



Weekly Precious Metals News Articles: December 24, 2021

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Below is a cross section of relevant news article to the world of Precious Metals:

Markets, Supply & Demand, Investment, and Industrial Applications.

Printable PDF version attached. Enjoy-

Merry Christmas

Gold

- **Gold adds to climb above \$1,800 to register highest finish in 5 weeks**
 - Gold futures climbed Thursday, finishing in positive territory for the day and week, ahead of the Christmas holiday Friday, after several days highlighted by concerns that the spread of the omicron variant of the coronavirus may impact the economic outlook in the new year. February gold closed \$9.50, or 0.5%, higher to settle at \$1,811.70 an ounce, marking the highest close for the most-active futures contract since Nov. 19.
<https://www.msn.com/en-us/money/markets/gold-adds-to-climb-above-241800-to-register-highest-finish-in-5-weeks/ar-AAS6ae9?ocid=BingNewsSearch>
- **Gold clings around \$1,800 as holiday lull sets in**
 - Noise on a low volume day ahead of Christmas - analyst
 - Gold on course for weekly gains
 - Palladium climbs over 9.2% for the week
 - Gold prices hovered around the key \$1,800-per-ounce level on Thursday ahead of the year-end holidays, even as the dollar steadied and appetite for riskier assets improved on easing fears over a fallout from the Omicron coronavirus variant. Spot gold was up 0.4% to \$1,809.89 per ounce by 1841 GMT, while U.S. gold futures settled up 0.5% at \$1,811.70 per ounce.
<https://www.reuters.com/markets/europe/gold-clings-around-1800-holiday-lull-sets-2021-12-23/>

Semiconductor Related Articles (impacting Precious Metals electronics):

- **17 Semiconductor Companies Forecast to Have >\$10.0 billion in Sales This Year**
 - Samsung, Intel, TSMC, SK Hynix, Micron, Qualcomm, Nvidia, Broadcom, Media Tek, TI, AMD, Apple, ST, AMD, NXP, and Analog Devices all are forecast to make between \$10 to \$80 billion USD in revenue in 2021.
<https://www.icinsights.com/news/bulletins/17-Semiconductor-Companies-Forecast-To-Have-100-Billion-In-Sales-This-Year/>

- **Chip crunch likely to improve in 2H22 as new capacities start production, says Central Bank**

Taiwan's Central Bank Governor Yang Chin-long said the chip crunch, which was caused by the imbalance in supply and demand due to severe epidemic in the first half of 2020 and the stronger-than-expected economic recovery in the second half, is expected to improve significantly in the second half of 2022.

<https://www.digitimes.com/news/a20211216VL206.html>

- **Semiconductor outlook**

- Semiconductor sales are expected to grow by >20% to \$550 billion in 2021 after growing 10.8% to \$464 billion in 2020. 2022 chip forecasts are all over the map. UBS is the most bullish with 15.8% growth, followed by IC Insights (10.8%), WSTS (10.1%), Gartner (9.9%), Semico (6.0%) and Omdia (4.2%), according to a slide during the presentation.
- The average among those forecasts is 9.5%, according to SEMI. That's still decent growth, but the ongoing chip shortage situation will likely extend into 2022 and ruin the party. "Shortages, initially for automotive, are spreading across the board, mostly at legacy technologies," Manocha said.

<https://semiengineering.com/masks-and-forecasts-at-semicon/>

- **2030 Long Term Outlook for Defense-Grade FPGA is not favorable**

- FPGA device maker failure to qualify additional suppliers of solder columns in 2022 may result in a collapse of American made FPGA for use by U.S. military in 2030. As a consequence, defense grade FPGA chips, including devices with sensitive IP must be entrusted to foreign countries, such as China. Signals end of US dominance in a once venerable onshore industry. FPGA are critical components for keeping US warfighters flying.

