Following the Nouveau Monde Highway to Battery Graphite

written by InvestorNews | August 16, 2023

I have some recurring themes that I tend to write about. I have no idea if people like them or not so I will continue along in my own little vacuum and hope that at least some readers out there find the same things interesting that I do.

One of those themes I like to revisit is clean, sustainable resource acquisition. By that I mean, we can't just pillage the earth for all the critical battery metals we require simply because it's a means to an end...well, we can, and currently we do. But I feel that at some point in time, there will be as much scrutiny on how we source these materials as there is on phasing out fossil fuels and reducing overall carbon emissions. At least I'd like to think that's the case, but who knows if policymakers will take that next step. To me, it seems the end goal of a greener economy is kind of pointless if we don't look at the whole picture.

Bottom line, in my opinion, we need to be just as concerned about where and how we are acquiring all the copious amounts of raw materials required to transition to a cleaner, greener future or we're simply trading in one problem for another. Whether companies are recognized for this today, or not for some time to come, I strongly believe they will eventually be rewarded.

That brings me to <u>Nouveau Monde Graphite Inc.</u> (NYSE: NMG | TSXV: NOU), a Québec-based company striving to become a key contributor to the sustainable energy revolution. The Company is working towards developing a fully integrated source of carbonneutral battery anode material in Québec, Canada for the lithium-ion battery and fuel cell markets, and other value-added graphite products. With excellent ESG standards, the Company aspires to become a strategic supplier to the world's leading battery and auto manufacturers, providing high-performing and reliable advanced materials while promoting sustainability and supply chain traceability.

The Company's activities are focused on the planned <u>Matawinie</u> <u>graphite mine</u> and the planned commercial value-added <u>Bécancour</u> <u>Battery Materials Plant</u>, both of which are progressing concurrently toward commercial operations.

The Matawinie graphite property, owned 100% by the Company, consists of 246 mining claims spanning 13,214 hectares, located around 120 km north of Montréal, Québec. An updated feasibility study for this property indicates an annual processing rate of 2.55 million metric tonnes and average annual graphite production of 103,328 metric tonnes. In 2018, the Company began operating a demonstration plant in Saint-Michel-des-Saints to validate the quality and processes of its graphite products, and to serve as a foundation for its Phase-2 battery material plants. Nouveau Monde has initiated steps towards making the Matawinie Mine one of the first all-electric open-pit operations globally, working in collaboration with Caterpillar and governments to achieve electrification in mining and aiming to reduce over 300,000 tonnes of CO2 emissions over the mine's lifespan.

At the same time, Nouveau Monde is progressing with its Battery Material Plant Project, producing spherical graphite at its Phase-1 facility, and leveraging a proprietary thermochemical purification process to yield graphite with purity levels surpassing 99.95%. The Company has a partnership with Olin Corporation for operational support and raw material supply, and has set up pilot plant purification modules at Olin's Bécancour, Québec facility. Nouveau Monde owns land in Bécancour to build its own manufacturing plant, projected to produce approximately 46,000 tpa of advanced graphite materials. This is further strengthened by the Québec Government's battery hub strategy, which has attracted significant industrial players to the area. The Company's current commercial plans for its Phase-2 Bécancour Battery Material Plant are being advanced in line with a recent Feasibility Study.

Nouveau Monde's latest quarterly operational update provides valuable insights into the progress being made on both fronts. The Company announced significant advancements in the development of its fully integrated value chain, with the aim of becoming one of the largest natural graphite sources in North America. As the company approaches its Phase-2 development, emphasis is being placed on securing optimal multiyear sales agreements, finalizing technical parameters for the Bécancour Battery Material Plant, enhancing commercial visibility, and ensuring long-term shareholder value. Collaborative testing is ongoing at the Company's Phase-1 plants alongside potential customers, aiming to optimize process efficiency, inform Phase-2 facility plans, and mitigate risks. Significant partnerships have been established, including a technology collaboration with Caterpillar and a potential long-term agreement with Panasonic Energy. The Company secured US\$22 million in a bought deal financing in April to finish Q2 with a cash position of C\$59.8 million, while continuing to engage with governmental agencies to optimize project financing.

Despite a slower start to EV sales in 2023, the market saw a 36% YoY increase with further growth expected in the latter part of 2023. Benchmark Mineral Intelligence forecasts the global production capacity of lithium-ion batteries to reach 8,930 GWh by 2030, suggesting a significant growth in demand for battery materials, including graphite. Nouveau Monde's comprehensive production model and strategic advantages, such as carbonneutrality and regional benefits, place the company in a favorable position to cater to Western markets looking to decrease dependence on Chinese suppliers. It's not just enough to supply a critical material anymore, it needs to be done sustainably.

Nouveau Monde Graphite Inc. trades at a market cap of C\$235 million.

Lithium Prices Recover as China EV Sales Rebound Reigniting Investor Interest in Albemarle & Tesla

written by Matt Bohlsen | August 16, 2023

The first quarter in 2023 was a rough period for lithium stocks as the China lithium carbonate spot price crashed lower. However, the second quarter is looking a lot better.

FIGURE 1: China lithium carbonate spot prices appear to be rebounding after hitting a low in late April 2023



Global and China EV sales recovered strongly in March and April 2023

March 2023 global plugin electric car sales were <u>over the 1</u> <u>million mark</u> and were the 'second best month ever'. This was due to very strong sales in China and Europe, with the USA also contributing. It is already looking like the panic sell-off in lithium stocks has been overdone with stocks rebounding higher in the past 3 weeks.

Reports have it that Chinese lithium consumers are buying again after running down inventories in Q1/2023. Certainly, China plugin electric car sales have rebounded very strongly with over 500,000 sales in March and approximately 600,000 in April 2023. Those sales numbers are a huge increase over China's January sales which fell 8% Year-over-Year to <u>343,000</u> as new energy vehicle ("NEV") subsidies expired.

Lithium stocks rallying again

Strong EV sales in China are leading to early signs of a China lithium price recovery. Lithium contract prices remain much higher than spot prices reflecting the past lithium price rise and the strong outlook for lithium demand in 2023 and beyond.

