

PRECIOUS APPRAISAL

No. 10
28th March 2022



MARKET SPOTLIGHT

GROWING 5G SMARTPHONE SALES AND 5G TOWERS SIGNAL MORE SILVER DEMAND

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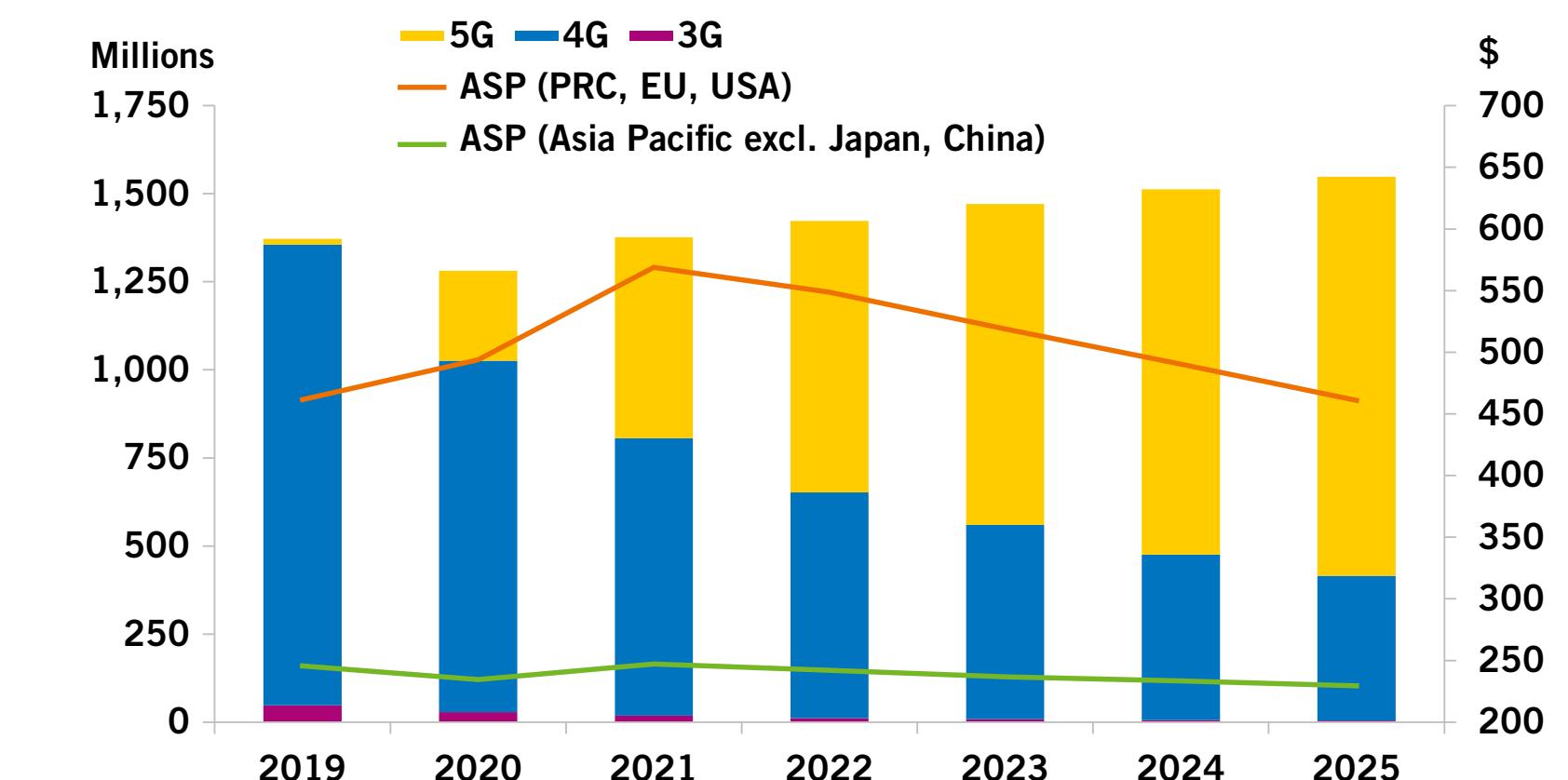
Consumer electronics demand for silver is growing. After dipping in 2020, silver electrical and electronics demand experienced growth of 10% in 2021 to around 335 moz, over 25% of total global silver consumption (source: The Silver Institute). The growth of this market segment will continue this year and could exceed 350 moz, if the broader economic impacts of the conflict in Ukraine are not too severe or long lasting. One of the drivers of this is 5G smartphones and base stations.

