



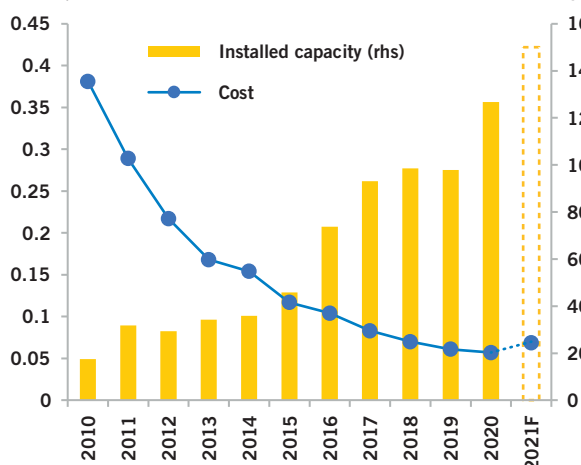
MARKET SPOTLIGHT

Will silver feel the heat from the rising cost of solar?

Silver paste is a key component of photovoltaic (PV) cells. The global solar PV industry accounted for over 10% of physical silver demand last year at 101 moz and is currently estimated to consume a further 105 moz this year (source: The Silver Institute). However, the rise in prices of other raw materials used in PV modules is seeing the cost of solar panels surge, which could weigh on installations and therefore silver demand this year.

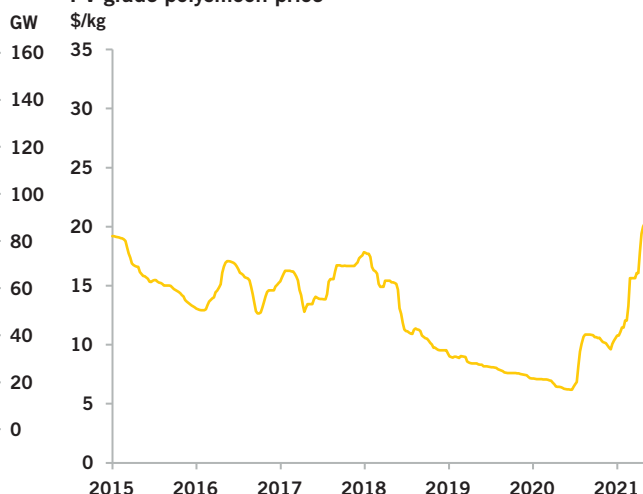
Higher raw material prices are estimated to increase the costs of installing new solar panels by ~20% this year, effectively reversing two years of declining costs. Supply chain constraints have led to a sharp rise in the price of polysilicon, jumping more than 350% over the past 12 months. Initially, this was caused by factory shutdowns during the pandemic, but more recently has been the result of the strong rebound in demand from the PV industry. High prices of solar glass, wafers, steel and aluminium are adding further pressure to manufacturers' margins. Consequently, module-makers are lowering capacity utilisation and cutting output. Compounding the material cost issue is a steep jump in Chinese shipping rates this year. Chinese companies are estimated to account for 60% of global capacity along the solar supply chain, and high freight costs and long lead times are weighing on downstream demand.

Solar PV costs and installations
2020 \$/kWh



Source: SFA (Oxford), IRENA, Bloomberg

PV-grade polysilicon price



Higher module prices could delay marginal projects and slow installations this year. The declining price of solar modules has helped to boost solar uptake over the past decade, but the current high prices of raw materials could limit growth this year by affecting project CAPEX and delaying their commissioning, ultimately weighing on demand for silver paste. Projects with tight margins, or those which do not qualify for subsidies, are likely to be most affected. At the start of the year, the industry consensus was a forecast of around 150 GW of solar capacity in 2021, but this may be a challenge given the current constraints on the industry.

However, the long-term trend for silver PV demand is robust as deployment of solar energy grows rapidly and continues to drive overall renewables' growth over the next decade (source: IRENA). Ongoing thrifting is likely to reduce silver loadings modestly, but this is anticipated to be largely offset by growth of new capacity.



PRECIOUS METALS REVIEW

79 Au Gold

| | Close | Weekly change | High | Date | Low | Date |
|-------|-------|---------------|-------|------------|-------|------------|
| \$/oz | 1,779 | 0.29% | 1,795 | 23/06/2021 | 1,772 | 22/06/2021 |
| €/oz | 1,490 | -0.28% | 1,503 | 22/06/2021 | 1,486 | 24/06/2021 |

Gold gloom in India. Retail demand for gold in the world's second-largest market has been severely hampered by lockdowns imposed for most of Q2'21 in response to the surge in Covid cases. In May, the Consumer Confidence Index fell to an all-time low of 48.5 (source: RBI). Jewellery stores have since reopened in most parts of the country, but anecdotal reports say footfall remains subdued and many dealers have been forced to offer discounts on domestic prices. Official gold imports last month totalled 11.4 tonnes, higher than the low base of May 2020 (1.9 tonnes), but down significantly from the previous month (110 tonnes), owing to weak demand and restrictions on international flights (source:

Ministry of Commerce & Industry, Govt. of India, World Gold Council). The economic impact of India's second lockdown is expected to weigh more heavily on rural consumers, who historically have accounted for a large proportion of gold purchasing. Pre-pandemic, Indian consumer demand accounted for ~700 tonnes of gold annually (23% of global consumer demand). Last year, this slipped 35% to 446.4 tonnes (source: WGC), and a strong recovery in 2021 now looks difficult to achieve. Gold recovered little ground last week. Near term, further price weakness is possible but over the medium term a recovery is still favoured as central banks are doing nothing to combat inflation currently.

