Weekly Precious Metals News Articles: October 29, 2021

Distribution: If you no longer wish to be on this mailing list, send me a note. If others want to be added to distribution, again let me know.

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

- **China's September net gold imports via Hong Kong hit 5-month high**
  - China's net gold imports via Hong Kong jumped nearly 60% in September to their highest level in five months, data from the Hong Kong Census and Statistics Department showed on Tuesday. https://www.nasdaq.com/articles/chinas-september-net-gold-imports-via-hong-kong-hit-5-month-high-2021-10-26
- **Highest Inflation 'Forecast' in 15 Years Sees Gold Prices Try $1800 Yet Again**
  - Gold prices bounced again in London trade Wednesday after trying and failing to hold $1800 per ounce the third time in 2 weeks despite inflation forecasts in the US bond market hitting their highest in over 15 years as a raft of data disappointed very stretched analyst forecasts. https://www.bullionvault.com/gold-news/gold-prices-102720211
- **Gold Regains $1800 as Powell, Yellen and the World Bank Acknowledge Higher and Persistent Inflation, Oil Hit Multi-Year High**
  - GOLD and SILVER PRICES continued rising this Monday as US Federal Reserve Chair Jerome Powell, Treasury Secretary Janet Yellen and the World Bank acknowledge pronounced inflation, amid oil prices hitting multi-year highs writes Atsuko Whitehouse at BullionVault. https://www.bullionvault.com/gold-news/gold-prices-102520215
- **New technology allows molecules to enter cells safely**
  - Nanoparticle-sensitized photoporation is particularly promising in this regard as it typically provides high efficiency, high throughput and low toxicity. It is based on the use of light-responsive nanoparticles, such as gold nanoparticles (NPs), which can form explosive nanobubbles upon pulsed laser irradiation. Those tiny explosions can induce small pores in cell membranes, allowing external effector molecules supplemented in the cell medium to enter cells. https://phys.org/news/2021-10-technology-molecules-cells-safely.html
- **The World Bank is looking for precious metals prices to pullback to averages**
  - In the Word Banks' latest report, they have noted that its Precious Metals Index fell by 3 percent in the third quarter of 2021. It noted that this is due to declining investor sentiment stemming from higher real interest rates and a stronger U.S. dollar, as well as lower physical demand. Moving forward the projections are for the average price to move back to the averages in 2022 on expectations of a tightening of monetary policy. There are upside risks to this outlook, including the threat of new virus variants, geopolitical tensions, and more persistent inflation than anticipated.

https://www.kitco.com/news/2021-10-22/The-World-Bank-is-looking-for-precious-metals-prices-to-pullback-to-averages.html

Semiconductor Related Articles (impacting Precious Metals electronics):

