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HALLGARTEN + COMPANY

Sector Review

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Magnesium

The West Strikes Back?

November 2026

Magnesium
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- + China produces around 86% of the world's primary Magnesium (Mg) and the West has finally taken notice with Mg entering the US critical minerals listing in November of 2025 and being declared a strategic raw material under the EU's Critical Raw Materials Act
- + The US has had no primary Mg production since its only producer filed for Chapter 11 in September of 2025 and the US now imports 75% of what it uses
- + Washington is finally putting its money where its mouth is with a US$19.6mn of Defense Production Act funding for a California brine-to-metal project
- + Demand is anchored in the car industry with castings for automotive purposes taking ~69% of US primary consumption
- + The listed universe in the West can be counted on one hand, so the few real projects stand out
- × Prices are in the doldrums again: China FOB was around US$2,250 per tonne in mid-November and import prices stuck at US£3.13 per lb since April of 2025
- × China can set the price to suit itself, and anti-dumping duties the West's only weapon
- × Production is a physical event not a financial projection: most of the Western pipeline is at pilot or letter of intent stage
- × The Utah smelter is unlikely to restart with the State's interest being in water rights rather than the metal supply
- × Aluminium and zinc can substitute for Mg in castings and wrought products

What Goes Up....

A favourite experiment of lazy high school chemistry teachers is to trot out the magnesium strip. "Have Bunsen burner, will travel!" One can easily and not messily provide a fiery introduction to a subject that might otherwise wallow in a plethora of valences and atomic weights. With a flash, the students are engaged. Then the boredom sets in.

The rise and then fall of Magnesium in 2021-22 seemed to be a similar flash in the pan. Was that a one-off or the harbinger of a turnaround?

Magnesium has scarcely crossed our transom in the past, except for four encounters. The first was as an element in the Salar de Uyuni in Bolivia, the world's largest Lithium *salar* which was a

frequent target for naysayers to claim that magnesium was a deleterious element. Of which more anon. Then there was someone that in 2016 offered us a magnesium deposit in Iran, of all places. We passed on that. Then we came across an explorer pursuing the element in British Columbia in 2024. Most recently, our work on the EU's critical elements targets we looked at a very advanced project in Romania that has been favoured by Brussels.

What is it? Why should we care?

Magnesium has the symbol Mg and atomic number 12. It is a shiny gray metal having a low density, low melting point, and high chemical reactivity. Like the other alkaline earth metals (Group 2 of the periodic table), it occurs naturally only in combination with other elements. As per teenage chemistry l essons, the free metal burns with a brilliant white light.



Magnesium is the eighth most abundant element in the Earth's crust and the fourth most common element in the Earth (after iron, oxygen, and silicon), making up 13% of the planet's mass and a large fraction of the planet's mantle. It is the third most abundant element dissolved in seawater, after sodium and chlorine.

The metal is obtained mainly by obtained mainly by the Pidgeon (thermal) process in China, and by electrolysis of brines elsewhere. It is less dense than aluminium and is used primarily as a component in strong and lightweight alloys that contain aluminium.

Applications

The leading use for primary magnesium metal, which accounted for 45% of reported consumption, was in castings, principally used for the automotive industry. Aluminium-base alloys that were used for packaging, transportation, and other applications accounted for 35% of primary magnesium metal consumption; desulfurization of iron and steel, 16%; and all other uses, 4%. About 31% of the secondary magnesium was consumed for structural uses, and about 69% was used in aluminium alloys.

It is important to note that Mg is critical for performance but accounts for only a small fraction of the total production cost of defense & aerospace end-products.