47 Ag Silver

| | Close | Weekly change | High | Date | Low | Date |
|-------|-------|---------------|-------|------------|-------|------------|
| \$/oz | 26.05 | 0.12% | 26.30 | 25/06/2021 | 25.69 | 22/06/2021 |
| €/oz | 21.82 | -0.45% | 21.98 | 25/06/2021 | 21.55 | 22/06/2021 |

Silver recycling: a second life after solar panels. A €4.8 million EU-funded project is planned to develop a process to recover silver, silicon and glass from spent solar panels. One of the largest problems associated with the solar PV market is end-of-life management as most panels are currently disposed of to landfill. At present, there is not a recycling process that exists which makes the recovery of materials used in solar panels economically viable. Recycled silver is currently dominated by other industrial sources, such as electronics

and spent ethylene oxide catalysts, which amounted to 102.7 moz last year. Total recycled material was 182.1 moz in 2020, 18.5% of total silver supply (source: The Silver Institute). With more than 100 moz of silver used in the PV industry each year, in time material recovered from panels could account for a significant volume of secondary silver supply. After a sharp fall following the recent Fed meeting, silver's rebound last week was quite weak. Further sideways to lower price action is possible near term.

78 Pt Platinum

| | Close | Weekly change | High | Date | Low | Date |
|-------|-------|---------------|-------|------------|-------|------------|
| \$/oz | 1,107 | 4.95% | 1,114 | 25/06/2021 | 1,034 | 21/06/2021 |
| €/oz | 927 | 4.39% | 932 | 25/06/2021 | 872 | 21/06/2021 |

Limited long-term growth for platinum petroleum requirements. The IEA expects global oil refinery throughput to remain below 2019 levels this year. Next year, refining activity is forecast to increase by 2.4 mb/d, as new capacity coming online is partly offset by closures or conversions to bio-refineries. Platinum requirements from the petroleum industry suffered a sharp decline last year (-55% year-on-year/-130 koz), the largest fall recorded across all industrial end-uses. Restrictions on travel curbed petroleum demand, which

led to refinery closures, delayed capacity expansions and lower utilisation rates. Expansion in oil refining and gas-to-liquids capacity this year, some of which was delayed from 2020, is expected to boost petroleum platinum demand to >250 koz this year, but there is a risk of lower demand owing to the impact of closures. The platinum price recovered somewhat last week but progress may slow as the \$1,110/oz area could provide some resistance.



PRECIOUS METALS REVIEW

⁴⁶Pd **Palladium**

| | Close | Weekly change | High | Date | Low | Date |
|-------|-------|---------------|-------|------------|-------|------------|
| \$/oz | 2,636 | 4.95% | 2,661 | 25/06/2021 | 2,487 | 21/06/2021 |
| €/oz | 2,208 | 4.39% | 2,228 | 25/06/2021 | 2,097 | 21/06/2021 |

EV growth is a minimal threat to palladium demand in the medium term. China's State Council has announced that, under the latest five-year plan, sales of new-energy vehicles in China, including battery-electric, plug-in hybrid, and hydrogen-powered vehicles, are predicted to rise to 20% of overall new car sales by 2025, from the current 5% market share. The increased forecasts, for BEVs in particular (as hybrids and hydrogen fuel cell cars still contain PGMs), have reduced the estimates of China's automotive palladium demand by more than 100 koz over the forecast period. Global BEV production estimates have been consistently revised up

over the last few years, even during the pandemic, and BEV production by the mid-2020s is now likely to be higher than was projected before the pandemic. Despite these upward revisions, gasoline light vehicles are not anticipated to lose ground to BEVs in the medium term as the overall number of light-vehicle sales is predicted to increase. This year, global automotive palladium demand is forecast to be boosted by higher loadings and rising sales of gasoline light vehicles, reaching 8.5 moz. Hence, the palladium price is expected to remain elevated.

