



Weekly Precious Metals News Articles: Feb 2, 2024

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Below is a cross section of relevant news article to the world of Precious & Critical Metals: This markets, supply & demand shifts, investment, mining, recycle and industrial applications.

A printable PDF version with more embedded graphics is attached. Enjoy-

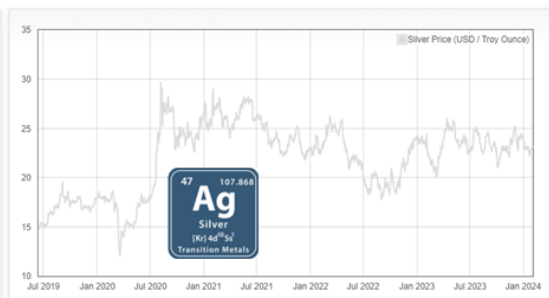
Gold

Gold Prices for the Last 5 Years



Gold – Friday pm ↑ 2,035.90/toz

Silver Prices for the Last 5 Years



Silver – Friday pm ↓ \$22.67/toz

- [A New Driver of Gold?](#)
 - Given these dynamics, the major downside risk to gold prices this year could stem from a risk-on environment in China, such as an equity market rally. However, BMO and Hamilton both expect central bank buying and household investment to be a multi-year theme. In this context, gold emerges not just as a safe haven in uncertain times, but as a strategic asset in a diversifying global economy.
- [Gold Demand Trends Full Year 2023](#)
 - Another year of blistering central bank buying, together with resilient jewellery consumption, offset sizable ETF outflows.
- [LBMA/LPPM 2024 Precious Metals Forecast Survey](#)
 - Gold: \$2,059 – forecast at +6.1% increase on the average price* for 2023
 - Silver: \$24.80 – forecast at +6.2% the ave. price \$23.35 in 2023 and +7.1% higher than early Jan. ave.\$23.14
 - Platinum: \$1,015, a definitive +6.25% compared to the actual average for early January of \$952.88.
 - Palladium: \$1,060.10, a bearish outlook when one considers the actual average price for 2023 was \$1,337.39.
- [Will we see Gold driving on to new highs in 2024?](#)
 - Spot gold prices closed the year up 14.6% (LBMA afternoon fixing, 29 December 2022 – 29 December 2023). While reaching a nominal high, in real terms (netting off inflation) gold is still 15% below the August 2020 level (that marked the previous nominal high). Gold significantly outperformed US Government Bonds (up

4.0% over the same period based on the Bloomberg US Treasury Index). In contrast to 2022, bond and US Dollar headwinds eased toward the end of the year, allowing the metal to gain.

- [**China Evergrande ordered to liquidate in landmark moment for crisis-hit sector**](#)
 - A Hong Kong court ordered liquidation of property giant China Evergrande, dealing a fresh blow to confidence in the country's fragile property market as policymakers step up efforts to contain a deepening crisis.
 - Justice Linda Chan decided to liquidate the world's most indebted developer, with more than \$300 billion of total liabilities, after noting Evergrande had been unable to offer a concrete restructuring plan more than two years after defaulting on its offshore debt and following several court hearings.
 - Evergrande, which has \$240 billion of assets, sent a struggling property sector into a tailspin and dealt a blow to the economy when it defaulted on its debt in 2021.
- [**Gold forecast: What lies in store for the yellow metal?**](#)
 - Gold has always remained resilient amid turbulent economic and geopolitical conditions. At the height of the COVID-19 pandemic in 2020, the gold price increased by 30% and breached the US\$2 000 mark.
 - Since then, it has broadly hovered around this price, however according to global precious metals consultancy, Metals Focus, the forecast for 2024 paints a different picture. GERARD PETER reports.

Semiconductor Related Articles (impacting Precious Metals electronics):

- [**U.S. to reportedly announce billions of dollars in subsidies for advanced chips**](#)
 - The Biden administration is expected to award billions of dollars in subsidies to top semiconductor companies, including Intel and Taiwan Semiconductor Manufacturing Co. (TSMC), in the coming weeks to help build new factories in the United States, The Wall Street Journal reported on Saturday.
 - The forthcoming announcements are aimed at kick-starting manufacturing of advanced semiconductors that power smartphones, artificial intelligence and weapons systems, the WSJ reported, citing industry executives familiar with the negotiations.
- [**Apple iPhone shipments may see 'significant decline' in 2024, analyst says**](#)
 - Apple may see a drop in iPhone shipments this year, due in part to the growing popularity of foldable phones, analyst Ming-Chi Kuo says.
 - Huawei's resurgence in the Chinese market is also having an impact on Apple's business, according to Kuo of TF International Securities.
 - In 2023, Apple for the first time became the top smartphone vendor in China by shipments.
- **(Foundry Giant)** [**UMC net profit falls 30.8% on slow demand**](#)
 - Contract chipmaker United Microelectronics Corp yesterday reported that net profit last quarter declined 30.8% from a year earlier due to challenging macroeconomic conditions, a prolonged inventory correction and slow demand dragging down factory utilization
- [**Samsung Electronics' semiconductor business reports record annual loss**](#)
 - Samsung on Wednesday reported a 34.57% drop in operating profit in the fourth quarter from a year ago, in line with its guidance issued earlier this month.
 - Samsung is the world's largest maker for dynamic random-access memory chips which are found in consumer devices such as smartphones and computers.
- [**China's top fabless chip firms estimate big 2023 losses despite push for greater self-sufficiency in semiconductors**](#)
 - Loongson cited softness in the industrial chips market and heavy spending on research and development for the weaker performance in 2023. Analysts say strict US sanctions and limited product catalogues at Chinese firms are hindering domestic chip development.

