

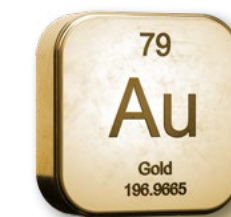
PRECIOUS APPRAISAL



- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIIDIUM
- 06 TRENDS AND INVESTMENTS
- 07 ABOUT HERAEUS

PRECIOUS METALS REVIEW

Gold



	CLOSE	WEEKLY CHANGE	HIGH	DATE	LOW	DATE
\$/oz	2,684	-2.17%	2,750	05/11/2024	2,643	07/11/2024
€/oz	2,506	-0.87%	2,552	06/11/2024	2,466	07/11/2024

Republican wins are not good for gold in the short term. Gold dropped to \$2,643/oz, the lowest price in 19 days, and the dollar strengthened as it became clear that Trump would return as US president. The dollar index saw more than a 1% gain against most major peers on the day of Trump’s win. Following the 2016 Trump victory there was an 11.6% fall in the price of the yellow metal. This downward response was not solely due to the Trump victory. Since 1976, election of a Republican administration has led to an average 4.5% decline in the price of gold within 60 days compared to an average 3.8% rise for a Democratwin. Likely control of the House of Representatives and confirmed Republican control of the Senate increase the likelihood of conservative economic policy implementation and reduce uncertainty in geopolitical direction, but not the details. As a safe-haven asset, gold tends to rise in a highly uncertain environment. However, probable execution of import tariffs and tax-cutting policies could stoke inflation and expand the federal deficit. The Federal Reserve’s rate cutting path – which was restated on Thursday by the expected 25 basis points – may have to slow or change if inflation rises. This outcome would support safe-haven demand on a slightly longer-term outlook.

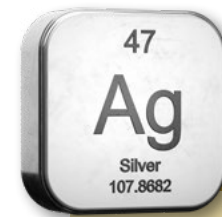
The US and Perth Mints both report large falls in bullion sales year-on-year. Cumulative totals up to October show a 663.5 koz decline in purchases of gold bullion from the US Mint in 2024 compared to 2023. This puts US Mint sales on track for the weakest year since 2019 when only 151 koz was bought. Similarly, purchases from the Perth Mint were down 261 koz by September 2024 compared to the same time last year. Notably, 2023 sales from the Perth Mint were 40% down from 2022 to 665 koz. This all represents a year-on-year continuation in decline in retail buying for both mints which fits with the larger trend globally. Bar and coin investment was down 9% year-on-year as of Q3’24. Notably, the decline in this metric accounted for by the US and Perth Mints was offset by India, Korea and Taiwan where buying was up 41%, 36% and 28% year-on-year, respectively (source: World Gold Council). Even with strong gains in these countries, retail investment demand is down and may continue to struggle if the gold price stays high.

After the initial drop following the US election results, the gold price firmed later in the week, but still closed 2.17% lower at \$2,684/oz.

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIIDIUM
- 06 TRENDS AND INVESTMENTS
- 07 ABOUT HERAEUS

PRECIOUS METALS REVIEW

Silver



	CLOSE	WEEKLY CHANGE	HIGH	DATE	LOW	DATE
\$/oz	31.27	-4.03%	32.92	05/11/2024	30.83	06/11/2024
€/oz	29.21	-2.68%	30.95	05/11/2024	28.27	06/11/2024

Demand drive for silver fuelled by expanding solar capacity and a shift in cell type. Last week, the UK’s National Energy System Operator (NESO) called upon the UK government to have 47 GW of solar capacity in the UK by 2030. UK solar capacity reached 17 GW as July 2024 drew to a close (source: Department for Energy Security and Net Zero). Recorded capacity in July 2024 was 1.2 GW higher than in July 2023, so to meet the aspirations of NESO the UK must increase its annual rate of solar deployment by nearly four-fold. The growth rate in Germany is higher than in the UK. In Germany, 10.23 GW of photovoltaic capacity was added in the first eight months of 2024, bringing the cumulative total to 93.02 GW. The EU is expected to install 401 GW of new solar between 2024 and 2028, potentially bringing the total to 671 GW. Meanwhile, the Chinese solar industry added 102.48 GW of capacity in the first half of 2024 alone, making the current total 711 GW and representing an unmatched 140% year-on-year growth. China is on track to exceed its 2024 expectation, laid out by the Energy Institute, of installing 165 GW of capacity. Furthermore, the East Asian industry brought about a divergence from P-type cells to N-type cells which carry a greater silver loading. Despite improved thrifting and substitution with cheaper metals, such rapid installation growth and the rising use of N-type cells should continue to bolster silver demand in 2024. Besides China’s leading role in the photovoltaic sector, the growth of this industry in all regions is positive for silver demand.

