



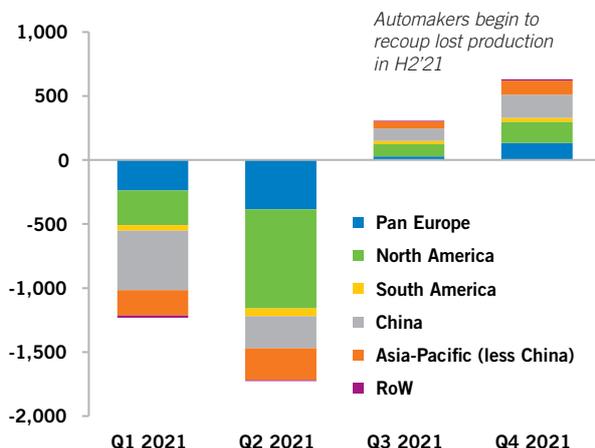
MARKET SPOTLIGHT

Auto chip shortage: a respite for palladium and rhodium?

A shortage of semiconductors is the greatest risk to automotive PGM demand this year. Automakers cut their semiconductor chip orders in Q3'20 in line with pandemic-weakened vehicle sales, meanwhile chip-makers focused production on the lucrative consumer electronics sector. When automotive orders rebounded stronger than expected in Q4'20, a global shortage of chips emerged. As a result, almost every automaker has been forced to idle production at some point this year. The automotive sector is the largest end-user for platinum, palladium and rhodium, accounting for 41%, 83% and 88%, respectively, of total demand for each metal.

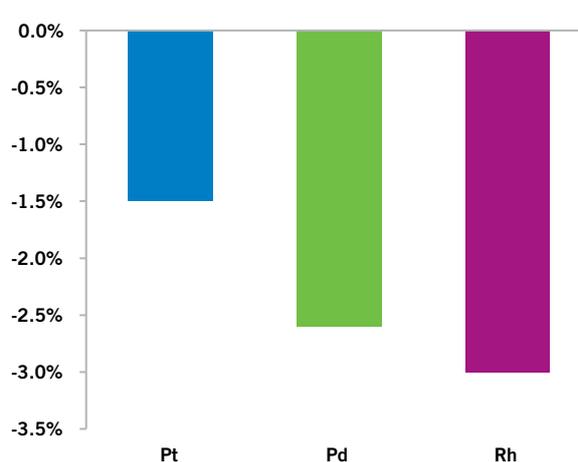
The full-year impact on global vehicle production is currently forecast to be around 2 million units, mainly weighted towards Europe and North America (source: LMC Automotive, May 2021 estimate). Vehicle losses to this extent could reduce PGM demand by more than 300 koz this year, with palladium and rhodium consumption predicted to be particularly hard hit owing to the dominance of gasoline light vehicles in the areas worst affected by production cuts.

Estimated light vehicle production impact
Units (000)



Source: LMC Automotive (publicly available data)

Auto chip shortage: impact PGM demand
% loss of total auto demand 2021



Source: SFA (Oxford)

However, the impact on PGM demand is being mitigated by automakers' 'adapt and overcome' response. This includes prioritising the production of more profitable, high-demand models such as SUVs and pick-up trucks which require higher palladium and rhodium loadings. Some OEMs have opted to leave out certain components, which can be retrofitted, to get vehicles off the factory floor as soon as possible. Chip-makers are also adding substantial capacity: Bosch has recently opened a €1 bn (\$1.2 bn) chip plant in Germany which will serve automakers directly and reduce Europe's dependence on imported supply.

Supply chain disruption could ease some tightness in the palladium and rhodium markets this year. A loss of more than 200 koz of palladium automotive demand could reduce the estimated market deficit by almost a fifth. The palladium and rhodium markets are still predicted to be in deficit but this could be enough to prevent the prices from revisiting their record highs.



PRECIOUS METALS REVIEW

79 Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,774	-5.64%	1,870	14/06/2021	1,767	17/06/2021
€/oz	1,494	-3.84%	1,542	15/06/2021	1,483	17/06/2021

Gold slips on hawkish Fed outlook. The Federal Reserve has shifted its tone regarding monetary policy as the US economy continues its strong post-pandemic recovery. Last week, the Fed's economic projections showed that most officials now expect higher interest rates in 2023, a notable change from the previous projection of 2024. The Fed Chairman, Jay Powell, also hinted at a slowing of the Fed's \$120 billion per month asset purchase programme. The announcement prompted a jump in the dollar index and a sharp sell-off in government bonds which saw yields increase, while gold pulled back below \$1,800/oz.

