Precious Metals Commodity Management LLC

Weekly Precious Metals News Articles: February 18, 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

- **Asia Gold-High prices hit purchases, Indian dealers offer big discounts**
  - Buyers in major Asian hubs put off physical gold purchases this week due to a rally in prices on escalating Russia-Ukraine tensions, pushing Indian dealers to offer the highest discounts in nearly seven months.
  https://www.nasdaq.com/articles/asia-gold-high-prices-hit-purchases-indian-dealers-offer-big-discounts
- **Non-invasive laser treatment destroys cancerous tumors in just 5 minutes**
  - One of these treatments is photothermal therapy. Doctors inject nanomaterials, usually gold nanorods, into a cancerous tumor and then expose them to near-infrared light. The procedure excites the gold, causing the metal to give off heat which kills cancer cells. The new study looked at a three-pronged approach to make this therapy more effective at destroying tumors.
  https://www.studyfinds.org/laser-treatment-destroys-tumors/
- **REAL ASSETS Explained: How Interest Rate Hikes Affect Gold's Price**
  - While rising interest rates bring macroeconomic headwinds for equity valuations, gold has had a special relationship with interest rates in recent hikes.
  - This graphic uses data from the World Gold Council to show how gold, U.S. stocks, and the U.S. dollar have historically performed around interest rate hikes.
  https://elements.visualcapitalist.com/explained-how-interest-rate-hikes-affect-golds-price/
- **Gold rises amid Russia-Ukraine crisis**
  - Traders piled into gold and dumped riskier assets like equities. The Dow Jones Industrial Average fell 367 points, or 1.1%. The S&P 500 also lost 1%.
  - On Monday, Reuters reported that Russian Foreign Minister Sergey Lavrov had advised Russian President Vladimir Putin seek a diplomatic solution to the crisis.
  https://www.cnbc.com/2022/02/14/gold-markets-dollar-bond-yields.html?

Semiconductor Related Articles (impacting Precious Metals electronics):

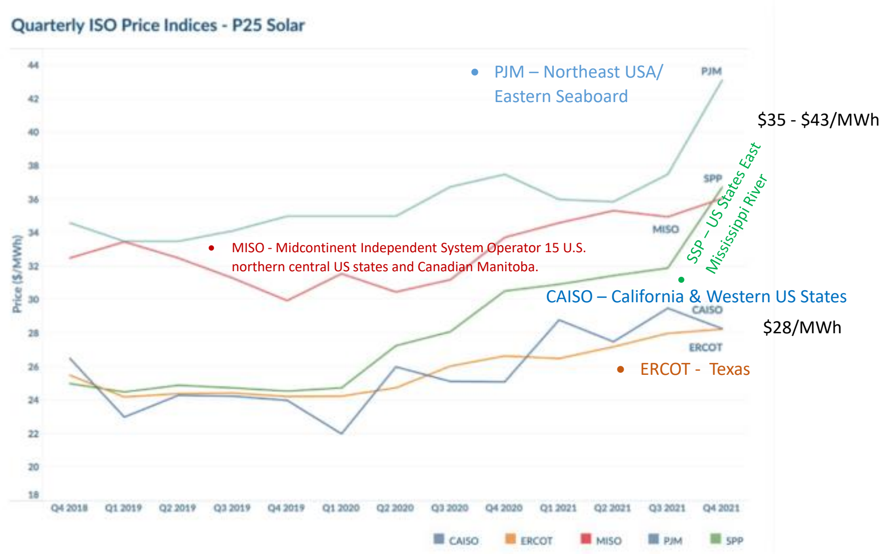
- **Semiconductor Sales To Rise at 7.1% CAGR Through 2026**
  - Total semiconductor sales +11% this year following a very strong +25% in 2021 and +11% in 2020. If achieved, it would mark the first time since 1993-1995 that the semiconductor market has enjoyed three consecutive years of double-digit growth. From 2016-2021, the CAGR for the total semiconductor market was 11.0%, a very strong period that included a big surge in DRAM and flash memory markets in 2017 and 2018 and strong post-Covid recovery

in 2020 and 2021. However, most industry observer, including IC Insights, realize that the semiconductor industry is very cyclical and ongoing annual double-digit gains are unsustainable. As a result, IC Insights now forecasts total semiconductor sales will rise over the next five years at a more moderate compound annual growth rate of 7.1%
https://www.icinsights.com/news/bulletins/Semiconductor-Sales-To-Rise-At-71-CAGR-Through-2026/

