



## MARKET SPOTLIGHT

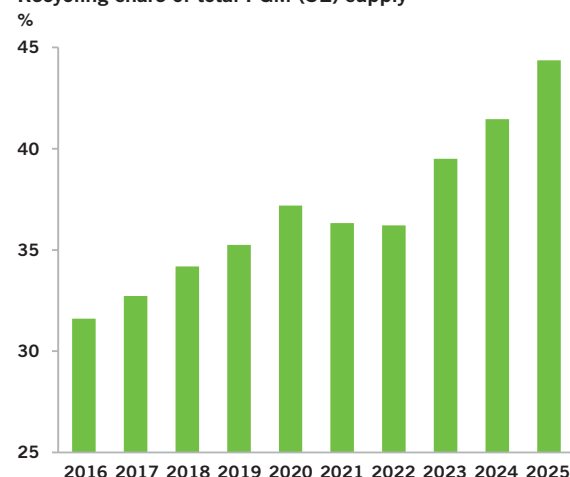
### PGM recycling – short-term pain, long-term gain

**Secondary PGM supply (3E) is forecast to rebound by 11% to around 5 moz this year**, following a 10% decline to 4.5 moz in 2020 owing to the impact of the pandemic on recycling activity. In the first half of the year, the very high PGM and scrap steel prices resulted in a good flow of material. However, there are some bottlenecks and supply chain issues which mean that PGM supply from spent autocatalysts is expected to be slightly lower than initially forecast for 2021.

**The increasingly complex material matrixes of autocatalysts have been an issue for recyclers.** The rising proportion of silicon carbide (SiC) diesel particulate filters (DPFs) from diesel systems, which are more difficult to process than gasoline autocatalysts, are a problem, with only a limited number of smelters able to process them in volume. Given the issue with DPFs, it is likely that gasoline autocatalysts will be favoured while rhodium and palladium prices are high, which could limit the growth of secondary platinum supply in the near term.

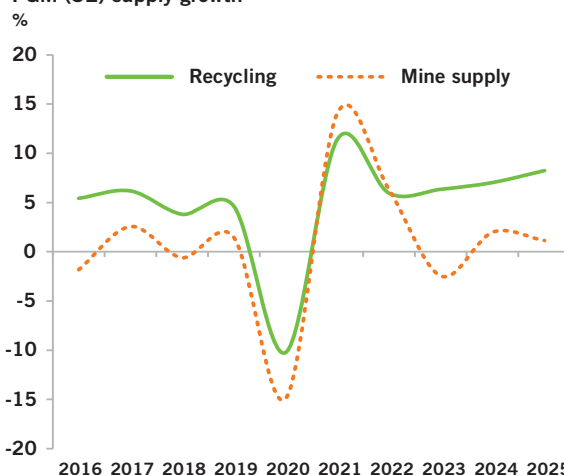
**There have also been refining capacity bottlenecks** building over recent years owing to the rising volume of spent catalysts (both diesel and gasoline), with several refineries in the northern hemisphere operating close to capacity. Additional refining capacity is being constructed in Europe and North America which should come online next year.

Recycling share of total PGM (3E) supply



Source: SFA (Oxford)

PGM (3E) supply growth



**The recent drop in PGM prices might cause a temporary slowdown in recycling** as collectors hold autocatalysts while they wait to see if the prices rebound. The collected material will ultimately reach a refinery. Despite these complications, secondary supply is expected to become an increasingly important source of PGMs. The rising volume of gasoline vehicles reaching their end of life is estimated to lift secondary palladium output in particular. Over the next five years, PGM recycling is projected to grow by an average of ~6% each year, and recycling's share of total PGM supply is also forecast to increase (from 36% this year, to 45% by 2025). This is a result of greater secondary output as refineries expand their capacity, compared to the largely flat year-on-year growth of primary supply, which highlights the growing importance of recycling as a PGM source.



## PRECIOUS METALS REVIEW

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### Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,753	0.01%	1,787	22/09/2021	1,738	23/09/2021
€/oz	1,496	0.17%	1,521	22/09/2021	1,481	23/09/2021

**India's gold imports hit a five-month high.** Strong consumer demand and retailer restocking ahead of the festival and wedding season in Q4 saw India's official gold imports reach 121.8 tonnes in August, a five-month high (source: World Gold Council). This marked a 108% hike from August 2020 (year-on-year) and a 68% rise from July 2021 (month-on-month). Imports were supported by a lower customer tariff from mid-August, which made gold imports cheaper, as well as increased manufacturing activity ahead of India's leading jewellery show this month. Strong growth in gold jewellery exports to the US, Hong Kong and China have also contributed

to stronger demand recently. Any further correction to the gold price for the remainder of the year is expected to lead to restocking by retailers, which will keep import volumes healthy and support stronger retail sales. India is the second-largest consumer gold market, accounting for 690.4 tonnes in 2019 (pre-pandemic). The Indian market was badly affected by the impact of Covid last year, and during most of H1'21, but retail demand has been steadily improving for the past three months now. The gold price was little changed last week even though the dollar weakened.

