

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

written by Matt Bohlsen | May 10, 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



Source: [Trading Economics](#)

Global and China EV sales recovered

strongly in March and April 2023

March 2023 global plugin electric car sales were [over the 1 million mark](#) 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 [343,000](#) as new energy vehicle ("NEV") subsidies expired.

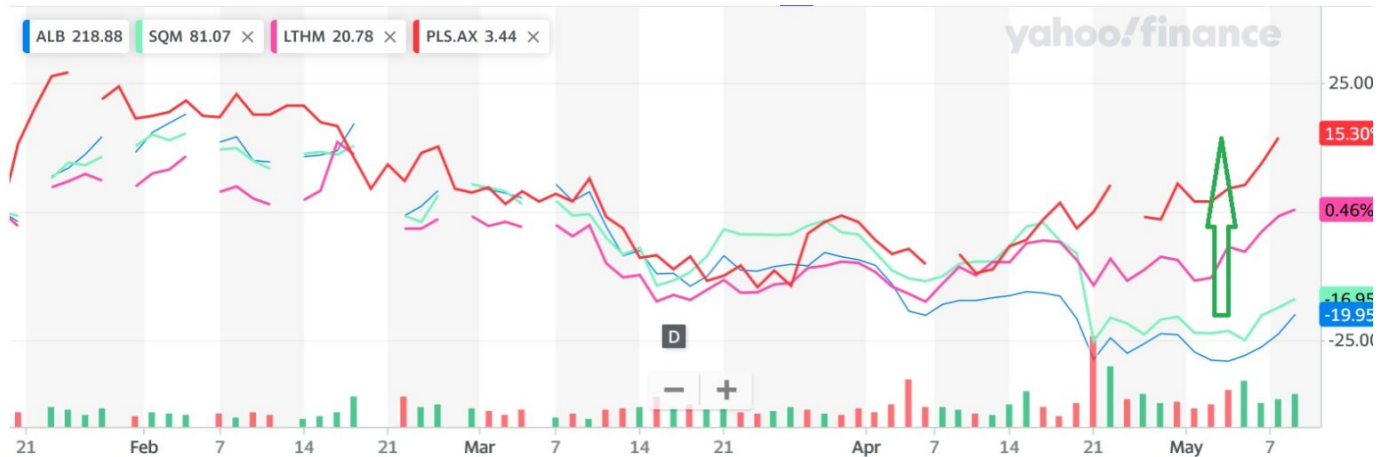
Lithium stocks rallying again

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)



Source: [Yahoo Finance](https://finance.yahoo.com/quote/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](https://www.albemarle.com/) 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 [announced a takeover offer for Liontown Resources at a 69% premium](#) to the 30-day VWAP.
- May 3, 2023 – Albemarle [announced plans to double lithium hydroxide output in Australia](#), effectively adding 50,000 tonnes per year of lithium refining capacity at their Kemerton plant.

Furthermore, Albemarle announced on May 3, a [net sales increase of 129% for Q1/2023](#). Albemarle CEO Kent Masters [commented](#):

“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 [Liontown Resources Limited](#) (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\\$250 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 [35x higher](#) (according to [Trend Investing](#)) 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 [Tesla Inc.](#) (NASDAQ: TSLA) [Master Plan 3](#) 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 [breaking ground on a new billion-dollar lithium refinery](#) in Texas this week.

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

written by InvestorNews | May 10, 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 [legislation last year](#) to ban private and non-Mexican lithium mining and processing activities and restrict all future projects to state-run companies, and the [recent discussions](#) 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:

[Albemarle Corporation](#) (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.

[CleanTech Lithium Plc](#) (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.

Wealth Minerals Ltd. (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.

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

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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 ever-increasing supply is failing to keep pace. There are lithium headlines in the news all the time now, with the likes of [General Motors Co.](#) (NYSE: GM) and [Tesla, Inc.](#) (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 [bullish forecasts](#) 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 [Bloomberg reported](#) Tesla has been discussing a possible bid for [Sigma Lithium Corporation](#) (TSXV: SGML | NASDAQ: SGML).

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



Source: [StockCharts.com](#)

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 one-year 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 cold-calling 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.