<https://www.topline.tv/MEPTEC10.html>

Silver

- **Silver Price Forecast – Silver Markets Continue Grind Higher**

- Silver markets have initially pulled back during the trading session on Friday but then turned around to show signs of strength again. Silver has recently been climbing again, suggesting that perhaps we have just formed a massive "double bottom."

<https://www.fxempire.com/forecasts/article/silver-price-forecast-silver-markets-continue-grind-higher-849847>

- **Silver Forecast: Threatening Resistance to the Upside**

- Silver markets rallied on Wednesday to reach towards the \$22.75 level. This is an area that has been resistance a couple of times over the last few days, and now it looks like we are trying to break out above there. If we can, then it is possible that we could go looking towards the 50 day EMA which is sitting at the \$23.17 handle.

<https://www.dailyforex.com/forex-technical-analysis/2021/12/silver-forecast-threatening-resistance-to-the-upside-december-23-2021/172461>

- **\$1 million of silver bullion stolen from truck traveling between Sydney and Melbourne**

- Matt: That's over 3,000 pounds of silver. Ho Ho Ho.

<https://www.kitco.com/news/2021-12-21/-1-million-of-silver-bullion-stolen-from-truck-traveling-between-Sydney-and-Melbourne.html>

Precious Metals Mining:

- **Nornickel plans to invest \$8 billion in energy infrastructure development to 2030**

- In addition to new power transmission lines, the company will invest in construction of four power units at two heat power plants in Norilsk

<https://tass.com/economy/1378493>

- **Generation Mining Secures \$240 Million Stream with Wheaton Precious Metals**
 - Generation Mining is pleased to announce that it has agreed to enter into a definitive Precious Metal Purchase Agreement with Wheaton Precious Metals Corp. in respect to the Marathon Palladium Copper project in Northwestern Ontario (the "Marathon Project"). The Marathon PMPA becoming effective is subject to the closing of Gen Mining's acquisition of the remaining 16.5% interest in the Marathon Project from Sibanye Stillwater Limited
<https://www.csiro.au/en/work-with-us/industries/mining-resources/Resourceful-magazine/Issue-25/Biomining>
- **Anglo American Platinum to Sell Interest in South African Mine to African Rainbow Minerals Ltd.**
 - Anglo American Platinum Ltd. said on Monday that it will sell its 49% interest in South Africa's Bokoni mine to African Rainbow Minerals Ltd. for 3.5 billion rand (\$220.2 million).
<https://www.marketwatch.com/story/anglo-american-platinum-to-sell-interest-in-south-african-mine-to-african-rainbow-minerals-ltd-271639981141>
- **Zimbabwe waves use it or lose it stick on big platinum project**
 - Mnangagwa's administration is keen to see companies holding mining claims develop them into productivity. The Todal-Bokai Platinum Project is one such operation that the government wants to jump into productivity.
 - "Cabinet also considered the need to get the Todal-Bokai Platinum Project next to Unki Mine into production as soon as possible so that it contributes to the \$12 billion mining industry milestone," notes a post-cabinet report released on Tuesday.
<https://www.iol.co.za/business-report/companies/zimbabwe-waves-use-it-or-lose-it-stick-on-big-platinum-project-4efc326c-ffb4-4b63-a695-ec96d05965a4>

E-Waste & Precious Metals Recycle Related:

- **Microbes to mine metals from e-waste?**
 - Biomining is already used at a large scale to bioleach metals from low-grade ores and biooxidise refractory sulfidic gold ore concentrates before cyanidation. Currently, 10–15 per cent of the world's copper and about 5 per cent of the world's gold are mined this way. Dr Kaksonen points out that primary ore resources are becoming progressively depleted globally, making e-waste a more critical resource for the minerals sector. "E-waste is like a high-grade ore – it's often called an urban mine," she says. "For example, there is up to 100 times more gold in a tonne of mobile phones than in a tonne of gold ore."
<https://www.csiro.au/en/work-with-us/industries/mining-resources/Resourceful-magazine/Issue-25/Biomining>
- **DIFS urges consumers to take precautions against catalytic converter theft**
 - With a rising number of catalytic converter thefts occurring across the country, Department of Insurance and Financial Services (DIFS) Director Anita Fox is encouraging Michiganders to review steps they can take to protect against these thefts, especially since the expensive damage caused by this crime may not be covered by their auto insurance policies.
<https://wtvbm.com/2021/12/21/difs-urges-consumers-to-take-precautions-against-catalytic-converter-theft/>
- **ERI details operational numbers in first ESG report**
 - ERI recycled 113.7 million pounds of scrap electronics and resold 4.3 million pounds of used devices in 2020, the company recently disclosed. It's the first time the processor has released these figures.
<https://resource-recycling.com/e-scrap/2021/12/23/eri-details-operational-numbers-in-first-esg-report/>

Platinum

- **Chemical's giant Johnson Matthey sells health division to focus on green tech**
 - JM blamed a "challenging" market for pharmaceuticals as it offloaded its health business to a US private equity firm for £325 million. The sale comes hot on the heels of the FTSE 100 group dumping its battery division last month, a surprise move which sent its share price spinning to a 12-month low.

<https://www.standard.co.uk/business/johnson-matthey-health-altaris-aviation-fuel-b972576.html>

- **Novel 2D catalyst can break the ties that bind in methane**

- Methane, which produces more warming than other greenhouse gases and is the subject of newly announced US emission restrictions, is hard to break down and keep out of the atmosphere. Typically, breaking these bonds involves high temperatures and mixing the flammable gas with oxygen to produce syngas to make methanol or with hydrogen to make ammonia. That's expensive and potentially explosive. Other conversion reactions aren't very efficient and also produce the most abundant of the greenhouse gases, carbon dioxide (CO₂).
- The catalyst consists of one or two layers of platinum, each layer just an atom thick, deposited on two-dimensional metal carbide structures called 'MXenes'. In this case, the structures are made from carbon, molybdenum and titanium.

<https://www.materialstoday.com/nanomaterials/news/novel-2d-catalyst-ties-that-bind-in-methane/>

- **Work begins on Canada's next truck emissions standards and targets**

- The federal government has already committed to building on heavy-duty vehicle emissions standards for post-2025 vehicles, and regulators are following California in a bid to have many categories of new medium- and heavy-duty vehicles generating zero emissions by 2040.

<https://www.trucknews.com/transportation/work-begins-on-canadas-next-truck-emissions-standards-and-targets/1003155934/>

Fuel Cells/Hydrogen Economy Related Articles:

- **Advent and BASF sign agreement related to manufacture of advanced fuel-cell membranes - Chemical Engineering**

- Advent Technologies and BASF New Business GmbH recently signed a Memorandum of Understanding. The agreement aims to develop and increase the manufacturing scale of advanced fuel cell membranes designed for long-term operations under extreme conditions. BASF intends to improve the long-term stability of its Celtec membrane and to increase production capacity with advanced technical capabilities to enable further improved and competitive Advent fuel cell systems and membrane electrode assembly.

<https://www.chemengonline.com/advent-and-basf-sign-agreement-related-to-manufacture-of-advanced-fuel-cell-membranes/?printmode=1>

- **SoCalGas and Bloom Energy to use gas blending for hydrogen economy**

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<https://www.hydrogenfuelnews.com/hydrogen-economy-caltech/8550544/>

- **Caterpillar to launch demonstration project using hydrogen fuel cell technology**

- Caterpillar has announced that the company has launched a 3-year project through a collaboration with Microsoft and Ballard Power Systems to demonstrate a power system incorporating a large-format hydrogen fuel cell to produce reliable and sustainable backup power for data centres. The project is supported and partially funded by the US Department of Energy under the H2@Scale initiative and backed by the National Renewable Energy Lab.