- **PC demand to fall as vaccinations rise**
  - PC shipments are forecast to drop 2.6 % year-on-year to 323.9 million units next year, compared with an estimated increase of 7.6% to 332.5 million units this year, KGI said, attributing the fall in PC shipments to weak Chromebook and desktop PC sales.
  - However, commercial and gaming notebook computers are expected to outperform the overall PC market next year, it added.
    https://www.taipeitimes.com/News/biz/archives/2021/10/25/2003766703
- **TSMC chairman expects Taiwan's IC output to grow by over 24% this year**
  - The production value of Taiwan's semiconductor industry is expected to increase 24.7% this year and surpass US$143.8 billion after growing 20.9% last year. The nation continues to be the No. 1 supplier in the semiconductor manufacturing sector and the IC packaging and testing services sector, he said.
    https://www.taipeitimes.com/News/biz/archives/2021/10/28/2003766862
- **Semiconductor Sector Shows Signs of Cooling**
  - While demand for chip design technology and talent continues to grow, the early signs of a semiconductor industry correction surfaced in mid-October.
  - SEMI reported that the historic rate of bookings for manufacturing equipment began to slow at the end of the summer.
  - Similarly, the growth rate for silicon shipments is forecast to slow next year to an annual increase of 6.4%, less than half of this year's projected growth.
  - "The growth momentum is expected to continue in the following years but could be tempered by the slowing pace of the macroeconomic recovery and timing of the wafer manufacturing capacity additions needed to meet growing demand."
  - Meanwhile, fab capacity for power and compound semiconductors is seen leveling off beginning at the end of this year, with the rate of increase declining steadily through 2024 as fab capacity begins to meet pent-up demand for automotive electronics.
    https://www.eetimes.com/semiconductor-sector-shows-signs-of-cooling/
- **China is fighting a chronic talent shortage in the semiconductor industry**
  - China has been facing this problem for years; a talent pool that is not keeping pace with the country's semiconductor ambition. The country is suffering from a chronic shortage of scientific and engineering talent within the semiconductor industry. If anything, it is hampering its efforts to become a semiconductor superpower.
    https://techwireasia.com/2021/10/china-is-fighting-a-chronic-talent-shortage-in-the-semiconductor-industry/
- **Defense Logistics Agency (DLA) delays certification of FPGA subcontractors**
  - America is racing the clock to certify alternative subcontractors to attach solder columns to defense grade FPGA devices. As a consequence, the US aerospace and defense industry cannot be assured of a continuing supply of ruggedized FPGA components to keep warfighters flying and rockets launching 5 years from now. A sudden shortage of mission critical FPGA devices is not in the defense industry's best interests.
    https://www.topline.tv/MEPTEC5.html

Silver

- **Silver price outlook: is the bullish industrial demand outlook still valid?**
  - Silver price is hovering around $24.50 after moving past the crucial level of $24 a week ago.

- Metals Focus, which is bullish about the metal, predicted its price to average at $27.30.
- With the slowed industrial activity, the forecast appears far from reach, though not impossible. https://invezz.com/news/2021/10/25/silver-price-outlook-bullish-industrial-demand-outlook-valid/

- **India added 8.8 GW of solar in first nine months of 2021**
  - The country is expected to reach 14 GW of newly installed PV capacity this year. Of this power, around 11 GW should come from utility scale projects and 3 GW from distributed generation.
  - Matt 11 GW at today's loadings represents 9.2 Moz of silver https://www.pv-magazine.com/2021/10/28/india-added-8-8-gw-of-solar-in-first-nine-months-of-2021/
- **US solar module imports fall 27% in Q3**
  - The largest single-quarter drop in three years comes as the American Solar Manufacturers Against Chinese Circumvention propose greater tariffs against Asian-imported modules. https://www.pv-magazine.com/2021/10/28/us-solar-module-imports-fall-27-in-q3/
- **Combination of AgNPs and Domiphen is Antimicrobial Against Biofilms of Common Pathogens**
  - Technical Paper Conclusion: Conclusion: Artemisia argyi leaf extract-synthesized AgNPs had antimicrobial activity against the above four strains. The combination of Artemisia argyi leaf extract-synthesized AgNPs and domiphen has synergistic antimicrobial effects to reduce the dosage of each antimicrobial drugs. Artemisia argyi leaf extract-synthesized AgNPs and domiphen have synergistic anti-biofilm effects. https://www.dovepress.com/combination-of-agnps-and-domiphen-is-antimicrobial-against-biofilms-of-peer-reviewed-fulltext-article-IJN

Precious Metals Mining:

