

Argentina, the new Saudi Arabia of Lithium

Former Chinese leader, Deng Xiao Ping, is most famous in mining circles for his oft-repeated aside from the 1980s that whereas “Saudi Arabia has oil, China has Rare Earths”. It didn’t grab much attention at the time because Rare Earths were largely a mystery to most listeners and, moreover, were not worth all that much and did not have many day-to-day applications then besides bringing red colors to one’s cathode ray tube television. The rest is history with the final wake-up call in 2009-10 as to what Deng was actually referring to in strategic terms.

Now we can add a third leg to the mantra because Argentina has lithium and oh, potentially, how much lithium it does have! In theory, Chile was the place to source lithium from brine lake lithium deposits (salares), but in a curious own-goal situation, Chile has squandered that advantage by trying to keep a tight control on the number of players and advantaging the two incumbents. Predictions are that Argentina will overhaul Chile in terms of lithium production by 2030. The result of the Chilean torpor at welcoming new entrants is that the surprisingly more laissez-faire attitude in Argentina has made it the go-to place for those wishing to stake positions in salares. Argentina has become something like, to paraphrase Deng, the Saudi Arabia of Lithium.

The Fluctuating Fortunes of Salares

One of the paradoxes of the middle of the decade was the “talking down” of salares as being in some way “too difficult” or too “long term”. Having said that though, several of the highest-flying stories in the First Lithium Boom such as Orocobre Limited, Galaxy Resources Ltd., and Lithium Americas Corp. were salar-based. Back in that boom, and its current

revival, there was/is a staking boom in the Argentine part of the Lithium Triangle of Chile, Argentina, and Bolivia that makes the California gold rush in the 1850s pale into insignificance. Explorers, quite literally, cannot get enough of Argentine lithium territory.

The caution relating to salares exploitation was powered by the mishaps that befell Orocobre and Rincon. However, in both these cases, the lessons learned meant that others will have the benefit of their difficult experiences. The argument that there is a longer lead time for salar development (due to the need to kickstart the evaporation process) does not hold much water (pardon the bad pun) due to the much longer (and more expensive) drilling and resource estimation phase at a hard rock deposit and the much higher development costs at underground mines.

The downfall firstly of Canada Lithium, after the end of the First Lithium Boom, and then the travails of Nemaska, at the beginning of the latest recovery, have cast a pall in many investors' minds over large-cap underground spodumene mines.

The Road Most Taken

Despite perennial concerns about Argentina's political direction, the metaphorical road to the Argentine salares opportunity has become more like a Los Angeles expressway in peak hour, of late. Argentina has been in the Lithium game for decades, so is no newbie, but was always perceived as playing second fiddle to Chile. With opportunities to enter and develop new projects in Chile finding constant stones in the road, several of Argentina's Andean provinces have become veritable boomtowns for the Great & Good of the global EV revolution.

The long-established Livent (formerly FMC) was joined by Orocobre and Galaxy Resources (which then merged), and then a stampede of the elephants in the Lithium space occurred with Posco, Ganfeng, Tianqi and most recently Zijin Mining Group

resetting the bar higher with its stunning move on Neo Lithium Corp. (TSXV: NLC | OTCQX: NTTHF).

Then in November of 2021 TSX-listed miner Lithium Americas offered \$400 million in shares and cash for Vancouver-listed Millennial Lithium Corp., the third offer for the company this year following one by China's largest battery maker CATL and another one by Chinese lithium producer Ganfeng Lithium. A feeding frenzy has begun.

Beyond these majors, there is an array of junior players hoping to replicate the Neo Lithium success story. One of these stocks that has come to attention lately is Edison Lithium Corp. (TSXV: EDDY | OTCQB: EDDYF).



Into the Fray

In mid-June 2021, Edison Cobalt Corp. as the company was then known, announced that it had entered into a Definitive Purchase & Sale Agreement to acquire Resource Ventures S.A. (ReVe), an Argentine corporation that owns or controls the rights to over 148,000 hectares (365,708 acres) of prospective Lithium brine claims in the province of Catamarca, Argentina. The claims are principally located in the two geologic basins known as the Antofalla Salar and the Pipanaco Salar in the famed Lithium Triangle.

