

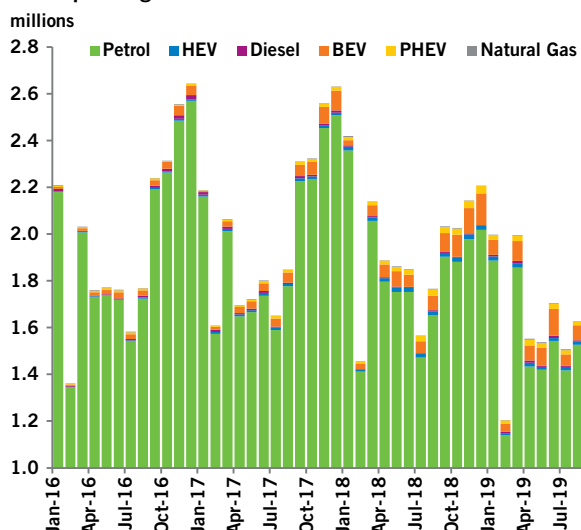
MARKET SPOTLIGHT

A rougher ride for NEVs in China adds to palladium's appeal

Slowing economic growth compounded by trade uncertainty has led to falling car sales in China. This has predominantly impacted petrol cars which are the largest segment of the market. However, new energy vehicle (NEV = battery, plug-in and fuel cell vehicles) sales dropped by 32% year-on-year in September, while the rate of decline in petrol car sales eased to 5%. NEV market share peaked in June at 8.1% on buying ahead of a change in subsidies, but shrank to 3.8% in September. NEV sales were over 1.2 million units out of a total of 23.1 million units in 2018, but at the current rate NEV sales will struggle to exceed 1 million this year.

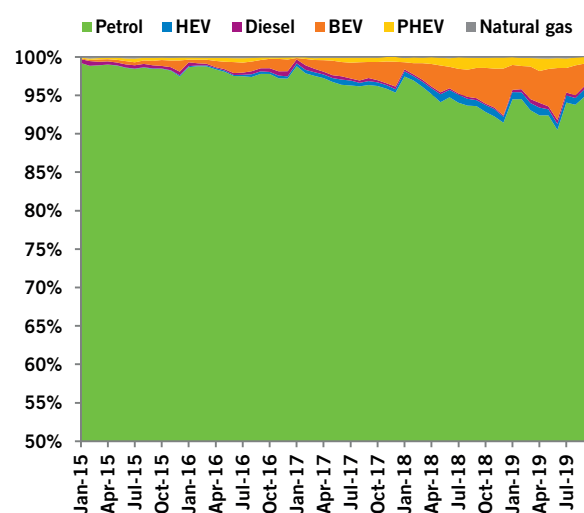
Government policy changes make NEVs look less attractive. Sales of NEVs have been encouraged with purchase subsidies. However, the government is gradually phasing out the subsidies. The revision for 2019 has seen the subsidy for a BEV with a 48 kWh battery and 320 km range cut from ~\$7,500 (~€6,300) last year to ~\$2,100 (~€1,900). For a PHEV the subsidy of ~\$3,300 (~€2,800) in 2018 has dropped to ~\$1,500 (~€1,300). The subsidies are scheduled to end in 2020. With overall car sales expected to recover next year, the changes to incentives for NEVs could leave gasoline vehicles with the advantage. If NEV sales stay at 2019 levels in 2020 rather than increasing, the extra gasoline car sales would add 100 koz to palladium demand.

China passenger car sales



Source: SFA (Oxford), CAAM

China passenger car market share



Source: SFA (Oxford), CAAM

Palladium demand is rising from increasing car sales and higher catalyst loadings. The introduction of China 6 emissions legislation in some cities this year and nationwide in July 2020 has resulted in autocatalyst loadings being increased. Even with the slowdown in car sales, the higher loadings are lifting palladium demand this year and the anticipated sales recovery next year will raise demand further. Overall palladium supply is expected to fall short of demand next year, meaning another year with a substantial market deficit of 700 koz. The price hit \$1,800/oz for the first time last week and with a strong demand outlook it is expected to remain elevated.



PRECIOUS METALS REVIEW

79

Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,511	0.45%	1,516	01/11/2019	1,481	30/10/2019
€/oz	1,353	-0.33%	1,360	31/10/2019	1,336	29/10/2019

Fed rate cut helps to boost gold. The gold price had slipped under \$1,500/oz ahead of the Federal Reserve rate decision. The widely expected announcement of a 25 bp cut in the Federal funds rate initially saw gold sell off, but the price quickly recovered and has moved back above \$1,500/oz. It seems that much of the positive news is already in the price, so gold may struggle to make further headway in the short term. Although further rate cuts appear to be off the agenda, with real interest rates becoming negative that should favour gold in the longer term.

