PLATINUM 2008

Interim Review

Johnson Matthey

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Strong growth in demand for fertilisers and for mining explosives has supported the widespread use of platinum gauzes like this in nitric acid manufacture.

PLATINUM 2008
Interim Review

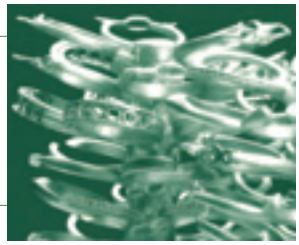
by David Jollie

Special Features

Supply and Demand Tables

JM
Johnson Matthey

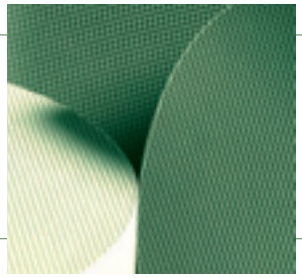
EXECUTIVE SUMMARY



The platinum market is forecast to be in deficit by 240,000 oz in 2008. Demand is set to fall by 2.3 per cent to 6.52 million ounces while platinum supply is expected to slip 4.2 per cent to 6.28 million ounces. Supply interruptions boosted the price to a record $2,276 in March. However, the onset of the global financial crisis in August led to huge fund sales and the price ended September at $1,004.

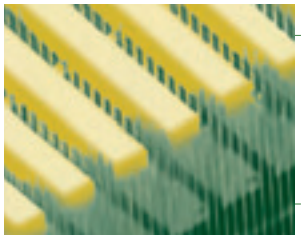
Net global jewellery demand will decrease by 340,000 oz to 1.12 million ounces this year. High metal prices in the first half of 2008 negatively affected the affordability of platinum jewellery and, as importantly, increased recycling rates in Asia. The rapid drop in the price from July to September allowed the industry to replenish stocks and reduced recycling volumes, stimulating a degree of recovery in demand.

Gross automotive platinum demand is expected to rise by 2.1 per cent to 4.23 million ounces in 2008. North American vehicle sales have weakened this year, with platinum demand in the region expected to fall by 305,000 oz to 540,000 oz.



However, this drop in North American usage will be outweighed by greater demand for platinum for diesel particulate filters in Europe and by continued growth in vehicle production in China and the Rest of the World region.

Net investment purchases of platinum are likely to fall to 145,000 oz in 2008, a decrease of 25,000 oz from 2007. Large amounts of metal were purchased through the Exchange Traded Funds in the first quarter but redemptions in July and August mean that net demand from these is set to fall to 130,000 oz. The Japanese market saw net disinvestment of large bars in early 2008 but strong demand in the third quarter.

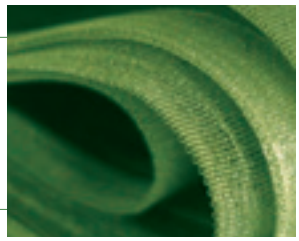


Industrial demand for platinum is expected to climb by 190,000 oz to a net global total of 2.00 million ounces in 2008. Global economic growth will drive demand in many sectors higher. Capacity will expand this year in the chemicals industry, fibre glass and LCD glass manufacturing and in the petroleum refining sector. Platinum demand will therefore rise in each of these areas.

Platinum supplies are forecast to decrease by 275,000 oz to 6.28 million ounces this year, the lowest total since 2003. Electricity supply problems, smelter outages, a lack of skilled staff and other

production challenges will depress South African output by 250,000 oz from 2007 levels. Production of platinum from Russia will fall too but North American and Zimbabwean output will rise.

The rhodium market is expected to be in deficit by 62,000 oz this year. Demand is set to drop by 5.6 per cent, to 810,000 oz, reflecting success in car makers' thrifting efforts and declining North American vehicle production. However, rhodium supplies will fall further, by 9.2 per cent, to 748,000 oz. The price soared to a record $10,100 in June but plummeted to end September at $4,350 on fund sales and weakening demand.



The palladium market will be in surplus by 320,000 oz in 2008, although this is a much smaller surplus than has been the case in recent years. Demand is forecast to rise by 3.8 per cent to 7.19 million ounces. Supplies of palladium are expected to fall by 12.5 per cent to 7.51 million ounces. The price peaked at $588 in March, its highest since 2001, but fell to end September at $199 due to heavy fund sales.

Net demand for palladium from the jewellery sector will rise by 55,000 oz to 780,000 oz in 2008, reversing two years of decline. A reduction in recycling of old stock in China and good interest from manufacturers and retailers will help boost demand there. More palladium jewellery will also be manufactured and sold in Europe and North America than in the previous year.

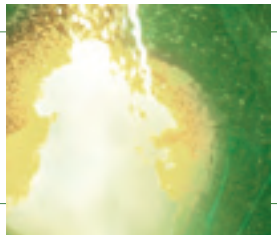
Gross demand from the global automotive sector will rise by 30,000 oz to a total of 4.58 million ounces in 2008. North American demand will fall by 350,000 oz as production volumes decline.

However, this will be outweighed by increased use of palladium alongside platinum in the diesel sector in Europe and by growth in production in China, Russia and South America.

Industrial and other demand for palladium should increase by 85,000 oz to 2.44 million ounces in 2008. Global economic growth will encourage higher palladium usage in the electronic and chemical sectors. Demand for palladium from the dental sector will fall 5,000 oz as a decline in European consumption outweighs the increased demand for palladium for lower-gold content dental alloys in North America.

Palladium investment demand will rise strongly in 2008, to an estimated 470,000 oz, up 210,000 oz from last year. Most of this – 430,000 oz – will be from metal purchases through Exchange Traded Funds. Investors bought large amounts of palladium in the first quarter of 2008 as the price rose, yet they sold little metal as the price fell in the third quarter and appear to be investing for the longer-term.

2008 supplies of palladium are forecast to fall by 12.5 per cent to 7.51 million ounces. Output is expected to fall in Russia, South Africa and North America, with sales from primary production

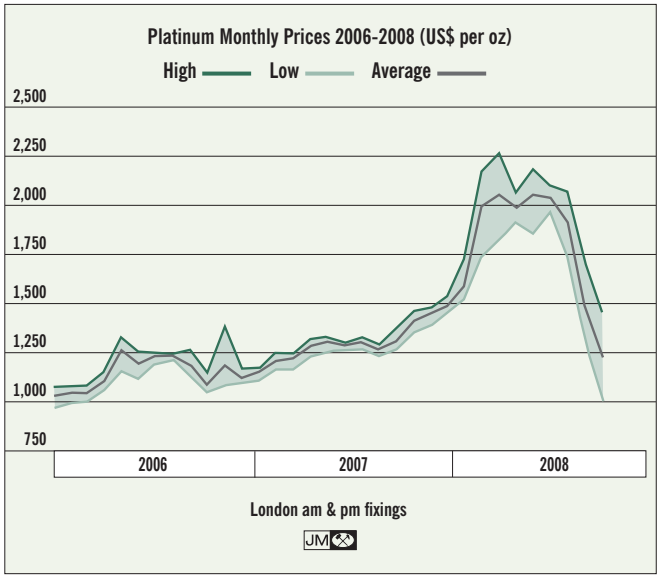


dropping 385,000 oz to 6.71 million ounces. We currently assume that sales of Russian state stocks of palladium will fall from 1.49 million ounces last year to 800,000 oz in 2008.

Ruthenium demand will fall in 2008, for the second successive year, to 787,000 oz. Although gross ruthenium demand from the electronics industry – mainly for hard disk drives and chip resistors – will increase in 2008, improved inventory control of ruthenium and faster recycling times will drive net demand lower. Iridium demand will rise to 132,000 oz in 2008, with more metal used in spark plugs and in the electronics industry.

SUMMARY & OUTLOOK

PLATINUM



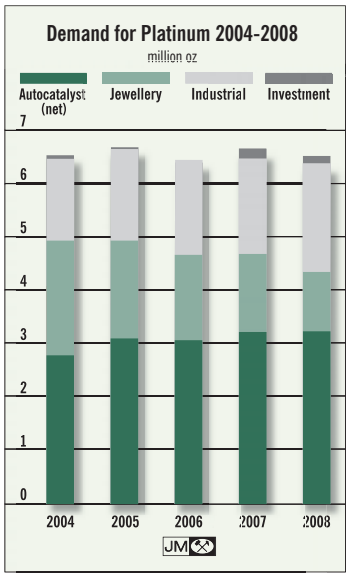
Platinum demand is expected to fall by 2.3 per cent to 6.52 million ounces in 2008. Gross purchases of platinum for use in autocatalysts should grow to 4.23 million ounces this year as more metal is used in diesel particulate filters in Europe, outweighing weak North American light duty vehicle output. Industrial demand is set to grow to a total of 2.00 million ounces, driven by a global economy that has shown growth in 2008. Jewellery demand is expected to fall to 1.12 million ounces, reflecting soft retail sales and greatly increased recycling levels in Japan and China. Investment demand is set to decrease to a net 145,000 oz.

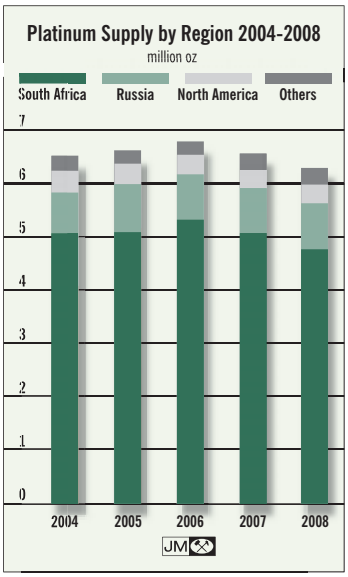
Platinum supplies will fall too, dropping 4.2 per cent to 6.28 million ounces. Primary production will decrease in South Africa, reflecting a range of challenges to mining and processing across the industry. Russian output is likely to fall but supplies from Zimbabwe and North America should rise slightly. Purchases of platinum by users are therefore predicted to exceed mine supply by 240,000 oz in 2008.

Price movements have demonstrated the shifting balance between fundamentals and investment as the year has progressed. Supply disruption, initially in the form of intermittent electricity supply and the temporary closure of the Amandelbult mine in South Africa, drove the platinum price from an opening $1,530 in January to an all-time high of $2,276 in March. But during the third quarter, global economic concerns prompted heavy fund sales of platinum which overwhelmed softening physical demand and forced the price sharply lower, to end September at $1,004.

Supply

Platinum supply will fall to 6.28 million ounces in 2008, some 275,000 oz below the 2007 figure. A range of problems in South Africa – not simply limited to power availability – is expected to trim supplies there by 5.0 per cent, to 4.78 million ounces, the lowest since 2003 despite the capital investment since that date.





In South Africa, the major producers – Anglo Platinum, Impala and Lonmin – have had a difficult year and will all produce and sell less platinum than during 2007. Electricity problems forced a hiatus in mining and processing in late January and early February. However, losses which were directly attributable to the electricity supply situation were smaller than initially expected and are likely to be less than 60,000 oz for the whole year.

Anglo Platinum was hit by further problems in early 2008 with Amandelbult temporarily closed

due to flooding. A shutdown of the Polokwane smelter also affected output. Lonmin had smelter problems and lost output from its Marikana mine due to delays in implementing mechanisation. Fortunately, there was increased production from a small number of newer operations including Crocodile River and Elandsfontein.

Outside South Africa, Russian output of platinum (from Norilsk Nickel and the alluvial producers) is likely to fall from 910,000 oz to 855,000 oz. North American platinum supplies should grow by 15,000 oz to 340,000 oz. The two mines operating in Zimbabwe have performed impressively considering the operating challenges in that country and are expected to produce 180,000 oz of platinum in 2008, 10,000 oz more than in the previous year.

Demand

Platinum demand should fall to 6.52 million ounces in 2008, a decrease of 155,000 oz from the previous year. High platinum prices and a slowdown in economic growth have affected some market segments negatively although many are still expected to purchase more metal this year than in 2007.

Gross autocatalyst demand will rise by 2.1 per cent to 4.23 million ounces with growth in European purchases outweighing weakness in the North American market. This year has already seen significant movements in automotive industry pgm inventories with a liquidation in strategic stocks by North American companies, whereas European auto makers have been increasing their stocks.

Autocatalyst demand in Europe will account for 2.40 million ounces of this total, with over 85 per cent of this being used in the light duty diesel sector. A rapidly-growing proportion of these vehicles is being fitted with platinum-containing diesel particulate filters (DPFs). This will drive platinum demand higher despite the greater co-use of platinum and palladium in diesel oxidation catalysts (DOCs).

Autocatalyst platinum demand will climb in China and the Rest of the World region, reflecting a rise in vehicle output. However, the North American automotive market has performed very weakly in 2008, with annual light duty production set to fall by 15 per cent to 11.0 million units. Output will also soften in the heavy duty sector and total North American platinum autocatalyst demand is forecast to fall by 305,000 oz to 540,000 oz this year.

In the jewellery sector, a rising platinum price had a strong negative impact on retail sales and manufacturing volumes in the first half of the year in most markets. Even more importantly, however, recycling of old jewellery increased dramatically in Japan and, to a lesser extent, China as the price rose, depressing net jewellery demand further. The fall in the platinum price in the third quarter has allowed manufacturers and retailers to rebuild stocks and should lead to stronger consumer purchasing of platinum jewellery in Asia. It has also depressed the amount of scrap material returning from consumers in these two markets. Net global demand is now expected to fall from 1.46 million ounces in 2007 to 1.12 million ounces this year.

Industrial demand will climb by 10.5 per cent to 2.00 million ounces in 2008. Demand from the glass and chemical sectors will rise, reflecting the addition of significant extra capacity in both industries in China. However, net platinum usage by the electronics industry will fall: although the number of hard disks manufactured continues to grow, producers have been able to thrift the metal content of an average disk successfully and have also reduced working stocks by recycling material more quickly, leading to lower net demand this year.

Investment interest fluctuated wildly during 2008, driven by large flows of metal into and out of Exchange Traded Funds (ETFs). Investment in ETFs is likely to be much lower than in 2007 – at 130,000 oz compared to 195,000 oz – despite a first full year of trading for these funds. Large amounts of platinum were bought through the ETFs in the first quarter as the price rose rapidly but sales were equally heavy in the third quarter as the price fell, suggesting that many investors have only a short-term interest in platinum. We also expect some net disinvestment from the Japanese large bar market this year. Net physical investment demand for platinum is therefore forecast to decrease to 145,000 oz.

Platinum Supply and Demand
'000 oz

		2007	2008
Supply			
South Africa		5,030	4,780
Russia		910	855
North America		325	340
Others		290	305
Total Supply		**6,555**	**6,280**
Demand			
Autocatalyst:	gross	4,145	4,230
	recovery	(905)	(970)
Jewellery		1,460	1,120
Industrial		1,805	1,995
Investment		170	145
Total Demand		**6,675**	**6,520**
Movements in Stocks		**(120)**	**(240)**

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Outlook

The outlook for the platinum market is more uncertain than it has been for many years. The high prices during early 2008 drove demand lower and encouraged end users to control metal consumption ever more closely. The dramatic fall in the platinum price in the third quarter of the year could yet pose significant challenges to the primary producers and make expansion less attractive. Additionally, the extreme uncertainty in the global financial markets makes it hard to forecast the severity of the present economic slowdown with any accuracy.

On the supply side, the ability of the South African producers to maintain output from their existing mines and to add extra ounces from newer operations will remain critical. Electricity supply currently appears to have stabilised and the mines are able to forecast the amount of power that they will receive and to plan accordingly. There is therefore scope for some recovery in platinum production at many established mines in 2009. We also expect to see the first significant production from Platinum Australia, Platmin and Ridge Mining next year.

However, a lack of trained and experienced staff at all levels of the South African mining industry means that production is likely to remain lower than would otherwise be the case. Rising UG2 output from the new generation of platinum mines is also placing increasing technical stresses on smelting capacity in South Africa and smelter outages or rebuilds may cause platinum supply to fluctuate in the very short-term. In the longer-term, questions remain about the ability of the mining companies to obtain sufficient power guarantees to start new operations. Additionally, at current prices, and with difficulties in obtaining credit, it may prove difficult or unattractive for many producers to expand their output. Although we expect increased platinum supplies from South Africa, this will be lower than had previously been envisaged over the medium to long-term.

