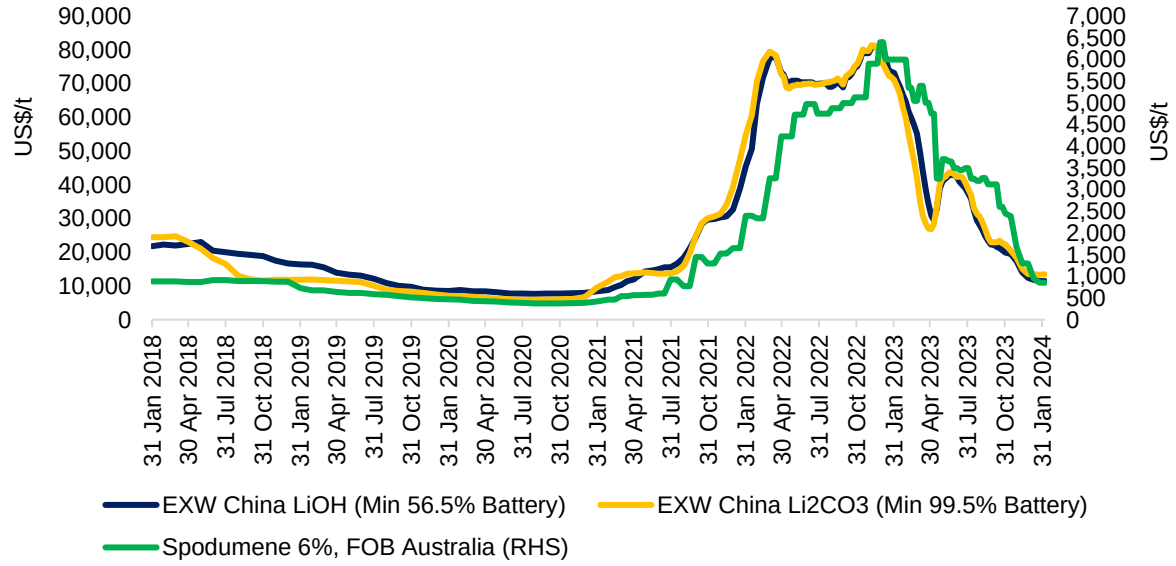
February 2024

# Lithium price volatility: where next for the market?

After a super-charged rally two years ago, the year-long slump in lithium (Li) and wider battery metals pricing has triggered a range of questions in the market: how sustainable are current spot prices? Has lithium's marginal cost of production become more dynamic compared to previous years? What next for lithium prices and pricing?

So far, lithium chemical spot prices have fallen by 80% from a historic high of US$80/kt (albeit a brief peak) to current levels near US$13/kt. Meanwhile, spodumene (SC6[1]) prices have fallen by 90%, with current prices trading near US$800/t – a level not seen since 2021.

**Figure 1: Lithium chemical spot prices (LHS) and spodumene concentrate (RHS), US$/t**




Source: Benchmark Minerals

Note: EXW = Ex Works, LiOH = Battery-grade Lithium Hydroxide, Li2CO3 = Battery-grade Lithium Carbonate

Complex forces continue to govern lithium prices. Chinese overcapacity in cells and cathode material have driven a multi-month destocking phase amplified by the cost of holding inventory. Lithium's supply-side has become more dynamic, with new sources of swing supply. Global EV sales meanwhile remain sensitive to policy - the latter an important consideration given that the battery value chain is long and

[1] Through beneficiation, hard-rock ore (spodumene) is converted to a concentrate – SC6 refers to spodumene concentrate with 6% lithium oxide content. The concentrate is refined to produce battery-grade lithium chemicals (e.g. lithium hydroxide).



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orderbooks are built ahead of time. Mismatches in real and implied demand can lead to inventory builds across the entire chain.

While there has been no shortage of analyses examining the challenges of scaling lithium supply to meet long-term net-zero targets[2], less discussed has been the role of pricing and its interaction with a more dynamic lithium market. After all, it is price signals which determine the efficient allocation of capital in any market, particularly in an immature one where China has an outsized role.

This Energy Insight sheds light on some key features of lithium's evolving pricing landscape; the drivers of volatility in the market; and the implications ahead as lithium's journey to market maturity continues apace.

## Li and the energy transition

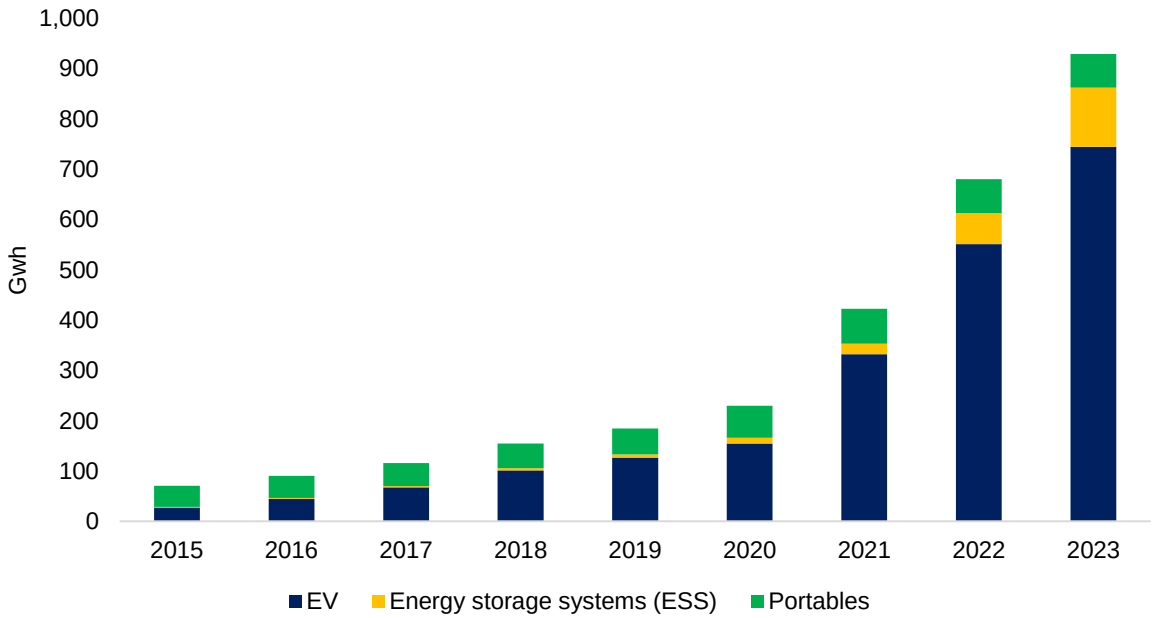
With lithium-ion battery (LiB) demand last year nearing 1Twh across all key segments (EVs, storage and portables), the battery value chain this year enters the terawatt era (see: Figure 2). For markets with strong supply and demand profiles, small changes in growth or in stocking/destocking rates can have a disproportionate impact on balances and prices compared to more mature markets such as copper or oil.