For example, it makes up:

- < 0.1% of F-35 Lightning II
- ~ 0.5% of Military Helicopters
- Humanoid Robots ~ 0.1% of Tesla Optimus
- In drones ~15–25% Mg content cuts airframe mass ~8–14%, giving about the same % more

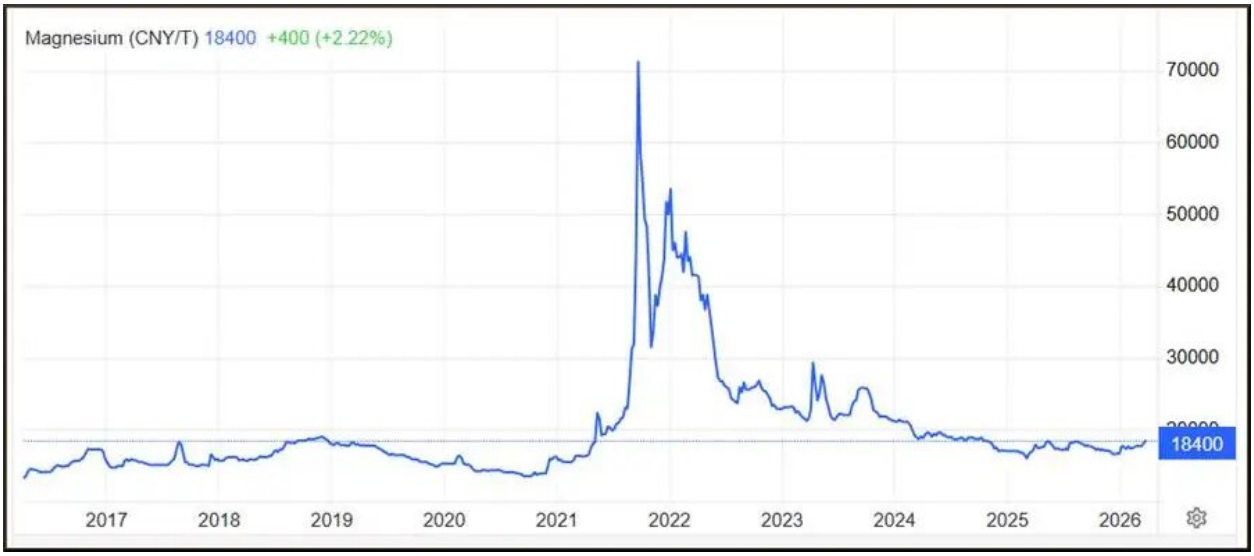
flight time or payload



The Great Magnesium Meltup

At the start of the Pandemic, Magnesium became one of those obscure metals that soared into public attention.

As the chart below (in yuan per tonne) shows spot magnesium prices started going intergalactic in China and Europe starting in March of 2021. The price range in Europe for the first 3 months was US$2,600 to US$2,700 per metric ton. By mid-October, the price ranged from $12,000 to $15,000 per metric ton. In late October, the price range started to decrease and was $7,700 to $9,500 per metric ton by mid-November, before “normalising”.



Source: TradingEconomics.com

A number of factors were cited by the USGS, including constrained shipping, high freight rates, and stockpiling by speculators as reasons for soaring magnesium prices and supply shortages. These combined with strong demand for magnesium by aluminium smelters and diecasters.

Also, in August and September of 2021, many smelters in China closed capacity to comply with energy consumption targets, leading to further shortages which further juiced up prices.

The Producers – Real & Wannabes

In 2021, primary magnesium was produced by one company in Utah. Secondary magnesium was recovered from scrap at smelters that produced magnesium ingot and castings and from aluminium alloy scrap at secondary aluminium smelters. Primary magnesium production in 2021 was estimated to have decreased significantly from that in 2020.

This was due to the bankruptcy of US Magnesium LLC, which had operated an electrolytic process smelter that recovered magnesium from brines from the Great Salt Lake. That then became a tug of war in the courts between the State of Utah and another buyer. The other buyer desisted in January of 2026 and Utah's $30mn offer seemed to get through. Maybe we misinterpreted the rationale, but it seemed to be directed towards getting the State's hands on the 144,000 acre-feet of water-drawing rights from the Great Salt Lake annually and "efforts to address environmental risks". This doesn't sound like they want to revive production.