On the demand side, it seems likely that most major national economies will suffer either a recession or a slowdown in growth during the next twelve months. This is likely to have an impact on industrial demand for platinum. In the automotive sector, though, the prospects for platinum demand are better. At current price differentials, palladium will continue to dominate the gasoline autocatalyst sector and will take an increasing share from platinum in the diesel sector. However, new Euro 5 light duty vehicle emissions rules will take effect in late 2009 and early 2010 in Europe. These will force the use of diesel particulate filters on almost all diesel cars sold in this region, supporting platinum demand despite a worsening outlook for global vehicle production.

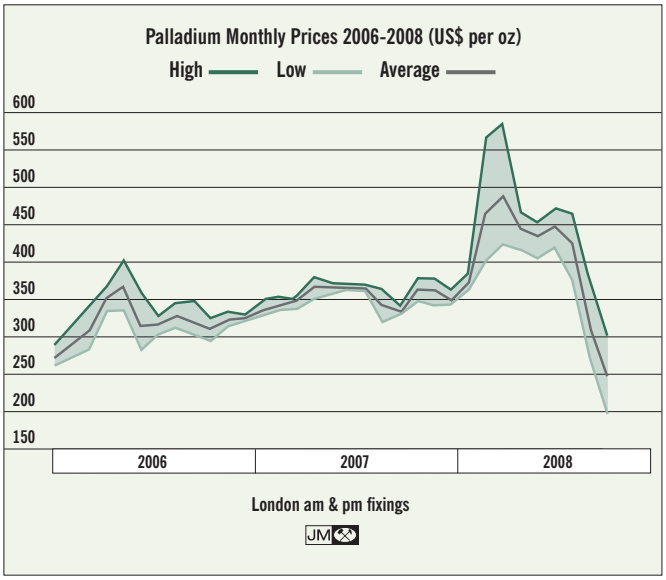
In the jewellery industry, latent demand – defined as consumers' desire to buy a product – remains intact but affordability of platinum jewellery has decreased in recent years, driving sales down. However, a lower price has already allowed the industry to restock and should help retail sales, as demonstrated by strong physical purchasing in China in September and early October. Additionally, the amount of metal returned to the market from second-hand jewellery in Japan has recently decreased as the price has fallen and net demand there is expected to improve. However, price volatility affects the trade's confidence, so a sustained period of price stability would benefit the industry further and help rebuild demand to previous levels.

While the global economy is slowing, production of nitric acid, hard disks and LCD glass could still rise next year, although a widespread slowdown will see some plant construction delayed. Investment demand for platinum will depend strongly on platinum's price performance. With the recent move by investors to liquidate all forms of investments in favour of cash, it seems unlikely that investment demand will rise significantly.

Forecasting the platinum price has become increasingly challenging in the current economic environment. Platinum remains mainly an industrial metal and the economic cycle will have an effect on price expectations. However, some major economies, including China, will escape actual recession, supporting physical demand when it might otherwise be expected to fall more significantly.

Nonetheless, the impact of the financial markets cannot be overestimated. Very heavy fund sales of platinum in the third quarter of 2008 drove the price rapidly downwards. Should the current economic crisis continue, platinum could trade as low as $700 during the next six months as investors prefer cash to other investments. Conversely, if fund selling abates, then the price will more closely reflect fundamentals, suggesting that platinum could trade as high as $1,400 an ounce within this period.

PALLADIUM



Palladium demand is forecast to rise from 6.93 million ounces to 7.19 million ounces in 2008. Gross autocatalyst demand is expected to grow by 0.7 per cent to 4.58 million ounces as usage in China, Europe and the Rest of the World region increases, offsetting a 350,000 oz drop in demand from the ailing North American market. Jewellery demand is set to climb 7.6 per cent to 780,000 oz, due to a fall in recycling of unsold stock in China and to rising consumer demand in several regions. Electronics demand is set to rise by 4.0 per cent to 1.29 million ounces. Physical investment demand will be particularly strong in 2008, at an estimated 470,000 oz, a rise of 80 per cent from last year.

Palladium supply is forecast to fall by 12.5 per cent in 2008, to 7.51 million ounces. Primary production in Russia should slip below 3 million ounces. South African palladium supplies are expected to fall by 8.8 per cent, to only 2.53 million ounces this year, the lowest since 2004. North American output of palladium will shrink by 4.0 per cent to 950,000 oz. Sales of metal from Russian state stocks are forecast at 800,000 oz, despite large shipments in September 2008.

The palladium market will therefore be in surplus again in 2008 – by an anticipated 320,000 oz – although this surplus is much smaller than in recent years. The price performed strongly in early 2008, rising from an opening $370 to a peak of $588 in March – its highest since 2001. However, the importance of speculative fund interest to the palladium price was amply demonstrated in the third quarter when very large fund sales sent the price spiralling down to end September at only $199 – the lowest since October 2005.

Supply

Global palladium supply is likely to fall to 7.51 million ounces in 2008 from 8.59 million ounces one year earlier. Russian primary (mine) production is forecast to fall below 3 million ounces. South African palladium shipments are expected to fall to 2.53 million ounces. Supplies from North America are expected to drop to 950,000 oz this year. We also forecast that Russian state stock shipments in 2008 will be lower than in 2007.

Supplies of palladium from Russian mining in 2008 – derived almost entirely from Norilsk Nickel's operations in Siberia – are expected to fall by 3.6 per cent. Difficult weather conditions in the first quarter delayed shipments of concentrate for refining and first quarter output of palladium was negatively affected. A rebuild of the Nadezhda smelter also reduced processing throughput. However, output should recover in the second half of the year to give full year production of roughly 2.94 million ounces compared to 3.05 million ounces in 2007.

Supplies from Russia have again been augmented by sales of state stocks of palladium. Trade statistics reveal substantial shipments from these stocks to Switzerland in December 2007 and August 2008. We assume these have been sold this year and include them in our 2008 supplies figure, at a combined 800,000 oz, substantially below the 1.49 million ounces we estimate was sold in 2007. We further assume that the large shipments into Switzerland in September 2008 will not be sold this year and thus exclude them from our supplies figures.

Palladium supplies from South Africa should drop by 245,000 oz in 2008 to 2.53 million ounces. The tonnage of ore mined at many South African operations has fallen due to a combination of safety stoppages, staff shortages and technical problems as well as losses due to the reductions in electricity supply.

North American output of palladium should dip 40,000 oz to 950,000 oz in 2008. Output from Stillwater's

operations are set to fall due to high staff turnover and a move to more selective mining methods. Sales by North American Palladium will fall due to difficult weather conditions and a temporary closure at the end of October.

Demand

Total demand for palladium in 2008 is forecast to be 7.19 million ounces, 260,000 oz higher than in 2007. Physical demand has increased in the autocatalyst sector, the jewellery industry, investment and other applications.

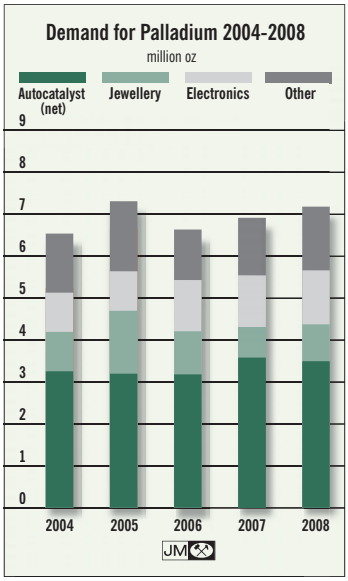
Gross demand for palladium for use in autocatalysts is forecast to rise by 30,000 oz to 4.58 million ounces in 2008. North American vehicle production is expected to decline by at least 15 per cent this year with the fall steeper than had initially been expected as credit problems have hit vehicle sales to consumers. High fuel prices have also driven consumers towards smaller, more fuel-efficient vehicles, leading to a decrease in average catalyst size. Both factors are negative for demand which will fall by 350,000 oz to 1.35 million ounces this year.

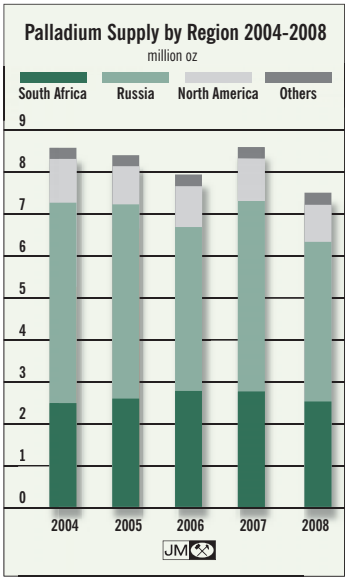
In other regions, however, the trend in palladium demand will be positive. Many more vehicles will be produced in China and the Rest of the World region in 2008 than in 2007. With new emissions legislation in some of these markets, their combined palladium consumption will rise 17.6 per cent to 1.31 million ounces. Auto makers' purchases of palladium in Europe will rise strongly too. The high price of platinum in the first half of 2008 accelerated the introduction of palladium into diesel oxidation catalysts and particulate filters. This will drive European palladium demand 190,000 oz higher to 1.12 million ounces in 2008.

Palladium jewellery demand is expected to increase by 55,000 oz to 780,000 oz in 2008, after falling for two successive years. Palladium jewellery is increasingly successful in Europe and North America where product availability improved in 2008, driving combined demand in these two regions to 125,000 oz. By contrast, the Japanese jewellery industry will consume less palladium in 2008 than in 2007 due to lower production of platinum alloys (which employ palladium) and increased recycling of old platinum jewellery.

China remains the most important region for palladium jewellery and demand is set to rise this year by 10.0 per cent to 550,000 oz. Most of the unsold Pd950 (95 per cent purity) stock has now been reprocessed into Pd990 pieces and recycling rates are declining, allowing demand to rise. Although the first half of the year saw weak purchases of palladium by jewellery manufacturers, the fall in the metal price in the third quarter of 2008 has rekindled this market. Demand is now expected to rise for the year as a whole.

Industrial demand for palladium is forecast to increase by 5.2 per cent in 2008 to an annual total of 1.81 million ounces. The electronics sector remains healthy with high sales growth and will consume more metal despite continued thrifting and miniaturisation. In the chemical sector, demand will rise this year as production plants for a number of commodity chemicals are installed in China and in the Rest of the World region to address a local lack of manufacturing capacity.





Physical investment demand will be driven primarily by purchases of metal through the Exchange Traded Funds. These accounted for demand of 385,000 oz in the first three quarters of 2008 as large amounts of metal were purchased as the price rose in the first quarter. There have been few large redemptions of this metal to date and we forecast that investment demand for the entire year – both through ETFs and in the form of coins and bars – will be in the region of 470,000 oz.

Outlook

Palladium is primarily an industrial metal and demand in most of its applications is therefore strongly affected by economic conditions. The recent turmoil in the financial markets, and the associated downturn in the global economy, can therefore be expected to have a negative impact on demand, although it remains challenging to forecast the scale of any effects. However, while palladium continues to trade at a large discount to platinum and gold, the outlook for palladium demand remains positive in some of its applications.

In the automotive sector, all major car makers have been reducing costs by replacing platinum with palladium in their gasoline (three-way) catalysts for some time. Programmes focusing on the introduction of palladium into diesel catalysts alongside platinum, are moving faster than had been expected, driven by a high platinum price. Current global financial issues will have an impact on demand – a lack of availability of credit in the USA has already hit car sales there – but this substitution of some platinum by palladium in the European diesel sector means that there is a possibility that automotive demand may yet grow in 2009.

Palladium Supply and Demand
'000 oz

		2007	2008
Supply			
South Africa		2,770	2,525
Russia:			
Primary Production		3,050	2,940
State Sales		1,490	800
North America		990	950
Others		285	295
Total Supply		**8,585**	**7,510**
Demand			
Autocatalyst:	gross	4,545	4,575
	recovery	(955)	(1,075)
Jewellery		725	780
Electronics		1,240	1,290
Other		1,375	1,620
Total Demand		**6,930**	**7,190**
Movements in Stocks		**1,655**	**320**

JM

Industrial demand could also climb in 2009 despite the economic slowdown. Disposable income will decrease in many countries but the constant addition of extra functionality into consumer electronics by manufacturers should drive MLCC production higher, helping palladium demand. In the chemical sector, though, limited availability of debt finance will see some new plant construction delayed and demand is likely to shrink.

In the dental sector, palladium should continue to prosper in North America due to the comparatively high price of gold. The lower-gold content alloys employed here have a higher-palladium content. In Japan, the longer-term trend is for palladium demand to fall, reflecting a gradual move to resin treatments and a declining number of visits to dentists.

The outlook for the jewellery sector is harder to forecast. In Europe, demand may benefit from the expected launch of a palladium hallmark in the UK in 2009. The introduction of newer, improved casting alloys may attract more manufacturers to this material in North America and demand could rise there. In China, we believe that most old Pd950 stock has now been recycled and physical demand is currently strong. There is still widespread interest in palladium from retailers and manufacturers and, as the Chinese economy is forecast to grow again next year, palladium jewellery demand seems likely to rise.

Primary production of palladium should rise in 2009. Russian output is not expected to change significantly but South African supplies should increase to some extent. Three new mines will start operations in South Africa in late 2008 or early 2009, boosting palladium production.

However, the question of the size and fate of Russian state stocks remains key to this market. Russian comments that these would be sold off within the next one to five years are the most precise public information on this issue. Russian shipments of metal into Switzerland in the first half of 2008 were lower than in previous years but a large amount of metal was imported in August and September. We take the view that not all of this metal will be sold at current low prices and that some will instead be sold in future years.

The palladium price moved wildly in the first three quarters of 2008, in sympathy with currency movements, other precious metal prices and investor sentiment, rather than the fundamentals of a market which was fairly close to balance. The overhang of substantial stocks of palladium which have been built up in the market during recent years remains a negative for the price, as a possibility remains that they may be sold. However, many investors in palladium seem to have a longer-term view and may wish to hold on to these positions.

A worsening economic climate can be expected to have an impact on palladium demand. Some commentators expect the US Dollar to strengthen against many currencies over the next year. Together, these factors could send the palladium price to as low as $125 during the next six months. However, should economic conditions stabilise or improve, palladium's strengthening fundamentals could see it trade as high as $300 within the same period.

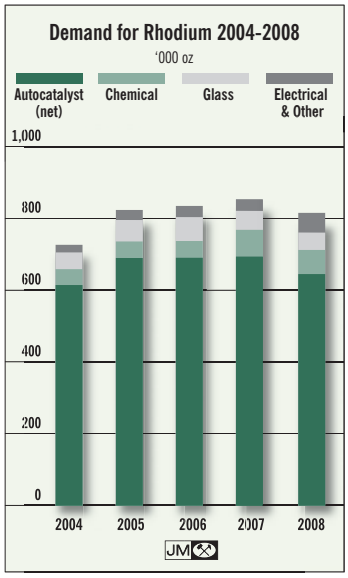
OTHER PGM

Rhodium

The rhodium market is expected to remain in deficit for the fifth successive year in 2008, by a forecast 62,000 oz. Net demand is expected to decrease to 810,000 oz with a reduction in rhodium loadings in autocatalysts cutting metal consumption in the auto industry. Rhodium supplies are set to fall heavily to 748,000 oz due to lower production in South Africa.

This deficit supported the price for the first half of 2008, driving it to a record high of $10,100 in June. However, supply of rhodium from South Africa improved in the third quarter of the year. At the same time, demand from the automotive sector softened and there were reports of sales of rhodium by auto makers and speculators. Overall, the rhodium market is likely to have moved into a short-term surplus – in contrast to the large deficit in the market in early 2008 – and this weakened the price which plummeted to end September at $4,350.

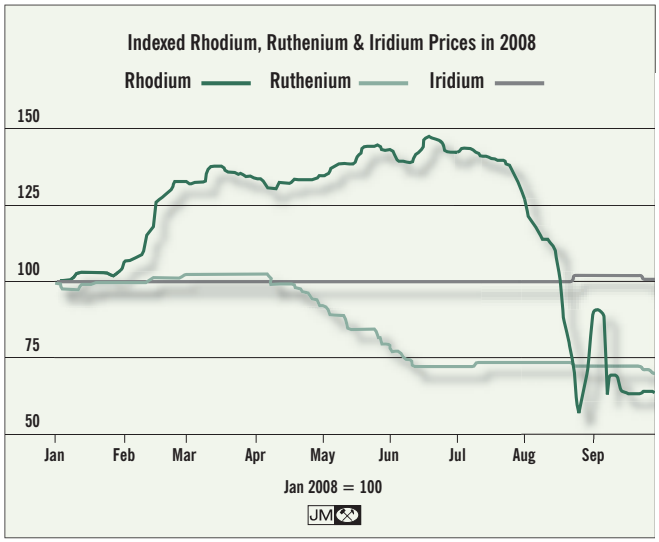
Global rhodium supply is set to fall by 76,000 oz in 2008 to a total of 748,000 oz. Production in South Africa accounts for the majority of world output and sales of rhodium from this source are expected to drop by 10.9 per cent to a total of 620,000 oz, reflecting lower mine production due to skill shortages, geological problems, bad weather and intermittent electrical supply. Rhodium sales from Russia are forecast to remain flat at close to 90,000 oz in 2008. Supplies of rhodium from North America and elsewhere will remain steady at 38,000 oz.