At the same time, sustaining capex for strong growth markets is essential, even if temporary surpluses are anticipated. As a result, pricing signals are key to incentivise capital allocation and investment.

Given this, it is worth asking: is Li's long-term demand profile secure? What are the fundamental drivers behind battery demand and what role does lithium play?

As Figure 2 shows, EVs continue to drive overall battery demand, with EVs last year accounting for over 80% of total LiB demand. Given that the battery (pack and cell) makes up around 25-30% of a total EV cost, and with the cathode being the most cost sensitive part of the battery cell, cathode costs remain central to EV economics. In this light, raw material price volatility can make or break battery economics.

**Figure 2: Global LiB demand by sector (Gwh)**



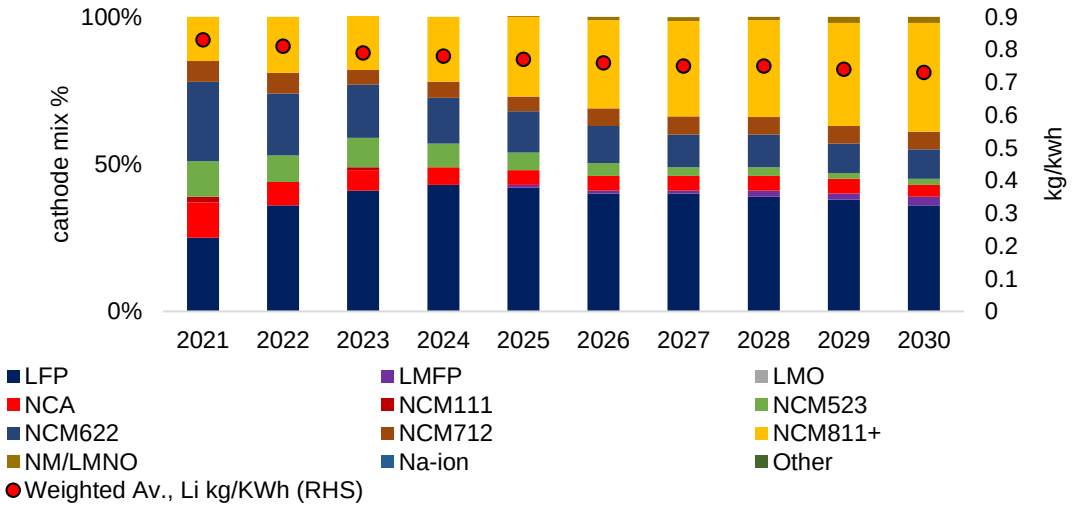

Source: Benchmark Minerals

[2] Critical Minerals Review 2023, International Energy Agency (IEA)

Today, over 85% of lithium demand comes from the battery sector, currently split between 39% lithium hydroxide and 61% lithium carbonate demand[3] - the latter being a function of China's cathode mix and its outsized position in the value chain.

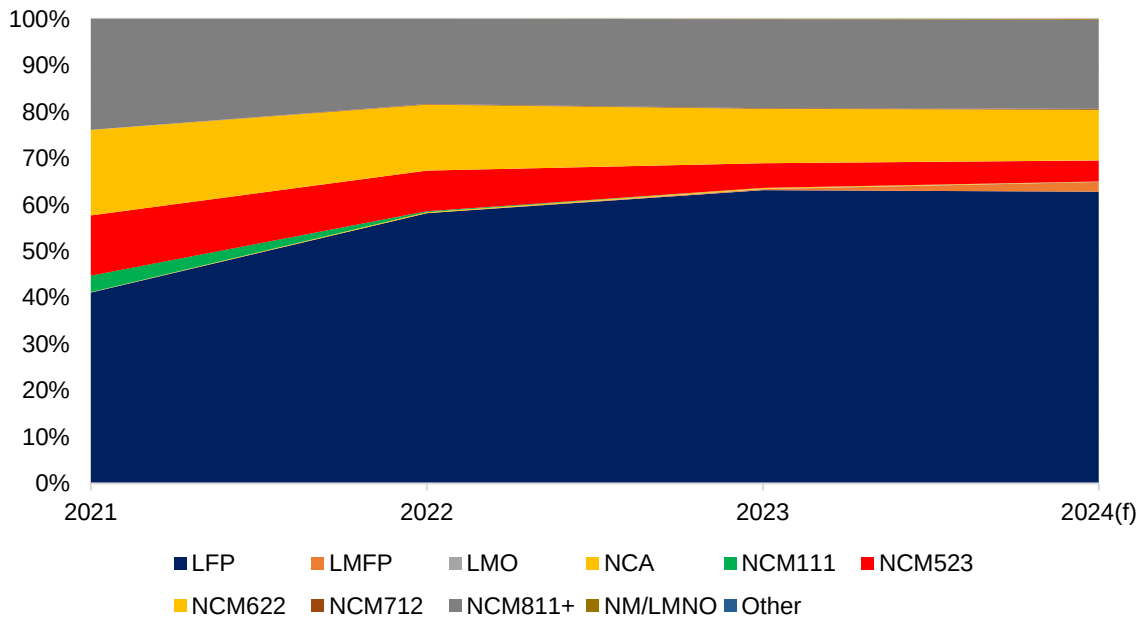
While cathode chemistry shifts have had an impact on the hydroxide-carbonate balance in the market over the past several years, lithium's chemical intensity has been relatively stable across various cathode formulations that have entered and are expected to enter the market (see: Figure 3). The same does not hold for cobalt, which has seen a lengthening in its supply balance, driven both by new sources of supply (Indonesia) and chemistry shifts in the market (e.g. higher lithium-ion phosphate (LFP) adoption rates on a y-o-y basis in China, see: Figure 4).