Silver

- [**Silver deficit to ease as rising mine output offsets higher demand**](#)

- The global silver deficit is expected to ease by 9% to 176 million troy ounces in 2024, with a 4% recovery in mine output expected to offset rising demand, the Silver Institute industry association said on Tuesday.
- **[Global Silver Demand Forecasted to Rise to 1.2 Boz in 2024](#)**
 - Global silver demand is expected to rise +1%, pushed higher by industrial, jewelry and silverware demand.
 - Total global silver supply is forecast +3% in 2024 to an eight-year high of 1.02 Boz, recovery in mine output.
 - Silver recycling is expected -3% to a three-year low. Lower jewelry and silverware.
 - The silver market is forecast to remain in a deficit (total supply less demand) in 2024, marking the fourth consecutive year of a structural market deficit. Although this year's deficit is expected to ease by 9% to 176 Moz (194 Moz in 2023), it will still be exceptionally high by historical standards.
- **[Top producers push for silver's inclusion as a critical mineral in Canada and US](#)**
 - Top producers of silver are pushing for the inclusion of the metal on the list of critical minerals in Canada and the US. In a letter sent on Wednesday to the Canadian Minister of Energy and Natural Resources, Jonathan Wilkinson, the CEOs of 19 miners, including top producers Coeur Mining, Hecla Mining, and First Majestic Silver, say that considering silver a critical mineral would position the country to be a supplier of choice for strategic allies.
- **[Gold:Silver ratio signals silver on sale](#)**
 - Silver is underpriced. In other words, silver is on sale. The current gold-to-silver ratio reveals this. This ratio tells you how many ounces of silver it takes to buy one ounce of gold. Or to put it another way, the gold:silver ratio tells you the price of gold in silver.
 - In general, the ratio tends to narrow as a precious metals bull market unfolds. In other words, silver outperforms gold. The opposite is true during a bear market for the monetary metals. The gold:silver ratio currently stands at over 87:1, meaning it requires 87 ounces of silver to purchase one ounce of gold.
- **[BNEF report: US\\$1.8 trillion of energy transition investment in 2023, solar oversupply points to manufacturing contraction](#)**
 - PV Tech head of research said 2024 would see a downturn in the solar manufacturing industry, partly as a result of massive capacity expansions by the major Chinese players which has forced prices to historic lows.
 - Wood Mackenzie said that module production capacity in China was around 3x the entire global demand.
 - In recent weeks European solar manufacturers and representative industry groups have been calling for aid to prevent a complete collapse of the industry. Major European companies Meyer Burger and REC Group have announced the shutdown of facilities in Europe due to unsustainable market conditions.
 - In the US, whilst abandoning operations in Germany, Meyer Burger is simultaneously setting up a new factory in Arizona, and many of the largest PV players including Canadian Solar, JA Solar, Hanwha Qcells and others are in the process of establishing US production bases.
- **[What's happened since California cut home solar payments? Demand has plunged 80%](#)**
 - The state Public Utilities Commission in late 2022 slashed by about 75% the rate that utilities pay homeowners with new solar panels when they sell surplus power to the grid. The rate structure went into effect for solar applicants beginning last April. The state's decision has caused consumer demand for residential solar to plummet since the new rate took effect. Solar companies say they've been shoved to the edge of a cliff, forcing them to lay off workers or even shut down.

Precious Metals Mining:

- **[The Largest Mining M&A Transactions of 2023 – \(Gold, Copper, Nickel top the list.\)](#)**
 - Gold mining companies are coming face to face with the challenge of stagnating and even declining production, harder-to-mine deposits, and rising costs. These challenges create opportunities for mergers and acquisitions, as companies seek to boost production and improve efficiencies through economies of scale.

- In addition, mining companies are on the hunt for new supplies of copper, a key metal in the transition to renewable energy, after years of under investment led to cuts in exploration and focusing on fixing balance sheets and appeasing upset investors by overspending in the last commodity boom.
- [Impala Platinum sees 20% decline in HY profit on lower metal prices](#)
 - "Due primarily to the impact of weaker dollar PGM pricing, Implats is expecting headline earnings and headline earnings per share (HEPS) for the period to be at least 20% lower than those reported in the comparative period," it said in a trading update.
- [Implats restarts tragedy-hit shaft amid sharp earnings fall](#)
 - Impala Platinum expected to lose about 60,000 ounces of PGM's owing to the tragic underground accident at its Rustenburg 11 shaft in November in which 13 of its employees were killed and 73 injured.
 - Commenting in a trading update on Wednesday – in which interim earnings were forecast to be at least a fifth weaker year-on-year partly owing to a 32% YoY decline in the basket price – the group said 11 shaft would resume full production in April.
- [Extraction of raw materials to rise by 60% by 2060, says UN report](#)
 - The global extraction of raw materials is expected to increase by 60% by 2060, with calamitous consequences for the climate and the environment, according an unpublished UN analysis seen by the Guardian.
 - Natural resource extraction ~+400% since 1970 due to industrialisation, urbanisation and population growth, according to a presentation of the five-yearly UN Global Resource Outlook made to EU ministers last week.
 - The stripping of Earth's natural materials is already responsible for 60% of global heating impacts, including land use change, 40% of air pollution impact, and more than 90% of global water stress and land-related biodiversity loss, says the report, due to be released in February.
- [Russia's Nornickel forecasts further \(7-15%\) nickel, and \(9-15%\) palladium output drop this year](#)
 - Nornickel, the world's largest palladium producer and a major producer of refined nickel, said its nickel production fell -5% YoY to 209,000 mt in 2023. This year, the company expects nickel output at 184,000 (-12%) to 194,000 (-7%) mt (further decline).
 - Palladium output dropped by 4% in 2023 to 2.692 Moz, Nornickel said. This year, palladium output is seen at 2.296 (-15%) to 2.451 (-9%) Moz