The market reaction looks excessive given that the Fed may not raise interest rates until 2023 and inflation is running hot at present. The \$1,755/oz to \$1,765/oz area is a support level so near term the price could bounce back, but further downside cannot be ruled out. Longer term, further upside still seems probable given that above-target inflation is likely to persist and any central bank action to tighten monetary policy appears to be a long way off.

47 Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	26.02	-7.18%	28.02	14/06/2021	25.77	17/06/2021
€/oz	21.92	-5.39%	23.11	14/06/2021	21.65	17/06/2021

Silver followed gold's descent on expectations of tighter US monetary policy. However, the current ultra-loose monetary regime and low interest rate environment will remain unchanged for now despite rising inflation, which

is positive for silver. Nevertheless, the Fed's comments unsettled the market and silver, with its history of more dramatic price movements than gold, fell further last week.

78 Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,054	-8.52%	1,175	14/06/2021	1,049	17/06/2021
€/oz	888	-6.79%	969	14/06/2021	881	17/06/2021

China's platinum jewellery market remains below pre-pandemic levels. According to Platinum Guild International's latest Platinum Jewellery Business Review, the volume of China's platinum fabrication in Q1'21 increased by 65% year-on-year from the low base of Q1'20 but is still only 73% of the levels seen in the same period of 2019. Platinum transactions via the Shanghai Gold Exchange declined by 16% year-on-year to 11.9 tonnes in Q1. Customs data also recorded a 20% year-on-year net decline in platinum imports to 20.6 tonnes. A narrowing price gap between gold and platinum, combined with strong demand for gold during the Chinese New Year tarnished platinum's appeal in the first three

months of the year. China is the largest platinum jewellery market, accounting for 750 koz last year. Demand is expected to rebound modestly in 2021 (+10% year-on-year) but the lacklustre state of the market in China means it is unlikely to reach 2019 levels in the near term.

Platinum was caught up in the precious metals sell-off last week, falling below \$1,100/oz for the first time since February. The market is forecast to remain in significant surplus this year (excluding investment), so there may be a lack of momentum to bring the price back up to levels seen at the start of the year.



PRECIOUS METALS REVIEW

⁴⁶Pd Palladium

	Close	Weekly change	High	Date	Low	Date
\$/oz	2,511	-9.79%	2,842	16/06/2021	2,493	17/06/2021
€/oz	2,115	-8.09%	2,351	16/06/2021	2,096	17/06/2021

China's car market is starting to feel the squeeze. Total vehicle sales in May fell by 3% year-on-year to 2.13 million units (source: China Association of Automobile Manufacturers), bringing China's 13 consecutive months of year-on-year gains to an end. Anecdotal reports note that the global chip shortage and the rising cost of raw materials are starting to weigh on the market. In the first 10 days of June, vehicle output from 11 automakers across China, which account for more than 90% of total production, fell by 37% (source: CAAM). Until now, China has appeared to minimise the impact of the chip shortage on its auto industry, but there is growing evidence of disruption. The light-vehicle selling rate in the world's largest car market in the year to date is 24.7

million units/year, down from the 28.6 million units/year recorded in Q4'20 (source: LMC Automotive). Despite some uncertainty surrounding vehicle production, palladium autocatalyst consumption is still expected to witness growth this year, as loadings are increasing to meet China 6 and RDE standards. China's auto demand is forecast to account for 2.7 moz of palladium this year, far exceeding both 2020 and 2019.

The sell-off last week has nearly wiped out all the gains following the announcement of Nornickel's mine flooding. However, the palladium market is likely to remain in deficit which will keep the price high by historical standards.

⁴⁵Rh ⁴⁴Ru ⁷⁷Ir Rhodium, Ruthenium, Iridium

	Rhodium	Ruthenium	Iridium
Reporting week	\$21,700/oz	\$795/oz	\$6,250/oz
Previous week	\$23,450/oz	\$820/oz	\$6,250/oz