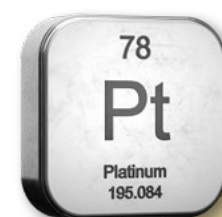
Global capacity additions this year are forecast to be 550-600 GW compared to 2023 when 447 GW was installed (source: The Silver Institute). Worldwide total demand for silver was 1,195 moz in 2023, of which photovoltaics consumed 14%. Total demand is expected to rise modestly to 1,200 moz in 2024. However, this increase in demand from the solar sector could push overall demand higher in 2024.

Like the rest of the precious metals, the silver price dropped last week, falling back below \$32/oz. By Friday’s close it had retraced comfortably below this key level to \$31.27/oz.

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIDIUM
- 06 TRENDS AND INVESTMENTS
- 07 ABOUT HERAEUS

PRECIOUS METALS REVIEW

Platinum



	CLOSE	WEEKLY CHANGE	HIGH	DATE	LOW	DATE
\$/oz	967	-2.95%	1,006	05/11/2024	965	06/11/2024
€/oz	904	-1.56%	928	08/11/2024	901	04/11/2024

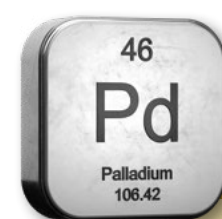
Sibanye-Stillwater achieved three-year-high platinum production in Q3'24. Sibanye-Stillwater's South African operations produced 295 koz of platinum in the third quarter of this year (including purchase of external concentrate), representing a 7.2% increase quarter-on-quarter and a 4.5% improvement year-on-year. Platinum production in the quarter was also the highest since Q3'21. Additional refined production as a result of the acquisition of Anglo American's share of Kroondal's output has helped to boost production, offsetting small declines at the Rustenburg operations owing to equipment repairs and restructuring. Production guidance has been maintained at 1.8-1.9 moz 4E PGMs for 2024, equal to approximately 1.07-1.12 moz of platinum. For Sibanye-Stillwater to reach the top of the range, Q4'24 production will have to rise further. Either way, refined production is expected to improve on the 1.05 moz of platinum produced in 2023. Despite this, the South African platinum supply picture is one of overall decline this year (-126 koz year-on-year), mainly as a result of a number of safety stoppages at various operations. The absence of load curtailment impacts from Eskom for most of this year has offset some of this loss, enabling some producers to refine work-in-progress stocks, improving refined output without boosting mining.

The rand has been trending lower over the last month, having hit a more than 12-month high against the dollar. A brighter outlook for dollar strength on the back of a Trump presidency is likely to keep pressure on the rand-dollar exchange rate for now, as traders price in the implications of the regime change. Should the rand move back into its previous range of 18-19.5 USDZAR, the platinum price could see pressure to the downside. Last week, the platinum price returned to a sub-\$1,000/oz level, closing 2.95% down on a one-week basis, and more than 5% lower over the last fortnight.

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 **PALLADIUM**
- 05 RHODIUM, RUTHENIUM, IRIDIUM
- 06 TRENDS AND INVESTMENTS
- 07 ABOUT HERAEUS

PRECIOUS METALS REVIEW

Palladium



	CLOSE	WEEKLY CHANGE	HIGH	DATE	LOW	DATE
\$/oz	991	-10.56%	1,113	04/11/2024	990	08/11/2024
€/oz	926	-9.20%	1.021	04/11/2024	923	08/11/2024