The Transaction

To effect the purchase Edison inked an agreement to acquire ReVe and a 100% interest in its properties for a purchase price of \$1.85 million paid by the issuance of ten million common shares of the company at a deemed price of \$0.185 per share. All securities issued pursuant were subject to a hold period of four months from the date of closing.

The Political Scene

For most of the last two decades, Argentina has been ruled by irregular iconoclastic governments, most recently by the dynasts of the Kirchner family and before that the Duhalde regime the country with a brief interlude of fiscal conservatism under Mauricio Macri, elected President in the last quarter of 2016.

The major bugbears of foreign miners operating in the country have been:

- Currency controls – though the devalued Peso results (in theory) in lower costs for project development
- Export taxes on concentrates
- Import restrictions on equipment

The Macri regime reverted these and this coincided with the Second Battery Metal Boom of 2017. Though that boom proved to be fleeting, it reenergized players in the Argentine space.

The Macri regime fizzled after three years and the Kirchnerites were back in power, but mining (and particularly Lithium) scarcely missed a beat with the surge of development of salares (and increasingly large copper projects) at the current time.

There is a good case to be made that the relative lack of salares moving to production pre-2019 was due to the double negatives of the low lithium price between 2011 and 2016 and the death throes of the first Kirchnerite period making Argentina an unattractive place to advance projects. Pricing has resolved itself and the Argentine government is welcoming Lithium players with open arms.

Edison Lithium's pivot from Cobalt to Lithium looks like a prescient move. While Cobalt is much sought after it is seldom found. Unicorn hunting can be a long and expensive sport. With Argentina's rapid evolution as the "Saudi Arabia of Lithium" who could fault the company moving into the territory and building up a substantial position?

It's still early days of course with exploration, resource definition (and presumably more territorial expansion) still lying ahead. However, in elephant country, one is more likely to find elephants than gerbils. The hunt is on at Edison Lithium.

Antimony – Critical or Strategic or Both?

China has a very strong position in Antimony and long has had. Indeed this is the metal it has been dominant in for the longest. However, like so many other resources this was

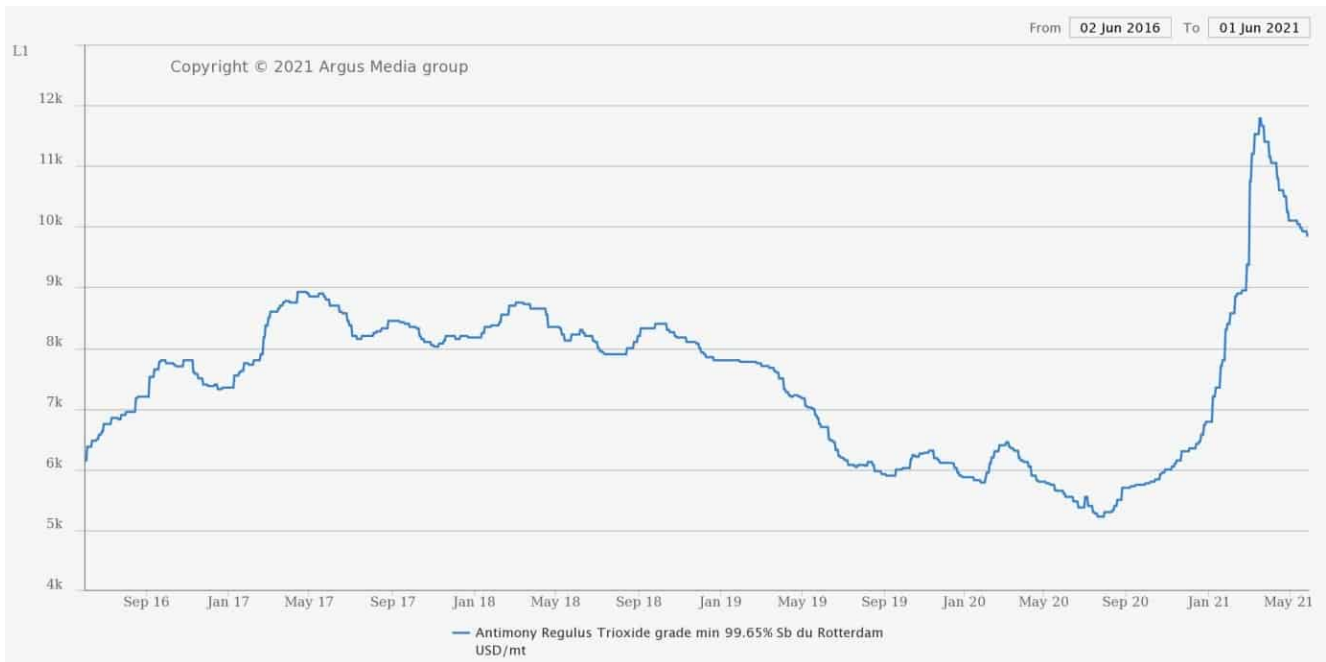
squandered through overproduction, predatory pricing and high-grading. China now finds its domestic share of global production plunging and to prop up its dominance it has become a leading importer of artisanal and “conflict” ore from all around the world. It then processes this imported ore/concentrate and manages to hold a still dominant position in processed end-product Antimony Trioxide and other products.

