



## Weekly Precious Metals News Articles: January 21, 2022

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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-

### Gold

- **Gold prices settle at 2-month high, buoyed by inflation worries**
  - Gold futures climbed on Wednesday to settle at their highest in two months, with the precious metal finishing in positive territory for the first time in four sessions.  
<https://www.msn.com/en-us/money/markets/gold-prices-settle-at-2-month-high-buoyed-by-inflation-worries/ar-AASVVBU?ocid=BingNewsSearch>
- **Gold firms on weak dollar; higher Treasury yields weigh**
  - The focus is now on the U.S. Federal Reserve's Jan. 25-26 meeting after policymakers signalled last week that they would start raising interest rates in March to tame surging inflation. "In our opinion, market participants are likely to refrain from buying gold ahead of the U.S. Fed's first rate hike," Commerzbank analysts wrote in a note.  
<https://www.nasdaq.com/articles/precious-gold-firms-on-weak-dollar-higher-treasury-yields-weigh>
- **What Drives the Price of Gold? Part 1**
  - Part 1 – Published Sept 2021  
<https://thegoldobserver.substack.com/p/what-drives-the-price-of-gold-part>
  - Part 2 – Published January 2022  
<https://thegoldobserver.substack.com/p/what-drives-the-price-of-gold-part-d25>
- **We're Moving Toward Higher Entrenched Inflation, Says Larry Summers**
  - Video Interview: Former Treasury Secretary and Wall Street Week contributor Lawrence H. Summers says "we are moving towards higher entrenched inflation." This interview was recorded with David Westin for "Wall Street Week."  
<https://www.bloomberg.com/news/videos/2022-01-14/we-re-moving-toward-higher-entrenched-inflation-summers-video>
- **Gold has gained value during 4 of the last 5 weeks**
  - For the most part, market participants and analysts have factored in a much more aggressive Federal Reserve with the anticipation of three or four interest rate hikes this year. The current assumption based on information released from the Federal Reserve is that each rate hike will be ¼%. That means that if they move forward with this more aggressive monetary policy, they will raise rates only 1% this entire year which would take the Fed fund rate from its current fix of zero to ¼%. This means that by the end of 2022 fed funds rate would be fixed between 1% and 1 ¼%.  
<https://www.kitco.com/commentaries/2022-01-15/Gold-has-gained-value-during-4-of-the-last-5-weeks.html>

### Semiconductor Related Articles (impacting Precious Metals electronics):

- **IC Sales Seen Growing by Double-Digits for Third Year in a Row**
  - The report forecasts that the IC market will rise 11% this year following a strong 26% increase in 2021 and a 13% jump in 2020. If achieved, it would mark the first time in 25 years that the IC market has enjoyed three consecutive years of double-digit growth. The previous time such an increase occurred was the four-year period from 1992-1995. <https://www.icinsights.com/news/bulletins/IC-Sales-Seen-Growing-By-DoubleDigits-For-Third-Year-In-A-Row/>
- **Semi content in electronic systems reaches record high in 2021, says IC Insights**
  - With global unit shipment growth rates of cellphones, automobiles, and PCs showing maturity and slowing over the past decade, the disparity between the 3.5% 2011-2021 CAGR registered in the electronic systems market and 6.5% 2011-2021 CAGR displayed by the semiconductor market is directly due to the increasing content and value of semiconductors in electronic systems, IC Insights noted.
  - *Matt: This bodes well for e-waste processors in years to come. High precious metals content IC's and semiconductors will be increasing per pound.* <https://www.digitimes.com/news/a20220114VL201.html>
- **Chip crisis hurts sales of vehicles in Europe**
  - If the shortage of semiconductors was the major factor holding back a rebound, the EU also underperformed compared with the other major markets, where the recovery from the pandemic was stronger. The Chinese market grew by +4.4% and the US market by +3.7%.
  - The decline in European sales might also reflect “the sharp increase in the average price of cars as well as an expectant attitude by consumers concerning electric vehicles, which are pushing them to put off purchases and hold on to their current vehicle longer,” said experts at Inovev, an automotive data analytics firm. [Chip crisis hurts sales of vehicles in Europe - Taipei Times](#)
- **Intel picks Greater Columbus for \$20B semiconductor factory to employ 3,000 workers**
  - Manufacturers and policy makers have been eager to bring back production of semiconductor chips to the U.S. as a result of a global supply chain crunch during the pandemic. Currently, 12% of the world's chips are made in the U.S., down from 37% in the 1990s, according to industry officials. About 80% are made in Asia. <https://www.dispatch.com/story/business/2022/01/14/factory-built-land-annexed-into-new-albany/6524507001/>
- **Worldwide PC Shipments Declined 5% in Fourth Quarter of 2021 but Grew Nearly 10% for the Year**
  - Worldwide PC shipments totaled 88.4 million units in the fourth quarter of 2021, a 5% decrease from the fourth quarter of 2020, according to preliminary results by Gartner, Inc. This is the first year-over-year decline following six consecutive quarters of growth. For the year, PC shipments reached 339.8 million units in 2021, a 9.9% increase from 2020. <https://www.gartner.com/en/newsroom/press-releases/2022-01-12-gartner-says-worldwide-pc-shipments-declined-5-percent-in-fourth-quarter-of-2021-but-grew-nearly-10-percent-for-the-year>
- **TSMC to invest US\$44 billion this year**
  - The contract chipmaker set a growth target of up to 29%, as it expects to outperform its
  - TSMC is planning to boost this year's capital expenditure budget by about 46% to exceed US\$44 billion, citing strong customer demand for advanced technologies used in high-performance computing and 5G-related applications. <https://www.taipetimes.com/News/biz/archives/2022/01/14/2003771309>