Reckless Decisions May Wreck the OEM Automotive Industry

written by Jack Lifton | May 10, 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-of-the-world enthusiasts is upending the world's largest manufacturing industry, [OEM automotive](#), 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 [lithium](#) 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 [Chinese demand and supply](#). 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

sourcing 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 oxymoronic 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.

Electra Battery Materials is leading the 'charge' for battery materials with a signed cobalt supply agreement

written by InvestorNews | May 10, 2023

South Korean LG Energy Solution Inc. (LGES), a leading global manufacturer of lithium-ion batteries for electric vehicles, mobility, IT, and energy storage systems, recently [announced three agreements](#) in a span of 24 hours with Canadian miners to source materials required to make batteries for EVs. It appears the [Inflation Reduction Act](#), which requires that 40% of battery components be sourced from factories in the U.S. or its free trade agreement partners, and that Chinese components and minerals be phased out beginning in 2024, has lit a fire under those who want to lead the charge to manufacture EV batteries for North American built vehicles. This could be a very positive trend for North American miners and material processors/recyclers.

One of the “winners” of the LGES battery supply deals was [Electra Battery Materials Corporation](#) (TSXV: ELBM | NASDAQ: ELBM). Electra is a processor of low-carbon, ethically-sourced battery materials that is currently commissioning North America’s only [cobalt sulfate refinery](#). Electra is executing a multipronged strategy focused on onshoring the electric vehicle supply chain. Keys to its strategy are integrating black mass recycling and nickel sulfate production at Electra’s refinery located north of Toronto, advancing Iron Creek, its cobalt-copper exploration-stage project in the Idaho Cobalt Belt, and expanding cobalt sulfate processing into Bécancour, Quebec. We’ve made several references to the Bécancour area in [previous InvestorIntel articles](#) as it also becomes a rapidly emerging center for producing the advanced materials needed for lithium-ion batteries.

Electra’s binding term sheet with LGES is [a three-year agreement](#) to supply LGES with 7,000 tonnes of battery grade cobalt from 2023 to 2025. Electra will supply 1,000 tonnes of cobalt contained in a cobalt sulfate product in 2023 and a further 3,000 tonnes in each of 2024 and 2025 under an agreed pricing mechanism. Cobalt sulfate provided under the term of the contract with LGES will be sufficient to supply up to 1.5 million full electric vehicles. In addition to the supply agreement, Electra and LGES have agreed to cooperate and explore ways to advance opportunities across North America’s EV supply chain, including, but not limited to, securing of sustainable sources of raw materials. In my opinion, this marks validation of Electra’s cobalt sulfate refinery as this is an actual binding agreement, not just a LOI or MOU or some other wishy washy type of agreement that makes great press but essentially means very little, at least initially.

Building on the momentum of the commercial agreement with LGES, Electra provided a September 28 [update](#) on the commissioning of

its cobalt refinery, confirming that it remains on track to meet project timelines, including the launch of a black mass recycling demonstration. The Company anticipates launching the battery recycling demonstration plant at the Ontario refinery site this fall. Revenue generated from black mass recycling activities will be accretive to results expected from the sale of cobalt sulfate that is anticipated beginning in spring 2023 when the refinery is commissioned. Possibly even more critical to their operations in today's environment, Electra will use a hydrometallurgical process to treat black mass to recover contained lithium, nickel, cobalt, copper and graphite. This process has a low carbon footprint and produces stable non-acid generating tailings, thereby reducing environmental impacts while meeting or exceeding water discharge effluent criteria as stipulated by both federal and provincial regulations.

However, Electra isn't simply a material processor/refiner/recycler, they also have the [Iron Creek Project](#) located within their Idaho property. Iron Creek is one of several cobalt-copper resources and prospects within the Idaho Cobalt Belt, a prospective mineralized system that contains the largest primary resources of cobalt in the United States, according to the U.S. Geological Survey. Last week the Company announced [a new cobalt zone](#) following the receipt of assay results from drilling at its Ruby prospect. The Ruby target is a new zone of cobalt mineralization located approximately 1.5 km southeast of Electra's flagship Iron Creek deposit. This project has the potential to become an important source of cobalt in the U.S. and reduce North America's reliance on foreign supply.