- **Global Semiconductor Sales, Units Shipped Reach All-Time Highs in 2021 as Industry Ramps Up Production Amid Shortage**
    - The SIA announced global semiconductor industry sales totaled $555.9 billion in 2021, the highest-ever annual total and an increase of 26.2% compared to the 2020 total of $440.4 billion. The industry shipped a record 1.15 trillion semiconductor units in 2021, as chip companies ramped up production to address high demand amid the global chip shortage. https://www.semiconductors.org/global-semiconductor-sales-units-shipped-reach-all-time-highs-in-2021-as-industry-ramps-up-production-amid-shortage/?
- **Intel to Acquire Tower Semiconductor for $5.4 Billion**
    - Transaction creates a globally diverse end-to-end foundry to help meet growing semiconductor demand and brings more value to customers across the nearly $100 billion addressable foundry market. Acquisition accelerates Intel's path to becoming a major provider of foundry services and capacity globally, now offering one of the industry's broadest portfolios of differentiated technology.
      https://www.intel.com/content/www/us/en/newsroom/news/feb-2022-corporate-news.html#gs.p7lnix
- **China lockdowns further tighten global chip supply**
    - If the lockdowns in Suzhou go on, electronics makers will have to order chips elsewhere, probably in Taiwan.
      https://asiatimes.com/2022/02/china-lockdowns-further-tighten-global-chip-supply/
- **These 5 Charts Help Demystify the Global Chip Shortage**
    - ...and reveal why even infusions of cash from the U.S. and European Union won't solve it
    - 1. Appreciating the vastness of the chip supply grid. Components can travel 50,000+ km and cross more than 70 international borders before a chip finally reaches its end customer
    - 2. Recognizing a fab-capacity shortcoming that predated the chip shortage. IC Factory utilization > 90% through 2022.
    - 3. Revealing the lost inventory backlog. 2019 was 40-days of inventory now 4 days.
    - 4. Comparing U.S. and China fabrication and R&D data. US $38 billion, China <$3 B.
    - 5. Contextualizing the semiconductor incentives in the America COMPETES Act. $52 billion set aside for semiconductors. "It won't fix the short-term problem, obviously," says Harrison, as fabs take years to build and spin up. More of a mid- and long-term play.
      https://spectrum.ieee.org/global-chip-shortage-charts
- **Notebook shipments to plateau for next 5 years**
    - Notebook shipments reached 247 M units in 2021, an increase of more than 20% over 2020.
      https://www.digitimes.com/news/a20220214PD202.html
- **Forces driving semiconductor boom are far from over**
    - Buckle Up, this will go on for a while. The Semicon industry, which reported a 26.2% jump in sales to an all-time high of $555.9bn last year, plans to pour record-breaking sums into new fabrication plants, fab expansions & new developments in the coming years.
    - *Matt: Anyone who has heard me on my talks about electronics knows I describe this point in time as an inflection point where the electronics boom is going to take on a new higher CAGR. Demands for Semi metals will only grow from here as packaging becomes more dense and the number of connected devices explodes.*
      https://www.ft.com/content/93366bc6-f2e9-492a-a33f-72652820a571

Silver

- **Silver Has Been Stuck at Lower Prices. It May Be Time to Buy.**
  - A "compelling argument can be made that 2022 will be a good year for silver," says Edmund Moy, former director of the United States Mint and senior IRA strategist for gold and silver dealer U.S. Money Reserve. "As the global economy recovers from the pandemic, expect to see silver demand rise from the industrial sector."
    https://www.marketwatch.com/articles/silver-has-been-stuck-at-lower-prices-it-may-be-time-to-buy-51645090200?
- **Solar power prices rising with demand**
  - BloombergNEF has reported that global procurement of renewable energy contracts by corporations has set a new record of 31GW of capacity. Most of that capacity was procured in the Americas, with 17GW coming from the United States and 3.3GW from other nations in North and South America.
  - Western US States and Texas $28/MWh
  - Central and Eastern US States $35-43/MWh
    https://www.pv-magazine.com/2022/02/15/solar-power-prices-rising-with-demand/



