

Strategic Activity Imminent in the Lithium Space; Who Wins?

Summary

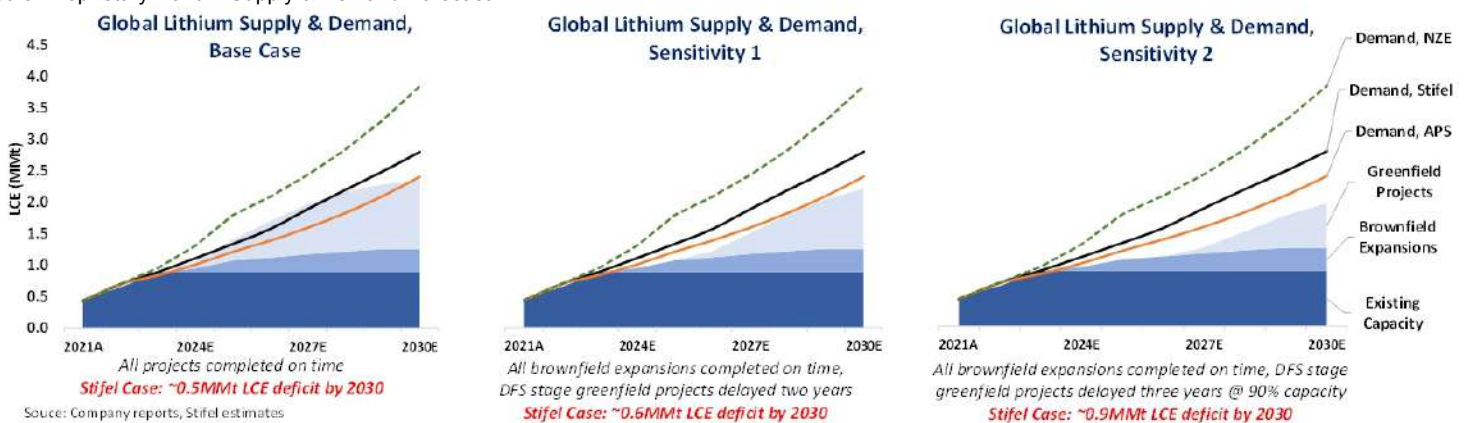
We continue to see Western Hemisphere lithium M&A on the horizon as lithium incumbents/new market entrants adjust capital allocation plans to maintain/grow market share. This is largely evidenced by recent premium deals, executive commentary through 2Q23 quarterlies, and the structural desire to develop localized supply chains ex-China. Amongst our coverage, lower pricing has resulted in valuations now trading ~2σ below 12 month average on a P/NAV basis. While lithium prices have the possibility to provide pressure on valuations, we continue to see incumbents of scale taking a long-term, secular view of the space driven by an expected ~450kt LCE (~50% of current market size) supply deficit by 2030, informed by our proprietary supply and demand model updated within. **As such, currently we favour Western Hemisphere lithium developers of scale, with our top picks being Lithium Americas and Lithium Ionic.**

Key Points

Lower commodity pricing, 12 month low valuations, heavy domestic downstream EV investments, a desire to develop farm-to-table supply chains, and increasing size/relevance of the lithium industry anchor our constructive outlook on Western Hemisphere lithium developers due to potential opportunistic bids in the space.

- Recent pricing volatility points to the increasing importance of refiners integrating with feedstock sources (and/or the importance of vertically integrated projects).** Economically, integrated conversion capacity allows double margin capture (mine + conversion margin, with hydroxide pricing currently ~9.5x spodumene), and provides full-cycle profitability for converters (we see a hypothetical +20% IRR on ALB's integrated Megaflex LiOH refinery at cycle-low pricing, compared to single-digit IRRs on the same facility purchasing spodumene on the market). Chinese refiners rely nearly exclusively on foreign sources of spodumene, and with the spodumene/chemical trending lower recently, Chinese converter economics are razor thin at an estimated 3% currently versus 14% just a month ago. With chemical pricing more volatile over the last 12 months, refiner margins are significantly jeopardized, **intimating the importance of vertically integrated incumbent producers** (and integrated projects).
- Bids are beginning to migrate towards the Western Hemisphere as supply chain diversification ex China gains momentum.** Canada, Brazil and Argentina host the largest and highest grade conventional lithium assets in the Western Hemisphere, and these assets trade at significantly lower valuations than Australian counterparts favoured by Chinese refiners. Albemarle recently invested C\$109MM for 4.9% of PMET, and this investment represents what we believe to be the early innings of further potential bids for Western lithium developers as incumbents look to secure resources to feed the emerging US-based EV supply chain. Select lithium majors are now sitting on a combined cash balance of ~\$8B.

Updating our proprietary S&D model; EV sales pace at 40% YoY growth through July, supply continues to face operational challenges. Successful greenfield projects have the most material effect on supply over the next two years, and contribute ~64% of our new incremental supply model, providing significant execution risk. Analysis of current DFS stage projects shows 4th quartile cost projects have an increased incentivized cost of production of ~22% over last year, topping out at ~\$23,000/t, which continue to provide pricing support at the ~\$25,000/t low we saw in April 2023. EV sales continue to track favourably through 1H23, and are globally on pace to grow ~40% YoY. We now forecast a balanced market through 2023, with 2025 supply/demand of 1.4/1.3MMt by 2025, increasing to 2.3/2.8MMt by 2030, implying a 15/19% CAGR, respectively. In our most stressed scenario, we see the potential for a ~0.9MMt supply deficit, roughly the size of the market this year. **As such, we continue to favour lower cost, scalable Western lithium projects for exposure to the space.** Stifel Proprietary Lithium Supply & Demand Forecast



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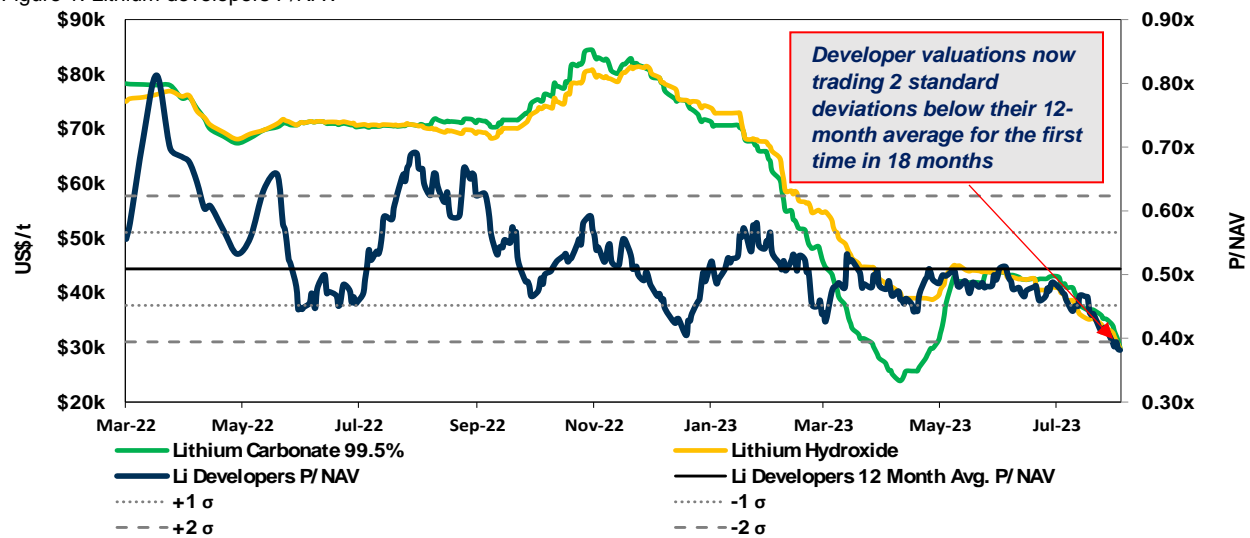
All relevant disclosures and certifications appear on pages 26 to 29 of this report.

Industry Thoughts

1. **M&A comes into focus as incumbent lithium producers grow cash balances along a desire to develop supply chains ex-China.** In light of recent spot price weakness and the resulting effect this has had upon the lithium developer equity space, we continue to see an increased M&A appetite for Western hemisphere assets. This thesis is predicated on lithium incumbents staggering cash balances (and multi-year low leverage) alongside a desire to maintain market share (and continued control of major supply chains) and develop new ex China supply chains.

- **Lithium prices are now at a range where marginal lithium units are likely to be less economic.** With China spot battery grade lithium carbonate pricing now at approximately ~\$30,000/t, we see marginal cost lithium units such as direct shipped ore, tailings, and various lepidolite sources decreasing in economic viability. We would also note Chinese refineries rely nearly exclusively on foreign sources of spodumene, and with the China Spodumene CIF/China Battery Grade Lithium Carbonate ratio down to ~9.5x, Chinese converter economics are razor thin at an estimated 3% currently versus 14% just a month ago in July.
- **Valuations have thus responded in part, and on a P/NAV basis, developers under coverage are now trading at 2 standard deviations below their 12-month average.**

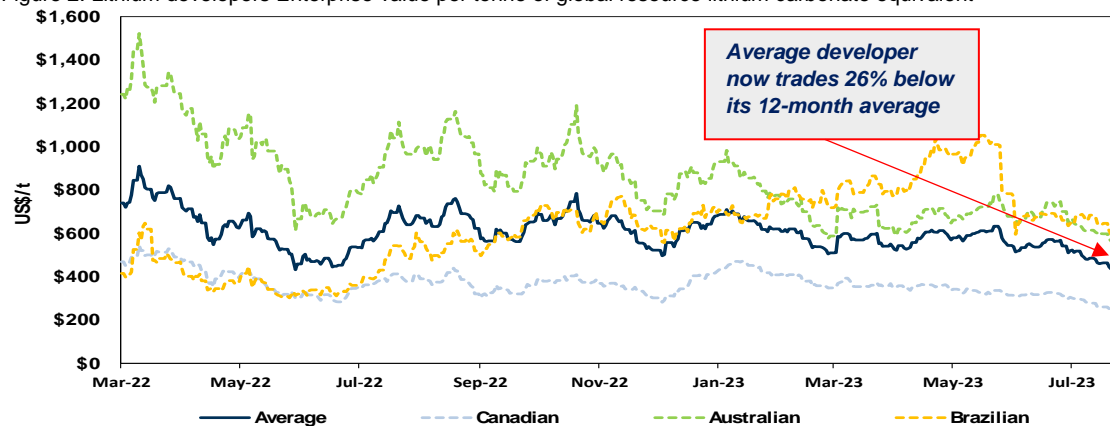
Figure 1. Lithium developers P/NAV



Source: FactSet, Stifel research

Valuations on a dollar-per-tonne basis have also trended lower, making the acquisition of developers of scale a compelling opportunity.

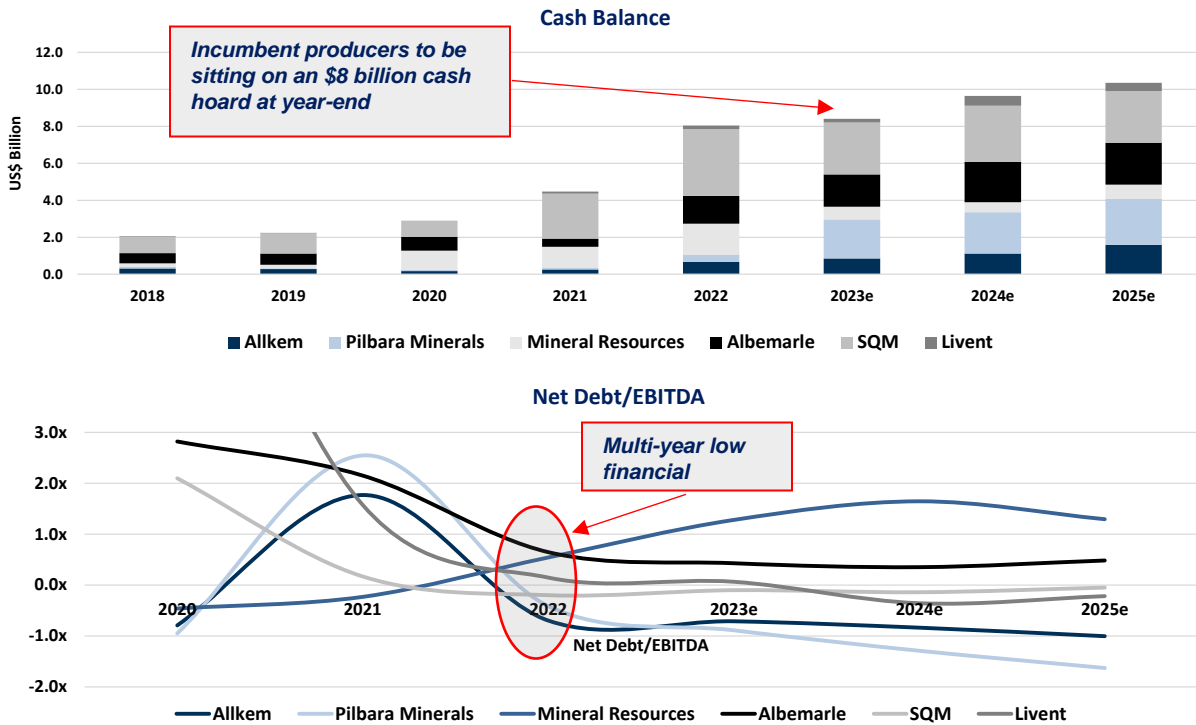
Figure 2. Lithium developers Enterprise value per tonne of global resource lithium carbonate equivalent



Source: Company disclosures, Stifel research

- **However, Industry financial strength remains high.** Select lithium majors are now sitting on a combined cash balance of ~\$8B, with multiyear low leverage. Cognizant of the amount of brownfield supply entering the market over the next 18 months, incumbent lithium producers have seemingly changed their capital allocation strategy over the last year from exclusively brownfield expansion announcements to either vertical value capture (Pilbara LiOH JV with POSCO, IGO ramp up of Kwinana, Albemarle purchasing remaining stake in Kemerton from Mineral Resources) or (attempted) acquisition of new resources in select jurisdictions. This trend has taken shape most notably by the attempted ALB takeover of LTR for the Kathleen Valley project (US\$3.4B all cash offer for 5.4MMt LCE), and recently the SQM attempted take out of Azure Resources as the firm looks to diversify ex Chile following nationalistic policy (think Mt. Holland).