Electra finished Q2/22 with over C\$40 million of cash, has completed 85 percent of all procurement and 90 percent of detailed engineering for its cobalt sulphate refinery, and has a binding cobalt offtake agreement with LG Energy Solution. That

seems like a pretty good combination to successfully move forward in the race to be relevant in the battery materials business in North America. Is the C\$135 million market cap a little rich at the moment? I guess it depends if they are successful at hitting their 5,000 tonnes per annum battery-grade cobalt goal in 2023. With spot prices over US\$50,000/t, that suggests an annual revenue stream of US\$275 million. I guess a lot depends on what kind of margins there are in cobalt refining.

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Nickel 28 Capital focuses on cash-flow positive nickel PNG mine and royalty portfolio that includes Mitsubishi JV

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[Nickel 28 Capital Corp.](#) (TSXV: NKL) is an innovative battery

metals investment vehicle with a focus on metal streaming and royalty agreements. They focus on exposure to metals integral to key technologies of the electric vehicle and energy storage markets. Nickel 28 is led by an experienced team of mining executives and financial professionals under Nickel 28's Chairman, Anthony Milewski, with a track record of value creation in the natural resources sector.

One of the company's main assets is its 8.56% interest in the Ramu Nickel Cobalt Mining Operation, located near Madang on the north coast of Papua New Guinea and operated by the Metallurgical Corporation of China. The company's interest in Ramu increases to 11.3% following repayment of Highlands' attributable Ramu construction and development loans. Nickel 28 recently [announced](#) the second quarter results of the Ramu project. Production at the Ramu Nickel Mine in Papua New Guinea was consistent in the second quarter of 2022, with a production of 8,128 tonnes of contained nickel and 695 tonnes of contained cobalt during the quarter. Nickel sales were also consistent in the second quarter, with 6,624 tonnes of contained nickel sold.

The mine is currently generating substantial free cash flow. The company has repaid all of its operational debt and is now receiving cash flow distributions from the project. Nickel 28 has significant leverage to Nickel and Cobalt prices, which should continue to support strong cash flow generation from the project.

The second quarter looked extremely promising as sales improved due to increased demand for lithium-ion batteries. However, the continued conflict in Ukraine, the continued pandemic's effects, and the suspension of nickel trading on the LME in March, were significant challenges. Ramu has been able to successfully navigate through these challenges due to the consistent and stable production at the company. This level of production has

allowed Ramu to maintain a position of strength in the nickel market despite the challenges that have arisen.

In addition to their main project, Nickel 28 also has a number of royalties. Streams and royalties have some key advantages as commodity investment vehicles. They provide exposure to the resource's underlying earnings and dividends rather than capital costs. This strategy means that they offer investors the potential to participate in both resource growth and production growth. In addition, streams and royalties avoid direct exposure to the many risks associated with commodity production, such as increasing capital, operating, and environmental costs. As a result, they can provide a more stable and predictable return profile for investors.

These royalties are likely to pay off for Nickel 28. [Recently](#), they announced an update on their 2.0% Net Smelter Return royalty from Giga Metal's Turnagain Nickel/Cobalt deposit. This deposit is a world-class nickel-cobalt deposit, and metallurgical test work indicates that a clean concentrate grading 18% nickel and 1% cobalt is achievable using proven technology.

On August 15, 2022, Nickel 28 announced the formation of a joint venture for Giga [with Mitsubishi Corporation](#). This joint venture will investigate the Turnagain Nickel Deposit in British Columbia, Canada, for the potential of nickel and cobalt. Mitsubishi has a long history of investing in high-quality mining projects all over the world. The backing of a massive corporation like Mitsubishi in a joint venture is good news for both Giga and Nickel 28. If the joint venture successfully develops the deposit, it could provide a significant source of battery metals for anticipated electric vehicle growth over the next decade.

The formation of the joint venture is just the first step in what is sure to be a long and complex process. However, it is an important step that increases the chances of success for all involved. Nickel 28 is in a solid position to continue to benefit from both the Turnagain and Ramu projects.

Betting the farm on lithium in the short term and the long term.

written by Jack Lifton | May 10, 2023

Politics Before Economics: The Coming Train Wreck of Peak Lithium, Mandated EVs, and Alternate Electricity Generation

This is the best time ever to invest in lithium mining and processing because the legacy global OEM automotive industry as well as dozens of newcomers, including TESLA, have bet their continued and future existence not on the market but on the politically mandated ultimate replacement of internal combustion engine power trains by rechargeable battery fueled electric ones. This powertrain replacement is to be 100% dependent on lithium-ion batteries to store the electricity (i.e., fuel) to supply the electric motors that will replace fossil fuel using internal combustion engines. These EV batteries are, for their operation, 100% dependent on the chemical element, lithium.

