

SUMMARY

PLATINUM

- Platinum was in deficit by 375,000 oz in 2012, largely due to production lost to strikes, stoppages and mine closures in South Africa.
- Primary supplies of platinum, at 5.64 million ounces, were at a 12-year low, with South African sales down by 16% to 4.10 million ounces.
- Gross demand for platinum fell marginally in 2012 to 8.05 million ounces, with higher jewellery demand but sharply lower industrial buying.
- Autocatalyst demand for platinum was poor in Europe but stronger in Asia and North America and for non-road diesel emissions control.

An unprecedented fall in supplies from South Africa arising from a series of illegal strikes put the platinum market into a deficit in 2012. Through industrial action, safety stoppages and mine closures, producers in South Africa altogether lost at least 750,000 oz of platinum production. Industrial demand in 2012 was hit by a downturn in purchasing by the glass and electrical sectors, while investment demand was steady. Growth in demand for platinum autocatalysts in Asia and North America offset lower requirements from the weak European vehicle market. Only the jewellery trade in China bought significantly more platinum, in order to supply an expanding jewellery retail network. The platinum price in 2012 was on average 10% weaker than in 2011, causing secondary recovery of platinum to decline as collectors of spent autocatalysts hoarded stock, waiting for better price opportunities to arrive.

A series of illegal work stoppages took place during the year at the mines on the western Bushveld operated by Impala Platinum, Lonmin and Anglo American Platinum. The first stoppage of the year started at Impala's Rustenburg lease

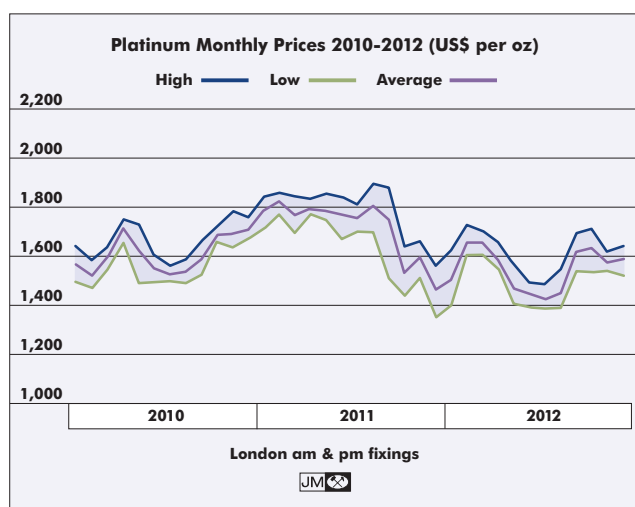
area in January and resulted ultimately in the loss of a third of the mine's annual output. There was significant disruption in August at Lonmin's Marikana operations, where the strike became violent and led to the loss of many lives, and between September and November at Anglo's Union, Rustenburg and Amandelbult operations.

We estimate that losses from legal and illegal strike action in 2012 came to more than 600,000 oz of platinum, compounding the pressure being felt by South African mining companies from above-inflation labour and energy cost increases, falling productivity and torpid dollar pgm prices. Interruptions due to safety inspections, although less onerous than in 2011, were a further drag on production and accounted for at least 70,000 oz of lost output.

These adverse factors began to make themselves felt in the form of mine closures, with three of the smaller mines in South Africa and one tailings reprocessing plant ceasing to operate, in all taking around a further 60,000 oz out of play in 2012. Even the major producers were not immune to the threat of cutbacks, as Anglo Platinum concluded a year-long review of its operations by announcing in January 2013 its intention to close shafts in order to reduce production capacity by up to 400,000 oz per year.

Changes to supply from other regions were relatively insignificant. Shipments of platinum from Norilsk Nickel's operations declined by 2% to 660,000 oz. Total Russian supply, including production from alluvial platinum mines, fell by 35,000 oz to 800,000 oz. Supplies of platinum from North America in 2012 dropped by 55,000 oz to 295,000 oz, reflecting lower production of metal at Vale's Canadian nickel mines. Shipments from Zimbabwe, at 340,000 oz, were unchanged.