It's interesting to note the widely divergent potential sources of Magnesium, not that these have produced all that much product. The USGS in its latest musings said that one company in Australia that planned to recover magnesium from coal fly ash. A company in Quebec planned to construct a primary magnesium smelter to produce magnesium from serpentine-bearing asbestos tailings. The same company in Canada completed construction of an 18,000-ton-per annum secondary magnesium smelter at the same location and started production.

Making it to the EU's Hit List

While seemingly unexciting, the Magnesium space was electrified by the Chinese squeeze during the Pandemic and thus the element managed to secure itself a position on the EU's critical minerals list.

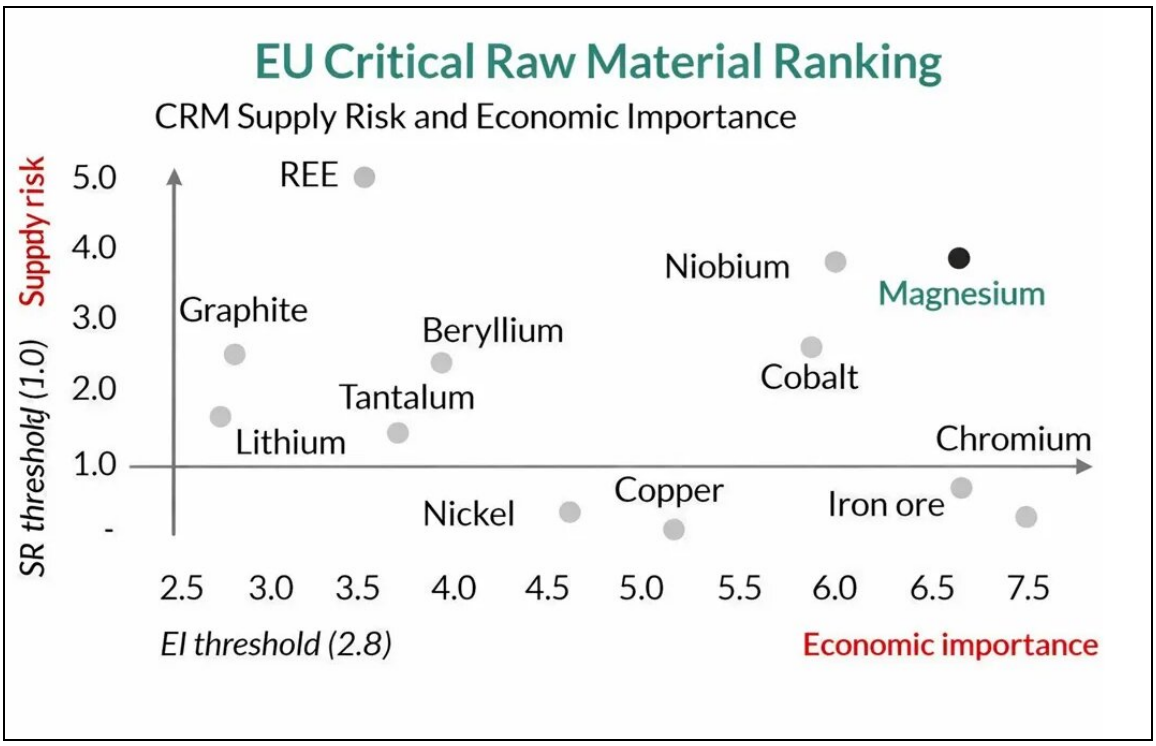
The EU's flailing Circular Economy concept needed a policy shot in the arm that was more than just feel-good verbiage. This was addressed (or so they thought) through the EU critical minerals initiative, which shifted to a legislative basis with the Critical Raw Materials Act (CRMA). This aimed to secure the EU's supply of essential raw materials by reducing import dependencies and promoting domestic extraction, processing, and recycling.

The initiative laid out ambitious targets for EU-based production and processing. It nevertheless fostered strategic partnerships with producer countries and streamlined (in theory) permitting for key

projects to meet the growing demand for green and digital technologies.