## Silver

- **South32 predicts at least two Canningtons needed each year until 2040 to meet colossal silver demand**

- \$19 billion ASX200 miner South32 and leading intelligence provider CRU estimate massive silver demand growth between now and 2040 thanks to its increasing use in solar panels. At the same time a lack of new silver mines coming online is expected to result in a material shortage of the precious metal. South32 in a presentation this week put the expected silver supply-demand gap under the microscope to show just how much of the precious metal will be needed by 2040 to help the world meet its emissions reductions targets.  
<https://stockhead.com.au/resources/south32-predicts-at-least-two-canningtons-needed-each-year-until-2040-to-meet-colossal-silver-demand/>
- **After years of 5G hype and investment, Wednesday's network launch makes it real**
  - Verizon and AT&T turned on a major new part of their 5G networks Wednesday.
  - The networks use wavelengths called C-band to cover a large part of the country with wireless service that should be noticeably faster than current 4G service.
  - People with compatible phones could see the network symbol at the top of their smartphone screen change Wednesday and access peak download speeds 10 times faster than an LTE network.  
<https://www.cnbc.com/2022/01/19/5g-launch-wednesday-caps-years-of-hype-investment.html>
- **Silver's Growing Role in the Automotive Industry**
  - Silver Institute: Market Trend Report written by Metals Focus  
[https://www.silverinstitute.org/wp-content/uploads/2021/01/SilverAutomotive\\_MmktTR2021.pdf](https://www.silverinstitute.org/wp-content/uploads/2021/01/SilverAutomotive_MmktTR2021.pdf)

## Precious Metals Mining:

- **Ivanhoe Mines secures \$300m in stream financing for Platreef**
  - Ivanhoe Mines said on Wednesday it had secured \$300 million in stream financing for its platinum group and gold Platreef (Northern Limb) mine in the South African province of Limpopo.
  - The Canadian miner said its subsidiary, Ivanplats, closed a \$200 million gold stream financing agreement with Orion Mine Finance and Nomad Royalty Company, as well as a \$100 million palladium and platinum streaming facility for Platreef. Ivanhoe said the proceeds will be used to advance the first phase of Platreef's mine development, w/expected commercial production 2024.  
<https://www.mining.com/ivanhoe-mines-secures-300m-in-stream-financing-for-platreef/>
- **Miners' unions threaten strikes at Sibanye-Stillwater operations**
  - A strike across the South African miners' operations seems likely following failed wage negotiations between the company and unions.  
<https://www.mining-technology.com/news/sibanye-stillwater-strike-action/>
- **Why Pan American Silver, Fortuna Silver Mines, and Coeur Mining Surged Roughly 10% Today**
  - The prices of silver and gold jumped, bringing these miners along with them.  
<https://www.fool.com/investing/2022/01/19/why-pan-american-silver-fortuna-silver-mines-and-c/>
- **The Periodic Table of Commodity Returns (2012-2021)**
  - Coal +161%, Crude Oil +55%, Natural Gas +47%, Aluminum +42%, Zinc +32%, Nickel +26%, and Copper +26% lead the way.  
<https://www.visualcapitalist.com/the-periodic-table-of-commodity-returns-2012-2021/>