Demand for platinum in autocatalysts rose slightly in 2012 to 3.24 million ounces. Depressed light vehicle output in Europe, combined with a lower market share for diesel vehicles, led to a significant fall in demand for platinum in the region. However, a rebound in output of vehicles in Japan, a



continued surge in the manufacture of diesel vehicles in India and Thailand, and increased production of diesel pickup trucks in North America bolstered demand for platinum. The use of platinum autocatalysts for heavy duty vehicles improved marginally, while purchases of platinum more than doubled for catalysts to control pollution from construction, agricultural and other non-road diesel engines, which we now include in our estimates of overall autocatalyst demand.

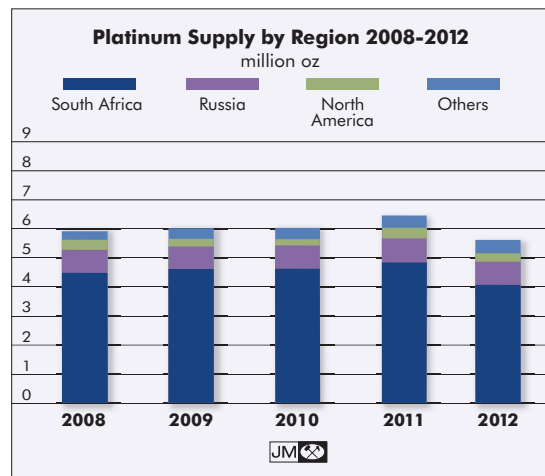
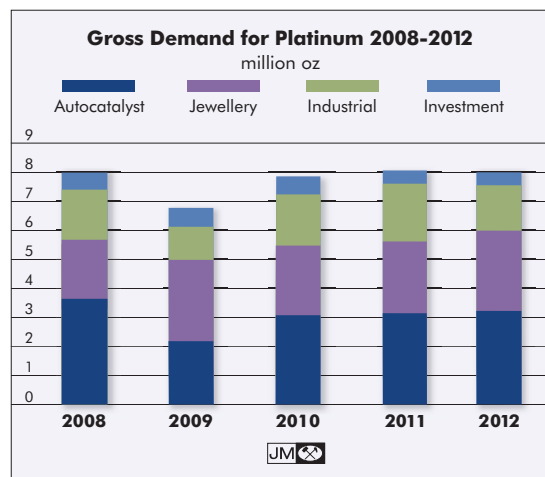
Demand for platinum for making jewellery increased by 305,000 oz in 2012 to 2.78 million ounces. There was a surge of buying by manufacturers in China, in order to supply platinum jewellery to a growing number of retail outlets in Chinese cities. Manufacturers also took advantage of the relatively weak platinum price to increase stocks. In India there was wider distribution of platinum jewellery in the retail network. The discount of platinum to gold during most of the year made platinum jewellery more competitive with white gold in all markets.

Demand for platinum in industrial applications fell by 405,000 oz in 2012 to 1.57 million ounces. This was largely the effect of changing conditions in the glass industry, where excess production capacity, combined with the use of platinum from decommissioned plants and existing inventories, led to a fall in purchases. In the electrical industry, inventory adjustments and weaker demand for hard disk drives impacted purchases of platinum. Demand from the chemical sector was slightly lower than in 2011, while demand for platinum in medical, petroleum refining and other applications was stable.

Net identifiable physical demand for platinum in the investment sector reached 455,000 oz in 2012, only 5,000 oz lower than in the previous year. Investment in exchange traded funds (ETFs) tended to fluctuate in accordance with changes in the platinum price, demand for platinum ending the year marginally higher compared to 2011. Significantly lower net purchasing of large bars in Japan was largely offset by a combination of increased demand for coins and small bars and the acquisition of metal for the launch of a new physically-backed product in North America.

The platinum price averaged \$1,552 in 2012, \$169 per oz lower than in 2011. It began the year brightly and was bolstered when the Impala mines went on strike, reaching a high of \$1,729 in February, but then came under pressure from weak demand and Europe's economic problems. It was at a low of \$1,390 before the eruption of violence during the Lonmin strike propelled it back over \$1,700. Although the price was unable to sustain this level, concern about mine supplies continued to provide support for the remainder of the year.