Gross annual autocatalyst demand for rhodium will decrease for the first time since 2001. High prices in recent years encouraged auto makers to work on thrifting rhodium from their catalysts. These efforts have started to bear fruit and have resulted in a decrease in average rhodium loadings. However, in China and the Rest of the World region, this thrifting will be outweighed by increased production of catalysed vehicles.

In Europe and Japan, where vehicle production will be relatively flat in 2008, rhodium demand will edge slightly lower this year. However, demand will fall steeply in North America. Production volumes have decreased dramatically as the economy has weakened and there has also been a trend towards smaller vehicles. Furthermore, we believe that the North American automotive industry has sold some strategic stocks of rhodium this year.

The glass sector has also tried to reduce its rhodium purchases and stocks, with some dealloying – a move to lower-rhodium content alloys – occurring. There have also been sales of rhodium inventory in Europe and North America. Nonetheless, the glass industry will purchase more rhodium globally than in 2007 – 57,000 oz compared to 52,000 oz last year – to meet growing demand for fibre glass in China and for the manufacture of LCD television glass elsewhere in Asia.



Demand for rhodium from the chemical sector, where it is employed as a catalyst in many industrial processes, should climb by 6,000 oz to 72,000 oz this year. Rhodium demand arising from the installation of new acetic acid production capacity should fall this year but its use in making oxo-alcohols will rise as new plants are constructed in Asia to meet a local shortage of these chemicals.

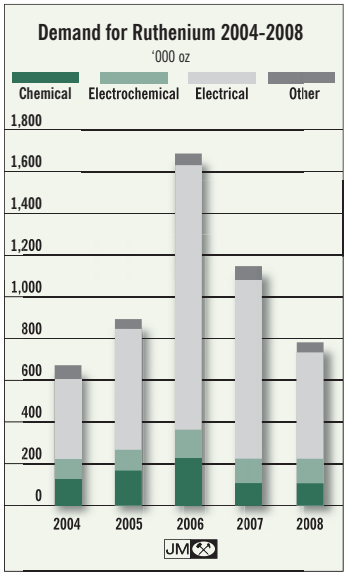
Looking forward, we expect rhodium supply to increase. In part this is simply a recovery from the

poor performance of the industry in early 2008 but it also reflects mine expansions in South Africa. This will see three new mines start operating around the end of this year. Many other mines are producing more UG2 ore which typically has a higher-rhodium content than Merensky Reef, driving output higher. However, future supplies are likely to be lower than previous forecasts due to the challenging operating environment in South Africa.

Thrifting of rhodium in autocatalysts could drive demand lower just as the amount of metal recovered from spent autocatalysts is increasing. A further fall in demand seems particularly likely in North America where vehicle sales are forecast to remain weak into 2009. Other sectors, including glass manufacturing, could take some extra metal but are unlikely to be able to compensate fully for this weakness.

Ruthenium

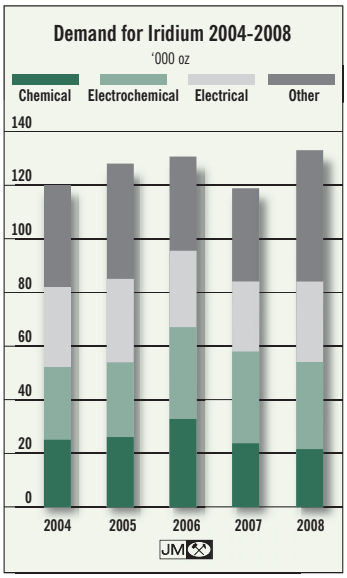
Net demand for ruthenium is expected to fall to 787,000 oz in 2008, as large amounts of scrap metal return from the electronics sector for recycling and reuse, reducing net consumption in that industry. Primary production remains above this level despite lower output from South Africa, resulting in an increase in stocks held at producers. The ruthenium price thus continued its downward trajectory of last year during the first three quarters of 2008. It started the year at $415 and, although it climbed to $425 in February, the price softened in mid-year when seasonal demand is slowest. It ended September at $290, where it had been in late 2006.



Net demand in the electronics sector fell by 40.6 per cent to 514,000 oz despite an increase in gross purchases. The most important use of ruthenium in electronics remains in perpendicular magnetic recording (PMR) hard disks. Global production of these disks will rise substantially in 2008 and most manufacturers have almost completed the transition to this technology. Despite this, they have been able to drive net ruthenium usage lower by the use of thinner layers of ruthenium. Refining lead times for spent sputtering targets (which are used to deposit the ruthenium layers) have decreased hugely as extra ruthenium refining capacity has come online. This has allowed the industry to reduce its working stocks of ruthenium, cutting demand further, a trend that may continue into 2009.

Ruthenium consumption in conductive pastes used in the manufacture of plasma display panels for television sets will decrease dramatically in 2008. Last year manufacturers developed lower-pgm content pastes and even some formulations with no precious metal content. Ruthenium demand from this application has fallen sharply in 2008 and may effectively disappear by the end of 2009. However, the use of ruthenium for chip resistors rose as manufacturing of these components increased.

In the chemical sector, ruthenium demand will fall to 89,000 oz as less acetic acid capacity is installed this year than in 2007. Electrochemical usage will rise to 122,000 oz this year.



Iridium

Iridium demand is forecast to rise by 13,000 oz to 132,000 oz in 2008.

Demand in the electrical industry will grow but chemical and electrochemical purchases of iridium will decrease. With supply comfortably meeting demand, the price moved little during the first nine months of the year. It started at $450 and ended $5 higher at $455.

The electrical sector will purchase more iridium in 2008 than in 2007 – a total of 30,000 oz – for crucibles to manufacture single crystals to meet rising demand for these crystals from the medical sector. Chemical industry requirements for iridium will fall to 21,000 oz as less acetic acid capacity is installed this year. Less iridium will be used in the electrochemical sector too – a total of 33,000 oz – as expansion in the chlor-alkali industry slows.

SUPPLIES, MINING & EXPLORATION

Platinum group metal supplies will decline this year due largely to problems faced by the South African mining industry. Primary output elsewhere is also expected to be weak. Supplies of platinum should decrease 4.2 per cent to 6.28 million ounces. Palladium and rhodium supplies will also fall, to 7.51 million ounces and 748,000 oz respectively.

SOUTH AFRICA

Expectations of platinum supplies in 2008 have been adjusted sharply downwards since the start of the year, with labour, safety and technical issues affecting output at all producers. This will be partly offset by higher output from some ramp-up operations. We predict 2008 shipments of platinum from South Africa to total 4.78 million ounces, 5.0 per cent below 2007 levels.

Anglo Platinum

In the first half of 2008, Anglo Platinum's refined platinum production totalled 1.00 million ounces, a drop of 16 per cent compared with the same period a year earlier. However, sales were above this level, with 111,000 oz of platinum sold from refined stocks.

Following a shutdown of the Polokwane smelter during the first quarter, there was a large increase in the company's pipeline stocks of unrefined pgm. 127,000 oz of platinum was mined but not refined from January to June 2008: much of this will be processed this year, and refined production during the second half should therefore increase substantially.

Underlying "equivalent refined platinum production" (platinum in concentrate, adjusted for standard smelting and refining recoveries) fell by 146,000 oz or 11 per cent in the first half. The electricity crisis accounted for the loss of only 30,000 oz of platinum output, much less than had initially been feared. The most serious incident affecting production was the flooding of the Amandelbult mine, following exceptional rainfall in January, which resulted in the loss of 67,000 oz. Refurbishment of the Turffontein shaft at Rustenburg cost a further 36,000 oz, while plant breakdowns and grade control issues cut output at Mogalakwena (formerly PPRust) by 34,000 oz.

PGM Supplies: South Africa
'000 oz

	2007	2008
Platinum	5,030	4,780
Palladium	2,770	2,525
Rhodium	696	620

JM

Safety stoppages, labour unrest, skill shortages and absenteeism also had negative effects on production. Output fell at almost all the group's operations, including its joint ventures, except Modikwa where output had been hit by a strike in the first half of 2007.

Despite a difficult first half, Anglo Platinum stated in August 2008 that it expects to produce 2.4 million ounces of platinum this year. The new Mogalakwena North plant produced its first concentrate in March 2008 and will add to pgm output in the second half. Anglo Platinum is now refining all production from Kroondal and benefiting from a ramp-up at the other pool & share agreement operation, Marikana. The group will also refine more pgm from Xstrata's Elandsfontein mine, which is in its first full year of operation.

Impala Platinum

Production of platinum from the Impala lease area fell by 8 per cent to 468,000 oz in the first half of 2008, reflecting a 6 per cent decline in mill throughput and a slight decrease in head grade (due to increased dilution and a rise in the proportion of UG2 mined).

8,000 oz of platinum production was lost due to electricity shortages during the first half of the year. A further 12,000 oz was lost due to the Presidential Safety Audits, with some shafts closed for short periods while inspections took place. Operations were also hampered by skill shortages and high staff turnover.

At the Marula mine, production of platinum in concentrate rose by 8 per cent to 35,000 oz in the first half, despite a 3 per cent reduction in mill throughput to 694,000 tonnes. This reflected a sharp improvement in grade arising from the ongoing switch from mechanised to conventional mining techniques. However, the mine's ramp-up has been delayed by labour disputes, safety stoppages and a shortage of skilled miners and artisans.

Lonmin

Production of platinum in concentrate at Lonmin fell by 20 per cent to 342,000 oz in the first six months of 2008. At the Marikana mine, mill throughput fell by 15 per cent to 5.3 million tonnes, affected by delays in

the ramp-up of production from the new mechanised shafts and a number of safety-related shutdowns. Meanwhile, at the Limpopo operation a decline in tonnage of nearly 30 per cent was reported, as resources were diverted away from mining and towards the development of new ore reserves.

Refined production from the Lonmin refineries totalled 316,000 oz in the first half, with maintenance work on the No. 1 furnace in the first quarter leading to a build-up of unrefined pgm in the processing pipeline. Processing was again disrupted in June and July due to shutdowns of the No.1 furnace and the Merensky furnace respectively. Lonmin does not expect to process the backlog of unrefined pgm before the end of its financial year to September 2008, and anticipates that some 10-15,000 oz of platinum sales will be deferred. The company forecasts platinum sales in the year to September of around 725,000 oz: a 9 per cent fall from the previous financial year.

Other Producers

The Northam mine has encountered the same difficulties as other platinum mines, with safety, power and industrial relations issues all affecting production in 2008. In addition, mine performance has been hampered by difficult geological conditions on the Merensky Reef, with the amount of ore milled from this reef down by 13 per cent in the first half of the year. This was partly offset by an increase in UG2 mining, so that total mill throughput fell by only 2 per cent. However, the higher proportion of UG2 had a negative influence on grades and recoveries, and production of pgm in concentrate fell.

At Aquarius Platinum's Everest mine, a decision was taken to convert to owner-operation of the underground mine following the resignation of the mining contractor in January. Aquarius estimates that 25,000 oz of pgm were lost in the first half of 2008 due to the switch-over. In addition, production was disrupted by a series of industrial disputes. Mill throughput for the period fell by 28 per cent, while output of platinum in concentrate was down 21 per cent at 38,000 oz.

The Two Rivers mine, ARM Platinum's joint venture with Impala, produced 111,000 oz of pgm in the first half of 2008, down 14 per cent on the previous year. There was a 2 per cent fall in mill throughput, while grades also declined. However, the mine's performance improved in the second quarter, with the plant consistently exceeding its design capacity of 225,000 tonnes of ore per month. In addition to its stake in Two Rivers, ARM also has joint ventures with Anglo Platinum (Modikwa) and Norilsk Nickel (Nkomati). The conversion of Nkomati from a small underground mine exploiting the high-grade massive sulphide body to a lower-grade open pit mine is now almost complete. Output of pgm in concentrate was little changed in the first half of 2008, at 26,000 oz.

Production fell at most operations on the Bushveld due to skill shortages, safety stoppages and labour issues.

Eastern Platinum's Crocodile River mine produced 29,000 oz of platinum in concentrate in the first half of 2008, an increase of 7 per cent on the previous year. Mine production rose by 28 per cent to 584,000 tonnes of ore while recoveries and grades also improved.

Sylvania continues to develop its chrome dump operations, treating pgm-containing tailings from chrome mines on the Bushveld. During the first half of 2008, Sylvania milled a total of 267,000 tonnes and produced just under 10,000 oz of pgm.

At Ridge Mining's Blue Ridge operations, mining has begun and the company is building a stockpile of ore ahead of the commissioning of the concentrator (scheduled for November). The first refined metal will not be seen until early 2009. At Platinum Australia's Smokey Hills project, open pit mining began in January and it is possible that some pgm could be refined before the end of the year. A third new operation, Platmin's Pilanesberg open pit mine, is due to come into production in early 2009.

RUSSIA

Russian supplies from primary production are expected to fall in 2008 to 2.94 million ounces of palladium and 855,000 oz of platinum. We expect sales of state stocks to contribute a further 800,000 oz of palladium. Total palladium supplies will slip 17.6 per cent lower to 3.74 million ounces.

We forecast that Norilsk Nickel's annual Russian production will fall in 2008 to just below 3 million ounces of palladium and under 700,000 oz of platinum. First half output of palladium was 1.40 million ounces but sales of refined metal were above this level.

Production was affected by severe weather conditions on the Taimyr peninsula in the first quarter, preventing the shipment of concentrates to Krasnoyarsk for refining. The rebuild of the Nadezhda smelter in the first half of 2008 also affected pgm output which should therefore improve in the second half.

PGM Supplies: Russia
'000 oz

	2007	2008
Platinum	910	855
Palladium:		
Primary Production	3,050	2,940
State Sales	1,490	800
Rhodium	90	90

JM

Sales of platinum by the alluvial producers should fall to roughly 175,000 oz, reflecting the gradual exhausting of some of these deposits.

In December 2007, and in August and September 2008, there were large palladium shipments from Russia to Switzerland. These appear to have been from Russian state stocks. We believe that 800,000 oz of this palladium will be sold in 2008, and therefore include this in our supplies figure for this year. The remainder is expected to be sold at some future date.

NORTH AMERICA

Palladium supplies from North America are set to fall by 4.0 per cent to 950,000 oz in 2008, reflecting lower production at Stillwater and North American Palladium. Platinum output will rise to 340,000 oz.

North American Palladium produced 127,000 oz of palladium in the first half of 2008, 13 per cent down on the previous year. Scheduled maintenance reduced mill throughput and open pit mining was disrupted by record rainfall. In October, the mine announced its temporary closure due to low metal prices.

At Stillwater, production of platinum and palladium fell by 8 per cent in the first half of 2008, to 197,000 oz and 58,000 oz respectively. The company has suffered from high employee turnover and a shortage of key mining skills at a time when its mines are undertaking a conversion to more selective mining methods. It has therefore reduced its production forecast for this year, from 550-565,000 oz to 515-525,000 oz of pgm.

PGM Supplies: North America
'000 oz

	2007	2008
Platinum	325	340
Palladium	990	950
Rhodium	20	19

JM

First half production of pgm at Vale Inco's Sudbury nickel operations grew: platinum output rose 16 per cent to 79,000 oz and palladium supplies were up 3 per cent at 103,000 oz. Xstrata reported lower nickel output at its North American mines in the first half of 2008 due to severe weather at Raglan and lower mill throughput at Sudbury and it is likely that pgm production fell.

ZIMBABWE

Despite a challenging operating environment, platinum output from Zimbabwe is expected to rise by 5.9 per cent to 180,000 oz.

The Mimosa mine (a joint venture between Impala and Aquarius Platinum) reported a 6 per cent fall in production of platinum in concentrate in the first half of 2008, primarily due to power outages and equipment failures at the mill. Nevertheless, there was a sharp rise in mill throughput in the second quarter, following the commissioning of the Phase 5 metallurgical plant expansion. Mining operations proceeded smoothly, and Mimosa has built a stockpile of ore which should enable higher pgm production in the second half.