## E-Waste & Precious Metals Recycle Related:

- **2022 Needs to Be the Year that Technology Recycling Goes Mainstream | Opinion**
  - At the 2021 U.N. Climate Change Conference, coal, methane and CO<sub>2</sub> took the spotlight. Yet there was a deafening silence around the fastest growing solid waste stream in the world—technology. In 2019 alone, the world generated 53.6 million tons of waste, which is approximately 16 pounds per person. Only 17% of that e-waste got recycled. The rest of it was shipped out of sight to a landfill or sent offshore, often in the developing world, where mercury, arsenic and lithium are left to seep into the ground and data-bearing devices with sensitive information can be found and exploited.

<https://www.msn.com/en-us/news/technology/2022-needs-to-be-the-year-that-technology-recycling-goes-mainstream-opinion/ar-AASHDoX?>

- **E-Scrap Conference & Trade Show**
  - New Orleans, Sept. 19-21, 2022  
[https://www.e-scrapconference.com/?utm\\_medium=email&utm\\_source=internal&utm\\_campaign=Jan+18+RR](https://www.e-scrapconference.com/?utm_medium=email&utm_source=internal&utm_campaign=Jan+18+RR)
- **Solar's Bright Future Faces A Cloudy Reality: What About All The Waste?**
  - Cumulative solar waste projections worldwide are anticipated to reach around 78Mt by 2050.
  - The composition of a panel includes aluminum, glass, complex plastics and an assortment of metals, including cadmium, chromium, lead, selenium, and silver, among others, that left untreated and unmanaged, can contaminate soils and leach into groundwater systems. Because of the presence of heavy metals and other constituents that exceed regulatory thresholds for toxicity, end-of-life panels can be classified as a federally regulated hazardous waste under the Resource Conservation and Recovery Act, the statute governing the management of hazardous waste.  
<https://www.forbes.com/sites/thebakersistitute/2022/01/18/solars-bright-future-faces-a-cloudy-reality-what-about-all-the-waste/?sh=185f39ec4503>
- **Sustainable method for recovering neodymium from electronic waste**
  - A NEW method has been developed to remove neodymium from electronic waste using cellulose, which could lead to more effective recycling.
  - The Penn State team developed a new biotechnology named anionic hairy nanocellulose (AHNC), where "hairy" refers to cellulose chains attached to the ends of the nanoparticles. The hairy layers of the nanoparticles are negatively charged so that they attract the positively-charged Nd ions. This separates the Nd from other ions such as iron, calcium, and sodium in aqueous media, and gathers enough Nd particles so that it can be effectively recycled.  
<https://www.thechemicalengineer.com/news/sustainable-method-for-recovering-neodymium-from-electronic-waste/>

## Platinum

- **Industrial demand for platinum can be highly variable on a short-term basis, due to steady top-up demand being intermittently boosted by capacity expansion demand**  
[https://platinuminvestment.com/files/234944/WPIC\\_Platinum\\_Essentials\\_January\\_2022.pdf](https://platinuminvestment.com/files/234944/WPIC_Platinum_Essentials_January_2022.pdf)
- **Sensor Array Records Electrical Signals from Human Brain Surface**
  - The team developed reconfigurable thin-film, multithousand-channel neurophysiological recording grids using platinum nanorods (PtNRGrids). The new brain sensors feature densely packed grids of either 1,024 or 2,048 embedded electrocorticography (ECoG) sensors. For comparison, the ECoG grids most commonly used in surgeries today typically have between 16 and 64 sensors, although research-grade grids with 256 sensors can be custom made.  
<https://www.genengnews.com/news/sensor-array-records-electrical-signals-from-human-brain-surface/>
- **WPIC: The market for platinum-based active pharmaceutical ingredients is growing**
  - The market recovered during 2021, growing by 4% to 247 koz, close to the pre-pandemic level. This year, medical demand for platinum is forecast to exceed pre-pandemic levels, growing by 3% y/y and 2% when compared 2019, to 254 koz, as demand for platinum-based cancer treatments increases and surgical procedures, involving the use of platinum-containing devices, continue to rise.  
[https://platinuminvestment.com/files/sixtysecs/WPIC\\_60seconds\\_Medical\\_capacity\\_expansion\\_011922.pdf](https://platinuminvestment.com/files/sixtysecs/WPIC_60seconds_Medical_capacity_expansion_011922.pdf)