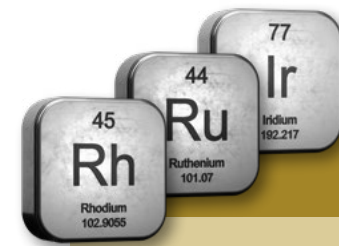
Trump 2.0 may be a challenge for BEV progress in the US. With a second Trump presidency now confirmed, and Republican control over the legislature looking set, changes to the clean-car subsidy regime in the US may be at risk. The returning president has postulated that Biden-era emissions targets will be overturned, and that unspent IRA funds will be rescinded once power switches hands. Exactly how, or if, these changes are implemented is unclear at present, but with the Senate and House of Representatives being majority Republican there will be fewer legislative obstacles to the changes if actioned. Removing fleet emissions targets and increasing the cost of BEVs (through subsidy removal and introduction of tariffs on batteries) would likely lead to fewer BEV sales and a slower rate of BEV penetration in the US. In this scenario, autocatalyst palladium demand in the US would be sustained for longer. The share of BEVs in US new light-vehicle sales reached 7.6% as of September (source: Argonne National Laboratory), only slightly higher than in 2023, as sales of fully electric vehicles have underperformed expectations from the beginning of the year. Combined with a moderate rise in total vehicle sales and a greater proportion of (slightly higher Pd-loaded) hybrids, North American palladium autocatalyst demand is forecast to rise by ~2.5% to 1.8 moz this year. It remains to be seen whether Trump policies will help to sustain demand near this level, but it is likely that the new administration will be supportive for palladium demand.

The palladium price continued to retreat last week, underperforming platinum and posting a second straight week with a decline of >10%. Support may be found around \$1,000/oz given previous price lows, but the close below this level last week shows momentum is still to the downside.

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIIDIUM**
- 06 TRENDS AND INVESTMENTS
- 07 ABOUT HERAEUS

PRECIOUS METALS REVIEW

Rhodium, Ruthenium, Iridium



	RHODIUM	RUTHENIUM	IRIDIUM
Reporting Week	\$5,225/oz	\$530/oz	\$5,150/oz
Previous Edition	\$5,275/oz	\$530/oz	\$5,150/oz

Other electrolyser manufacturers are making strides to reduce iridium usage. UK-based PEM electrolyser manufacturer ITM Power has announced that it has successfully reduced iridium catalyst loadings by 40%, resulting in a total reduction in iridium use of 80% in its electrolysers over recent years, though data on original loadings are not made public. Heraeus Precious Metals has also been developing low-iridium PEM catalysts, and last year partnered with Sibanye-Stillwater to develop a dual-metal iridium and ruthenium-oxide catalyst, which could reduce loadings by 80-90% vs. ‘iridium black’ 100% iridium catalysts. The dual-metal technology brings iridium loadings to below 100 kg/GW of electrolysis capacity, compared to 300-500 kg/GW for iridium black catalysts.

Iridium thriftig not only reduces the input costs for electrolysis production but also helps to reduce concerns over iridium availability limiting PEM electrolyser and green hydrogen scaling-up. More than 80% of primary iridium supply comes from platinum production in South Africa and is very inelastic to demand. By reducing iridium loadings, electrolyser rollout is less likely to be capped by iridium availability.

The ruthenium and iridium prices were stable last week, while the rhodium price dropped back to \$5,225/oz.