**Figure 3: Global Cathode demand forecast by chemistry and Li chemical intensity (RHS)**




Source: Benchmark Minerals

**Figure 4: China cathode mix split by chemistry (%)**




Source: Benchmark Minerals, Rho Motion

[3] Benchmark Minerals, Li forecast Q4 23

What about the role of competing technologies?

Since 2022, attention has fixated on the role of sodium-ion batteries (Na-ion) – seen by Chinese battery strategists as a hedge to Li price volatility. It is no coincidence that R&D attention on Na-ion increased dramatically in 2022 (following Li's price hike), particularly among scaled cell players with large R&D budgets (e.g. CATL).

Na-ion's competitiveness derives from its ability to compete on cost and its thermal stability. Despite this, Na-ion economics remain sensitive to the Li price: the lower the Li price, the narrower the cost differential to mature LiB technologies (e.g. next-generation LFP batteries). Other issues also exist. Na-ion's cathode market remains undeveloped; on the anode side, new technologies are required. Graphite – which remains highly cost competitive in today's market with a mature value chain – does not work for Na-ion batteries. Instead, undeveloped anode feedstocks such as hard carbons are required[4]. These suffer from poor first cycle efficiency and remain a limiting factor on energy density. While this is not to say that Na-ion will not play a role in the future (particularly in the storage market), it is unlikely to be seen as a major threat to Li demand.

Other battery technologies such as Solid-state batteries (SSB), while important post-2030, still have challenges to overcome. These include an immature supply chain, dendrite formation, and scale challenges[5]. And in any case, SSB *increase* Li demand, given the use of a Li metal anode. While attempts have been made to see technology as a silver bullet, particularly in the West, Li's structural demand will continue to remain most sensitive to developments in the EV market, particularly around the following issues:

- **Internal Combustion Engine (ICE) – Battery Electric Vehicle (BEV) cost differentials** and the ability of western Original Equipment Manufacturers (OEMs) to transition from premium models to mass-market models.
- **The risk of western policy retrenchment around subsidies/trade policy** (e.g. US Inflation Reduction Act demand-side policies, tariff/subsidy policy in EU etc) versus Chinese scale/overcapacity which continues to remain the geopolitical mega-trend this decade. China's playbook of overseas expansion to offset margin pressure at home will further amplify western anxieties around the cost of localisation.
- **OEM margins and shareholder pressure:** 2023 was a reminder of the pressure faced by OEMs from rising competition in the market. Tesla's weaponisation of its gross margin and falling residual values in the EV market compressed margins for legacy OEMs[6]. While OEMs have not abandoned electrification targets, product launch delays and rising costs (e.g. labour) continue to drive volatility around demand expectations.

*While the above continue to remain dynamic drivers of demand-side volatility, lithium's story of secular demand growth continues to remain intact.*

Positive feedback loops also play a role. Lower lithium prices feed into lower cell costs, increasing aggregate demand. As a result, cyclical headwinds may drive demand deferral, rather than demand destruction with government policy, further battery technology gains and efficient pricing signals being key trends going forward.

The latter is perhaps most important given the dynamic shifts in pricing over the past few years and lithium's ongoing road to pricing maturity.

[4] Partnerships are however being developed in the market, e.g. Phillips 66 and Faradion anode material partnership

[5] Reinforced by Toyota's pushback on solid-state delivery timeline over the past several years. Benchmark estimate 2023 SSB production at around 4Gwh (with capacity pegged at around 20 Gwh).

[6] Houston (Austin?) - we have a problem! Slowing EV demand growth — is price or product to blame?, Bernstein Research, November 2023

## The evolution of Li pricing

Unlike other markets where the road to pricing maturity took many years (e.g. the financialisation of the Brent complex in oil markets; the evolution of a liquid LNG spot market or the development of iron ore futures), Li's pricing journey has only just begun. Several important features distinguish the Li pricing landscape, key among them being:

- **The role of product quality:** Li's value chain is deep and include a range of products (i.e. battery-grade carbonate and hydroxide as well as technical-grade products used in the lubricants/steel/glass industry). Lithium hydroxide has typically commanded a premium over carbonate due to the cost of converting carbonate-hydroxide. Spreads between the two products can fluctuate, depending on dynamics in the cathode market. For instance, higher LFP penetration rates in China have narrowed the spread between the two in recent years. Product quality also has an impact on tradeability and suitability for a successful terminal market mechanism. Despite discussions around storage mechanisms or strategic stockpiling [7], hydroxide has a limited shelf-life and unlike oil or LNG, battery-grade products are highly specialised, making physical delivery upon contract expiry a challenge. For instance, participants may not receive material that meets their cathode specification or qualification requirements. While China established a physically backed carbonate contract (Guangzhou Futures Exchange) in July last year, multiple challenges around quality and warehousing have already taken root[8].
- **Contract v spot pricing:** historically, volumes in the Li market were dominated by long-term contracts with fixed-price components (i.e. bilateral deals set to define pricing level), largely insulating players from spot volatility. This reflected the immaturity of the industry. Fixed price deals guaranteed stable cash flows and was a means to securing financing, particularly for junior miners. Adjustments to the contract price (otherwise known as Quotation Periods, QPs) typically took place on a quarterly or semi-annual basis. In some cases, QPs could be even longer. In this sense, the average selling price (ASP) of some players during this period (2015-21) could be quite sticky and lag developments in the spot market. Typically, the contract price reference has been based on deals reported in the South Korean and Japanese markets – buyers of seaborne lithium (otherwise known as the Li carbonate CIF Asia price) – upon which EU and North American CIF swap prices largely track. The spot price meanwhile has typically been determined by transactions in China, largely a function of its outsized role in the value chain. China represents around ~80% of global cathode capacity, where contracts are much shorter, allowing for greater spot liquidity and procurement channels. Given this liquidity concentration, Chinese buying of Li (above and beyond contracted volumes) has been seen as the industry bellwether for spot pricing.
- **The emergence of dynamic pricing:** the surge in the Li spot price in 2022 however led to a shift in mechanisms. Spreads between the Asia CIF-China EXW price blew out (see: Figure 5) and attention focused on how ASPs could capture Li's status as a seller's market, with prices being more market-led. For established players with a competitive position in the cost curve, dynamic pricing also made sense as it allowed for greater upside improving valuations and dividend streams and an ability to withstand downside pressures. As a result, QPs were shortened from quarterly to monthly and the contract price moved from a fixed to variable basis with a greater share of contracts moving to indexed-linked pricing, assessed by Price Reporting Agencies (PRAs). The development of more frequent reporting of spot prices from fortnightly to weekly to reflect greater spot volumes also helped with this trend.