- **Silver bullion coin sales up in January**
  - The United States Mint kicked off 2022 with American Eagle silver bullion coin sales in January that are 4.7% higher than sales for the same period in 2021.
  - Silver American Eagle sales in January 5,001,000 coins.
  - American Eagle gold bullion coin sales in January 2022 reached 363,000 ounces
    https://www.coinworld.com/news/us-coins/silver-bullion-coin-sales-up-in-january

Precious Metals Mining:

- **Unions to vote on Sibanye strike over wage dispute deadlock**
  - South African labour unions will meet next week to plan a vote over a potential strike at miner Sibanye-Stillwater's gold operations after the latest bid to resolve a wage dispute failed, a union official told Reuters on Thursday.
    https://www.mining.com/web/unions-to-vote-on-sibanye-strike-over-wage-dispute-deadlock/
- **Mapping Africa's natural resources**
  - Nearly half the world's gold and one-third of all minerals are in Africa. Here's a look at the resources African countries have.
    https://www-aljazeera-com.cdn.ampproject.org/c/s/www.aljazeera.com/amp/news/2018/2/20/mapping-africas-natural-resources

- **Amplats expects blowout results**
    - Anglo American Platinum (Amplats) says it expects another spectacular set of results for the year to December 2021, with headline earnings likely to increase by between 146% and 166%. https://www.moneyweb.co.za/mineweb/amplats-expects-blowout-results/
- **Amplats to double share earnings but rise in mining inflation suggests PGM cycle is maturing**
    - Anglo American Platinum said full year headline 2021 earnings would be more than 2x the previous year after it rapidly sold a backlog of PGMs & benefited from a 22% increase in rand basket prices. https://www.miningmx.com/news/platinum/48687-amplats-to-double-share-earnings-but-march-of-input-inflation-suggests-cycle-is-maturing/

E-Waste & Precious Metals Recycle Related:

- **San Jose police announce new method to stop thefts of valuable car part**
    - The program, called Etch and Protect, is a collaboration between the police department and the San Jose Police Foundation. Auto mechanics have been enlisted to etch the vehicle license plate #s, and other identifying info, on catalytic converters for free while conducting routine vehicle maintenance. https://www.kron4.com/news/bay-area/san-jose-police-announce-new-method-to-stop-thefts-of-valuable-car-part/
- **New PV module recycling tech from France**
    - French start-up Rosi Solar has developed an industrial solution claimed to be capable of recovering high purity silicon, silver and copper contained in end-of-life PV modules. The company's technology is based on a pyrolysis process that makes it possible to isolate the different metals from the cells.
    - The start-up has set up a thermal and chemical separation process to recover ultra-pure silicon and other metals lost during the production of photovoltaic cells and at the end of the life of solar panels. https://www.pv-magazine.com/2022/02/15/new-pv-module-recycling-tech-from-france/
- **Aurubis to build 70 mln euro nickel recycling plant in Belgium**
    - Aurubis AG, Europe's largest copper producer, said on Wednesday it plans to build a 70 million euro ($79.5 million) recycling plant in Belgium to expand production of recycled nickel along with copper. https://www.reuters.com/business/energy/aurubis-build-70-mln-euro-nickel-recycling-plant-belgium-2022-02-16/
- **Umicore to launch new battery-recycling technology; announces ACC agreement**
    - Umicore is a pioneer in the recycling of rechargeable batteries, and its battery recycling plant in Hoboken, Belgium, has an annual capacity of 7,000 tons of lithium-ion (Li-ion) batteries and battery production scrap, the equivalent of 35,000 electric vehicle (EV) batteries.
    - Furthermore, in the course of 2022, Umicore will introduce the latest generation of its proprietary recycling technology. Recovery rates for Cobalt, nickel and copper to now reach over 95% yield for a wide variety of battery chemistries, as well as most of the lithium. https://www.chemengonline.com/umicore-to-launch-new-battery-recycling-technology-announces-acc-agreement/?printmode=1
- **Umicore posted all-time record revenues and earnings in 2021**
    - Recycler Umicore's earnings up 81% on strong precious metal prices
    - Revenues in Catalysis reached record levels with strong growth across business units. Automotive Catalysts outperformed the global car market. This was enabled by market share gains and a favorable platform mix in the European and Chinese light-duty gasoline markets, particularly strong demand for Umicore's China V heavy-duty diesel catalysts in the first half. Sales volumes of fuel cell catalysts were also well up.
    - Recycling posted record revenues and earnings, significantly above the previous record levels of 2020, driven by a robust operational performance in the various business units, a strong contribution from the trading activities and an exceptional precious metals price environment. https://finance.yahoo.com/news/umicore-announces-time-record-results-063000994.html

