

# Molten Metals Aims to Meet the Rising Demand for Antimony in Energy Storage

written by InvestorNews | May 4, 2023

Supply chain disruptions and geopolitical concerns caused Western governments to re-examine the source of critical metals that will drive the economic engine for decades to come.

Media attention seems focused on the battery metals required for electric vehicles (“EVs”), including lithium, cobalt, graphite, and rare earths, but antimony was one of the few metals that is on all of the critical metals lists across Australia, Canada, China, the EU, Japan, and the USA.

## The importance of antimony

Currently, Antimony is primarily used as a flame retardant in items such as paints, plastics, and textiles. It is also used in brake pads, ceramics, glass for televisions and monitors, and rubber. When alloyed with lead, it is found in metal products used in ammunition and lead-acid batteries.

As we strive towards transitioning to a carbon-free society, it is essential not only to harness renewable energy but also to store it efficiently. The future increase in demand for antimony lies in its potential to become a crucial component in battery technology.

Antimony’s unique property as a heat retardant is essential in preventing thermal runaway in batteries, making it a crucial element in the development of effective energy storage systems. Its heat retardant properties enable the mass scalability of

batteries, making it the only metal capable of achieving this goal.

## Antimony molten salt batteries

[Ambri Incorporated](#), a US-based energy storage company, has developed a long-duration liquid metal battery technology for the power grid with backing from prominent investors, including Bill Gates, [Khosla Ventures](#), and [SoftBank Group](#), and funding from the [US Department of Energy](#).

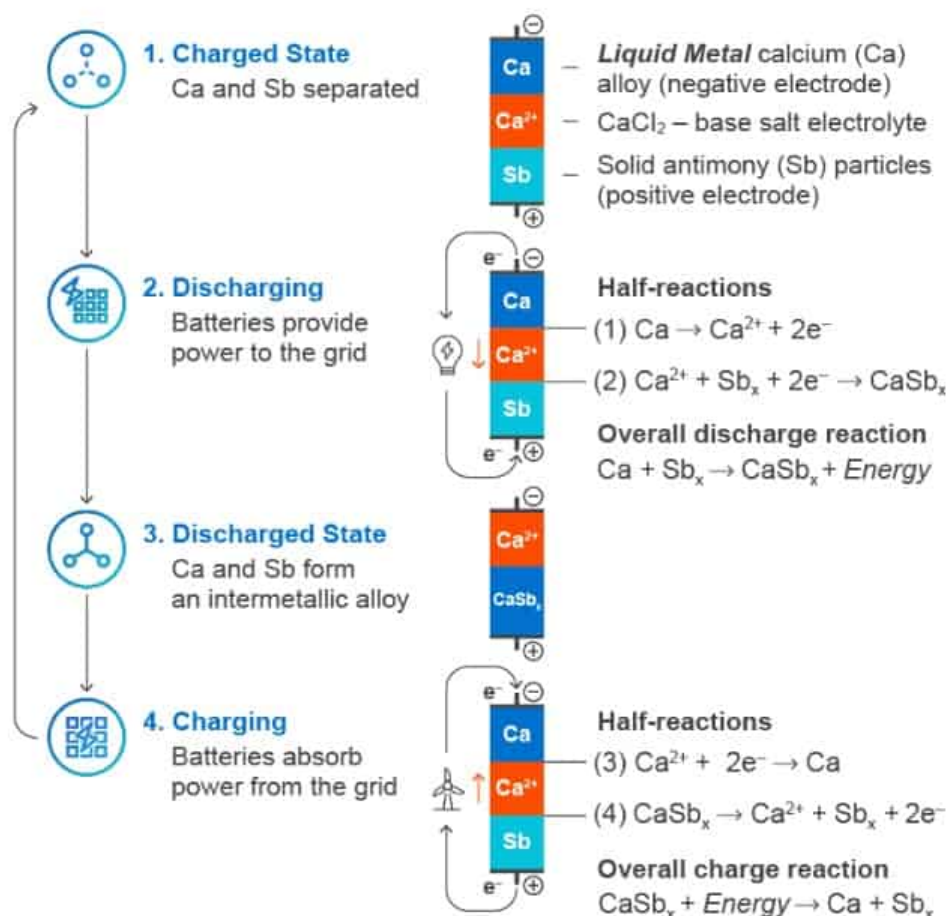
Ambri's battery technology uses solid antimony as the positive electrode, liquid metal calcium as the negative electrode, and a salt electrolyte consisting of calcium and chloride. The use of these metals allows for a reliable, low-cost, long-lasting, and safe energy storage solution that can enable the integration of renewable energy sources into the electric grid.

As Ambri continues with its commercialization efforts, it is estimated that its forward contract sales will require over 25% of the global production of antimony outside of China by 2026.