- **Anglo American Platinum Limited Production Report for Q3 ended 30 September 2021**
  - Refined PGMs production (owned production, excluding tolling) increased by 39% to 1,420,400 ounces, due to the continued robust performance of the Anglo Convertor Plant (ACP), providing operational stability.
  - Matt: AMPLATS is effectively catching up on mining WIP from ACP plant failures. Now both ACP A & B plants available to run even faster on catch up. https://www.angloamericanplatinum.com/media/press-releases/2021/21-10-2021
- **S.Africa's Implats in talks to acquire Royal Bafokeng Platinum**
  - Implats produced 2.8 million ounces of refined platinum group metals in its 2020 financial year, while RBPlat produced 419,000 ounces of PGMs in 2020. https://www.nasdaq.com/articles/s.africas-implats-in-talks-to-acquire-royal-bafokeng-platinum-2021-10-27
- **Sibanye-Stillwater grabs stake in Australian zinc miner**
  - Expansion-hungry Sibanye-Stillwater (JSE: SSW) (NYSE: SBSW) is extending its footprint to Australia with a $46 million acquisition of a 19.99% stake in New Century Resources (ASX: NCZ), which owns the Century tailings zinc retreatment plant in Queensland.
  - The news comes on the heels of the South African miner's purchase of two nickel and copper mines in Brazil from Appian Capital Advisory, in a $1 billion deal that boosts the company's growing battery materials portfolio. https://www.mining.com/acquisitions-hungry-sibanye-grabs-stake-in-australian-zinc-miner/
- **Sibanye in talks to buy two Brazilian nickel-copper miners**
  - The precious metals miner confirmed on Monday negotiations with affiliates of funds advised by Appian Capital Advisory LLP, regarding a potential deal that would add the Santa Rita nickel-copper and the Serrote copper-gold mines to its portfolio. https://www.mining.com/sibanye-stillwater-in-talks-to-buy-two-brazilian-nickel-copper-miners/
- **Visualizing the Genealogy of Exploration Success**

- In the Western World, 63% of new discoveries in the past decade have been made by Junior Minors.
- Matt: This is so important that we keep investing in mining to meet the clean energy transition and the electrification of everything, yet it's the small players doing the exploration, and environmentalists blocking the access to the needed minerals. To electrify everything, remember one simple point. Electrons pass through minerals. Go figure.
  https://elements.visualcapitalist.com/visualizing-the-genealogy-of-exploration-success/

E-Waste & Precious Metals Recycle Related:

- **Igneo targets low-grade material with $85 million plant**
  - A large electronics processing operation is launching in Georgia, and its focus will be lower-value, plastics-heavy devices in the e-scrap stream. Igneo Technologies and Georgia state officials recently announced the $85 million project. The site is slated to include multiple shredders and furnaces at the Port of Savannah. The facility will use a pyrolysis technology that mirrors a process Igneo subsidiary WEEE Metallica has used for over five years in France.
  - At the center of the venture is Igneo's pyrolysis and gas-handling system. Pyrolysis is the process of heating a material in the absence of oxygen. Igneo notes its system "neutralizes the dioxins and traps the halogens that are contained in the plastic and resin fractions of e-waste. The resulting sustainable copper concentrate is rich in both copper and precious metals and the released process gases exceed and meet all environmental requirements."
    https://resource-recycling.com/e-scrap/2021/10/28/igneo-targets-low-grade-material-with-85-million-plant/?utm_medium=email&utm_source=internal&utm_campaign=Oct+28+ESN
- **Flash method may allow quick recovery of precious metals from e-waste**
  - A method called 'flash Joule heating,' which was originally developed to produce graphene from carbon sources like food waste, has been adapted by researchers at Rice University to recover rhodium, palladium, gold and silver from electronic waste.
    https://www.mining.com/flash-method-may-allow-quick-recovery-of-precious-metals-from-e-waste/
- **Catalytic converter theft quadruples in one year**
  - Through Oct. 10, 2,170 catalytic converters were reported stolen in the five boroughs, more than four times the 501 ripped off through the same date in 2020, the NYPD said.
    https://nypost.com/2021/10/23/catalytic-converter-theft-quadruples-in-one-year/
- **Elemental Holding is building first car battery recycling plant in EU**
  - The company's new facility designed to recycle lithium-ion batteries for electric vehicles, as well as other waste containing precious metals, will be constructed in Zawiercie in southern Poland. Elemental Holding has acquired the land for the plant in co-operation with the local authorities and the local special economic zone in Katowice.
    https://www.recycling-magazine.com/2021/10/28/elemental-holding-is-building-first-car-battery-recycling-plant-in-eua/
- **Royal Mint to recycle e-waste for precious metals**
  - In the case of the Royal Mint, a proprietary chemical process developed by the Canadian start-up company Excir will be used to extract such metals from circuit boards. The process developed by Excir can selectively extract precious metals with great efficiency, thereby making the process of gold and silver extraction economical.
    https://www.electropages.com/blog/2021/10/royal-mint-recycle-e-waste-precious-metals