Platinum

- **Platinum industry expected to take off**
  - Consequently, mined platinum supply is expected to remain constrained because most supply growth projects have three- to four-year lead times. However, strong potential short-term demand growth from substitution and higher loadings with significant medium- to long-term demand growth potential from platinum's strategic role in the hydrogen economy provides investors with a compelling reason to consider an investment in platinum, Raymond concludes.
    https://www.engineeringnews.co.za/article/platinum-industry-expected-to-take-off-2022-02-10
- **Platinum industry sees value in offshore wind-to-hydrogen technology**
  - Sustainable offshore energy production could help deliver cost-competitive green hydrogen, which the World Platinum Investment Council says could play a significant role in the transition away from fossil fuels.
    https://www.miningweekly.com/article/platinum-industry-sees-value-in-offshore-wind-to-hydrogen-technology-2022-02-18/rep_id:3650

Fuel Cells/Hydrogen Economy Related Articles:

- **Is green ammonia fit to decarbonize shipping?**
  - Designing an ammonia-powered engine, Augsburg, Germany-based Marine propulsion and engine designer Man Energy Solutions is developing a dual-fuel ammonia engine for marine use. "There's no precedent for running big engines on ammonia. … It's the fuel itself and the combustion process that is simply unknown."
  - The company is conducting its first full-scale two-stroke dual-fuel ammonia engine test at its HQ for development of two-stroke engines in Copenhagen, Denmark, this summer. This should lead to delivery of the first ammonia engine to a shipyard by the end of 2024.
    https://www.freightwaves.com/news/is-green-ammonia-fit-to-decarbonize-shipping
- **Biden Allocates $9.5 Billion to Develop Clean Hydrogen Capacity in US**
  - Among the actions announced was the launch of $9.5 billion of investments targeting clean hydrogen initiatives.
    https://www.esgtoday.com/biden-allocates-over-9-billion-to-develop-clean-hydrogen-capacity-in-us/
- **Wind to Hydrogen: Cost competitiveness of green hydrogen boosted by offshore production initiatives using platinum-based electrolysers**
  - Recent innovations are demonstrating the potential for a new era of sustainable offshore energy production to help deliver cost-competitive green hydrogen, by combining wind power with platinum-based proton exchange membrane (PEM) electrolysers to produce green hydrogen in an off-grid solution.
    https://platinuminvestment.com/files/sixtysecs/WPIC_60seconds_Wind_to_hydrogen_02162022.pdf
- **'World's first' hydrogen aircraft propulsor nacelle set to power long-haul flights**
  - Believed to be a world first, the development distributes multiple integrated powertrains incorporating batteries, fuel cells, hydrogen storage, and smaller electric motors across the wings, instead of just a single centralised hydrogen fuel cell system.
    https://www.h2-view.com/story/worlds-first-hydrogen-aircraft-propulsor-nacelle-set-to-power-long-haul-flights/?
- **H_2 Council Membership Grows to More Than 130 Members, with Eleven New Companies Committing to Foster Development of the H_2 Economy.**
  - The Hydrogen Council now includes one new steering member: OCI NV; nine new supporting members: Eberspächer Gruppe, Fuel Cell Energy, Haldor Topsoe, Matrix Service Company, PJSC Cryogenmash, Southern Company, Subsea 7, The Anschutz Corporation, Westport Fuel Systems; and one new investor: Temasek.