At Zimplats, production of pgm in concentrate fell by 9 per cent to 94,000 oz in the first half of 2008, reflecting lower mill throughput and a decrease in grades and recoveries. Difficult mining conditions were encountered in the open pit, while electricity outages in the first quarter disrupted operations. However, production of platinum in matte rose 6 per cent to 54,000 oz, as the company continued to process concentrate that built up ahead of the smelter during a furnace re-line in late 2007.

PGM Supplies: Zimbabwe and Others
'000 oz

	2007	2008
Platinum	290	305
Palladium	285	295
Rhodium	18	19

JM

South African Electricity Supply

In January 2008, rolling electricity power cuts, or load-shedding, were introduced in South Africa due to insufficient generating capacity. The immediate impact was a suspension of mining activities at most of South Africa's platinum mines and a loss of production. Although more power was restored to the mining operations comparatively quickly and production soon restarted, they continue to receive only a portion – 95 per cent – of their normal power requirements at the time of writing (early October). While some mines will produce more refined metal, few if any companies have been able to meet their initial production plans partly due to these electricity supply issues.

THE CAUSES

A number of problems combined to cause the South African power crisis. Wet coal and low coal stocks, unexpected shutdowns and unplanned maintenance of power generating equipment were all cited as partial reasons for the mismatch between electricity generation and electricity consumption.

However, what appears to have been the most important factor is a continued underinvestment in new generating capacity under the South African Eskom utility. In support of this view, Eskom believes that demand management will be vital to the South African power industry for at least the next five years as a method of balancing supply and demand.

PRODUCTION LOSSES

A limited amount of platinum production – below 60,000 oz – was lost directly due to the electricity supply situation in the first six months of the year. In fact, this was less than the 67,000 oz of platinum production lost due to the temporary closure of Amandelbult after the flooding of that mine in January.

Where mining was stopped in January and February, less ore was produced, with a direct impact upon refined metal output. Restrictions on power usage also impacted on smelting and refining operations at this point and later in 2008. However, many companies were able to adjust their processing by prioritising particular process steps and controlling the throughput of materials in their smelters and refineries. As a result, most producers should lose only a minimal amount of pgm output in the second half of 2008 because of power supply issues despite a 5-10 per cent drop in power availability.

Direct losses due to power problems are hard to estimate as companies took the opportunity to repair equipment that they might not have been able to power in any case - such as Anglo Platinum at its Polokwane smelter or Lonmin at its No.1 smelter. However, Anglo Platinum estimates that it will lose 30,000 oz of platinum production while Lonmin and Impala have estimated losses of 15,000 oz and 8,000 oz of platinum respectively.

To place this in perspective, Anglo Platinum lost a greater amount of production from the refurbishment of the Turffontein shaft at its Rustenburg operations than it expects to lose due to electricity problems this year. Likewise, Impala lost 12,000 oz of platinum output due to shaft shutdowns for the Presidential Safety Audits, 50 per cent more than its losses due to power problems in the first six months.

THE FUTURE

Eskom is currently developing plans to install further electrical generating capacity in the medium-term and is refurbishing previously mothballed generating capacity as well. This latter activity, combined with supply side management, has decreased the risk of power outages in the near future.

The South African government is encouraging some demand side improvements such as the use of low energy lightbulbs at domestic level and it is likely this will have some beneficial impact as will a gradual slowing of the economy. However, despite these measures, the power supply-demand gap is unlikely to be closed entirely within the next five years.

Legislation is also being enacted to control industrial power consumption. Currently, compliance with the limits on peak power usage and total power consumption is semi-voluntary. However, these new proposed rules are likely to impose punitive power costs on organisations that exceed their quota, effectively controlling electricity demand from industry.

Some mining companies are also installing some of their own generating capacity to ensure continuity of supply in emergencies and reduce the risk of production losses due to unexpected power cuts. However, the guaranteeing of power supplies for new capital projects (where these guarantees had not previously been received) is still expected to prove a major obstacle to expansion in the platinum industry over the next two to three years.

While we still expect growth in platinum group metal supply from South Africa in the medium-term, electricity is likely to continue to be a constraint in the platinum industry for the next five years.

PLATINUM

Global platinum demand is expected to fall from 6.68 million ounces in 2007 to 6.52 million ounces in 2008. Gross autocatalyst demand will rise marginally and demand will grow in many industrial sectors. Net jewellery demand will fall, partially due to rising recycling rates. Investment demand fluctuated wildly during the first three quarters of the year but annual demand is forecast to be lower than in 2007.

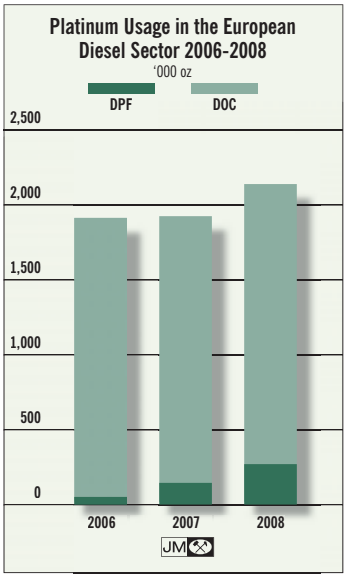
AUTOCATALYST

Gross autocatalyst demand is forecast to be 4.23 million ounces in 2008, an increase of only 85,000 oz from the previous year. A heavy fall in vehicle output in North America will depress platinum demand there by 305,000 oz. However, this will not offset the healthy rise in platinum use in the European diesel sector. Production growth in markets such as Brazil, China, India and Russia will also support total platinum use.

While most platinum demand in the European diesel sector is due to the use of diesel oxidation catalysts (DOCs), increasing fitment of diesel particulate filters (DPFs) will drive most of the growth in this sector.

Europe

European autocatalyst demand for platinum is forecast to rise 16.2 per cent to 2.40 million ounces in 2008. Western European vehicle production is forecast to fall 2.4 per cent to 15.8 million units but 330,000 more cars and trucks will be manufactured in Eastern Europe than in 2007. Total European production is thus expected to remain flat.



Very little platinum will be used in European gasoline-fuelled cars this year as substitution by palladium in this subsector has continued to spread. The light duty diesel sector in Europe therefore remains key to platinum demand. While diesel fuel prices have risen, gasoline prices have soared too, maintaining the economic benefits for many consumers of operating a diesel car. More than half of all light duty vehicles sold in Europe now have diesel engines and 40-50 per cent of these will be fitted with a platinum-containing diesel particulate filter (DPF) this year, in most cases in addition to a diesel oxidation catalyst. The introduction of Euro 5 emissions rules in 2009 and 2010 will drive the use of DPFs higher.

Platinum Demand: Autocatalyst
'000 oz

	2007	2008
Europe	2,065	2,400
Japan	600	590
North America	845	540
China	175	200
Rest of the World	460	500
Total	**4,145**	**4,230**

JM

However, palladium is eroding the dominance of platinum in this sector. More platinum/palladium oxidation catalysts will be fitted to diesel vehicles offsetting some of the growth in platinum demand which would otherwise have occurred.

In the heavy duty diesel sector, platinum demand will be flat, despite the introduction of Euro V legislation in October 2008 for new models. Most truck manufacturers have opted to use engine management and selective catalytic reduction (SCR) technology to meet these emissions rules. Only a small proportion of new vehicles is being fitted with diesel particulate filters or oxidation catalysts containing platinum.

Japan

Auto makers will purchase 590,000 oz of platinum for use on vehicles made in Japan in 2008, a drop of 10,000 oz. This is despite a likely 2.0 per cent rise in annual light duty vehicle output to 11.4 million units.

Japanese car makers have historically used higher platinum loadings than other manufacturers. The increase in the platinum price over recent years has driven a move to using more palladium in gasoline catalysts – something that has become increasingly feasible as fuel quality improves around the globe. Thrifting will also have an effect and the average platinum loading of a vehicle will fall marginally this year as a result of both trends.

North America

Platinum purchases by the North American automotive sector are expected to fall by 305,000 oz to 540,000 oz in 2008. The North American automotive sector was expected to perform poorly this year. However, it has proved to be even weaker than initially forecast: annual production of light duty vehicles in Canada and

the USA is forecast to fall 15 per cent to only 11.0 million units with a corresponding negative impact on demand. North American auto makers have also reduced their strategic stocks of platinum this year, cutting demand further than would otherwise be the case.

Sales of all passenger vehicles are falling but sales of trucks and sports utility vehicles (SUVs) are suffering most. A weakening economy, low availability of credit and high fuel prices are all driving consumers towards smaller vehicles, and this is being reflected in the type of vehicles produced in North America. The combination of a smaller average vehicle size and lower production will depress platinum demand in 2008.

The heavy duty diesel market has also weakened with sales of large trucks falling heavily. Even though a growing number of these are being fitted with catalytic aftertreatment to meet emissions rules, platinum demand from this sector will decrease this year.

China

Chinese light duty vehicle production is expected to climb from 8.1 million units in 2007 to 9.1 million units in 2008, despite a slowdown in sales during the Beijing Olympics and increases in fuel prices. New emissions legislation also came into effect in 2008 in the form of Euro 3 rules in most of the country and Euro 4 in Beijing, Shanghai and Guangzhou. This will increase the average pgm content of a vehicle produced in China. Gross platinum demand should rise by 14.3 per cent to 200,000 oz in 2008.

Rest of the World

Autocatalyst platinum demand in the Rest of the World region will climb 8.7 per cent to 500,000 oz in 2008. Production of diesel cars (for the European market) in countries like Korea will drive much of this growth. Some light duty diesel production has also been transferred from the USA to Mexico, further boosting demand in this region.

Autocatalyst Recovery

970,000 oz of platinum should be recovered from spent autocatalysts in 2008, an increase of 7.2 per cent from 2007. High pgm prices in the first half of 2008 encouraged collection of these catalysts from scrapped vehicles and the percentage of end-of-life autocatalysts which are recycled has risen. In the mature North American market, 625,000 oz of platinum should be recovered this year. In Europe, the amount of platinum reclaimed is expected to rise strongly to 245,000 oz, reflecting the increasing number of end-of-life catalysed diesel vehicles being scrapped.

Platinum Demand: Autocatalyst Recovery
'000 oz

	2007	2008
Europe	(215)	(245)
Japan	(35)	(35)
North America	(590)	(625)
China	(5)	(5)
Rest of the World	(60)	(60)
Total	**(905)**	**(970)**

JM

JEWELLERY

Net global demand for new platinum from the jewellery industry is set to fall by 23.3 per cent in 2008 to 1.12 million ounces. High metal prices had a negative impact on all markets in the first half of the year, with the affordability of platinum jewellery being adversely affected. Retail sales are likely to recover to some extent in the second half of the year but nervousness remains in the trade over fluctuating metal prices. However, as importantly, the level of recycling of old jewellery increased in the key markets of China and Japan as the price rose. This is covered in more detail in the jewellery recycling article on page 24.

Europe

European jewellery demand for platinum is forecast to fall by 5,000 oz to 205,000 oz in 2008.

The UK market exhibited increased signs of price sensitivity in 2008, with the total weight of hallmarked pieces falling during the first half of the year. The volatile metal price has been a problem for retailers who have been unable to change their prices quickly enough in response. They have also reduced inventories in order to minimise their working capital and exposure to the metal price, with the effect of cutting demand for new metal. The bridal and luxury sectors have remained fairly strong and are likely to benefit from the fall in the platinum price as affordability improves.

Elsewhere, the Swiss watch industry was untroubled by the high price. In fact, watch manufacturing volumes

were higher in the first eight months of 2008 than in the whole of the previous year. Platinum watches are a true luxury item and a rising material price only reinforces the cachet of these products, adding to demand and offsetting much of the weakness in the rest of the European platinum jewellery market.

Japan

Japanese platinum jewellery retail sales are set to fall by ten per cent in 2008. The rapid rise in the metal price in the first quarter made platinum jewellery unaffordable for some consumers at the lower end of the market, particularly as the economy remains weak.

Conversely, the fall in the platinum price in the third quarter of 2008 is likely to lead eventually to higher consumer purchases. However, retailers in Japan typically amend their prices only once or twice per year, so retail prices could remain high for the remainder of 2008.

Manufacturing demand for platinum has also been affected by the large amounts of old, second-hand jewellery which have been returned by consumers for recycling. A collection and recycling infrastructure has been established in recent years and this now appears to be a permanent feature of the Japanese market. The flow of this scrap material peaked in the first half of 2008. We estimate that, during this period, more consumer platinum jewellery was returned to the market as scrap than was used in manufacturing. Although there are still large quantities of platinum jewellery in consumers' hands, lower prices mean that flows of this material back to the market have started to decrease. For 2008 as a whole, there will therefore be some demand for new metal from manufacturers.

Manufacturing volumes, including the use of scrap, are still significant. However, with retail sales soft and recycling having grown, net demand for platinum from the Japanese jewellery industry (which peaked at 1.48 million ounces in 1996) is forecast to drop heavily to only 40,000 oz in 2008 from 180,000 oz last year.

North America

Platinum demand for North American jewellery manufacture will drop to an estimated 195,000 oz, a decrease of 11.4 per cent. Credit worries, a slow domestic economy and high metal prices will all have a negative effect on this market.

The US domestic economy has struggled in 2008: credit has been harder to obtain, house prices have fallen and consumer spending has weakened. Customer interest in buying jewellery – whether made from platinum or other materials such as gold – has diminished. In early 2008, this came at the same time as the rapid increase in the price of platinum which required higher levels of working capital to be held by manufacturers and retailers. Although the price has since fallen, these trends have affected the platinum jewellery market negatively: stock levels have decreased and retail sales have been weak, particularly at the lower end of the market. Sales in the bridal sector will dip due to some switching from platinum to other materials in wedding bands. However, sales at the high-value and luxury end of the market have remained fairly strong, supporting North American platinum jewellery demand.

Platinum Demand: Jewellery
'000 oz

	2007	2008
Europe	210	205
Japan	180	40
North America	220	195
China	780	610
Rest of the World	70	70
Total	**1,460**	**1,120**

JM

China

Chinese jewellery manufacturers are expected to purchase 610,000 oz of new platinum metal in 2008, a fall of 21.8 per cent from the previous year. High prices have again driven the use of large amounts of recycled metal in this industry but they have also impacted upon manufacturing volumes.

January 2008 saw positive demand from the Chinese jewellery industry with sales on the Shanghai Gold Exchange, or SGE, (where the majority of new platinum is purchased) at much higher levels than in January 2007. However, as the platinum price rose, purchases slowed dramatically as manufacturers and retailers started to minimise their platinum stocks. Sales to consumers – outside of the bridal sector – also suffered in the first half of the year as the high price meant that some consumers simply could not afford to buy platinum jewellery. Recycling volumes increased too in this period with more consumers choosing to exchange old pieces in order to purchase new jewellery.

The high platinum price has encouraged increased use of the cheaper white gold for gem-set jewellery and there is some evidence of a trend to reduce the average weight of a piece of platinum jewellery.

When the price dropped in July and August, purchasing volumes climbed on the SGE as the industry replenished its inventory. The lower international price of platinum has fed through relatively quickly into retail prices, making platinum more affordable to consumers. We therefore expect demand to improve in the second half of the year. However, the industry remains nervous about the future direction of the price and a sustained period of price stability would overcome this and help boost demand further.

INDUSTRIAL

Industrial platinum demand is expected to reach 2.00 million ounces in 2008, an increase of 190,000 oz from the 2007 total of 1.81 million ounces. Demand from the chemical, glass and petroleum refining industries should be strong but platinum sales to the electrical sector are likely to fall.

Platinum demand from the glass sector is set to rise sharply to 490,000 oz in 2008. Glass fibre production is being relocated from Europe and North America to China which now has over forty per cent of global manufacturing capacity. Demand for bushings therefore continues to rise in China, offsetting weaker, or even negative, demand elsewhere.

Demand for LCD glass is expected to rise by 25-30 per cent in 2008 with over half of new televisions now having flat screen displays. Glass manufacturers have installed new production capacity and platinum demand for this application is increasing, particularly in South-East Asia.

Platinum Demand: Industrial
'000 oz

	2007	2008
Chemical	410	425
Electrical	320	315
Glass	390	490
Petroleum	210	270
Other	475	495
Total	**1,805**	**1,995**

JM

Chemical sector demand for platinum is set to grow by 3.7 per cent to 425,000 oz. Platinum consumption by the silicones industry seems likely to peak in 2008 as the rate of thrifting is nearing the point where it will balance growth in silicone production. Elsewhere, China is trying to decrease its dependence on imports of commodity chemicals such as paraxylene by building additional manufacturing capacity. Double digit percentage growth in production is expected this year adding extra platinum demand.