Is the metal strategic? Thus far it does not have the type of sexy applications that other high-tech metals possess, but it is still a key component in the things it is used for such as fire retardants and its historical application as an alloy used to harden Lead in ordnance/ammunition and Lead-acid storage batteries.

And now the latest new technology to utilize the metal is Antimony molten salt batteries for mass storage. The potential here is for a quantum surge in demand. This new application may be its own undoing if the price of the metal goes too high and unravels the economics.

Lighting a Fire Under the Price

After a price slump that lasted several years, and sank the prospects of several Antimony wannabes, the price of Antimony started to uptick in 2016. It got to around \$8,500 per tonne and then plunged again to around \$5,500. That price was the result of a regulator-induced swoon over the use of the metal in fire retardants in children’s pajamas (the culprits being the EU and State of Massachusetts), however the main application in fire retardants has not gone away and in the wake of Grenfell Tower fire in London the regulators act against fire retardants at their own peril. This was further complicated by the ever-looming liquidation of the FANYA stockpile, which amounted to around 19,000 tonnes, which was finally sanctioned by Chinese courts in 2019. The talk in the trade was that the FANYA stocks were bought by one of China’s largest Sb producers.



Source: Argus Metals

In the wake of the pandemic and with the marketplace dry of product, the price has had a fire lit under it by Molten Salt batteries capturing the *Zeitgeist*. This move was compounded by global shortages caused by the Pandemic, the coup in Burma, long term underinvestment, declining Chinese production and the arrival of Molten Salt batteries in the commercial marketplace.

The worries about regulators evaporated like Gorillas in the Mist in the last quarter of 2020 and a stampede to rebuild stocks occurred sending buyers (notably in the US) into a feeding frenzy with Antimony becoming the hottest metal in the last six months (though tussling with Tin for that title) doubling in price from around \$5,500 in late 2020 to nearly \$11,000, from where it has eased back slightly.

On the supply-side protracted low prices have stymied anything beyond small-scale production by artisans outside China.

Molten Salt Batteries as Icing on the Cake

We have written before on how Molten Salt batteries, based on Antimony are starting to make waves. If Liquid Metal Batteries

become the “killer application” in grid-linked storage (or non-grid linked) then it potentially lights a fire under Antimony demand and pricing. The announcement that United States Antimony Corporation (NYSE: UAMY) had secured an offtake deal with Ambri for its output lit a fire under the price of that stock in late 2020.

To mix some metaphors, molten salt batteries have flown under the radar thus far but definitely have a place in the evolving battery universe and hopefully will take the Antimony market along for the ride.

In this Third Wave of battery metals, Antimony (the prime component in Molten Salt batteries) has joined the ranks of battery metals and the hunt is on for that scarce commodity, the non-Chinese Antimony miner.

Each GWh of Ambri batteries requires around 1% of current annual production of these (calcium and Antimony) anode and cathode materials. This is the closest we have to divining how much Antimony that the Ambri product line might consume if it gains traction. Current Sb production is around 170,000 tonnes per annum, implying that a Gigawatt of Ambri cell utilizes 1.7 tonnes of Antimony.