The Critical Raw Materials Act (CRMA) entered into force in May 2024 and identified 34 critical raw materials (CRMs) and 17 strategic raw materials (SRMs) based on their economic importance and supply risk.

First list of CRMs – in 2011, a list of 14 CRMs. This went through various iterations until, in 2023, a fifth list of 34 CRMs was published in the Annex II of the Regulation proposal COM(2023) based on the Study on the Critical Raw Materials for the EU 2023 – Final Report.



Production is a physical event, not a financial projection.

In a recent thinkpiece for InvestorNews, the veteran commentator on critical elements, Jack Lifton, noted that: "I believe restoring American primary magnesium production offers us an unusually clear opportunity to answer that question. Magnesium is abundant, its chemistry is well understood, its industrial applications are established, and the United States once possessed a substantial domestic magnesium industry. We are not attempting to discover a new mineral resource. We are trying to recover an industrial capability we once had and later lost.

If federal financing, private capital, and modern process technology cannot restore the competitive American production of magnesium metal and its alloys, then we should seriously question how

quickly those same financial mechanisms can establish entirely new domestic industries for the much more complex rare earths and other critical minerals.

The magnesium industry may therefore provide the most revealing test of whether America's critical minerals policy is creating productive industrial capability or simply financing its promise".

Risks

There are a number of potential risks that should be taken into consideration:

- That the Magnesium price malingers in barely marginal territory
- The Chinese using price signalling (i.e. their usual disinformation/misinformation) to keep wannabes from getting financed
- A surfeit of Western producers
- Financing difficulties for exploration projects

Price is the first and last risk. Western producers have to pay for power, labour and environmental standards that many Chinese smelters do not, yet China FOB was quoted at around US$2,250 per tonne in mid-November and US import prices sat at US$3.13 per lb from April to November of 2025. If the price malingers there, few Western projects make money.

China has form here. With around 86% of world primary output, it can let prices sag just as Western projects go looking for money, and a whisper of idle Chinese capacity coming back is often enough to scare off financiers. Anti-dumping orders on Chinese magnesium help in the US, but they come up for review (the alloy order's fourth five-year review started in October).

Paradoxically, success is also a risk. If Latrobe, Verde, Arkansas Magnesium and others all reach production, a market this small could be swamped by a handful of new plants, and the weakest would be squeezed.

Finally, financing remains patchy. Most of the Western pipeline is at pilot or letter-of-intent stage, and investors are favouring producers over promises. Government money, such as the US$19.6mn of Defense Production Act funding, helps, but it is small change next to the cost of a commercial smelter.

Conclusion

With a market size of around US$6 billion in 2025, Magnesium is not really niche, but the number who focus on it in the marketplace (particularly the mining markets) is *de minimis*. As we have hoped to point out here, the listed players figure on less than the fingers of one hand. Thus, the potential to enter the market is fairly wide open, but few have been bothered. Many in the lithium space have regarded it as a deleterious element either because they could not be bothered adding

a circuit or because they preferred to bad mouth projects/*salares* that had it.

The number of players entering (or claiming to do so) is not potentially disruptive if they are replacing Chinese supply but if they get to production and then are unprotected from the fiery breath of Chinese predatory price action they will all be going the way of US Magnesium.

While never fans of protectionism or tariffs, the Magnesium space either needs "most favoured (Western) supplier status" or new entrants will be vaporized pretty early in the industrial trajectory.

The melt-up of 2021-22 showed the West's vulnerability and yet this vital metal has been given almost zero airtime compared to mollycoddled claimants to criticality, such as Rare Earths.

Appendix I: The Players

Niche, but with Some Contenders

Clearly, the supply crunch of 2021 opened some eyes to the potential. However, it did not produce the type of frenzied rush of promotorial types as Rare Earths did in 2010 (and again post-2020).

A magnesium-bearing ore, a tonne of primary metal and a finished aircraft casting represent three different businesses. These six publicly listed companies show where North America already has industrial capacity and where developers are still trying to build it.