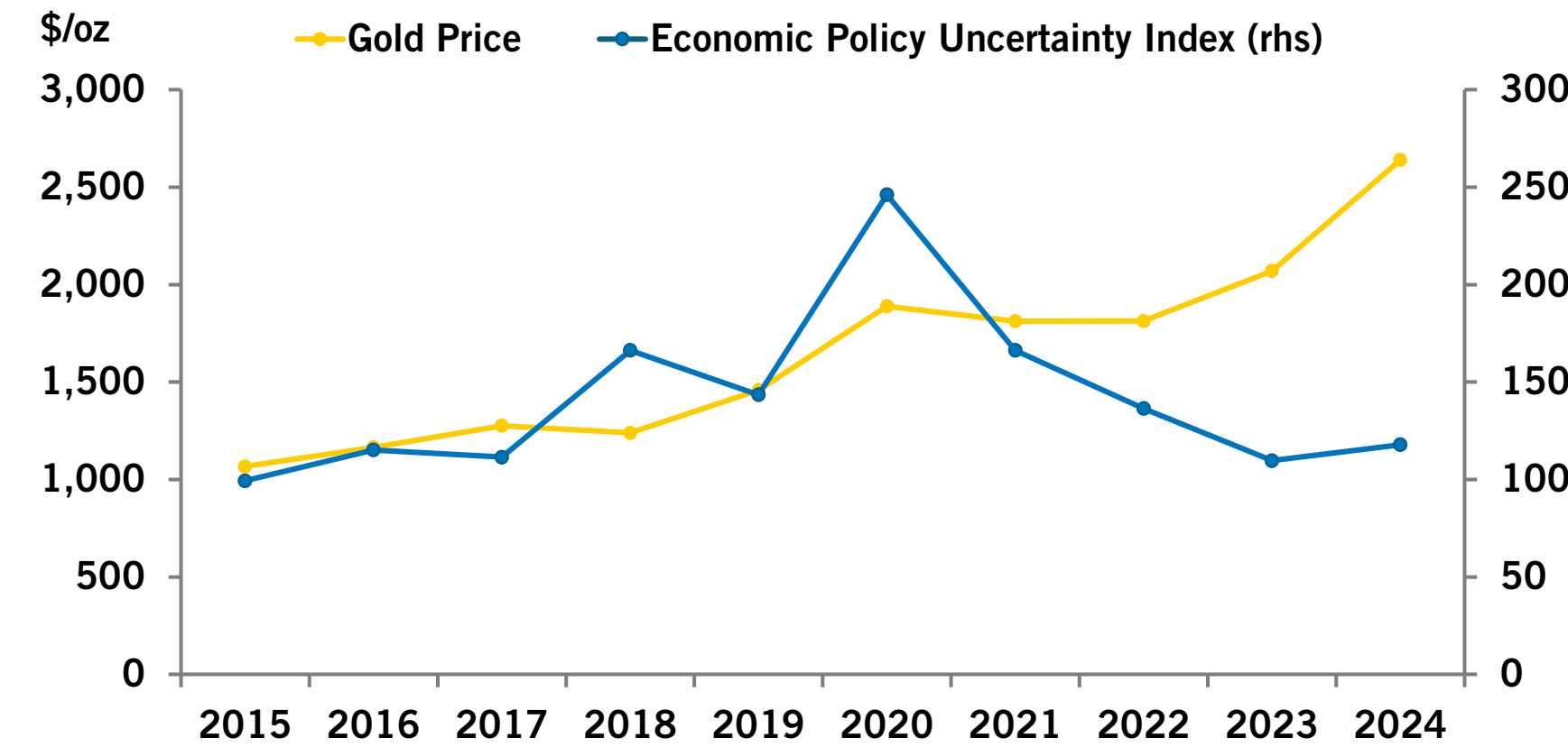
PRECIOUS APPRAISAL

11th November 2024

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIIDIUM
- 06 **TRENDS AND INVESTMENTS**
- 07 ABOUT HERAEUS