At the same time, the politicians have also decreed that the

generation of relatively inexpensive electricity, which today is mostly done by the use of the fossil fuels, coal, oil, and natural gas (with the balance, more than 20%, coming from nuclear) shall be completely replaced by alternate forms of electricity generation dependent upon the wind and the sun with their excess outputs stored until needed in lithium ion batteries. Wind and solar are, at best, intermittent, and they are therefore not remotely reliable or dependable. They exist only because of government subsidies and, worse, mandates. Alternate energy generation being intermittent must be smoothed out (continuously maintained) ideally (in the Green Dream) by backup batteries. This would ultimately require enormous quantities of lithium, more than for EVs, for the gigantic smoothing and backup systems that would be necessary.

From the perspective of the supply of the key critical battery metal, lithium, these two goals, electrification of mobility and stationary storage of electric power for grid smoothing are competitive with each other for lithium, and this competition shows the complete ignorance of politicians and manufacturers of the fact that the overall demand for lithium from the two mandated uses [cannot possibly be supplied](#) from currently existing, planned, or known accessible sources.

A recent article in the Wall Street Journal states that “mining is like anything else. Eventually high prices stimulate more production. But the slow real-world expansion capabilities of mining explain the IMF’s forecast that mineral inflation would last “roughly a decade” until supply catches up.”

This is utter nonsense.

Mining any natural resource is entirely dependent on the physical accessibility of the resource, the grade (concentration) of the desired mineral, the ability of

deployable technology to extract the desired mineral, the economics of the processing of the mineral concentrate to a usable form, and that the total costs incurred by the entire supply chain can be borne by the selling price for the end user products enabled or manufactured from that resource.

Supply of anything cannot “catch up” to demand if that supply is limited by a maximum price limit for the demanded form and for the accessibility, grade, and applicable process technology for the “deposit.”

The highest grade accessible and processable deposits of lithium from brine and from hard rock minerals are, respectively, in Chile, Argentina, and Australia. These deposits are already mined at scale and represent the lowest cost of production today. So, since the highest grade, accessible, physically and technologically, deposits are in production why can't they just ramp up and supply any amounts of lithium needed? Those writers who are ignorant of geology, mineral economics, and geopolitics, and who are not aware of the limitations of contemporary known deposits of natural resources, think that lithium production is organic, i.e., that to get more lithium you simply do more mining. But, in fact, all mineral deposits decline in grade and fall below economic grades after a time. The period during which the mine is projected to be profitable is called, for that reason, the life of the mine.

In 2007 the global production of lithium, measured as metal, was 16,000 tons. In 2021 that figure was 86,000 tons, a 5.5X increase. Yet at the beginning of 2022, the price of metallic lithium, \$60,000 a ton in January 2021 had reached \$360,000 a ton! I note that lithium metal is now more expensive than silver.

Why?

The demand for lithium today just for batteries is 60% of global lithium production, and new battery factories are coming online and being planned and under construction daily. The total demand for lithium for all of these factories by 2025 is calculated to be 2.5 times total global lithium production in 2021. By 2030 that figure would be 5 to 10 times the total global 2021 output of lithium.

It is likely that the lithium supply is already in deficit due to existing battery factories buying for inventory and traders buying for speculation.

The legacy OEM car/truck makers have almost all allocated essentially all of their R&D capital and their new manufacturing construction to EVs. The better managed ones realizing that the total conversion of their outputs solely to EVs cannot be supported anytime soon, if ever, by the lithium supply chain and that the cost of such vehicles is already prohibitive in the mass market are hedging their bets by continuing to plan for a mixed output of EV and fossil fueled powertrains indefinitely.

Mis-allocations of capital in the most capital intensive industry on earth, the OEM automotive industry, cannot be reversed rapidly, and the damage to competitive advantage from losing the lead in internal combustion engine and transmission development could be fatal. This misallocation is not confined to the assembly operations of the global legacy OEMs. It could also be fatal to suppliers of ICE specific components.