https://hydrogencouncil.com/en/hydrogen-council-membership-grows-to-more-than-130-members-with-twelve-new-companies-committing-to-foster-development-of-the-hydrogen-economy/

Palladium

- **Global Metals & Mining: Russia Vs Ukraine - which are at risk? (in one chart)**
  - Palladium, potash, coal, platinum, (and vanadium) are the most exposed to Russia. https://www.linkedin.com/posts/anthonymilewski_mining-commodities-activity-6899774901939523584-B92o
- **Palladium up 4% on geopolitical tensions, but platinum's move to 3-month high is attracting all the attention**
  - According to analysts, platinum group metals are seeing a perfect storm as rising geopolitical uncertainty between the U.S. and Russia over Ukraine looks to threaten the market supply. Analysts note that palladium, already in deficit, would be the most impacted if Russia restricted the precious metal. Russia represents about 40% of the palladium market.
  - "Any disruptions in palladium market will only send prices higher," said Bark Melek, head of commodity strategy at TD Securities. March palladium futures last traded at $2,363.50 Toz, +4%. https://www.kitco.com/news/2022-02-17/Palladium-up-4-on-geopolitical-tensions-but-platinum-s-move-to-3-month-high-is-attracting-all-the-attention.html
- **The Blockchain and Electrode Metals for MLCCs: How the Supply Chain Is Reacting to Eastern European Tensions**
  - We estimate the global value of primary metals consumed as electrodes in the global multilayered ceramic chip capacitor (MLCC) market at $1.9 billion USD worldwide in 2021, a figure that includes engineered powders and pastes manufactured from palladium and nickel.
  - Matt: This includes 400-600koz of Pd. MLCC containing Pd have grown to > 13% of the MLCC mix. https://www.tti.com/content/ttiinc/en/resources/marketeye/categories/passives/me-zogbi-20220208.html

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

- **Chemists Discover New Way to Harness Clean Energy From Ammonia**
  - The scientists were excited to find that the addition of ammonia to a metal catalyst containing the platinum-like element ruthenium spontaneously produced nitrogen, which means that no added energy was required. Instead, this process can be harnessed to produce electricity, with protons and nitrogen gas as byproducts. In addition, the metal complex can be recycled through exposure to oxygen and used repeatedly, all a much cleaner process than using carbon-based fuels. https://www.goodnewsnetwork.org/chemists-discover-new-way-to-harness-clean-energy-from-ammonia/
- **The Biden administration is updating truck pollution standards**
  - Over the past few years, the EPA has been working on new standards for nitrogen oxide, or NOx, emissions from heavy-duty trucks, a key ingredient of the brownish haze that blankets the valley east of Los Angeles where Mendez Ulloa lives. Experts expect the proposed rule, currently under interagency review, to be released any day now. https://grist.org/transportation/epa-updating-emission-standards-for-heavy-duty-trucks/
- **Electrolysers & green hydrogen: Are we moving quick enough?**
  - H_2 demand continues to soar across the world and, according to the IEA Hydrogen Projects Database 2021 **global installed capacity will reach 54GW by 2030**. The IEA also believes that consumption of 220 million megatonnes of H_2/year will need to be consumed to attain our climate goals. https://www.h2-view.com/story/electrolysers-green-hydrogen-are-we-moving-quick-enough/
- **Iridium and Ruthenium Oxides: Chemieanlagenbau Cheminitz Receives Order for Chlor-Alkali Plant in France**

- CAC; Germany is building a chlor-alkali electrolysis plant for KEM ONE (Lyon, France), Europe's second largest manufacturer of polyvinylchloride (PVC). The €57-million contract is said to be the largest order of this kind in the history of the Chemnitz-based company.
- KEM ONE awarded CAC a contract for the construction of a modern, energy-efficient and environmentally friendly membrane electrolysis plant as a replacement for the existing diaphragm electrolysis plant at the end of 2021. CAC will implement the plant at the Fos-Sur-Mer site in France together with its long-standing Japanese technology partner Asahi Kasei Corp.
  https://www.chemengonline.com/chemieanlagenbau-chemnitz-receives-order-for-chlor-alkali-plant-in-france/

