

Lithium 2022 – Parting Shots & Initial Thoughts for 2023

In recent years I have allowed myself from 45 to 90 minutes to write my “stream of consciousness” thoughts (typos and all) on the year ending and the one about to begin. Let’s get started.

What follows are my thoughts and opinions – nothing more, nothing less. Some of what I believe will prove correct, other thoughts will prove to be chaff. As always what follows is not investing advice. DYOR and make your own decisions. What your reading are thoughts off the top of my head not rigorous analysis. The only prep I do is read what I wrote last year. The rest is from memory except stock prices. For example: last year I commented that Morgan Stanley predicted \$13/kg lithium carbonate by the second quarter of 2022. At year end 2021, with “China spot” hovering near \$40/kg; I said that a price over \$50/kg was more likely than a return to the teens. Yes, \$80/kg shocked me too but my underlying thesis that supply wouldn’t catch up with demand proved sound.

Today is 12/31/2022 – yesterday was the final trading day of 2022. From a stock market perspective, 2022 can’t end fast enough for me. Despite an incredible rise in lithium prices, most of the top lithium stocks are ending the year closer to their 52 week lows rather than their highs. At present I own eleven lithium stocks and two that are closely related.

Livent is hovering cents above their 52 week low of \$19.35 while Albemarle is selling for just under \$217 well below their 52 week high of \$334. I do not own Livent as I believe their strategy is flawed and their ability to execute resource projects remains questionable. Albemarle has great assets but given their project execution record and contracting missteps, I prefer other options that I believe have more upside.

I own Lithium Americas another company hovering just cents above their 52 week low of \$18.42 – the price has dropped ~\$10 in a little more than a month just as they are starting up the most significant new brine project in South America (along with partner Ganfeng) since SQM began their Atacama lithium operations a quarter century ago. It is interesting that concern over the soon to be decided legal proceeding that will determine if and when development of Thacker Pass proceeds seems to have completely overshadowed the start-up of Cauchari. I firmly believe Thacker Pass will get a green light in 2023. The US cannot rely on “friendly” countries for lithium especially given the fact Chinese companies control much of the lithium in some of the countries the US considers friends. At present, the US produces less than 1% of what domestic lithium demand is likely to be in 2030.

Another of my larger lithium holdings, Pilbara Minerals, is selling at A\$ 3.75 well below their 52 week high of A\$ 5.66. My point? Those that believe the Goldman Sachs and Morgan Stanleys of the world and their coming oversupply and price crash narrative have created what I believe is a great opportunity to selectively add to existing positions or begin new ones. As always, I am just expressing my thoughts on the market NOT giving you investment advice. The new year that has already begun “down under” as I type this

will likely be volatile for lithium stocks. I am in for the long haul in my core positions (six of the eleven stocks I hold). While homebound during Covid, I started trading lithium volatility in my retirement accounts given there are no immediate tax consequences. LAC and Pilbara are both core holdings for me as are four other lithium stocks.

It is impossible to predict how long lithium pricing will remain disconnected from the cost curve and completely driven by market forces. I believe the current pricing dynamics remain through 2027 and likely the remainder of the decade but investors in the top tier lithium producers will win EVEN if Goldman Sachs is correct about lepidolite supply. Why? If lepidolite becomes a significant portion of supply (> 15%) in the next five years, the high end of the cost curve will be > \$30,000/MT instead of \$10-12,000/MT (if spodumene price returns to the levels the big banks predict) ensuring cost curve based pricing of over \$30,000/MT. The top 6 producers plus the new majors such as LAC will still have high margins. The industry doesn't need \$80,000/MT pricing. World class assets will print money (just not as much) at prices well under half of that. The biggest loser when prices go back to the cost curve will be Chile's CORFO who will see their billions in royalties from SQM and Albemarle shrink precipitously.

My take? In a world where lepidolite (or DSO) is the high cost hard rock, spodumene prices aren't going below \$2,500/MT. Just do the math which apparently the likes of Goldman and Morgan Stanley haven't. Goldman Sachs forecasts a 2024 carbonate spot price of \$11,000/MT.

Clearly, I disagree with GS on the cost of low grade lepidolite. JP Morgan stated in their 12/15/22 report that they believe CATL's lepidolite project will have costs in the \$20,000/MT range and that Gotion's current costs are in the \$30,000/MT range.

Changing gears here: should Elon have purchased one (or two) lithium companies instead of Twitter? I have always said that lithium is Elon's Achilles' heel (or kryptonite if you want a Superman comparison). An Elon purchase of an Albemarle or SQM would have created a "moat" for Tesla ensuring a huge raw material cost advantage vs Tesla's main competitors.