In the electrical sector, platinum purchases will fall marginally to 315,000 oz in 2008. Economic growth has slowed in North America and in Europe but global production of hard disks is still set to grow by over 20 per cent in 2008. However, manufacturers have been able to control the cost of these disks by using thinner platinum layers. This thrifting will more than offset growth in other parts of the electronics industry.

INVESTMENT

Net investment demand for platinum is forecast to drop from 170,000 oz to 145,000 oz in 2008. Demand from investors through Exchange Traded Funds (ETFs) is set to shrink. However, net sales of coins and large bars are likely to rise.

2008 is the first full year of trading of the two ETFs which accounted for demand of 195,000 oz in 2007. Investors were attracted in large numbers in the first two months of 2008 by a rising price, with 165,000 oz of platinum bought. As the price fell in the third quarter, net redemptions exceeded 200,000 oz. Over the entire year, we expect to see net platinum demand of 130,000 oz.

Platinum Demand: Investment
'000 oz

	2007	2008
Europe	195	130
Japan	(60)	(10)
North America	30	20
China	0	0
Rest of the World	5	5
Total	**170**	**145**

JM

In the coin market, the US Mint was forced to suspend sales of its platinum coins at various times in 2008 due to rapid fluctuations in the metal price. As a result, demand from the sale of coins is expected to fall 10,000 oz to 25,000 oz in 2008.

In Japan, we forecast net disinvestment of 10,000 oz this year. Many investors who bought platinum in the 1980s viewed the high prices of early 2008 as an opportunity to sell. With new legislation making such sales by private investors more difficult from March onwards, there was a large net return of platinum to the market in the first quarter. However, as the price fell towards $1,000 in September, buying interest from the general public increased, with net flows of material in the two halves of 2008 set to almost balance.

PALLADIUM

Palladium demand is forecast to rise by 260,000 oz to 7.19 million ounces in 2008, its highest level since 2005. The autocatalyst sector should use marginally more palladium than in the previous year. The electronics and investment sectors will also take more metal than in 2007 but dental demand is set to edge lower. Palladium jewellery demand will rebound after falling for two successive years with growth in metal purchases in China, Europe and North America.

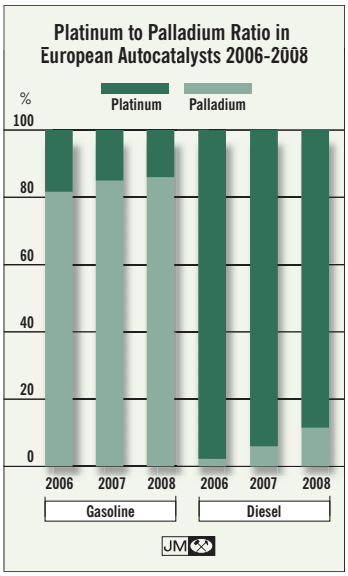
AUTOCATALYST

Gross autocatalyst demand for palladium is forecast to increase by 0.7 per cent to a global total of 4.58 million ounces in 2008. Auto makers continue to replace platinum with palladium in their gasoline and diesel formulations where possible. With vehicle production rising in China and the Rest of the World region, palladium demand is growing despite much weaker North American output.

Europe

Palladium purchases by the European autocatalyst sector are set to rise to 1.12 million ounces in 2008. Few catalysts fitted to gasoline cars contain platinum: most now use palladium formulations and little room remains for further substitution. Growth will instead be due to rising use of palladium on diesel vehicles.

The amount of palladium used in diesel oxidation catalysts and diesel particulate filters will be over 200,000 oz this year.



With some car makers now fitting gasoline catalysts to meet the forthcoming Euro 5 emissions rules, some average catalyst loadings will rise in 2008. However, many palladium formulations which were already in use have been successfully thrifted. With European vehicle production expected to be flat in 2008, palladium demand for gasoline catalysts will change little this year.

In the diesel sector, a growing number of oxidation catalysts and particulate filters contains palladium as well as platinum. This will drive much of the growth in consumption, contributing over 200,000 oz of gross demand in 2008.

Japan

Japanese light duty vehicle production is set to climb slightly to 11.4 million units in 2008. Auto makers have been gradually moving catalyst formulations from being platinum-based to palladium-based. Despite this, gross annual palladium demand is expected to drop marginally, by 0.6 per cent, to 810,000 oz.

Fewer than half of all vehicles made in Japan are sold domestically with the remainder being exported. Domestic sales will be weak this year and Japan has recently become the first developed nation where the total number of cars in use is falling. However, more vehicles will be exported this year than in 2007, supporting palladium demand at close to last year's levels despite a small amount of ongoing thrifting.

North America

North American (Canadian and US) light duty vehicle manufacturing volumes are set to fall for the third successive year, to only 11.0 million units in 2008. This will reduce regional autocatalyst demand for palladium significantly. However, an additional clear trend is the move to downsize both vehicle and engine sizes. High fuel prices and a weak domestic economy have led many consumers to move to vehicles which are, in North American terms, comparatively small. In mid-2008, Ford and General Motors announced plans to refocus their production on these smaller vehicles.

The number of trucks and sports utility vehicles manufactured in North America this year is therefore likely to fall by a greater percentage than is the number of conventional automobiles produced there. This will further exacerbate the effect of the downturn in production volumes, driving down average catalyst volumes and metal content. North American automotive palladium demand will therefore fall by an estimated 20.6 per cent to 1.35 million ounces this year.

Palladium Demand: Autocatalyst
'000 oz

	2007	2008
Europe	925	1,115
Japan	815	810
North America	1,695	1,345
China	325	410
Rest of the World	785	895
Total	**4,545**	**4,575**

JM

China

Chinese light duty vehicle production is forecast to rise by more than ten per cent again this year despite some signs that the pace of growth may be slowing. This equates to additional annual production of more than one million catalysed vehicles. Chinese palladium purchases by the autocatalyst sector will therefore rise strongly in 2008, to a new record level of 410,000 oz.

New emissions rules for cars, closely equivalent to Euro 3, were introduced in July 2008, a year later than originally planned, due to the challenges of providing gasoline of sufficiently-high quality. However, many manufacturers were already fitting catalysts to meet these emissions limits and pgm loadings on these catalysts should change little. By contrast, the introduction of Euro 4 rules in the largest cities will lead to some increase in palladium usage this year.

However, the average pgm content of a catalyst in this region remains lower than at the equivalent stage of legislation in Europe, reflecting smaller average engine sizes in China, and the accumulated experience in thrifting of the pgm content of a catalyst.

Rest of the World

Production in much of the Rest of the World region is healthy. Vehicle output in India, Russia and South America will grow strongly this year. In many of these markets there is a strong focus on meeting emissions legislation at low cost and palladium/rhodium catalysts are almost universally employed on gasoline vehicles. The tightening of emissions legislation – for instance the introduction of rules equivalent to Euro 3 in Russia earlier this year – and rising vehicle production numbers should push palladium demand up to a record 895,000 oz in the Rest of the World region.

Autocatalyst Recycling

The amount of palladium recovered from end-of-life autocatalysts will rise by a forecast 12.6 per cent this year, to 1.08 million ounces.

The cumulative weight of metal in catalysts fitted on vehicles is greatest in North America where autocatalysts first came into use. The average vehicle size and pgm content of a catalyst are highest here and North America also has the most well-established collection infrastructure. As a result, 55 per cent of all metal reclaimed globally from autocatalysts comes from cars and trucks scrapped in North America. We forecast that 600,000 oz of palladium will be recovered here in 2008, 7.1 per cent more than in the previous year, with high metal prices boosting recycling rates.

Palladium Demand: Autocatalyst Recovery
'000 oz

	2007	2008
Europe	(300)	(365)
Japan	(30)	(35)
North America	(560)	(600)
China	(5)	(5)
Rest of the World	(60)	(70)
Total	**(955)**	**(1,075)**

JM

More palladium will be recovered from spent autocatalysts in Europe too. Palladium usage in the European automotive sector peaked around the end of the last decade. The average palladium content of a scrapped catalyst will continue to rise for the next few years as more of the cars produced at this point are recycled as they reach the end of their useful lives.

DENTAL

Net palladium demand from the dental sector is expected to be 630,000 oz, almost identical to the 2007 figure. Palladium is losing some ground in Europe – principally in Italy – but this will be balanced by slight additional demand in North America. The Japanese market will be flat in 2008.

Long-term trends dominate the use of palladium in this conservative industry. Most Japanese demand derives from the use of Kinpala (a gold/silver/palladium alloy) where its use is subsidised by the government. A steady decrease in the aggregate annual number of visits to dentists in Japan is eroding this market and gross demand will fall again this year.

However, net demand will be more stable due to a fall in recycling of Kinpala scrap from dental laboratories. Before 2007 recycling rates were low but they rose that year, reflecting the increased efficiency of collection and reprocessing of a backlog of scrap alloy. With this material collected, recycling rates will return to a lower, more sustainable level in 2008. This decrease in recycling almost

Palladium Demand: Dental
'000 oz

	2007	2008
Europe	75	65
Japan	275	275
North America	265	270
China	5	5
Rest of the World	15	15
Total	**635**	**630**

JM

exactly balances the fall in use of Kinpala, and net Japanese dental demand will be flat at 275,000 oz.

In North America, palladium demand will rise by 5,000 oz to 270,000 oz. In this market, a high price differential between palladium and gold has encouraged some dentists to switch from the use of high-gold content alloys to lower-gold palladium-based alloys, driving this slight additional demand.

ELECTRONICS

Electronics sector palladium demand is set to rise by 50,000 oz to a 2008 total of 1.29 million ounces. Palladium is benefiting from a cost advantage over gold in some applications, while growth in production of electronic components will outweigh any reduction in average palladium content.

Palladium Demand: Electronics
'000 oz

	2007	2008
Europe	160	160
Japan	270	245
North America	190	200
China	325	355
Rest of the World	295	330
Total	**1,240**	**1,290**

JM

The main use of palladium in the electronics industry is in multi-layer ceramic capacitors (MLCC) which are used in many applications. The number of MLCC produced will rise again in 2008, reflecting a move to greater functionality and complexity in the consumer and automotive electronics markets – including growth in the number of mobile phones with cameras and the introduction of multicore processors in personal computers.

Component manufacturers continue to work on controlling costs. Thrifting of the palladium content of the pastes used is increasingly difficult, as much has already been achieved in this area. However, miniaturisation is a key trend and the average sizes of devices such as MLCC are shrinking. This will, though, not be sufficient to outweigh rising MLCC volumes.

Palladium is also used for plating in electronics where it often competes with gold. Its lower density and sustained price advantage compared to gold have allowed it to gain market share, increasing demand.

The recovery of palladium from scrapped electronic devices will rise in 2008, continuing the trend of recent years. Developed nations are increasingly subject to stringent rules on the recycling of a range of end-of-life consumer electronics and electrical devices. The weight of palladium reclaimed from these is rising steadily. However, recovery rates are lower in China and much of the Rest of the World region. Recycling here is often subject to less strict rules and employs less-advanced technology. Recyclers will reclaim the highest value components first, which typically include copper and gold, and will often not recover the pgm content of this scrap material.

JEWELLERY

Global net jewellery demand for palladium is expected to grow by 7.6 per cent to 780,000 oz in 2008. Sales and manufacturing volumes of palladium jewellery are edging up in Europe and North America. Palladium purchases by the larger Chinese jewellery industry should also rise in 2008 as the rate of recycling of old stock decreases.

China

Net demand for palladium for jewellery production in China is forecast to grow by 10.0 per cent in 2008, to 550,000 oz, despite challenging market conditions.

In fact, palladium demand from jewellery manufacturers was relatively weak in the first half of 2008. The palladium price hit a six-year high in March and encouraged the industry to reduce stocks of metal in order to control working capital. The huge earthquake in Szechuan in May also appears to have temporarily affected jewellery sales. This area is one of the strongholds for palladium jewellery and the enormous damage caused unsurprisingly had a strong negative impact on jewellery sales.

However, purchases of palladium by manufacturers rose in the third quarter of 2008 and should be healthy in the final quarter. Palladium jewellery is benefiting from the fall in the palladium price compared to the price of gold. This has driven extra manufacturing and retail interest compared to earlier in the year.

Palladium Demand: Jewellery
'000 oz

	2007	2008
Europe	45	50
Japan	100	80
North America	55	75
China	500	550
Rest of the World	25	25
Total	**725**	**780**

JM

Demand has also been supported by a decrease in the usage of recycled metal from unsold Pd950 (95 per cent purity) jewellery. Most of this material has now either been sold to

consumers or returned for conversion to higher-purity pieces. Fresh metal, therefore makes up an increasing percentage of the metal used by manufacturers, meaning that demand now more closely reflects manufacturing volumes.

Other Regions

In Europe and in North America, palladium is steadily establishing itself as a jewellery metal. The high price differential which has existed between palladium and both platinum and gold for some time has encouraged manufacturers to work with this material. New, improved casting alloys have made the manufacturing processes easier to carry out and have improved product quality. Product availability and consumer acceptance of palladium are therefore growing in both markets. Combined palladium demand is expected to rise by 25 per cent to 125,000 oz this year.

In contrast, palladium demand in Japan is expected to fall. Palladium is used in platinum jewellery alloys. The volumes of all types of jewellery being sold in Japan are expected to fall this year and this will drag palladium demand lower. Additionally, large amounts of platinum jewellery were recycled in the first half of 2008, with the 10-15 per cent palladium content of a typical piece also being recovered. As a result, palladium demand in Japan – net of recycling – is set to fall by 20 per cent to 80,000 oz in 2008.

CHEMICAL

Net palladium demand from the chemical sector is forecast to grow by 10.4 per cent to a total of 425,000 oz this year, as companies construct further manufacturing capacity for commodity chemicals in the Rest of the World region.

Output of chemicals such as purified terephthalic acid (PTA), vinyl acetate monomer (VAM) and hydrogen peroxide is rising in order to meet demand. Palladium process catalysts are used in the production of all three compounds and demand will rise by more than ten per cent. Growth will be seen in all regions but is particularly strong in China and the Rest of the World region where the largest chemical production facilities are being constructed.

Growing numbers of nitric acid plants employ palladium catchment gauzes to cut losses of the more expensive platinum from the catalytic gauzes which are used. Palladium purchases for new installations of catchment gauzes and top-up catalyst will rise in China and the Rest of the World region and fall in Europe and North America in 2008.

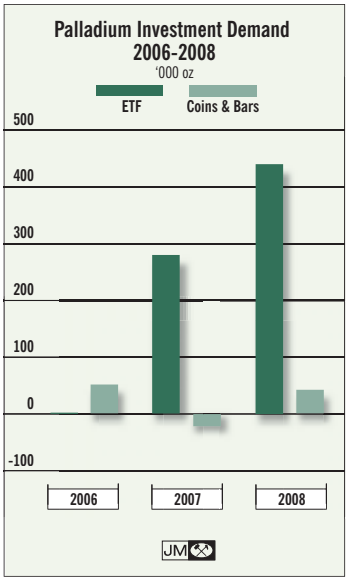
Palladium Demand: Chemical
'000 oz

	2007	2008
Europe	100	105
Japan	25	25
North America	80	80
China	80	90
Rest of the World	100	125
Total	**385**	**425**

JM

INVESTMENT

Physical palladium investment demand is expected to soar by 80 per cent in 2008 to a record total of 470,000 oz. Purchases through Exchange Traded Funds, or ETFs, will constitute most of this demand but we also expect some investment in coins and small bars in North America.



The majority of physical palladium investment demand is now through the two European Exchange Traded Funds.

280,000 oz of metal were bought through the two palladium ETFs in 2007 under steady buying. However, in 2008, the weight of metal purchased each month has varied with movements in the price. As palladium reached its highest price of the year to date in March, large amounts of metal were purchased. Interestingly, while platinum was sold from the ETFs from July to September, the palladium positions changed little, suggesting that many investors in this metal are willing to hold it for the longer-term. Assuming that there are no further price spikes in 2008, we expect to see net annual demand of 430,000 oz through the ETFs.

Interest in palladium coins was muted for the first half of 2008 but has since returned. Rapid fluctuations in the prices of all of the precious metals reduced the availability of gold and platinum coins. This has reinvigorated buying interest in palladium coins as an alternative and investors will purchase a net 40,000 oz of palladium in this form.