Platinum

- **Platinum's atypical alkaline electrolyser role lowering hydrogen cost outlook**
  - By incorporating PGMs in the catalytic coatings of the electrodes, hydrogen densities of more than 700 mA/cm2 are being achieved at an operating voltage of 1.8 VDC and the company is confident that its AAE unit can hold its own against PEM electrolysis technology counterparts.

    - Matt: Both low loadings of Platinum, and even lower loadings of Ruthenium being used in Alkaline. https://www.polity.org.za/article/pgms-playing-atypical-role-in-alkaline-electrolyser-lowering-green-hydrogen-cost-outlook-2021-10-26
- **Woven gauzes**
    - Gauzes made from platinum are instrumental to a range of industrial processes https://platinuminvestment.com/about/60-seconds-in-platinum/2021/10/28?utm_source=Newsletter&utm_medium=email&utm_campaign=60+Seconds+in+platinum+281021&utm_id=60+Seconds+in+Platinum
- **Reduced platinum recycling could help offset chip-related platinum automotive demand losses**
    - Reduced vehicle production and sales due to global semiconductor constraints results in delays to end-of-life vehicle scrappage. This reduces platinum auto catalyst recycling supply and partially offsets chip-related platinum automotive demand losses. https://platinuminvestment.com/investment-research/perspectives

Fuel Cells/Hydrogen Economy Related Articles:

- **Ames Goldsmith Ceimig exhibits its role in the hydrogen economy to UK MP ahead of COP26**
    - Ames Goldsmith manufacture the platinum group metal (PGM) based electrocatalysts that play a vital in the production of green hydrogen through proton exchange membrane (PEM) fuel cells and electrolysers. https://www.h2-view.com/story/ames-goldsmith-ceimig-exhibits-its-role-in-the-hydrogen-economy-to-uk-mp-ahead-of-cop26/
- **Toyota testing race car hydrogen combustion engines**
    - Toyota is testing H^2 in race cars as an important step toward using this tech commercially.
    - Toyota had already announced that it was working on this type of engine, a technology that other automakers such as Ford Motor Co have already developed. Vehicles powered in this way differ from fuel cell vehicles, despite the fact that H^2 is used in both cases. FCEVs use the H^2 to create electricity which then powers BEVc or hybrid vehicles. However, in the technology being tested by Toyota, it is burned in a way comparable to the way rockets are fueled. https://www.hydrogenfuelnews.com/hydrogen-combustion-engines-toyota/8549190/?mc_cid=8ab16b3a89&mc_eid=70c1246d58
- **First commercial hydrogen-electric flight between London and Rotterdam The Hague Airport expected in 2024**
    - The aviation sector is planning zero emission commercial passenger flights between Rotterdam The Hague Airport (RTHA) and London with a 19-seater aircraft in 2024. https://www.newswire.ca/news-releases/first-commercial-hydrogen-electric-flight-between-london-and-rotterdam-the-hague-airport-expected-in-2024-889364985.html
- **No zero carbon without green hydrogen, US pledging $1/kg coal-parity price**
    - The world will be unable to meet its zero-carbon targets without the introduction of green hydrogen solutions, says Plug Power chief strategy officer Sanjay Shrestha, at a time when the US has launched a programme to cut the cost of clean hydrogen by 80%.
    - Plug Power, a pure play green hydrogen company, is building out North America's first completely green hydrogen end-to-end supply chain network, coinciding with the cost target for clean hydrogen being set at 'one dollar per one kilogram in one decade' by the US DOE. The level of $2/kg hits oil price parity and $1/kg attains coal price parity. https://www.miningweekly.com/article/no-zero-carbon-without-green-hydrogen-us-pledging-1kg-coal-parity-price-2021-10-21
- **German auto giants place their bets on hydrogen cars**
    - Battery power may be the frontrunner to become the car technology of the future, but don't rule out the underdog hydrogen.