	Activity	Market	Ticker	Currency	Price	Capitalisation (mns)	Rating
Inomin Mines	Explorer	TSX-V	MINE	CAD	$0.06	$3.33	Neutral
Latrobe Magnesium	Explorer	ASX	LMG	AUD	$0.01	$51.67	Neutral
West High Yield	Explorer	TSX-V	WHY	CAD	$0.24	$30.06	Neutral
Verde Magnesium	Processor	N/A	Unlisted				Neutral
Arlington Magnesium	Midstream	N/A	Unlisted				Neutral
Tetra Technologies	Explorer	NYSE	TTI	USD	$5.79	$859.41	Neutral
Magellan Aerospace	End-user	TSX	MAL	CAD	$30.68	$1,751	Neutral
Industrias Peñoles	Producer	BMV	PE&OLES	Mex $	$644.12	$256,000	Neutral

Inomin Mines Inc. (TSXV: MINE) – No Longer the Lone Mg Warrior

This company came to our attention in 2025, and we had a call with management out of curiosity as to its resource. Inomin holds a 100% interest in the 11,000 hectare Beaver-Lynx property in British Columbia, of which it is the project operator. It is advancing with Sumitomo Metal Mining, one of Japan's largest mining and smelting companies. The deal is an earn in and joint venture agreement through which Sumitomo may earn a 60% to 80% interest in the project by funding exploration and providing Inomin other consideration.

The exploration efforts to date, including multiple drill programs, indicates that the Beaver property has potential to host significant volumes of nickel and magnesium. Time will tell.

Verde Magnesium – The EU's Anointed

This company, backed by US private equity investor Amerocap, aims to start production in Western Romania project by 2027. Its plan is to revive a disused mine, shut down in 2014, which would be the first new magnesium metal project in Europe in decades. This has the potential to produce as much as 90,000 tonnes of magnesium a year, meeting around 50% of the EU's demand.

Verde aims to become the EU's first dedicated primary metallic Magnesium producer and also plans to build processing facilities that would use renewable power to recycle aluminum.



This company has vowed to invest US$1 billion in Romania as the country's government has granted it the go-ahead.

This project has made it to the rather exclusive (47 in number) projects that the EU is prioritising.

Latrobe Magnesium Limited (ASX: LMG) – Coal Ash as the Feed

This company is constructing a 1,000 tpa demonstration magnesium production plant in Hazelwood North, Latrobe Valley 150km southeast of Melbourne which was expected to start production in 2025 but doesn't seem to have done so. The company's patented hydrometallurgical extraction/thermal reduction process extracts magnesium metal from fly ash produced by brown coal power plants. The Latrobe Valley was famous for the size and longevity of its brown coal

deposits in the days when Australis produced energy and made things.

LMG hopes to eventually construct a 10,000 tpa commercial production facility in the Latrobe Valley. The company is evaluating larger-scale developments, including a proposed 100,000 tpa plant in Sarawak, Malaysia, and a proposed 50,000 tpa plant in South Carolina, US.

Latrobe's US plans now have a proposed address. In October of 2026, the company signed a nonbinding letter of intent to buy roughly 250 acres at the Colleton Megasite in Walterboro, South Carolina, for US$5mn. The proposed plant would produce 50,000 tonnes of primary magnesium metal a year. The land proposal provides for 120 days of due diligence, with an option to extend that period.

Latrobe's October quarterly report also disclosed letters of intent covering 32,000 tonnes of potential annual sales, equivalent to 64% of planned capacity. The next milestones are a definitive land purchase agreement, committed financing and firm customer contracts. Those are the steps that would turn the proposed capacity into a project customers could plan around.

Industrias Peñoles, S.A.B. de C.V. (BMV: PE&OLES) | US$16.56 billion

At Química del Rey in Ocampo, Coahuila, Peñoles already produces magnesium compounds at industrial scale. The complex turned out 76,217 tonnes of magnesium oxide and 65,925 tonnes of magnesium sulfate in 2025. Magnesium oxide output rose 13.6% from 2024, helped by recovering demand for several grades, particularly the refractory grade used by steel and cement producers. That material goes into bricks that line high-temperature furnaces and kilns.