As shown on the chart below, February, March, and April saw the leading lithium stocks (Albemarle Corporation (NYSE: ALB), Sociedad Química y Minera de Chile S.A. (NYSE: SQM), Livent Corporation (NYSE: LTHM), and Pilbara Minerals Limited (ASX: PLS)) follow spot prices lower; however, in May we can see a potential price recovery starting (green arrow in chart below).

FIGURE 2: Leading lithium stocks have been moving higher in May buoyed by improving EV sales and lithium prices (NYSE: ALB, NYSE: SQM, NYSE: LTHM, ASX: PLS)



Albemarle remains very positive on the lithium market with takeover offers and expansion plans

During the lithium price collapse of early 2023, Albemarle was

moving in the opposite direction as it made several key announcements that indicated its strong belief that the lithium market would rebound. Below is a brief summary:

- March 27, 2023 Albemarle <u>announced a takeover offer for</u> <u>Liontown Resources at a 69% premium</u> to the 30-day VWAP.
- May 3, 2023 Albemarle <u>announced plans to double lithium</u> <u>hydroxide output in Australia</u>, effectively adding 50,000 tonnes per year of lithium refining capacity at their Kemerton plant.

Furthermore, Albemarle announced on May 3, a <u>net sales increase</u> <u>of 129% for Q1/2023</u>. Albemarle CEO Kent Masters <u>commented</u>:

"Compared to last year, first quarter net sales more than doubled, adjusted diluted earnings per share more than quadrupled providing a robust start to the year. ... We see strong sales volume growth for the rest of the year but have modified our guidance to reflect softening lithium market pricing. We remain confident in the underlying market strength of our world-class asset base and our long-term growth strategy."

Albemarle knows the lithium market better than most, especially given it has been the industry leader for over a decade. Currently, they have numerous expansion plans globally including:

- The Salar Yield Improvement Project in Chile;
- The above-mentioned Kemerton trains III & IV lithium hydroxide production expansion in Australia;
- An under-construction lithium conversion facility in Meishan China; and,

 The Kings Mountain mine development in the USA that will eventually feed their planned new South Carolina lithium processing facility.

Added to these items is the attempted takeover of <u>Liontown</u> <u>Resources Limited</u> (ASX: LTR) for A\$2.50 or US\$1.66 per share in cash, which values Liontown at A\$5.2 billion or US\$3.4 billion on an enterprise basis, at the time of the offer.

Both Bank of America and Scotiabank have recently upgraded Albemarle. The latter assigned a US price target, which is well above the current price of US\$195 at the time of writing.

Closing remarks

Several negative events in early 2023 caused a dramatic fall in China spot lithium carbonate prices. The lithium price had increased over 10x and was due for a fall, with Q1 typically being a weak quarter due to seasonal impacts causing lower EV sales.

Discussions about sodium-ion batteries did not help either. As it turns out, market participants are now realizing that lithium demand is still very strong, despite some short-term volatility. Sodium-ion batteries, at best, will have limited use cases in energy storage, and cheap, small EVs, mostly sold in China, due to inferior volumetric energy density.

For investors, the recent market dip in lithium stocks may prove to be a good time to go shopping. The long-term demand wave for lithium is a supercycle with 2037 demand forecast to be <u>35x</u> <u>higher</u> (according to <u>Trend Investing</u>) than 2020 levels.

Certainly, Albemarle, the lithium leader, remains extremely bullish on the lithium sector with a multi-billion dollar takeover offer and expansion plans. The EV and stationary energy storage booms are here and will only grow stronger this decade. The <u>Tesla Inc.</u> (NASDAQ: TSLA) <u>Master Plan 3</u> reports that we need 240 TWh (240,000 GWh) of energy storage for the world to run on 100% renewable energy, most from lithium-ion batteries. Given global lithium-ion battery production in 2022 was only about 700 GWh you can draw your own conclusions. Albemarle and Tesla already have shown us what they think. The latter is <u>breaking ground on a new billiondollar lithium refinery</u> in Texas this week.

Lithium Royalty's Lithiumfocused Royalty Portfolio of Sustainable and ESG "Friendly" Projects

written by InvestorNews | August 16, 2023

In <u>late February</u>, I opined that perhaps we had seen a near-term top for the price of lithium. Hindsight suggests that was a pretty good call. However, that was more of a short-term trading view on lithium as opposed to an overall investing view.

Generally speaking, I still believe that the overall lithium market is reasonably bullish over the next several years barring some sort of technological breakthrough that obsoletes the lithium battery.

In fact, if you believe what the <u>IEA published</u> on lithium (along with other critical minerals), you'd be very bullish based on

the IEA view that the lithium market will see a 33% compound annual growth rate ("CAGR") for the next decade.

Another stat that puts future lithium demand into perspective is the fact that Tesla is targeting the manufacture of 20 million electric vehicles ("EVs") per year by 2030 and in order to produce that many vehicles in a year, Tesla would need more lithium than was produced in the world in 2021.

Assuming lithium prices have now stabilized or perhaps even bottomed before another move higher, the question becomes how best to play lithium going forward.

Lithium Royalty Corp. overview

One option to get more broad-based exposure to the market is the newly listed <u>Lithium Royalty Corp.</u> (TSX: LIRC).

Lithium Royalty is a lithium-focused royalty company with a globally diversified portfolio of 30 high-grade revenue royalties on mineral properties around the world that supply, or are expected to supply, raw materials to support the electrification of transportation and decarbonization of the global economy.

The Company's portfolio is focused on high-grade and low-cost mineral projects that are primarily located in Australia, Canada, South America, and the United States. Lithium Royalty is a signatory to the United Nations Principles for Responsible Investment.

There are two key takeaways from that corporate description.

 First off, they have focused on "friendly", stable jurisdictions with 46% (based on acquisition costs) of their projects in North America, 62% comprise OECD nations, and no Russian, Chinese, or African asset exposure. Their non-OECD assets are primarily in Brazil and Argentina, which are both stable enough at present.

 Secondly, the integration of ESG factors and sustainable mining are important considerations in Lithium Royalty's investment analysis and royalty acquisitions. This includes a focus on the use of renewable power in extraction and processing; infrastructure benefits to remote communities; environmental and economic impact on local communities; water use; surface disruption and remediation plans as well as tailings management.

I've noted as recently as <u>last week</u> that I strongly believe a premium will start to be placed on sustainable miners with responsibly sourced materials and a low-carbon footprint. Lithium Royalty definitely ticks that box.