Growth of the 5G handset market share is picking up as availability increases. Overall, the smartphone market contracted by 7% in 2020 owing to both supply and demand issues. This was juxtaposed by a more than ten-fold rise in the market share of smartphones for 5G devices – which can require additional internal electromagnetic shielding using silver. This was the first product cycle that made 5G widely available in flagship phones which already had a large market share.

Silver demand will be boosted by 5G, but not just in mobiles. The effective range of 5G towers is far shorter than those used for 4G networks. Therefore, a far higher density of base stations is required for equivalent coverage. The addition of 5G to national networks will require more silver in the electronics than for 4G. The next two years will be critical to this, as the largest growth in 5G smartphone shipments is expected from 2021-23 (source: IDC). China already has an estimated 1.3 million 5G base stations installed as of late 2021, while the US and EU have estimated a coverage of 49% and 62%, respectively, as of Q4'21 (source: Ookla). Most of the short-term demand growth will be focused on these markets.

Near-term growth has stalled. February's data for shipments of smartphones within China show a decline of 32% year-on-year, down 8 million unit sales compared to 2021. The decline is attributed to a combination of unexpected and sporadic factory shutdowns owing to Covid outbreaks and unwillingness to upgrade by the Chinese public. Near term, inflation could squeeze disposable incomes and rising costs could slow sales growth. However, China will move beyond the coronavirus lockdowns and Southeast Asia is preparing for 5G. In India, the world's second-largest smartphone market by users, the high cost of base station installation and the relatively low revenue per user have impeded 5G's progress. As the price disparity with 4G handsets is narrowed, 5G market share and infrastructure rollout will increase. The uncertainty created by the conflict in Ukraine, along with higher inflation, is likely to see silver's precious aspect come to the fore, with the price following gold higher.

Worldwide smartphone sales and average sale price (ASP) forecasts



Source: SFA (Oxford), Bloomberg, IDC

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Gold

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Au

	CLOSE	WEEKLY CHANGE	HIGH	DATE	LOW	DATE
\$/oz	1,956	1.43%	1,966	24/03/2022	1,911	22/03/2022
€/oz	1,780	2.10%	1,789	24/03/2022	1,731	22/03/2022

The Fed is likely to accelerate rate rises, but high inflation could maintain interest in gold. The Federal Reserve Chairman, Jay Powell, speaking at a conference noted that the labour market was extremely tight and that inflation is much too high, and signalled that the Fed needed to move more quickly in raising rates. After the Ukraine conflict increased economic uncertainty, the Fed raised rates by only 25 basis points at its last meeting. However, the futures market is now pricing in a greater than 70% chance of a double rate rise (50 bp) at the Fed's May meeting. The gold price has been holding up very well against a stronger dollar and higher bond yields, as real interest rates have become increasingly negative. With inflation being exacerbated by the Ukraine conflict, real interest rates could become even more negative before the next Fed meeting arrives, supporting the gold price.

Green gold? The Royal Mint plans to recover gold from scrap electronics. A new facility opens this month in the UK that will provide a stream of gold for the Royal Mint, originating in discarded electronics. Currently, it is estimated that 99% of the UK's electronic waste is shipped abroad, and globally only 20% is recycled. The new chemical process developed by Canadian company Excir can extract and allow recovery of up to 99% of the gold on printed circuit boards without the use of high temperature smelters to extract the metals. The new plant will process 90 tonnes of waste circuit boards a week when at full capacity, which could yield a few tens of thousands of ounces of gold each year. The recycled gold will provide bars to add to the bullion backing the Mint's exchange-traded commodity fund.