The operation also illustrates how one chemical business can supply another. Peñoles makes magnesium oxide using residual brine from its sodium sulfate operation and dolomite from its La Esmeralda mine. Química del Rey's contribution to the regional supply chain is a line of magnesium compounds that industrial customers already buy in volume.

Magellan Aerospace Corporation (TSX: MAL) | US$1.38 billion

Magellan shows what happens further down the chain, where magnesium alloys become aircraft parts. Its Haley, Ontario, foundry specializes in large, complex precision sand castings, including engine cases and helicopter transmission housings. Its Glendale, Arizona, facility makes smaller castings, including accessory gearbox housings and covers. Magellan can also machine and assemble castings within its own manufacturing network.

In 2023, Magellan announced a long-term agreement extension with Collins Aerospace to supply complex magnesium and aluminum castings for military and commercial aircraft programs. The agreement gives the magnesium supply discussion a concrete customer and a set of parts that North American foundries already know how to make.

TETRA Technologies, Inc. (NYSE: TTI) | US$914.35 million

TETRA and Magrathea are testing whether Arkansas brine can support commercial production of primary magnesium metal. In June, their Arkansas Magnesium joint venture reported producing metal of more than 99.9% purity from Smackover brine sourced from TETRA's acreage in Lafayette County. Magrathea used its electrolytic process to produce the sample, which met ASTM B92 specifications for primary magnesium.

The partners bring different pieces of the proposed operation. TETRA supplies the brine resource and an industrial site at its Evergreen chemical campus, while Magrathea supplies the process technology. The June result established that the Arkansas feedstock could yield metal that meets the specification. The next commercial test is whether the first plant, which was in engineering when the result was announced, can achieve that quality consistently at scale.

West High Yield Resources Ltd. (TSXV: WHY | FSE: W0H)

West High Yield's Record Ridge project near Rossland, British Columbia, would enter the supply chain as a mine selling magnesium-rich serpentine ore. The project reviewed by the Impact Assessment Agency of Canada envisaged annual production of approximately 63,500 tonnes of magnesium-bearing ore. In March, the company signed a definitive forward sales agreement with U.S.-based Galaxy Trade and Technology for ore from the proposed mine. Downstream processing remains a longer-term part of the company's plans.

Record Ridge received its provincial Mines Act permit in October 2025 and a highway access permit in June 2026. A September timber-cutting licence moved it closer to site preparation. In that update, West High Yield said it was still pursuing an environmental authorization and would have to post the balance of its reclamation security and satisfy other pre-disturbance conditions before clearing could begin.