Clean Energy General News

- **Scientists raise alarm over 'dangerously fast' growth in atmospheric methane**
  - Methane concentrations in the atmosphere raced past 1,900 parts per billion last year, nearly triple preindustrial levels, according to data released in January by the US National Oceanic and Atmospheric Administration. Scientists says the grim milestone underscores the importance of a pledge made at last year's COP26 climate summit to curb emissions of methane, a greenhouse gas at least 28 times as potent as CO_2.
    https://www.nature.com/articles/d41586-022-00312-2
- **The Consequences of China's Slowdown**
  - Excellent economist and market analyst view of China macro-economic slowdown & monetary easing.
    https://youtu.be/fE2Tn7k8kss
- **Climate Change: China's new five-year energy efficiency targets to drive heavy industry consolidation, analysts say**
  - According to a joint circular published on Friday by regulators overseeing industrial development and environmental and energy policies, higher energy efficiency bars have been set for companies in sectors ranging from oil refining to non-ferrous metals smelting.
  - For example, steel, cement, coal-to-chemicals, aluminum smelting, among the country's biggest carbon dioxide emitting industries, must all meet certain minimum standards by 2025. Currently, some 20% to 40% of their capacity fails to do so.
    https://www.scmp.com/business/article/3166968/climate-change-chinas-new-five-year-energy-efficiency-targets-drive-heavy
- **Green, bio-based extraction of rare earths from domestic ores for a sustainable world**
  - Lawrence Livermore National Laboratory, Penn State and University of Arizona researchers are partnering with industry collaborator Western Rare Earths (WRE), U.S. subsidiary of American Rare Earths Limited, to use a naturally occurring protein to extract and purify REEs from abundant, domestic ore-based feedstocks and waste materials without harming the environment. It could offer a new avenue toward a more diversified and sustainable REE sector for the United States.
    https://techxplore-com.cdn.ampproject.org/c/s/techxplore.com/news/2022-02-green-bio-based-rare-earths-domestic.amp
- **Electric car construction will drive aluminum prices to 30-year high: Mining company CEO**
  - Aluminum is set to reach its highest price for more than 30 years. In 2021, the price of the metal surged to a 13-year high, gaining over 40% y/y. Benedikt Sobotka believes a combination of Chinese demand, a global focus on renewables, & rising electric vehicle production will further push up the cost of aluminum over the upcoming 12 months.
    https://www.arabnews.com/node/2013951/business-economy

BEV / LiB Mineral & Battery Market News

- **Graphite supply a concern in meeting growing battery demand**
  - Graphite demand expected to be three times higher by 2030, Shortage of mining projects, processing outside China, More investment needed to increase supply

https://www.spglobal.com/platts/en/market-insights/latest-news/energy-transition/021622-feature-graphite-supply-a-concern-in-meeting-growing-battery-demand