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Silver

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03 SILVER	\$/oz	25.43	1.88%	25.85	24/03/2022	24.59	22/03/2022
04 PLATINUM	€/oz	23.14	2.56%	23.51	24/03/2022	22.27	22/03/2022

Silver still has upside potential. Silver climbed above \$25/oz last week. The silver price has slipped back since it hit a 9-month high of \$26.95/oz on 8 March. To keep the upward momentum, the price will need to move above that level again. To confirm the bull market is back the price will then need to climb above \$30/oz, a level it failed to hold in August 2020 and again in February 2021. Inflation will remain high in the near future, which is good for silver as an alternative safe-haven option for investors. If gold pushes to new highs, silver will follow and may outperform gold.

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Platinum

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\$/oz	1,006	-2.61%	1,046	21/03/2022	1,004	25/03/2022
€/oz	916	-2.02%	952	22/03/2022	914	25/03/2022

South African platinum production is forecast to decline slightly this year to around 4.6 moz. In 2021, South African refined output received a significant boost as Anglo Platinum processed the bulk of the stockpiled material (~390 koz Pt) that had built up owing to the Anglo Converter Plant problems. Anglo Platinum has an estimated 80 koz of platinum in stockpiled material remaining to be processed this year. Meanwhile, the rebuild and upgrade of one of Northam's two smelter furnaces from May to October 2021 resulted in a reduction of 7.3% in total refined metal volumes (equivalent to ~15 koz less platinum refined) for the first six months of FY2021 (H2'21). Production stayed relatively steady year-on-year, falling by just 0.4% to approximately 210 koz of platinum. Inventory built up during the smelter maintenance will be processed this year. The platinum market is predicted to have a surplus of over 1 moz (ex. investment) in 2022, so the price may remain relatively weak compared to gold and palladium.

Investments help to maintain future Southern African platinum production. Impala Platinum is aiming to maintain and grow its Southern African production. The company has already committed to increasing output and beneficiation in Zimbabwe with the expansion of smelting capacity and a base metals refinery. The Merensky project at the Two Rivers mine, owned by Impala and joint venture partner African Rainbow Minerals, could add 180 koz p.a. (6E = 5 PGMs + gold). The mine life extension for the Marula mine could add 40 koz of 6E production p.a. and there are also life-of-mine extension projects at the Impala Rustenburg operation. The larger projects will take some years to reach full capacity. However, in the near term Impala has reduced its production guidance by around 150 koz of platinum to 1.43-1.47 moz for its financial year to June owing to operational issues in H2'21 and planned smelter maintenance in H1'22.

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Palladium

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Pd

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\$/oz	2,398	-3.99%	2,607	21/03/2022	2,377	25/03/2022
€/oz	2,193	-2.89%	2,369	21/03/2022	2,182	25/03/2022

More bad news for semiconductor chip production could impact automotive palladium demand. A 7.4 magnitude earthquake shook Japan on 16 March, causing three of Renesas Electronics' – a major producer of automotive chips – plants to shut down. As of 24 March, two plants were back to full operation while the third reached 50%, putting it behind schedule. The major impact appears to be loss and damage of work-in-progress material. Additionally, ASML has warned the company will be unable to supply enough lithography machines used in advanced chip manufacturing to meet demand over the next two years, which will holding back expansion of chip production. Already this year, light-vehicle production forecasts have been cut by 1.2 million units owing to semiconductor supply issues, and this latest interruption is likely to worsen the problem. That would reduce demand and move the palladium market further into surplus, so the price could slip lower.

The Waterberg project may be scaled back. The project is on the Northern Limb of the Bushveld Complex in South Africa. It is palladium-rich and also has relatively high base metal by-products. Platinum Group Metals is investigating adding a smelter and refinery to process the ore from its Waterberg project because the company has not managed to reach an offtake agreement. That adds capital costs and execution risk to the project, which might need to be scaled down to 400 koz p.a. of PGM production (~270 koz Pd). The project is several years from production and the very high palladium price will likely mean the project keeps moving forward.