[7] It remains unclear what the IEA, for example, means by "strategic stockpiling' and at which point in the value chain
[8] China exchange adds lithium warehouses to allay fears of short squeeze, Mining.com, Dec 2023

**Figure 5: Li carbonate contract v spot and spreads (RHS), US$/t**

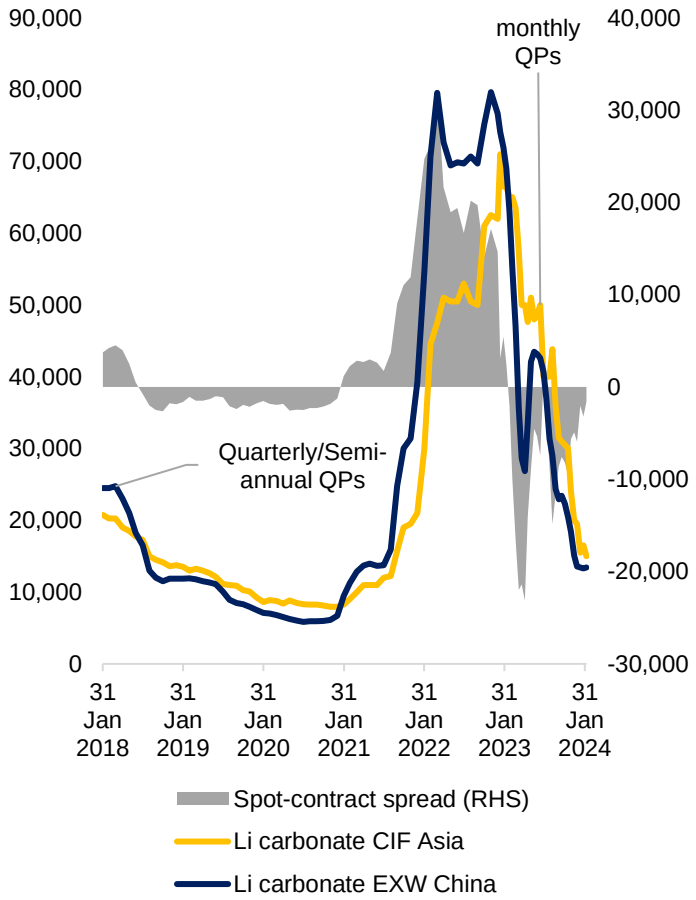
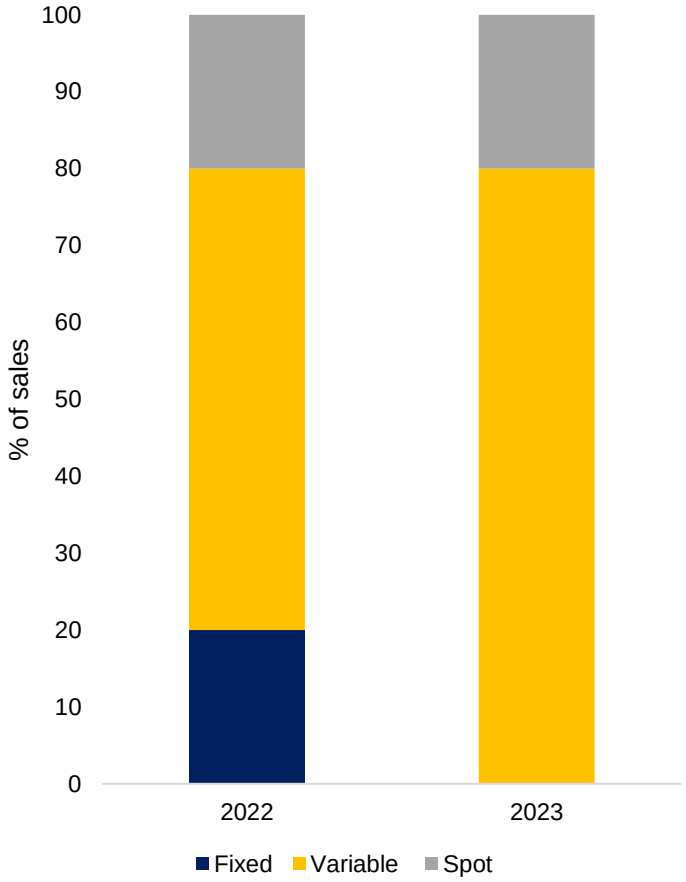



**Figure 6: Albermarle sales by contract type (2022 v 2023)**




Source: Benchmark, Albermarle

- **Role of floor and ceiling prices:** While Li pricing since 2022 has become more dynamic in the chemicals market, several factors prevent a full exposure to spot volatility, namely:
    - **price floors**: these come to the rescue of players during spot meltdowns. Price floors vary across the industry but are typically based on an understanding of long-run marginal costs/incentive prices. While some players may have floors in the range of US$12-16/kt, new project developers – particularly those in North America – would need floors in the low-mid 20s to be feasible given higher capital costs.
    - **price ceilings:** these are governed by bilateral negotiations between buyer and seller which also include discounts and other factors to dampen volatility risks.

