softening demand and aggressive destocking, this has resulted in more ample supply compared with 2022.
- Experience tells us that even though we have allowed for delays and disruption factors in our supply outlook, more issues are likely to affect the delivery of new material into the market, especially considering the current price environment.
- We expect Chinese lepidolite production and DLE to be factors of supply. There is environmental risk and technological execution to each of these supply sources respectively; therefore, forecast surpluses could be eroded.
- A lack of visibility on supply toward the end of the period makes forecasting challenging. We expect a sustained high price that will incentivize project development and ensure that supply comes online to fill these gaps.

Lithium supply-demand balance

'000 tonnes LCE



Source: Fastmarkets

Changes Q1'24 vs Q4'23 forecast

Demand changes

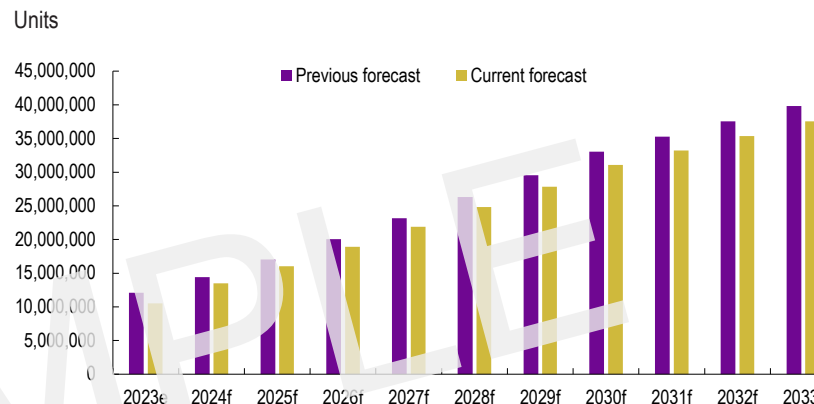
There have been near-term downgrades across the board due to weaker than expected BEV sales in the fourth quarter, with consumers, notably in China and the US purchasing a higher volume of PHEVs.

We have seen that residual inflationary pressure and high interest rates have restricted EV adoption while also preventing governments from making legislative and financial investments to support EV adoption across developing markets. As a result, certain markets have not performed as well this year as we had previously hoped, and we expect that it will take longer for EVs to become more commonplace due to affordability concerns and a focus on luxury brands (especially in Europe).

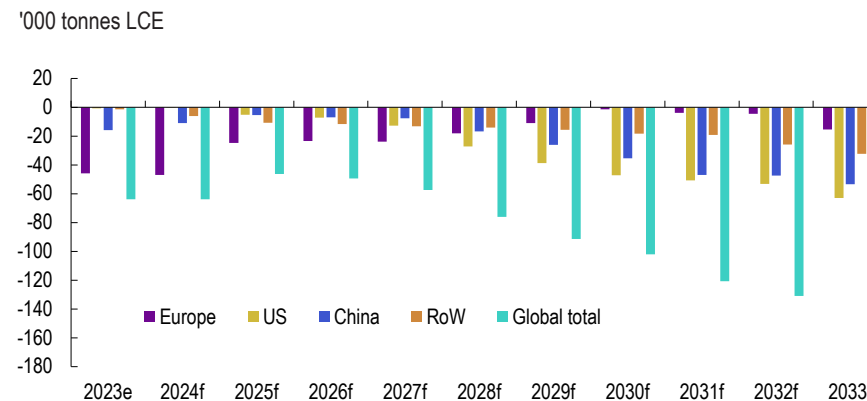
The announcement of delayed investment in EVs from major legacy OEM brands such as Ford and GM over the near term has a negative effect on vehicle sales projections and therefore lithium demand. The increasing adoption of lower lithium intensity chemistries such as LF/LMFP has also had negative effect on demand from BEVs over the long term.