However, the current supply lacks the necessary capacity to fulfill this demand, leading to an imbalance in the supply-demand equation. This highlights the urgent need for investment in new antimony mines and refining ("roaster") facilities.

## FIGURE 1: Ambri's Molten Salt Battery Chemistry

## Our Chemistry



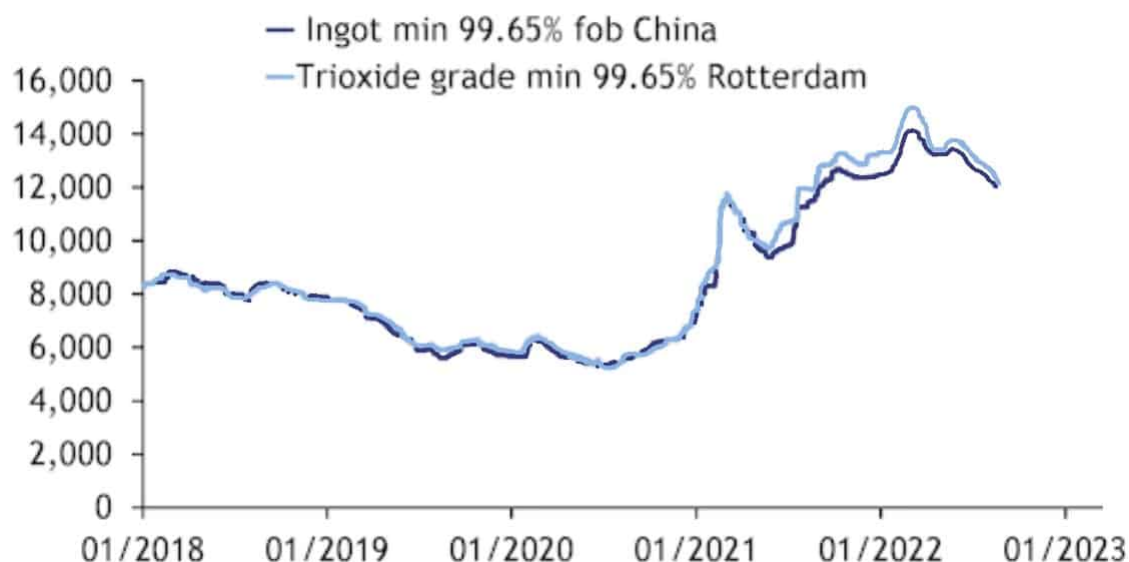
Source: [Ambri's website](#)

## Lack of supply and increasing demand drives the price higher

Currently, the global supply of antimony is heavily reliant on China, Russia, and Tajikistan, which produced over 88% of the world's supply in 2022, according to the [US Geological Survey](#) ("USGS").

Antimony prices have surged this year to a record high, currently trading at US\$13,000 per tonne, more than double the US\$5,500 per tonne rate in 2019.

**FIGURE 2: Antimony Market Prices (US\$/tonne)**



Source: Argus Media

## Newly Listed Molten Metals Corp.

Listed in August 2022, [Molten Metals Corp.](#) (CSE: MOLT| FSE: Y44) is a Canadian mineral exploration company and one of the few companies actively developing antimony assets in North America and Europe, reducing the foreign dependence on this resource.

The Company has four properties, which include a former antimony mine in Nova Scotia, Canada and it has two antimony-gold projects and one tin project in Slovakia. All of the Slovakian projects are brownfield sites, either past-producing mines or previously explored.

In Nova Scotia, Molten Metals' [West Gore project](#) is home to one of Canada's foremost historic antimony mines, which has been abandoned since the 1960s. The Company is currently testing the remaining stockpiles and tailings at the site, in an effort to extract valuable antimony and revive the mine.

According to the Company's website, these stockpiles could

contain up to 570 tonnes of antimony and 2,500 ounces of gold, worth approximately US\$7.4 million and US\$5.0 million at today's price, respectively. These estimates were taken from a report released by George Packard in 1949 using a survey undertaken by Nova Scotia's Department of Mines.

The Company is also focusing on the past-producing [Trojarova project](#) in Slovakia with a well-preserved mining infrastructure and a historic resource calculation, which, if correct, would make it one of the world's largest unmined antimony projects globally.

Upcoming exploration plans include confirmation sampling and drill hole twinning to complete a NI 43-101 initial resource to validate the historical resource. Molten Metals could have one of the largest antimony resources globally if it can confirm the historical resources that were calculated in the 1980s and 1990s when Slovakia was part of the Soviet Union.

## **Offtake agreements and future capital**

Molten Metals recently [announced](#) that it executed a non-binding Memorandum of Understanding ("MOU") for a long-term antimony supply agreement with Swedish company [Scandinavian Steel AB](#).

