HERAEUS Precious Appraisal

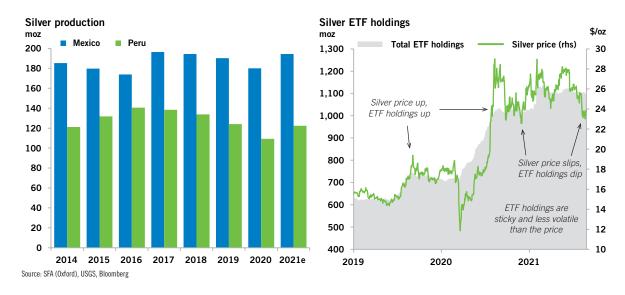
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Heraeus



More silver investment may be needed to lift the price

Silver mine production is rebounding. Lockdowns resulted in mines being temporarily shut last year in several countries including Mexico and Peru, the two largest producers of silver. Coronavirus cases at some mines also impeded output. Primary silver producers are on track to lift output by around 8% this year. Primary silver mines produce approximately 27% of total supply, and gold, copper and lead/zinc mines account for the majority of the rest. Gold and lead/zinc mines suffered more production losses than copper mines last year, so silver output is also recovering from them. However, it is not just about the recovery of existing mines, there are also some new mines that are ramping up production such as Juanicipio, Capela, and Cerro Los Gatos in Mexico which combined could add over 5 moz to supply.



Recycling is likely to be higher this year too. Industrial recycling is the largest component of secondary silver supply and is likely to pick up with the improving economic situation. The amount of recycled silverware and jewellery is correlated with the price and this year silver has averaged its highest price since 2012. India is a large source of demand for silver jewellery and silverware and provides a significant portion of the recycled material. With further lockdowns and restrictions in India this year, economic hardship may also result in additional silver recycling.

Stronger investment demand may be needed to propel the price higher. Silver demand (excluding ETFs) is expected to grow faster than supply this year, even with the ongoing pandemic and semiconductor shortages making it a bumpy recovery. However, that demand increase should now be priced in. This year, although coin demand has been stronger than last year, ETF investment has been weaker. ETF holdings had gained 140 moz when the price briefly touched \$30/ oz in February, but they have fallen back since then. Global holdings are now up just 7% (+68 moz) so far this year compared to a rise of 44% (+313 moz) last year. Silver's attraction may well increase if the US Congress passes more than \$4 billion in additional spending which could weaken the dollar and help to lift the silver price.

PRECIOUS METALS REVIEW

Au

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		Close	Weekly change	High	Date	Low	Date
\$/	οz	1,813	1.56%	1,813	27/08/2021	1,780	26/08/2021
€/	οz	1,533	0.42%	1,540	24/08/2021	1,515	26/08/2021

Is India heading for a supply bottleneck? Gold jewellers in India may have difficulty fulfilling orders over the upcoming festival season owing to the implementation of new mandatory hallmarking standards. The new rules were introduced in June across 256 districts, and apply to 14k, 18k and 22k gold. While this is expected to be a positive step for India's gold industry over the long term, there are concerns that there is not enough hallmarking unique ID process (HUID) capacity in India for retailers to meet the new rules before the rebound in consumer demand for the festival season. HUID is currently restricted to assaying and hallmarking centres, and anecdotal reports suggest many centres are already at full capacity with retailers being turned away. From September, jewellers will be fined for selling non-hallmarked goods. If the situation has not improved by the end of August, supply of hallmarked gold during Dussehra and Diwali (15 October and 4 November, respectively) is likely to be impacted (source: All India Gem and Jewellery Domestic Council). A supply bottleneck is a threat to India's nascent recovery in consumer gold demand this year, which was one of the hardest hit markets in 2020 (-35% year-on-year to 446.4 tonnes) and was badly affected by a second wave of Covid cases and subsequent lockdowns this year. Full-year demand is not expected to return even close to pre-pandemic levels this year (690.4 tonnes in 2019).

g Silver

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		Close	Weekly change	High	Date	Low	Date
\$/	'oz	23.98	3.47%	24.01	27/08/2021	23.17	23/08/2021
€/	'oz	20.33	2.56%	20.38	24/08/2021	19.79	23/08/2021

The silver price is bucking its seasonal trend. Silver typically climbs through the summer, but the price has been moving lower. Lacklustre ETF demand has not helped. Even with a rebound this year for other demand segments, in light of increasing cases of the Delta variant there may also be a reassessment of the strength of that recovery weighing on the price.