There are today some 1.5 billion ICEs in use globally, and the number is growing. Imagine that each of them will use on average 4 kg of lithium, measured as metal, for a 50 kWh lithium-ion battery. A Tesla Model 3 uses 6-8 kg for a 100 kWh battery. So to replace just today's powertrains would require 6 billion kg of lithium, or 6 million tons of lithium, or 36 million tons of

LCE (lithium carbonate equivalent). This is more than 70 years total global 2021 lithium production with nothing left over for the stationary storage market for grid smoothing of wind and solar generation. Neither conversion will ever happen, because it is beyond the capability and capacity of our current know-how in mining, refining, and fabricating the end-use raw materials.

The looming and fatal to the green revolution lithium supply deficit has spawned an enormous price increase for the metal and its compounds, which has reversed the steady decline in the costs of lithium-ion batteries.

But is it too late to stop the attempted suicide of the global OEM automotive and electric energy generating industries?

Cars and trucks running on high priced electricity generated by increasingly expensive wind and solar systems backed up by hugely expensive stationary storage battery parks will not have large enough markets to be self sustainable or reasonably priced.

Lithium mining and processing will boom until no one can afford the vehicles or the electricity. At some point before that occurs the decarbonization of Western society will reverse and steel, aluminum, oil and gas will return to their central place in our world of cheap energy. Until then look for lithium, the rare earths, copper, and uranium to enter a long Super Cycle.

Betting the farm on lithium in the short term and the long term.

Some potential winners from the White House commitment to 'Securing a Made in America Supply Chain for Critical Minerals' Announcement

written by InvestorNews | May 10, 2023

Could this be the moment the USA finally takes some actions towards supporting critical minerals supply chains? The big news in the world of securing domestic supplies of critical minerals for the USA last week were two key announcements by the White House:

- [FACT SHEET: Securing a Made in America Supply Chain for Critical Minerals](#) – *Biden-Harris Administration, Companies Announce Major Investments to Expand Domestic Critical Minerals Supply Chain, Breaking Dependence on China and Boosting Sustainable Practices.*
- [DOE Releases First-Ever Comprehensive Strategy to Secure America's Clean Energy Supply Chain](#) – *DOE Report Includes Over 60 Actions to Enhance Supply Chain Resiliency, Spur Domestic Manufacturing Capacity, and Create Millions of Good Paying Jobs for American Workers.*

Additionally, the first article linked above refers to earlier reports (E.g: [America's Supply Chains](#)) and [states](#): “the reports recommended expanding domestic mining, production, processing, and recycling of critical minerals and materials – all with a laser focus on boosting strong labor, environmental and

environmental justice, community engagement, and Tribal consultation standards.”

The takeaway here is that investors looking to benefit from the new White House initiatives need to look for U.S. domestic critical mineral projects, processing projects, and recycling projects. A U.S. processing project would include [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) rare earths processing at their White Mesa mill in Utah, USA. Today I will focus on the U.S. critical minerals projects.

China has dominated the critical minerals supply chain, leaving the U.S. vulnerable this decade

After many years of talk and very limited action, it appears the USA may finally be waking up to the need to urgently support and facilitate domestic U.S. critical minerals supply chains. Those of us involved in the manufacturing industry know that for years China has been buying up and controlling the critical minerals’ supply chains. The consequences are that China now completely dominates the supply chains for lithium-ion batteries, electric vehicles, wind energy, and solar energy. These are multi-trillion-dollar industries, but if you cannot access the raw materials then you cannot produce a product. We saw that in 2021, with semiconductor shortages slowing the U.S. auto industry, and we are seeing it again now with lithium-ion battery shortages leading to a limited supply of domestically produced EVs, despite enormous consumer demand. Tesla has an estimated [1.3 million pre-orders](#) for its Cybertruck but has [delayed production until 2023](#) due to not having enough lithium-ion batteries.