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

| | Rhodium | Ruthenium | Iridium |
|----------------|-------------|-----------|------------|
| Reporting week | \$19,950/oz | \$795/oz | \$6,150/oz |
| Previous week | \$21,700/oz | \$795/oz | \$6,250/oz |

Electrochemical demand linked to ballast water treatment supports iridium and ruthenium. All ships must meet the International Maritime Organization's (IMO) D2 standard by 8 September 2024, which for many ships will involve installing a ballast water management system. Electrochlorination is one method of treating ballast water, which uses ruthenium- and iridium-coated electrodes to produce chlorine. Owing to delays and challenges to retrofitting associated with the pandemic last year, there are now an estimated 35,000 ships which still need to install a ballast water treatment system within the next 40 months, equivalent to 875 retrofitting installations a month, according to retrofitting specialists,

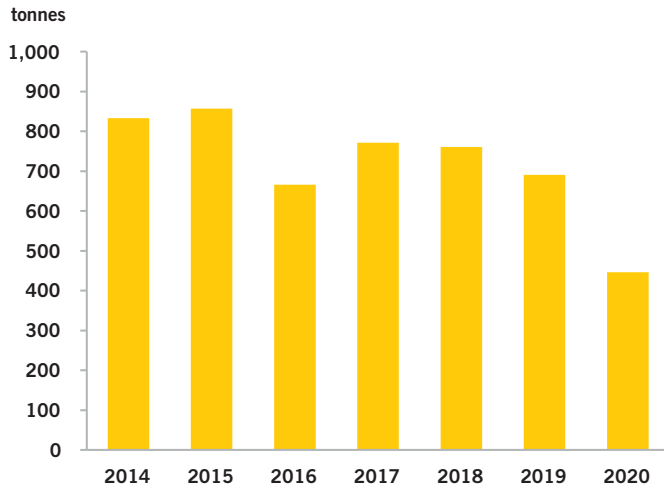
European Marine Technology. The rush to install the appropriate technology in time to meet the IMO Ballast Water Management Convention by the 2024 deadline is expected to sustain strong growth for iridium- and ruthenium-related electrochemical demand in the near term. Electrochemical applications account for around 25% (65 koz) of global demand for iridium and 20% (185 koz) for ruthenium.

The rhodium price dipped last week and traded below \$20,000/oz for the first time since January. Iridium dropped \$100/oz, but ruthenium was unchanged.



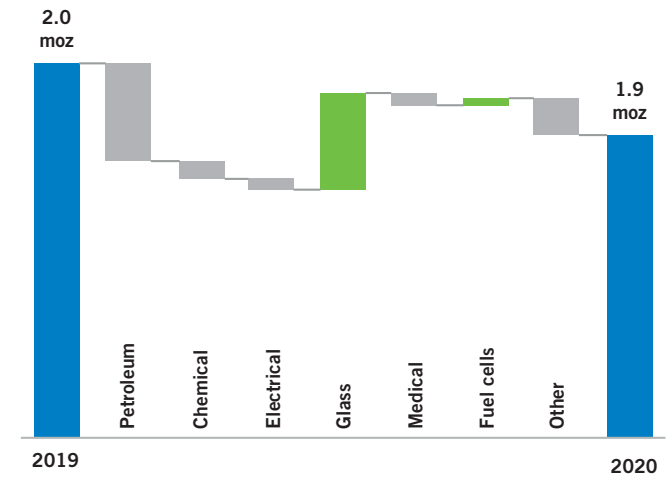
TRENDS AND INVESTMENTS

India consumer gold demand



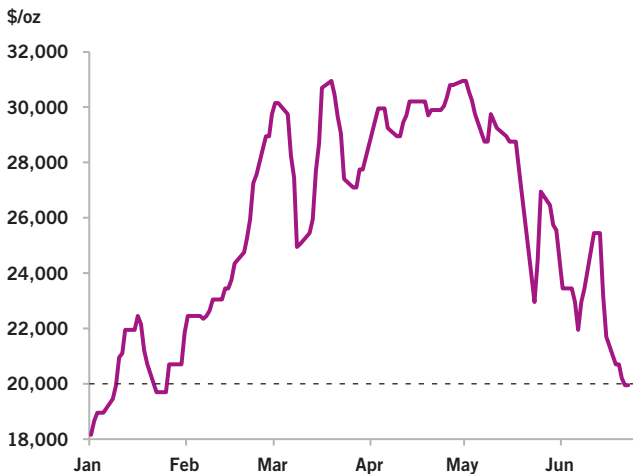
Source: Metals Focus, Refinitiv GFMS, ICE Benchmark Administration, World Gold Council

Industrial platinum demand



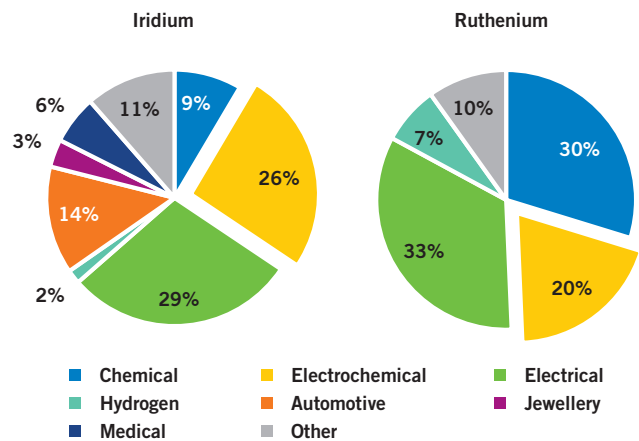
Source: SFA (Oxford)

Rhodium price



Source: SFA (Oxford), Heraeus

Small PGM end uses



Source: SFA (Oxford)

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