Royalty portfolio and upside potential

But ultimately it comes down to whether you can also make money while being responsible. The royalty that excites me the most at present in the Company's portfolio is one that has just transitioned from construction to production.

In all Lithium Royalty now has 3 producing royalties but their 90% interest in a 1.0% Net Smelter Royalty (NSR) in <u>SIGMA</u> <u>Lithium Corporation</u>'s (NASDAQ: SGML | TSXV: SGML) Grota do Cirilo project is about to start generating returns with its inaugural shipment of approximately 15,000 tonnes of spodumene concentrate in May 2023. Sigma is now focused on ramping up to full production capacity for Phase 1 of the project, which is expected by July 2023.

Other assets currently generating income for the company are both in Australia, including <u>Allkem Limited</u>'s (ASX: AKE | TSX:

AKE) Mt. Cattlin project with a royalty of A\$1.50 per tonne of ore mined and <u>Core Lithium Limited</u>'s (ASX: CXO) Finniss mine where the Company expects to receive its first royalty payment for its 2.5% Gross Overriding Royalty (GOR) as a result of Q1/2023 sales.

In total, Lithium Royalty has 30 royalties in its portfolio, of which 29 are summarized in the slide below. Additionally, the acquisition pipeline currently has 10 additional royalty targets with the opportunity to deploy over US\$130 million of new capital.

FIGURE 1: Lithium Royalty's Current Portfolio of Royalities

Current Royalty Portfolio

	Operator	LRC Royalty	Assot					
			Name	Country	Туре	Product	Stage	Report
	-11	(26)	100 AUG			C		
1	Alkem	A\$1.5/t Treated	Mt. Cattlin	Australia	Hard Rock	Spodumene	Production	FS
2	Core Lithium	2.50% GOR'	Finniss	Australia	Hard Rock	Spodumene	Production	DFS
3	Sigma Lithium	1.00% NSR ²	Grota do Cirilo	Brazil	Hard Rock	Spodumene	Construction	FS
4	Zijin Mining	1.00% GOR ²	Tres Quebradas	Argentina	Brine	Carbonate	Construction	FS
5	Ganfeng	0.50% NSR ²	Mariana	Argentina	Brine	Chloride / Carbonate	Construction	PEA
6	Sinova Global ³	8.00% - 4.00% GOR4	Horse Creek	Canada	Silica Quartz	Silica Quartz	Construction	FS
7.	Sayona Mining	2.50% - 1.50% GOR ^{5.6}	Moblan	Canada	Hard Rock	Spodumene	Development	1
8	Sayona Mining	2.00% NSR	Tansim	Canada	Hard Rock	Spodumene	Development	IGR
9	Euro Lithium	Various'	Valjevo	Serbia	Clay	Carbonate / Boric Acid	Development	PEA
8 11	Winsome Resources	4.00% GOR [®] & 1.00% NSR	Cancet	Canada	Hard Rock	Spodumene	Development	IGR
8 13	Winsome Resources	4.00% GOR [®] & 2.00% NSR	Adina	Canada	Hard Rock	Spodumene	Development	IGR
14	Winsome Resources	4.00% GOR	Sirmac-Clapier	Canada	Hard Rock	Spodumene	Development	IGR
15	Grid Metals	2.00% GOR	Donner Lake	Canada	Hard Rock	Spodumene	Development	-10
16	Grid Metals	2.00% GOR	Campus Creek	Canada	Hard Rock	Spodumene	Development	
17	Lithium Springs	1.50% GOR	Lithium Springs	Australia	Hard Rock	Spodumene	Development	1
18	Noram Lithium	1.00% GOR	Zeus	United States	Clay	Carbonate	Development	PEA
19	Bradda Head	2.00% GOR	Basin E & W / Wikieup	United States	Clay	Hydroxide	Development	MRE
20	ACME Lithium	2.00% GOR	Shatford Lake / Cat-Euclid Lake	Canada	Hard Rock	Spodumene	Development	
21	Red Dirt	1.00% GOR	Yinnetharra	Australia	Hard Rock	Spodumene	Development	
22	Morella	1.50% GOR	Mallina	Australia	Hard Rock	Spodumene	Development	
23	Morella	1.25% GOR	Tabba Tabba	Australia	Hard Rock	Spodumene	Development	
24	Morella	1.25% GOR ⁸	Mt Edon	Australia	Hard Rock	Spodumene	Development	±2
25	Green Technology	1.00% GOR	Seymour Lake	Canada	Hard Rock	Spodumene	Development	MRE
26	Green Technology	1.00% GOR	Root Lake	Canada	Hard Rock	Spodumene	Development	
27	Green Technology	1.00% GOR	Wisa Lake	Canada	Hard Rock	Spodumene	Development	-
28	Larvotto	1.00% GOR	Eyre	Australia	Hard Rock	Spodumene	Development	
29	Arvo Lithium	1.25% GOR	Kaustinen / Ilmajoki	Finland	Hard Rock	Spodumene	Development	
	nitially assessed at 2.115% of gr ocur no later than June 2023, ti Vitus Minerals Corporation has a Not production at the Horse Cr Off of a solution of the Horse Cr	oss revenues. Once Core Uthium achieves o he royalty rate will increase to 2.5% a 10% indirect interest in this royalty eek quary took place in the third quarter of a 5.55% of 0.00	ertain milestones and LRC makes a contingent pe 2021. Commercial production is anticipated to co	yment, each of which is anticipat ammence in 2023	ed to FS - Feasibility Study DFS - Definitive Feas	PEA - Preliminary Ec	onomic Assessment Geologist's Report	MRE - Mineral Resource Estin

Source: Lithium Royalty Corporate Presentation

Final thoughts

Given the Company just reorganized into the publicly traded entity we have today, my numbers could be a little off. My math suggests the Company finished 2022 with US\$35 million in cash, raised a net amount of C\$100 million as part of the go-public transaction, and acquired its 30th royalty position (not included in the above table) for US\$1.8 million. Using today's exchange rate that puts cash available to pursue additional royalties at roughly US\$108 million.

There are currently just over 55 million shares outstanding which puts Lithium Royalty's market cap at C\$818 million (US\$604 million).