Palladium Demand: Investment
'000 oz

	2007	2008
Europe	280	430
Japan	0	0
North America	(20)	40
China	0	0
Rest of the World	0	0
Total	**260**	**470**

JM

Jewellery Recycling

Falling headline figures for net platinum and palladium jewellery demand over recent years have obscured some of the trends in this sector. High platinum prices have had a negative impact on platinum jewellery sales, while palladium has retained its price advantage over other materials and jewellery demand is rising.

However, rising pgm prices have also meant that recycling of unsold retail stock and old pieces from consumers has become ever more important in this industry, reducing net demand for metal.

PLATINUM RECYCLING

The recycling of platinum jewellery is greatest in China and Japan where the total weights of metal bought by consumers in recent decades are highest. However, there are significant differences in how recycling functions in these two countries.

In China, retail margins are lower than they are in most other countries and platinum jewellery often acts not just as a decorative item but also as a store of value. Consumers are therefore aware of the value of the precious metal and a market has built up where retailers will exchange old platinum jewellery for new pieces.

This material typically returns to the manufacturers for remelting and reworking into new jewellery, offsetting demand for new metal. Importantly, since jewellery is only returned in part exchange for a new piece of higher price, it is not possible for more metal to be recycled than is used in manufacturing.

High prices have driven this recycling activity and have also encouraged retailers and manufacturers to minimise their stocks, often by recycling and re-manufacturing them. As prices fall, the level of recycling in China is therefore likely to fall too.

In Japan, the situation is somewhat different: in the last few years a network of jewellery collectors and pawn shops has become established which will buy old jewellery for cash from consumers. Much of this is in the form of neckchains or rings bought in the 1970s and 1980s.

Some of this scrap material is reused in jewellery production within Japan but a volume of scrap is also exported for refining and much is refined within Japan and then exported or used in other industries.

The rising Yen price for platinum over the last few years has raised the profile of the recycling industry and increased the weight of metal recovered dramatically. It is likely that more metal was recycled in the first half of 2008 than was used in domestic jewellery manufacturing, i.e. net Japanese jewellery demand was temporarily negative.

However, as in China, the steep drop in the platinum price restricted the flow of jewellery scrap in the third quarter of 2008. Assuming that the price remains depressed for the remainder of 2008, net demand for the year should be positive.

Consumer behaviour is quite different in Europe and North America. Although the jewellery trade in these regions has reduced inventories due to high metal prices, very little second-hand jewellery is returned for resale or recycling. As a result, changes in jewellery demand here closely reflect trends in manufacturing volumes.

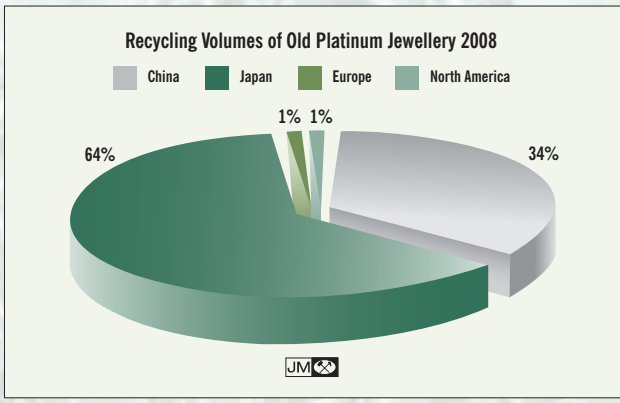
PALLADIUM RECYCLING

By contrast, most global palladium jewellery demand is for the manufacture and sale of jewellery items in China. While it is possible for consumers to trade in second-hand palladium jewellery, many shops do not offer this service or only allow exchange for new palladium pieces as the retail price is significantly higher than the raw material price. The market is also much younger than the platinum jewellery market and there are fewer palladium pieces to be returned. The purchase and reprocessing of old palladium jewellery is therefore not an important trend.

However, manufacturers are still receiving some quantities of Pd950, an earlier, lower-purity material, to rework into Pd990 (a 99 per cent palladium alloy). This Pd950 did not sell particularly well to consumers and shops have therefore sought to minimise their inventory costs by returning jewellery made from this alloy and recycling it into Pd990, reducing the amount of metal that manufacturers have had to buy in order to manufacture new product. However, it is likely that most of this Pd950 stock has now been reprocessed.

Material flows from this source have therefore started to decrease and Chinese manufacturers have been forced to purchase more of their palladium requirements as new metal, driving demand higher.

Net platinum jewellery demand will be depressed by over 500,000 oz of recycling during 2008.



OTHER PLATINUM GROUP METALS

Net rhodium demand will drop to 810,000 oz in 2008 due to a fall in autocatalyst purchases. Rhodium supplies are set to decline to 748,000 oz. Ruthenium demand will drop to 787,000 oz while iridium demand will rise to 132,000 oz. Iridium and ruthenium supplies will both fall.

RHODIUM

Global rhodium supplies have been negatively affected by the problems in the South African mining industry and will fall by 76,000 oz to a total of 748,000 oz this year. Demand will shrink by a similar rate, to 810,000 oz, as thrifting in the autocatalyst sector starts to take effect. The rhodium market is therefore expected to be in a deficit once again in 2008, by a forecast 62,000 oz.

Autocatalyst

In the automotive sector, gross rhodium purchases are expected to fall for the first time since 2001. Demand will drop by an estimated 5.7 per cent to 829,000 oz, with decreases in Europe, Japan and North America because of thrifting. However, rhodium use will increase in China and the Rest of the World region as strong growth and tightening legislation outweigh the impact of this thrifting activity.

Rhodium Supply and Demand
'000 oz

		2007	2008
Supply			
South Africa		696	620
Russia		90	90
North America		20	19
Others		18	19
Total Supply		**824**	**748**
Demand			
Autocatalyst:	gross	879	829
	recovery	(172)	(184)
Chemical		66	72
Electrical		9	10
Glass		52	57
Other		24	26
Total Demand		**858**	**810**
Movements in Stocks		**(34)**	**(62)**

JM

All of the major auto makers have invested significant effort into reducing their rhodium usage as the price has risen during recent years. The impact of this work on rhodium thrifting is now being seen as new, lower-rhodium content catalysts are being fitted to gasoline vehicles everywhere. Average rhodium loadings will therefore fall in most regions this year, and demand will likewise decline.

Gross autocatalyst rhodium demand in Japan will fall to 228,000 oz, but this thrifting process will almost be balanced by the effects of tightening legislation in some of the key Japanese export markets, which will require higher loadings on some catalysts for exported vehicles. In Europe, demand is set to drop by 2.0 per cent to 144,000 oz, despite some purchases of metal for car companies' strategic stocks.

The decline in rhodium purchases will be greatest in North America where they will fall to 222,000 oz this year. The automotive sector in this region has had a rocky year with light duty vehicle production falling throughout 2008 to an estimated 11.0 million units. There is also a trend away from large passenger vehicles towards smaller cars and trucks. These typically use less pgm in their catalytic aftertreatment and average rhodium loadings have thus fallen. There is also some evidence that the North American automotive industry has reduced its strategic stocks of rhodium, cutting further ounces from automotive demand this year.

Elsewhere, China, Russia and South America are still seeing firm growth in vehicle production. China and Russia have also introduced new, tighter emissions rules. Rhodium use will therefore rise in China and the Rest of the World region to a combined 235,000 oz.

Other Demand

Rhodium purchases by the glass industry will rise to 57,000 oz in 2008. Glass makers have continued to expand their manufacturing capacity in Asia this year. The Chinese fibre glass industry will again grow strongly in 2008, with most of its output going into the construction sector, adding to rhodium demand. In Singapore, South Korea and Taiwan, LCD glass manufacturing is expanding, also driving rhodium demand higher in the Rest of the World region.

However, the glass industry in Europe and in North America will remain weak, with capacity still being transferred to Asia. Further, a high rhodium price has driven glass producers to use lower-rhodium alloys, allowing them to reclaim some metal which they have sold back to the market.

Demand for rhodium from other applications will increase slightly this year. Demand for many commodity chemicals remains strong and significant production capacity is being installed. For instance, demand for rhodium for the low-pressure production of oxo-alcohols will rise this year as more plants are constructed throughout Asia.

Supplies

Rhodium supplies are forecast to fall by 9.2 per cent to 748,000 oz in 2008. Primary output of rhodium from South Africa will decrease in 2008. As importantly, last year's sales of refined metal from stocks seem unlikely to be repeated in 2008, accentuating the fall in supplies (metal sold to the market). Rhodium supplies from Russia, Zimbabwe and elsewhere will change little.

RUTHENIUM & IRIDIUM

Ruthenium demand is forecast to weaken by 31.7 per cent to 787,000 oz in 2008, due to lower net purchases by the electrical sector. Supplies will drop, in line with the fall in output of platinum from South Africa. Ruthenium will therefore remain in surplus. Iridium demand will climb to 132,000 oz and the market will remain adequately supplied despite a fall in iridium production.

Demand

In the hard disk sector, the market share of perpendicular magnetic recording (PMR) disks – which utilise ruthenium – continues to grow. In fact, the transition to PMR technology is now almost complete at many manufacturers. 2008 has also seen increased demand for hard disks as consumer electronics sales have risen. However, high ruthenium prices in 2006 and 2007 encouraged the hard disk industry to reduce metal use. They can now apply thinner layers of ruthenium to their disks without compromising performance and this has constrained growth in gross metal usage.

Recycling of used ruthenium sputtering targets and production scrap has risen over this period, more than offsetting the growth in the total weight of metal deposited on hard disks. The time taken to recycle this waste material has decreased and stocks held by the industry are falling. Net demand for ruthenium for hard disk manufacture will therefore fall in 2008.

Ruthenium Demand by Application
'000 oz

	2007	2008
Chemical	101	89
Electrochemical	119	122
Electrical	866	514
Other	67	62
Total Demand	**1,153**	**787**

JM

The use of ruthenium in conductive pastes used in the manufacture of plasma display panels (PDP) will decline in 2008. Manufacturers of these pastes have developed non-precious metal alternatives which are becoming more widely employed across the industry.

However, ruthenium demand from the production of chip resistors will rise this year. Manufacturing volumes of these components are growing and the physical properties of ruthenium make it difficult to thrift from these resistors, allowing metal demand to increase.

Ruthenium demand in the chemical sector will fall to 89,000 oz in 2008. Some new capacity for ammonia manufacture will be installed but high metal prices have driven a slow reduction in net annual ruthenium use at existing chemical plants and overall demand will decrease. In the electrochemical sector, ruthenium demand is forecast to rise to 122,000 oz in 2008 as an increase in the chlor-alkali industry's installed capacity outweighs the lower ruthenium content of membrane cells which are replacing mercury cells due to environmental legislation.

Iridium demand is likely to climb to 132,000 oz in 2008 with use in the electrical sector rising to 30,000 oz. Iridium is used to manufacture crucibles for the growth of crystals used in medical imaging equipment or in lasers. Demand for these is rising and iridium purchases will grow in 2008. The use of iridium in high-quality spark plugs will also increase.

Iridium Demand by Application
'000 oz

	2007	2008
Chemical	24	21
Electrochemical	34	33
Electrical	25	30
Other	36	48
Total Demand	**119**	**132**

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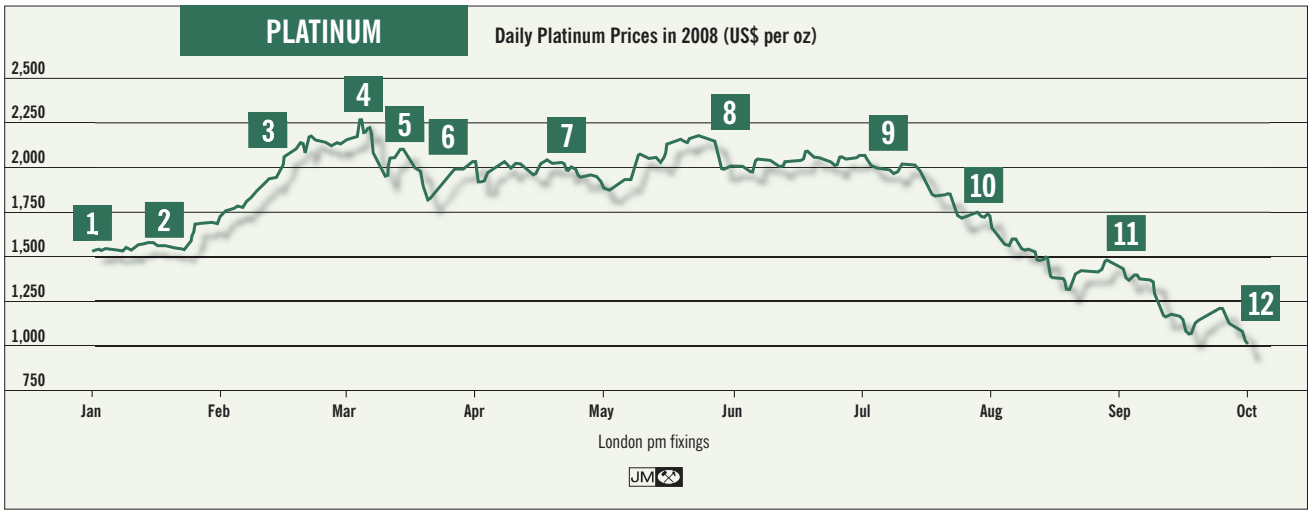
However, the chemical and electrochemical sectors will both take less iridium this year: a combined 54,000 oz. Heterogeneous iridium catalysts are used in one major process for manufacturing acetic acid and less capacity will be installed in 2008 than in 2007 and demand will fall. Iridium is also used in some chlor-alkali plants and demand will drop as the flurry of new construction seen last year has slowed.

Supplies

Iridium and ruthenium supplies will fall in 2008. Most of the production of these metals is by the South African mining industry. A decrease in the tonnes of ore mined and milled and a build-up in refined stocks will therefore reduce supplies of both metals substantially.

PRICES & FUTURES MARKETS



Movements in the platinum price in the first nine months of 2008 perfectly illustrated the importance both of supply and demand fundamentals and of speculative interest.

Platinum traded at an average price of $1,811 during the first nine months of 2008. The price performed strongly in the first half of the year, driven by tight fundamentals: supply disruption drove platinum to a record $2,276 in March and the price remained highly volatile. Later, spreading global financial problems weakened the commodity sector and drove heavy fund sales, forcing the price sharply lower. Platinum dropped to less than half of its peak and ended September 34.4 per cent below where it had been at the start of 2008, at $1,004.

1 Platinum started the year at $1,530, just below its December 2007 record price of $1,544. Weakness in the US Dollar supported commodity prices and platinum hit its first record for the year, $1,555, on the 9th of **January** as a result. Physical buying of platinum on the Shanghai Gold Exchange (SGE) remained strong, powering platinum to a peak of $1,589 on the 14th. A sharp fall in equities forced a sale of platinum to cover some of these losses and the price fell to $1,522 on the 22nd. The next day, Anglo Platinum announced that torrential rains in South Africa had flooded its Amandelbult mine, causing its temporary closure and the loss of 50,000-70,000 oz of platinum output. In a tight market, the price leapt back to $1,591 on the 24th.

Average PGM Prices in $ per oz (Jan-Sep)

	2007	2008	Change
Platinum	1,256.47	1,811.26	44%
Palladium	353.00	405.11	15%
Rhodium	6,069.14	8,163.21	35%
Ruthenium	601.97	358.49	(40%)
Iridium	445.96	451.45	1%

Platinum and palladium prices are averages of London am and pm fixings. Other pgm prices are averages of Johnson Matthey European base prices.

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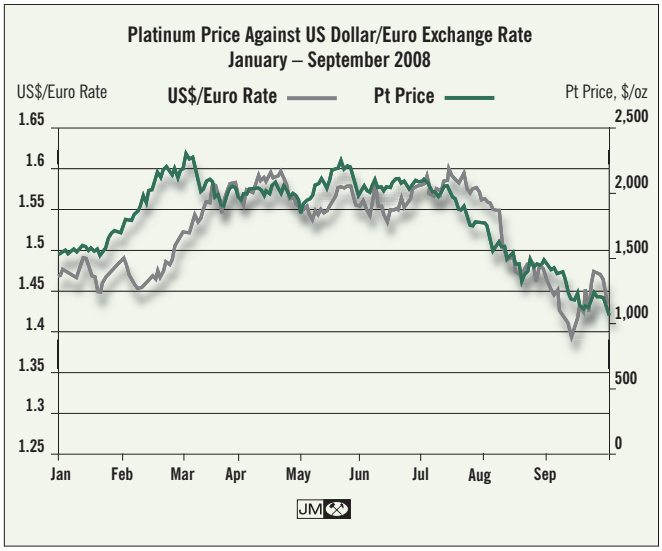
2 On January 25th, Eskom, the South African electricity utility, proved unable to guarantee uninterrrupted power supply to its customers, including mining companies, due to lack of generating capacity. With unscheduled power cuts ever more frequent, the industry suspended all mining and processing operations except for essential activities. Platinum leapt $90 to a new record of $1,681 that day.