E-Waste & Precious Metals Recycle Related:

- [Mastermelt's double strategic acquisitions in homogeneous catalyst recycling](#)
 - Mastermelt Ltd – Precious Metal Recovery Specialist proudly announces the strategic acquisition of IEX Technologies Ltd, a leading provider of advanced ion exchange materials and process technology.
 - Simultaneously, we are pleased to announce the acquisition of the solvent distillation process plant from Green Lizard Technologies
- [BASF Environmental Catalyst and Metal Solutions \(ECMS\) completes acquisition of Arc Metal AB in Sweden](#)
 - Acquisition adds smelting capability to serve spent automotive catalyst customers in EU, Middle East & Africa
 - Complements ECMS's global recycling operations and precious metal services
 - Broadens range of materials that can be processed by ECMS
- [Tanaka claims precious metals recovery breakthrough](#)
 - Tanaka Kikinzoku Kogyo K.K., a producer and recycler of precious metals, says it has established a method that can recover metals including platinum and palladium that are adhere to certain types of equipment used in semiconductor manufacturing and other processes.
 - Calling the new process Tanaka Green Shield, the company says the method involves cleaning nickel plating from an adhesion-preventing plate on certain components to which sputtered films can adhere. These film traces can contain PGMs that the Tanaka Green Shield process can detach from the plate.

- “After detaching sputtered films adhering to components, mainly made from stainless steel, of vacuum film formation equipment such as sputtering and vacuum deposition equipment, the recovered precious metals are refined and returned to the customer with the precision-cleaned components,” states the firm.
- [The Royal Mint partners with the Ministry of Defense to provide a sustainable solution for the recycling of military electronic devices](#)
 - The Royal Mint has partnered with the Ministry of Defence’s Defence Equipment Sales Authority to process redundant, non-saleable defense equipment at The Royal Mint’s new South Wales based plant each year
 - The Royal Mint has developed a world-first processing facility to recover gold from electronic device using patented chemistry
- [E-waste not, want not | Business Post](#)
 - With the pressure on to make the economy circular Jason Walsh asks whether the demand to extend the life cycle of IT equipment can trump demand for shiny new devices
- [This is the only company recovering precious metals in an environmentally sustainable way](#)
 - It is anticipated, then, that the diesel catalytic converter market will experience a CAGR of 8.1%. However, a substantial challenge arises as most smelters reject (or downgrade terms for) these (diesel) converters due to processing inefficiencies. Regenx provides a safe cleantech process that is a responsible way to recover precious metals from end-of-life products. The company’s innovative clean technology offers a solution, with a single plant featuring four modules, capable of recovering over 100,000 ounces of platinum and palladium from end-of-life catalytic converters annually.
- [Energy and e-waste - the AI tsunamis](#)
 - **AI Power Surge:** By far the greatest challenge in supporting generative AI is a huge surge in power loads. Generative AI models use graphics processing unit (GPU) chips which require 10–15 times the energy of a traditional CPU. To train a ChatGPT 3.5 model requires 300-500 MW of power. A typical data center requires 30-50 MW of power. While LLMs are at the most power-hungry end of the generative AI boom, every generative model has processor and power needs which grow exponentially, doubling or tripling each year.
 - **AI & A Wave of E-Waste:** The second AI-generated tsunami is at the back end; a stream of used equipment. AI is driving faster server innovation, particularly in chip design, and the latest AI chips such as the Nvidia H100 have had so many billions advanced against their manufacture and are in such short supply that they are even being used as debt collateral and made available for rent. While this refresh rate will be key to improving efficiency it will also - in tandem with the rise in capacity - increase the scale of e-waste.
- [Startups are raking in up to \\$85,000 per day by recycling gold and copper from electronics thrown in the trash — e-waste 'gold mining' efforts are expanding](#)
 - The e-waste recycling boom is upon us.
- [The world's biggest jeweller now only sources recycled metals](#)
 - Pandora, known for its affordable sterling-silver charm bracelets, is the world's largest jewellery company by volume: The Danish chain sells more than 100 million pieces annually. This week, it announced that it is now sourcing only 100% recycled silver and gold for its collections.
- [Secondary market for solar panels continues to grow](#)
 - *Matt: Since most Solar PV recyclers are still economically underwater, refurbishing or repairing Solar PV Modules for secondary life repurposing is becoming a means to close the recycle profitability gap.*
 - For the third year in a row, the PV Module Price Index for the Secondary Solar Market report from EnergyBin points to a growing secondary solar market. The price index tracks wholesale pricing and supply of crystalline-silicon (c-Si) modules that have fallen out of traditional distribution channels, and as a result are listed for resale on the EnergyBin exchange.