Festival gold sales in India fell in October, but exceeded very low expectations. Initial reports vary but suggest sales of gold in India during Dhanteras dropped by around 25% to 30 tonnes this year. Owing to weak demand due to high prices, the India Bullion and Jewellers Association had predicted a decline of about 50% compared to 2018. The gold price is 20% higher than last year. Dhanteras is considered an auspicious day to buy gold and marks the start of the five-day festival of Diwali. Gold consumer demand in India was 760 tonnes in 2018 (source: World Gold Council). Weak sales in the festival period mean that Indian gold demand this year will most likely be lower than in 2018.

47

Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	18.09	0.56%	18.18	31/10/2019	17.59	30/10/2019
€/oz	16.20	-0.20%	16.31	28/10/2019	15.87	30/10/2019

Silver underperforms gold despite rallying following the Fed meeting. Both gold and silver rallied last week, but even with the silver price climbing back above \$18/oz the gold:silver ratio has moved up to 84. As has often been the case this year, the stronger buying has been directed at gold rather than silver. The speculative futures position in silver is less than half its peak level and ETF buying has dried up. The rally was not even sufficient to move the price to a new high for the month, so silver may continue to trade sideways with gold.

Supply from the world's second-largest producer is down 10% year-to-date compared to 2018. Silver production from Glencore was 23.7 moz in the first three quarters of the year as a result of lower silver by-product output from copper and zinc operations. Glencore's results, combined with the poor production performances that some major primary silver producers have reported, mean that silver production is likely to fall this year.

78

Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	951	2.40%	955	01/11/2019	909	29/10/2019
€/oz	851	1.41%	855	01/11/2019	821	29/10/2019

Platinum producer results disappoint in Q3. Impala's refined platinum output fell by 24% to 281 koz in Q3 owing to processing problems. The stock that has built up as a result will be processed over the remainder of the company's financial year (to June 2020). Sibanye-Stillwater has maintained guidance for 4E production of 1.0-1.1 moz for this year. However, that implies that there will need to be a notable improvement in performance in Q4 or platinum production will fall short of expectations.

Expansion in fuel cell capacity is positive for platinum. Umicore has opened a new fuel cell catalyst production centre near Seoul, South Korea. The facility will produce Polymer Electrolyte Membrane (PEM) fuel cell catalysts, which uses a platinum catalyst, for the automotive industry. Fuel cell demand for platinum is a few tens of thousands of ounces, but this will grow over time as the numerous initiatives that are currently underway to expand the hydrogen economy gain traction.



PRECIOUS METALS REVIEW

⁴⁶Pd **Palladium**

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,809	2.02%	1,825	30/10/2019	1,776	28/10/2019
€/oz	1,622	1.33%	1,640	30/10/2019	1,597	31/10/2019

Norilsk Nickel (Nornickel) is on track to exceed palladium output guidance. Nornickel, the largest palladium producer in the world, produced 2,204 koz of palladium in the first nine months of the year, 7% higher than in the same period in 2018. Output in the third quarter was 720 koz, which was 6% lower than in the previous quarter. However, with 80% of annual palladium production guidance already achieved, the company remains on track to comfortably meet, and most likely exceed, palladium production guidance of 2,770-2,800 koz.

Stillwater's palladium production could fall this year. Sibanye-Stillwater has reduced its production guidance for its US operation to 590-610 koz 2E PGM, which equates to 455-470 koz of palladium. Palladium production through September was 335 koz so the lower end of guidance might be achieved. This would be 45 koz less than projected at the start of the year and slightly below output in 2018.

⁴⁵Rh ⁴⁴Ru ⁷⁷Ir **Rhodium, Ruthenium, Iridium**

	Rhodium	Ruthenium	Iridium
Reporting week	\$5,425/oz	\$250/oz	\$1,500/oz
Previous week	\$5,450/oz	\$250/oz	\$1,500/oz

Rhodium production dropped in South Africa in Q3. Reduced output by two of the three largest rhodium producers would have contributed to the market tightness and the price climbing 60% since June. Processing problems cut Impala's refined rhodium output by 30% to 33 koz in Q3. The stockpiled material will be refined during the remainder of the company's financial year (to June 2020). Sibanye-Stillwater needs to improve production in Q4 for the combined South African operations to produce the same amount of rhodium as Lonmin and Sibanye-Stillwater achieved in 2018.