Chile's Plan to Nationalize its Lithium Industry Could Impact These 5 Companies

written by InvestorNews | August 16, 2023

In a television address on Thursday evening, Chile's president Gabriel Boric announced plans to nationalize the country's lithium industry, with massive implications for the booming lithium industry.

The left-wing former student leader set out his government's strategy for developing the huge lithium resources, including the creation of a state-owned National Lithium Company to lead the sector and partner with companies to develop the lithium projects but with state control.

The prospect of state intervention in natural resources would normally send investors running for the exit. Could this time be different? Under Cold War-era rules, lithium production in Chile is strictly controlled with only two companies, Albemarle (NYSE: ALB) and SQM (NYSE: SQM), entering production in the last four decades.

To break the deadlock, the National Lithium Company would be empowered to form joint ventures with private investors to develop lithium production in the salt flats that dot the Andean Mountains.

State-owned copper producer Codelco, one of the largest copper producers in the world, will lead the transition until the new National Lithium Company can be set up. President Boric's plan still needs to be approved by Chile's National Congress which is expected to be debated later this year.

This announcement follows Mexico's <u>legislation last year</u> to ban private and non-Mexican lithium mining and processing activities and restrict all future projects to state-run companies, and the <u>recent discussions</u> amongst leaders in Argentina, Chile, Bolivia, and Brazil to form an OPEC-like cartel for the lithium industry.

According to the USGS, Chile was the second largest lithium producer in 2022, behind Australia, with China third, Argentina a distant fourth, and Brazil fifth. Chile has the largest lithium reserves, while Bolivia and Argentina have the largest overall resources.

Here are some of the firms operating in Chile that could be impacted:

<u>Albemarle Corporation</u> (NYSE: ALB)

 ALB is a global leader in engineered specialty chemicals. The company produces lithium, bromine, and catalysts for various industries, such as electric vehicles, flame retardants, and oil refining.

- The company has operations in Chile, where it extracts lithium from brine deposits in the Salar de Atacama, and an existing joint venture with Codelco to explore and develop new lithium resources in the country.
- ALB has a market capitalization of over US\$24 billion and employs about 5,600 people and serves customers in 100 countries.

<u>CleanTech Lithium Plc</u> (AIM: CTL)

- CLT owns claims on three Chilean salt flats, the largest of which – Laguna Verde – is estimated to contain 1.5 million tonnes of lithium carbonate equivalent ("LCE").
- Using Direct Lithium Extraction technology, which avoids the need for large and wasteful evaporation pools, the company plans to build an operation that could produce around 20,000 tonnes annually LCE by 2025.
- CLT has a market capitalization of approximately £60 million.

Lithium Power International Limited (ASX: LPI)

- LPI controls one of the most advanced private lithium projects in Chile. With an environmental license and export permits already in place, it is already in talks with financiers to fund its US\$626 million Blanco project on the Salar de Maricunga which could produce around 20,000 million tonnes annually of lithium carbonate over 15 years.
- The company now expects the government to name the project as the country's newest lithium project through a

partnership with the state.

• Its market capitalization is approximately A\$167 million.

Sociedad Química y Minera de Chile S.A. ("SQM") (NYSE: SQM)

- SQM is today the world's largest producer of lithium and ramped up production from the claims it rents on the Salar de Atacama to keep up with booming demand. But it has said future investments are conditional on reaching a new agreement with economic development agency CORFO, which owns the claims, on its rental contract which expires in 2030. So far, these talks have got nowhere.
- But investment bank JP Morgan thinks the announcement of a new policy could be positive for the firm by facilitating a new deal with CORFO while the creation of the new national lithium company, which requires the approval of Congress where the government lacks a majority, could take several years.
- SQM has a market capitalization of over US\$22 billion and employs about 7,000 people in 110 countries.

<u>Wealth Minerals Ltd.</u> (TSXV: WML)

- WML owns mineral claims on the southern part of the Salar de Atacama which today accounts for around a third of global lithium production and 15% of known lithium reserves.
- The salt flat boasts lithium grades of more than 1,800 micrograms per liter ("mg/l"), compared to 1,250 mg/l and just 740 mg/l in Salar de Hombre Muerto in northwest Argentina where Livent Corporation (NYSE: LTHM) operates

its main lithium operation.

 WML has a market capitalization of approximately C\$110 million.



Figure 1: South America's Lithium Triangle

Source: eResearch Corp.

Mixed Signals for the Lithium Market as China Spot Prices Decline but M&A Paints a Bullish Picture

written by Matt Bohlsen | August 16, 2023 So far in 2023, the lithium sector is a mix of good news and bad news.

The bad news relates to the China lithium carbonate spot price collapsing, now down ~65% (see chart below) from its crazy high of CNY 600,000/t (US\$87,272/t) in late 2022. Contract prices remain strong and lithium hydroxide (~US40,000/t) and spodumene (US\$3,810/t) spot prices have been less impacted, but have still fallen about 1/3 to 1/2 from their recent highs.

The good news relates to the fact that the leading lithium companies and <u>most analysts</u> remain very bullish on lithium in the mid to long term. We saw this very recently with <u>Albemarle Corporation</u>'s (NYSE: ALB) A\$5.2 billion (US\$3.4 billion) takeover offer, at a 69% premium, for <u>Liontown Resources Limited</u> (ASX: LTR). Little wonder investors seem confused. Is the lithium boom over, or is it just getting started?

China lithium carbonate spot price collapsing

As shown in the chart below, the China lithium carbonate spot price had a meteoric rise in 2022 and is now collapsing in 2023. The main reasons for the downturn in price are a slowdown in China's new energy vehicle ("NEV") sales growth in 2023 and the Chinese cathode and battery suppliers running down inventory thereby delaying lithium purchases in order to get a lower price. Also, liquidity in the China spot market has been rather low in Q1/2023.

China NEV sales in January 2023 saw <u>an 8% year-over-year ("YoY")</u> <u>fall</u>, due to the China federal NEV subsidies ending, Covid-19 impacts, and the Chinese New Year falling in January. February saw China NEV sales recover and <u>rise by 56% YoY</u>, and March saw sales <u>rise by 34.8% YoY</u>. As a result, in Q1/2023, China saw NEV sales <u>rise 26.1% YoY</u> and reach a total of nearly <u>1.59 million</u> units. The first quarter is always the slowest month for NEV sales in China, so the seasonal slowdown from Q4/2022 to Q1/2023 was also a significant factor.