## Fuel Cells/Hydrogen Economy Related Articles:

- **New fuel cells that can operate at temperatures between -20 to 200°C**
  - The primary aim of the recent study conducted by Li and his colleagues was to create a membrane that could absorb PA. To further strengthen its ability to capture PA, the researchers leveraged what is known as the 'capillary siphoning effect,' an effect through which liquids can be easily absorbed.

<https://techxplore.com/news/2022-01-fuel-cells-temperatures-200c.html>

- **New Irena Publication:**
  - The Report analyses the geopolitical implications of the accelerating global shift to renewables.  
<http://geopoliticsofrenewables.org/Report>
- **IRENA: Green hydrogen could disrupt global trade and bilateral energy relations**
  - H<sub>2</sub> could cover up to 12% of global energy use by 2050, with over 30% of the energy carrier being traded across borders, a higher share than natural gas today. That's according to new analysis by the International Renewable Energy Agency, which believes the rapid growth of the global H<sub>2</sub> economy could bring significant geoeconomics and geopolitical shifts giving rise to a wave of new interdependencies.  
<https://www.h2-view.com/story/irena-green-hydrogen-could-disrupt-global-trade-and-bilateral-energy-relations/>
- **Isuzu, Honda to test hydrogen trucks on Japan's public roads**
  - The Japanese companies have jointly developed a large fuel cell vehicle that can run for about 600km on a single tank of hydrogen. The performance and safety of a 25-tonne FCV will be tested over long distances in the Tokyo metropolitan area. The companies, which are aiming to launch the product in 2030 at the earliest, will begin mass production when lower manufacturing costs are achieved and a network of hydrogen refuelling stations is established, among other factors.  
<https://www.phnompenhpost.com/business/isuzu-honda-test-hydrogen-trucks-japans-public-roads>
- **South Korea to explore hydrogen production in 'close to its largest' nuclear plant**
  - Unveiled today, a memorandum of understanding has been signed between Estonia-based Elcogen, Uljin-County and Next Energy Corporation to install an electrolyser with a nuclear plant for hydrogen production. Under the terms of the MoU, a 200MW solid oxide electrolysis stack will be developed and implemented into the Hanul Nuclear Plant, regarded as 'close to Korea's largest', with an est. cost of ~75 MEUR, Elcogen said.  
<https://www.h2-view.com/story/south-korea-to-explore-hydrogen-production-in-close-to-its-largest-nuclear-plant/>
- **H<sub>2</sub> Production Co.'s Should Know the Prospects of Green H<sub>2</sub> Energy in 2022 & Beyond**
  - No wonder the green H<sub>2</sub> market size is projected to reach \$4,373 million by 2026 at a CAGR of 58% from 2021. Several countries have already envisioned a carbon-free future with green H<sub>2</sub>. It allows direct usage as fuel and can be converted into other synthetic fuels.  
[https://www.hydrogenfuelnews.com/hydrogen-companies-should-know/8550988/?mc\\_cid=d539370acf&mc\\_eid=70c1246d58](https://www.hydrogenfuelnews.com/hydrogen-companies-should-know/8550988/?mc_cid=d539370acf&mc_eid=70c1246d58)
- **The Hydrogen Standard**
  - NEW: The Hydrogen Standard Magazine Issue 2, Available Now!  
<https://view.publitas.com/thehydrogenstandard/hydrogen-standard-issue-2-final/page/1>
- **Is hydrogen fuel cell technology ready for the mainstream?**
  - H<sub>2</sub> fuel cell tech has taken off more rapidly in some areas than others. It is already rolling out in many parts of the world transitioning their public transit bus fleets and trains to zero-emission alternatives. That said, the potential for the technology is considerably broader, extending to industry, heavy-duty machinery, shipping, aviation, transport, as well as for residential and business electric power and heating. The US DoE's official fact sheet says, "Fuel cells are the most energy efficient devices for extracting power from fuels."  
<https://www.hydrogenfuelnews.com/is-hydrogen-fuel-cell-technology/8550869/>
- **Asia's richest man plans to invest more than \$80 billion in green projects**
  - Reliance Industries, the conglomerate controlled by the richest businessman in Asia, the Indian Mukesh Ambani, plans to invest more than \$80 billion in green projects, according to a presentation made on the National Stock Exchange of India this Thursday.

