

HERAEUS PRECIOUS APPRAISAL

Heraeus

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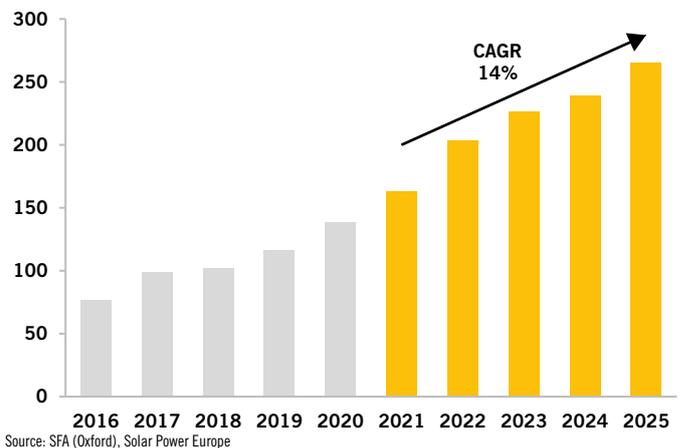


MARKET SPOTLIGHT

Silver's time in the sun

The solar photovoltaic (PV) industry accounts for 11% of total silver demand, consuming 101 moz last year, up from 98.7 moz in 2019 and almost double the level just five years earlier (54.1 moz in 2015) (source: The Silver Institute). Despite the pandemic, global PV installations reached 138 GW in 2020, a new annual record of 18% growth and causing a modest uptick in silver demand (+2% year-on-year) despite the ongoing thrifting of metal in solar cells. Even in countries badly affected by the pandemic, PV installations and associated silver demand have been resilient. Global PV deployment is expected to record another year of record growth in 2021, with estimates ranging from 163-183 GW (equivalent to ~120-130 moz of silver at current loadings). By 2022, PV installations are forecast to exceed 200 GW for the first time on record, with silver consumption moving closer to ~140 moz.

Global annual installed solar PV capacity
GW



Silver will benefit from the global renewable energy drive in the wake of COP26. The 26th United Nations Climate Change Conference (COP26) started in Glasgow last week, bringing global leaders together to accelerate action towards the goals of the Paris Agreement. Highlighting the importance of solar energy in achieving these goals, leaders from India and the UK launched the 'One Sun, One World, One Grid' initiative to accelerate the growth of an interconnected global solar energy economy. Solar energy is already expected to lead the growth of renewable energy over the next decade, with PV installations increasing by an average of 13% a year to meet almost one-third of electricity demand growth out to 2030 (source: IEA).

Silver price
\$/oz



Despite a high price regime, the outlook for silver demand is positive. For the PV market, the past 18 months have been characterised by the increasing cost of raw materials, particularly polysilicon and solar glass. Silver, the second most expensive component of a solar cell, now costs over one-and-a-half times its average cost over the last few years. While thrifting is expected to continue reducing the silver content of solar cells while prices are high, there is a limit to how much can be removed before efficiency losses outweigh cost benefits. With solar PV energy identified as a critical technology in meeting long-term goals to curb global warming, there is considerable upside for the silver market over the next decade.



PRECIOUS METALS REVIEW

79 Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,814	2.02%	1,815	05/11/2021	1,759	03/11/2021
€/oz	1,569	1.89%	1,571	05/11/2021	1,519	03/11/2021

Diwali lights up Indian gold purchases. Gold jewellery sales across India were estimated at 50 tonnes on Dhanteras (source: India Bullion and Jewellers Association), the first day of Diwali and an auspicious time for buying gold. In the first three quarters of the year jewellery purchases in India were 259 t (source: World Gold Council). With a strong fourth quarter, sales should comfortably exceed last year's 316 t, but are likely to fall well short of 2019's 545 t.

The Fed has finally started to reduce its asset purchases, by \$15 bn a month, a rate which will end them next June. The Fed is behind the curve on inflation as far as the markets are concerned as there is a greater than 50% chance of a first rate rise in June priced in. Should inflationary pressures remain high, gold could return to favour but, as stock markets keep hitting record highs, it is stuck in its trading range.

47 Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	24.06	0.64%	24.13	05/11/2021	23.02	03/11/2021
€/oz	20.81	0.51%	20.88	05/11/2021	19.90	03/11/2021

Silver investment demand was lacklustre in October despite the price rallying strongly from its lowest point of the year. US Mint silver American Eagle coin sales were 1,076 koz in October, less than half the level in September. Perth Mint bar and coin sales were also lower in October at 1,352 koz. ETFs managed a small gain of 1,217 koz, but that was well below the 7,855 koz

in September. While the Mints' coin sales are modestly higher for the year as a whole, ETF gains of 81.8 moz are well down on the 311.7 moz in the same January-October period last year. Without a catalyst to break it out of its trading range, silver's price performance is going to remain mediocre.

78 Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,037	1.90%	1,070	01/11/2021	1,022	03/11/2021
€/oz	897	1.80%	922	01/11/2021	883	03/11/2021

Platinum production in Zimbabwe is increasing as Zimplats expands output at its Bimha and Mupani mines. Zimbabwe's platinum output is projected to rise by 7% next year to 530 koz (8% of global output). Zimplats has announced a \$1.8 bn investment in its facilities over the next seven years. This includes an upgrade of the Mupani mine as a replacement for the depleting Rukodzi,

Ngwarati and Mupfuti mines, which will maintain production in the longer term. The smelter's capacity is also to be significantly increased which will allow it to process the rising output and provide more operational flexibility. Platinum above \$1,000/oz is a full price for a metal with a market surplus of more than 1 moz this year (ex. investment).