<https://www.intelligentdatacentres.com/2021/12/23/caterpillar-to-launch-demonstration-project-using-hydrogen-fuel-cell-technology/>

- **Trudeau presses for Canada to become a critical mineral powerhouse**

- Justin Trudeau wants to make Canada a global leader in the production of batteries for EVs, and asked for a review of investment legislation to protect industry from hostile foreign investors. Innovation Minister François-Philippe Champagne will be working to unlock the country's large rare-earth mineral deposits to put Canada at the forefront of supplying the world with these elements, vital to electric vehicles, smartphones, high-tech equipment and military hardware.

<https://www.theglobeandmail.com/cdn.ampproject.org/c/s/www.theglobeandmail.com/amp/politics/article-trudeau-wants-action-on-critical-minerals-and-renewal-of-investment/>

- **Could hydrogen airships return as fast, cheap, green cargo transports?**
 - California startup H2 Clipper wants to bring back hydrogen-filled airships, claiming they can unlock completely green intercontinental cargo operations carrying 8-10 times the payload of any cargo plane over 6,000 miles, at a quarter of the price.
<https://newatlas.com/aircraft/h2clipper-hydrogen-dirigible-cargo/>

Palladium

- **Palladium Is Poised for a Rebound After Being 2021's Worst Metal**
 - There are better days coming soon for palladium as Chinese purchases pick up and supply chain problems eventually ease, according to Nikos Kavalis, managing director at Metals Focus.
 - "We therefore expect a big rebound in demand, which should also be augmented by stock replenishment in China after a year of extremely low imports," he said. "The market will move back into deficit in the second half of next year, driving prices up."
<https://www.bnnbloomberg.ca/palladium-is-poised-for-a-rebound-after-being-2021-s-worst-metal-1.1699219>
- **Domino effect: Palladium price dives as full weight of semiconductor shortage hits home**
 - Palladium has had a turbulent 2021, from May's all-time peak price of \$3,019 to this week's yearly low of \$1,542. During the first half of the year the price enjoyed a tailwind of Russian mine closures, increased loadings from the implementation of the China 6 emissions standards and pent-up consumer vehicle demand. But since May the market has trended down significantly, and Metals Focus reckons this comes down to one thing – the global chip shortage.
<https://stockhead.com.au/resources/domino-effect-palladium-price-dives-as-full-weight-of-semiconductor-shortage-hits-home/>
- **Palladium ETF Could Rally in 2022**
 - PALL has declined 27.4% so far this year. The ETF was 5.6% higher on Wednesday and rose 10.7% over the past month. Some market observers anticipate that the precious metal will rally next year as a revival in the auto sector boosts demand for the metal used in engine exhausts before the momentum behind electric vehicles sends prices into a long-term decline, Reuters reports.
<https://www.nasdaq.com/articles/palladium-etf-could-rally-in-2022>
- **EPA announces stricter new vehicle emissions standards**
 - The final standards, which will take effect for the model years 2023 through 2026, aim to "unlock \$190 billion in net benefits to Americans," the EPA said, including reducing climate pollution, improving public health, and saving drivers money at the pump. The final rule also delivers more net benefits to consumers than the proposed rule, which came in August, the agency said.
<https://www.chron.com/news/article/EPA-announces-stricter-new-vehicle-emissions-16719628.php>

PGM Minor Metals (Rhodium, Iridium, Ruthenium, Osmium)

- **Advanced New Catalysts for More Efficient Clean Hydrogen Production**
 - An active phase of a catalyst based on amorphous iridium hydroxide exhibited efficiency 150 times that of its original perovskite structure and close to three orders of magnitude better than the common commercial catalyst, iridium oxide.
<https://scitechdaily.com/advanced-new-catalysts-for-more-efficient-clean-hydrogen-production/>
- **Low-light dye sensitized solar cells for connected devices**
 - U.S.-based technology company Ambient Photonics has been awarded a \$162 million loan guarantee by the U.S. Department of Energy for the construction of a low-light solar cell production facility.
 - "We have not yet made a public announcement of the location for either our first or second factory," the company's CEO and founder Bates Marshall. "But we can disclose that both factories will be in the

U.S., with the first located in California, and that funding from the DoE is for the second factory. We can also share that the first factory will be able to deliver tens of millions of cells and the second facility will have roughly ten times the capacity of the first.”