- His consortium has signed several agreements with the Government of the Indian to achieve the goal of zero net carbon emissions in 2035. In this way, some five trillion rupees (\$67.4 billion USD) will be used in the next 15 years to build 100-GW renewable energy projects and a green hydrogen grid, while 600 billion rupees (\$8.1 billion USD) will go to factories for solar modules, hydrogen electrolyzers, fuel cells and storage batteries.  
<https://www.parisbeacon.com/29757/>

## Palladium

- **China's annual auto sales climb for first time since 2017**
  - Overall sales in the world's biggest car market rose 3.8% year-on-year, after monthly sales of 2.79 million vehicles in December took total sales for 2021 to 26.28 million  
<https://www.thebharatexpressnews.com/chinas-annual-auto-sales-climb-for-first-time-since-2017/>
- **Global platinum group metals autocatalyst demand to hit record levels in 2022 – report**
  - According to Metals Focus, a growing global automotive sector has driven combined autocatalyst demand for platinum, palladium and rhodium (PGM), which rose by 5% in 2021 and expected to hit record levels in 2022. The consultancy said that the total PGM demand is expected to grow 11% breaching 12.8Moz in 2022.  
<https://www.kitco.com/news/2022-01-19/Global-platinum-group-metals-autocatalyst-demand-to-hit-record-levels-in-2022-report.html>
- **Palladium price forecast: Will the market rebound in 2022?**
  - In this article, we look at the market's key drivers and the latest forecasts for the future value of palladium, including Semiconductor shortage and EV growth hit demand.  
<https://capital.com/palladium-price-forecast-and-market-outlook>

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

- **Ruthenium & Platinum PVD: Samsung Claims First with In-Memory MRAM**
  - Samsung announced an MRAM innovation, claiming the world's first in-memory computing based on MRAM capable of performing both data storage and data computing within a single memory network. The company claims its MRAR array chip is the next step to realizing low-power AI chips.  
<https://www.eetimes.com/samsung-claims-first-with-in-memory-mram/#>
- **Rhodium price on the march again as demand from auto sector rises**
  - Rhodium prices are on the march again as OEMs ramp up their demand for the shiny, silvery metal commonly used in vehicles' catalytic converters. Since the start of 2022, rhodium prices have pushed up sharply, rising from \$14,250/Toz on January 4 to reach \$17,500/Toz on January 11 – the highest since September 2021. *Matt: Thursday \$17,650/Toz.*  
<https://www.mining.com/rhodium-price-on-the-march-again-on-rising-demand-from-auto-sector/>

## Clean Energy General News

- **Demand for rare minerals and metals creates eco-dilemma**
  - The Minerals Education Coalition has calculated that in the course of his or her lifetime, the average American will need almost 1,500 tons of metals, minerals and fuels.
  - According to the International Energy Agency (IEA), the demand for so-called critical raw materials will increase sevenfold by 2050. The reason for this is that our green, renewable energy technologies require far more metals and other materials than those used to supply fossil energy. The electric cars that carry us from A to B will require six times more minerals than our traditional petrol-driven cars, and the wind power technologies that provide us with renewable electricity will be demanding nine times more of these resources than our gas-fired power plants.  
<https://techxplore.com/news/2022-01-demand-rare-minerals-metals-eco-dilemma.html>

- **Metals in a NetZero Scenario**

- Critical Metals for an Electrified Future according to IMF  
[https://www.linkedin.com/posts/mitchellpsmith\\_netzero-copper-nickel-activity-6888914591561187329-vKPJ/](https://www.linkedin.com/posts/mitchellpsmith_netzero-copper-nickel-activity-6888914591561187329-vKPJ/)