https://www.reuters.com/technology/german-auto-giants-place-their-bets-hydrogen-cars-2021-09-22/

- **500 Containerized Hydrogen Refueling Station, A Milestone in the Hydrogen Energy Industry**
  - A US company has successfully developed and produced a 500KG/day containerized hydrogen refueling station. The station has a daily refueling capacity of 500 Kg (in 12 hrs). The whole system includes a 40 foot container, a hydrogen ground storage (200 Kg @ 43.8MPa), a compression cooling-water machine chiller, and a low temp chiller for hydrogen cooling. The refueling pressure is 35MPa, with TK16 and TK25 dual nozzle. http://www.hydrogenfuelnews.com/a-milestone-in-hydrogen-industry/8548959/
- **Greener, Faster, Cheaper: A Combination of Battery and Fuel Cell Electric Technology Is Key to Successfully Decarbonising Global Transport**
  - Both BEVs and FCEVs are needed to achieve net-zero economically and sustainably
  - A "combined world" will harness benefits of both technologies at a system level
  - It will also help de-risk the most significant transition in the automotive industry's history https://hydrogencouncil.com/en/greener-faster-cheaper-a-combination-of-battery-and-fuel-cell-electric-technology-is-key-to-successfully-decarbonising-global-transport/

Palladium

- **Palladium Price Analysis: XPD/USD directs nearby resistance breakout towards 200-EMA**
  - Palladium (XPD/USD) remains on the front foot around $2,045, up 0.18% intraday during the early European session on Tuesday. The precious metal crossed a downward sloping trend line from October 14 the previous day. The same joins upbeat MACD signals to keep buyers hopeful.
  - However, a clear upside break of the 200-EMA, around $2,070 by the press time, becomes necessary for the commodity bulls before challenging the monthly peak of $2,176. https://www.fxstreet.com/news/palladium-price-analysis-xpd-usd-directs-nearby-resistance-breakout-towards-200-ema-202110260556
- **Platinum and palladium forecasts slashed after chip shortage hits auto sector: Reuters poll**
  - (The latest poll) returned median forecasts for platinum to average $1,000 an ounce in the final three months of 2021 and $1,110 in 2022.
  - For palladium, it predicted averages of $2,050 an ounce in the fourth quarter of 2021 and $2,150 in 2022.
  - A similar poll three months ago forecast averages for platinum of $1,137.50 in the fourth quarter and $1,228 in 2022 and for palladium of $2,800 in the fourth quarter and $2,625 in 2022. https://www.kitco.com/news/2021-10-28/Platinum-and-palladium-forecasts-slashed-after-chip-shortage-hits-auto-sector-Reuters-poll.html
- **China's Overall Auto Sales Fell in Third Quarter, While Electric Vehicle Sales Boomed**
  - China's automotive sector felt the effects of these pressures in the third quarter this year. Although China remains 8.7% ahead of last year's new car sales on a year-to-date basis, new car sales fell 13% compared to Q3 of 2020. September had the largest drop, with a 17% year-to-year drop in sales. https://www.natlawreview.com/article/china-s-overall-auto-sales-fell-third-quarter-while-electric-vehicle-sales-boomed