Platinum Supply and Demand			
'000 oz			
Supply	2010	2011	2012
South Africa	4,635	4,860	4,095
Russia	825	835	800
Others	590	790	745
Total Supply	6,050	6,485	5,640
Gross Demand			
Autocatalyst	3,075	3,185	3,240
Jewellery	2,420	2,475	2,780
Industrial	1,755	1,975	1,570
Investment	655	460	455
Total Gross Demand	7,905	8,095	8,045
Recycling	(1,830)	(2,060)	(2,030)
Total Net Demand	6,075	6,035	6,015
Movements in Stocks	(25)	450	(375)



PALLADIUM

- The palladium market moved into a deficit of 1.07 million ounces in 2012 following a surplus of 1.19 million ounces in 2011.
- Palladium supply declined by 11% in 2012 to 6.55 million ounces. Russian mine supplies fell by 3% to 2.63 million ounces, while sales from state stocks fell by two-thirds.
- Gross demand for palladium rose by 16% to 9.90 million ounces in 2012, led by record purchases of palladium for autocatalyst manufacturing.
- Net physical investment in palladium switched from a negative 565,000 oz in 2011 to a positive 470,000 oz in 2012, a swing of over one million ounces.

Driven by record autocatalyst demand, a one million ounce swing in investment demand and a fall in primary and secondary supply, the market for palladium in 2012 moved into deficit by 1.07 million ounces. Although South African shipments were badly affected by the loss of production from strikes and other interruptions, the major impact on supply in 2012 was a fall in sales of metal from Russian state stocks to 250,000 oz, a fraction of what the market has been accustomed to seeing in recent years. The strength of demand for palladium was accentuated by the large swing in physical investment from negative to positive. However, excluding investment, demand still grew by 300,000 oz compared to 2011. Demand in the dominant auto sector increased by 460,000 oz, more than compensating for a reduction in electrical and jewellery demand, while chemical and dental demand were stable.

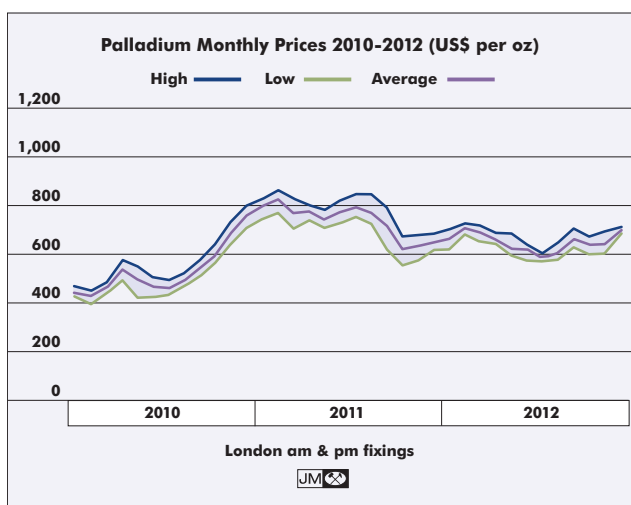
Supply of palladium last year, at 6.55 million ounces, was the lowest since 2002. In South Africa the output of by-product palladium suffered from disruption to platinum mining arising from strikes and other stoppages. PGM grades in the ores at Norilsk Nickel's Russian mines have been declining

for some time and in 2012 palladium output in Russia was 3% lower than in 2011. However, the most significant impact on supply last year came from a sharp drop in sales of Russian government stocks due, we believe, to state reserves being almost completely depleted.

In 2012, for the second year running, gross demand for palladium in autocatalysts was at a new all-time high. World demand of 6.62 million ounces represented a 7.5% increase on 2011 and, even more impressively, a rise of nearly two-thirds when compared to the depressed level of 4.05 million ounces during the recession year of 2009. Some of the causes of this demand strength were ongoing, such as increasing production of light duty gasoline vehicles in China and another rise in the ratio of palladium to platinum in autocatalysts for European diesel vehicles. Others were germane to 2012, notably the recovery of vehicle output in Japan after the tsunami of 2011 and, in the USA, growing consumer confidence and economic activity. This, along with a renewed willingness of banks to provide credit, persuaded an increasing number of US buyers to return to car showrooms to replace their ageing vehicles.