Figure 3 Financial strength of lithium producers



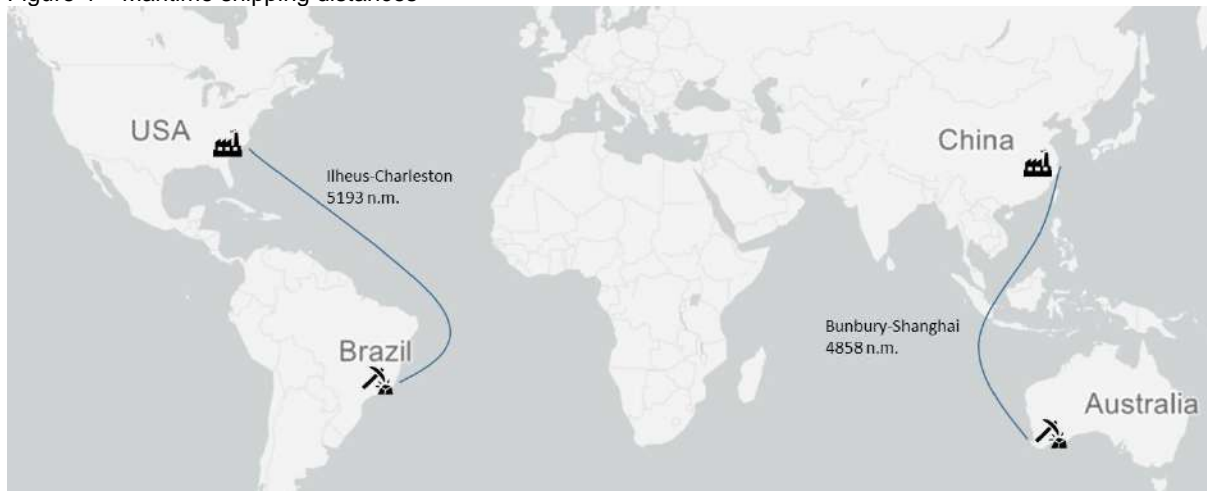
Source: FactSet, Stifel research

- **Bids are beginning to migrate towards the Western Hemisphere as supply chain diversification ex-China gains momentum.** Canada and Brazil host the largest and highest grade conventional lithium assets in the Western Hemisphere, and these assets trade at significantly lower valuations than Australian counterparts. Albemarle recent invested C\$109MM for 4.9% of PMET, and this investment represents what we believe to be the early innings of further potential bids for Western lithium developers as incumbents look to secure resources to feed the emerging US-based EV supply chain. Argentinian brine supply is also gaining interest as the merger of LTH/AKE and the separation of LAC should help to increase development of the Puna.
- **Chatter of Big Oil, Mining to be joining the party.** Big Oil continues to dip its toe in the DLE market with Exxon's recent purchase of Smackover acreage. Following Rio Tinto's C\$115MM option agreement with Azimut Exploration (QC based project generator), boss Jakob Stausholm has stated the company is looking at numerous possible lithium acquisitions. We continue to think Canada would be an ideal jurisdiction for the company (think extensive QC aluminum smelting business, alongside the company trialing spodumene concentration at its plant in Sorel Tracy, QC). We note the company recently announced the construction of a major solar power facility adjacent to their Diavik diamond mine in the NWT which is scheduled to wind down by 2029 (Diavik is located ~260km from an emerging LCT pegmatite district in territory).
- **Weak commodity pricing, 12-month low valuations, heavy domestic downstream EV investments, a desire to develop farm to table supply chains, and increasing size/relevance of the lithium industry anchor our Western Hemisphere M&A thesis for lithium developers.** We believe M&A activity in the near-term will continue to be strong, particularly for those seeking vertical

integration in Western supply chains as the global EV supply chain undergoes a bifurcation. OEMs and integrated producers are investing heavily on this assumption, as seen most recently by Ford's partnering with South Korean cathode maker EcoPro to build a \$1.2B cathode facility in Becancour, Quebec. Developers with logistically-favourable routes to feed this developing hub will be particularly desirable targets.

- The development of vertically integrated, western supply chains ex China is gaining speed.** The recent decision of China to restrict exports of gallium and germanium is but the latest sign of escalating conflict as advanced economies look to secure the critical minerals required by strategically important industries such as semi-conductors and electric vehicles.
 - Germanium and gallium export restricts a shot across the bow as China controls 77% of global lithium hydroxide production.** As we discussed in [Bridging the Lithium Refining Gap: Who Benefits?](#), the global lithium refining gap remains a major source of strategic vulnerability. China continues to dominate global lithium refining, and is responsible for 2/3 of global refined lithium chemical product production and 77% of global lithium hydroxide production.
 - Western firms moving to fill this void.** Albemarle announced in 1Q23 a \$1.3B lithium hydroxide plant in South Carolina, with nameplate capacity of 100ktpa LiOH. While emphasizing that they have no plans of curtailing their Chinese operations, **Albemarle nonetheless spoke of a "pivot to the West" on their most recent conference call as they come to grips with the emerging bifurcation of global EV supply chains.** Livent is attempting to build hydroxide conversion capacity in North Carolina (Bessemer City) and Quebec (Bécancour), with offtake deals inked with GM and Ford to date. Rio Tinto is operating a demo plant for lithium refining in Sorel - Tracy, Quebec, testing ore from various local suppliers including Sayona. Tesla has broken ground on a \$1B+ lithium refinery in Texas.
 - Can the Australia/China mine/refine model be replicated in the Western Hemisphere?** Just as most Chinese spodumene feedstock is sourced from China, we see the possibility for this mine/refine model to be replicated in the Western hemisphere with logistically well-positioned Canadian & Brazilian spodumene being shipped to the US Eastern seaboard (and Becancour QC as an emerging hub) for processing. Brazil could be in a particularly good place to seize this opportunity as strong government support for lithium projects in Minas Gerais state means mining projects can move to into production relatively quickly to meet the needs of the US refineries now planned or under construction. **Likely winners in this build out are western hardrock developers (Canada, Brazil), due to proximity to Western markets, attractive geology, and valuation.**

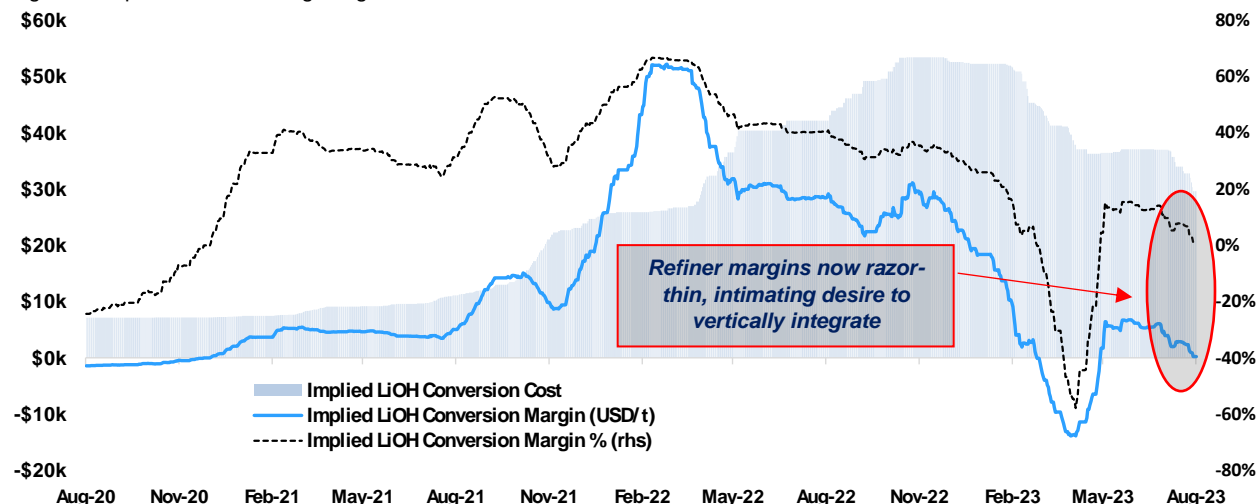
Figure 4 – Maritime shipping distances



Source: S&P Capital IQ, Stifel research

- Further, recent lithium pricing volatility points to the increasing importance of refiners integrating with feedstock sources (and/or the importance of vertically integrated projects).** Economically, integrated conversion capacity allows double margin capture (mine + conversion margin, with hydroxide pricing currently ~9x spodumene), and provides full-cycle profitability for converters (we see a hypothetical +20% IRR on ALB's integrated Megaflex LiOH refinery at cycle-low pricing, compared to single-digit IRRs on the same facility purchasing spodumene on the market). With chemical pricing more volatile than spodumene over the last 12 months, refiner margins are significantly jeopardized (currently estimated at ~3%) as spodumene pricing typically lags chemical, intimating the importance of vertically integrated incumbent producers.

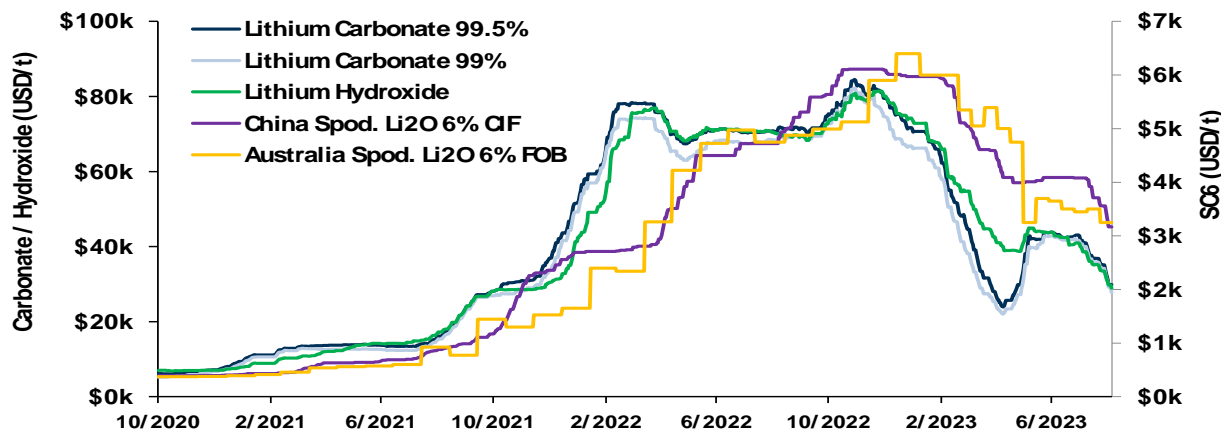
Figure 5. Implied lithium refining margins



Source: Bloomberg, Stifel research

4. **Moving downstream, as a sign of increasing negotiation power on behalf of resource companies, offtake agreements are now requiring partnership in the form of debt/prepay/project equity.** While OEM/resource vertical integration was typified in 2022 by offtake agreements, we would note 2023 has seen an emergence of project equity/prepay/debt partnerships in order to secure feedstock. Kicked off by the landmark US\$650MM GM investment in LAC Thacker Pass, this trend has continued through the year. Stellantis and GM both made investments into companies developing Direct Lithium Extraction technology from brines. Stellantis also joined Volkswagen in a move to secure copper and nickel via an equity investment into a new Brazilian mining outfit also involving Glencore. Ford signed several new offtake agreements in the quarter, securing lithium supplies from industry heavyweights Albemarle and SQM, and well as a smaller deal for 13kt annually over 11 years from Livent/IQ joint venture Nemaska Lithium.
5. **EV sales continue to climb globally as competition for market share drives OEMs to cut the fat of 2022.** In Europe, sales of battery-electric vehicles have surpassed sales of diesel vehicles for the first time. Fossil-fuel-only vehicles now make up just 50% of new sales in the European Union. In China, June New Energy Vehicle sales grew 35% year-over-year. *In the United States, the average EV price has fallen nearly 20%. This is starkly divergent to the general US vehicle market, where prices have climbed 6% year-over-year.* Increasingly strict emissions standards should help continue this momentum. The Biden administration through the US Environmental Protection Agency this quarter announced that CO₂ emissions for cars and light trucks will be capped at 82 grams per mile by 2032. To meet the standards it is estimated that 2/3 of vehicles sold in 2032 will have to be electric. This should prove bullish for battery metals, as both Toyota and Stellantis complained that the standards do not take into account the scarcity of materials like lithium and nickel.
6. **Everything in moderation, including lithium prices.** Lithium prices have moderated substantially over the last several months. From a refinery-bottleneck induced high of ~\$85,000/tonne lithium carbonate reached in November 2022, prices fell rapidly, reaching a nadir of ~\$24,000/tonne in April 2023. Industry chatter such as that provided by Livent and Albemarle on their Q1 conference calls suggested the decline was caused by de-stocking of high inventories on behalf of battery manufacturers, which subsequently eased prices in what had been a very tight refining market characterized by ballooning margins. The initial de-stocking wave was compounded by slower EV sales in China earlier this year due to competition from internal combustion engines vehicles. Prices of ICE vehicles in China were being slashed as dealers tried to move them off lots before stricter emissions standards came into force in July.
 - **Buyers necessarily returned to the spot market earlier in the summer,** reversing the downward trend and pushed prices as high as \$43,000/tonne in July. In a case of déjà vu all over again, the pricing drop we've seen in the last month (down 22% since mid-July) is likely the result of more de-stocking on behalf of Chinese battery manufacturers as they continue to digest weak economic data in the country. At time of writing, spots prices for lithium carbonate are hovering around \$30,000/tonne.

Figure 6. Lithium commodity prices



Source: Bloomberg, Stifel Research

- While long-term the bull case for lithium remains undeniably robust, we would caution against an imminent return to the euphoria that gripped the spot market in late 2022.** China remains by far the largest market for EV sales in the world, with approximately 60% of global sales coming from the country, and likely has an interest in price moderation for vehicle affordability/penetration. With most domestic Chinese lithium supply seen at the high end of the cost curve around ~\$40,000/t LCE, and the market expected to be fairly balanced through 2023/2024 as brownfields supply comes to market (re: lithium majors changing capital allocation strategy), we see lithium prices potentially rangebound between earlier 2023 lows and the latter over the balance of 2023.
- However, we note significant upside potential remains based on ramp up risk at Australian brownfield expansions (with the Australian labour market historically tight), and subsequent greenfield developments, and the ramp up of further Chinese hydroxide conversion capacity at spec.** Successful greenfield projects have the most material effect over the next two years with respect to our lithium supply model, contributing ~64% of our new incremental supply model. Analysis of current DFS stage projects shows 4th quartile cost projects have an increased incentivized cost of production of ~22% over last year, topping out at ~\$23,000/t, which continue to provide pricing support at the ~\$25,000/t floor we saw in April 2023. On average, the incentivized cost of new production has increased 25% over last year's cohort on a project basis.
- Thus, we would note incremental tonnes are increasingly risky whose investment case is underpinned by higher prices, positive financing, and the availability of specialized labour.

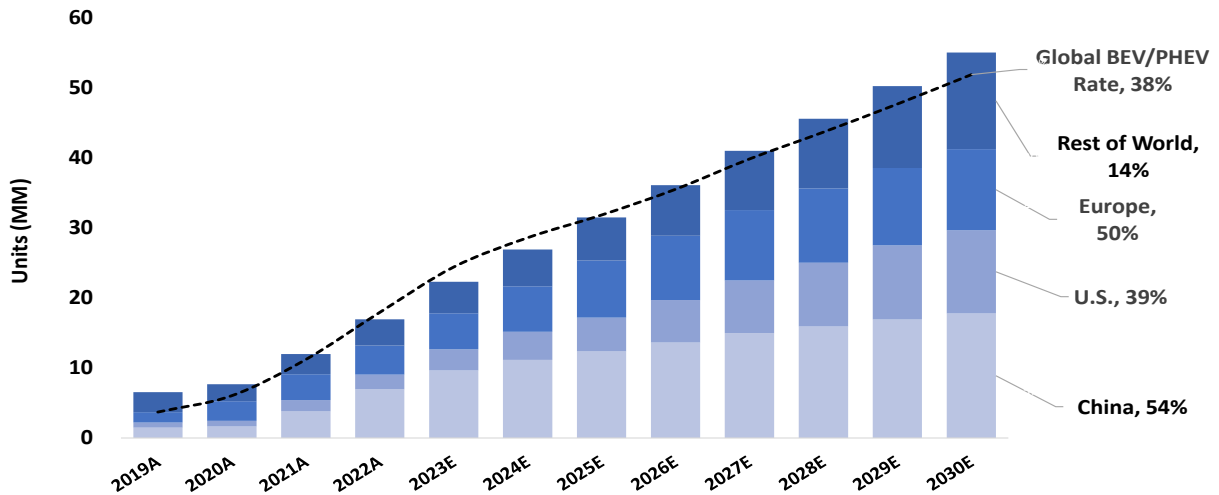
Lithium Demand

Forecast Update: EV sales in China remain strong (+42% YoY), with the one year anniversary of the U.S. Inflation Reduction Act helping to spur 51% YoY EV sales growth YTD. We have updated our lithium demand forecast to match our updated EV forecasts in each region. Our lithium demand forecast is underpinned by EV adoption, accounting for an estimated 75% of lithium demand in 2023, increasing to 80% by 2030 (3C products, stationary energy storage, and industrial uses make up the difference). We are slightly increasing our EV penetration rate forecast in China, where a strong recovery post seasonally weak first half continues through the summer months (June + July saw two of the highest EV sales months on record in China with an average of ~793k units sold) and a 32% NEV penetration rate.

