Wood Mackenzie

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Lithium:

5 things to look for in 2024

While lithium demand remains the posterchild for battery raw material requirements, its rate of growth is slowing with a maturing market, more muted sales of electric vehicles, and a falling intensity of use within the evolving landscape of cathode chemistries. EV sales in 2024 will be curtailed by lower government incentives and inadequate charging infrastructure. We forecast global plug-in EV sales to rise by 33% this year, falling from the average growth of 71% per year between 2021 and 2023. At the same time, growth of lithium iron phosphate (LFP) cathode chemistries with lower lithium requirements will outstrip the increase in high-nickel cathode chemistries and put further downward pressure on a declining rate of lithium demand growth.

On the supply side, new mineral project ramp-ups in Australia and China will be supplemented by additional production in Brazil and Zimbabwe. Meanwhile, we expect to see strong growth in the supply of lithium chemicals from China, where output is forecast to increase significantly in 2024. There will also be continued ramp-up of lithium chemicals in Chile, Argentina, and Australia.

While overall demand growth remains strong, lower growth rates combined with surging short-term supply will push the lithium industry further into surplus in 2024, limiting upward price movements. The upside is expected to be greater price stability as the pricing mechanism for lithium products continues to evolve with a maturing lithium market.

1. Price evolution

In 2023, we witnessed a downward trajectory of prices as the market moved toward a supply surplus. Prices were impacted negatively due to the continuous destocking of inventories. We expect the destocking trend to continue in early 2024. This will be followed by a period of minor restocking before the market reaches a ‘new normal’ for inventory levels and the market enters a more mature state where supply and demand fundamentals take precedence in price setting. Ultimately, this will lead to less volatility in the price of lithium.

2. The effect of lower prices and the impact of the cost curve on supply

Following the relentless decline in lithium prices throughout 2023, it's unsurprising that we head into 2024 with a sharp focus on lithium production costs.

Based on our analysis, the prices are starting to bite into the higher-cost lithium supply sectors, namely the higher-cost, lower-grade, large lepidolite operations that have recently started up in China, as well as the direct-shipping-ore (DSO) supplies of lithium imported into China for processing and refining. However, these parts of the supply chain are viewed as likely swing/marginal producers. What about the core of the curve, and where might we see output curtailed?

There is a tendency to focus exclusively on the shape of the cost curve, but the industry is at an immature stage, and other complicating factors need to be considered. That said, the first thing to note is that much of the cost curve remains profitable on an operating cash flow (C1 cost) basis and has previously weathered periods of markedly lower prices in 2019-20, including a 16-month span where carbonate spot prices were under US$10,000/t. The second is that lithium demand growth remains robust (despite recent slowdowns), and the volume of new supply entering the market is driving the surplus balance. This new supply can’t just be viewed on the merit of the cost curve, it’s also essential to consider the requirement of these projects to generate significant positive cash flow to repay debt associated with the construction of the mine and plant. This is evident by Altura’s road to receivership in October 2020, as the miner was unable to cover its financing costs.

Stepping back from the cut-and-dry fundamental of supply/price analysis, we need to consider other factors:

- Companies with one asset, mining, or refining, cannot stop production or their entire cash flow will dry up. Reducing production could be an option, but the fixed cost component often renders this moot. Instead, operators look to pull leavers such as high-grading (i.e., mining more lithium per unit of ore) or reducing their spend on waste mining, maintenance, and sustaining capex, generally with future implications for the asset's economics.

- In contrast, the lithium majors with multiple assets can stop production at one or more assets to reduce supply to the market, thereby bringing some balance to the industry. This was seen in the last downturn where Albemarle curtailed operations at Wodgina only shortly after acquiring part of the asset from Mineral Resources. Arguably, it also allows them to restart the operation in better times and derive more value from the asset longer-term.

- Political pressure can also result in unprofitable assets remaining open despite sales prices below the cost of production.