Appendix II:
The Salar de Uyuni

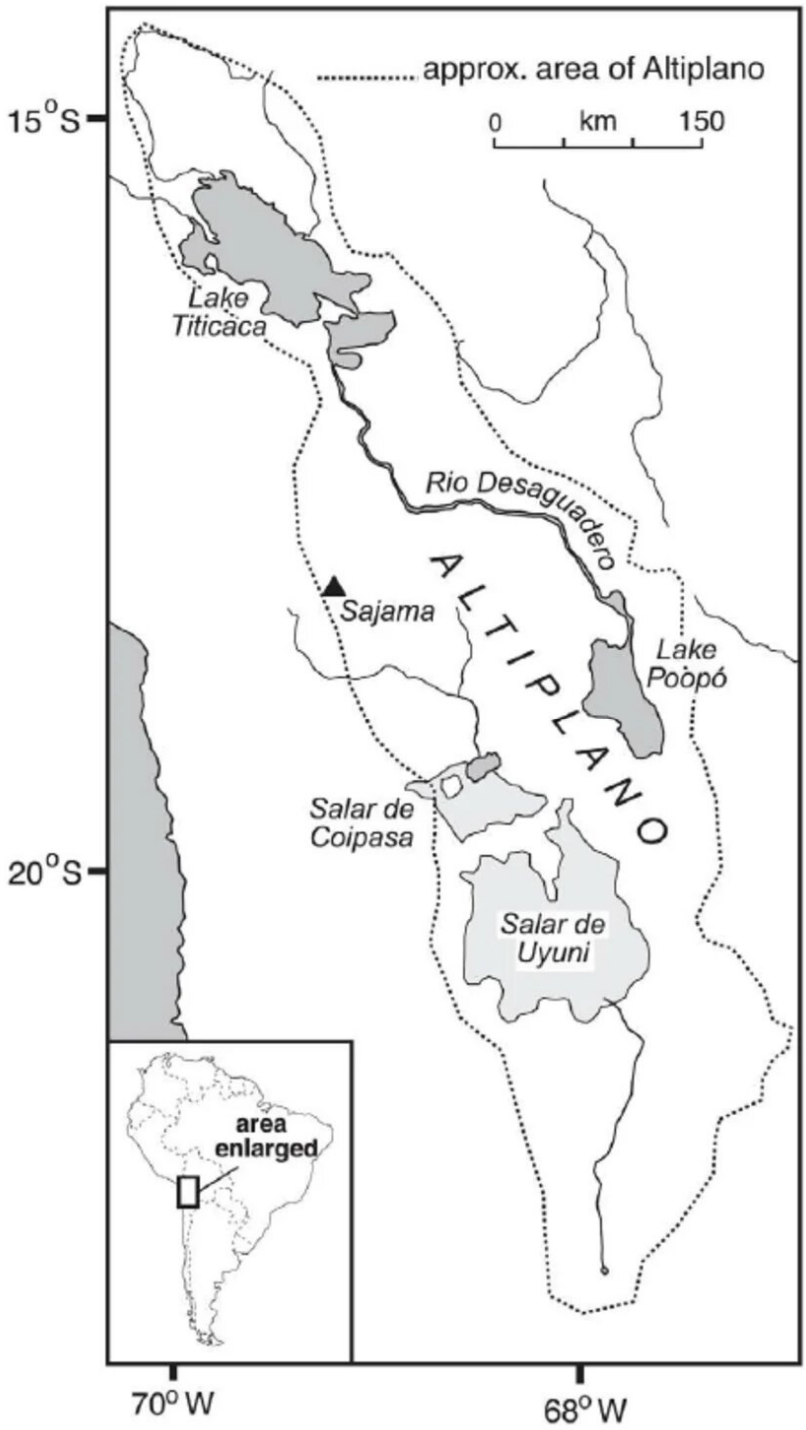
Biggest (and Best?)

The Salar de Uyuni, has an area of about 9000 km^2 and is the largest salt pan on earth. There are also two other nearby *salares* of Coipasa and Empexa in the southern part of the Bolivian Altiplano show the presence of widespread lithium-rich brines.

Preliminary investigations at Salar de Uyuni and the nearby *salares* of Coipasa and Empexa in the southern part of the Bolivian Altiplano show the presence of widespread lithium-rich brines.



The crystalline saline material and brines in these *salares* are residual from a former large lake, Lago Minchin, that occupied much of the southern Bolivian Altiplano during late Pleistocene time, augmented by saline material carried to the *salares* by streams since final drying of this lake. Thermal springs associated with rhyolitic volcanic rocks of Quaternary age may have been a major source of the lithium.



Throwing Shade on Mg

As mentioned, the world's largest *salar*, located in Bolivia is constantly belittled for its Magnesium content. This fallacious commentary is usually directed to the cheap seats in the Lithium space trying to talk up their own *salares* and downplaying the "threat" to whatever their own project might be from Uyuni finally starting to move forward in a concerted way under a stable Bolivian regulatory regime.

So far, the missing component has always been the stability factor in La Paz.

The trash-talking of this *salar* usually relates to its Magnesium component. This dissing of Uyuni dates back to a period where the Mg factor in whatever output looked deleterious because the price of Mg was derisory and Mg's dominance by China was not seen as a threat, i.e. the metal was not critical.