In the U.S., a combination of continued IRA tax credits and price cuts across EV manufacturers were the major drivers of US EV sales, with June prices down 20% YoY. Price cuts continue as competition in the U.S. EV space pushes Tesla market share below 60% for the first time in 2Q23. June saw a 9.3% EV penetration rate, the highest on record.

This, combined with the U.S. firmly passing the 5% BEV penetration tipping point (7% YTD), and an increasingly broad suite of EVs coming to market that are more lithium intensive (larger battery size in UV + pickups) leave upside to our forecast. We are now forecasting global 0.9/1.6/2.8MMt LCE demand in 2023/2026/2030, implying an 18% LCE demand CAGR 2023 to 2030. Below we outline trends in major geographies.

Figure 7. Global Electric Vehicle sales



Source:

Stifel

research

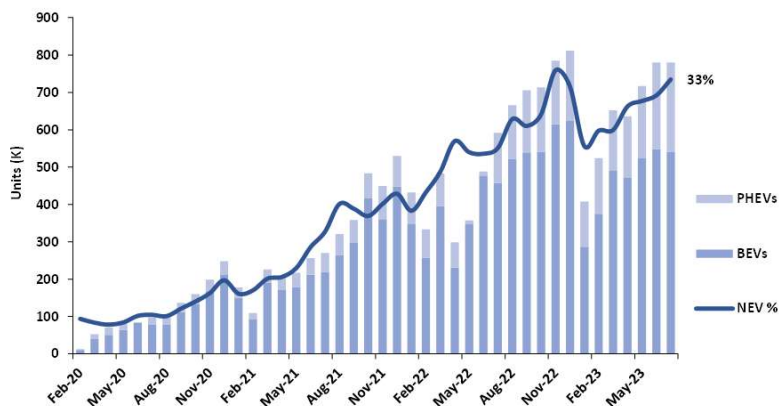
China: China announced an extension to tax exemptions on electric-vehicle purchases previously scheduled to expire at the end of 2023. New Energy Vehicles (NEVs) purchased in 2024 and 2025 will earn a ¥30k (~\$4,000) tax exemption while 2026 and 2027 vehicle purchases will earn a ¥15k (~\$2,000) exemption. The New Energy Vehicle category includes Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs) and hydrogen fuel cell vehicles. China's decision to impose stricter emissions standards on Internal Combustion Engine vehicles with a July 1 deadline led to price cuts on ICE vehicles as dealers rushed to clear inventory before the deadline, making them relatively attractive to consumers. Expect an uptick in EV sales once this trend abates in H2 2023. We expect 9.3MM BEV + PHEV sales in 2023.

Figure 8 – China EV Sales

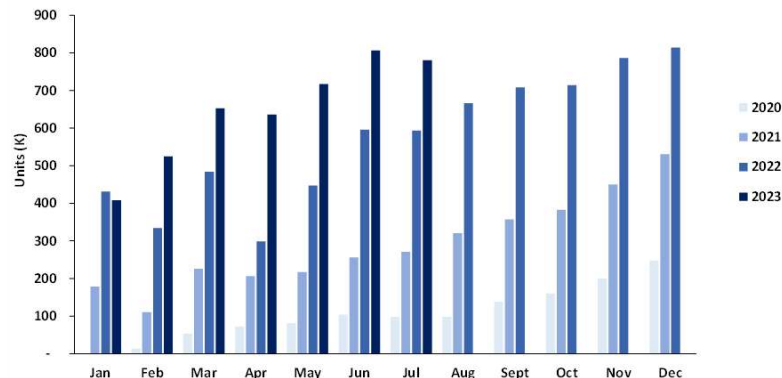
Electric Vehicle Sales - China

- 2Q23 NEV sales totaled 2.16MM units, up 61% from 2Q22 sales of 1.342MM units.
- 1H23 NEV sales totaled 3.745MM units, up 45% from 1H22 sales of 2.591MM units
- July 2023 NEV sales totaled 780k units, down 3% from June 2023 and up 32% from July 2022

China New Energy Vehicle (BEV + PHEV) Sales



China New Energy Vehicle (BEV + PHEV) Sales YoY



Source: CAAM

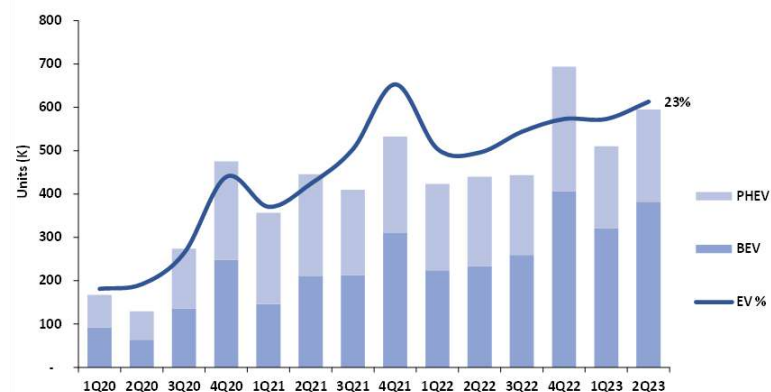
Europe: BEV market share in June reached 15.1% in June, overtaking diesel (13.4%) for the first time. Hybrid Electric Vehicles represented 24.3% of sales. Gasoline-powered cars remained the most popular option, with 36.3% market share. Fossil-fuel cars now make up just half of EU car sales. Sales continue to be supported by subsidies in Europe, which vary from country to country. Germany currently provides a bonus of 6-9k euros for fully-electric vehicles priced less than 40,000 EUR while France is doling out payments of 5k euros for vehicles prices at less than 47,000 EUR. We expect 2.5MM BEV + PHEV sales in 2023.

Figure 9 – Europe EV Sales

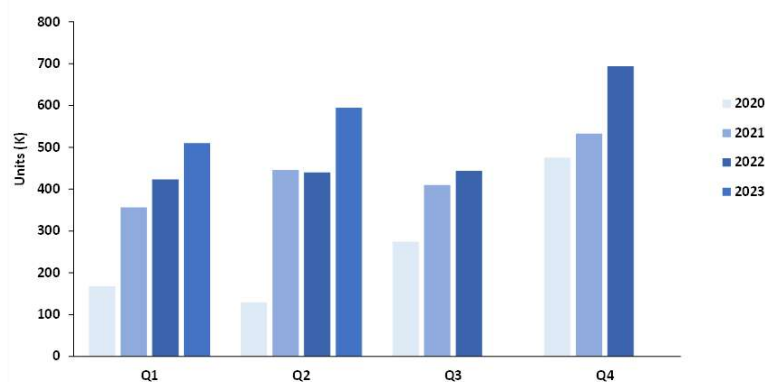
Electric Vehicle Sales – Europe

- 2Q23 BEV + PHEV sales totaled 595k units, up 35% from 2Q22 sales of 440k units.
- 1H23 BEV + PHEV sales totaled 1.105MMk units, up 28% from 1H22 sales of 863k units.

European Electric Vehicle (BEV + PHEV) Sales



European Electric Vehicle (BEV + PHEV) Sales YoY



Source: ACEA

US: Price cuts were a major driver of US EV Sales this quarter, as June prices for EVs were down 20% year over year. The price cuts came in the context of increasing competition in the EV space, with legacy automakers beginning to slowly chip away at a still-dominant Tesla. In Q2, Tesla's market share fell below 60% for the first time. BEV adoption continues apace in the US, and has now reached 7.3% of new vehicle sales. We expect 1.5MM BEV + PHEV sales in 2023.

Figure 10 – U.S. EV Sales

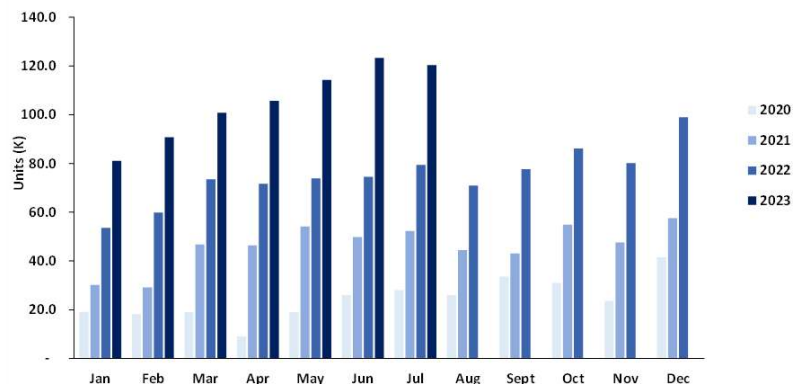
Electric Vehicle Sales – U.S.

- 2Q23 BEV + PHEV sales totaled 343k units, up 56% from 2Q22 sales of 220k units.
- 1H22 BEV + PHEV sales totaled 616k units, up 51% from 1H22 sales of 407k units.
- U.S. BEV + PHEV penetration rate hit 8.9% in 2Q22.
- July 2023 ZEV sales totaled 120k units, down 2% from June 2023 and up 52% from July 2022.

U.S. Zero Emission Vehicle (BEV + PHEV) Sales



U.S. Zero Emission Vehicle (BEV + PHEV) Sales YoY



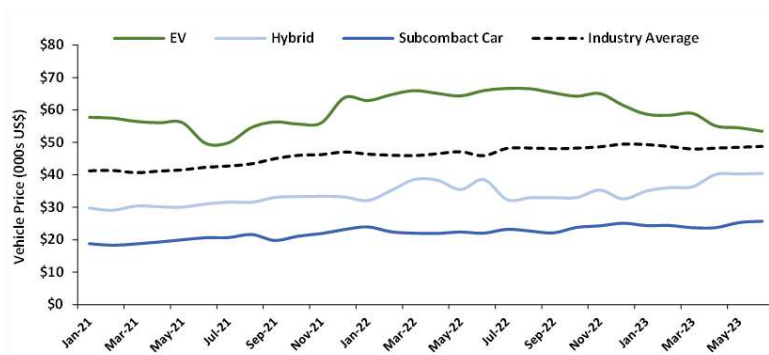
Source: IAA

Figure 11 – U.S. EV Transaction Price

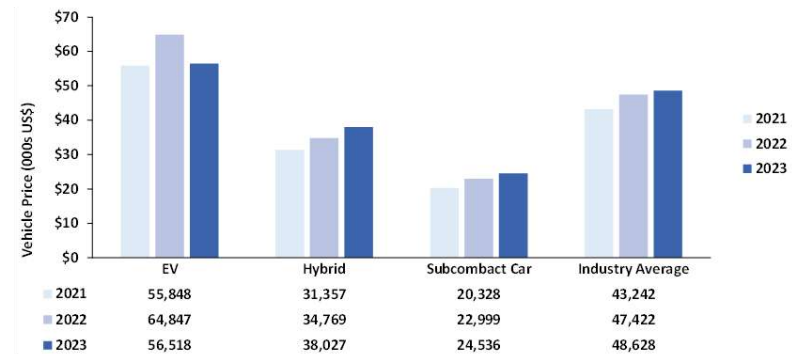
U.S. Light Duty Vehicle Transaction Prices

- 2Q23 EV average transaction price was \$54,352, down 7% from 1Q23 average transaction price of \$58,683
- 1H23 EV average transaction price was \$56,518, down 13% from 1H22 average transaction price of \$64,827
- 2Q23 subcompact average transaction price was \$24,910, up 3% from 1Q23 average transaction price of \$24,162

U.S. Light Vehicle Transaction Price



U.S. Light Vehicle Transaction Price, YoY



Source: AAI

OEM Updates

Tesla 2Q23 Update: Tesla delivered a record 466,100 vehicles in Q2, a 10% increase of the previous record of 422,875 delivered vehicles set in the previous quarter. This represents a year-over-year increase of 83% for the Texas automaker. Sales were boosted by price cuts: \$3000 for Model 3s, \$10,000 for the Model X SUV and \$7,500 for the Model S Sedan.

Sales were also boosted in part thanks to all three Model 3 becoming eligible for the full \$7,500 US Inflation Reduction Act vehicle tax credit. Vehicles receive a \$3,750 tax credit if 50% of the battery components are produced or assembled in North America. Consumers receive the full \$7,500 credit if 40% of the value of the critical minerals are sourced in the US or a country with a free trade agreement with the US.

On the theme of shifting supply chains, in May Tesla broke ground on a \$1B+ lithium hydroxide refinery in Corpus Christi, Texas. The company hopes to produce enough hydroxide at the new facility to support the construction of 1 million vehicles annually.

Ford 2Q23 Update: Ford bucked the trend of rising US EV sales and reported a 2.8% reduction of EV sales in Q2 compared to Q1. Sales of the company's E-Mustang and E-transit van led the decline. A bright spot was the company's electric pick-up truck, the F-150 Lightning, which saw a 119.7% increase in sales from ~2,000 in Q1 to 4,466 in Q2. Sales of the vehicle could be boosted further after price cuts ranging from \$6,000 to \$10,000 were announced on the Lightning in mid-July. The company claims that the cuts have increased orders by 600%, and the company is gearing up to produce 70,000 of the pick-ups this year.

In a major boost to the trend of onshoring battery production, Ford announced they would be teaming with South Korean battery maker SK Innovation to build three new battery plants in the US; two in Kentucky, and one in Tennessee. The plan is made possible thanks to The Department of Energy's Advanced Technology Vehicles Manufacturing (AVTM) program, which is making a \$9.2 billion loan for the projects. The factories will have a combined 129 GWh annual capacity, producing enough batteries for 2 million EVs each year.

Ford also made more efforts to secure long-term lithium supplies in the quarter. In May, Ford announced new supply deals with three separate companies. Albemarle agreed to secure 100kt of lithium hydroxide between 2026-2030. Nemaska Lithium will supply Ford with 13kt of lithium hydroxide per year over 11 years from Becancour, Quebec. Finally, Chile's SQM will supply Ford an undisclosed amount of lithium carbonate and hydroxide. As Chile has a free trade agreement with the US, this will allow Ford vehicles containing batteries made from this raw material to qualify for the all-important IRA consumer tax credit.

GM 2Q23 Update: GM reported Q2 EV sales of 15,652 vehicles. While up 117% YoY, this is a disappointing 24% drop from Q1 sales of 20,648 vehicles. CEO Mary Barra claimed that the low figure for EVs was due to a slower-than-expected ramp-up in domestic battery production. Most EV sales was for the company's Bolt model, which is being discontinued this year. The company is hopeful for EV versions of the Silverado, Blazer and Equinox set to debut in H2.

GM teamed up with Samsung SDI to build a new \$3 billion battery plant in the United States with the aim of being operational by 2026. The move, announced in April, will add 30 gigawatt hours to GM's US battery production capacity, bringing total US capacity to 160 gigawatt hours.

Adding to their \$650 million investment in Lithium Americas, GM led a \$50 million funding round for start-up EnergyX, who are working on technology for Direct Lithium Extraction from brines.

Stellantis 2Q23 Update: Stellantis sold 36,473 plug-in hybrid electric vehicles in the quarter, up 144% YoY and up 46% QoQ.

In May Stellantis and Samsung SDI announced plans for a \$2.5 billion, 23 gigawatt-hour battery plant in Kokomo, Indiana. The facility, scheduled to open in Q1 2025, adds to Stellantis' March announcement of a \$4.1 billion, 45 gigawatt hour battery plant planned for Windsor, Ontario, in partnership with LG Energy Solution.

The battery plant investments are in addition to a new offtake agreement announced in June with Controlled Thermal Resources, a US company planning on lithium production from Salton Sea geothermal brines via Direct Lithium Extraction technology. The deal is for 25kt lithium hydroxide annually over 10 years.