In many ways, the lithium market's move to dynamic pricing continues to evolve and is the first chapter in the industry's road to market maturity. However, it has also exposed the value chain to greater spot volatility creating a dynamic tension with efforts to build out the value chain outside China, impacting Net Present Value (NPV) sensitivity for greenfield projects and the hurdle rate for new entrants.

## SC6 pricing: the search for the optimal continues…

Li's pricing journey does not end with shifts in chemical pricing. As a primary feedstock for Li refiners, spodumene concentrate (SC6) pricing has a direct impact on Li refiner profitability and margins. This is further reinforced by the industry structure of the Li value chain – split between integrated and non-integrated refiners. The latter typically sit at the top end of the Li cost curve, given their lack of integrated feedstock and sensitivity to raw material price volatility. This is similar in many ways to the oil refining cost curve, except without the ability to hedge cracks or pricing differentials.

While the Li chemicals market has coalesced on a clear path to variable pricing; the SC6 pricing landscape remains more fragmented. Currently, several pricing mechanisms exist in the SC6 market, namely:

- **Formula-based pricing:** SC6 has been priced as a formula linked to the price of chemicals tied to indexes for Li carbonate/hydroxide where there is greater liquidity, in some ways similar to the payables method used in cobalt hydroxide pricing[9]. While formulas vary in the market, a typical model would look like the following:

  ***SC6 formula price = (prevailing chemical price – conversion cost/processing fee + margin) ÷ recovery rate (i.e. number of tonnes of SC6 required) – freight (Aus-China)***

The chemical price quotation is typically taken from a basket of PRAs, with a range of quotation periods used in the market.

Other formulas also exist in the market, including formulas which use a floor price for the miner and share of the converter's margin:

***SC6 Price = Cash cost of production + (Prevailing chemical ref. price ÷ Conversion factor - Floor SC6 Price) * SC Producer Margin Share.***

- **Fixed price bilateral negotiations**
- **Link to independent SC6 price indices (e.g. Benchmark Minerals)**
- **Spot sales and auctions:** a model pioneered by Pilbara Minerals' platform auctions and used throughout 2022. Auctions for SC6 material can create competition for the marginal tonne and prove a useful tool for price discovery. However, the mechanism is largely limited by the volume of spot material and frequency.

While all the above have been active components in the SC6 pricing ecosystem, formula-based pricing has largely led the way.

Within those formulas however, shifts are taking place, particularly around the QPs used for chemical prices. While a large percentage of formula-based pricing continues to reference an average of the chemical price from the previous month (M-1 basis), change has been afoot in the market.

The volatility witnessed in 2023 has led Chinese converters to push for changes in the QP basis, moving from M-1 to M+1/M+2 basis – meaning that a converter would have greater ability to manage cash flow exposure during downcycles as the chemical price aligns more closely with SC6 price upon delivery.

So far, only a few players have shifted to the M+1 QP method, but it does signal the potential for a more dynamic cost curve and source of pricing tension between Chinese converters and non-integrated SC6 producers. On the one hand, some players who have moved to M+1 QP pricing can benefit more greatly when prices are rising but also increase their exposure during downturns with the cash cost of production being a key source of defence. At the same time, a fragmented pricing landscape with

[9] Change also appears to be afoot in the cobalt markets with growing focus on moving away from linking cobalt battery chemical pricing from metal pricing.

different QP tenors could create greater pricing risk and room for dispute, especially given the lack of hedging tools.

As a result, the SC6 pricing landscape continues to remain in flux, with the search for optimal pricing an ongoing trend. The potential for an independent spot price may be the next chapter for the industry, given the large volume of spodumene expected to enter the market over the next decade.

How SC6 pricing evolves is not purely theoretical. Given the top-end of refining cost curve being determined by non-integrated producers, SC6 feedstock pricing can make or break converter margins – which has consequences for all players in the lithium value chain.

## Lithium price cycles

The Li market has been through various cycles over the past several years, key among them being:

- **Spot price collapse of 2019-20:** This was a function of excess spodumene supply from Western Australia that saw SC6 prices fall below US$400/t. The excess supply in the market drove a series of high-profile closures[10] and represented the first wave of restructuring in the Li value chain.
- **Covid recovery and government stimulus cycle:** while headlines in recent months have fixated on lithium's spot collapse[11], the question should not be why prices fell by 80% but why prices increased to high levels in 2022 (particularly end-22 peak of US$80/kt, multiples above the cost of the marginal tonne). Clearly, the covid-led stimulus packages of governments, pent-up demand stretching orderbooks (shown by delays) and an element of irrational exuberance in buying patterns had a role. Companies across the value chain also built-up inventory to protect themselves against further price increases – an important consideration given the lack of hedging tools to manage inventory.
- **Jan 2023-present:** the price collapse witnessed in 2023 cannot be pinned on a single factor but a range of drivers, the most important being:

a) **Chinese overcapacity:** Even accounting for higher exports in 2023 on a y-o-y basis, cell inventory builds were a key feature of Chinese balances last year. The same also held for cathode inventory which limited pressure to purchase additional material on the spot market. In many ways, early indications were apparent at the start of 2023 when CATL – the world's largest cell producer – began offering lower prices for its cells in exchange for fixed orders from OEM customers. CATL's cell discounts, based on a discounted Li carbonate price equivalent to cash costs of its integrated supply, reinforced the company's willingness to use its scale to secure market share, particularly acute given the withdrawal of EV subsidies by Chinese authorities at the end of 2022. The episode highlighted a key trend which came to define China's market in 2023: dog-eat-dog competition in the Chinese value chain, where margin compression was acute and overseas expansion a priority for tier-1 players.

b) **Chinese macro policy:** In a bid to avoid counter-cyclical debt financing to offset challenges in the property sector (amplifying long-term imbalances), China accelerated its pivot to the "Three New Industries" - solar, EVs, and battery manufacturing - in a bid to meet annual GDP targets[12]. One estimate suggested that China invested almost US$900bn in the clean energy industry in 2023, a 40% y-o-y increase[13]. The impact has not only been felt in China's battery industry but it's solar industry too – where wafer prices are currently trading at their lowest prices ever. In