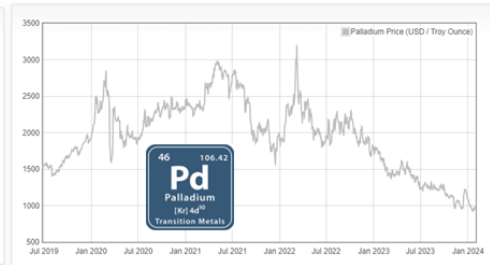
Platinum

Platinum Prices for the Last 5 Years



Platinum - Friday pm ↓ \$902/toz

Palladium Prices for the Last 5 Years



Palladium - Friday pm ↓ \$964/toz

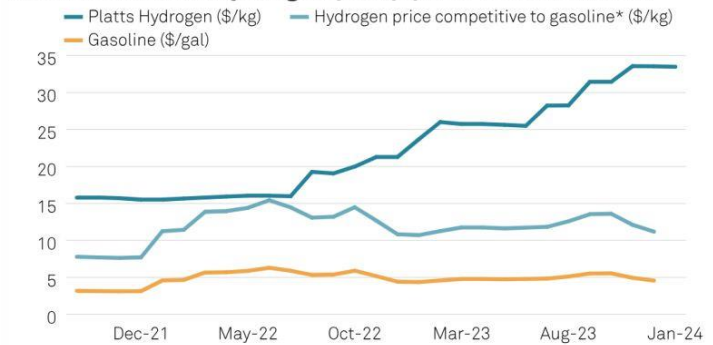
- [Platinum will edge higher amid deficit, on track for price parity with palladium](#)
 - "We see a positive year ahead for platinum with an anticipated deficit of 350,000 ounces in 2024, constituting 5% of the total platinum demand for the year," said independent analyst Ross Norman.
 - "With this, above-ground stocks are set to decline to a four-year low which again suggests the price risk is to the upside." The metal touched a six-month high of \$1,012 in late December and has been unwinding this rally so far in 2024. It fell by 8% in 2023.
- [Electrolyte for Electroplating with Pure Platinum](#)
 - Umicore Metal Deposition Solutions has developed an electrolyte for electroplating with pure platinum: Platuna PT. The electrolyte enables the deposition of exceptionally thick, homogeneous and crack-free platinum layers, which are particularly convincing in various technical applications.
- [WPIC: Spotlight On South Korea](#)
 - The country's adoption of hydrogen technologies as it moves towards net zero has positive implications for platinum demand. South Korea has previously announced domestic plans to deploy 300,000 hydrogen FCEVs — including 21,200 buses — and more than 660 hydrogen filling stations by 2030.

Fuel Cells/H₂ Economy Related Articles:

- [Green Hydrogen: A Multibillion-Dollar Energy Boondoggle](#)
 - The key problem with using H₂ as an "energy carrier" is that, unlike coal or natural gas, H₂ cannot be extracted directly in elemental form and then used. Instead, H₂, like electricity, must be manufactured. And in contrast to crude oil that must be refined into usable products like gasoline and diesel fuel, more energy is required to manufacture H₂ than that H₂ contains. No technology can change this immutable thermodynamic fact. Consequently, and in contrast to fossil fuels and nuclear power, H₂'s "energy return on investment" (EROI), i.e., the ratio of energy output to energy input, is less than one. Coupled with the additional lost energy from combusting (burning) H₂ directly or using it in a fuel cell, H₂'s overall energy efficiency is dismal, making its use as a primary energy carrier self-defeating.
- [Logistical woes and high pump prices stall California H₂ market development](#) - Subscription

- Achievements in ZEV push marred by H₂ challenges: Senator
- High pump prices make FCEVs commercially inaccessible
- LCFS credit surplus spikes retail hydrogen prices to \$34/kg
- California's success in decarbonizing its transportation sector using hydrogen as a zero-emission fuel option is being hampered by the lack of reliable infrastructure and prolonged elevated hydrogen prices at fueling stations, according to an analysis by S&P Global.

Retail California hydrogen pump price vs benchmark



*EER adjusted

Source: S&P Global Commodity Insights, Energy Information Administration

[Hundreds Of Hydrogen Fuel Cell Electric Vans To Flood The Streets](#)

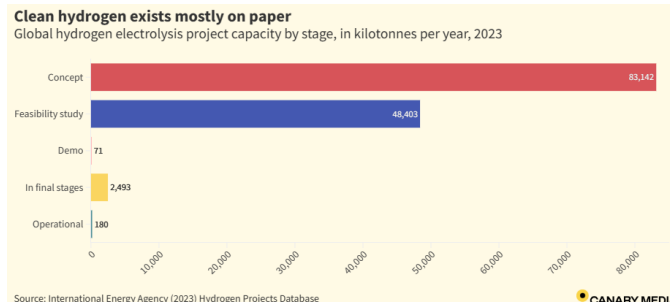
- The debate over hydrogen fuel cell electric vehicles rages on, and Renault Group just added some fuel to the fire. The auto maker's Hyvia electric vehicle venture is kicking into high gear with an initial delivery of 50 hydrogen fuel cell vans to the Auvergne-Rhône-Alpes region this year, towards a near-term goal of 400 light-duty and 80 heavy-duty fuel cell vehicles. The later-term goal is 1,000 vehicles in all, which leads to the question: Where's the hydrogen?

[GE Vernova, IHI to develop 100% ammonia capable gas turbine combustor](#)

- GE Vernova and IHI aim to develop a two-stage combustor that can burn up to 100% ammonia in order to comply with emission requirements. IHI's facilities in Japan will be used for combustion testing to mature the new combustor design.

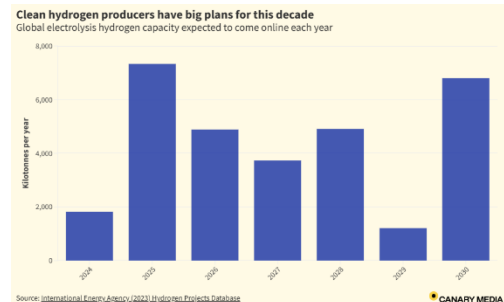
[The dawn of the clean hydrogen economy — visualized](#)

- Thanks to generous subsidies, the world is about to start making a lot more low- and zero-carbon H₂. These charts show how. To be clear, the world does make a fair amount of H₂ today. It's just overwhelmingly dirty H₂, made using fossil fuels. Nearly all of the 95,000 kt of H₂ produced each year comes from an emissions-intensive process called steam methane reforming, which uses fossil gas as its input.