In addition, Stellantis made a \$52 million investment in Vulcan Energy Resources, who own a lithium brine project in the Upper Rhine Valley in Germany; and an undisclosed investment in Lyten, a start-up working on lithium-sulfur batteries, which promise higher energy density than lithium ion batteries.

Volkswagen 2Q23 Update: Volkswagen all-electric vehicle sales surged 53% YoY and 28% QoQ to 180,600 vehicles. Unlike last year, when the company's BEV sales growth was led by China, this year Europe is taking the lead, with sales on the continent up 69% YoY and now making up 68% of the group's YTD BEV sales.

Volkswagen will be spending \$7 billion to build a 90 gigawatt-hour battery plant in St. Thomas, Ontario. The decision to build the plant was made easier for Volkswagen thanks to C\$15 billion in combined subsidies from the Canadian federal and Ontario provincial governments.

In June, the company announced they would invest \$100 million into a new Special Purpose Acquisition Vehicle named ACG Electric Metals. ACG will also receive equal amounts of equity funding from Glencore and fellow auto-maker Stellantis. Together with other equity, royalty, and debt financing, ACG will be purchasing two Brazilian mines for \$1 billion, allowing the automaker to secure copper and nickel supplies.

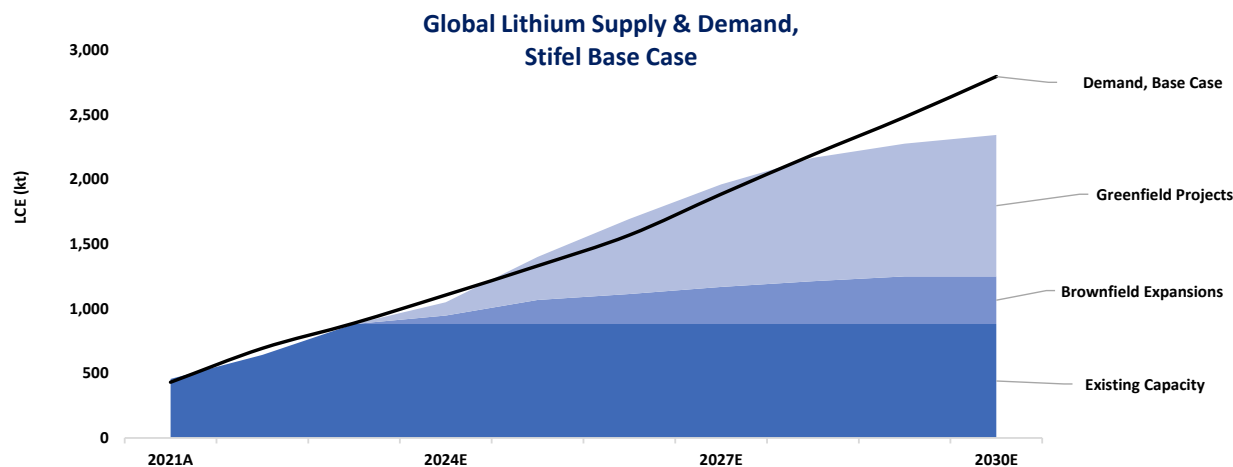
Lithium Supply

Main changes to our supply model: FID on select W.A. brownfield projects brings forward some mid-decade production; inclusion of additional select Argentinian greenfield projects adds higher risk tonnage at risk of being pushed right. We have updated our lithium supply model based off current producer guidance changes through 2023 as well as to reflect the realistic guidance of brownfield expansions. We have also updated our greenfield project universe to reflect anticipated DFS stage projects' commercial production dates.

Notably, we do not see as pronounced of an increase in brownfields supply as the majority of expansions across lithium incumbent producers have been previously communicated to market. Instead, capital allocation has shifted towards vertical value capture (i.e. hydroxide/carbonate refinery announcement/JVs) or the (attempted) purchase of upstream resources (i.e. ALB/LTR, ALB/PMET, SQM/AZS).

Supply response from 2015-22 has been dominated by six brownfield asset expansions, while average global grades have dropped 29%. Between 2015- 2022, we saw the lithium market grow from approximately ~200kt LCE in 2015 to ~700kt LCE in 2022, with the majority of new supply from a select basket of Australian spodumene producer ramp ups (Greenbushes increased production 127% from 88kt LCE in 2015 to 2022) and Chilean asset expansions (consolidated production out of the Salar de Atacama from ALM & SQM increased 255% from ~55kt LCE in 2015 to ~195kt LCE in 2022). In 2022, we saw the restart of Wodgina, and the ramp up of Pilgangoora and Mt. Marion. Together, operating assets and brownfield asset ramp ups accounted for 85% of total 2022 supply, while the average grade of global lithium production decreased 29% between 2015 (4.0% LCE) and 2022 (2.84% LCE). With the majority of the last three years supply response buoyed by hardrock expansions, we continue to be of the opinion that the 'easy' supply elastic tonnage has been turned on.

Figure 12. Lithium supply and demand base case



			2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Supply	Old Estimate	LCE, kt	785	1,018	1,365	1,666	1,860	2,007	2,091	2,150
	New Estimate	LCE, kt	883	1,051	1,401	1,696	1,963	2,169	2,278	2,344
Demand	Old Estimate	LCE, kt	819	1,018	1,203	1,471	1,786	2,119	2,416	2,772
	New Estimate	LCE, kt	888	1,106	1,331	1,569	1,886	2,191	2,482	2,797

Source: Stifel research

Greenfield supply basket increasing, but so is project risk. With pricing remaining elevated versus historical levels, we have included select higher cost greenfield projects in our supply model, but would note these carry higher levels of financing/production risk. Analysis of current DFS stage projects shows 4th quartile cost projects have an increased incentivized cost of production of ~22% over last year, topping out at ~\$23,000/t, which continues to provide pricing support at the ~\$25,000/t floor we saw in April 2023. On average, the incentivized cost of new production has increased 25% over last year's cohort on a project basis.

Thus, while our supply model now carries more tonnage, we would note incremental tonnes are increasingly risky whose investment case is underpinned by higher prices, positive financing, and the availability of specialized labour.

We now forecast LCE supply of 883kt in 2023 and 1.7MMt LCE in 2026. Successful greenfield projects have the most material effect over the next two years on our supply model, contributing ~64% of new incremental supply. By 2030 we expect 2.3MMt LCE supply, up 9% from previous estimates mainly on the inclusion of a select number of greenfield expansions.

Risks to our supply forecast

While we continue to expect a material supply increase between 2024-2025, we would note a significant amount of this production is from greenfield assets. In 2025, 24% for ~333kt LCE of our supply forecast is to come from 18 greenfield projects not currently in production. Of these projects, 74% for ~247kt LCE supply is to come from greenfield projects in non-OECD countries.

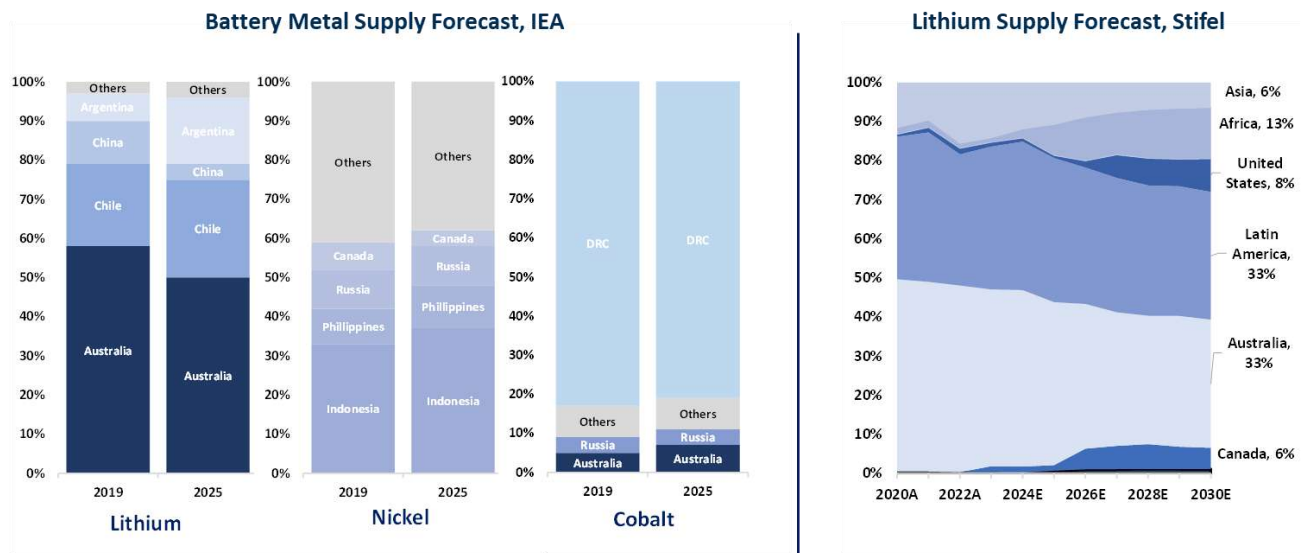
Across the spectrum, material risks to our supply forecast include:

- i. geography of supply,**
- ii. the successful ramp up, financing, and permitting of multiple greenfield projects,**
- iii. capital intensity of new projects, where lower grades will increase capital intensity, and thus the incentivized cost of production moving forward, and**
- iv. global average lead times from discovery to production, effectively minimizing the supply response of projects currently in the exploration stage.**

We note that the necessary pace of lithium supply growth is something the industry has yet to experience. Capital intensive project development is common in other metals industries (*precious, base metals*), but is something the lithium supply industry has not yet experienced at mass scale.

1. **Geography of supply.** In 2021, 49% of lithium supply was from OECD countries, with 51% from other countries. By 2025, we expect this number to remain strikingly similar (45% OECD/55% other) intimating the difficulty of onshoring supply chains in capital intensive industries. The recently announced Inflation Reduction Act includes certain eligibility requirements based on geography as we continue to see a bifurcation of global supply chains in light of global conflict.

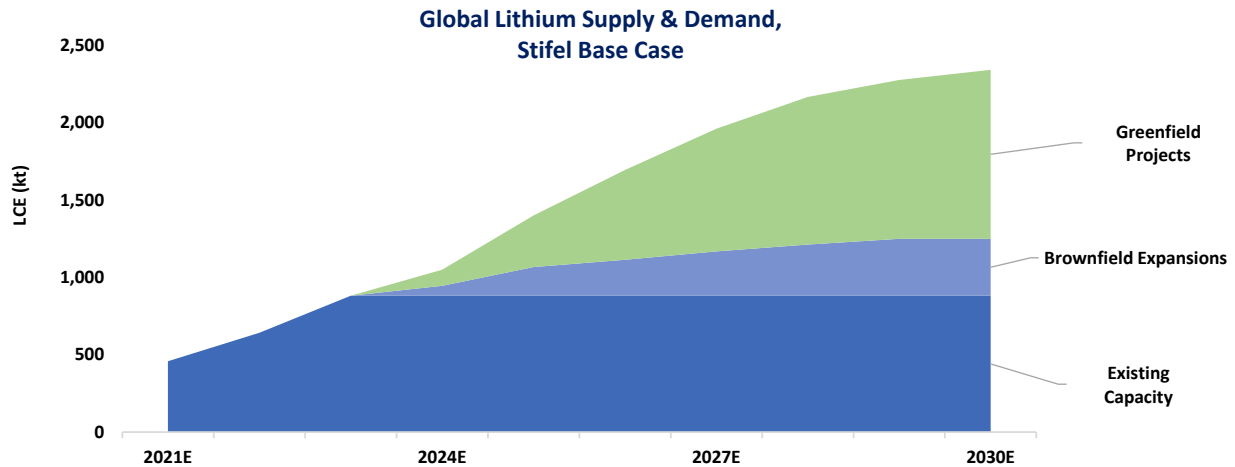
Figure 13. Battery metal supply forecasts



Source: International Energy Agency, Stifel research

2. **Greenfield success.** Our supply model relies upon the successful ramp up of 18 greenfield assets by 2025 for ~333kt LCE supply (24% of our total supply forecast), in addition to successful brownfield expansions across multiple Western Australian hardrock assets. If we were to see a delay in these projects, it would have a material impact on our supply forecast.

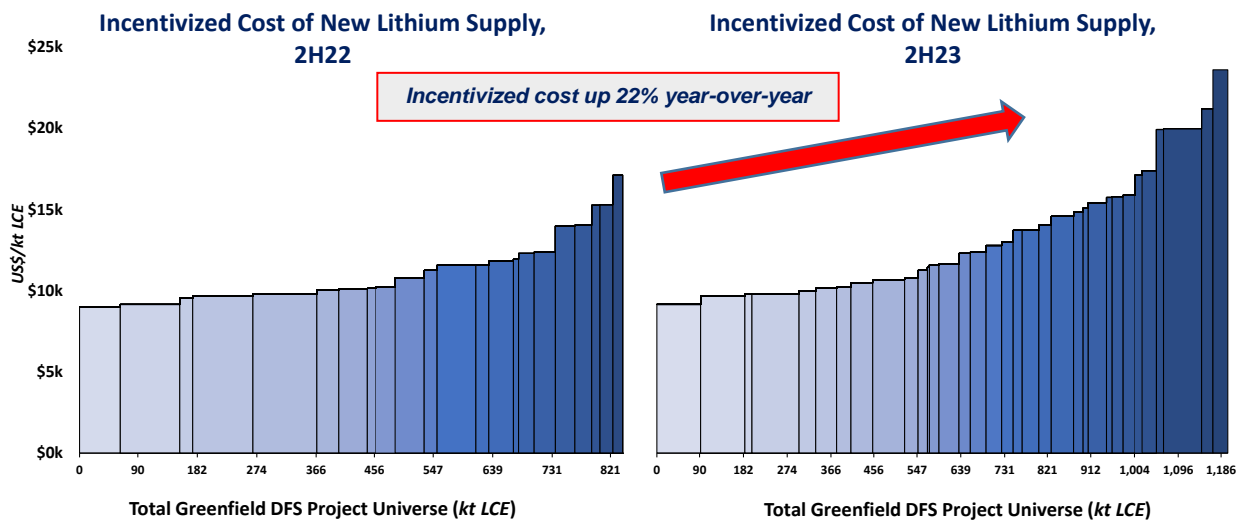
Figure 14. Lithium supply outlook



Source: Stifel research

3. **Capital Intensity of Greenfield projects.** New DFS stage greenfield projects have increasingly higher capital intensities, with more difficult processing technologies, showcasing the difficulty of new project execution, as intimated by recent definitive feasibility study publications. Analysis of current DFS stage projects shows 4th quartile cost projects have an increased incentivized cost of production of ~22% over last year, topping out at ~\$23,000/t LCE (with capital intensities of \$48,500/t LCE).