[10] E.g. 2019 forced administration of Alita Resources

[11] Lithium price plunges on slowing Chinese demand for electric vehicles, Financial Times, January 2024

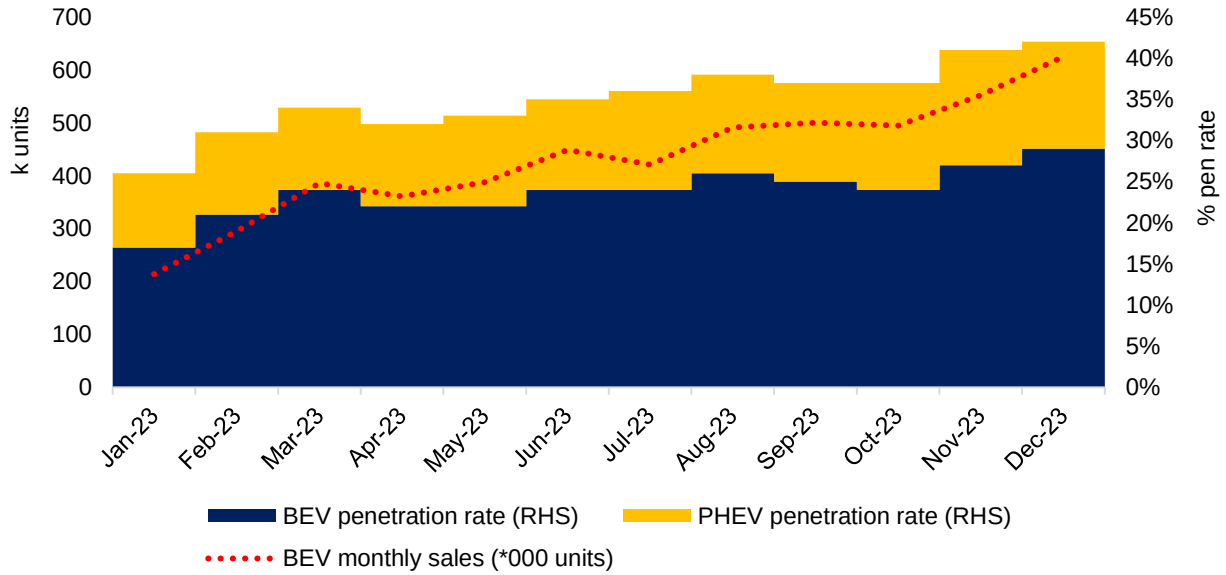
[12] China Goes All In on Green Industry to Jolt Ailing Economy, Wall Street Journal, Jan 2024

[13] Many thanks to Joel Couse, Special Advisor at the IEA for pointing me to this: Clean energy was top driver of China's economic growth in 2023, Carbon Brief, January 2024

this sense, China's strategic defence of its position in the lithium value chain is now tied up with its broader macro pivot[14].

c) **EV market dynamics ex-China:** Tesla's weaponisation of its gross margin particularly via EV discounts for Model 3/Y in 2023 had a ripple effect. Legacy OEMs faced margin pressure from increased competition and EV residual values were negatively impacted particularly given the large % of the US market which continues to buy EVs on a leased basis, also not helped by high interest rates[15]. Other cyclical headwinds for OEMs included: rising labour costs, EV subsidy withdrawals (e.g. Germany) and the delayed impact of credits allocated under the Inflation Reduction Act. Nevertheless, despite EV inventory builds, overall EV sales (BEV+PHEV) did register **38%** growth in 2023 – with the biggest surprises having been hybrid sales.

**Figure 7: China BEV monthly sales (LHS) and BEV/PHEV penetration rates (RHS)**




Source: China Passenger Car Association (CCPA)

Note: BEV = Battery Electric Vehicle; PHEV = Plug-in hybrid Electric Vehicle

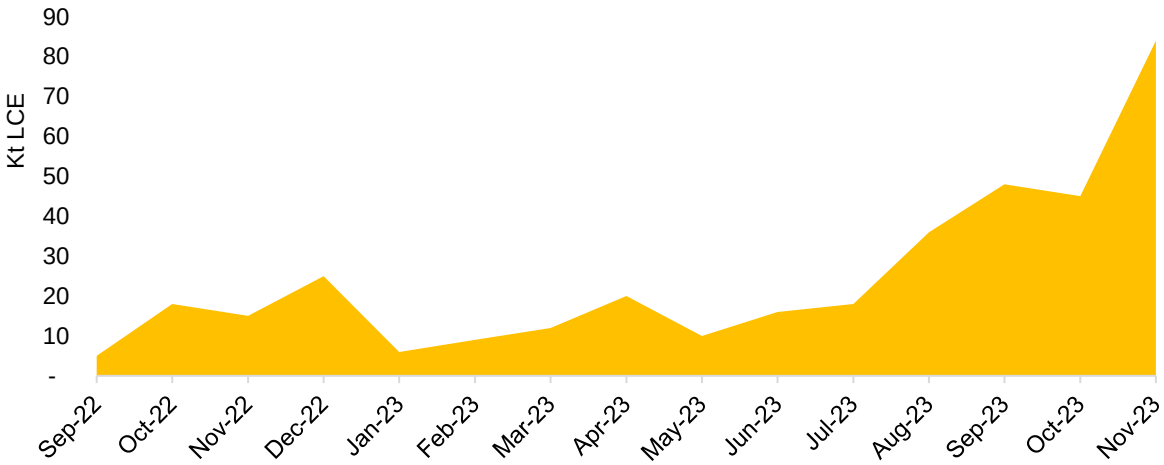
d) **A more dynamic Li supply-side equation:** exploration budgets in 2022-23 increased by around 20% particularly for hard-rock plays. Key supply-side trends in 2023 included China's focus on securing new sources of cost competitive feedstock[16], primarily Africa (Zimbabwe) and within China itself (higher cost lepidolite), the latter anchoring itself as a key source of swing supply in the market. This dynamic is not trivial but also deeply strategic, given the reality of western goals in seeking to integrate more sources of Australian spodumene into their value chains and Australia wanting to go further downstream. China's lithium playbook in 2023 demonstrated an ability to identify new sources of feedstock for conversion and deepen the goal of value chain integration.