The Q1/2023 26.1% growth is not bad considering the poor January; however to keep the lithium market in balance between supply and demand, Trend Investing forecasts we need global plugin electric car growth to be at 36% YoY. In other words, China's NEV sales growth rate in Q1/2023 of 26.1% is lagging below the 36% global growth rate needed in 2023.

China lithium carbonate spot price – 5-year chart



<u>Source</u>: Trading Economics

Albemarle's A\$5.2 billion (US\$3.4 billion) takeover offer for Liontown Resources

If we are in a lithium bear market, why is the lithium leader, Albemarle, offering to buy Liontown Resources at a <u>69% premium</u> to its 30-day volume weighted average price ("VWAP")? And willing to outlay A\$5.2 billion (US\$3.4 billion)?

The short answer is that Albemarle sees the longer-term picture, that is lithium demand is set to grow $\sim 35x$ from 2020 to 2037 according to Trend Investing, or <u>13-42x</u> from 2020 to 2040 according to the IEA.

Also, the fact that tier 1 lithium assets are rare. Liontown Resources 100% owned Kathleen Valley Project is a tier 1 global resource, one of the top 5 largest lithium spodumene resources globally. The resource estimate is a massive <u>156MT @ 1.4% Li20</u>. The project is at the advanced stage with production set to begin in <u>mid-2024</u> and initially ramp up to about 600,000 tonnes per annum ("tpa") of spodumene.

Albemarle is playing the long game and understands the lithium market better than most. They want to secure another tier 1 long-life mine in Australia just as they did when they bought Rockwood Holdings Inc. (former owner of the <u>Greenbushes Mine</u>) for <u>US\$6.2 billion</u> in 2014. The reason then was "to capture the upside potential from the electrification of automobiles that's likely to occur over the next several years". The reason to buy Liontown Resources is the same today.

Lithium demand should surge in 2024 and 2025 as new EV segments hit the market

The second half of 2023 should see the Cybertruck from Tesla (Nasdaq: TSLA) finally begin production and a <u>rapid ramp-up in</u> 2024. We will also see in 2024 a strong ramp-up in sales of other pickup trucks in the USA from Ford, GM, Ram (Stellantis), and others. With reportedly <u>over 1.6 million reservations</u> for Tesla Cybertruck and a battery size twice that of a Model 3 RWD, the Cybertruck alone will cause a bump in lithium demand.

Then in late 2024 or 2025, we should see Tesla potentially start production of their compact car, with plans 'reportedly' to produce 4 million per year. BYD is already producing great value compact cars (Dolphin, Seagull, etc) in China at very affordable prices well under US20,000. BYD plans to sell "at least 3 million" plugin electric cars in 2023. It looks like by 2025, Tesla and BYD alone could be selling 10 million electric cars per year combined, which would be almost the same as the entire market in 2022 of 10.522 million. That's how fast things are changing! Global electric car sales are forecast to almost double in just 2 years from 10.5 million in 2022 to ~20 million in 2024, according to Trend Investing.

The limiting factor for auto OEMs will be securing batteries and their limiting factor is lithium.

Electric pickup trucks will soon be as popular as Tesla Model 3 in the USA, after that will be millions of compact electric cars potentially in 2025



Source: <u>iStock</u>

Closing remarks

So far in 2023, it has been a year of contradictions in the lithium market. Collapsing China spot lithium carbonate price paints a bearish picture, yet a multi-billion dollar takeover offer at a 69% premium price paints a bullish picture.

The conclusion is rather simple. Short-term lithium price action is a result of a China Q1/2023 NEV slowdown in growth, just as a wave of new lithium supply is hitting the markets. Chinese cathode and battery makers winding down inventory has helped them achieve lower pricing, but cannot go on too much longer. New emissions rules in China come into effect from July 1, 2023 which should boost NEV sales. Combined with strong demand from the USA boosted by the IRA incentives, and Europe embracing EVs, means that H2, 2023 should start to see some strong recovery in global EV sales and hence lithium prices. This assumes we are not in a severe global recession by then.

Looking out to the rest of the decade and it continues to look like lithium supply is the limiting factor for the EV boom, which means quality lithium miners should be the long term winners. But remember as is usual in the mining sector, expect to see large price swings up and down, even in a lithium supercycle.

Lithium Prices Soar as Demand Surges Amid EV Boom, But Is the Bull Run Sustainable?

written by InvestorNews | August 16, 2023 Most commodities are cyclical in nature. The ebb and flow of demand, potentially from a new application or general growth, which in turn makes the supply of that commodity scarce can cause prices to rise, sometimes dramatically. This is followed by a supply response that typically is too effective (because everyone wants to partake in the high commodity price) and eventually, the demand is outstripped by supply, commodity prices in turn fall or outright collapse and the cycle repeats. In the case of lithium, we've been seeing demand surge as the electric vehicle (EV) revolution accelerates while the everincreasing supply is failing to keep pace. There are lithium headlines in the news all the time now, with the likes of <u>General Motors Co.</u> (NYSE: GM) and <u>Tesla, Inc.</u> (NASDAQ: TSLA) inking supply deals with producers or the speculation of deals. It would appear we are in the heart of a bull market for lithium...or are we?

Lithium Boom - 1950s

This isn't the first lithium boom the world has seen. You may be surprised to learn that the first one began in the 1950s when the world's primary source of lithium came from North Carolina. Lithium was extracted from spodumene (hard rock) and was a key component of the military's H-bomb program. As a reference point, by the mid-1970s U.S. lithium production was roughly 2,900 tons per year. (1 US ton = 0.97 metric tonne)

Lithium Boom - 1990s

Lithium's next rally occurred in the early 1990s when Sony first began production of the lithium-ion battery used in consumer electronics. By the end of 1991, Sony had ramped up production to 100,000 batteries a month. Enter Sociedad Química y Minera de Chile S.A., or SQM, the Chilean fertilizer and mining company which began selling lithium (from brine) in late 1996, almost immediately lithium carbonate prices fell by a third, to US\$2,000 a ton. This marked the end of the existing American lithium industry.