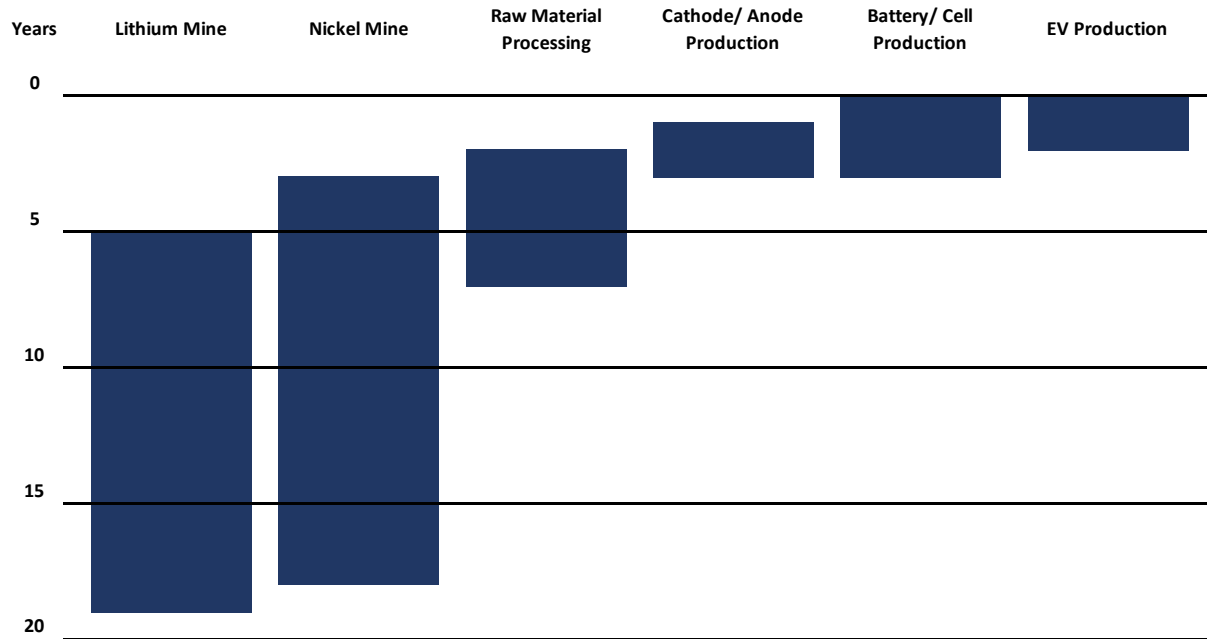
Figure 15. Lithium greenfield projects supply curves



Source: Company disclosures, Stifel research

- Global average lead times.** Between 2010-2019, the global average lead time from discovery to production of the top 35 mining projects that came online was 17 years, including 12.5 years from discovery to PEA, effectively muting the impact of current discoveries on supply this decade. According to the IEA, lithium mines have the longest lead times from discovery to production (6-19 years), whereas downstream verticals often have materially shorter lead times, keeping the bottleneck at the mine gate.

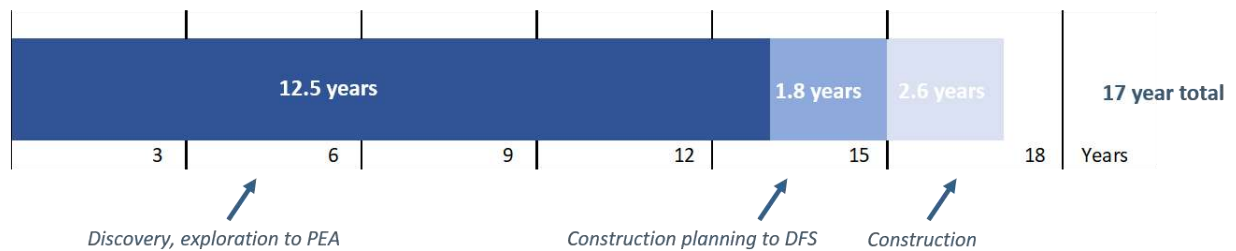
Figure 16. Project lead times comps



Source: International Energy Agency

Figure 17. Mine construction timelines

Global Average Lead Times from Discovery to Production, 2010-2019

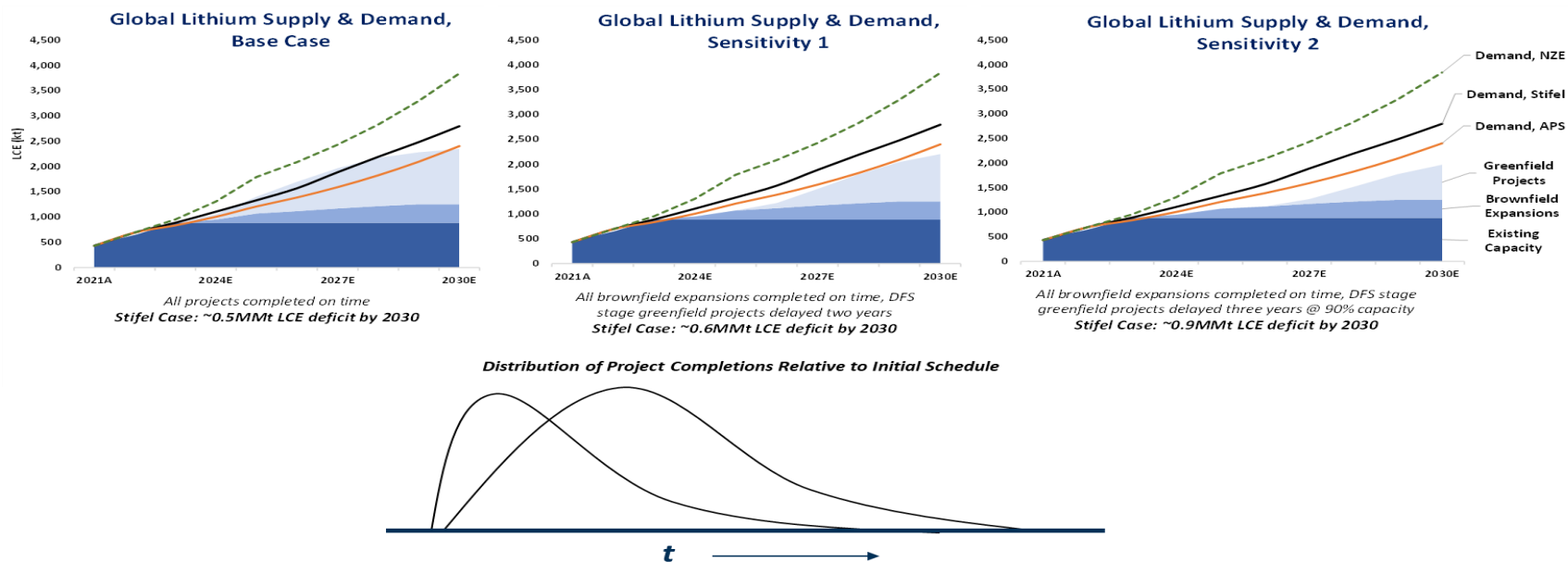


Source: Stifel research

Supply Sensitivity Analysis

Globally low lithium reserve grades provide a natural production barrier, thus increasing capital intensities of new project builds. Below we outline a scenario analysis on our supply model should we see a material delay in greenfield projects. We also baseline our model versus multiple International Energy Agency scenarios, including the Announced Pledges Scenario (APS - assumptions outline a path to 1.5 degree C warming by 2050 in line with Paris Accord parameters and assumes a 35% LDV BEV penetration rate), and Net Zero Emissions by 2050 Scenario (60% of global car sales are BEV by 2030).

Figure 18. Global lithium supply outlook



Source: International Energy Agency, company disclosures, Stifel research

- **Base Case:** Our base case supply model assumes a realistic progression of the ramp up of brownfield expansions and greenfield projects temporally at or near company guidance. In this scenario, our model forecasts a 452kt LCE deficit by 2030. Versus the IEA Net Zero Emissions Scenario, we see a 1.5MMt LCE gap.
- **Sensitivity 1 - All Brownfields Expansions Completed on Time, DFS Stage Greenfield Projects Delayed Two Years.** Our Sensitivity 1 supply model assumes a realistic progression of the ramp up of brownfield expansions, and pushes out the completion of DFS stage greenfield projects by two years. In this scenario, our model forecasts a 591kt LCE deficit by 2030. Versus the IEA Net Zero Emissions Scenario, we see a ~1.6MMt LCE gap
- **Sensitivity 2 - All Brownfields Expansions Completed on Time, DFS Stage Greenfield Projects Delayed Two Years @ 90%.** Our Sensitivity 2 supply model assumes a realistic progression of the ramp up of brownfield expansions, and pushes out the completion of DFS stage greenfield projects by three years and assumes attainable capacity is 10% less than nameplate on ramp up issues. In this scenario, our model forecasts an 832kt LCE deficit by 2030. Versus the IEA Net Zero Emissions Scenario, we see a ~1.9MMt LCE gap.

Main Producer Trends

Continued strong cash generation, issues in labour availability in Australia, worker retention and ability to scale in Australia, prioritizing vertical integration/ acquisition of new resources to maintain/grow scale as brownfield expansion plans have been laid out. Below we run through major individual producer updates in 2Q23.

IGO 2Q23 Update: IGO achieved record EBITDA of A\$636M and free cash flow of A\$381M in the quarter, thanks to strong production from Greenbushes. These represent QoQ increases of 19% and 34%, respectively. Full-year EBITDA came in at A\$2B and full-year free cash flow at A\$1.1B. IGO owns a 49% stake in Tinaqi Lithium Energy Australia, which owns a 51% interest in Greenbushes, the world's largest lithium mine by production. Greenbushes recorded sales of A\$3.5B in the quarter, 23% higher than last quarter, as higher production outpaced lower spodumene prices.

Operations: Greenbushes produced 395kt spodumene concentrate in the quarter, for full-year production of 1,491kt. This beat prior guidance of 1,350-1,450kt of spodumene concentrate. 2024 guidance is for 1,400-1,500kt. Full-year costs per unit of spodumene produced was A\$279/tonne for the year, exceeding guidance of A\$225-275. Western Australia is experiencing particular tight supply for labour in the resource industry, and costs are expected to rise next year. Cost guidance for 2024 is A\$280-330/tonne of spodumene produced.

Despite good performance at the mine, lithium hydroxide output at the company's Kwinana refinery plunged 85% in the quarter, from 963 tonnes to 142. The plant is now operating at 20% capacity, and is expected to reach 50% by the end of the year.

Pricing: Realized pricing for spodumene concentrate in the quarter was \$5,431/tonne, a small decrease from \$5,783 in the previous quarter. IGO expects an average chemical-grade spodumene concentrate price of \$3,739/tonne for the next three months.

Livent 2Q23 Update: Livent reported Q2 adjusted EPS of \$0.51 and Q2 adjusted EBITDA of \$135 million. Volumes were mostly flat in the quarter while lower pricing pushed both EPS and EBITDA 15% lower compared to the previous quarter.

Operations: Livent is currently expanding operations at the Salar de Hombre Muerto in Argentina. The company expects an additional 10kt pa LCE coming online in Q3 2023, and 10ktpa more in Q1 2024. They currently produce 20kt pa at the salar. A second expansion of 30kt pa is in the engineering phase, with production targeted for 2026.

The company owns a 50% share in Nemaska Lithium Project, which is currently under construction in Quebec. Project completion is expected by the end of 2024 and will eventually ramp up to 235kt pa of spodumene concentrate production.

Pricing: Livent expects similar pricing in H2 from H1, given their existing customer contracts.

Allkem 2Q23 Update: Allkem and Livent agreed to an all-stock merger this quarter, pro-forma revenue for the combined entity was \$334 million in the quarter. On July 25, the company signed a project financing deal with the International Finance Corporation, a World Bank member. The deal will provide \$130 million over 10 years to finance the Sal de Vida lithium project in Argentina.

Operations: Olaroz had a quarterly record 5,059 tonnes of lithium carbonate produced in the quarter, for record annual production of 16,703 tonnes. Cash costs were \$5,882/tonne. Costs have crept from last year due to increasing costs for consumables, fuel, and labour.

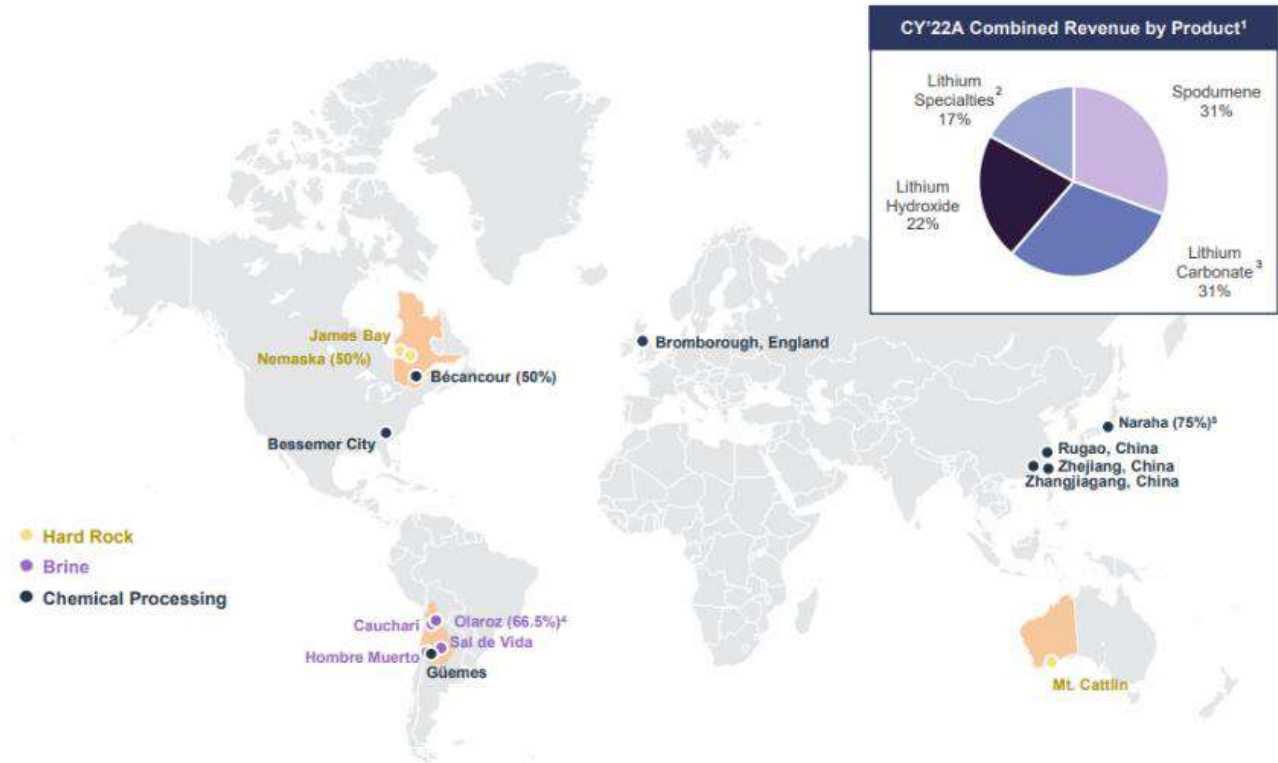
At Mt. Cattlin, 58,059 5.3% Li₂O grade spodumene concentrate was produced, for 130kt total annual production. Last summer 2023 guidance for Mt. Cattlin was 140-150kt, which itself was a revision downwards from the original 160-170kt. Cash costs were \$830/tonne in the quarter.

Allkem has several development projects ongoing: The Nahara lithium hydroxide plant in Japan is ramping up and delivered 464 tonnes of hydroxide in the quarter (capacity 10ktpa). Sal de Vida construction continues with the first 9 ponds completed and filled with brine. First production from stage one (15kt lithium

carbonate p.a.) remains on track for mid-2024. At James Bay engineering is 73% complete and permitting is ongoing.

Pricing: Allkem realized spodumene concentrate pricing of \$4,297/tonne for its SC 5.3% product, or \$4,800/tonne on an SC6 equivalent basis. Lithium carbonate sales averaged \$38,062/tonne in the quarter.

Figure 19. Combined Allkem + Livent operations



Source: Company presentation

Pilbara 2Q23 Update: Revenue in the quarter declined 18% as a 22% increase in sales was not enough to offset a 33% drop in the average realized price of spodumene concentrate. Nevertheless full-year 2023 revenue hit A\$4.0 billion thanks to a 64% increase in output from Pilgangoora, as that mine ramps up to full production.

Operations: Spodumene concentrate production at Pilgangoora hit a record of 162.8kt in the quarter, up 10% over Q3. The company ended the fiscal year with output of 620.1kt, 64% higher than last year. Costs for the year came in at \$613/tonne, within guidance of \$600-640/tonne.

The P680 Project, which aims to achieve 640-680ktpa of concentrate production, is scheduled for completed in Q2 FY 2024, i.e., Q4 2023. Another expansion project, P1000, targets 1Mtpa production, has first ore expected in Q3 FY 2025 (Q1 2024).