[14] Historically, China's disinflationary impact was offset by the inflationary impact of its status as a major commodity consumer: A Global Disinflationary Force returns, Gavekal Research, February 2024

[15] Houston (Austin?) - we have a problem! Slowing EV demand growth — is price or product to blame?, Bernstein Research, November 2023

[16] With some Chinese-backed integrated projects in Africa being highly cost competitive (range of US$7-12/kt).

**Figure 8: Zimbabwe SC6 exports to China (Kt LCE)**




Source: Customs data

## Where next for Lithium Prices?

With current spot prices already deep into the cost curve (see: Figure 9 and 10) and expectations of Chinese spot buying expected to pick up in H2 24 (as restocking picks pace), spot prices are likely to correct later this year.

**Figure 9: 2024 Spodumene cost curve v spot price**

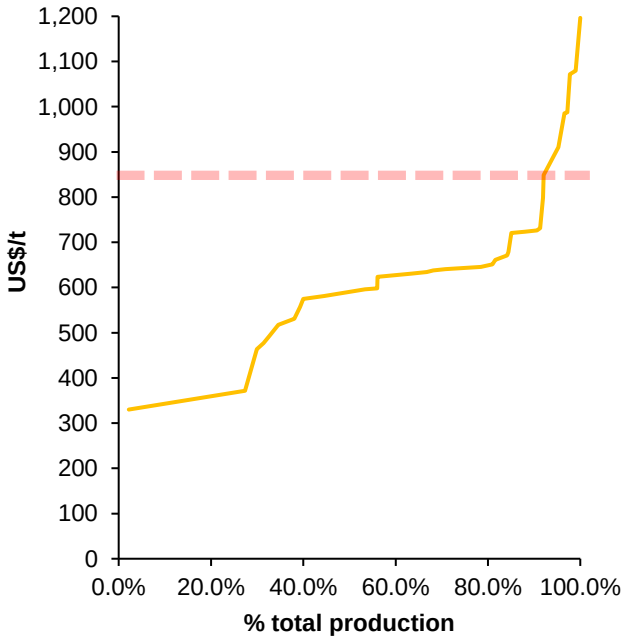
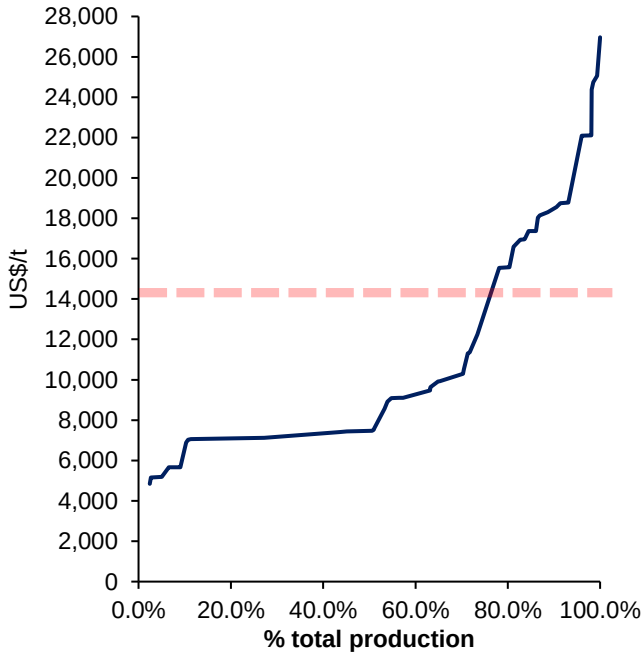



**Figure 10: 2024 Li Chemicals cost curve v spot price**




Source: Benchmark Minerals

Supply curtailments have already taken root in recent weeks (see: Table 1), with further curtailments and cost-cutting[17] expected, particularly for higher cost Australian projects which would rather push projects into care and maintenance than be loss-making.

[17] ALB's 2024 capex guidance revised downward to US$1.6-1.8bn (from US$2.1bn in 2023), with a 4% cut to global workforce.

**Table 1: 2024 production cuts**

| Country | Mine/operator | Update |
|---|---|---|
| Australia | **Finiss (Core Li)** | Operations suspended and will process stockpiles from concentrator (280kt). |
| Australia | **Talison (Greenbushes)** | Cut of ~100kt. |
| Australia | **Kathleen Valley (Liontown)** | Spot price slump leads to revisit on ramp-up strategy. |

Source: Company reports

In this light, a mix of factors are likely to provide price-support in the short-term: the pace of inventory draws which is expected to accelerate in Q2 24 and further curtailments in the market, especially from higher cost producers in Australia.

## Longer-term implications

With the current Li spot price at multi-year lows, questions have been raised as to what this means for the longer-term, particularly given spot prices being below incentive prices for greenfield projects. The long-run incentive price is the long-run price that would encourage or justify bringing on the marginal tonne to satisfy incremental demand. The capital cost of this marginal project feeds into the incentive price.

As previously mentioned, incentive prices are not a purely academic exercise. Producers embed incentive prices to establish price floors in contract prices with ranges from US$12-26/kt – depending on several factors: scale, jurisdiction, and value chain position.