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### Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	22.48	-0.01%	23.14	22/09/2021	22.11	24/09/2021
€/oz	19.19	0.15%	19.69	22/09/2021	18.88	24/09/2021

**Silver set for strong growth as global connectivity ramps up.** The use of silver in electronics and electrical applications is forecast to reach 246 moz by 2025, a 10% increase from 2020 (source: The Silver Institute), largely owing to the expansion in global connectivity and underlying infrastructure, including 5G and the Internet of Things. As a critical metal in the electrical components

that will enable these technologies, silver demand is expected to be sustained over the long term. Electrical and electronic applications are the largest end-use for silver, accounting for around a quarter of total demand each year. The silver price moved sideways in line with gold last week.

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### Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	982	3.93%	1,015	23/09/2021	905	20/09/2021
€/oz	838	4.06%	865	23/09/2021	773	20/09/2021

**Ambitious goals for platinum-rich, heavy-duty fuel cell vehicles.** Hyundai Motor Group, the fifth-largest automaker, is aiming to become the world's first to power all its commercial vehicles with hydrogen fuel cells by 2028. The carmaker is also pledging to slash the prices of fuel cells by 50%, bringing prices in line with battery electric vehicles (BEVs) by 2030. Hyundai has been investing heavily in developing hydrogen technology after introducing the world's first mass-produced fuel cell electric vehicle in 2013, and it is also involved in the development of hydrogen-powered engines for shipping and aviation. Hyundai has consistently championed

hydrogen, which is better suited to heavy-duty and long-distance transport, over batteries, which currently have limitations to driving range and longer refuelling times. Heavy-duty trucks are expected to be one of the earliest adopters of hydrogen fuel cells in the transport sector. From the low base of 2020, platinum demand from automotive fuel cells is forecast to escalate by over 200% this year, close to 10 koz, alongside record demand growth from both electrolyzers and industrial fuel cells. It seems that a platinum price of under \$1,000/oz was cheap enough to entice some buyers and the price has rebounded.



## PRECIOUS METALS REVIEW

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### Pd Palladium

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,971	-1.73%	2,083	23/09/2021	1,850	20/09/2021
€/oz	1,683	-1.64%	1,776	23/09/2021	1,582	20/09/2021

**Light-vehicle production is now predicted to be impacted well into 2022** owing to the worsening semiconductor chip shortage, with a cut of 8.45 million units (-9.3%) to next year's forecast. Production in 2021 has also been subject to further downward revisions (-6.2%), now at 75.8 million units this year and 82.6 million units forecast in 2022 (source: IHS Markit). Volumes in 2023 have also been adjusted slightly (-1.1%) to account for ongoing supply chain issues. As a result

of vehicle production cuts and the associated impact on autocatalyst demand, the palladium market is now expected to be close to balance or in a slight surplus in 2022. After its recent sharp decline, the price appears to be finding a level around \$2,000/oz. However, with such a high proportion of palladium's demand coming from the auto market (81%), the price is very vulnerable to further losses as the chip shortage crisis shows no sign of abating.

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Ir

44

Ru

45

Rh

### Rhodium, Ruthenium, Iridium

	Rhodium	Ruthenium	Iridium
Reporting week	\$15,750/oz	\$710/oz	\$5,300/oz
Previous week	\$13,950/oz	\$710/oz	\$5,350/oz