Pricing: Realized spodumene pricing for 5.3% Li₂O concentrate was \$3,256, a sharp drop from \$4,840 in the previous quarter. On a SC6 equivalent basis, Q4 average realized pricing was \$3,714/tonne.

Mineral Resources 2Q23 Update: 22% of Mineral Resources' revenue in FY23 came from its lithium operations. The company announced a change in terms to their Wodgina operations: In December 2023, MinRes will increase its stake in Wodgina from 40% to 50%. In exchange, Albemarle will take full ownership of the Kemerton lithium hydroxide plant along with making a payment of \$380-\$400 million to MinRes.

Operations: Wodgina produced 41kt on spodumene concentrate in the quarter, down 6% from Q3. Full-year production came in at 148kt. SC6 equivalent FOB costs for FY2023 are expected to be between \$925-\$975/tonne. In addition, Wodgina produced 4.2kt of lithium hydroxide, a 30% increase from Q3. Full-year production was 11.5kt, meeting guidance of 11.5kt-12.5kt

At Mt. Marion (50% owned by MinRes), 60kt of SC6 equivalent concentrate was produced in Q4, in-line with Q3. FOB costs for full-year are expected to meet guidance of \$1,200-\$1,500/tonne.

Pricing: Upcoming SC6 equivalent shipments from Wodgina are expected to fetch \$3,739/tonne. The realized price for lithium hydroxide in the quarter was \$40,484/tonne, down 46% QoQ. The realised SC6 price at Mt. Marion was \$2,589/tonne, down 23% QoQ.

SQM 2Q23 Update: SQM saw a drop in most reported financial metrics in the quarter, as record-high sales volumes were unable to overcome lower realized prices. EPS came in at \$2.03, vs \$2.63 in Q1. Revenue of \$2.05 billion and EBITDA of \$900.7 million were also lower than Q1's figures of \$2.26 billion and \$1.09 billion, respectively. In comments following their earnings release, the company stated they expected annual lithium demand growth to be 20% in 2023.

Operations: SQM sold 43kt of lithium carbonate in Q2, bringing their H1 total to 65kt. They are expecting their Salar de Atacama operations in Chile to continue their ramp-up and have guided to total company-wide production of 180-190kt of lithium carbonate for 2023. Production is expected to hit 210kt in 2024. First production from Mt. Holland is expected by the end of this year.

Pricing: Realized prices for lithium carbonate dropped 37% in the quarter compared to Q1, falling from ~\$51,000/tonne to ~\$34,000/tonne. SQM is subject to significant realized pricing volatility as over 85% of their supply contracts are linked to price indexes that follow market prices.

Albemarle 2Q23 Update: Albemarle reported Q2 adjusted EPS of \$7.33, revenue of \$2.4B and adjusted EBITDA of \$1.03B. These are all lower than the record numbers posted in Q1 of adjusted EPS of \$10.32, revenue of \$2.58B and adjusted EBITDA of \$1.6B. Guidance has been lifted thanks to the recovery in lithium prices by quarter-end. 2023 EPS now \$25-\$29.50 from \$20.75-\$25.75 and EBITDA \$3.8-\$4.4B from \$3.3-\$4.0B.

Key transactions in the quarter were: A 100kt pa lithium hydroxide supply agreement inked with Ford for delivery from 2026 to 2030; taking full ownership of the Kemerton lithium hydroxide plant in Australia in exchange for \$380-\$400 million and a 10% stake in the Wodgina mine; and a \$109 million strategic investment in Canada's Patriot Battery Metals.

Operations: Albemarle expects full-year 2023 sales volumes to be 30-40% higher than 2022.

Pricing: The company does not give specific pricing guidance, but notes that they believe supply growth will roughly match demand growth in the near-term, and expect tight market conditions to persist into 2024. Currently 20% of company sales are at spot prices while the remainder are under contracts, typically tied to indexes with a 3-month lag.



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Analyst				Associate				Commodity			Prices as of		8/22/2023
Cole McGill (416) 943-6631 cmcgill@stifel.com				Derek Rosin (416) 941-0208							Spot	LT Deck	
							Lithium Carbonate 99.5% (USD/t)			\$29,813	\$20,000		
							Lithium Hydroxide (USD/t)			\$28,854	\$20,000		
							China Spod. Li2O 6% CIF (USD/t)			\$3,170	\$1,750		
							Cobalt (USD/lb)			\$14.96	\$25.00		
							Copper (USD/lb)			\$3.74	\$4.00		
							Nickel (USD/lb)			\$9.13	\$10.00		
							Zinc (USD/lb)			\$1.04	\$1.20		

Ticker	Exchange	FX	Price		Analyst	Rating	Target	Implied Return	Market Cap	EV	P/E		P/CF		EV/EBITDA		FCF Yield	Performance			Momentum		Consensus Outlook						
			Local	USD							Local	12 Mo	USD	USD	2024e	2025e		2024e	2025e	2024e	2025e	2024e	1 Week Δ	1 Mo Δ	YTD Δ	12MF EPS, 1Mo/3Mo Δ	12MF EBITDA, 1Mo/3Mo Δ	+	=
Battery Input Manufacturers																													
BASF ^	BAS	DE	BAS-DE	EUR	45.86	49.76	AH	HOLD	€45	-2%	44,412	67,960	9.6x	8.3x	6.0x	5.2x	6.6x	6.0x	3%	0%	-6%	1%	↓	↓	32%	53%	16%	19	↑
Fujitsu *	6702	TKS	6702-TKS	JPY	18,045	123.72	-	N.C.	-	-	23,301	22,801	13.2x	11.7x	8.9x	7.7x	6.2x	5.7x	6%	-1%	-4%	-7%	↓	↓	67%	22%	11%	9	↓
Ganfeng Lithium *	002460	SHE	002460-SHE	CNY	49.24	6.75	-	N.C.	-	-	13,604	11,821	7.0x	5.8x	5.2x	4.1x	5.3x	4.2x	4%	-7%	-17%	-32%	↓	↓	100%	0%	0%	2	↑
Umicore *	UMI	BE	UMI-BE	EUR	23.57	25.57	-	N.C.	-	-	6,148	7,680	13.0x	12.6x	7.9x	7.5x	6.9x	6.4x	n.m.	-6%	-16%	-30%	↓	↑	29%	47%	24%	17	↑
POSCO Chemical *	003670	KRX	003670-KRX	KRW	438,000	327.97	-	N.C.	-	-	25,391	26,979	78.4x	49.9x	44.5x	30.4x	45.4x	29.3x	n.m.	1%	-14%	130%	↑	↓	65%	18%	18%	17	↓
Sumitomo Chemical *	4005	TKS	4005-TKS	JPY	392	2.69	-	N.C.	-	-	4,397	15,704	8.4x	6.5x	3.0x	2.6x	8.0x	7.1x	1%	-4%	-13%	-25%	↓	↓	29%	71%	0%	7	↑
EcoPro BM *	247540	KRX	247540-KRX	KRW	337,500	252.71	-	N.C.	-	-	24,680	25,858	64.6x	44.0x	43.9x	29.6x	36.7x	25.2x	n.m.	6%	-15%	247%	↑	↑	31%	19%	50%	16	↓
NOVONIX *	NVX	ASX	NVX-ASX	ASX	1.08	0.69	-	N.C.	-	-	338	295	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	0%	7%	7%	-30%	n.m.	n.m.	n.m.	n.m.	n.m.	-	n.m.
Average											27.8x	19.8x	17.0x	12.5x	16.4x	12.0x	3%	-1%	-10%	32%	↓	↓							
Battery Producers																													
CATL *	300750	SHE	300750-SHE	CNY	230.75	31.64	-	N.C.	-	-	138,876	139,839	17.2x	13.7x	8.5x	8.2x	11.0x	8.9x	8%	0%	3%	1%	↓	↓	94%	3%	3%	34	↓
BYD *	002594	SHE	002594-SHE	CNY	234.54	32.16	-	N.C.	-	-	93,445	79,259	18.9x	14.6x	5.9x	5.8x	7.7x	6.2x	7%	-4%	-13%	-13%	↑	↑	85%	15%	0%	13	↓
LG Chem *	051910	KRX	051910-KRX	KRW	573,000	429.05	-	N.C.	-	-	33,584	48,707	10.9x	7.1x	5.0x	3.8x	5.7x	4.2x	n.m.	-4%	-21%	-10%	↓	↑	100%	0%	0%	19	↑
Samsung SDI *	006400	KRX	006400-KRX	KRW	598,000	447.77	-	N.C.	-	-	29,944	32,364	16.2x	13.0x	9.5x	7.7x	9.3x	7.4x	0%	-2%	-16%	-4%	↑	↑	88%	8%	4%	24	↓
Panasonic *	6752	TKS	6752-TKS	JPY	1,589	10.89	-	N.C.	-	-	25,431	30,648	9.8x	8.3x	5.0x	4.5x	4.8x	4.4x	6%	-2%	-11%	29%	↑	↑	75%	17%	8%	12	↑
SK Innovation *	096770	KRX	096770-KRX	KRW	177,000	132.53	-	N.C.	-	-	12,609	28,865	9.0x	6.7x	2.8x	2.3x	6.2x	4.9x	n.m.	-4%	-2%	10%	↑	↑	88%	8%	4%	25	↓
Average											13.7x	10.6x	6.1x	5.4x	7.5x	6.0x	5%	-3%	-10%	2%	↑	↑							
EV OEMs																													
Tesla *	TSLA	US	TSLA-US	USD	233.19	233.19	-	N.C.	-	-	739,218	793,426	48.8x	36.2x	33.7x	29.7x	34.6x	24.4x	1%	0%	-10%	89%	↓	↓	39%	50%	11%	18	↑
NIO *	9866	HKG	9866-HKG	HKD	86.95	11.09	-	N.C.	-	-	18,529	17,828	n.m.	n.m.	66.9x	17.2x	n.m.	46.8x	n.m.	-11%	6%	10%	↓	↓	71%	29%	0%	17	↑
Lucid Motors *	LCID	US	LCID-US	USD	6.07	6.07	-	N.C.	-	-	13,799	8,677	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	-5%	-12%	-11%	↑	↓	36%	45%	18%	11	↓
Rivian *	RIVN	US	RIVN-US	USD	20.08	20.08	-	N.C.	-	-	19,109	11,849	n.m.	n.m.	n.m.	88x	n.m.	n.m.	n.m.	-3%	-21%	9%	↑	↑	57%	39%	4%	23	↓
Xpeng *	XPEV	US	XPEV-US	USD	15.94	15.94	-	N.C.	-	-	10,760	12,793	n.m.	n.m.	n.m.	57.1x	n.m.	n.m.	n.m.	-1%	9%	60%	↓	↓	55%	28%	18%	40	↓
Average											48.8x	36.2x	50.3x	47.9x	34.6x	35.6x	1%	-4%	-5%	32%	↓	↓							
EV Infrastructure																													
ChargePoint ^	CHPT	US	CHPT-US	USD	7.02	7.02	SG	BUY	\$17	142%	2,475	2,454	n.m.	120.5x	n.m.	18.6x	-107x	20.8x	n.m.	-8%	-16%	-26%	↑	↑	100%	0%	0%	3	↑
EVGo ^	EVGO	US	EVGO-US	USD	4.10	4.10	SG	BUY	\$9	120%	421	927	n.m.	n.m.	n.m.	25.1x	-34.5x	20.3x	n.m.	-4%	-2%	-8%	↓	↓	42%	42%	17%	12	↑
Wallbox ^	WBX	US	WBX-US	USD	2.78	2.78	SG	BUY	\$6	116%	545	536	n.m.	138.3x	n.m.	11.2x	199x	9.7x	n.m.	-3%	-33%	-22%	↓	↓	83%	17%	0%	6	↓
Blink Charging ^	BLNK	US	BLNK-US	USD	4.53	4.53	SG	HOLD	\$8	77%	288	220	n.m.	n.m.	n.m.	n.m.	-4.9x	-7.8x	n.m.	-17%	-26%	-59%	↓	↓	25%	75%	0%	8	•
Canoo ^	GOEV	US	GOEV-US	USD	0.52	0.52	SG	BUY	\$1.5	191%	305	299	n.m.	n.m.	n.m.	n.m.	-1.3x	-2.8x	n.m.	6%	-20%	-58%	↓	↓	75%	25%	0%	4	•
Average											n.m.	129.4x	n.m.	18.3x	10.1x	8.0x	n.m.	-5%	-19%	-35%	↓	↓							

* Consensus estimate data provided in full by FactSet, N.C. = not covered

Source: Stifel estimates, FactSet

^ Rating/TP provided by Stifel analysts, estimates provided by FactSet. BASF target price based on an equally weighted average of 1. historical dividend yield and P/E and 2. historical EV/EBITDA multiples. Chargepoint target price based on a 10 year, 10% DCF. EVGo target price based on a 10-year, 12% DCF. Wallbox target price based on a 10-year, 12% DCF. Blink Charging target price based on a 10-year, 12.5% DCF. Canoo target price is based on a 0.75x multiple of 2025 sales estimate.

Analysts: AT = Alex Terentiew, CM = Cole McGill, AH = Andreas Heine, SG = Stephen Gengaro