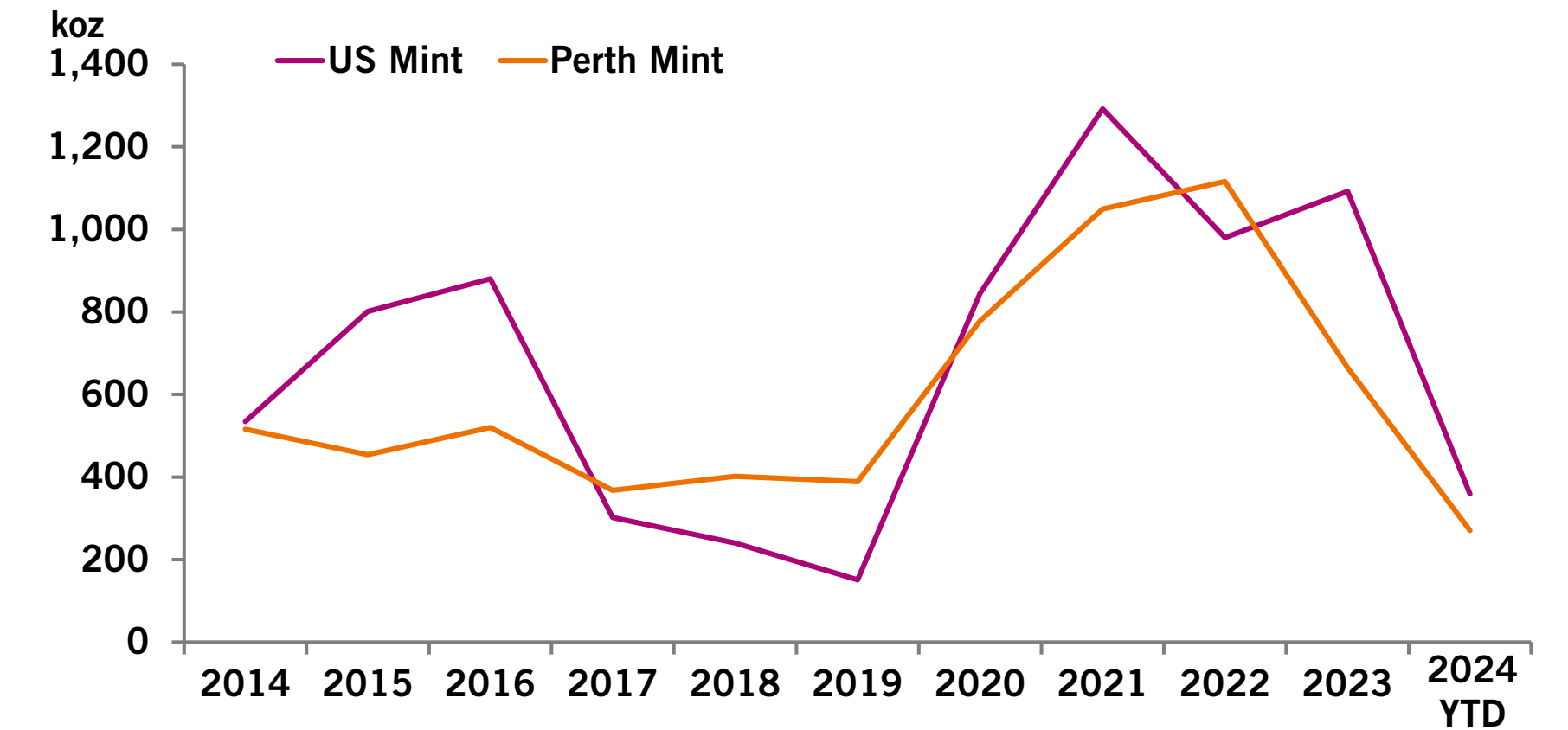
TRENDS AND INVESTMENTS

Gold vs. Policy Uncertainty Index



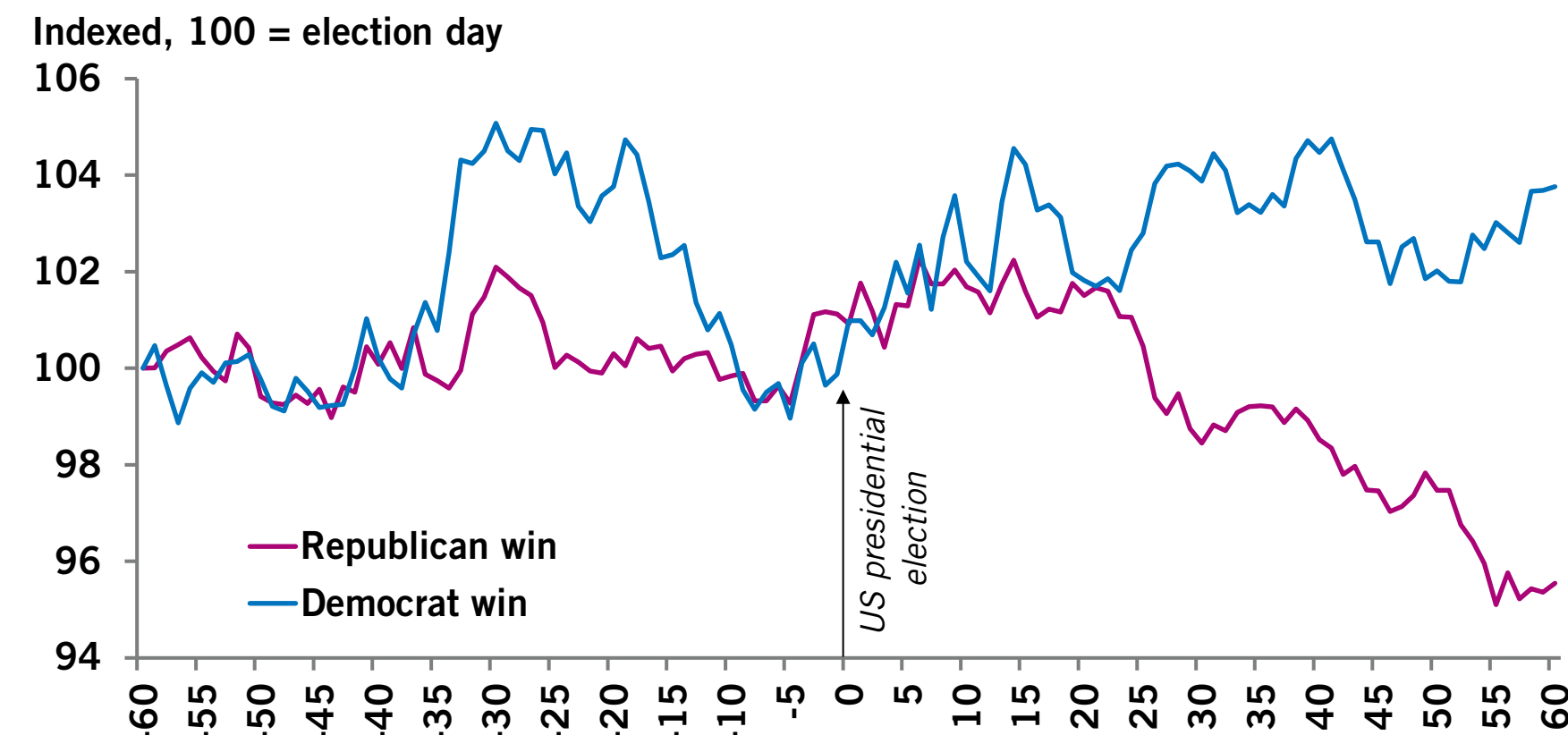
Source: SFA (Oxford), Bloomberg, policyuncertainty.com