Mining resumed over the weekend but this brought little respite. Platinum climbed above $1,700 on the 29th before Eskom announced it would supply 90 per cent of the mines' power requirements. On the 31st, news emerged that it could not even provide that much power and the price rose to a new high of $1,731.

3 The price continued rising in early **February**, posting new records almost every day. Mining restarted in South Africa but power availability remained intermittent. Physical purchasing decreased but Japanese investors continued to gamble on a rising price. Platinum rose over $1,800 on the 5th on TOCOM and moved up again on the 6th due to unfounded rumours that Russian exports could not meet contractual obligations.

On the 11th, Anglo Platinum lowered its 2008 production forecast prompting another price rise. Speculation that the power supply problems in South Africa might last until 2012 added more momentum, catapulting platinum through $2,000 on the 14th. Heavy purchasing of metal through the Exchange Traded Funds further increased volatility and helped to firm the price. Anglo Platinum temporarily shut its Polokwane smelter, sending the price up to $2,160 on the 19th.



Movements in the US Dollar against the Euro go some way to explaining trends in the platinum price during the second and third quarters of 2008.

4 The introduction of new margin rules drove some liquidation on TOCOM and platinum slumped to $2,073 on February 20th. However, the dollar remained weak and, as gold closed in on $1,000, platinum climbed again. Amid widespread nervousness, it fixed at $2,276 on **March** 4th. This was the peak for the first three quarters of 2008 and an all-time record.

5 Physical buying dwindled and investor activity became more important. Volatility increased hugely, with price swings of $100 in a few hours common. Eskom announced (prematurely it later emerged) that it could now supply 95 per cent of the mines' power needs and platinum dropped, even as gold climbed towards $1,000. Investors who had built up large platinum positions sold some of this metal and the price fell by over $300 in two days to $1,947 on March 10th. However, gold finally broke through the $1,000 level on the 13th and platinum followed obligingly, rebounding to $2,100 that day.

6 Equity prices dropped in mid-March as the scale of losses in the US mortgage sector began to become apparent. Funds sold large amounts of metals and other commodities to offset these losses, pulling platinum below $2,000 on the 17th. The US Federal Reserve cut interest rates by 75 basis points. This was less than anticipated and the dollar firmed, depressing the price further. More fund sales dragged the price down to $1,823 on the 20th before the US and European markets closed for Easter.

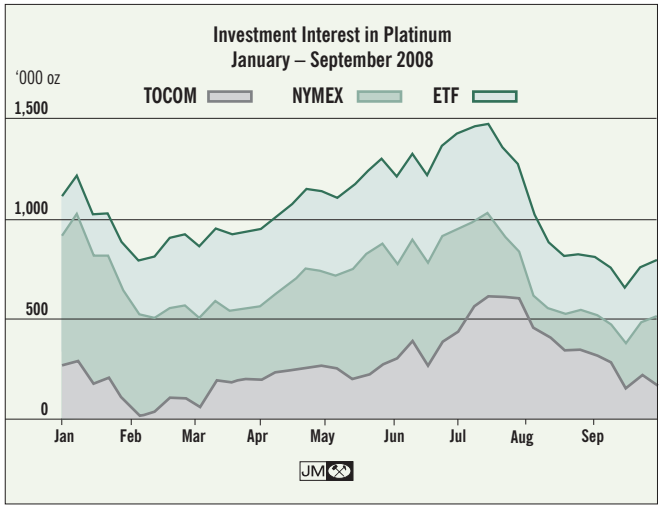
7 Platinum found strong support once the markets reopened, creeping over $2,000 at the end of March. However, it fell $102 to start **April** at $1,938, driven by fund sales to cover losses in equities. The price quickly regained much of this lost ground. However, at the start of **May**, Eskom announced that it would suspend load-shedding, as it euphemistically termed its power cuts, and platinum fell sharply to $1,855 on the 2nd. Consumer buying increased and the price firmed. News emerged on the 9th of the impending launch of a platinum Exchange Traded Note. Although this had no direct link to the physical platinum market, the price soared to $2,082 that day. Even with physical interest low, investor momentum pushed platinum to a peak of $2,192 on the 22nd.

8 Speculation that a slowing US economy could damage industrial demand now dogged platinum. Investors sold positions on TOCOM and platinum kept falling, as gold tumbled below $900, hitting $1,976 on the 30th of May.

However, the price edged higher again on worries of further power cuts in South Africa. Sales on NYMEX were countered by growing TOCOM long positions and platinum traded out **June** range-bound, at $2,064.

9 In **July**, investor sentiment turned sharply against commodities including the platinum group metals. The market ignored bullish news but, when poor US automotive sales data were released, the price fell as funds sold many of their investments.

Oil posted a new record price and fears intensified over future pgm demand. Platinum slipped to $1,966



ETF and futures exchange positions grew quickly in early 2008 but dropped even faster in the third quarter, leaving the platinum price below where it had started the year.

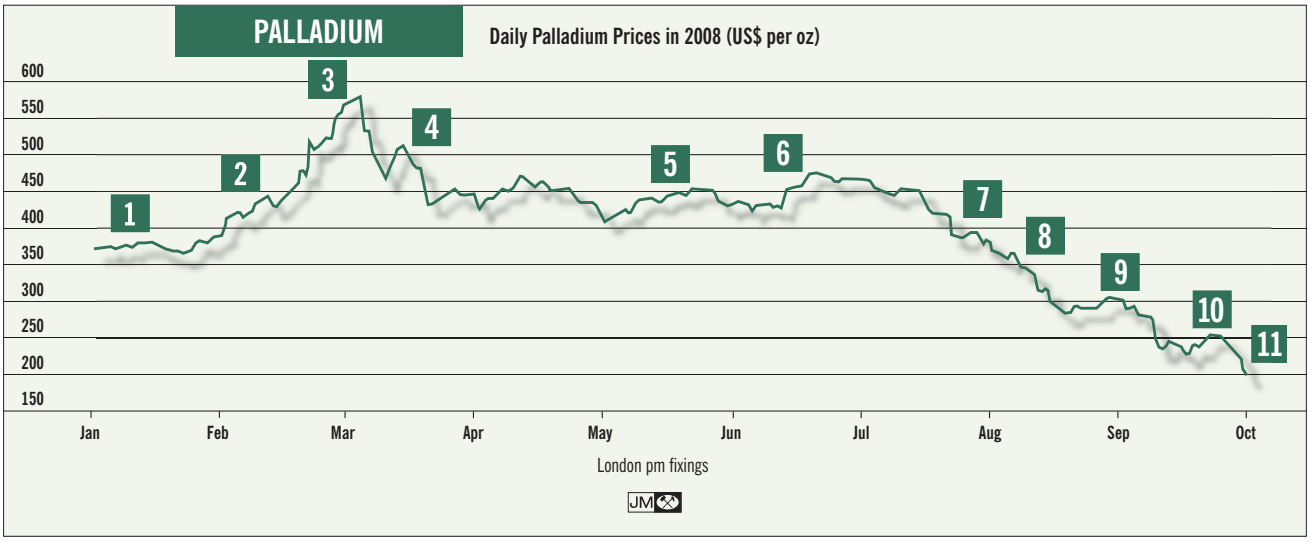
on the 9th although buying intensified in Shanghai where volumes remained high for the rest of the month. Platinum firmed to $2,040 on the 11th as credit concerns drove the dollar lower. Sales of 25,000 oz of metal from the ETFs reversed the tide and platinum started to weaken again. On the 15th, General Motors revealed cuts in planned vehicle output, forcing the price down to $1,951 the next day. It did not rise back above $2,000 again in the first three quarters of 2008.

10 On the 17th of July, Eskom commented that it did not foresee further power cuts and the price lurched to $1,893. A falling oil price pulled gold lower and platinum dropped spectacularly to $1,771 on the 23rd. Ford revealed a huge quarterly loss, driving platinum lower again. NYMEX net long speculative positions continued to decrease from 510,000 oz at the start of July to only 241,000 oz by its end.

Platinum crashed through $1,600 on the 4th of **August**, coming to rest at $1,550 on the 5th but the price rebounded to $1,612 a day later on a one-day strike in South Africa. However, the dollar strengthened and substantial ETF sales drove the price below $1,500 on the 12th. This heavy liquidation continued and platinum slumped to a low of $1,313 on the 19th.

11 Short covering in oil helped platinum back as high as $1,494 on the 28th. In early **September**, Ospraie announced the closure of its flagship commodities hedge fund, sending platinum below $1,400. The dollar continued to strengthen and, on the 9th, platinum plunged over $100 lower to $1,270. It kept on plummeting, following oil, reaching $1,152 two days later. A spell of calm was interrupted by the bankruptcy of Lehman Brothers on the 16th. Amidst the chaos, platinum fell below $1,100.

12 On the 22nd, South Africa's President, Thabo Mbeki resigned, lending support to platinum which bounced back to $1,225 a day later. However, the respite was temporary: the US legislature rejected a proposal to spend $700 billion to stabilise the financial markets and almost every market fell in response. Platinum ended September at $1,004, its low for the year to date.



Investor interest drove the palladium price to a high of $588 but evaporated in the third quarter under pressure from global events.

The palladium price averaged $405 from January to September of 2008, 14.8 per cent higher than in the first three quarters of 2007. Palladium peaked at $588 in March but gave up ground readily. It rallied briefly in June as information reached the market regarding Russian state stocks. However, it was hit by worsening investor sentiment, losing 26 per cent of its value in nine days in July. It fell further in August and although it bounced back over $300 briefly, it ended September very weakly at $199, 46.2 per cent below the first fix of the year.

1 Palladium started 2008 at $370, close to its high for the previous twelve months but with little momentum. However, strength in the broader commodity markets helped the price climb to $382 on the 14th of **January**. Late in the month, on the 25th, news emerged of the disruption to South African mining due to intermittent

electricity supply. As platinum leapt, palladium followed, moving over $400 for the first time since May 2006 on the 1st of **February**. Investor interest drove palladium to a six-year peak of $420 on the 4th.

2 Palladium broke through resistance at $450 on February 18th. ETF buying interest, which had already been significant, suddenly accelerated with 130,000 oz of metal bought in the last two weeks of the month. This sped the price to a fix of $484 on the 19th before funds took some profits from their NYMEX positions.

3 However, this was only a temporary setback. Investors nudged palladium higher, to fix at $507 and $519 on the 21st. While platinum slowed, palladium powered on. The dollar fell and forced the price higher. TOCOM buying finally drove palladium to a peak for the first three quarters of 2008 of $588 on the 4th of **March**.

4 A brief fall in the oil price stopped palladium's rise and, suddenly, significant selling pressure developed with palladium falling to $532 on the following day. A rising gold price did not help stem the fund profit-taking and the slide only stopped at $463 on the 10th of March, a fall of over 20 per cent in less than one week.

Net speculative longs on NYMEX fell below one million ounces, the lowest level since the start of 2008 and palladium slipped into a range from $450-$460 before the Euro weakened against the US Dollar and drove precious metal prices down. Poor North American automotive production figures weighed on palladium too and it fell to $406 on the 1st of **May**.

5 Slowly, the price started to rise again: oil reached an all-time high on the 6th of May, intensifying worries about the impact of high inflation on the global economy. This stimulated buying of gold as the traditional "hedge against inflation". Palladium followed despite its more industrial nature. Anglo Platinum, Lonmin, Norilsk and Stillwater all revealed palladium production below year earlier levels and the price rose to $453 on the 19th.

6 The oil price dipped on inflation concerns and the prices of many industrial metals fell too in early **June**. Palladium found a new range of $420-$430. On the 12th of June, Russian comments on the likely trend in Russian state palladium stocks were reported. Little new information was imparted but the speculation that these stocks could effectively be depleted within "one to five years" proved hugely positive for the price. Palladium fixed at $450 on the 13th and rose to a peak of $475 on the 20th of June on investor purchasing. Three days later, frantic selling hit gold but palladium proved remarkably resilient, dropping only into a range of $460-$470.

North American automotive output fell and investor sentiment worsened, driving palladium down to $442 on **July** 9th. Net long speculative NYMEX positions dived from 1.10 million ounces at the start of July to only 535,000 oz at the month's end. Negative comments on the US economy from the Federal Reserve weakened commodity prices on the 17th. Palladium found support close to $420 but lost over $30 on the 22nd and 23rd as oil fell, triggering fund sales. Technical buying kept palladium close to $380 in the last week of July.

7 The wave of fund sales restarted in **August**, driven by worries over the health of the financial markets. Physical metal, futures positions and ETF holdings were sold, overpowering low seasonal demand. Net long speculative NYMEX positions fell by 65,000 oz in the first week of August, driving palladium to $349 on the 5th. The selling continued as the dollar strengthened: gold hit an eight-month low and palladium dropped to $310 on the 12th before finding some support.

8 On August 15th, selling in Asia drove all the precious metals lower. Palladium fell over nine per cent between two London fixings, halting only at $286. However, sales on the futures exchanges slowed and braver investors were able to recover some value as the price staggered back to $304 on the 1st of **September**.

9 There were more sales in Asia on September 2nd as the dollar firmed. Poor US automotive data hit palladium and it slipped below $280 on the 5th. A toxic cocktail of a strong dollar, a weak car market and heavy fund sales submerged palladium in the following days and the price fell to $218 on the 11th.

10 Hope briefly re-emerged on the 17th as the Federal Reserve proposed a rescue package for US insurers, AIG. The US Treasury also gave its plans for helping the financial markets. A range of commodities benefited and palladium rallied to $250 on the 22nd.

11 However, this was a false dawn: platinum and palladium both fell on the 25th. Market confidence dwindled and palladium slumped further before the US House of Representatives rejected the Treasury's financial rescue plan. Palladium fell to a final September fix of $199, a decline of almost two thirds from its March peak.

OTHER PGM

The rhodium price has fluctuated wildly in 2008. It started at $6,850 and climbed to a record $10,100. Rhodium fell heavily in the third quarter, with South African production improving as demand weakened and metal sales by auto makers and speculators were reported. It ended September at $4,350.

Rhodium began 2008 just below its previous record of $7,000 (set in 1990) at $6,850. Constant bids pushed it to a record price of $7,025 on the 9th of **January**. Later in January, interruptions to South African mining drove the price upwards. These power supply issues combined with good end user interest to lift the price to $9,425 on **March** 7th before buying dissipated and the price fell back below $9,000. In early **April**, offers disappeared and the price rose to close to $9,500 in mid-**May** – possibly driven by industrial users buying metal which they had previously been borrowing.