Current Lithium Production By Country

(2021)

Rank	Country	2021 Production (tonnes)	% of Total
#1	Australia 🎟	55,416	52%
#2	Chile 🏎	26,000	25%
#3	China 📟	14,000	13%
#4	Argentina 🕮	5,967	6%
#5	Brazil 🕅	1,500	1%
#6	Zimbabwe 🗯	1,200	1%
#7	Portugal 🖾	900	1%
#8	United States 📶	900	1%
	Rest of World 🕥	102	0.1%
	Total	105,984	100%

Source: World Economic Forum

Lithium Boom - Today!

Fast forward to today and in November we saw lithium prices surge above US\$80,000/tonne in a sign that supply was definitely not keeping pace with the huge increase in demand sparked by EVs. You have wildly <u>bullish forecasts</u> suggesting supply needs to grow somewhere between 150,000 to 200,000 tonnes every single year.

For more perspective, consider that Tesla is targeting the manufacture of 20 million EVs per year by 2030. In order to produce those vehicles in a year, Tesla will need more lithium than was produced in the world last year, which could explain why the market was all excited when <u>Bloomberg reported</u> Tesla has been discussing a possible bid for <u>Sigma Lithium</u> <u>Corporation</u> (TSXV: SGML | NASDAQ: SGML).

And speaking of Sigma Lithium, have a look at their 2 year chart!



Source: <u>StockCharts.com</u>

Investors should be very happy with a 10x move in just under 2 years. There have also been some pretty good runs for some of the Canadian hard rock lithium names. A quick look at the oneyear chart for Critical Elements Lithium Corporation (TSXV: CRE | OTCQX: CRECF) and Patriot Battery Metals (TSXV: PMET | OTCQX: PMETF) and you'll see a double and another 10 bagger. It suggests that we may not be in the early innings of this game.

When all this starts to become prevalent in the news cycle, I start to get a little concerned. It's almost like fanatic optimism is a harbinger that the cycle is about to end. I know that isn't very scientific, but let's look a little closer at what I'm getting at. Capital solves problems. With the lithium price at current levels, lithium mines are some of the most profitable in the whole mining sector. One could surmise that supply might respond more rapidly than currently forecast with lots of capital being thrown at exploration and development at present. I wouldn't be surprised if Investment Bankers are coldcalling anyone involved with lithium right now to see if they would like to raise capital. On top of that, when you have the likes of Tesla, GM, etc. buying into producers it tends to stretch valuations beyond anything that would otherwise seem reasonable. M&A, especially by companies not actually in the mining business, can often be considered a sign that we are getting close to a top. Again, not scientific by any stretch of the imagination but it also typically isn't sustainable behaviour.

Is this a Market Top?

I'm not suggesting lithium is going back to US\$2,000/ton but we have seen the price retreat to just over US\$60,000/tonne largely due to the Chinese market seeing lower subsidies for electrified vehicles and weak consumer confidence. With that said, lithium is still worth eight times more than it was before 2021 and still wildly profitable for both hard rock and brine producers. Is this a sign that the current bull run for lithium prices is over or just taking a breather before it settles into a new price range or perhaps starts to climb again? I guess it depends on your time frame. Traders may want to look at taking a little profit off the table for now, long term buy and hold investors may not even be paying attention to the day-to-day noise in the market and be comfortable holding lithium equities for the foreseeable future.

My caution to anyone wildly bullish on lithium prices and the corresponding mining companies is this — there are a lot of smart capitalists out there and if a component becomes the most expensive part of your product, a lot of effort will be spent to try and find a replacement or an alternative. I also have a nagging concern that at some point in time, the rapid adoption of EVs may overwhelm the electric grid and put a hard stop to EV growth (at least temporarily). Either of these scenarios could have a sudden and very negative impact on lithium prices but not likely in the near future. So when it comes to investing in

lithium, make sure your risk tolerance matches your investment exposure.

Dan Blondal of Nano One Talks about the \$10M Gov't Grant to Accelerate the Cathode Plant Targeting NA Lithium-ion Battery Demand

written by InvestorNews | August 16, 2023 In this InvestorIntel interview, Tracy Weslosky talks to <u>Nano</u> <u>One Materials Corp.</u>'s (TSX: NANO) Founder, CEO, and Director, Dan Blondal about being awarded \$10 million in non-dilutive, non-repayable contributions from Sustainable Development Technology Canada ("SDTC").

Using the funds to fast-track the conversion of its Candiac lithium iron phosphate ("LFP") facility (North America's only LFP plant) to its patented One-Pot process, Dan explains how Nano One is progressing towards securing supply chains for the North American lithium-ion battery ecosystems.

Speaking about Nano One's strategic partnerships with Rio Tinto, BASF, Umicore, CBMM, and undisclosed automotive OEMs, Dan discusses how the Candiac facility will help them accelerate licensing and offtake agreements that would then enable the Company to scale the facility larger and lead to commercial production and revenues.

To access the full InvestorIntel interview, click here

Don't miss other InvestorIntel interviews. Subscribe to the InvestorIntel YouTube channel by <u>clicking here</u>.

About Nano One Materials Corp.

Nano One Materials Corp (Nano One) is a clean technology company with a patented, scalable, and low-carbon intensity industrial process for the low-cost production of high-performance lithiumion battery cathode materials. It employs approximately 120 people at its innovation and commercialization hubs in British Columbia and Québec, including the only LFP plant and production team in North America. It has strategic collaborations and partnerships, that include Rio Tinto, BASF, Umicore, CBMM, and various automotive OEMs.

Nano One's technology is applicable to electric vehicles, energy storage, consumer electronics, and next-generation batteries in the global push for a zero-emission future. Its One-Pot process, its coated single crystal materials, and its Metal to Cathode Active Material (M2CAM®) technologies address fundamental performance needs and supply chain constraints; they also reduce equipment and raw material costs, operating expenses, and carbon intensity; and they eliminate a significant waste stream for a much-improved environmental footprint.

The Company aims to pilot and demonstrate its technology as turn-key CAM production solutions for license, joint venture, and independent production opportunities. This leverages Canadian talent, critical minerals, renewable energy, and a thriving ecosystem with access to large emerging markets in North America, Europe, and the Indo-Pacific region. Nano One has received funding from SDTC and the Government of Canada and the Government of British Columbia.