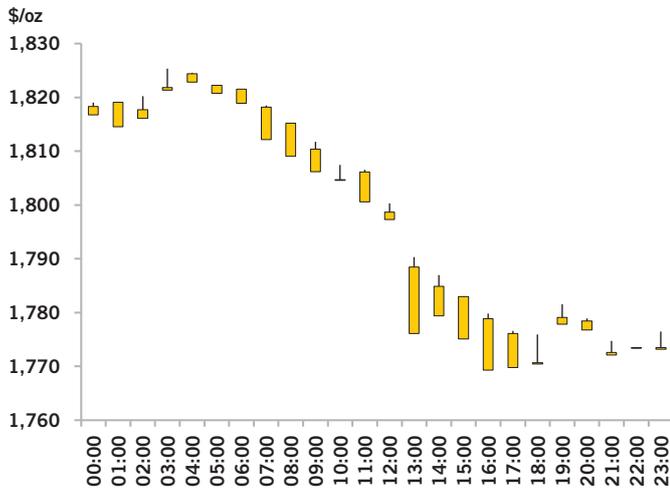
The chip shortage has helped to cut the estimated market deficit for rhodium this year by several thousand ounces. The full-year impact to global vehicle production is currently forecast to be around 2 million units, with some estimates ranging up to as many as 4 million units. If it is closer to the latter, then the rhodium market will be much closer to balance than what is currently forecast. This,

combined with the increased supply of metal from South Africa anticipated in the second half of the year following the release of work-in-progress stocks, means the price is expected to remain subdued relative to the first half of 2021. However, based on the current forecast the market remains in a structural deficit, so prices could remain historically high for quite some time.



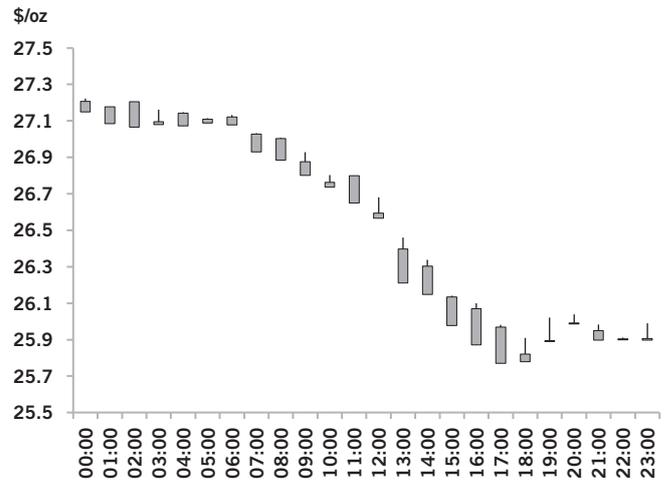
TRENDS AND INVESTMENTS

Gold intraday prices 16 June



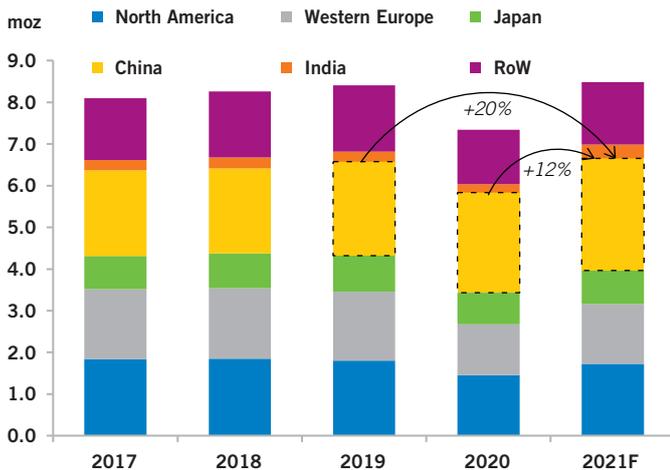
Source: Bloomberg

Silver intraday prices 16 June



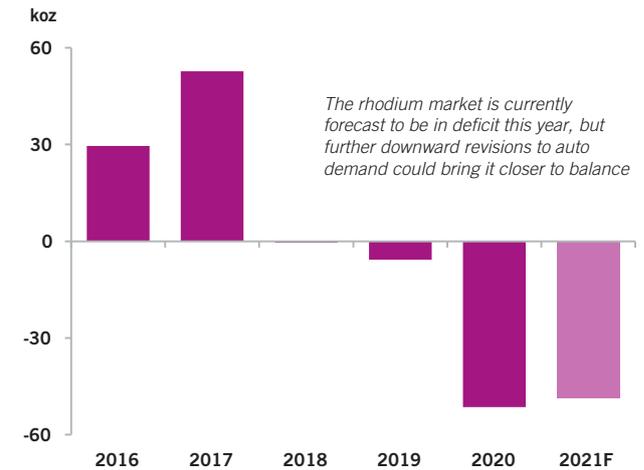
Source: Bloomberg

Palladium auto demand



Source: SFA (Oxford)

Rhodium market balance



Source: SFA (Oxford)

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.