Pt Platinum

Ę		Close	Weekly change	High	Date	Low	Date
	\$/oz	1,010	1.06%	1,025	24/08/2021	979	26/08/2021
	€/oz	857	0.25%	874	23/08/2021	833	26/08/2021

A strong year-on-year recovery for platinum at Sibanye-Stillwater's SA operations. During H1'21, 4E¹ PGM production was 894,165 oz (including an estimated 447 koz of platinum), 42% higher than the same period last year which was negatively impacted by the effects of a nationwide lockdown. Production guidance for the full year is 1.75-1.80 moz 4E. In the latest results, Sibanye-Stillwater reported significant investment in high-return brownfield projects, which is understood to include the development of the K4 project at Marikana. K4 is currently expected to reach annual output of 250 koz 4E within seven years, including an estimated 125 koz of platinum, and is predicted to extend the life-of-mine of Marikana to around 50 years, from 16 years currently (i.e. replacement production from the late 2020s).

¹4E refers to platinum, palladium, rhodium and gold.

PRECIOUS METALS REVIEW



Palladi	ium	
Close	Weekly change	

ļ		Close	Weekly change	High	Date	Low	Date
	\$/oz	2,407	4.66%	2,487	25/08/2021	2,300	23/08/2021
	€/oz	2,041	3.75%	2,118	25/08/2021	1,966	23/08/2021

US palladium supply slips. Sibanye-Stillwater has issued a revision to its 2021 production forecast from US PGM operations this year to 620-650 koz 2E1 (down from 660-680 koz 2E), because of safety-related stoppages. This equates to around 27 koz less palladium this year. Year-on-year production from the Group's US operations was flat during H1'21 at 298,301 oz 2E (including 230,643 oz of palladium) owing to an accident in June. However, the disruption that took place in the first half of the year was partially offset by steady year-on-year growth in recycling volumes as well as increasing output from

Stillwater East (Blitz Project). The second half of the year should see slightly higher PGM output than the first half. The reduction in global palladium supply this year (largely from Nornickel) is expected to be partly offset by demand losses associated with the ongoing semiconductor chip shortage and lower vehicle production. As a result, the palladium market is still forecast to remain in deficit in 2021, which will keep prices elevated relative to historical levels.

¹2E refers to platinum and palladium.

hodium, Ruthenium, Iridium

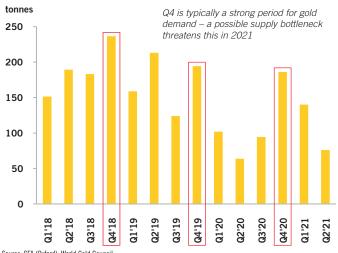
Rn-		Rhodium	Ruthenium	Iridium
	Reporting week	\$19,000/oz	\$745/oz	\$5,550/oz
	Previous week	\$19,400/oz	\$745/oz	\$5,650/oz

PEM electrolysers are a key technology in the hydrogen economy, producing green hydrogen for heavy industry and transport and supporting iridium demand. The UK government has published plans for a national hydrogen economy, which it hopes will attract investment in 5 GW of hydrogen production by 2030 to mostly power heavy industry, as well as for transport and up to 70,000 homes. Fittingly, the announcement took place at the official opening of the world's largest electrolyser factory in Sheffield, England. ITM Power's Gigafactory, with an annual capacity of 1 GW, manufactures the proton

exchange membrane (PEM) electrolysers to produce hydrogen. Of several competing technologies, PEM electrolysis is the best suited to the mass production of clean hydrogen and uses iridium- and platinum-coated electrode catalysts. Iridium demand from the hydrogen sector is expected to grow by an average of close to 50% per year, from a small base, over the next five years, as PEM electrolysers eventually become a more significant source of iridium demand. The ruthenium price remained unchanged last week, while iridium slipped 1.7% and rhodium pulled back to \$19,000/oz again.

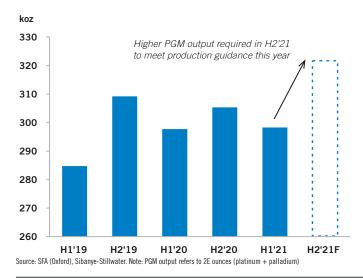
TRENDS AND INVESTMENTS

India consumer gold demand

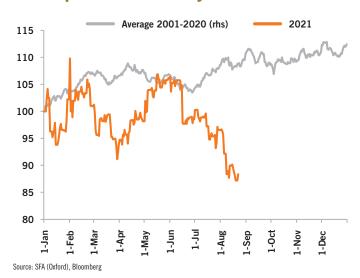


Source: SFA (Oxford), World Gold Council

Sibanye-Stillwater US PGM output



Silver price seasonality



Rhodium price

United States of America

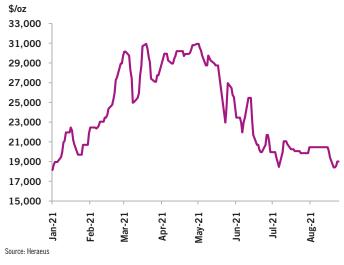
Phone: +86 21 3357 5658

Phone: +1 212 752 2180

tradingny@heraeus.com

tradingsh@heraeus.com

China



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

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Rhodium, ruthenium and iridium quotes reflect the Heraeus offer price at the time of writing.