

Press release

Hanau, February 5, 2019

Heraeus Precious Metals Forecast: 2019

- **Global turbulence strengthens gold and silver**
- **Palladium remains scarce and expensive**
- **Repercussions from the diesel scandal put further pressure on platinum**
- **Trend: Precious metals recycling must make up for decreasing production from mines**

Precious metals forecast for 2019: price increases expected

Heraeus Precious Metals, the world's largest precious metals provider, sees precious metals prices rising in 2019 despite some fluctuations. Growing economic and political uncertainties such as the trade conflict between China and the United States, the unresolved Brexit, the protests in France, slower economic growth worldwide, and volatile capital markets are leading to stronger demand for gold and silver in 2019. The strongly risen industrial demand for palladium will push its price up as well. Despite the lower request for platinum, the price of that precious metal will rise moderately.

Overview of trading ranges:

Precious metal	Range
Gold	\$1,225/oz to \$1,450/oz
Silver	\$14.50/oz to \$20.00/oz
Platinum	\$700/oz to \$950/oz
Palladium	\$1,130/oz to \$1,650/oz
Rhodium	\$2,000/oz to \$3,250/oz
Ruthenium	\$200/oz to \$350/oz
Iridium	\$1,150/oz to \$1,750/oz

Heraeus Precious Metals prepared its precious metals forecast in cooperation with the international consulting firm SFA Oxford Ltd, which specializes in precious metals.

The precious metals forecast in detail:

Gold as a safe haven

There are several indications that the price of gold could rise in 2019. In light of unrest in the capital markets, investors are increasingly turning to less volatile alternatives. The central banks in developed markets have pursued an unconventional monetary policy for years. The US Federal Reserve appeared to have first retreated from the zero-interest rate policy to a normal interest rate environment and now seems to act with more caution again. A temporarily weaker US dollar could support gold. This overall situation holds the potential for unexpected tensions. Gold can be used as a tool to hedge against currency fluctuations. Furthermore, economic and political uncertainties are globally on the rise. The Brexit, the unsolved trade conflict between China and the United States, the government shutdown in the

United States, or the recession in Italy – these and other factors are causing the global economy to experience lower growth. Central banks are increasingly becoming gold buyers again, thus supporting demand. For 2019, the price per fine ounce of gold is expected to range between US \$1,225 and US \$1,450.

Following in the wake of gold, silver sees stronger growth

In uncertain times, the price of silver is influenced by the same factors as the price of gold. Furthermore, there are other signs that the price of silver will experience a steeper rise than gold in 2019. The underlying demand from the industry is growing. This precious metal is indispensable for photovoltaics, and, despite more efficient products with lower silver content, a higher number of new installations in many regions will lead to higher demand for silver. Furthermore, silver is necessary in the growing areas of electronics for vehicles, smartphones, tablets, and so forth. On the investor side, silver supplies declined last year and for ETFs, they have fallen by 280 tons.

The current gold-silver ratio of 83 is also indicative for this. Silver is consequently undervalued compared to gold. Historically, ratios above 80 have never lasted long. Because the market environment now favors the demand for silver, the price per fine ounce of silver is expected to range between US\$14.50 and US\$20.00.

Platinum surplus remains; strikes could temporarily prop up the price

The lower demand for diesel engines continues to lead to an excess of platinum. The automotive industry is the largest consumer of platinum, with a 42 percent market share. Platinum is used in diesel catalytic converters.

The platinum demand from the jewelry industry, at a share of 25 percent, remains with the risk of declining.

A slight uptick in demand for platinum is due to its applications in oil refineries, especially in China and in the USA, and a higher demand for platinum as a catalyst material for chemical processes.

The offer of platinum from mines, primarily in South Africa, is supposed to grow by one percent. Potential strikes over wage negotiations in the mining industry could temporarily prop up the price. The offer from recycling is seeing moderate growth this year. All in all, a production surplus of 21 tons of platinum is expected for 2019, with overall production amounting to 207 tons in 2018. The close correlation with gold could temporarily support the price of platinum. The price per fine ounce of platinum is expected to range between US\$700 and US\$950.

Palladium remains in short supply; price expected to rise with high volatility

The shortage of palladium will continue in 2019, as visible ETF stocks have shrunk from 39.4 tons to around 20 tons. The automotive industry is the heaviest consumer of palladium, at 81 percent. Palladium is used in catalytic converters in gasoline engines. A slight growth in the automobile market and stricter emission regulations in China are further increasing the demand for palladium. Although the production of palladium from mines and from recycling slightly exceeds demand, there is still a market deficit of 17 tons. Strikes by South African mine workers could exacerbate this deficit.