Green energy from solar, wind, and nuclear will increasingly power electric vehicles



Companies that may benefit from U.S. support of the critical minerals industry

Looking through the White House announcement gives us several clues:

1. "These minerals—such as **rare earth elements, lithium, and cobalt**.....As the world transitions to a clean energy economy, global demand for these critical minerals is set to skyrocket by 400-600 percent over the next several decades, and, for minerals such as **lithium and graphite** used in electric vehicle (EV) batteries, demand will increase by even more—as much as 4,000 percent.....will also discuss **\$3 billion** in [BIL funding](#) to invest in refining battery materials such as **lithium, cobalt, nickel, and graphite**"
2. "President Biden will announce that the Department of Defense's Industrial Base Analysis and Sustainment program has awarded MP Materials Corp. (NYSE: MP) **\$35 million** to separate and process heavy rare earth elements at its facility in Mountain Pass, California."
3. "Berkshire Hathaway Energy Renewables (BHE Renewables) will announce that this spring, they will break ground on a new demonstration facility in Imperial County, California, to test the commercial viability of their sustainable lithium extraction process from geothermal brine.....In addition to BHE Renewables, Controlled Thermal Resources (CTR) and EnergySource Minerals have established operations in Imperial County to extract lithium from geothermal brine."
4. "Redwood Materials will discuss a pilot, in partnership with Ford and Volvo, for collection and recycling of end-of-life lithium-ion batteries at its Nevada based facilities to extract lithium, cobalt, nickel, and graphite."

5. "Tesla intends to source high-grade nickel for EV batteries from Talon Metals' Tamarack nickel project."
6. "DOE, DOD, and the Department of State signed a memorandum of agreement (MOA) to better coordinate stockpiling activities to support the U.S. transition to clean energy and national security needs."

The winners of the U.S. critical minerals policy should be those with projects in the USA which are focused on critical minerals (rare earths, lithium, cobalt, nickel, graphite), critical minerals processing and critical minerals recycling. Needless to say, they will need to pass environmental and permitting rules and support local communities and American jobs.

Of the companies mentioned above, MP Materials and Talon Metals are the only two that are listed. BHE Renewables, Controlled Thermal Resources (CTR), EnergySource Minerals, and Redwood Materials are all private companies.

MP Materials Corp.

MP Materials Corp. (NYSE: MP) owns and operates the Mountain Pass open pit rare earths mine facility, located in Mountain Pass, California, USA. Mountain Pass plans to have an output containing 5,000 metric tons of neodymium and praseodymium (NdPr), starting in ~2022. MP Materials also plan to have their own Heavy Rare Earth separation facility at their Mountain Pass Mine. As discussed above MP Materials have now been [awarded a DoD contract](#) (refer to the US\$35 million in point 2 above). MP Materials Chairman and CEO, James Litinsky, [stated](#): "The ability to mine, process, and refine rare earths at Mountain Pass is foundational to a national effort to secure the U.S. rare earth supply chain.....We thank the Department of Defense for its confidence and support."

MP Material's stage III plan is to develop a rare earth metal,

alloy and [permanent magnet manufacturing facility in Fort Worth, Texas](#). MP Materials has [an agreement to supply General Motors](#) (GM) with magnets to be used in EV motors for the Hummer EV, Cadillac Lyriq, Chevrolet Silverado EV, and more than a dozen models using GM's Ultium platform.

Talon Metals Corp.

Talon Metals Corp. (TSX: TL0) has a JV with Rio Tinto (ASX: RIO) at their Tamarack nickel-copper-cobalt Project in Minnesota, USA. Talon owns 50% but can earn-in to a 60% share of the Project. Talon recently announced a 5-year [nickel supply agreement](#) with Tesla (NASDAQ: TSLA).

Other critical mineral companies with USA projects

Lithium – Lithium Americas Corp. (NYSE: LAC | TSX: LAC), Standard Lithium Ltd. (TSXV: SLI | NYSE.A: SLI), Piedmont Lithium Inc. (NASDAQ: PLL | ASX: PLL) (have a [supply deal with Tesla](#)), Cypress Development Corp. (TSXV: CYP | OTCQX: CYDVF), Ioneer Ltd (ASX: INR), Albemarle Corporation (NYSE: ALB).

Cobalt – Jervois Global Limited (ASX: JRV | TSXV: JRV), Electra Battery Materials Corporation (TSXV: ELBM | OTCQX: ELBMF) (previously First Cobalt), Global Energy Metals Corporation (TSXV: GEMC | OTCQB: GBLEF).

Graphite – Westwater Resources, Inc. (NYSE American: WWR), Syrah Resources Limited (ASX: SYR) (spherical graphite plant planned for USA).

Nickel – Global Energy Metals Corporation (TSXV: GEMC | OTCQB: GBLEF).