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

- **Iridium & Platinum Green H2 Electrolyzer Catalyst: ITM Power to build second Gigafactory in the UK and teases plans for a third overseas**
  - Just ITM alone. 1.0 GW plant = 1,000MW = 1,000,000Kw * 0.4 gr Ir = 400,000 grams Ir / year =
  - 13,000 Toz Ir per year per 1GW plant
  - Now building second, in route to a third Giggaplant. ITM Power growing to 59k Toz Iridium Demand https://www.h2-view.com/story/itm-power-to-build-second-gigafactory-in-the-uk-and-teases-plans-for-a-third-overseas/

- **Iridium Crucibles for BAW/SAW Filters: Qualcomm Creates New Bulk Acoustic Wave Filter to Cover C-Band**
    - Qualcomm's new BAW filter for the C-band complements its existing SAW filter technology. Qualcomm's portfolio now differentiates frequencies from 600 MHz to 7.2 GHz. https://www.allaboutcircuits.com/news/qualcomm-creates-new-bulk-acoustic-wave-filter-to-cover-c-band/

Clean Energy General News (New Section)

- **Harnessing wind and hydroelectric power from the Arctic Circle: BMW Group plans to source steel produced with green power and hydrogen from northern Sweden**
    - The region is best known for its reindeer and spectacular northern lights, but also provides access to high-quality iron ore, plentiful energy from renewable sources such as hydroelectric and wind power, a major seaport and generations of steel production know-how.
    - The specially built hydrogen power plant, which uses water and green power from across the region, will be directly integrated into the steel production plant. The company also uses local green power for the remainder of the manufacturing process. https://www.press.bmwgroup.com/global/article/detail/T0350612EN/harnessing-wind-and-hydroelectric-power-from-the-arctic-circle:-bmw-group-plans-to-source-steel-produced-with-green-power-and-hydrogen-from-northern-sweden
- **Toyota exec: Not everyone should drive a battery electric vehicle**
    - Many people are passionate about climate change, but not everybody should drive a battery electric vehicle as a means to combat climate change, Toyota Chief Scientist Gill Pratt said on Thursday at the Reuters Events Automotive Summit. https://www.reuters.com/business/autos-transportation/toyota-exec-not-everyone-should-drive-battery-electric-vehicle-2021-10-21/
- **Two north of England sites selected for multibillion-pound carbon capture plan**
    - The UK government has selected two sites in the north of England to develop multibillion-pound carbon capture projects by the middle of the decade as part of its fast-track scheme to cut 20-30m tonnes of CO2 a year from heavy industry by 2030. https://amp-theguardian-com.cdn.ampproject.org/c/s/amp.theguardian.com/environment/2021/oct/19/two-north-of-england-sites-selected-uk-carbon-capture-plan
- **Carbon Emissions and Particulates Are the Enemies (not IC Engines), with Ameya Joshi (Corning)**
    - Dr. Ameya Joshi is the director of emerging technologies and regulations at Corning Incorporated. Ameya joined Episode 69 of the Future of Mobility podcast to discuss topics including:
    - - The importance of clearly defining our objective – to reduce CO2 and particulate emissions
    - - What to do when science and public perception point in different directions
    - - Why environmental justice is so critical as we clean up transportation
    - - The disproportionate role of cold-start emissions, and technologies to address this
    - - Regulations, including Euro 7, and the propulsion systems that will define our future
    - - The downside of blanket bans on ICEs https://youtu.be/UVtbJQyJwJc
- **Millions Of Jobs At Risk As Europe Faces Magnesium Shortage**
    - Morgan Stanley's Amy Sergeant and Ioannis Masvoulas told clients last week that Europe stands out as the most exposed region to magnesium shortfalls from China. They said Europe shuttered its last magnesium smelter in 2001. This means that there's no way for Europe to domestically increase magnesium supplies and hinges all on China's output.
    - Barclays analyst Amos Fletcher warned clients, "there are no substitutes for magnesium in aluminum sheet and billet production. If magnesium supply stops," the auto industry will grind to a halt.

https://www.zerohedge.com/commodities/millions-jobs-risk-europe-hit-magnesium-shortage