Thin Pickings amongst Actual & Wannabe Producers

Despite the metal price excitement, the equities markets are starved for options in this metal. The small field consists of the gold/silver miner, Mandalay Resources Corporation (TSX: MND) that has Antimony as a by-product from its Costerfield mine in the Australian state of Victoria, and United States Antimony with its curious focus upon the Los Juarez Silver-Antimony mine in Mexico. Red River Resources Limited (ASX: RVR), another developer basically focused on gold is trying to revive the Hillsgrove mine in New South Wales (which has Sb as a by-product) and Perpetua Resources Corp. (NASDAQ: PPTA) which was formerly called Midas Gold, has a mega project in

Idaho (again with a gold focus) that also has the potential to supply half the current US demand for Antimony displacing China as the main supplier to the US. It will be interesting to see if the price surge broadens the offering in equities markets.

Molten Salt Batteries – Hot but not Flammable

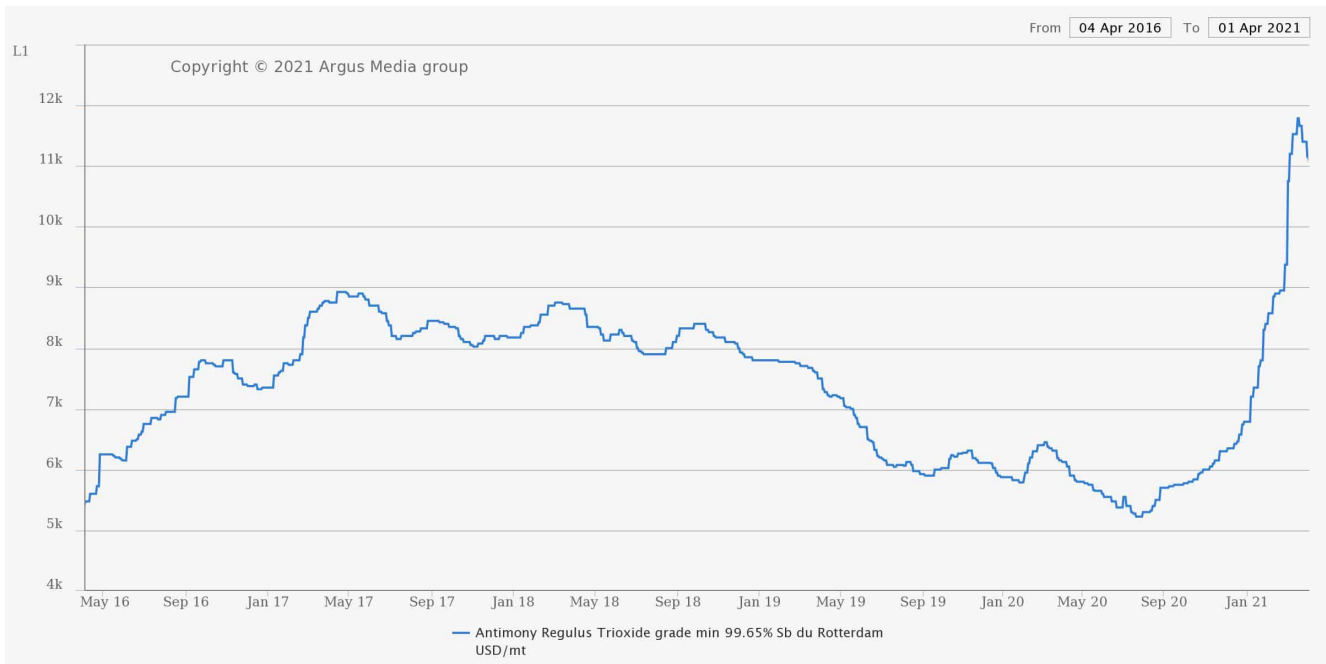
When we first wrote for InvestorIntel on Molten Salt battery technology almost half a decade ago, the technology was already five years in the making, but it has now taken a further five years for it to get traction amongst end-users.

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Antimony – Lighting a Fire under the Price

The price of this metal has taken off in recent times on a combination of global shortages caused by the Pandemic and the coup in Burma, long-term underinvestment, declining Chinese production, and the arrival of Molten Salt batteries in the commercial marketplace.

The effect was stunning, with Antimony breaking out of a multi-year malaise and becoming the hottest metal in the last six months (though tussling with Tin for that title).