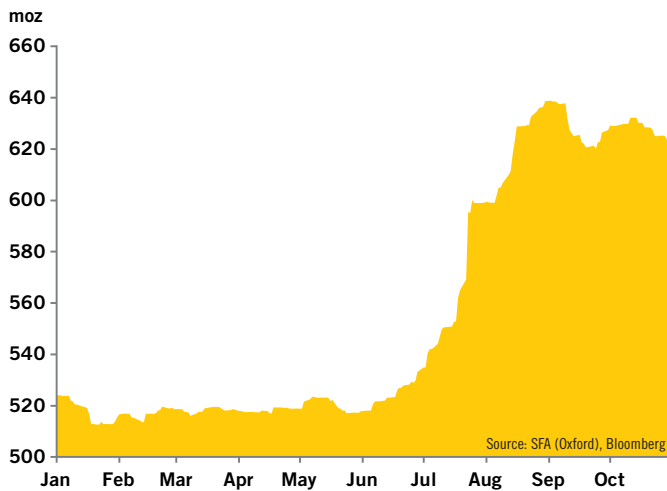
The biggest Cativa™ acetic acid plant is to be built in China. BP and the Zhejiang Petroleum and Chemical Corporation (ZPCC) are looking at building a 1 mtpa acetic acid plant which will use iridium-based catalysts in the production of acetic acid. China is the world's largest acetic acid market. Chemical uses including Cativa represent around 9% or 20 koz of annual iridium demand.

The rhodium price slipped by \$25/oz last week, while the ruthenium and iridium prices were unchanged.

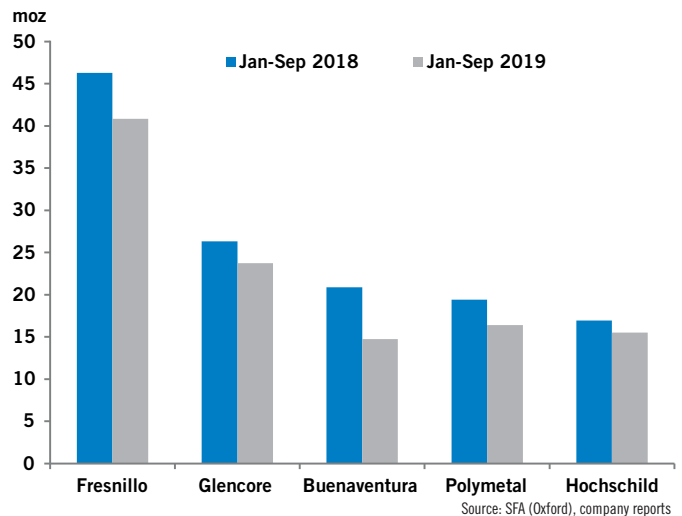


TRENDS AND INVESTMENTS

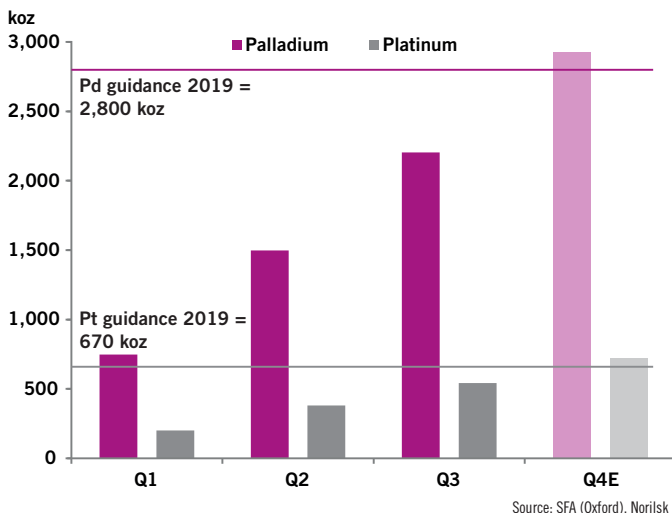
Silver ETF holdings 2019



Silver production



Norilsk YTD production and guidance



Palladium price



Heraeus Precious Metals

Europe, Middle East, Africa & other regions
Phone: +49 6181 35 2750
edelmetallhandel@heraeus.com

South East Asia
Phone: +852 2773 1733
tradinghk@heraeus.com

www.herae.us/trading-market-report

United States of America
Phone: +1 212 752 2180
tradingny@heraeus.com

China
Phone: +86 21 3357 5658
tradingsh@heraeus.com

The HERAEUS PRECIOUS APPRAISAL 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

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. Prices quoted are interbank (offer) prices for gold, silver, platinum and palladium. Rhodium, ruthenium and iridium quotes reflect the Heraeus offer price at the time of writing.