Prices as of close on

8/22/2023

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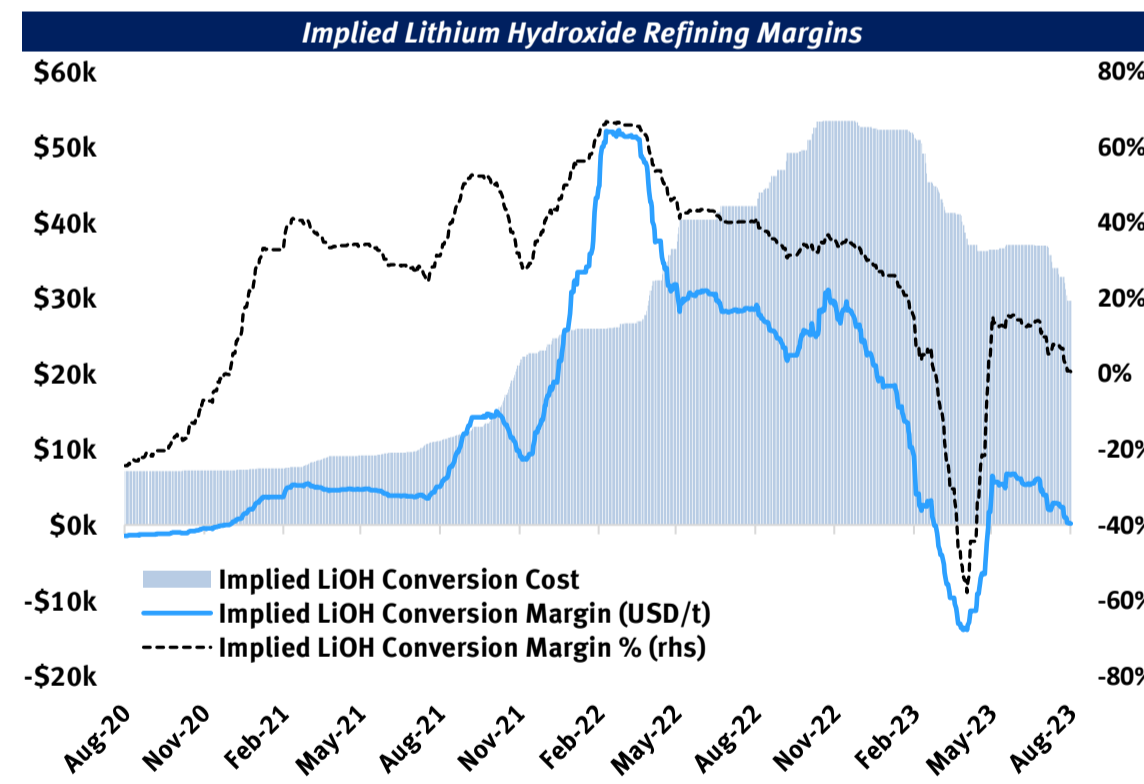
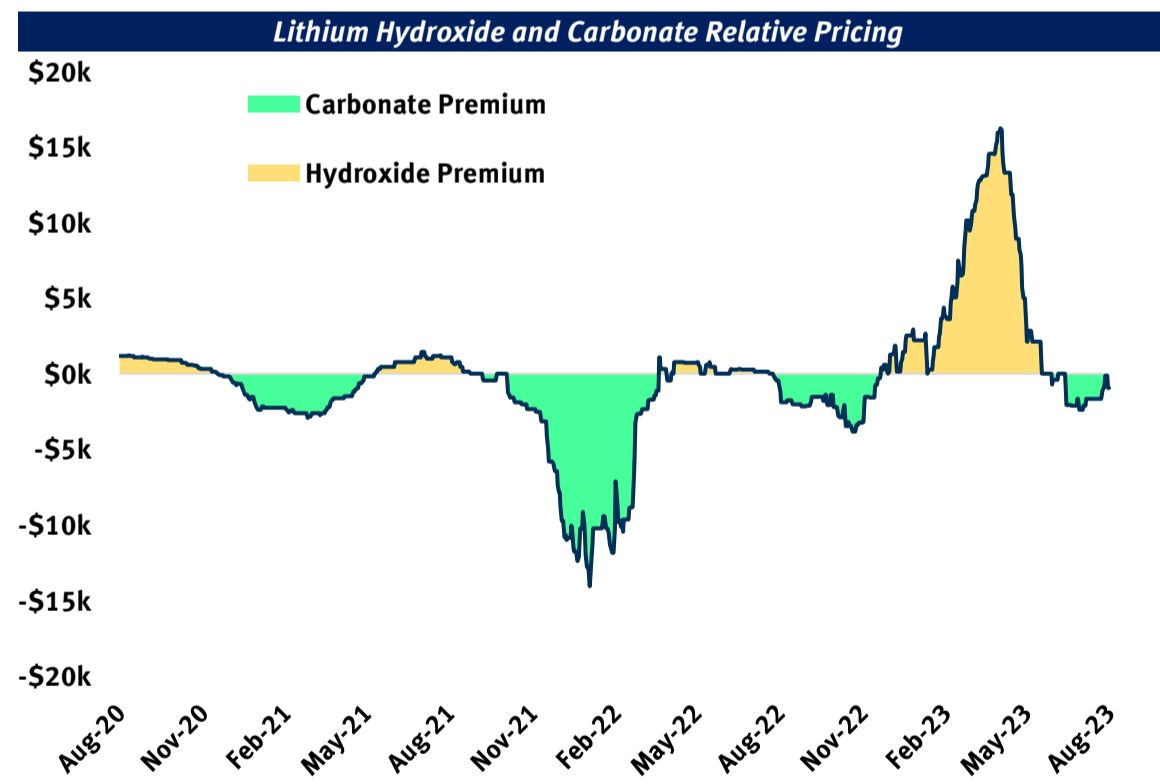
161 Bay St, Suite 3800
Toronto, ON M5J 2S1, Canada

Analyst				Associate				Prices as of	
Cole McGill	(416) 943-6631	cmcgill@stifel.com		Derek Rosin	(416) 941-0208			8/22/2023	

Commodity	Spot	LT Deck
Lithium Carbonate 99.5% (USD/t)	\$29,813	\$20,000
Lithium Hydroxide (USD/t)	\$28,854	\$20,000
China Spod. Li ₂ O 6% CIF (USD/t)	\$3,170	\$1,750
Cobalt (USD/lb)	\$14.96	\$25.00
Copper (USD/lb)	\$3.74	\$4.00
Nickel (USD/lb)	\$9.13	\$10.00
Zinc (USD/lb)	\$1.04	\$1.20

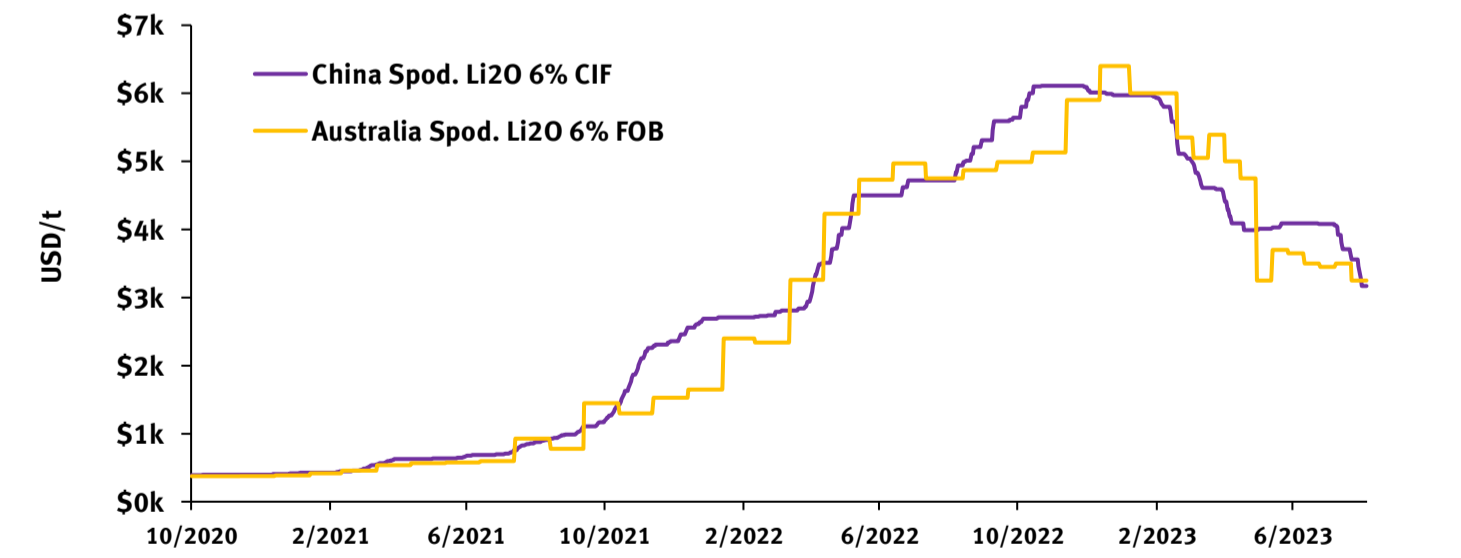
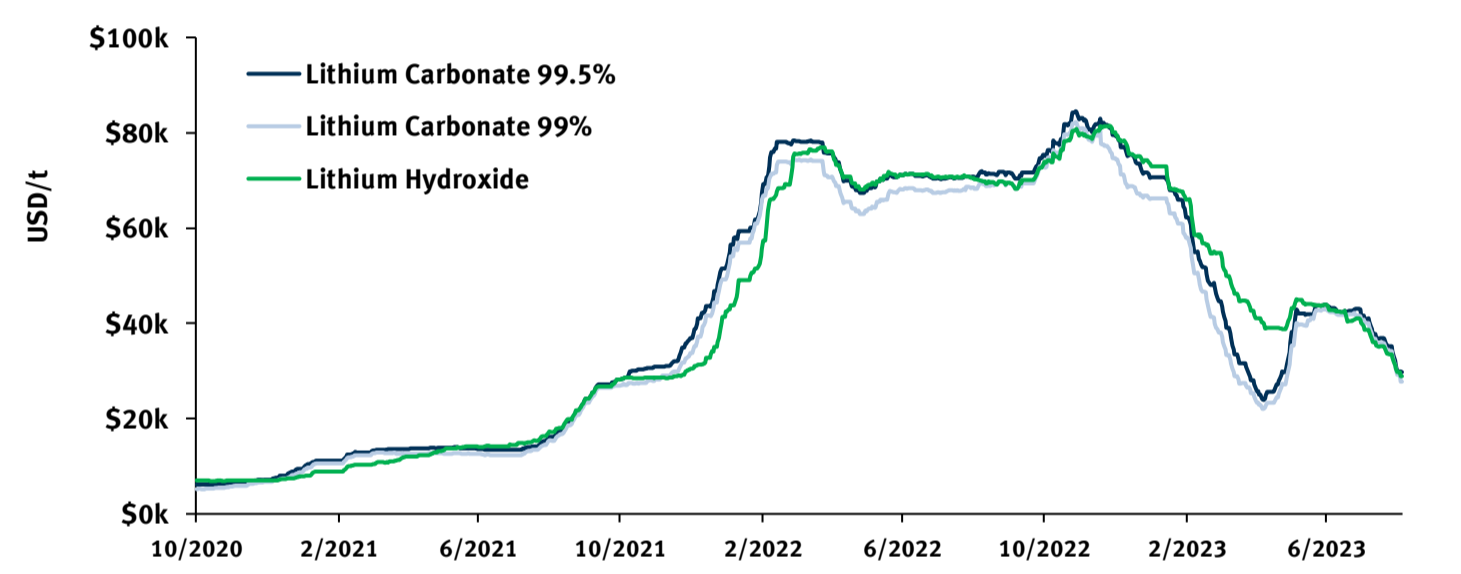
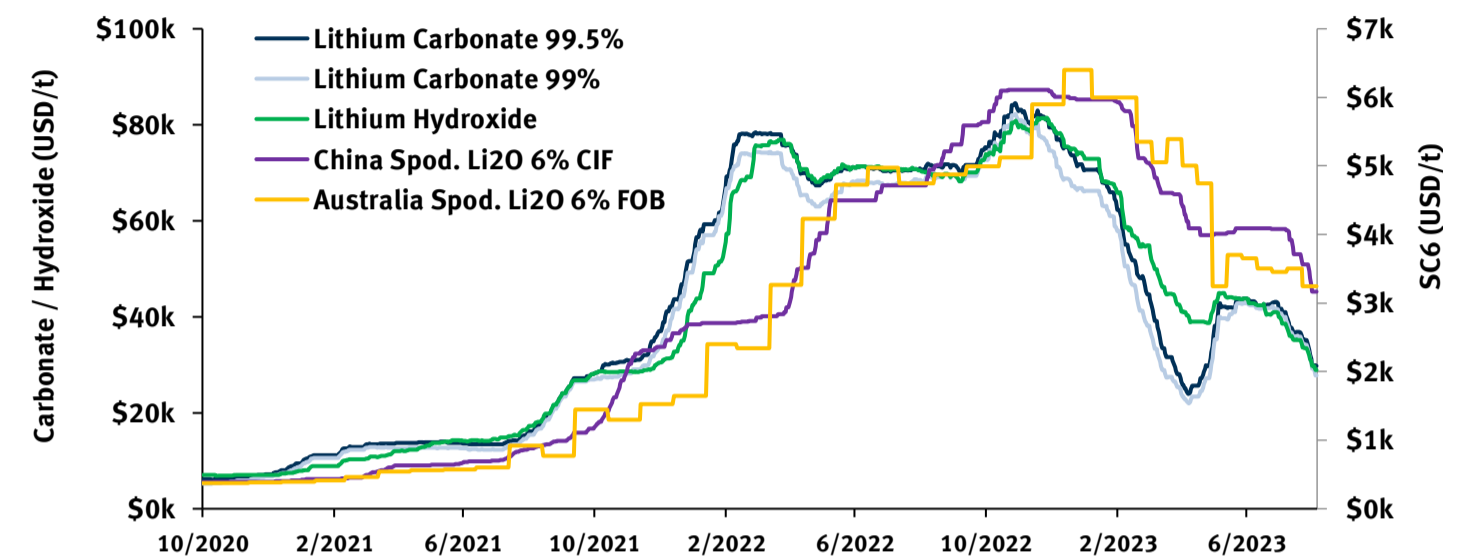
Battery Metal Price Performance												
Commodity	Unit	Spot	1 Week	1 Month	1 year	3 year	5 year	1 Week Δ	1 Month Δ	1 Year Δ	3 Year Δ	5 Year Δ
			8/15/2023	7/23/2023	8/22/2022	8/22/2020	8/23/2018	%	%	%	%	%
Lithium Carbonate 99.5%	USD/t	29,813	32,999	40,970	70,747	5,752	12,887	-10%	-27%	-58%	418%	131%
Lithium Carbonate 99%	USD/t	27,757	32,039	39,997	68,557	4,914	11,367	-13%	-31%	-60%	465%	144%
Spread	%	7%	3%	2%	3%	17%	13%					
Lithium Hydroxide	USD/t	28,854	31,901	38,605	70,017	6,937	18,027	-10%	-25%	-59%	316%	60%
China Spod. Li ₂ O 6% CIF	USD/t	3,170	3,460	4,080	4,720	390	N.A.	-8%	-22%	-33%	713%	N.A.
Australia Spod. Li ₂ O 6% FOB	USD/t	3,250	3,250	3,450	4,750	390	N.A.	0%	-6%	-32%	733%	N.A.
Cobalt	USD/lb	14.96	14.96	14.97	22.23	14.99	28.95	0%	0%	-33%	0%	-48%
Copper	USD/lb	3.74	3.69	3.82	3.66	2.95	2.71	1%	-2%	2%	27%	38%
Nickel	USD/lb	9.13	8.97	9.42	10.14	6.67	6.02	2%	-3%	-10%	37%	52%
Zinc	USD/lb	1.04	1.05	1.07	1.61	1.10	1.12	-1%	-3%	-36%	-6%	-7%

Stifel GMP Price Forecast												
Commodity	Unit	Q3/22	Q4/22	2022a	Q1/23	Q2/23	Q3/23	Q4/23	2023e	2024e	2025e	2026e
Lithium Carbonate 99.5%	USD/t	70,948	78,695	71,584	59,855	35,097	35,000	35,000	45,000	35,000	20,000	20,000
Lithium Carbonate 99%	USD/t	68,240	75,665	68,407	54,595	32,907	35,000	35,000	43,500	33,500	18,500	18,500
Lithium Hydroxide	USD/t	70,449	77,123	68,873	64,199	42,403	35,000	35,000	45,000	35,000	20,000	20,000
China Spod. Li ₂ O 6% CIF	USD/t	4,890	5,960	4,363	5,659	4,173	3,500	3,500	4,208	3,000	1,750	1,750
Cobalt	USD/lb	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	22.00	25.00	25.00
Copper	USD/lb	3.52	3.63	4.01	4.07	3.85	3.80	4.00	4.00	4.25	4.50	4.00
Nickel	USD/lb	10.01	11.48	11.91	11.81	10.15	9.25	10.00	12.50	11.00	10.00	10.00
Zinc	USD/lb	1.49	1.36	1.58	1.41	1.15	1.10	1.20	1.40	1.30	1.20	1.20