Source: International Energy Agency (2023) Hydrogen Projects Database

CANARY MEDIA



Source: International Energy Agency (2023) Hydrogen Projects Database

CANARY MEDIA

[Infinium & Amogy partner to drive green ammonia and e-fuels innovations | Methanol & e-fuels](#)

- In the drive to decarbonise the hard-to-abate transport sector, carbon-free power solutions company Amogy has signed a deal with e-fuels provider Infinium to jointly study and identify the most suitable applications to deploy their e-fuels and green ammonia solutions.

[Importing Ammonia As An Energy Carrier Is Bad Policy & Worse Economics](#)

- Many power-to-x firms and energy exporting companies are looking at Japan especially, but also other hydrocarbon light countries as a great market to send ammonia to as an energy carrier. That's not going to end well. Why not?

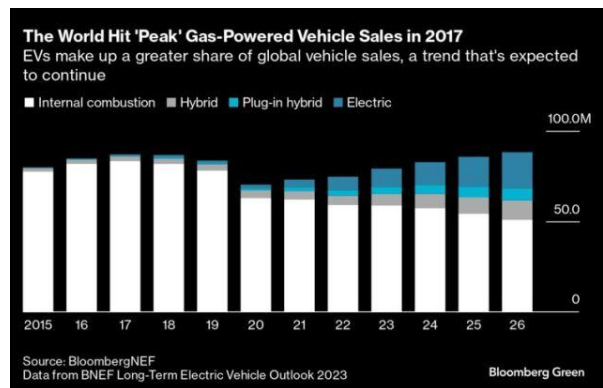
[Sales of Chinese hydrogen fuel cars rose by over 70% last year](#)

- Last year, the country saw the sale of about 6,000 hydrogen fuel cars, which was an increase of 72% over the number of units sold in 2022, according to data released by CAAM.
- **[BASF and Envision Energy enter a collaboration to develop e-methanol technologies](#)**
 - Backed by their respective expertise, the two companies aim to optimize the process of producing e-methanol from green hydrogen and CO₂, paving the way for a more sustainable energy landscape. This collaboration will see BASF provide its cutting-edge SYNSPIRE catalyst technology, which Envision Energy will integrate with its innovative energy management system. The two organisations plan to demonstrate the viability of the advanced process design next year, at Envision Energy’s Chifeng site in Inner Mongolia, China.
- **['Unprecedented' | Stellantis sells 150 hydrogen vans to Toyota/Air Liquide joint venture days after unveiling eight new models](#)**
 - Hyssetco — a JV between Toyota, Air Liquide, energy efficiency services company IDEX and electric taxi firm Step that leases fuel-cell vehicles to customers in France — will now add the 150 Peugeot E-Expert hydrogen vans to its fleet, which currently includes the Toyota Mirai and Renault Master van.
- **['No light at the end of the tunnel' for H₂ electrolyser maker Nel amid 'enormous' market oversupply](#)**
 - “When we look at sales multiples, Nel is more expensive than its competitors and the company has gone from having a very leading position to losing market share over time.” Nel is the world’s oldest pure-play H₂ company, having sold alkaline electrolysers since 1927, and was the biggest electrolyser manufacturer on the planet when it acquired PEM electrolysis company Proton OnSite in 2017.
- **[Novel technology that uses light rather than heat to crack ammonia into hydrogen goes on sale](#)**
 - US start-up Syzygy Plasmonics says it has started accepting orders for “the world’s first light-powered reactor cell for industrial chemical reactions”, which can crack ammonia into hydrogen and nitrogen using ultra-high-performance LED bulbs and proprietary catalysts.

Palladium

- **[Global Gas-Powered Vehicle Sales Have Fallen 23% Since 2017 Peak](#)**

- Global sales of internal-combustion-engine vehicles have fallen each year since 2017 thanks to electric cars taking up a growing share.
- The result: The world has hit “peak” gas-powered vehicle sales, said Colin McKerracher, BloombergNEF’s head of transport and automotive analysis, at the group’s summit Tuesday in San Francisco. Since that peak in 2017, gas-powered vehicle sales have dropped 23%. At the same time, EV sales have steadily risen.

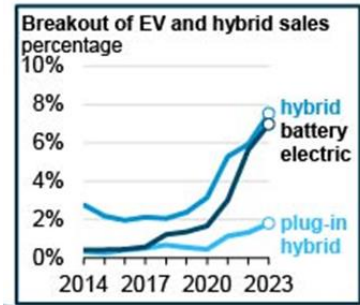


- **[Can Palladium Recover?](#)**

- The palladium futures arena could be in for a significant price recovery when it finds its bottom. However, the trend remains bearish in early 2024, and bear markets in illiquid markets can take prices to irrational, illogical, and unreasonable levels that defy fundamental and technical analysis

- **[Electric vehicles and hybrids surpass 16% of total 2023 U.S. light-duty vehicle sales](#)**

- Combined sales of hybrid vehicles, plug-in hybrid electric vehicles, and battery electric vehicles (BEV) in the United States rose to 16.3% of total new light-duty vehicle (LDV) sales in 2023, according to data from Wards Intelligence. In 2022, hybrid, plug-in hybrid, and BEV sales were 12.9% of total sales.