- **California pours \$2 billion into renewable hydrogen and offshore wind**

- The Blueprint California \$286.4 billion proposal Newsome has put forward for FY22-23 has been sent to the legislature for approval. It sets aside \$100 million for the advancement of green H<sub>2</sub> use and production. "Green hydrogen is critical to the decarbonisation of California's economy and achieving carbon neutrality," said the budget summary released by Newsom's office. An additional \$380 million in funds will be directed toward enabling investments into long-duration energy storage projects that would come online to support the reliability of the electric grid as of next year.  
[CA pours \\$2 billion into renewable hydrogen - H2 News \(hydrogenfuelnews.com\)](https://www.hydrogenfuelnews.com/news/ca-pours-2-billion-into-renewable-hydrogen-h2-news/)

## **BEV / LiB Mineral & Battery Market News**

- **Tavares says 'electrification is a technology chosen by politicians, not by industry'**

- The disconnect between government and industry: Fittingly, today marks the final day of the SAE Government/Industry in DC. I saw this quote from Carlos Tavares and was struck by how well it fit what we've been hearing so far.
- Since merging Fiat Chrysler and Peugeot-maker PSA Group, Tavares has mapped out a 30 billion euro (\$34 billion) electrification plan that helped Stellantis shares surge more than 60% in their first year.
- "What is clear is that electrification is a technology chosen by politicians, not by industry," he said in a joint interview. "There have been several great presentations at the event so far, but one striking theme is the disconnect between government and industry when talking about electrification. Crudely speaking, the tone from government is that we need to get away from ICEs as fast as possible and make a complete switch to BEVs."
- He also said a ban on internal combustion engine vehicles by 2035 in Europe means carmakers need to start transforming their plants and supply chains quickly. "The brutality of this change creates social risk," he said.

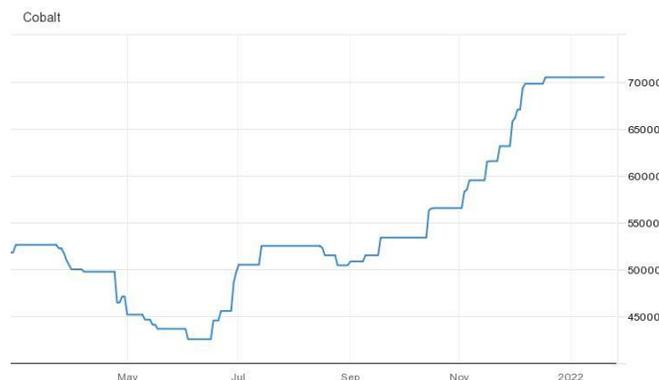
<https://www.autonews.com/executives/stellantis-ceo-carlos-tavares-says-electrification-technology-chosen-politicians-not>

- **Trafigura Strikes \$600 Million Deal for DRC Cobalt and Copper Supply**

- Commodity trader Trafigura has agreed to finance the construction of a Congolese copper and cobalt mine as part of a \$600 million deal to secure supplies of the battery metal. The mine is set to start production in 2023. It would also help fund a nearby processing facility, it said. The deal comes as cobalt metal prices trade at their highest levels in three years.

<https://www.benchmarkminerals.com/membership/trafigura-strikes-600-million-deal-for-drc-cobalt-and-copper-supply/>

Cobalt past 1-year USD \$/mt



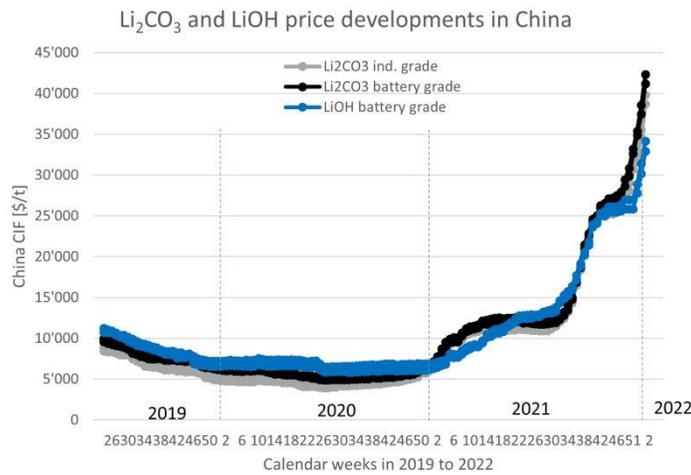
source: tradingeconomics.com

- **Serbian government revokes Rio Tinto's licences for lithium project**

- “All decisions (linked to the lithium project) and all licences have been annulled,” Brnabic told reporters after a government session. She said the government decision came after requests by various environmental organisations to halt the project. “Rio Tinto did not give sufficient information neither to local community nor to the government (about the impact of the project),” she added.
- *Matt: Serbia has 1.3Mt, or 6% of the of known global Lithium Reserves according to USGS.*  
<https://www.mining.com/web/serbian-government-revokes-rio-tintos-licences-for-lithium-project/>