Prices as of close on 8/22/2023
Source: Stifel estimates, FactSet, Bloomberg

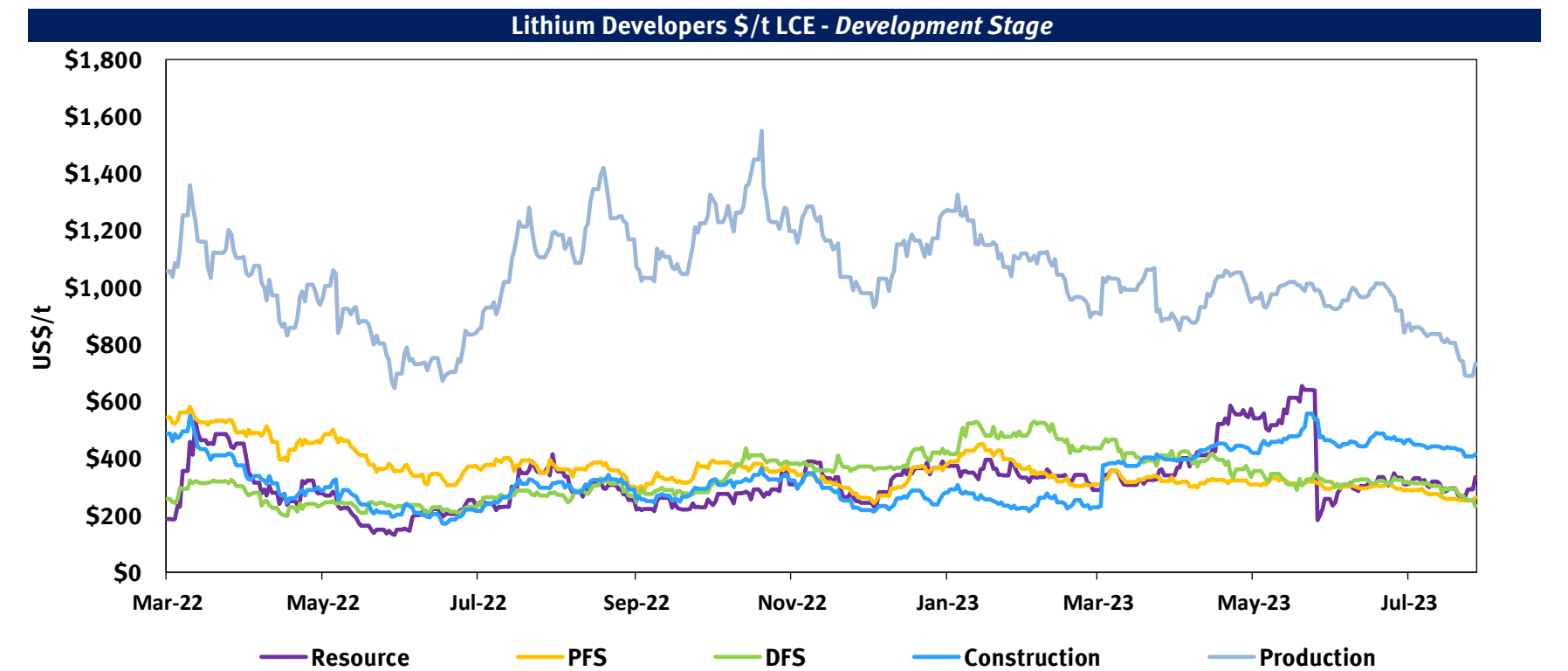
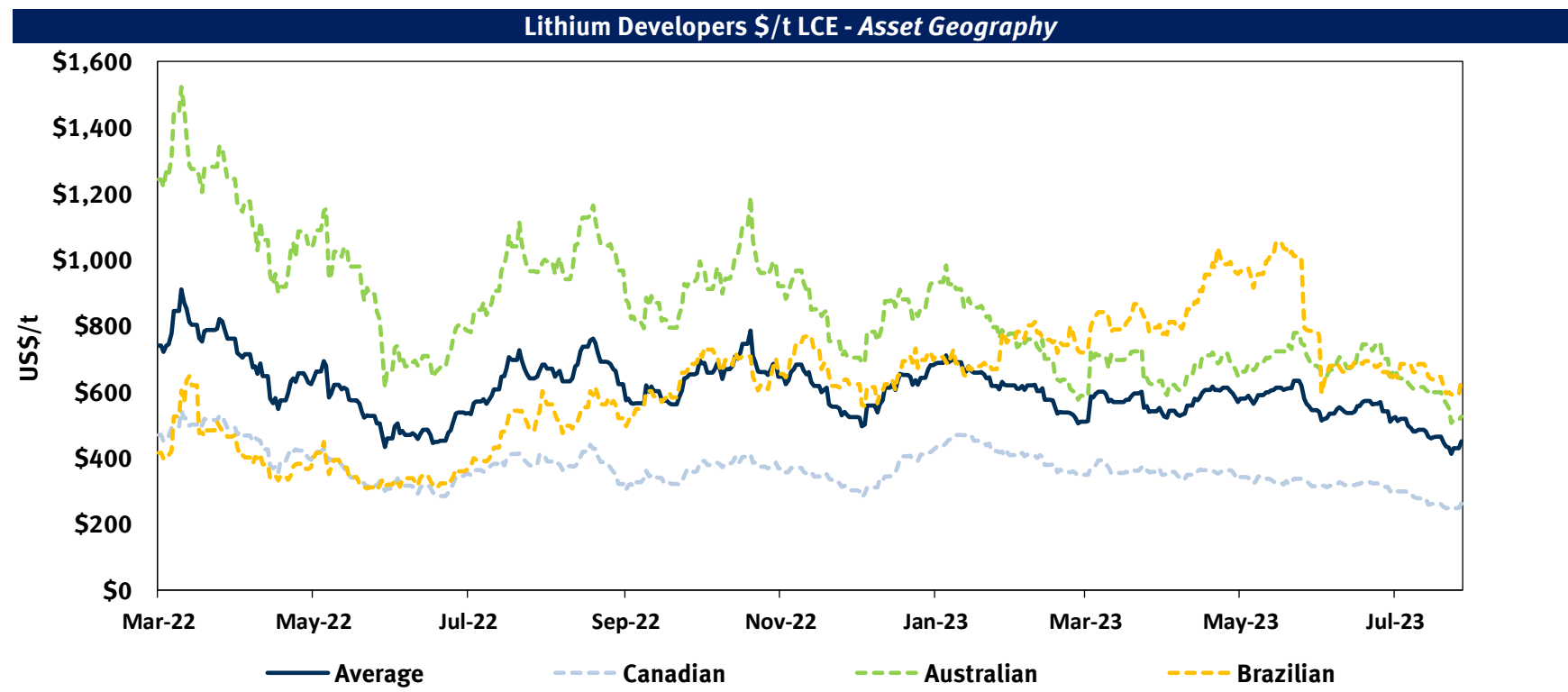
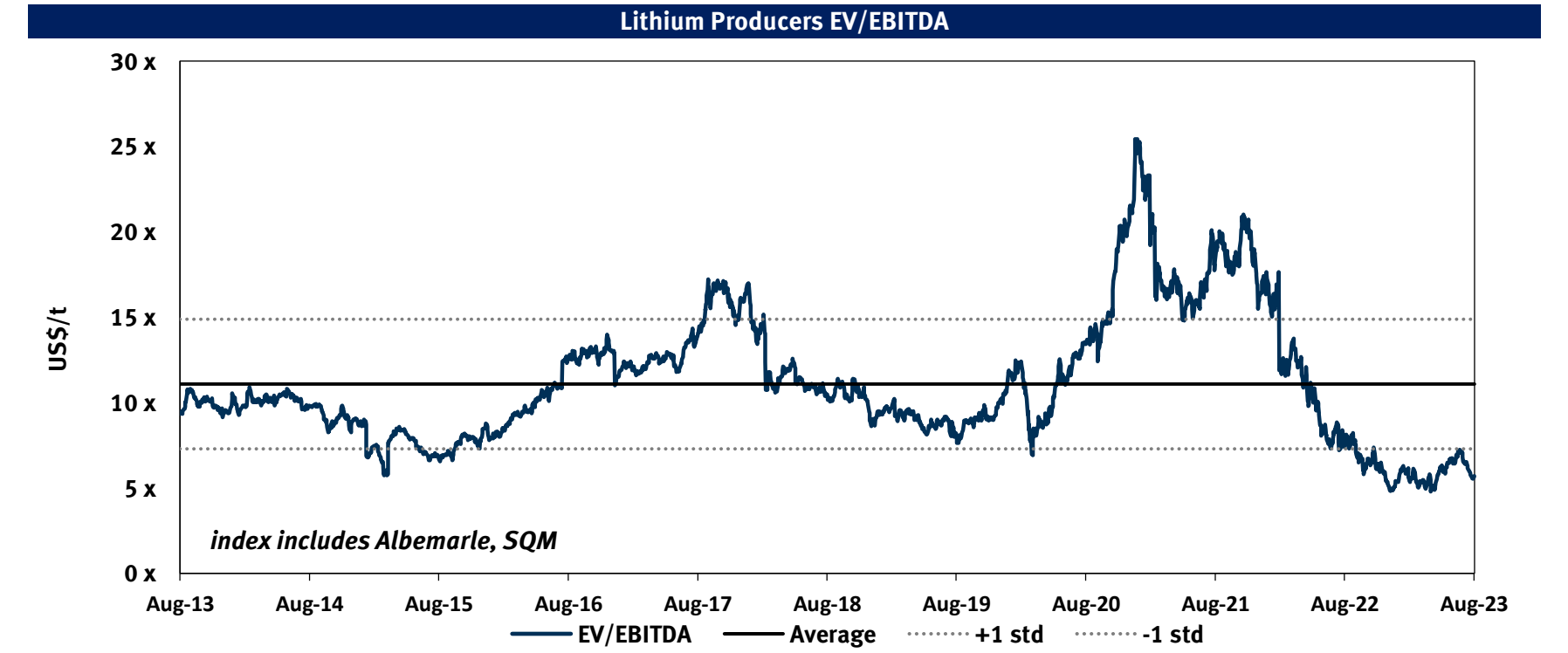
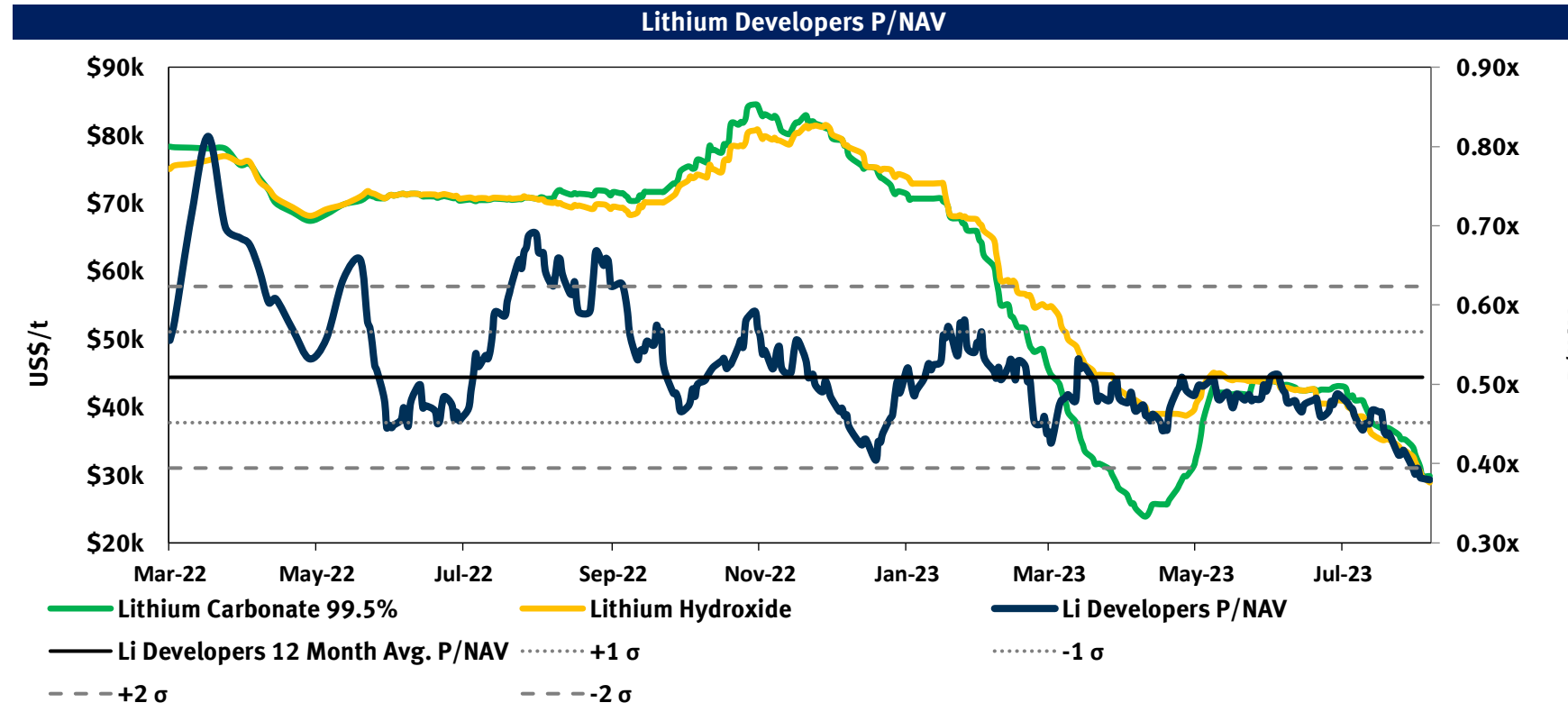
Lithium Compound Price Performance





161 Bay St, Suite 3800
Toronto, ON M5J 2S1, Canada

Analyst			Associate		Commodity			Prices as of	8/22/2023
								Spot	LT Deck
Cole McGill	(416) 943-6631	cmcgill@stifel.com	Derek Rosin	(416) 941-0208	Lithium Carbonate 99.5% (USD/t)		\$29,813	\$20,000	
					Lithium Hydroxide (USD/t)		\$28,854	\$20,000	
					China Spod. Li2O 6% CIF (USD/t)		\$3,170	\$1,750	
					Cobalt (USD/lb)		\$14.96	\$25.00	
					Copper (USD/lb)		\$3.74	\$4.00	
					Nickel (USD/lb)		\$9.13	\$10.00	
					Zinc (USD/lb)		\$1.04	\$1.20	



Prices as of close on

8/22/2023
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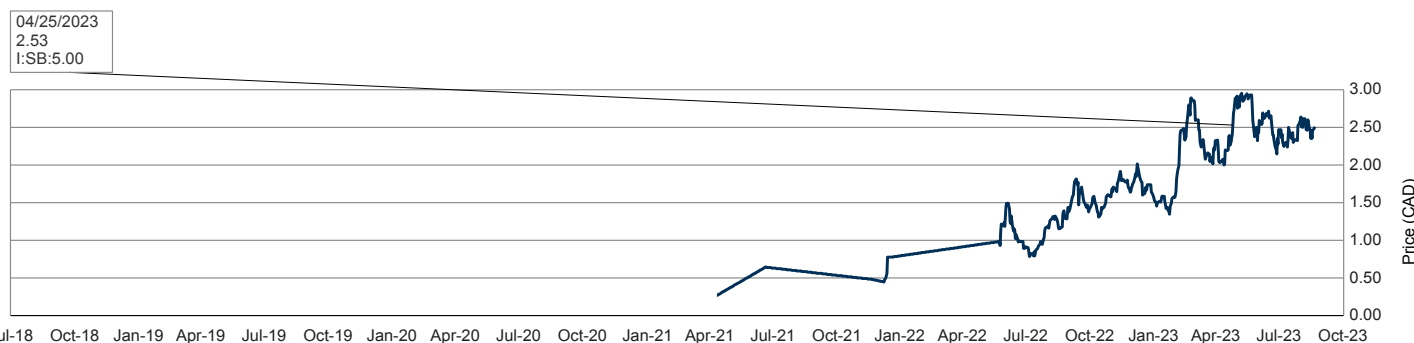
Lithium Americas Corp. (LAC) as of August 21, 2023 (in USD)



*Represents the value(s) that changed.
 Buy=B; Speculative Buy=SB; Hold=H; Sell=S; Discontinued=D; Suspended=SU; Initiation=I

For a price chart with our ratings and target price changes for LAC go to <http://stifel2.bluematrix.com/sellside/Disclosures.action?ticker=LAC>

Lithium Ionic Corp (LTH CN) as of August 21, 2023 (in CAD)



*Represents the value(s) that changed.
 Buy=B; Speculative Buy=SB; Hold=H; Sell=S; Discontinued=D; Suspended=SU; Initiation=I

For a price chart with our ratings and target price changes for LTH CN go to <http://stifel2.bluematrix.com/sellside/Disclosures.action?ticker=LTH CN>

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¹ This rating is only utilized by Stifel Canada.

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