If he had really been thinking he could have acquired multi asset LAC at a low enough cost to add a Pilbara and a Livent with enough cash left over to fund all the capital required to fully leverage develop a more significant asset base. What happened to all the Elon "first principles" rhetoric in his lithium strategy? Just a few years ago the lithium world was beating contract price down to say they supplied Tesla. Now Tesla is viewed as a pain in the ass to deal with. Majors really don't need him. Consider this – the top six lithium chemical producers can sell 100% of their product without selling a kilogram to Tesla. The BMWs, Fords and GMs are more attractive as customers than a very arrogant Tesla. If Tesla doesn't get their act together, they will be buying from a collection of juniors just starting production and trying to make battery quality. Again, do the math. Take the estimated 2023 production of SQM, ALB, Ganfeng, Tianqi, Allkem and Livent. Compare it with total global demand less Tesla demand. The top 6 don't need Elon. Elon was completely wrong that mining is easy and refiner's "print money". He

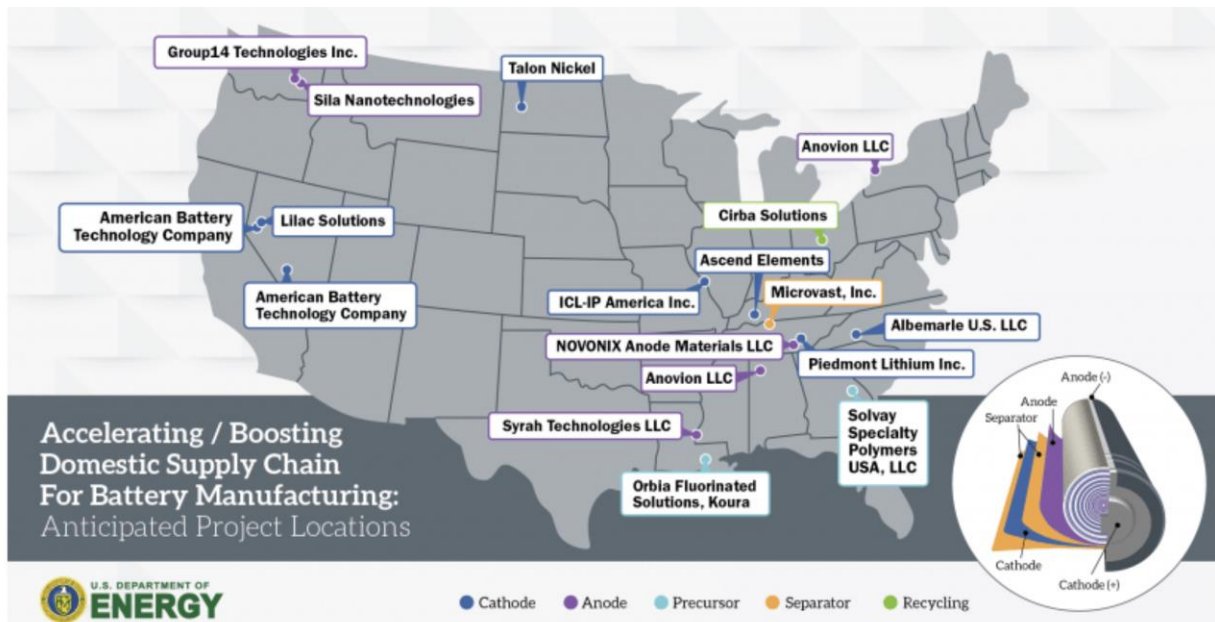


When it comes to lithium, will Chris tell Elon to “go fish”?

should listen to Chris Ellison who said a couple of months ago “there is way more (lithium) demand than supply”. Elon, Chris has the rock, maybe you should call him but his ego might be as large as yours so watch out. First principles indeed.....

It would be irresponsible of me not to mention the Inflation Reduction Act and other US/Canadian initiatives to jump start a “robust North American battery supply chain”. Although the Biden administration seems “all in” on investment in battery capacity, cathode, recycling, etc. Where are lithium resource projects? Why build conversion capacity when there is nothing to

convert? Of course, Albemarle has the ability to re-open the Kings Mountain mine – if they can get a permit but did ALB really need a loan to build conversion capacity? Why not support a project where the financing is needed.



What’s wrong with this picture? Of the \$2.8 Billion, not one cent for lithium resource production

Ok, ok – I believe Jigar Shah will ultimately “loosen the DOE purse strings” for a lithium project or two by year end 2023 but if he doesn’t by early 2024, I will transfer the title “House of Cards” from Livent’s hydroxide strategy to the Biden Administrations battery strategy. Seriously, do I see Lilac on that map?