- **Hold That Tesla! Inflation Will Be Made of Aluminum**
  - On the London Metal Exchange, spot prices for the metal have surged above $3,300/mt for the first time since June 1988. Worse, manufacturers are paying eye-watering surcharges above the LME price to get hold of physical metal. For example, European consumers of billets, a widely traded form of aluminum, face a premium of about $1,500/mt, four times higher than the 2000-to-2020 average. https://www.bloomberg.com/opinion/articles/2022-02-14/aluminum-will-intensify-the-inflationary-wave-washing-around-the-world
- **Australia's Liontown signs 5-year lithium supply deal with Tesla**
  - Australia's Liontown Resources said on Wednesday it signed a five-year agreement with Tesla to supply lithium spodumene concentrate to the electric carmaker, sending the Li miner's shares +20%. https://www.reuters.com/business/australias-liontown-signs-5-year-lithium-supply-deal-with-tesla-2022-02-15/
- **Sumitomo Metal Mining to spend big to boost output of nickel, battery materials**
  - SMM, which also makes electrical materials, plans to boost its monthly output capacity of cathode materials for rechargeable batteries used in EV's to 10,000 mt by end-March 2028 and 15,000 mt by end-March 2031 from nearly 5,000 mt now to meet burgeoning demand. https://www.reuters.com/article/idUSKBN2KK1IH
- **Concerns for mineral supply chain amid booming EV sales**
  - The sales of electric cars are booming, but the rising demand for transition minerals will pose a challenge for the mining industry. https://www.mining-technology.com/features/concerns-for-mineral-supply-chain-amid-booming-ev-sales/
- **Nickel Prices Likely to Move Upward Amid Tight Supply**
  - The nickel prices rose steadily last week. Before the Chinese New Year (CNY) holiday, the continuous falling nickel inventory in China and overseas pushed up the nickel prices sharply. https://news.metal.com/newscontent/101748715/Nickel-Prices-Likely-to-Move-Upward-Amid-Tight-Supply-/
- **Lithium: Spot prices soar on Lunar New Year**
  - Fastmarkets' price assessment for lithium carbonate, 99.5% Li_2CO_3 minimum, battery grade, spot price range, ex-works domestic China, was 400,000-430,000 yuan ($62,833 to $67,545) / mt on February 10, up by 50,000-60,000 yuan per tonne from 350,000-370,000 yuan / mta week earlier. https://www.mining.com/lithium-spot-prices-soar-in-lunar-new-year/
- **Lithium supply crunch Part II - this time it's for real: Andy Home**
  - Fastmarkets analyst Will Adams pegs the likely shortfall this year at around 60,000 mt of LCE, stressing that's based on apparent demand, which allows for stock building. New mines and restarts of idled capacity will generate a supply response as the year progresses, with Fastmarkets anticipating robust production growth of 28% this year and another 27% in 2023.
  - Benchmark Mineral Intelligence thinks the deficit will be smaller at 26,000 mt, while Citi is somewhere in the middle with a forecast 36,000 mt gap.
  - Benchamrk Minerals isn't convinced, pencilling in consecutive years of shortfall, with the cumulative deficit mushrooming to 300,000 mt LCE by 2030. https://www.reuters.com/article/idUSL8N2UQ530
- **Trina Storage switches on SMS's 50MW/56.2MWh UK battery storage system**
  - Trina Storage has completed the supply of its first UK battery energy storage system, the 50MW/56.2MWh fully integrated grid-scale battery energy storage system owned by SMS plc. https://www.solarpowerportal.co.uk/news/trina_storage_switches_on_smss_50mw_56.2mwh_uk_battery_storage_system?
- **Umicore introduces new generation Li-ion battery recycling tech. & announces award with ACC**

    - Umicore announces today the signing of an agreement with Automotive Cells Company (ACC) on battery recycling services for the needs of ACC pilot plant in Nersac, France.
    - Umicore is a pioneer in the recycling of rechargeable batteries and its battery recycling plant in Hoboken, Belgium, has an annual capacity of 7.000 tons of lithium-ion batteries and battery production scrap, the equivalent of 35,000 EV batteries. https://www.umicore.com/en/newsroom/news/new-generation-li-ion-battery-recycling-technologies-and-announces-award-with-acc/?
- **Patented Hydro-to-Cathode™ process increases material performance and value**
    - Traditional Li-ion recycling processes involve many steps that use a lot of energy. Also, they focus on reclaiming intermediate compounds to sell to commodities markets. Our Hydro-to-Cathode process is more efficient and more sustainable while it returns higher-level materials to the supply chain. Using a life cycle assessment methodology from Argonne National Labs, our process demonstrated signif. reductions in all environmental impact categories, when compared with traditional methods. https://ascendelements.com/innovation/
- **Innovations in End-of-Life Lithium-Ion Battery Disposal & Recycling**
    - The DOE found was that froth flotation can separate the materials. How does froth flotation work? The spent batteries' oxides go into flotation tanks, and air is pumped in with the mixers helping to get the solution frothy. Cathode materials typically sink to the bottom after absorbing water. In this case, they found the addition of a chemical additive that prevented the absorption of water caused the lithium nickel manganese cobalt oxide to float. That left the lithium manganese oxide to sink. https://www.altenergymag.com/article/2022/01/innovations-in-end-of-life-lithium-ion-battery-disposal-recycling/36680

Regards –