- *Matt: Multiple technical references indicate likely involves Ruthenium thin film technology.*
<https://www.pv-magazine.com/2021/12/23/low-light-dye-sensitized-solar-cells-for-connected-devices/>
- **Ambient Photonics Invited to Submit Part II Application for Proposed \$162 Million From DOE’s Title XVII Loan Guarantee Program**
<https://www.businesswire.com/news/home/20211221005277/en/>

Clean Energy General News **(New Section)**

- **Global renewable capacity surges 4.7% in 2021 as countries focus on clean energy projects**
 - Global renewable energy capacity jumped 4.7% in 2021, as countries focus on reducing emissions to protect the environment. The total installed renewable capacity reached 227 GWs this year, mainly driven by residential solar and offshore wind projects, according to a report from Rystad Energy.
 - “The renewable energy industry is facing some of its most significant challenges yet over the short term, but the future has never looked brighter with new and aggressive commitments from governments and companies alike,” Gero Farruggio, head renewables R&D with Rystad Energy.
<https://www.msn.com/en-ae/money/news/global-renewable-capacity-surges-4-7-in-2021-as-countries-focus-on-clean-energy-projects/ar-AAS70Cx?ocid=BingNewsSearch>
- **Copper market in 57,000 tonne deficit in Sept - ICSG**
 - The global refined copper market swung into a 57,000 mt deficit in September from a surplus of 56,000 mt in August, the International Copper Study Group (ICSG) said in its latest monthly bulletin.
<https://www.nasdaq.com/articles/copper-market-in-57000-tonne-deficit-in-sept-icsg>
- **The Dirty Truth About Clean Technologies**
 - The poor South is being exploited so that the rich North can transition to environmental sustainability. Entire swaths of land are being destroyed to secure the resources needed to produce wind turbines and solar cells. Are there alternatives?
<https://www.spiegel.de/international/world/mining-the-planet-to-death-the-dirty-truth-about-clean-technologies-a-696d7adf-35db-4844-80be-dbd1ab698fa3>

The Dirty Sources of Clean Energy

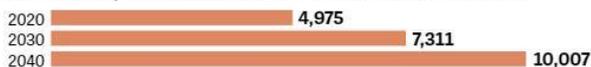
Global demand for mineral raw materials for the expansion of clean energy technologies, in 1,000 metric tons. Forecasts for 2030 and 2040 factor in the targets of the Paris climate agreement*

■ copper
 ■ nickel
 ■ lithium
 ■ cobalt
 ■ rare-earth metals
 ■ other**
 — key mineral raw materials for all technologies —

For Electric Vehicles and Battery Storage battery-operated and plug-in hybrid vehicles

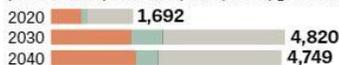


For Electricity Networks Übertragung, Verteilung und Transformatoren



For Low-Emission Power Generation

photovoltaics, solar heat, wind, water, geothermal, bio energy, nuclear power



For Hydrogen Technology electrolyzers and fuel cells



*Global warming stabilizes at well below an increase of 2°C compared to pre-industrial times; ** excluding steel and aluminum

Sources: IEA (2021) World Energy Outlook Special Report, IEA data (2021, compiled by DER SPIEGEL)