Rare Earths – Lynas Rare Earths Limited (ASX: LYC) (rare earths processing plant planned for USA).

Li-ion batteries – Magnis Energy Technologies Limited (ASX: MNS)
– New York battery factory.

Li-ion battery recycling – Li-Cycle Holdings Corp. (NYSE: LICY)
– [Partnership](#) with GM and LGES's Ultium JV for a battery recycling facility in Ohio.

Closing remarks

In addition to the above-mentioned companies with U.S. projects it should be noted that allied countries such as Canada and Australia will also be needed to help supply critical materials. Several of these companies can be found [here](#) in our InvestorIntel member's page.

The USA's domestic production of green energy and the associated need for critical materials supplies has long been a major weak point for the USA to compete with China. It does look like the USA is finally taking some **actions** to catch up, albeit still about a decade behind China.

Investors can look to play this catch-up trend, and as we saw with Tesla, if you invest early the sky is the limit.

Disclosure: The author is long Tesla (NASDAQ: TSLA), MP Materials (NYSE: MP), Lithium Americas (TSX: LAC), Piedmont Lithium (ASX: PLL), Jervois Global (TSXV: JRV), Electra Battery Materials (TSXV: ELBM), Syrah Resources (ASX: SYR), Lynas Rare Earths (ASX: LYC), and Magnis Energy Technologies (ASX: MNS).

ESG Investors look to Nano One as a connector in a sustainable future

written by InvestorNews | May 10, 2023

If you follow Jack Lifton on InvestorIntel you'll have a pretty good idea that the dream of replacing all the internal combustion engines on the road today with battery electric vehicles (BEVs) is more of a fantasy than a reality based on today's technology. The demand for raw materials, in particular lithium, just doesn't add up. Jack does a great job of explaining the math in his [Lithium by the numbers](#) article from earlier this month with a follow up to hammer the point home in [Lithium: The Haves and the Have Nots](#) from last week. In summary, the first article suggests that even if lithium production doubles by 2025 (which producers say they can do), that will only get the world to roughly 10% of annual car production being BEVs. The latter article states "There is not even the remotest possibility that [global lithium \(measured as metal\) production](#) could grow to this week's prediction, for example, by the child-like prognosticators at Deloitte, that in 2030 32% of all newly manufactured motor vehicles would be battery electric vehicles (BEVs)."

I think it's safe to say that most reasonable people around the world agree that reducing emissions is a positive step for humanity. But how do we think as a global community that we can achieve these goals in light of some pretty serious shortfalls in the basic building blocks to making this happen? Obviously, technology has to be the answer. We have to be more efficient with the resources we've got if we want to have any chance at not only meeting the political goals of carbon reduction but

also avoiding the often unwitnessed reality of destroying the earth by mining every possible resource required to achieve those goals.

The good news is that there is already a company out there working on technology to improve lithium-ion batteries. [Nano One Materials Corp.](#) (TSX: NANO) is a technology company with a patented and scalable industrial process for the production of low-cost, high-performance cathode powders used in lithium-ion batteries. These unique materials are being designed to add value to electric vehicles and grid storage batteries in the global push for a zero-emission future. Nano One's patented manufacturing technology – the “One Pot Process” – streamlines the production process and thereby reduces cost while enabling higher performance cathode materials as compared to the standard manufacturing process. Last year the Company announced the development of a coated, [single crystal cathode material](#) for lithium-ion batteries that provides up to 4 times improvement in longevity. Granted this doesn't necessarily reduce initial demand for lithium but it certainly helps to put less stress on the supply chain going forward.

With that said, last month Nano One announced [three new patents](#) issued and allowed in Canada, the US and China. Notably coverage for a novel method for phosphate stabilizing of lithium-ion battery cathodes. An important, low-cost durability improvement to lithium nickel manganese oxide (LNMO) cathode material which delivers energy and power on par with other high-performance cathodes and is more cost-effective because it is cobalt-free, low in nickel and does not require excess lithium. LNMO also has an operating voltage that is 25% higher than commercial high nickel cathodes, enabling fewer cells in applications such as power tools and electric vehicles while providing improved productivity, efficiency, thermal management and power. So no cobalt, less nickel and ultimately less lithium

given you don't need as many power cells.