Times have changed after alarm bells rang on Chinese dominance. Moreover, the bulk of the brine exploitation being proposed has moved towards DLE where the Mg does not present the challenges it did when the Lithium was only exploitation via evaporation ponds.

Grades – Magnesium @ 20:1

The USGS in a paper dating from 1978 reported on widely scattered brine samples from Salar de Uyuni, and the neighbouring *salares*, showing lithium values ranging from 80 to 1500 ppm. High values of 300–700 ppm were most prevalent in an area of about 2500 km^2 in the east-central and southeastern part of the *salar*. A few brine samples in small areas in Coipasa and Empexa Salars had values ranging from 170 to 580 ppm Li. All the brines were essentially saturated with halite and are moderately high in sulphate (5000–15,000 ppm SO_4) but low in carbonate (<500 ppm HCO_3). Potassium and magnesium values are relatively high, chiefly in the range of 2000–20,000 ppm, and the K:Mg ratio is about 1:1.

The key thing to note is that the Li:K and Li:Mg ratios are relatively constant at about 1:20.

Characteristics

The Salar de Uyuni is the largest resource of lithium (Li) in the world not only contains a high level of Li but also ~ 1.3% w/w magnesium (Mg) in strong NaCl brines. The recovery of Mg is therefore essential as the resources represent high value of Mg by-products if recovered. High purity hydrated magnesium carbonate (HMC as dypingite or hydromagnesite) could be recovered from the Uyuni brines, by a precipitation process, to create an easy-saleable product.

The Current State of Play

Currently, Lithium extraction at the Salar de Uyuni operates under state control rather than traditional private mining concessions, as Bolivia's constitution reserves lithium for the state. Historically, this activity has been dominated by state firm *Yacimientos de Litio Bolivianos* (YLB).

YLB was initially established under Evo Morales in 2008, with operations centred around the Llipi area on the Salar de Uyuni. The formula to industrialize lithium in Bolivia has its roots in the

National Development Plan (NDP) Bolivia with Dignity, Sovereignty, Productive and Democratic way to Live Well (NDP, 2006-2011).

Progress was halting, to say the least. According to an NGO, the Fundacion Solon, up until 2020, the total amount of credit disbursed by the Central Bank of Bolivia to the state company YLB was US$772mn. This debt, at that time, was equivalent to 72% of the debt of Bolivia with China (US$1,073mn), was more than twice the debt of Bolivia with France (US$344mn) and was equivalent to 58% of the debt disbursed by the World Bank (US$1,325mn). Up until 2019 the total accumulated sales were a mere US$11.9mn while the accumulated payments for interest and debt amortizations reached US$25.7mn.

The 70-year concession was given by the Bolivian government in Supreme Decree 3738 to a joint venture between YLB and the small German company ACISA (ACI Systems Alemania). In November of 2019, the government of Evo Morales had to repeal the Supreme Decree 3738 because of strong social protests, and the new government of MAS (Movement Toward Socialism) began conversations with ACISA which ultimately saw the Germans depart.

The previous government, citing production far below its 15,000-tonne annual plant capacity, signed agreements worth over US$2bn in 2024 with Russia's Uranium One Group and China's CBC consortium.

After that, the framework shifted again amid stalled output, the foreign direct-extraction agreements, and policy changes under President Rodrigo Paz. Most recently, in late 2026, the Paz administration moved to reshape lithium governance, including creating a six-ministry commission (which sounds mind-bogglingly unwieldy) for Bolivia's *salares* and proposing a new lithium law and international tender to court Western investors.

Those 2024 contracts, however, lacked congressional approval and faced pushback, with reports in late 2026 indicating the Paz administration had halted, or paused, state operations and contracts that had been negotiated with the Chinese and Russian partners, while reviewing the framework.

Summary

Taking the volume of Lithium estimated to be contained in the Salar de Uyuni and multiplying by a factor of 20 one can see that Bolivia is the (potential) Saudi Arabia of Magnesium.

Important disclosures

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