BEV / LiB Battery Market News

- **China is buying up the critical green-revolution minerals sector in Canada and elsewhere. Enough already**
 - China has been quietly buying lithium producers and deposits around the world for years and is also going after cobalt, another vital component of car batteries, and rare earths, a group of 17 specialty metals that are indispensable for the manufacture of high-tech products such as electric motors, mobile phones, wind turbines, hard disk drives and LEDs.
 - China's strategy is obvious and hardly a secret: It wants to lock up the raw supplies and the processing capability of the metals that will power the next industrial revolution, from EVs and other clean-energy innovations to leading-edge consumer electronics.
<https://www.theglobeandmail.com/business/commentary/article-china-is-buying-up-the-critical-green-revolution-minerals-sector-in/>
- **Battery Giant LG Energy Strikes Supply Deal With Recycling Firm - Li-Cycle**
 - South Korea's LG Chem Ltd. and its battery unit LG Energy Solution agreed to buy 20,000 metric tons of battery-grade nickel from Li-Cycle over 10 years starting in 2023 as part of a deal that includes a \$50 million investment in the Canadian firm, the companies said Tuesday in a statement. LG Energy Solution, the world's No. 2 EV battery producer, will also sell nickel-bearing lithium-ion battery scrap and other materials to Li-Cycle under the pact.
<https://li-cycle.com/news/battery-giant-lg-energy-strikes-supply-deal-with-recycling-firm/>
- **Nornickel Harjavalta Wins Eur 15 million Grand from Finland.**
 - Business Finland has granted EUR 15 million in funding for Nornickel Harjavalta's expansion investment, which will support the growing demand of responsibly produced battery materials in the EU for EVs with a low carbon footprint. With the investment, Nornickel Harjavalta's production capacity will be increased from 65 ktons to 100 ktons nickel content in metal and chemical products.
 - The expansion investment will be implemented in two stages. In the first one, production will increase from 65 ktons to 75 ktons in 2023. During the second stage, production will increase to more than 100 ktons by the beginning of 2026.
<https://www.nornickel.com/news-and-media/press-releases-and-news/nornickel-harjavalta-wins-eur-15-mln-grant-from-finland/>
- **Rio Tinto buys Argentina lithium project for \$825m**
 - Rio Tinto is expanding its lithium ambitions beyond the Jadar project in Serbia by agreeing to buy the Rincon brine project, located in the heart of the lithium triangle in Argentina's Salta Province. The \$825 million acquisition comes as analysts warn of an imminent and "significant" supply gap for lithium, driven by booming demand for the metal used in electric vehicles (EV) and green technologies.
<https://www.mining.com/rio-tinto-to-buy-lithium-project-in-argentina-for-825m/>
- **Chile's Presidential Election Puts Billions of Mining Investment on the Balance**
 - **Lithium:** Chile announced plans on Oct. 13, 2021 to auction five new lithium developments, with a quota for each of 80,000 tonnes of lithium metal equivalent annually, potentially unlocking lithium reserves outside the country's largest salar, the Salar de Atacama.
 - The new projects, which would take around decade to put into production, could produce as much as 100,000 tonnes of lithium carbonate equivalent for the global market each year, increasing Chile's production by 71% above 2021 forecast levels, according to S&P Global Market Intelligence.
 - **Copper:** During his victory speech, Boric, who is part of a broad leftwing coalition that includes the Chilean Communist party, said he would oppose mining initiatives that "destroy" the environment. This included the \$2.5-billion (Iron Ore & Copper) Dominga mining project that was approved this year. The mining project would be is located ~500 km north of the capital Santiago, near ecological reserves.

<http://prospectorportal-8333928.hs-sites.com/your-weekly-nugget-5?>

- **Lithium supply: Posco to build \$830m plant in Argentina**

- Leading South Korean steelmaker Posco will spend \$830 million on lithium production in Argentina as it seeks to become a major supplier of electric vehicle battery materials. The steelmaker will build a plant near the Hombre Muerto salt pan, an Andes Mountains site that is a rich source of lithium.
- The facility will be capable of extracting roughly 25,000 tons of lithium hydroxide a year, enough to make batteries for 600,000 EVs, the company said Thursday.