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Rhodium, Ruthenium, Iridium



		RHODIUM	RUTHENIUM	IRIDIUM
	Reporting Week	\$20,350/oz	\$695/oz	\$5,750/oz
	Previous Week	\$20,450/oz	\$695/oz	\$5,750/oz

Hydrogen-powered trains diversify fuel cell transport. Hydrogen fuel cell trains are undergoing testing around the world and the first generation is expected to enter commercial operation in 2023. In Japan, a Hitachi train using proton exchange membrane (PEM) fuel cells from Toyota is undergoing testing this month. Simultaneously in Europe, Spanish train manufacturer Talgo is testing its own hydrogen locomotives. Ballard Power Systems has also received an expanded order for its fuel cell modules from Canadian Pacific for its Hydrogen Locomotive Program in North America. Demand for PEM fuel cells which contain ruthenium (and platinum) is expanding from a low base, with metal demand forecast to be a few tens of thousands of ounces of ruthenium in 2022. These projects provide proof of concept for the use of hydrogen power outside the automotive sector and its suitability for heavy-duty applications. In the longer term, demand will ramp up as the technology is adopted more widely.

The small PGM prices all stayed stable last week. Iridium and ruthenium both finished the week unchanged, while rhodium fell slightly to \$20,350/oz.

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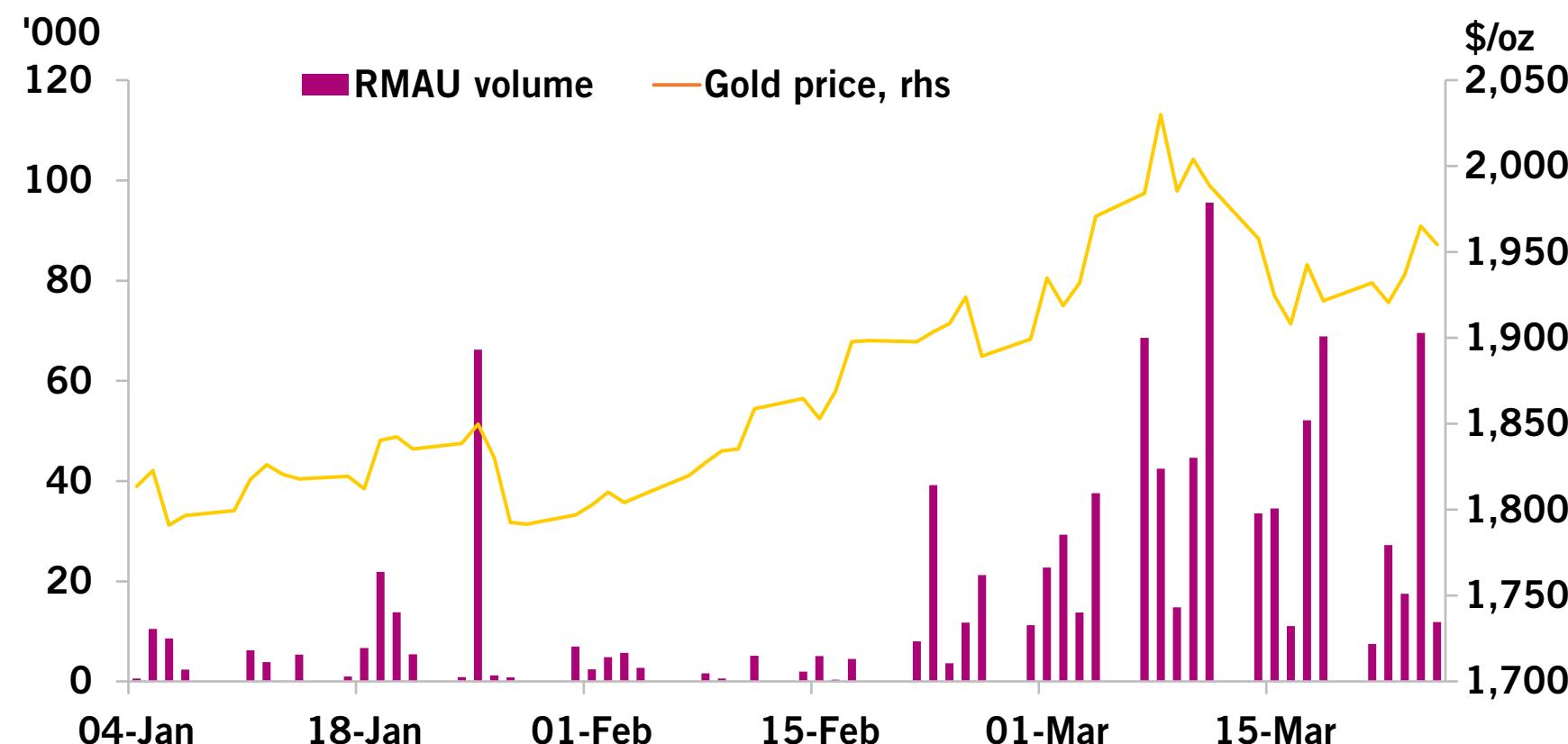
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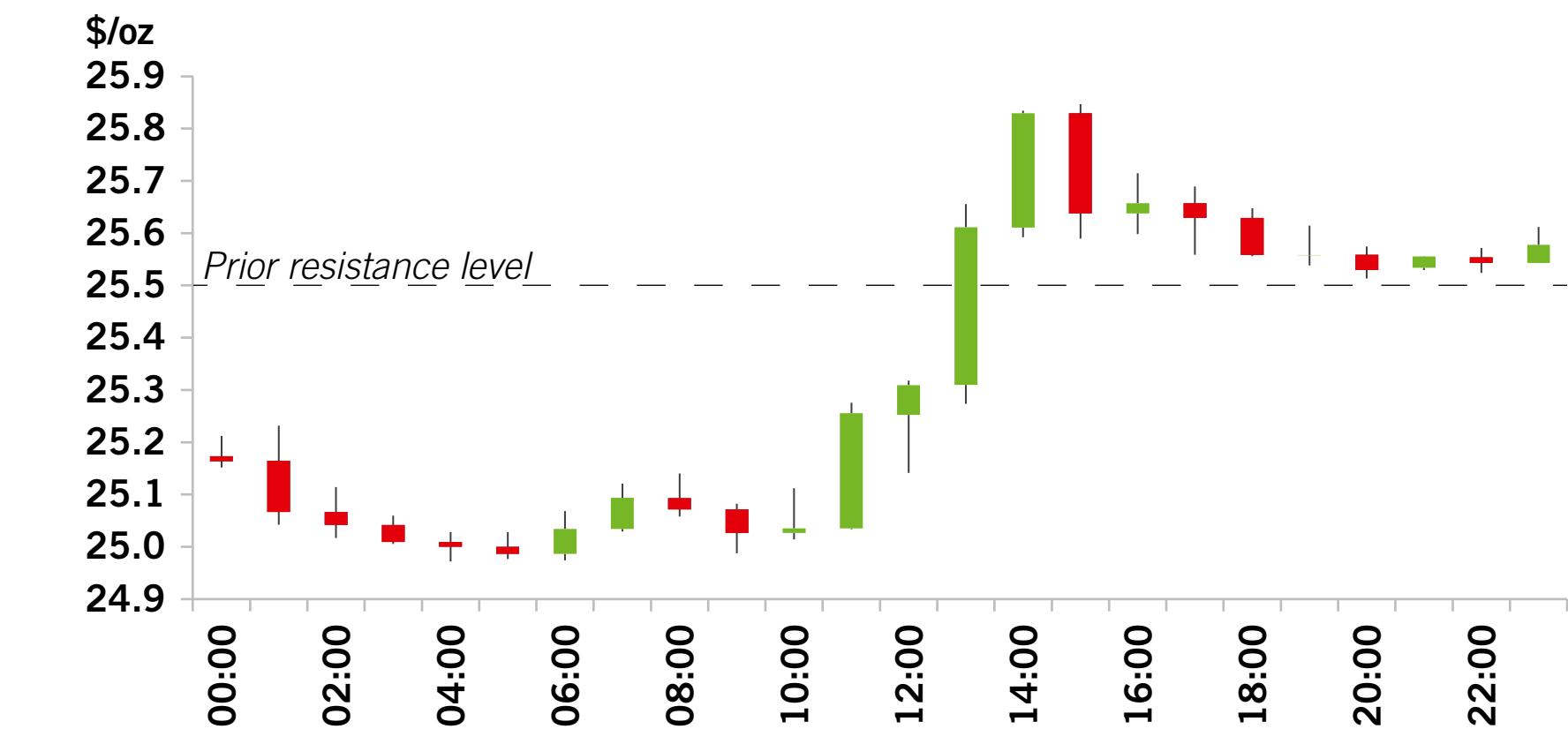
TRENDS AND INVESTMENTS