To learn more about Nano One Materials Corp., click here

Disclaimer: Nano One Materials Corp. is an advertorial member of InvestorIntel Corp.

This interview, which was produced by InvestorIntel Corp., (IIC), does not contain, nor does it purport to contain, a summary of all the material information concerning the "Company" being interviewed. IIC offers no representations or warranties that any of the information contained in this interview is accurate or complete.

This presentation may contain "forward-looking statements" within the meaning of applicable Canadian securities legislation. Forward-looking statements are based on the opinions and assumptions of the management of the Company as of the date made. They are inherently susceptible to uncertainty and other factors that could cause actual events/results to differ materially from these forward-looking statements. Additional risks and uncertainties, including those that the Company does not know about now or that it currently deems immaterial, may also adversely affect the Company's business or any investment therein.

Any projections given are principally intended for use as objectives and are not intended, and should not be taken, as assurances that the projected results will be obtained by the Company. The assumptions used may not prove to be accurate and a potential decline in the Company's financial condition or results of operations may negatively impact the value of its securities. Prospective investors are urged to review the Company's profile on <u>Sedar.com</u> and to carry out independent investigations in order to determine their interest in investing in the Company.

If you have any questions surrounding the content of this interview, please contact us at +1 416 792 8228 and/or email us direct at <u>info@investorintel.com</u>.

Economy of Scale – A Misused Metric in Mining

written by Jack Lifton | August 16, 2023 I was surprised earlier this week to see an article in the Wall Street Journal in which the rule of "economy of scale" was mistakenly used with regard to the output of a mine to predict that the price of lithium would fall as mine output increased. The author did not seem to understand, and his guoted "experts" didn't seem to care, that mines are not organic, they don't continuously renew their ore bodies, nor are concentrations of hard rock minerals uniform, so that such mines have limited useful lifetimes. The concentrations of the minerals first sought out for extraction are always the highest in the deposit, so that as the extraction of the ore continues lower and lower grades are encountered until it becomes uneconomical, at the price then realized for the ore, to continue "mining" it. Economic assessments of the value of the mine describe this metric as the "life of the mine." The enormous cost of setting up a mining and beneficiating (concentrating) operation assumes that it is unlikely that some new and more economical method of beneficiation will be discovered, and be experimented upon and proven effective, during the life of a mine, so that the life of the mine could be extended economically by enabling the economically effective processing of lower grade ores. Mines are designed with "best practices' at the time of the construction. It is not assumed that new technologies will be discovered during the life of the mine that will extend its life.

Yet, on the 23rd oif January, the following sentence appeared in an article about the future supply and price of lithium: "Increasing production, which typically has the effect of reducing unit costs through economies of scale, will likely be the primary source of growth in the industry this year."

Mine production decisions will of course be dependent upon the price of the mineral being mined. Gold mines are typically opened and shut down and then reopened, for example, by the price of gold dropping to less than the cost of extracting it and then bouncing back. Note well that gold is often mined in grades of just a few parts per million, because its value is as much as \$2,000.00/oz or more than \$60/gram.

Lithium, today, is produced from two types of "deposits." One, is hard rock minerals, the best known of which is spodumene and the largest deposits of which are in Australia. The other is from brines typically found in deserts, which may range in "grade" from the 3000+ grams per ton in the vast brine deposits of Chile to, more typically, 300-1000 grams/ton in the more typical desert brines of Chile, Argentina, and Bolivia.

Most of the lithium produced today comes from spodumene mining in Australia. The golden triangle of South American nations contribute less than 40% from their brines due to the enormous costs and time required to dry and process the brine to recover the lithium.

One may ask why are brines, in particular the vast ones in Chile, which have uniform concentration not dominant in the

production of lithium. The answer, always, is cost including the cost of time. The brines must be evaporated in order to bring the lithium concentration to 20,000 parts per million (2 percent), at which concentration they can be processed to selectively recover the lithium. The Wall Street Journal writer would probably ask why not just increase production to lower costs? The answer here is cost, and the cost involved is that of time. It takes 18 months for the brine to be evaporated in the sun (the amounts necessary are simply too vast, one million tons of water must be evaporated to produce 3,000 tons of lithium in Chile's Atacama Desert, for example, to even consider pumping the brines to fossil fuel heated tanks. Note, by contrast, that the production of one million tons of spodumene can recover 60,000 tons of lithium. But again that is an energy and reagent (sulphuric acid at high pressure and temperature) intensive operation, so it is very costly.

I have been told, privately, by the CEO of a large brine operation that his judgement is that lithium production may double by 2025, but that even holding that level of production, economically, depends entirely on the market price of lithium and the price of energy, so that the very high prices of today, a response to the law of supply and demand caused by the lithium industry's inability to keep up with the surging demand for EV and stationary storage batteries, are, as always, the driver of supply. Should the price of lithium drop as precipitously as it has risen, or if the cost of energy rises too much, that part of the lithium supply dependent on high prices will close (at least in the capitalist "free market" economies).

Economy of scale does not apply here. It is an inapplicable metric in mining. Miners always want the prices of minerals to rise, not decline!

Reckless Decisions May Wreck the OEM Automotive Industry

written by Jack Lifton | August 16, 2023 A decision to support alternate non fossil fueled energy technologies, which has been made by ideologically driven politicians reacting to voter polls, flawed models and end-ofthe-world enthusiasts is upending the world's largest manufacturing industry, <u>OEM automotive</u>, and the financializers taking advantage of the turmoil have thrown the retail commodity metals markets into chaos. This cannot end well.

Should we accept the incompetence of those who ignore foreseeable consequences and are "surprised" and call them unintended consequences? Expertise is not just detailed factual knowledge of a subject; it is also the ability to reason out the consequences of ignoring that factual knowledge when planning.

Thus, the global "reserve" of lithium is not the amount of lithium in the earth's crust (so-called "earth abundance, a measure of availability wrongly used by many academics). It is that amount of <u>lithium</u> accessible to us *economically* as defined by current and foreseeable exploration, environmental, and technological capabilities of the mining and refining industries, globally.

You may have noticed that as the necessity for lithium has increased so has its price. Yet, all we hear from the "experts" is that the cost of lithium-ion batteries must and will decline as their use scales upward. The experts tell us that the lithium price increase is only a temporary effect caused by a temporary imbalance between supply and demand. The price, the experts tell us, reflects the high cost of opening new lithium sources, but it, the price, they assure us, will sharply decline when the supply meets the demand. The negative effect that this prediction has upon mining finance, and thus commodity production and supply, seems to have been overlooked by the "experts."