Recycling of palladium from end-of-life catalysts did not keep pace with gross demand last year, falling by 35,000 oz to 1.66 million ounces. Weakness in pgm prices caused collectors to hoard stocks of spent converters for a time and only towards the end of the year did recycling volumes begin to strengthen as inventories were released. Consequently, the increase to 4.96 million ounces in net autocatalyst demand for palladium was an 11% advance on the 2011 level.

Gross demand for palladium in jewellery in 2012, at 445,000 oz, was 60,000 oz lower than in 2011. Demand for palladium jewellery in China fell for the fourth consecutive year, while in other markets it was largely unchanged. Anaemic consumer demand for palladium jewellery in China has resulted in fewer manufacturers and retailers producing it or carrying stock. With the amount of palladium recycled from scrapped jewellery falling to 190,000 oz in 2012, net demand



reached 255,000 oz, compared with 295,000 oz in 2011.

The use of palladium in various industrial sectors came to 2.37 million ounces in 2012, 100,000 oz lower than the previous year. The use of palladium in dental restorations, and in several minor applications such as petroleum refining catalysts, stationary source pollution control and industrial alloys, was largely stable. Chemical demand increased due to further expansion of capacity for manufacturing chemical intermediates for polyesters and plastics using palladium catalysts, but these gains were eliminated by sharply lower gross demand in electrical applications.

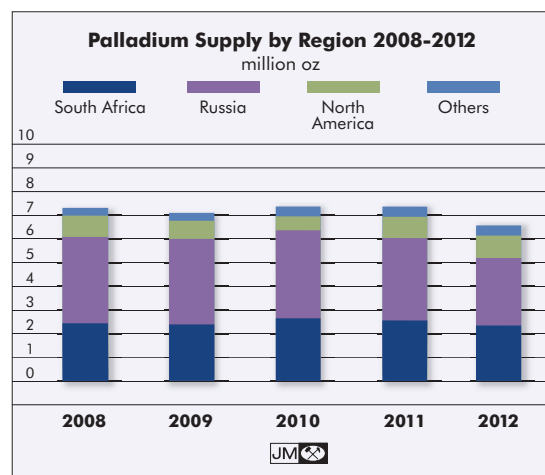
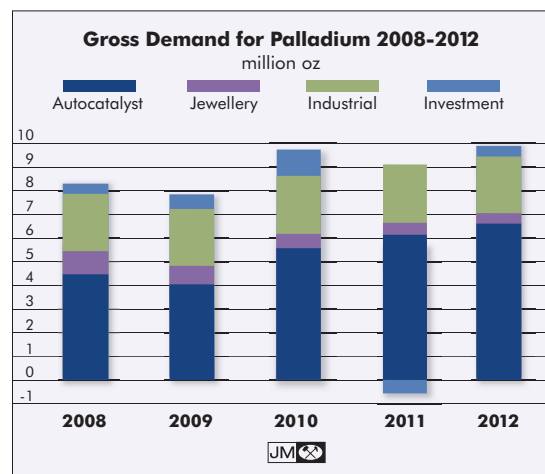
The metal content of multi-layer ceramic capacitors, an important use for palladium in the electrical sector, is constantly being reduced. At the same time, the improving performance and reliability of base metal capacitors has enabled manufacturers of electronic systems to employ them in applications where previously only the performance of precious metals was acceptable. Palladium capacitors have been displaced from many automotive electronics, for example, and increasingly their use is being confined to extremely demanding applications such as military aircraft systems. Demand for other electrical uses of palladium held up well, especially as the price of palladium remained at a large discount to the price of gold, the alternative material in applications such as electronic plating.