Perth Mint and US Mint gold bullion sales



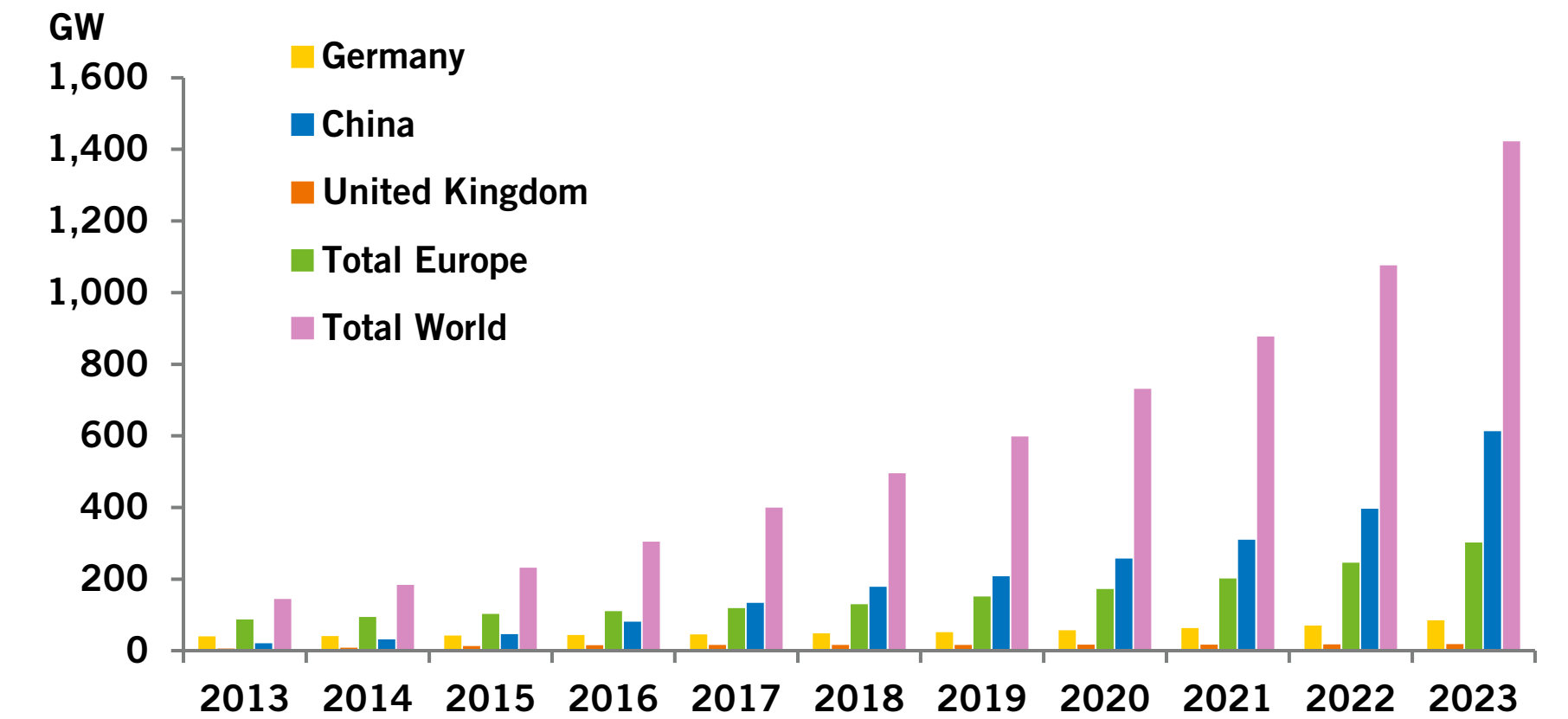
Source: SFA (Oxford), Perth Mint, US Mint