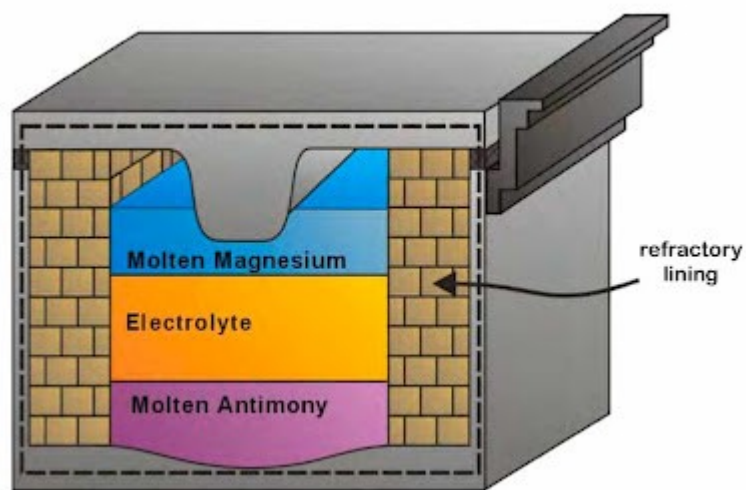


Mass Storage Devices

The important consideration is that mass storage devices do not even need to be connected to the grid and thus can be in the middle of nowhere bridging the infrastructure gap (and cost) that weighs on emerging economies (and isolated mine sites).

And then there are liquid metal batteries using molten salts. The origin of using these salts for storing energy goes back to the Second World War.

Molten salt is a solid at standard temperature/pressure but enters the liquid phase under elevated temperatures. Liquid metal batteries can be stored indefinitely (over 50 years) yet provide full power in an instant when required. Once activated, they provide a burst of high power for a short period (a few tens of seconds to 60 minutes or more), with output ranging from watts to kilowatts. The high power is due to the high ionic conductivity of the molten salt, which is three orders of magnitude (or more) greater than that of the sulphuric acid in a Lead-acid car battery.



A team of researchers at MIT led by Professor Donald Sadoway worked on a liquid battery system that could enable renewable energy sources to compete with conventional power plants.

The research was put into a commercial venture, called Ambri, which was funded to the tune of \$15M by Bill Gates, energy giant Total, the US Department of Energy's Advanced Research Projects Agency and Khosla Ventures (run by Sun Microsystems co-founder Vinod Khosla).

What this means for antimony Demand

Each GWh of Ambri batteries requires less than 1% of current annual production of these (calcium and antimony) anode and cathode materials. This is the closest we have to divining how much Antimony that the Ambri product line might consume if it gains traction. Current antimony production is around 170,000 tonnes per annum, implying that a Gigawatt of Ambri cell utilizes 1.7 tonnes of Antimony.

Higher prices are rather a "chicken-and-egg" issue for the likes of Ambri. To be sure of adequate supplies of metal higher prices are needed (probably over \$8,000 at least) and yet if they go too high then the viability of the economic equation is cast into doubt.

United States Antimony Corporation (NYSE American: UAMY) – Collateral Beneficiary?

As the main Antimony producer in North America (and we use the word “producer” very generously) this company was finding it hard to get two dimes to rub together in 2020. To add to the woes its long-term CEO (who was in his 80s) died.

The price of the stock started to rise slightly on the Antimony price rally but then... in February of 2021 it announced an offtake deal with Ambri... then followed a massive financing (\$14.3M) with Roth Capital Partners... the stock then soared and the rest is history. The fact that it doesn't have a proper mine is a mere detail.



Despite all that such is the uplift that Antimony stocks can achieve in a market starved for options in this metal. The only other plays are the gold/silver miner, Mandalay Resources Corporation (TSX: MND | OTCQB: MNDJF) that has Antimony as a byproduct from its Costerfield mine, and Perpetua Resources Corp. (NASDAQ: PPTA | TSX: PPTA) (formerly called Midas Gold – that is controlled by the famed Paulson hedge fund group) but is not in production at its Stibnite Mine.

Conclusion

If Liquid Metal Batteries become the killer application in grid-linked storage (or non-grid linked) then it potentially lights a fire under Antimony demand and pricing.

To mix some metaphors, molten salt batteries have flown under the radar thus far but definitely have a place in the evolving battery universe and hopefully will take the Antimony market along for the ride.