The above factors have seen a reduction of some 164,000 tonnes of LCE from BEV demand in 2033. Between 2024 and 2033 the cumulative decline in LCE demand from BEVs is expected to be 900,000 tonnes.

BEV sales forecast



BEV LCE demand changes Q1-24 vs Q4-23 forecast



Source: Fastmarkets



Changes Q1'24 vs Q4'23 forecast

Supply changes

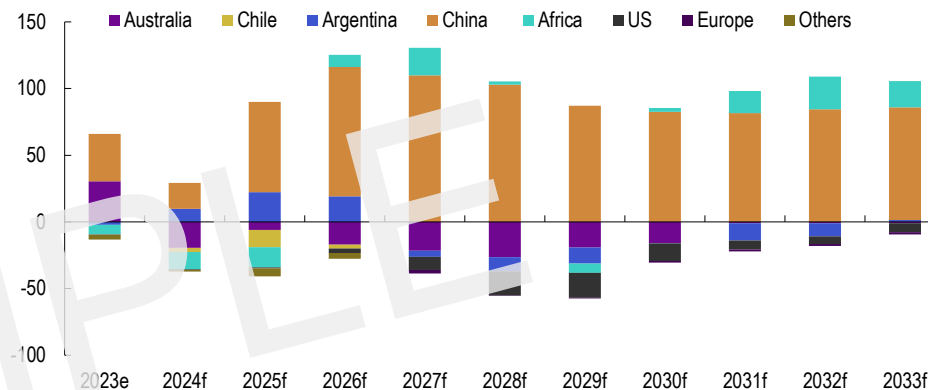
Notable changes come from the removal of Core Lithium's Finnis mine due to the suspension of mining activities. It is unclear when these might restart.

Upgrades to Argentina and China stem from several projects ramping up and therefore have been moved from probable (75% probability weighting) to operational (100% weighting).

There are some downgrades to mine production from Africa over the next two years due to the current price environment which has forced some projects to reduce output and cut costs. But over the long term this has been outweighed by the inclusion of the Kamitivi project which began ramping up in Q4'23 and is expected to be producing over almost 28,000 tonnes of LCE by 2029.

Mine supply changes Q1-24 vs Q4-23 forecast

'000 tonnes LCE

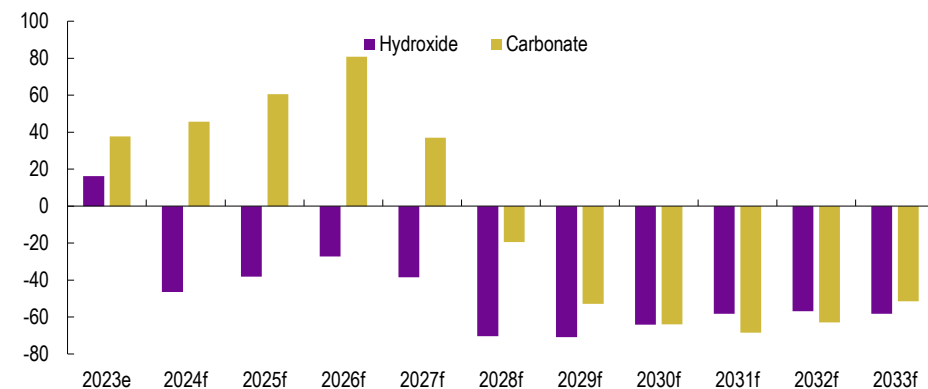


Our carbonate forecast has increased over the next four years because of a better-than-expected initial ramp-up of operations in Argentina as well as sticky lepidolite supply in Jiangxi and higher production from China's brine assets. The long-term downgrades to carbonate are mainly attributable to delays in commissioning and expansions at assets in Argentina, and the halt to development of spodumene processing lines (Ganfeng & General Lithium) and recycling (Jinhui Lithium) in China.

The downgrades to our lithium hydroxide forecast are chiefly from China where several tier 1 and 2 converters have either halted development of conversion facilities (Ganfeng & Jinhui Lithium) or reduced the number of planned processing lines at the facility (Tianhua Times Technology).