3. The effect of lower prices on capital commitment

As we move into 2024 with a supply surplus and weak outlook for prices in the near term, companies will look to curtail spending to secure survival. In the past, when we have seen capital investments being postponed, it has resulted in periods where demand growth exceeded supply growth.

In 2024, beyond the cuts to the marginal sources of lepidolite and DSO, the bulk of established operating assets look safe, with many having weathered the previous downturn. We expect notable delays to be announced for projects in the early stage of construction or at the final investment decision stage as companies look to conserve cash.

Meanwhile, further down the project pipeline, development and evaluation activity will slow as funding dries up. Of the operating assets, those at advanced construction or newly commissioned projects look most at risk, either as the majors that own them look strategically at the implication of their additional supply on the market or as the single asset owners that developed them face financial pressure.

In contrast, mergers and acquisitions will be something to watch out for in 2024, with many of the lithium majors holding healthy cash positions built in the recent bull market surely poised for discounted growth opportunities. To this end, one can’t rule out the true mining majors using this as a point to enter the lithium space or bolster their portfolio. It is no secret that, long-term, a significant amount of capital is needed in the lithium industry to meet continued demand growth.

4. Commissioning challenges

Aside from market conditions, new supply will face several unique challenges. Commissioning and ramp up are always difficult times for producers, but with the sheer number of projects due to come on-line in 2024, attention will focus on comparative routes to market. In our forecast, we include a number of resource and conversion projects starting in 2024. Resource and refinery projects will face challenges regardless of the company's experience. For mining companies, the ore body and concentration of the ore will present challenges. Brine projects will have a level of variability in the resource to contend with. Refining projects must deal with the precision chemistry needed to produce the products and quality the supply chain requires for rechargeable batteries.

Large-scale lithium production is still relatively new and widening geographical diversity and evolving extraction technologies bring new difficulties. We have seen even experienced producers struggle outside of China in commissioning lithium refineries due to various challenges such as high capex requirements, and the fact that essential expertise to build and operate refineries is still limited in much of the rest of the world. Historically, we have noticed the challenges miners in Australia have faced in starting a mine and producing spodumene concentrate at acceptable utilisation rates and quality. Building an extractive asset or a refinery is extraordinarily difficult and complex, and the world is still on a steep learning curve.

5. Continued DLE enthusiasm and first production

2023 was the year of Direct Lithium Extraction (DLE) enthusiasm. We saw a flurry of announcements committing to investment and the uptake of DLE in lithium production, extolling its purported benefits for improved recovery of lithium (shorter recovery times, and reduced use of freshwater). In the USA, amongst the momentum and support for domestic lithium production facilitated by the Inflation Reduction Act, oil giant ExxonMobil has announced aims to extract lithium chemicals from brines in Southern Arkansas using DLE technology. Standard Lithium, a North American small-cap, has been operating a demonstration plant for DLE since May 2010 and, in 2023, published a definitive feasibility study for a commercial lithium extraction plant utilising its LiPRO LSS DLE process developed with Koch Technology Solutions. Lithium chemical prices into 2024 are less of a cause for celebration, but more is needed to thoroughly dampen the enthusiasm around DLE, particularly for North American oil field and geothermal brine projects fuelled by government policies and the expanding EV industry.

Chinese DLE providers, such as SunResin, have dominated the commercial application of DLE. Despite sub-optimal market conditions, 2024 will see further testing and first production from a generation of new, largely proprietary, DLE technologies and providers. Eramet and Tsingshan's Centenario project in Argentina is anticipated to begin the first lithium carbonate production using its in-house DLE technology in H1 2024. We expect continued announcements from DLE developers (including EnergyX, EnergySource Mineral’s ILiAD technologies, Lilac Solutions, and SLB) and lithium producers developing or enhancing in-house DLE technologies (such as E3 Lithium, Rio Tinto, Vulcan Energy, and Volt Lithium).

However, it should be noted that, despite the flurry of recent attention, challenges will remain preventing large-scale uptake of DLE in 2024. These include concerns over the CAPEX requirements entailed in DLE uptake, especially at a time when many producers will be looking to scale back on spending.

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