The agreement will be subject to a specific financial investment into the development of one or more of Molten Metals' projects and a provision to upgrade the MOU to a binding offtake agreement within a reasonable time frame.

## **Final thoughts**

Molten Metals (CSE: MOLT| FSE: Y44) has a strong focus on antimony, which is increasingly in demand due to its use in batteries. In the short term, the Company plans to process the remaining stockpiles of tailings at its Nova Scotia project and

advanced its mines in Europe. The company has two antimony-gold projects and one tin project in Slovakia that could provide a near-term, large resource and additional upside.

With a market cap of only C\$1.9 million and a tight share structure of only 16.9 million shares outstanding, if you have confidence in the antimony theme, it should be a stock to watch.

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## Molten Metals sees opportunity in bringing antimony projects back into production

written by | May 4, 2023

[Molten Metals Corp.](#) (CSE: MOLT) is a relative [newcomer](#) to the world of antimony (Sb) and tin (Sn). Formed by Christopher Ecclestone in 2021 to look at near term production of lesser-known battery material antimony, the focus of the company is to look at previously operating mines to develop [non-Chinese sources of material](#).

Molten Metals' first target was the historic [West Gore antimony/gold mine](#) in Nova Scotia, Canada, that produced antimony and gold from the 1880s to 1917. From 1915 to 1917 operations were expanded, and over 35,000 tons of ore were milled yielding 7,761 tons of concentrate at 46% antimony. The total amount of gold obtained from the deposit up to 1917 was 6,861 oz. According to reports, high grade material (46% Sb) was shipped to England but lower grade material was kept on site, which would be readily available with no mining cost. The mine

site is located one hour by road north of the provincial capital, Halifax.

Molten Metals' second move was to incorporate a company in Slovakia, Slovak Antimony Corporation. Slovakia was the key source of antimony for the Soviet Union. They have purchased a processing plant in July in Eastern Slovakia. It is planned to process material from the tailings from their Tienesgrund project. Samples from this project show antimony levels of 39.4% and 9.69 g/t of Au.

I am a strong believer in looking at ex-producing mines or mine tailings as new sources of raw material. Typically, they have infrastructure and possibly tailings that were processed using old technology which can be economically recovered with today's improved processes.

The largest applications for metallic antimony are in alloys with lead and [tin](#), which have improved properties for [solders](#), [bullets](#), and [plain bearings](#). It improves the rigidity of lead-alloy plates in [lead-acid batteries](#). [Antimony trioxide](#) is a prominent additive for [halogen](#)-containing [flame retardants](#). Antimony is used as a [dopant](#) in [semiconductor devices](#). It is increasingly important as an essential element in high-capacity molten metal batteries. Antimony production in 2016 was 130,000 tonnes with China producing 100,000 tonnes. A recent report from the USGS shows that total global production of antimony fell to 110,000 tonnes in 2021, and Chinese production dropped to 60,000 tonnes, with Russia in second at 25,000 tonnes and Tajikistan at 13,000 tonnes. Some of the reduction in China was due to COVID production problems and China's focus on environmental issues. As a result, antimony prices rose from an average of \$2.67 per pound versus \$6.65 per pound in October of last year.

A growing fear is that China can use rare earths as a weapon against the USA by throttling back or even banning rare earth exports to the USA. However, I believe there would be a more direct and immediate impact on American industry if China curtails shipments of other key minerals like antimony, which would result in problems for the manufacturing of bullets and electronics plus lead-acid batteries. The USA buys components and assemblies with rare earths in them but not much of key rare earth oxides/carbonates. However, antimony goes directly into manufacturing companies like East Penn, which is the world's largest lead-acid battery producer. It is not hard to imagine the consequences of a sudden reduction in bullet manufacturing and batteries for new vehicles.

On the corporate side, Molten Metals [recently announced](#) additions to their advisory board. An impressive group has been assembled including Donald Sadoway, an inventor of the liquid metal battery for large scale stationary storage and Professor Emeritus in the Department of Materials Science and Engineering, Massachusetts Institute of Technology ("MIT"). Also on the board is Anthony Balmeis who is active in both private and public companies and David Henderson who is very familiar with opaque markets and critical materials over his 35-year career. The fourth member is Alon Davidov, an Angel investor in several companies in the construction-tech, FMCG, natural resources and media industries.

There is much to applaud in Molten Metals' enlightened approach to pursuing opportunities in some of the less-followed elements. I am sure there are other opportunities out there in tailings and old mines which traditionally have been shunned by the markets just waiting to be recognized for their potential.



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# Antimony – Critical or Strategic or Both?

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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.