- **Why palladium matters to the growth of the platinum market**

- Multi-year platinum deficits, exacerbated by ongoing substitution of platinum for palladium in automotive end uses, will draw down above ground platinum stocks and tighten markets at a time of rapid acceleration in the growth of the hydrogen economy, and consequent demand growth for platinum in hydrogen-related technologies. Substitution of platinum for palladium in automotive end uses will reach an estimated 640 koz this year, rising to a forecast 700 koz in 2024. It is expected to peak at over 1 Moz per annum by 2025.

- **Toyota group tops global auto sales in 2023 for 4th straight year**

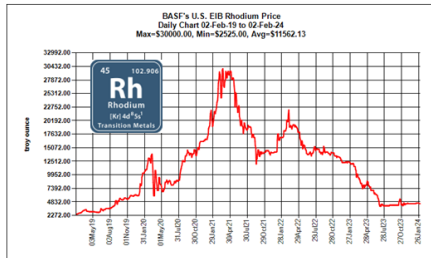
- The automaker sold a record 11.23 million vehicles globally last year, including those produced by the group's mini vehicle maker Daihatsu Motor Co. and truck manufacturer Hino Motors Ltd., up 7.2% from a year earlier.
- Archrival Volkswagen AG of Germany sold 9.24 million cars in the year. The Japanese automaker's previous high was 10.74 million vehicles in 2019.

- **How have Euro 7 emission standards changed?**

- The latest iteration of Euro 7 sees the limits of carbon monoxide, hydrocarbons, nitrogen oxides and particulate matter from petrol and diesel exhausts remain the same as the current Euro 6.
- Euro 7 was originally expected to be in place by the middle of 2025. However, with the recent changes to the plans, this timeline has been deemed unrealistic.
- Instead, the final plans are expected to be approved by the European Parliament by the middle of 2024. After this approval, the rules are expected to be in place for vehicles undergoing type approval within 30 months, while the legislation will be enforced for all vehicles available for sale after 42 months of the approval.

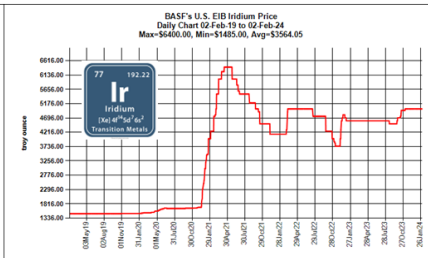
PGM Minor Metals (Rhodium, Iridium, Ruthenium, Osmium)

Rhodium Prices for the Last 5 Years



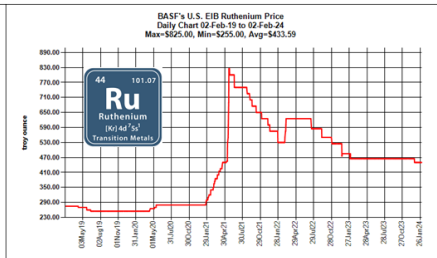
EIB US Friday: Rhodium ↓ \$4,500/toz

Iridium Prices for the Last 5 Years



Iridium EIB Friday → \$5,000/toz

Ruthenium Prices for the Last 5 Years



EIB US Friday Ask: Ruthenium → \$450/toz

- **The Hydrogen Stream: Europe prioritizes PEM electrolysis**

- Europe is embracing polymer electrolyte membrane (PEM) electrolysis, prioritizing it over alkaline electrolysis, said Thomas Hillig, managing director at THEnergy. "While many of the older installations were alkaline electrolyzers, now there is a clear predominance of PEM technology," he told pv magazine. THEnergy recently published an electrolysis capacity map for Europe. "My best guess would be that the map covers 80% of electrolyzers that are used for producing green hydrogen," said Hillig.

- **Hydrogen electrolyser factories are only operating at 10% capacity on average: BNEF**

- Electrolyser factories built to supply machines for green hydrogen projects are on average operating at 10% of their nameplate capacity — with the lowest utilisation in mainland China, analysis from research house BloombergNEF (BNEF) has revealed.
- [PGMs and hydrogen think tank to cause disruption](#)
 - The adoption of PGMs in a growing hydrogen economy requires improved research and development initiatives, with advances in technology addressing thrifiting, or the substitution, of iridium.
- **Ru/Pt/Au/Ag in HDDs/Servers: [The FT writes, the world's ever-expanding digital footprint is gobbling up so much power it's prompting alarm from regulators and backlash from environmentalists.](#)**
 - By 2026, global power demand from data centres could surpass 1,000 TWhs, more than double 2022 levels, according to the IEA. The power-hungry facilities consumed 460TWh of electricity in 2022, roughly 2% (*Matt: 460/29,000 TWh = 1.53%*) of the world's global, although the share is much larger in particular countries.
 - Data centers are the backbone to our digital lives. Their 24/7 operations and large cooling systems require vast amounts of power, and the recent boom in AI and cryptocurrency is helping drive the industry's electricity consumption to unseen levels. ChatGPT uses nearly 10x electricity than Google search.
 - *Matt: As a 17-year HDD industry veteran, I can tell you the SSD's although 2-3x more expensive than HDD's have a lower OpEx, especially in locations with higher power costs. HDD's run hotter, requiring more AirCon, the data centers main OpEx component. This is a reason SSD's are winning out vs HDD's in market share.*
- [Carbon-Extraction-Induced Biaxial Strain Tuning of Carbon-Intercalated Iridium Metallene for Hydrogen Evolution Catalysis](#)
 - Metallene materials with atomic thicknesses are receiving increasing attention in electrocatalysis due to ultrahigh surface areas and distinctive surface strain. However, the continuous strain regulation of metallene remains a grand challenge. Herein, taking advantage of autocatalytic reduction of Cu²⁺ on biaxially strained, carbon-intercalated Ir metallene, we achieve control over the carbon extraction kinetics, enabling fine regulation of carbon intercalation concentration and continuous tuning of (111) in-plane (−2.0%–2.6%) and interplanar (3.5%–8.8%) strains over unprecedentedly wide ranges. Electrocatalysis measurements reveal the strain-dependent activity toward hydrogen evolution reaction (HER), where weakly strained Ir metallene (w-Ir metallene) with the smallest lattice constant presents the highest mass activity of 2.89 A mg^{−1}Ir at −0.02 V vs reversible hydrogen electrode (RHE).
- [Targeting cancer stem cell OXPPOS with tailored ruthenium complexes as a new anti-cancer strategy.](#)
 - The safety and anti-CSC activity of a ruthenium complex featuring bipyridine and terpyridine ligands and one coordination labile position (Ru1) were evaluated across primary pancreatic cancer cultures and in vivo, using 8 patient-derived xenografts (PDXs). RNAseq analysis followed by mitochondria-specific molecular assays were used to determine the mechanism of action.
 - We show that Ru1 is capable of inhibiting CSC OXPPOS function in vitro, and more importantly, it presents excellent anti-cancer activity, with low toxicity, across a large panel of human pancreatic PDXs, as well as in colorectal cancer and osteosarcoma PDXs.