<https://asia.nikkei.com/Business/Materials/Lithium-supply-Posco-to-build-830m-plant-in-Argentina>

- **Large US manufacturer orders LFP cells from Gotion - electrive.com**

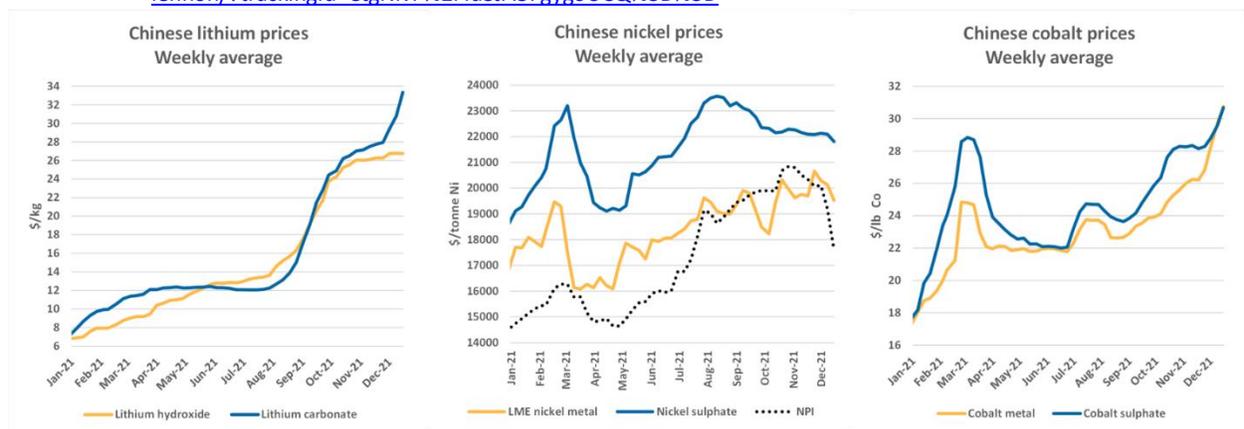
- Chinese battery cell manufacturer Gotion High-Tech has signed a supply agreement with a major publicly traded US automaker to supply it with LFP cells. Gotion is not disclosing the name of the customer, but there are suggestions it could be Tesla.
- The supply agreement covers the years 2023 to 2028 and includes a total volume of at least 200 GWh. Gotion will produce LFP batteries in China and export them to the customer. The partners also plan to localize the production and supply of LFP batteries in the US, as well as jointly explore the possibility of establishing a joint venture in the future.

<https://www.electrive.com/2021/12/20/large-us-manufacturer-orders-lfp-cells-from-gotion/>

- **Nickel prices underperform cobalt and lithium 2021**

- Demand for battery materials has risen fastest for, despite the booming production of LFP batteries in China. Nickel use in Chinese ternary precursor production is up almost double in 2021 compared with 2020. Despite this, nickel prices have lagged price gains of lithium and cobalt for (at least) two reasons:
- 1) Unlike lithium and cobalt, nickel had an abundance of inventories to draw upon from LME warehouses and most of the incremental Chinese demand for nickel in batteries has come from this source (over 100kt Ni), thus preventing any real shortages developing.
- 2) All of the supply growth in nickel in 2021 has come from Indonesia, where production has risen over 40% y/y in 2021 and there is an ongoing concern that the growth in 2022 could be even bigger than this year. For the battery market, supply from Indonesia could be 100kt+ from new HPAL plants and NPI to matte conversion facilities. On top of that NPI production growth could be another 250kt+.

<https://www.linkedin.com/pulse/nickel-prices-underperform-cobalt-lithium-2021-jim-lennon/?trackingId=CtgNlvP%2Fid3JA87gygoUCQ%3D%3D>



Regards –