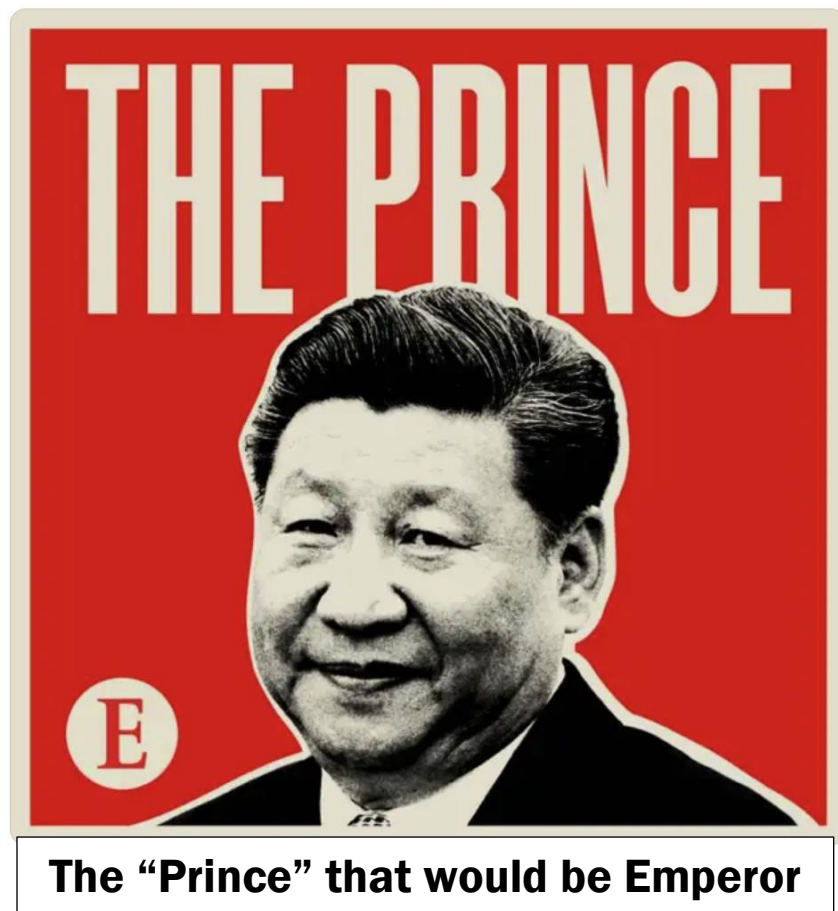
What are the main themes for 2023? Watch new supply coming online carefully. From Jujuy to Qinghai, from Brazil to Africa to Quebec. I don’t much care about the “spice flowing” but I will tell you as long as you see the “DSO flowing” you know we are in a

structural shortage. As long as DSO is flowing, lepidolite won't be able to claim the title of high cost lithium source.

Geopolitics will certainly continue to be of interest in 2023. In the time I take to write this post, there were thousands of new Covid infections in China. The curious policy change from "Zero Covid" to "let's infect the entire country quickly" may prove cruel but effective – especially if you don't value human life and suffering.

Unwinding global supply chains from China dependence to China as just one of many trading partners is going to take time. Having lived in the Middle Kingdom for more than half a decade pre Xi Jinping, my family greatly benefitted from our years in China. Both of our daughters graduated from high school in Shanghai. I am in no way anti-Chinese. However, when I say that, I am referring to the Chinese people not the government or the "new Mao". As an American, I don't think we can limit our dependence on China fast enough. Once they become "just another supplier" of any type of goods, I have no issue dealing with them but make no mistake Mr. Xi is not our friend.

If you want to learn more about the ruler of China, the podcast series "the Prince" is worth a listen.



The supply and demand dynamic, of course, will drive price. The combination of a global recession temporarily dampening EV demand and efforts from China to do so could push lithium prices down temporarily but I don't believe price will reconnect with the cost curve in 2023 or the next few years for that matter. Even a significant price correction in early 2023 (into the \$50,000/MT range) will be short lived. That said, nobody saw \$80,000 as a possibility at this time last year.

Clearly CATL and BYD's statements on lower prices are more of a "hopeful strategy" than anything based on facts. Ask yourself, who benefits most from lower prices?

This week Bloomberg quoted Sinomine's Wang Pingwei on lithium price. Who? My thought exactly. Demand may go down temporarily as the article states but in the case of Mr. Wang, this is analogous to the broken clock being right twice a day. Anyone that says with a straight face that Afghanistan is a more promising lithium jurisdiction than North America clearly has a bias. In fairness, since Canada ordered his company to divest their stake in a Canadian listed firm his feelings about North America probably are more based on geopolitical reality than asset quality.

The Global Lithium podcast added several new countries to the ranks of listeners. As of episode 150, a total of 157 countries have registered downloads. According to Google, there are 195 countries including the Holy See aka the Vatican. I never thought 80% of the countries in the world would tune in. I intend to do the podcast for at least another year. If you are a listener – thanks.

Yes, there are many more topics that deserve comment but I am already past 90 minutes. Maybe next year I allow myself two full hours.

PS: Although I think Elon would have been wiser to invest in lithium rather than Twitter, I am glad he cleaned house at the social media giant.