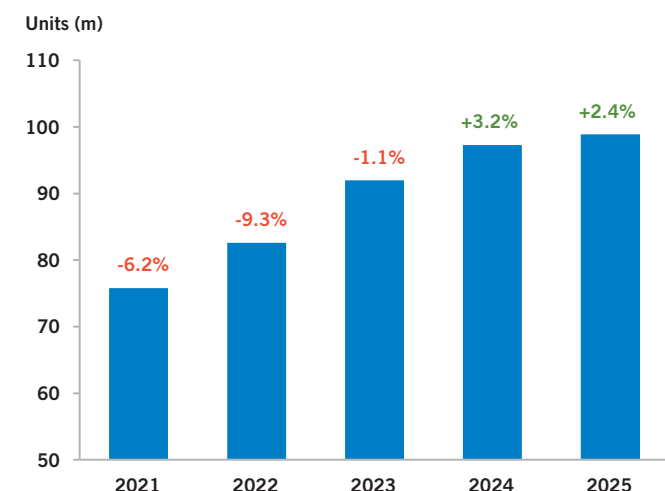
**Chipping away at rhodium demand.** Further cuts to light-vehicle production forecasts for both 2021 and 2022 also impact the rhodium market significantly, with 89% of its end-use attributed to autocatalyst demand. The latest round of cuts to vehicle production reduces demand in 2022 and could apply further downward pressure to the

price. However, given that the overall rhodium market is small, only a slight improvement in the 2022 outlook for light-vehicle production could provide some support for the price. Rhodium recovered slightly last week, moving back above \$15,000/oz. Ruthenium remained unchanged while iridium dipped lower (-1%).



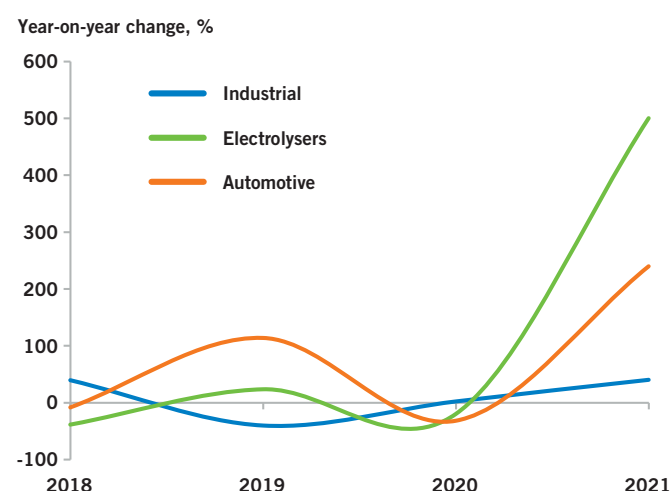
# TRENDS AND INVESTMENTS

## Global light vehicle production forecast



Source: IHS Markit. Note: percentage change is the increase/decrease from earlier forecast

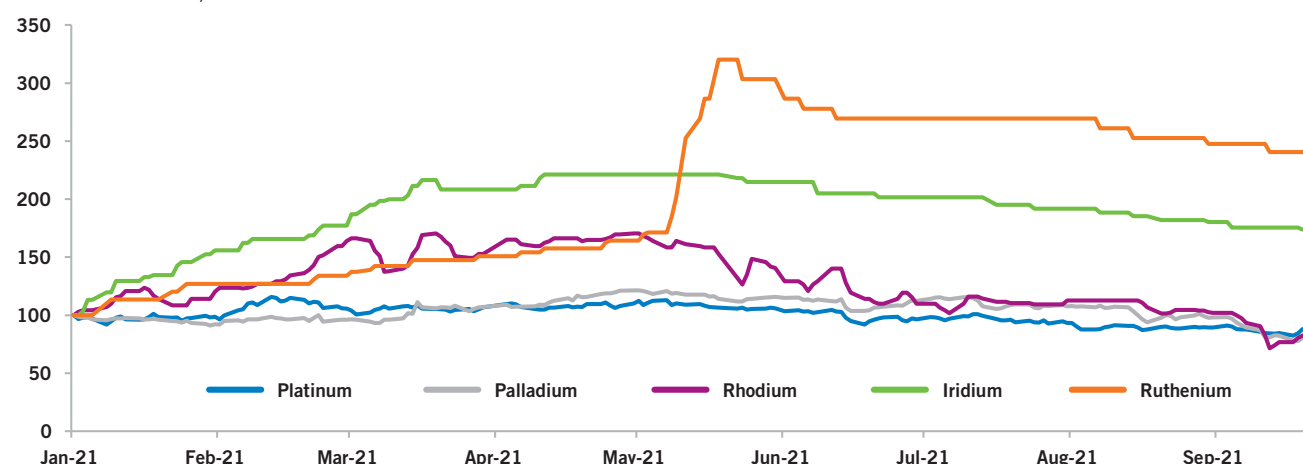
## Hydrogen & fuel cells: platinum demand



Source: SFA (Oxford). Note: Industrial fuel cells includes stationary and non-road applications such as trains, material handling equipment etc.

## Year-to-date PGM prices

Prices indexed to 100, 4 Jan 2021



Source: SFA (Oxford), Heraeus

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