- **Lithium Market – LinkedIn Posting**

- During 2021, Li<sub>2</sub>CO<sub>3</sub> was routinely more expensive than the more costly to produce LiOH due to the LFP cell growth of +319% in 2021 while NCM only +101%, this will ease market tension in long run.  
[https://www.linkedin.com/posts/michael-hess-a5149489\\_good-news-this-morning-byd-chile-servicios-activity-6887275694162812928-f1v0](https://www.linkedin.com/posts/michael-hess-a5149489_good-news-this-morning-byd-chile-servicios-activity-6887275694162812928-f1v0)

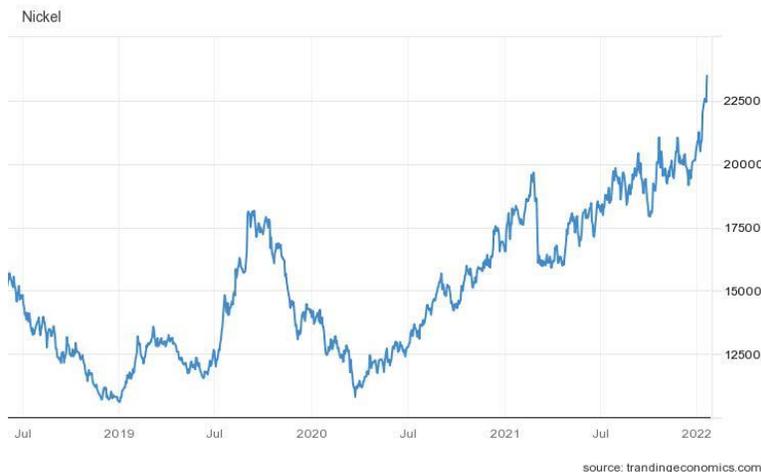


- **GRAPHIC-Nickel bulls gamble on tight LME supplies**

- Nickel traders fretting about supplies on the London Metal Exchange LME have driven up prices of the metal used in electric vehicle batteries and stainless steel to their highest in more than 10 years.
- Benchmark nickel CMN13 on the LME touched \$24,435/mt on Thursday, a gain of 14% so far this year and the highest since August 2011.  
<https://www.nasdaq.com/articles/graphic-nickel-bulls-gamble-on-tight-lme-supplies>

- **Nickel Market Prices Hit 10-Year High**

- 5-year Nickel price chart below: USD \$/t



- **BMW's Fifth-Generation Electric Motor Is a Magnet-Free Masterpiece**

- BMW developed its magnet-free fifth-gen motor, which operates as a three-phase AC synchronous motor and, in a retro twist, utilizes brushes and a commutator to power its rotor windings. Typically, brushes and commutators generate dust and cause wear that requires them to be replaced periodically. That's why most electric vehicle makers have opted not to use them.
- However, BMW hopes that its use of modern materials and its high-tech sealing technology will mean a longer lifespan for its brushed motor than is traditionally the case. According to MotorTrend, a BMW representative told them that the new motor's brush modules are placed "in an enclosed and sealed compartment, eliminating dust contamination inside the stator/rotor wiring."
- *Matt: Light Rare Earth Element Neodymium (Nd) is key to use in today's highest strength NdFeB magnets. This market, like so many others, is under a demand/supply assault with the ramp of both Wind and EV's that use these magnets. The price of Nd has climbed 7x in the past 5-years, and 3x in the past 20 months. Electronics clients of mine are very worried about the direction of this market. This puts this BMW breakthrough in some better context.*  
<https://interestingengineering.com/bmws-fifth-generation-electric-motor-is-a-magnet-free-masterpiece>

**Regards –**