PRECIOUS METALS REVIEW

⁴⁶Pd **Palladium**

	Close	Weekly change	High	Date	Low	Date
\$/oz	2,029	3.18%	2,077	01/11/2021	1,979	01/11/2021
€/oz	1,756	3.11%	1,791	01/11/2021	1,711	01/11/2021

US light-vehicle sales remain stuck in first gear as the shortage of semiconductor chips continues to hinder production. For a third consecutive month, light-vehicle sales were fewer than 1.1 million, coming in at 1,046,300 units in October (source: BEA). Sales for the year are estimated to come in at under 16 million units, although that is still an improvement on 14.5 million last year.

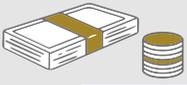
Palladium demand has been significantly hampered by the production bottlenecks. This year, the impact on demand has moved the market into surplus on an annual basis despite curtailed supply from Russia. Next year, Russian supply is forecast to be back to normal and, although vehicle production is set to rise, the chip shortage is also expected to continue to limit light-vehicle production and palladium demand. That could keep the market in surplus and the price under pressure.

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

	Rhodium	Ruthenium	Iridium
Reporting week	\$15,550/oz	\$620/oz	\$4,550/oz
Previous week	\$15,550/oz	\$595/oz	\$4,750/oz

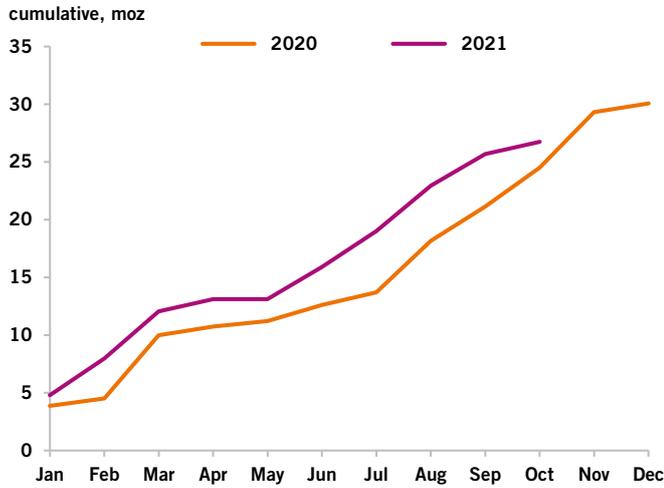
Reduced small PGM output from Impala in Q3'21. Scheduled maintenance restricted Impala Platinum's Q3'21 output with 44 koz of refined rhodium being produced, a 17% drop compared to Q3'20. Iridium and ruthenium output suffered a similar year-on-year decline,

but for the year as a whole production is expected to be up 9% compared to last year's Covid-impacted output. The metal prices diverged last week, with ruthenium gaining, iridium falling and rhodium remaining flat.



TRENDS AND INVESTMENTS

US Mint silver American Eagle sales



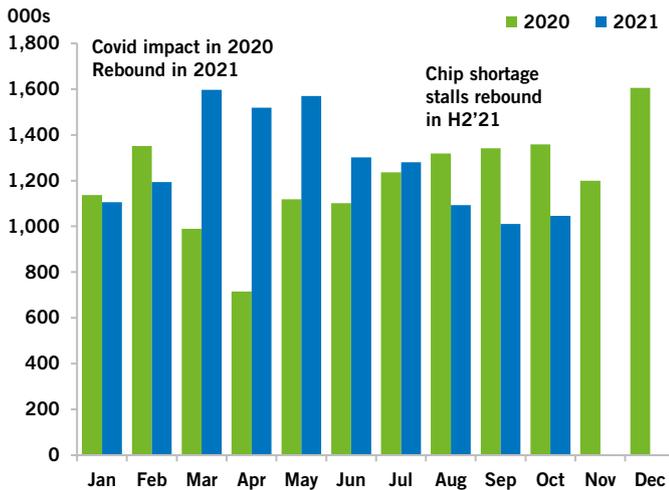
Source: SFA (Oxford), US Mint

Silver ETF holdings



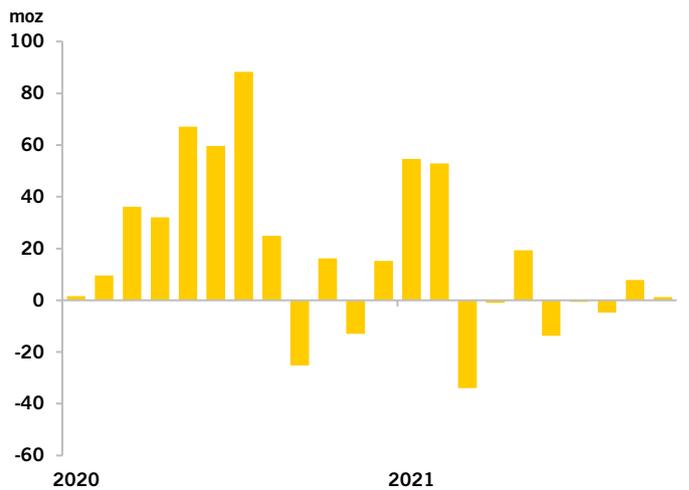
Source: SFA (Oxford), Bloomberg

US light vehicle sales



Source: SFA (Oxford), Bloomberg, BEA

Silver ETF holdings monthly changes



Source: SFA (Oxford), Bloomberg

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