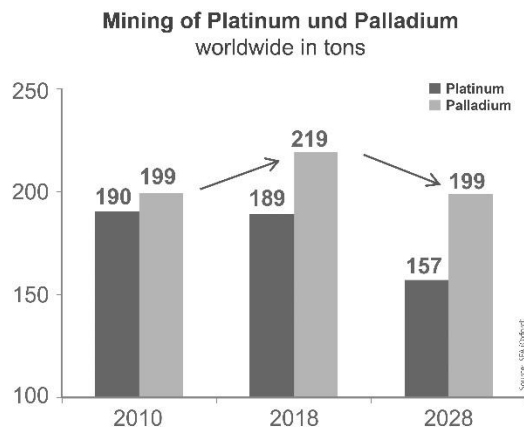
The situation might ease if economic growth slows in China and the USA, the automotive heavyweights. Based on the continuing palladium shortage, the price per fine ounce of palladium is expected to range between US \$1,130 and US \$1,650.

Medium- and long-term trends in the precious metals industry

For the medium to long term, the Heraeus Precious Metals sees two major trends that will affect the precious metals industry:

1. The primary production of platinum and palladium from mines will decline during the next ten years. The recycling of platinum group metals (PGMs) will acquire an increased importance.

Not sufficiently high prices and high and further growing cost of mining have led to a consolidation in industry within the last years, especially in the field of PGMs.



2. Alterations in mobile powertrain technologies lead to a lower request for platinum. The request for platinum will return to significant growth by the development of the fuel cell technology.

Due to the diesel scandal and an absence of a connection technology that relies on platinum there will be a surplus of platinum in the next decade. However, hydrogen technology using predominantly platinum in catalytic converters as a drive for vehicles and stationary motors and for energy storage will boost demand for platinum. But this might have increasingly noticeable effects on both the supply of platinum and its market price around the year 2030.

In contrast, the growth in automobile sales worldwide will increase the demand for palladium in the next decade despite an increase in electric vehicles. The growing number of gasoline and hybrid vehicles will more than compensate for the drop in palladium use due to entirely electric vehicles.

Investments in recycling and hydrogen technology

To serve these two trends, Heraeus Precious Metals is investing in expanding its recycling capacities in Germany, the USA, India and China. In China, the company opened the world's largest and most modern factory for precious metals recycling short time ago. "We are already recycling more than 100 tons of platinum and palladium per year. Compared to primary extraction, this accounts for significant savings in CO₂ emissions and energy consumption. Precious metals recycling is increasingly important for closing the gap between the shrinking output by mines and the demand," explains André Christl, president of Heraeus Precious Metals for the Germany-based Heraeus technology group. The company is also investing in the development of new technologies, including hydrogen technology.

Disclaimer

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Moreover, any projections regarding precious metals, including any forward-looking statements, set out in this Forecast are based on the expectations and assumptions of Heraeus and SFA (Oxford) Ltd as of the date of this Forecast. Actual results may significantly differ from this Forecast due to risks, uncertainties and various other factors that are outside the control of Heraeus and SFA (Oxford) Ltd. Therefore, there is no assurance that any forward-looking statements will materialize. Heraeus and SFA (Oxford) Ltd do not undertake to update any of the forward-looking statements to reflect developments which differ from those anticipated.

About Heraeus Precious Metals

Heraeus Precious Metals – a global business unit within the Heraeus group – is a world-wide leading provider of precious metals services and products. It combines all activities related to its comprehensive expertise in the precious metals loop – from trading to precious metals products to recycling. Heraeus Precious Metals is among the world's largest refiners of platinum-group metals (PGMs) and an authority in industrial precious metals trading.

About Heraeus

A globally leading technology group, Heraeus is headquartered in Hanau, Germany. Founded in 1851, it is a family-owned portfolio company which traces its roots back to a pharmacy opened by the family in 1660. Today, Heraeus combines businesses in the environmental, energy, electronics, health, mobility and industrial applications sectors. In the 2017 financial year, Heraeus generated revenues of € 21.8 billion. With approximately 13.000 employees in 40 countries, the FORTUNE Global 500-listed company holds a leading position in its global markets. Heraeus is one of the top 10 family-owned companies in Germany. With technical expertise, a commitment to excellence, a focus on innovation and entrepreneurial leadership, we are constantly striving to improve our performance. We create high-quality solutions for our clients and strengthen their long-term competitiveness by combining unique material expertise with leadership in technology.

Media Contact Heraeus

Andrea Schlepper
Heraeus Holding GmbH
Heraeusstraße 12-14
63450 Hanau, Germany
Phone: +49 (0) 6181.35-4478
E-Mail: presse@heraeus.com