- **EU in talks with China to avoid "catastrophic" magnesium crunch**
  - European leaders, worried about the effect a global shortage of magnesium will have on the European Union's industrial recovery from the pandemic, have open talks with China, which supplies the block with about 95% of the silvery-white metal used to make aluminum.
  - Local companies, including Norway's Norsk Hydro, have stopped producing magnesium because they were unable to compete with lower costs at Chinese producers.
    https://www.mining.com/eu-in-talks-with-china-to-avoid-catastrophic-impact-of-magnesium-crunch/

BEV / LiB Battery Market News

- **Hertz Orders 100,000 Tesla Model 3 Cars for Rental Fleet, TSLA Stock Surges**
  - The cars will be delivered over the next 14 months, and Tesla's Model 3 sedans will be available to rent at Hertz locations in major U.S. markets and parts of Europe starting in early November, the rental company said in a statement. Customers will have access to Tesla's network of superchargers, and Hertz is also building its own charging infrastructure.
    https://www.bloomberg.com/news/articles/2021-10-25/hertz-said-to-order-100-000-teslas-in-car-rental-market-shake-up
- **Panasonic Unveils 4680-Type (46mm x 80mm) Cylindrical Battery Cell Prototype**
  - Panasonic says no to LFP: Panasonic announced also that the company will not offer Lithium Iron Phosphate (LFP) EV batteries. Kazuo Tadanobu said: "...Panasonic had no plans to make cheaper Lithium Iron Phosphate (LFP) batteries for more affordable EVs."
  - It's interesting because this market is significant. Tesla uses LFP - the company switched its entire lineup of standard range vehicles to LFP - and according to some reports, even Apple is searching for a LFP battery supplier.
    https://insideevs.com/news/542991/panasonic-4680-battery-cell-prototype/
- **BYD to reportedly raise battery prices by 20% due to raw material costs**
  - According to the report, the price of lithium battery cathode materials will increase by more than 200%, while the price of electrolyte and anode materials will increase by more than 150%.
  - This price hike, on top of hindered supply chains, means the overall cost to produce a lithium cell has increased dramatically.
  - Matt: Rising material prices will impact the $/kW of LiB and BEV's. Price climbs just getting started. Same is true in the Solar PV Cell and Module costs. Materials & commodity price climbs have been that PV cost curve too.
    https://electrek.co/2021/10/26/byd-to-reportedly-raise-battery-prices-by-20-due-to-raw-material-costs/?utm_source=dlvr.it&utm_medium=linkedin
- **Europe's carmakers face raw material bottleneck for EV batteries**
  - Failure to obtain adequate supplies of lithium, nickel, manganese or cobalt could slow the shift to electric vehicles (EVs), make those vehicles more expensive and threaten carmakers' profit margins.
  - "There is a serious question as to whether supply can keep up with demand across the battery supply chain," says Daniel Harrison, an auto analyst at Ultima Media.
  - But forecasts from banks like UBS that EV sales would soar over the coming decade shook the political establishment and carmakers, and forced a rethink of battery production.
    https://www.reuters.com/business/autos-transportation/europes-carmakers-face-raw-material-bottleneck-ev-batteries-2021-10-13/
- **Ranked: Top 25 Nations Producing Battery Metals for the EV Supply Chain**
  - China, Australia, Brazil, Canada, South Africa, Chile, Indonesia, DRC, India, Philippines, Finland, Japan, Argentina, Mexico, U.S., Vietnam, South Korea, Germany, U.K., France

https://elements.visualcapitalist.com/ranked-top-25-nations-for-battery-metals/

- **New flow battery from the United States**
  - Developed by Honeywell, the flow battery is currently being tested by U.S. utility Duke Energy. The battery can reach a storage capacity of 12 MWh and be used through a modular approach in large scale renewable energy projects.
    https://www.pv-magazine.com/2021/10/27/new-flow-battery-from-the-united-states/

Regards –