In this light, while much attention has focused on the wave of pain ahead for the Li market in the short-term, it remains valid to ask what lessons the recent price cycle might give for long-run incentive prices? In particular, the following issues remain key considerations:

- **Incremental demand growth:** while 2023 saw some hiccups to EV demand growth in the US and EU, total Gwh demand still showed CAGR growth of 35% y-o-y. As previously mentioned, there does not appear evidence of any major threat to lithium's structural demand growth view (with revisions mostly attributed to policy-**driven/net-zero growth scenarios).** In this light, even under a conservative view of lithium demand growth, it is still expected that the marginal tonne in the long-run will need to be met by a greenfield project, not a brownfield one.[18]
- **Geopolitics and Li's capital cost base:** between 2015-20, the most efficient route for Li production was Australian hard rock fed to China's converters to meet incremental demand growth. This kept the marginal cost of Li at a reasonably low level (US$6-7/kt). Notwithstanding issues such as degrading ore qualities and deeper depletions of high-grade resources, processing and labour costs, geopolitics also threaten to increase Li's capital cost base where capital costs of a greenfield refinery ex-China is 3-4 times higher. This requires a higher incentive price to make the economics viable.[19]

China's behaviour in 2023 showed its ability to source new feedstocks and challenge Australia's pricing power, a reminder that geopolitics could bifurcate the Li value chain between two opposing cost forces:

a) ongoing Western policy toward localisation (shifting upward the cost curve); and

[18] Even accounting for expansions from established low-cost producers.
[19] New brine projects also have higher costs due to ESG/water usage, especially if Direct Lithium Extraction (DLE) is being used – pushing up capex (but lower Opex per Li unit). Many thanks to Simon-Gardner Bond (Techmet) for this point.

b) China's ongoing attempt to integrate across the value chain, expanding its hunt for low-cost feedstocks, particularly in geopolitically agnostic jurisdictions (e.g. Africa, Brazil etc). Indeed, in an environment where spot prices remain below the long-run incentive price for ex-China greenfield projects, Chinese majors could use the opportunity to execute further M&A activity in key new lithium 'hot spots' – particularly Brazil, Africa and Argentina.

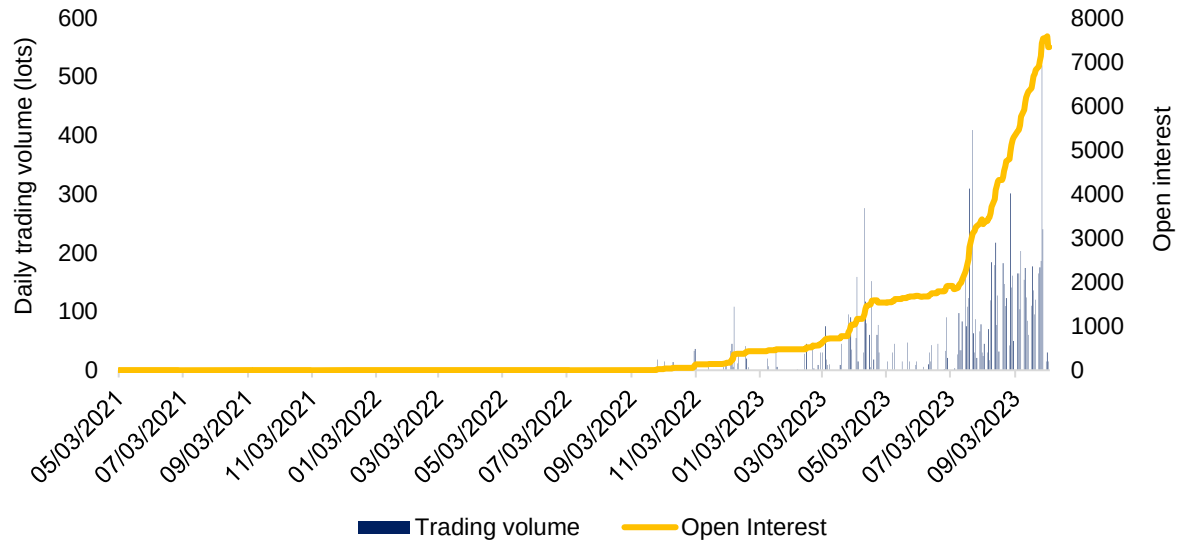
## The long journey to market maturity

Regardless of whether the current slump in spot prices is setting the market for another round of volatility, several tools exist to manage price risk in the market, with further room for growth expected over the next decade. These include:

1) **OEM backward vertical integration:** a trend which has accelerated since 2022's price spike, OEMs are directly investing in raw material offtakes to mitigate price risk and ensure security of supply. Recent examples include GM's US$650 million investment in Li Americas, Ford's lithium offtakes (Albermarle etc) and Tesla's plan to build a LiOH refinery in Texas.

2) **Growth of financial instruments to hedge price risk:** a relatively new trend has been the establishment of exchange-based venues to facilitate risk management. The CME, for example, has cash-settled contracts for lithium chemicals (see**:** Figure 11). Despite the increase of trading volume and Open Interest (OI) on these venues, liquidity remains relatively low and OI still a small percentage of overall ex-China OEM hedging demand. This should not overshadow the fact that OEM hedging demand is expected to increase substantially, creating significant room for trading volumes to grow and other exchanges to also establish exchange-based products.

**Figure 11: CME LiOH futures contract, daily trading volume and OI (RHS) – up to Sept 2023**




Lot size: 1,000 kg

Source: CME

In many ways, the Li market has shown signs of moving to greater market maturity over the past several years – a greater range of players (e.g. the entry of capitalised oil majors), a greater variety of feedstocks and technology routes (e.g. Direct Lithium Extraction), and financing mechanisms (e.g. prepayment deals). The end of fixed-term pricing also heralded a move to greater market maturity.

But that journey has only started. With no established global benchmark, a relatively small spot market and ongoing issues with the transfer of pricing risk, it remains to be seen where Li's pricing journey will move next.

Nevertheless, the Li market does appear to be at an inflection point. With current spot prices well below incentive prices to encourage new greenfield projects outside China, the risk of a bifurcated market emerging cannot be discounted. It is not inconceivable that China continues its “price defence” strategy: using its swing status in the market to keep spot prices below “western” incentive prices; finding new sources of supply to increase its length of integrated supply (particularly from new low-cost regions, e.g. Africa and Brazil); and ensuring it does not lose pricing power in the market.

At the same time, building the lithium value chain outside China will require not only higher incentive prices but also a greater focus on cost control, technology maturity, strong balance sheets, and scale – particularly as it will take time for new pricing centres to emerge and a mature ecosystem for risk transfer to develop. Further consolidation, new waves of M&A and the entry of bigger players may well be the next chapter for the industry.