Clean Energy Market News





- **[France drops renewables targets, prioritises nuclear in new energy bill](#)**
 - Critics are deriding as a step backward a new French energy bill that favours the further development of nuclear power and avoids setting targets for solar and wind power and other renewables.
 - The country became a leader in nuclear power generation after the 1973 oil crisis, building over 50 such power plants that produced around two-thirds of the country's electricity.
- **[Uranium prices could rally past 16-year highs as the world's largest producer \(Kazatomprom\) runs short \(of Sulfuric Acid\)](#)**
 - The world's largest miner of uranium is staring at production issues over the next two years.
 - Kazakh mining company Kazatomprom cautioned it is likely to fall short of production targets through 2025.
 - Kazatomprom is the world's leading uranium miner, accounting for over one fifth of the world's production.
 - Kazakh mining company Kazatomprom recently cautioned that it is likely to fall short of production targets through 2025 due to construction delays and "challenges related to the availability of sulfuric acid." Sulfuric acid is critical in the extraction process as it is used to leach and recover uranium from raw ore.
- **[BASF joins forces with Envision Energy in e-methanol mission](#)**
 - Commenting on the agreement, Detlef Ruff, Senior Vice President, Process Catalysts at BASF, said, "By combining our innovative catalyst technology with Envision Energy's deep expertise, we are confident that we can unlock the full potential of green hydrogen and CO2 conversion to e-methanol."
 - According to BASF, the advantages of e-methanol extend beyond its ability to be used without a change in infrastructure. The fuel can be stored at room temp & ambient pressure indefinitely.
- **['Airlines are not willing to pay a premium for green hydrogen-based e-kerosene': report](#)**
 - High cost of synthetic aviation fuel a 'significant barrier' to projects accessing finance and public funding, says T&E. Many international airlines are shying away from paying a premium for e-kerosene made from green hydrogen, which is putting the future of projects producing the fuel in jeopardy, according to a new study published by a clean transport group. E-kerosene is made by synthesising green hydrogen with either biogenic carbon dioxide (derived from biomass combustion) or waste CO2 from industrial processes.
- **[Germany: Habeck authority publicly admits: Energy transition will be hundreds of billions of euros more expensive than planned](#)**
 - Why these figures are so explosive: Previously, according to the grid development plan, the Federal Network Agency had assumed 209 billion euros for the transmission grid, i.e. the large power lines and lines, by 2037 – now it is at least twice as much in half the time, which is equivalent to a fourfold increase. In the case of the distribution grid, the government agency had assumed 42.3 billion by 2032 – in two years less, it will now be at least three times as much.
- **[Siemens Gamesa seals stake sale as CEO looks for 'reliable and profitable' future](#)**
 - Windar divestment comes as troubled turbine giant refocuses on core business following torrid 2023
- **[California solar-plus-storage project with world's largest BESS fully online](#)**
 - The Edwards & Sanborn solar-plus-storage project in California is now fully online, with 875MWdc of solar PV and 3,287MWh of battery energy storage system (BESS) capacity, the world's largest.

- The 4,600-acre project in Kern County is made up of 1.9 million PV modules from First Solar and BESS units from LG Chem, Samsung and BYD totaling 3,287MWh of energy storage capacity.
- [POLL-Copper to dither before recovering later in 2024](#)
 - "Concerns about high interest rates and the impact on construction will weigh on prices in the short term," said Matthew Sherwood at the Economist Intelligence Unit. "Prices will rise more significantly in the second half of the year as markets take on board looming supply shortages."
- [New multi-million dollar \(aluminum\) recycling facility coming to Defiance County](#)
 - The \$253 million MetalX facility specializes in assembling, sorting, recycling and wholesale distribution of aluminum scrap and waste materials.
- [Biden to offer \\$1.5-billion loan to restart Michigan nuclear power plant](#)
 - Funding will be offered as soon as next month to Holtec to restart its Palisades nuclear plant
- [German net power imports to triple this year – Icis](#)
 - German net electricity imports were likely to reach 38 TWh, compared to just short of 12 TWh in 2023, Icis said in a 2024 outlook for Europe's power, gas and carbon markets.
 - Europe's biggest electricity consumer would transform from "the second largest net exporter of power in Europe to the second largest net importer within the space of just two years," the report said.
 - Icis attributed this to the completion of the country's nuclear phaseout last year together with its ongoing coal exit. Icis expected another 10 GW of German hard coal and lignite plants to exit the market in 2024.