Gold price performance around US elections



Source: SFA (Oxford), Bloomberg

Annual additions to solar capacity by country



Source: SFA (Oxford), Statistical Review of World Energy

PRECIOUS APPRAISAL

11th November 2024

- 01 GOLD
- 02 SILVER
- 03 PLATINUM
- 04 PALLADIUM
- 05 RHODIUM, RUTHENIUM, IRIIDIUM
- 06 TRENDS AND INVESTMENTS
- 07 **ABOUT HERAEUS**

ABOUT HERAEUS

Learn more about important trends in the precious metals markets on a weekly basis with our Heraeus Precious Appraisal. **Please subscribe: www.herae.us/trading-market-report.**

Heraeus Precious Metals

Europe, Middle East, Africa & other regions

Phone: +49 6181 35 2750

tradinghu@heraeus.com

South East Asia

Phone: +852 2773 1733

tradinghk@heraeus.com

USA

Phone: +1 212 752 2180

tradingny@heraeus.com

China

Phone: +86 21 3357 5658

tradingsh@heraeus.com



Heraeus is a family-owned global technology group headquartered in Hanau, Germany. The company's roots go back to a family pharmacy started in 1660. With its expertise and resources, Heraeus has been making meaningful contributions over generations and is committed to do so in the future. Today, the group bundles diverse activities in four Business Platforms: Metals and Recycling, Healthcare, Semiconductor and Electronics, as well as Industrials. Customers benefit from innovative technologies and solutions based on broad materials knowledge and technological leadership.

Heraeus Precious Metals is globally leading in the precious metals industry. The company is part of the Heraeus Group and covers the value chain from trading to precious metals products to refining and recycling. It has extensive expertise in all platinum group metals as well as gold and silver.

The Heraeus Precious Appraisal is produced in collaboration with:

SFA (Oxford) Ltd

United Kingdom

Phone: +44 1865 784366

www.sfa-oxford.com

The Oxford Science Park,
Oxford, United Kingdom, OX4 4GA



consulting analysts in tomorrow's commodities and technologies

Disclaimer

This document is being supplied to the recipient only, on the basis that the recipient is reasonably believed to be a professional market participant in the precious metals market. It is directed exclusively at entrepreneurs and especially not intended for the use of consumers.

The material contained in this document has no regard to the specific investment objectives, financial situation or particular need of any specific recipient or organisation. It is not provided as part of a contractual relationship. It is not and should not be construed as an offer to sell or the solicitation of an offer to purchase or subscribe for any investment or as advice on the merits of making any investment.

This report has been compiled using information obtained from sources that Heraeus and SFA (Oxford) Ltd ("SFA") believe to be reliable but which they have not independently verified. Further, the analysis and opinions set out in this document, including any forward-looking statements, constitute a judgment as of the date of the document and are subject to change without notice.

There is no assurance that any forward-looking statements will materialize. Therefore, neither SFA nor Heraeus warrants the accuracy and completeness of the data and analysis contained in this document.

Heraeus and SFA assume no liability for any losses or damages of whatsoever kind, resulting from whatever cause, through the use of or reliance on any information contained in this document. However, in so far as a liability claim exists under German law, Heraeus and SFA shall have unlimited liability for willful or grossly negligent breach of duty.

Unless expressly permitted by law, no part of this document may be reproduced or distributed in any manner without written permission of Heraeus. Heraeus specifically prohibits the redistribution of this document, via the internet or otherwise, to non-professional or private investors and neither Heraeus nor SFA accepts any liability whatsoever for the actions of third parties in reliance on this document.