And then there's the other unintended consequence of moving towards a lower carbon future, the supply chain. Currently, the cathode supply chain is long and complex. Nano One technology enables [cathode materials](#) to be manufactured directly from nickel, manganese, and cobalt metal feedstocks in the form of metal powders, metal carbonates and other salts rather than metal sulfates. Metal powders are one-fifth of the weight of metal sulfates, avoiding the added costs, energy, and environmental impact of converting to sulfate and shipping and handling of waste. Nano One's technology aligns it with the sustainability objectives of automotive companies, investment communities and governmental infrastructure initiatives. It also offers an opportunity for metals refiners to provide environmentally, and sustainably mined sources of nickel ore to integrate and manufacture cost-reduced value-added cathode powders for direct supply to battery manufacturers.

In summary, Nano One appears to have the right technology at the right time. On top of that, the Company does it all with a lower overall carbon footprint than many, if not all, of its peers. In my opinion, the latter concept still isn't valued as high as it should be given as most ESG investors appear to be focused on top line carbon impact, and rightfully so given that policymakers haven't really made it an issue yet. In the meantime, as Jack Lifton educates the world that BEVs in every driveway may be a fallacy in our lifetime utilizing current technology, here's a company that could perhaps help make it more of a reality.

A cleaner greener world is what Nano One Materials is all about

written by InvestorNews | May 10, 2023

The market sure liked the latest news that [Nano One Materials Corp.](#) (TSXV: NNO) received [conditional approval](#) to graduate to the Toronto Stock Exchange under a new trading symbol “NANO” as the share price was up an impressive 13% yesterday. Perhaps this reflects market interest of the exciting potential of this interesting cleantech innovator.

For starters, Nano One is a technology company with a patented process for the low cost production of high performance cathode materials used in lithium ion batteries. You know, the batteries that are going to power virtually every battery electric vehicle and store the power from all the renewable energy sources coming online along with all your portable electronic devices. In other words, a pretty large addressable market. Nano One is in the process of showing the world that they have a better design for coating the cathode of a lithium ion battery.

All lithium ion batteries have cathode materials and it's estimated that the cathode represents roughly 25% of the cost of the overall battery. This is where Nano One has focused on trying to reduce costs and improve efficiency. The Company's silver bullet (that's an expression, I don't think there's any silver involved) is the patented “One Pot Process” which streamlines the production process and thereby reduces cost while enabling higher performance cathode materials versus the standard manufacturing process.

Cost reduction comes from the process being able to go directly

from metals (lithium, nickel, cobalt and manganese) to cathode powder without having to convert it to sulphate or in lithium's case, a hydroxide. This results in reduced costs for raw materials and energy input which in turn makes for a greener, lower carbon footprint overall. Cost savings can be several thousands of dollars per ton for cathode material.

The One Pot Process also helps on the performance side. As a battery charges and discharges, conventional polycrystalline cathode particles start to break apart from the stress of repeated charging. Over time this can fracture the protective coating and expose the inner part of the crystals to side reactions. This has the effect of reducing the range, life and charge of a battery. The Nano One process individually coats nanocrystals which form in one step and resist fracturing thus boosting durability and in turn full life cycle performance.



Source: [Nano One Materials Corporate Presentation](#)

The technology has been proven to work on several occasions including a [joint development program](#) focused on LNMO cathode materials (lithium nickel manganese oxide) that was successfully completed with validation by a multi-billion-dollar Asian cathode material producer and in [collaboration](#) with the University of Michigan on the development of innovative solid-state battery technology, to highlight the most recent updates. As well the Company is involved in strategic partnerships with Volkswagen, an undisclosed large US auto producer, Pulead Technology Industry (a highly respected Chinese cathode producer) and Saint Gobain (a 400-year-old materials company). In February Nano One announced its [M2CAM](#) (metal to cathode active material) initiative to engage in discussions with large integrated miners to reduce environmental footprints and maximize upstream value in the global battery supply chain.

As you can see, this company ticks all the boxes for a greener, cleaner world. And the best part is, they have more than enough cash to continue ongoing research and development, pilot plant expansion, business development and strategic initiatives having [raised \\$29 million at the start of April](#) to go along with the [\\$30 million of working capital](#) they finished Q1/21 with. Nano One appears to have the right solution at the right time and if the new green economy is serious about reducing its carbon footprint we all know who should be at the top of the list.

Follow Dean on Twitter: [@iiDeanB1](#)