Recovery of palladium from electronic scrap fell by 50,000 oz in 2012 to 430,000 oz due to a decline in the concentration of palladium in electrical waste, the result of years of miniaturisation of components and thrifting of the palladium content. This offset part of the overall decline in gross demand from the electrical sector.

Net physical investment demand for palladium reached 470,000 oz in 2012, compared to liquidation of 565,000 oz in 2011, a swing of over one million ounces. This was due primarily to a return to net investment in the ETF market following heavy profit-taking the previous year, notably by investors in the two largest funds based in London and New York. New demand of 285,000 oz was registered in ETFs and to this was added a further 185,000 oz of palladium bought for the fully-subscribed Sprott Physical Platinum and Palladium Trust when it was launched in December 2012.

Like the platinum price, which it broadly shadowed for most of the year, the palladium price peaked at \$722 in February 2012 and reached its nadir of \$564 in July before being bolstered by the mine strikes in South Africa. Palladium was more resilient than platinum in the final two months, averaging \$643 for the year, \$90 per oz lower than in 2011.

Palladium Supply and Demand '000 oz			
Supply	2010	2011	2012
South Africa	2,640	2,560	2,330
Russia	3,720	3,480	2,880
Others	995	1,320	1,335
Total Supply	7,355	7,360	6,545
Gross Demand			
Autocatalyst	5,580	6,155	6,615
Jewellery	595	505	445
Industrial	2,465	2,465	2,365
Investment	1,095	(565)	470
Total Gross Demand	9,735	8,560	9,895
Recycling	(1,850)	(2,385)	(2,280)
Total Net Demand	7,885	6,175	7,615
Movements in Stocks	(530)	1,185	(1,070)



OTHER PGM

- Gross demand for rhodium grew by 6% in 2012 to 966,000 oz, largely due to strong demand for rhodium in autocatalysts, especially in North America and Japan.
- Primary supplies of rhodium declined by 43,000 oz to 722,000 oz. Weaker South African production was partly offset by a rise in Russian output. Recovery of rhodium from autocatalyst scrap fell by 6.5% to 259,000 oz.
- Ruthenium demand in 2012 was 32% down at 679,000 oz due to sharply reduced buying of ruthenium for the production of hard disks and chemical catalysts.
- Adequate capacity for growing single crystal sapphire meant a pronounced drop in buying from the electrical industry, causing global iridium demand to fall by 46% to 178,000 oz in 2012.

Rhodium

Supply and demand for rhodium came close to balance in 2012 after the previous year's substantial surplus. This was the outcome of a reduction in mine supply, principally from South Africa, a smaller amount of rhodium reprocessed from end-of-life autocatalyst scrap and a strong increase in demand for rhodium for new autocatalyst manufacture and for physical investment.

Supplies of rhodium from South Africa fell in 2012 to 576,000 oz, a decline of 65,000 oz. This was due to loss of production during a series of illegal strikes and other interruptions at the operations of all three of the major South African mining companies. The fall in supply was not so pronounced as for platinum because the producers were able to augment their regular production of rhodium by releasing metal from inventories.

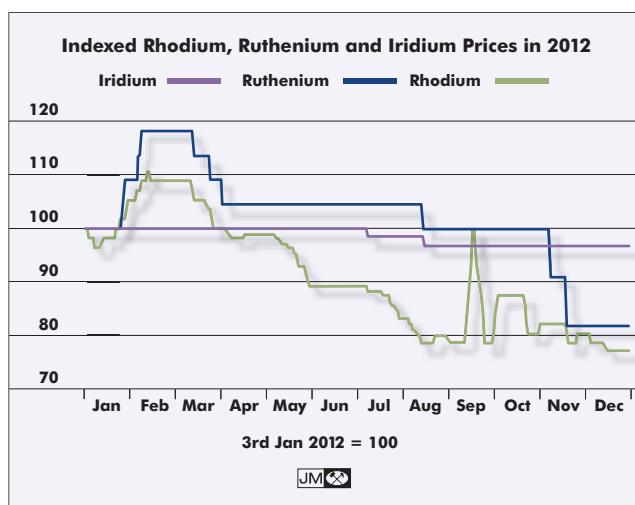
Higher shipments of rhodium reached the market from Russia, the result, we believe, of metal being processed from stored mine concentrates to supplement regular

newly-mined output at Norilsk Nickel. Russian supply rose by 20,000 oz to 90,000 oz, offsetting the losses from South Africa to some extent and bringing total primary sales of rhodium in 2012 to 722,000 oz – 43,000 oz less than in 2011 and the lowest level of supply for four years.