Changes in processing forecast Q1-24 vs Q4-23

'000 tonnes LCE



Source: Fastmarkets

Macro outlook and policy drivers

Macroeconomic outlook & lithium

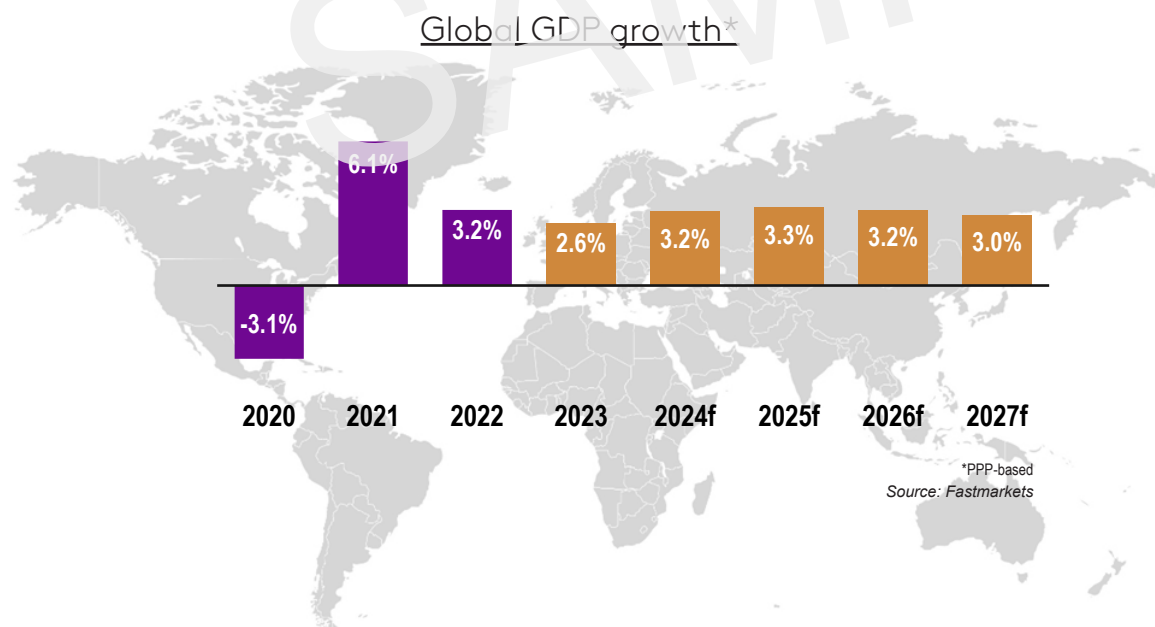
While global economic growth was severely affected by the Covid-19 pandemic in 2020, Russia's invasion of Ukraine in 2022 and the inflation-driven dip in 2022-23, the current drivers both of battery demand and battery raw material supply override the general macroeconomic fluctuations.

Fastmarkets' macroeconomic outlook, which was updated in September 2023, predicts global economic growth (measured by real GDP, purchase power parity) reaching 2.6% in 2023 before rising to 3.2% in 2024 and 3.3% in 2025. The expected higher overall global economic growth has the potential to boost consumer demand for batteries, especially for non-EV products such as ESS and power tools. This higher demand could pose a positive risk to the demand side.

In terms of global policies that could affect macroeconomic factors supporting the lithium market, key are those related to the energy transition and energy storage, as well as electrification of transport (land, maritime and aviation). Policies enacted since 2021 include the US Inflation Reduction Act (IRA), the EU Green Deal, the Canadian Critical Minerals Strategy and India's FAME II Strategy.

FAST FACTS

- We expect global economic growth to pick up in 2024 after slower growth in 2023
- Higher overall global economic growth has the potential to boost consumer demand — an upside risk for lithium demand





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