Royal Mint Au ETC (RMAU) vs gold price



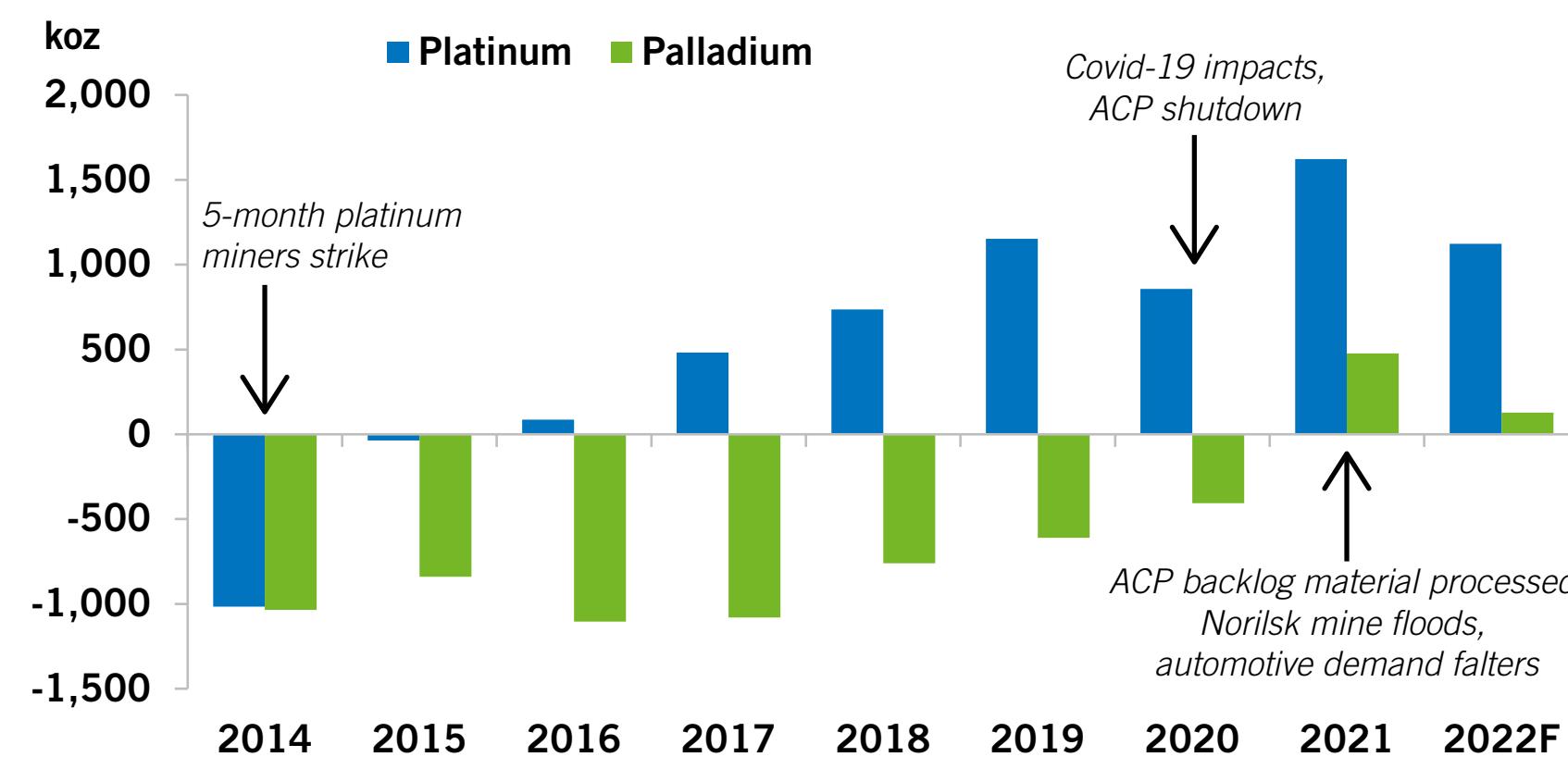
Source: SFA (Oxford), Bloomberg

Silver price 24/03/2022



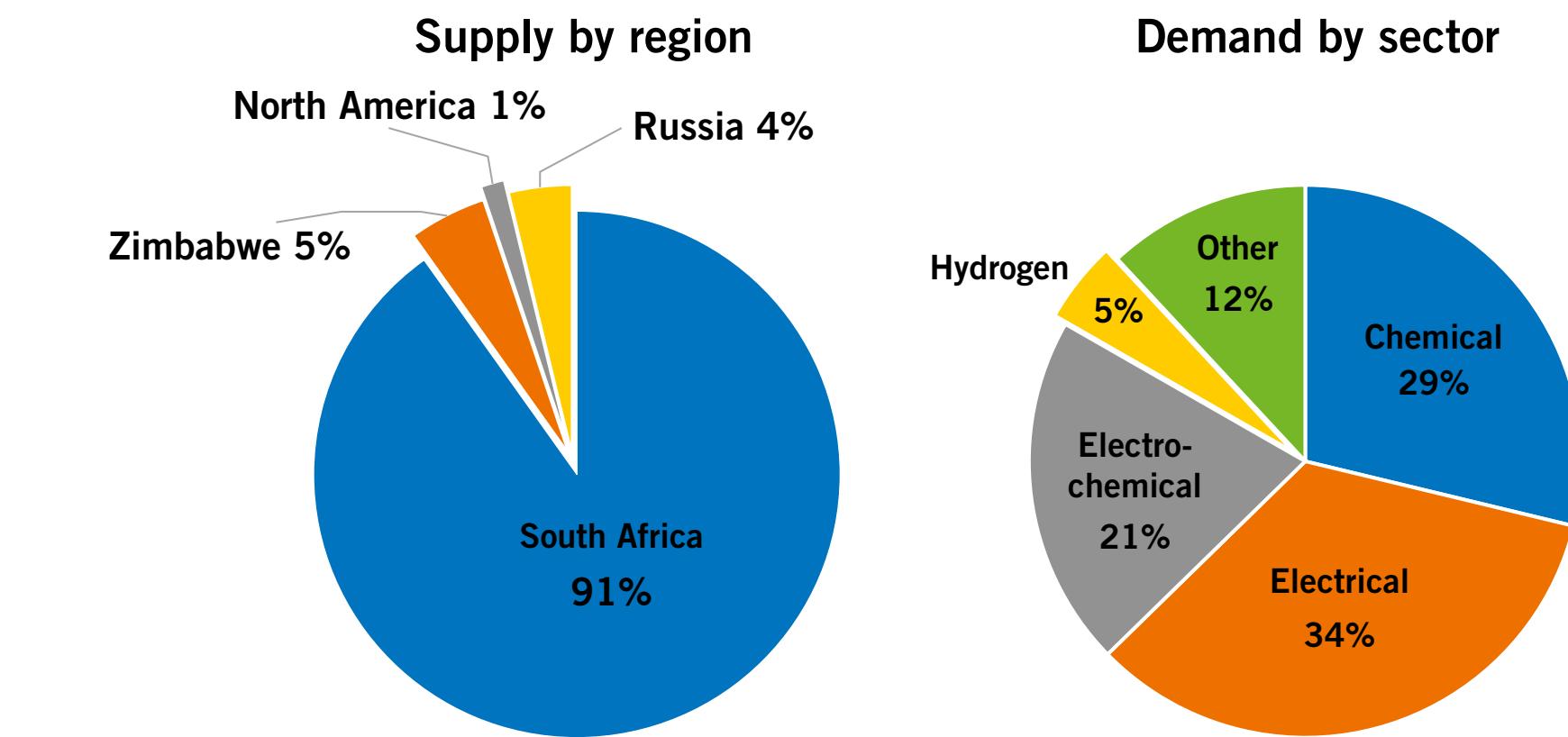
Source: SFA (Oxford), Bloomberg

Platinum-palladium market balance



Source: SFA (Oxford). Note: balances exclude investment.

Ruthenium supply and demand



Source: SFA (Oxford)

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