The Chinese domestic economy accounts for 82% of the production of lithium-ion batteries and 60% of the global processing of lithium for all purposes. The price of lithium is thus set by <u>Chinese demand and supply</u>. Mining finance is thus dependent on Chinese industry to value the target product and revenue from a lithium mine and refinery, but the Chinese economy is based on a detailed and well-articulated industrial policy, which prioritizes government goals through subsidies and cheap loans to targeted industries. Thus, Chinese lithium prices are not market-driven, so that dependence upon them for investment planning by non-Chinese institutional investors is extremely risky. It is the same for any commodity under Chinese control.

This year, 2023, we will be told by the experts that any reduction in the lithium price is proof of the rebalancing of supply and demand, but, in fact, it is more likely that it is a move away from lithium as an asset class by financializers souring on commodities and returning their complex trading to the traditional usual "experts traders." Chinese entities and their government are notoriously opaque about production levels, inventories and balance sheets. Mandarin fluent experts make their living by reading Chinese "official" statistics and speculating from those along with fantasizing what's in the minds of Chinese officials who plan and execute industrial policy without any interest whatsoever in the welfare of the non-Chinese world. An oxymoronically named "Intelligence" group of self-described "analysts" has "studied" the situation and has now decreed that 300 new lithium mines will be needed to reach the EV production goals set by (well-named) "green experts" for 2030. Perhaps these "expert analysts" know so little of natural resource economics, mining costs and the staffing of mining companies that they believe that this is possible. It is not. Existing mines have lifetimes. Their output declines with age. New discoveries take decades to bring into production and are limited to lifetime output declines. It will take an enormous outlay of capital to increase annual lithium production much beyond current outputs and an enormous amount of capital to maintain that output. Does this bode well for decreased lithium pricing?

A sharp decrease in lithium pricing will mean not that supply and demand have balanced due to increasing demand but that miners have determined that demand is peaking, or, worse yet, that future demand goals cannot be reached and so that further discovery and development is a waste of shareholder value (I think that ESG was devised and has been adopted by financiers to head off this very issue).

For American durable goods manufacturing companies facing deglobalization, regionalization, and even national re-focusing on supply chains the real question is: Can the EV and magnet industries be vertically integrated within the political unit in which they operate? I'll save the acne-challenged experts the trouble of studying this complex question. The answer is assuredly NO. As usual, the markets will determine who are the winners and losers. The US government, also, as usual, can be counted upon to make uninformed, anti-free market, and poor choices.

Understanding why the Nano One JDA with Umicore is significant in the battery materials world

written by InvestorNews | August 16, 2023 Unfortunately, a publicly traded company can't do much about the timing of news as they are required to disclose material information pretty much immediately. When you put out a press release on December 21st, when everyone is seemingly obsessed with holiday travel issues and winter storm warnings, it can potentially fly under the radar of investors. Pile on a market that was visited by the Grinch for all but one day in the last two weeks (ironically the best day in that period for the S&P 500 was Dec 21) and you can see how there is the potential for a very meaningful piece of news to appear to get lost in the shuffle.

I'm referring to <u>recent news</u> from <u>Nano One Materials Corp.</u> (TSX: NANO) that stated it had entered into a Joint Development Agreement (JDA) for production process technologies for cathode active materials (CAM) for lithium-ion batteries with Umicore.

This is a really big deal for Nano One, but before I explore why that's the case let's look at why I think the market appears to have either missed it or ignored it. Sure the stock rallied almost 8% the day the news came out, but as I noted above, it was a good day for the market overall and many stocks saw substantial gains that day. In the case of Nano One, the volume traded that day was not out of the ordinary, and the share price has subsequently sold off to below where it was trading when this news first came out. More telling (at least to me), is that there isn't a noticeably above average trading volume day since this news. Yes, overall market volume has been below average for the last few days, but if a company puts out material news, somebody will take notice, and it appears (based on trading volume) no one has.

At this point, you might be thinking I'm the one missing the point and perhaps the news isn't as big a deal as I'm making it out to be. I can live with that but I'll let you be the judge as I flesh out what this could mean for Nano One.

Let's start with who the JDA was signed with - Umicore. Belgiumbased Umicore SA is a significant player in the battery materials world, with revenues of $\pounds 2.1$ billion (turnover of $\pounds 13.8$ billion) in the first half of 2022 and currently employs 11,350 people. It is a leading circular materials technology company with an extensive expertise in the fields of material science, chemistry, and metallurgy. Umicore is the largest producer of cathode material outside of Asia, and they are far and away the Western world's largest recycler of technology metals. They are a dominant player in LCO batteries and nickel

rich cathode materials. Canadian readers may recall the <u>July 13th</u> <u>announcement</u> of plans to build a C\$1.5 billion battery supply chain plant near Kingston, Ontario. Additionally, Umicore has a joint venture with Volkswagen AG to build precursor and cathode material production capacities in Europe to supply Volkswagen AG's European battery cell production.

And what could all this mean for Nano One? If the JDA is successful in increasing throughput for high nickel NMC cathode active materials while reducing costs and environmental footprint, we could see Umicore making their cathode materials using Nano One's patented M2CAM® One-Pot process technology. Now you can see why it's important to understand who Umicore is and what they've got going on. This could be huge for Nano One, albeit both the Kingston facility and the Volkswagen joint venture aren't slated to be in production until 2025.

Nevertheless, Nano One is on a roll and continues to make material progress. When I <u>last discussed</u> Nano One in August, I commented on how years of hard work was starting to come together and that momentum was starting to snowball. At the time they had recently acquired 100% of the shares of Johnson Matthey <u>Battery Materials Ltd.</u> located in Candiac, Québec, <u>signing a</u> joint development agreement for lithium-ion battery materials with industry giant BASF, and announced a <u>US\$10 million equity</u> <u>investment</u> by one of the world's largest mining companies, Rio Tinto. This latest deal with Umicore brings further credibility to Nano One and signals that this well funded (almost C\$46 million in working capital), C\$235 million market company appears to be headed in the right direction.