BEV / LiB Mineral & Battery Market News



Friday: Lithium → \$13,275/mt

Friday: Nickel ↑ \$16,067/mt

Friday: Cobalt → \$29,135/mt

- [Game changer in global nickel market: booming Indonesian nickel industry](#)
 - As the nickel price at LME market has decreased by nearly half over the last 13 months, global nickel producers are facing huge challenges now. Most recently, Wyloo Metals and BHP in Australia announced to shut down some capacity due to the falling prices, respectively. Although weak demand is one of problems, many market participants believe the booming of Indonesian nickel industry is the key driver for oversupply.
- [Trafigura-backed nickel mine seeks new partner for bailout](#)
 - The French territory, a remote archipelago in the South Pacific, was once seen as the future of nickel production and attracted billions of dollars of investment. But instead, it became a byword for the sector's exuberance, with projects beset by technical mishaps and high costs. Pressure on the local industry has rapidly increased over the past year as nickel prices plunged more than 40%.
- [Europe's biggest EV market is about to hit a perfect storm of problems](#)
 - Germany is Europe's biggest auto market, and it's been one of the main drivers of EV growth. But now that is expected to change course, as EV sales are projected to drop – by 14% – for the first time in eight years.
 - Germany's VDA, an interest group for the country's automobile industry, says that battery-powered vehicles are likely to see a decline from 524,000 units last year – more than any other European market – to 451,000 units this year. Considering Germany is aiming to have 15 million BEVs on the road by 2030, that number is moving in the wrong direction.

- It's due to a number of factors – primarily because Germany pulled the plug on its EV subsidy program in December, a full year earlier than expected. Add inflation, rising car prices, and “sub-par charging infrastructure,” writes Automotive News Europe, into the mix, and it's inevitable that sales will drop.
- **Cobalt oversupply brings change to long-term contracts**
 - The emergence of a large oversupply in the cobalt market over the past 18 months has helped drive further evolution into how long-term supply agreements will be structured going into 2024
- **Glencore to Cut Cobalt Output With Market Struggling**
 - The company will produce between 35,000 to 40,000 mt of the battery metal this year, down - 42% from a production target set in December 2022, it said on Thursday. It also expects to incur higher production costs at its copper mines, due partly to its stockpiling of unsold cobalt.
 - Glencore was overtaken by China's CMOC Group as the world's top cobalt producer last year, and the sharp cut to its output target marks a major revision to a planned expansion that could have helped it to regain its crown. Cobalt production fell 6% to 41,300 tons in 2023, while copper output fell 5% and zinc was 2% lower.
- **Battery recycling tech aims for fully domestic production**
 - Singapore-founded Green Li-ion's system was developed to solve a geopolitical and environmental problem with recycling lithium-ion batteries, Stephen Hayward, vice president of operations, told E-Scrap News. Traditionally, recycling batteries involves shredding them then separating out the critical materials, such as cobalt, manganese and nickel, along with the black mass.
 - The units, manufactured globally, use a single-batch, four-stage process. Instead of breaking the materials out into different sulfates, the technology keeps the critical materials in the desired end format through a series of leaching, filtration, precipitation, co-precipitation, selective regeneration and electro-separation.
- **Albemarle lays off 300 employees on weak lithium prices**
 - Goldman Sachs recently said it estimated a surplus of 200,000 tonnes of lithium carbonate equivalent, or 17% of global demand, this year. It anticipated the situation to push producers, particularly Australians, to “substantially” reduce output to balance the market.
- **Chinese companies to pour \$7 billion into mining infrastructure in Congo**
 - The DRC's state miner, Gecamines, will be entitled to a 1.2% royalty. Congo holds the title of the world's largest producer of cobalt, a vital element in batteries for electric vehicles and mobile phones.
 - The country also ranks as the third-largest global producer of copper, and its mining landscape is largely dominated by Chinese companies.
- **Short sellers bet against green minerals boom as battery commodity prices plunge**
 - Half of the 10 most shorted stocks on the Australian market are involved in battery minerals or electrification, according to data from the Australian Securities and Investments Commission. Lithium producer Pilbara Minerals tops the list.
- **Solid-State EV Batteries Now Face “Production Hell” - IEEE Spectrum**
 - Recent solid-state battery announcements by Volkswagen and QuantumScape are raising hopes in the electric-vehicle market, but automotive battery experts are warning that the road to widespread, solid-state success is still a long and arduous one. A single breakthrough, as if from above, is not likely to turn the whole industry on its nose anytime soon.
- **China's rare earth imports shot up in 2023**
 - According to customs data, China's rare earth metal ore imports reached 5,616 mt in December, up 21% YoY and 24% MoM. In 2023, China's rare earth imports were some 3.4 times its exports. Imported products were mainly rare earth's raw materials, while exported products were deeply processed rare earth.
- **The first big batch of used EVs will hit the market in 2026. No one knows what's going to happen**
 - “The rapid escalation in new EV leases in 2023 is going to fuel an exponentially growing used EV market, particularly in the year 2026, because most leases are 36 months,” says Jimmy Douglas, a former Tesla executive who is the founder and CEO of Plug, an online wholesale marketplace for used EVs.

Regards – Matt

44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver
76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold

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