Autocatalyst demand for rhodium rose by 67,000 oz in 2012 to 782,000 oz, bolstered by a rebound in vehicle production in Japan after the catastrophic natural disasters of 2011 and by a buoyant market for cars in North America. A 22% increase in light duty gasoline vehicles made in Japan last year was equivalent to an additional 1.6 million cars and light trucks, while an improving economy brought consumers back to showrooms in North America, prompting a 1.9 million unit rise in the light duty gasoline build. As Japanese auto companies tend to use, on average, more rhodium on autocatalysts than other producers, and also have a large manufacturing base in North America, the recovering production in both regions was significant for rhodium demand.

Industrial demand for rhodium was mixed, with growth in purchasing by the chemical industry outweighed by a fall in demand from the glass sector after two very strong years. Chemical demand was up by 9,000 oz to 81,000 oz, driven by Asian demand for rhodium process catalysts to make acetic acid and oxo-alcohols. Producers of glass fibre reduced their purchases of rhodium in 2012 as they had metal on hand from closures of old plants, while liquid crystal display (LCD) glass manufacturers installed less capacity than in 2011 and had access to rhodium bought in previous years, bringing total glass demand down to 31,000 oz, from 77,000 oz in 2011.

A rise of 28,000 oz in Other demand for rhodium, to 66,000 oz, was entirely due to an increase in holdings of physical rhodium in the Deutsche Bank ETF. In total, gross demand for rhodium in 2012 rose by 58,000 oz to 966,000 oz. With autocatalyst recovery falling by 18,000 oz to 259,000 oz, the rhodium market was oversupplied by 15,000 oz.



The price of rhodium was \$1,400 at the start of 2012. It ticked upwards to \$1,500 in the first quarter, shadowing the rise in platinum and palladium prices, but then went into decline, reaching \$1,100 in August. A characteristic pattern of trading during the period was for buying interest from Asia to be met by sellers in Europe and North America, with the latter having a greater effect on the price. When the Anglo Platinum mines in South Africa went on strike in September the price spiked to \$1,400 before relapsing. The average price of rhodium for the year was \$1,276, a fall of \$746 per oz from 2011.

Ruthenium

Demand for ruthenium fell by nearly a third in 2012 after two exceptionally strong years.

Purchases of ruthenium declined in the electrical and chemical sectors. Weaker production of computer disk drives required less ruthenium for coating of hard disks and this, combined with a reduction of inventories and improved manufacturing efficiency, accounted for the bulk of a 30% decline in demand from the electrical industry.

Chemical demand for ruthenium fell by over 60% compared to 2011, when demand was unusually high due to purchases of new catalyst charges for converting natural gas to ammonia. With demand for ruthenium catalysts for the production of chlorine and for other minor applications broadly stable, total demand for ruthenium in 2012, at 679,000 oz, was 318,000 oz lower year-on-year. The price of ruthenium averaged \$112 for the year, lower by \$54 per oz than in 2011.

Mine production of ruthenium fell in 2012, in line with lower platinum output at strike-hit South African mines.

Iridium

Iridium demand fell by almost a half in 2012 because of lower purchasing from the electrical sector.

There was significant change in demand for iridium in electrical applications last year as expansion in the use of iridium crucibles to grow single crystal sapphire, which had driven demand sharply higher in 2010 and 2011, came to an end. Purchasing for other industrial applications was steady. In total, demand for iridium fell to 178,000 oz from 332,000 oz in 2011. The iridium price on average was \$34 an ounce higher than in 2011 at \$1,070.

Production of iridium was also impacted by disruptions to South African mining operations. However, with industrial buying in decline, there was no lack of availability in the market.