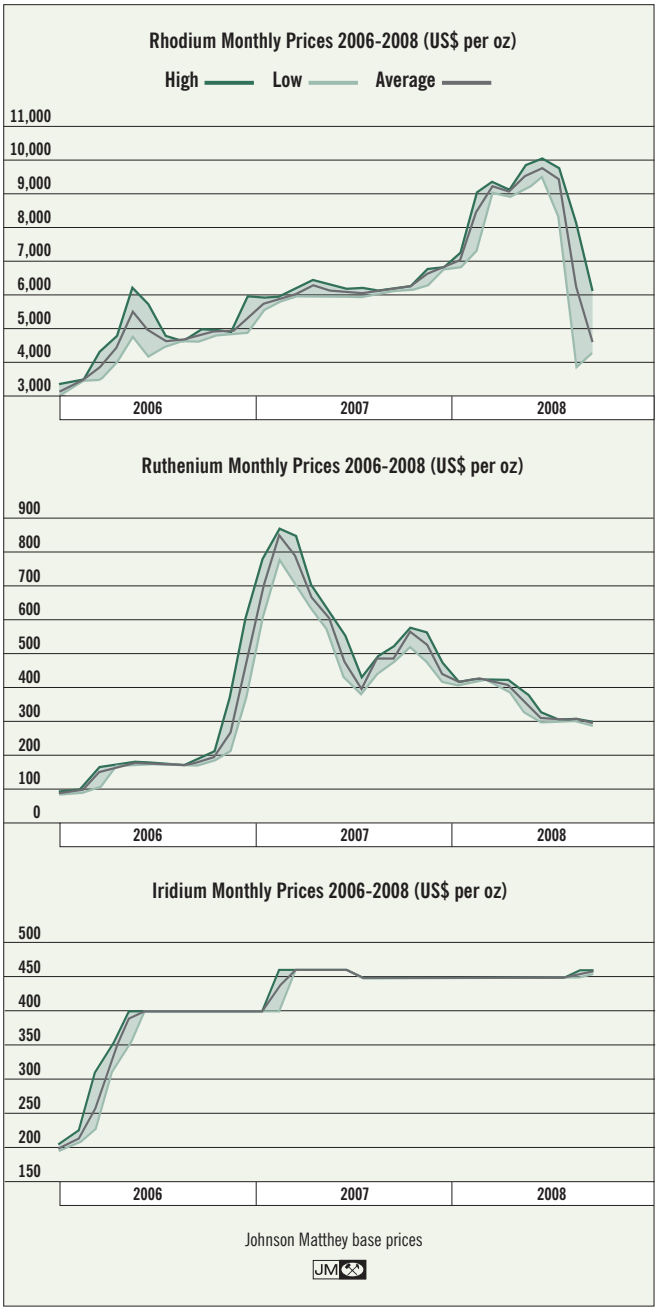
Although the price climbed to $9,900 by the end of May, it dropped back to $9,525 before finding support: physical purchasers quickly returned and the price rose to an all-time record of $10,100 on **June** 19th.

Buying entered a seasonal slow period and rhodium slipped to $9,600 by mid-**July**. However, market sentiment now changed as US vehicle output fell. There were widespread rumours of sales of rhodium stocks by the automotive sector and hedge funds. The price started inching lower but this turned into a rout, with rhodium hurtling below $7,000 on the 12th of **August** and below $5,000 a week later. The price finally came to a sudden halt at $3,850 on the 21st.

Rhodium bounced sharply to $6,200 at the end of August but US vehicle sales continued to worsen and Ospraie closed its flagship commodities hedge fund, draining any energy from the market. Rhodium ended the third quarter very weakly, at $4,350.

Ruthenium started 2008 at $415 and speculator and end user buying pushed the price up to $425 in **February**. It remained at this level until early **April**. However, a slowdown in purchasing meant that most demand could now be met by scrap recycled from hard disk production. The price dropped to $300 in **June** but stabilised somewhat, ending **September** at $290.

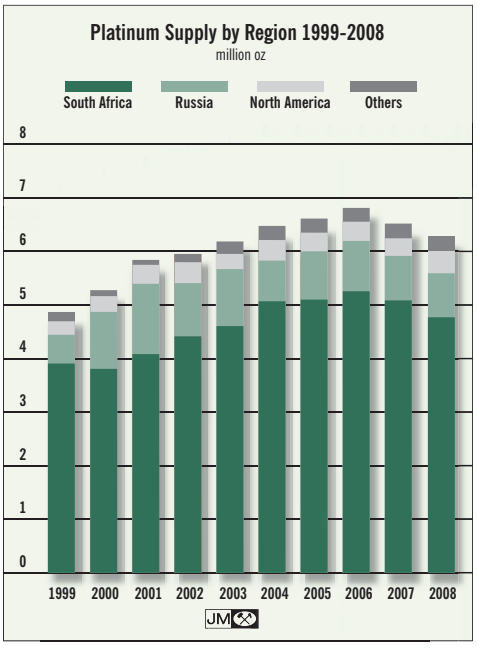
The iridium price remained at $450 for the first seven months of 2008. However, it finally responded to steady buying and rose $10 in **August** before falling back to end **September** at $455.

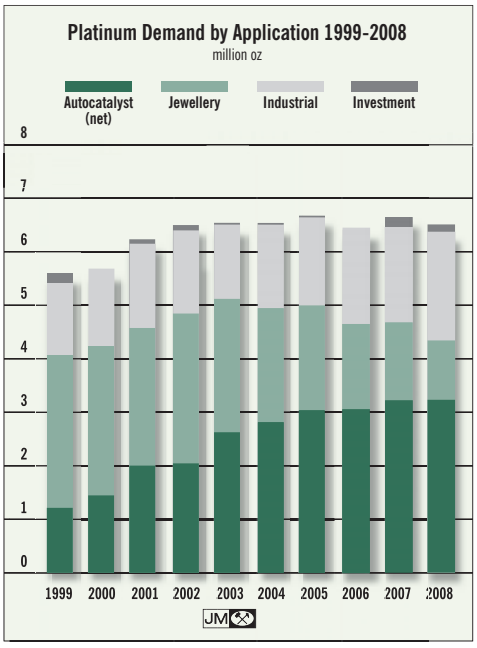


The rhodium price varied wildly, even by its own standards, in 2008. Ruthenium and iridium were rather less exciting.

Platinum Supply and Demand

	'000 oz	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Supply[1]	South Africa	3,900	3,800	4,100	4,450	4,630	5,010	5,115	5,295	5,030	4,780
	Russia[8]	540	1,100	1,300	980	1,050	845	890	920	910	855
	North America	270	285	360	390	295	385	365	345	325	340
	Others	160	105	100	150	225	250	270	270	290	305
	Total Supply	**4,870**	**5,290**	**5,860**	**5,970**	**6,200**	**6,490**	**6,640**	**6,830**	**6,555**	**6,280**
Demand by Application[2]	Autocatalyst: gross[3]	1,610	1,890	2,520	2,590	3,270	3,490	3,795	3,905	4,145	4,230
	recovery[4]	(420)	(470)	(530)	(565)	(645)	(690)	(770)	(860)	(905)	(970)
	Chemical	320	295	290	325	320	325	325	395	410	425
	Electrical	370	455	385	315	260	300	360	360	320	315
	Glass	200	255	290	235	210	290	360	405	390	490
	Investment[7]	180	(60)	90	80	15	45	15	(40)	170	145
	Jewellery	2,880	2,830	2,590	2,820	2,510	2,160	1,965	1,640	1,460	1,120
	Petroleum	115	110	130	130	120	150	170	180	210	270
	Other	335	375	465	540	470	470	475	490	475	495
	Total Demand	**5,590**	**5,680**	**6,230**	**6,470**	**6,530**	**6,540**	**6,695**	**6,475**	**6,675**	**6,520**
	Movements in Stocks[5]	**(720)**	**(390)**	**(370)**	**(500)**	**(330)**	**(50)**	**(55)**	**355**	**(120)**	**(240)**
	Average Price (US$)[6]	**377**	**545**	**529**	**540**	**691**	**846**	**897**	**1,143**	**1,304**	**1,811**



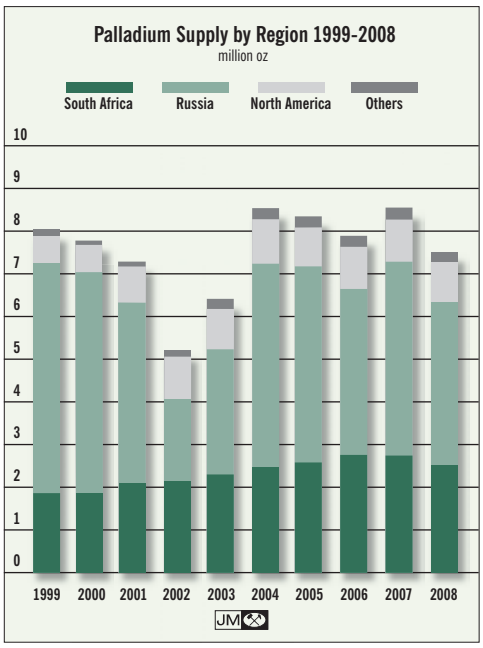


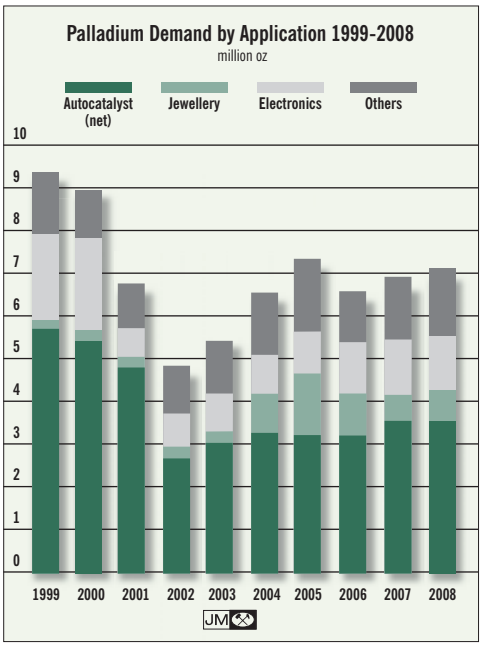
Platinum Demand by Application: Regions

	'000 oz	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Europe	Autocatalyst: gross	560	680	1,060	1,210	1,455	1,680	1,960	2,060	2,065	2,400
	recovery	(30)	(40)	(70)	(90)	(115)	(145)	(170)	(190)	(215)	(245)
	Chemical	80	100	105	115	105	115	100	100	110	105
	Electrical	70	80	65	40	35	40	40	25	20	25
	Glass	20	20	10	10	10	5	10	10	15	25
	Investment	5	0	0	0	0	0	0	0	195	130
	Jewellery	185	190	170	160	190	195	195	195	210	205
	Petroleum	15	15	15	15	15	15	15	20	25	35
	Other	90	105	155	190	185	190	175	175	180	185
	Total	**995**	**1,150**	**1,510**	**1,650**	**1,880**	**2,095**	**2,325**	**2,395**	**2,605**	**2,865**
Japan	Autocatalyst: gross	250	290	340	430	500	615	600	605	600	590
	recovery	(60)	(60)	(55)	(55)	(60)	(55)	(35)	(35)	(35)	(35)
	Chemical	20	20	25	30	40	40	50	50	55	55
	Electrical	75	90	80	55	40	50	65	55	45	40
	Glass	65	65	85	60	85	90	95	100	85	65
	Investment	110	(95)	45	40	(10)	15	(15)	(65)	(60)	(10)
	Jewellery	1,320	1,060	750	780	660	560	510	360	180	40
	Petroleum	5	5	5	5	5	5	5	5	5	5
	Other	35	35	35	55	40	40	45	40	45	45
	Total	**1,820**	**1,410**	**1,310**	**1,400**	**1,300**	**1,360**	**1,320**	**1,115**	**920**	**795**
North America	Autocatalyst: gross	535	620	795	570	885	800	820	705	845	540
	recovery	(315)	(350)	(370)	(380)	(420)	(435)	(505)	(575)	(590)	(625)
	Chemical	95	100	100	100	95	90	100	100	100	100
	Electrical	120	145	120	100	85	90	95	75	60	35
	Glass	25	50	35	30	(30)	(10)	5	10	25	(5)
	Investment	60	35	45	40	25	25	25	20	30	20
	Jewellery	330	380	280	310	310	290	275	245	220	195
	Petroleum	40	35	40	45	40	35	35	35	35	50
	Other	190	210	250	265	215	205	220	225	205	215
	Total	**1,080**	**1,225**	**1,295**	**1,080**	**1,205**	**1,090**	**1,070**	**840**	**930**	**525**
China[9]	Autocatalyst: gross	5	10	15	35	60	75	120	155	175	200
	recovery	0	0	0	0	0	0	0	0	(5)	(5)
	Chemical	15	20	10	10	10	10	10	65	55	70
	Electrical	20	20	15	15	15	20	25	45	50	70
	Glass	25	35	65	40	30	60	70	50	100	150
	Investment	5	0	0	0	0	0	5	0	0	0
	Jewellery	950	1,100	1,300	1,480	1,200	1,010	875	760	780	610
	Petroleum	10	15	15	5	5	5	5	10	10	15
	Other	5	5	5	5	5	5	10	10	15	15
	Total	**1,035**	**1,205**	**1,425**	**1,590**	**1,325**	**1,185**	**1,120**	**1,095**	**1,180**	**1,125**
Rest of the World[9]	Autocatalyst: gross	260	290	310	345	370	320	295	380	460	500
	recovery	(15)	(20)	(35)	(40)	(50)	(55)	(60)	(60)	(60)	(60)
	Chemical	110	55	50	70	70	70	65	80	90	95
	Electrical	85	120	105	105	85	100	135	160	145	145
	Glass	65	85	95	95	115	145	180	235	165	255
	Investment	0	0	0	0	0	5	0	5	5	5
	Jewellery	95	100	90	90	150	105	110	80	70	70
	Petroleum	45	40	55	60	55	90	110	110	135	165
	Other	15	20	20	25	25	30	25	40	30	35
	Total	**660**	**690**	**690**	**750**	**820**	**810**	**860**	**1,030**	**1,040**	**1,210**

Palladium Supply and Demand

	'000 oz	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Supply[1]	South Africa	1,870	1,860	2,010	2,160	2,320	2,480	2,605	2,775	2,770	2,525
	Russia[8]	5,400	5,200	4,340	1,930	2,950	4,800	4,620	3,920	4,540	3,740
	North America	630	635	850	990	935	1,035	910	985	990	950
	Others	160	105	120	170	245	265	270	270	285	295
	Total Supply	**8,060**	**7,800**	**7,320**	**5,250**	**6,450**	**8,580**	**8,405**	**7,950**	**8,585**	**7,510**
Demand by Application[2]	Autocatalyst: gross[3]	5,880	5,640	5,090	3,050	3,450	3,790	3,865	4,015	4,545	4,575
	recovery[4]	(195)	(230)	(280)	(370)	(410)	(530)	(625)	(805)	(955)	(1,075)
	Chemical	240	255	250	255	265	310	415	440	385	425
	Dental	1,110	820	725	785	825	850	815	620	635	630
	Electronics	1,990	2,160	670	760	900	920	970	1,205	1,240	1,290
	Jewellery	235	255	240	270	260	930	1,430	995	725	780
	Investment[7]	0	0	0	0	30	200	220	50	260	470
	Other[7]	110	60	65	90	110	90	265	85	95	95
	Total Demand	**9,370**	**8,960**	**6,760**	**4,840**	**5,430**	**6,560**	**7,355**	**6,605**	**6,930**	**7,190**
	Movements in Stocks[5]	**(1,310)**	**(1,160)**	**560**	**410**	**1,020**	**2,020**	**1,050**	**1,345**	**1,655**	**320**
	Average Price (US$)[6]	**358**	**681**	**603**	**337**	**201**	**230**	**201**	**320**	**355**	**405**





Palladium Demand by Application: Regions

	'000 oz	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Europe	Autocatalyst: gross	1,530	1,900	1,730	1,370	1,220	1,105	975	890	925	1,115
	recovery	(10)	(15)	(30)	(45)	(70)	(110)	(165)	(225)	(300)	(365)
	Chemical	65	95	65	70	65	70	155	175	100	105
	Dental	180	100	50	55	70	80	75	75	75	65
	Electronics	255	265	35	85	85	115	80	105	160	160
	Jewellery	50	45	35	35	35	35	35	40	45	50
	Investment	0	0	0	0	0	0	0	0	280	430
	Other	25	20	20	15	20	25	20	25	20	20
	Total	**2,095**	**2,410**	**1,905**	**1,585**	**1,425**	**1,320**	**1,175**	**1,085**	**1,305**	**1,580**
Japan	Autocatalyst: gross	600	510	505	520	550	635	660	795	815	810
	recovery	(55)	(50)	(40)	(40)	(40)	(40)	(30)	(30)	(30)	(35)
	Chemical	20	20	20	20	25	25	25	25	25	25
	Dental	545	470	475	505	515	520	475	270	275	275
	Electronics	980	990	260	140	225	235	265	275	270	245
	Jewellery	105	150	140	165	160	155	145	130	100	80
	Investment	0	0	0	0	0	0	0	0	0	0
	Other	10	15	10	10	5	10	10	10	10	10
	Total	**2,205**	**2,105**	**1,370**	**1,320**	**1,440**	**1,540**	**1,550**	**1,475**	**1,465**	**1,410**
North America	Autocatalyst: gross	3,490	2,805	2,375	640	1,205	1,445	1,430	1,415	1,695	1,345
	recovery	(125)	(155)	(200)	(260)	(270)	(345)	(390)	(500)	(560)	(600)
	Chemical	75	65	75	75	70	85	85	80	80	80
	Dental	350	230	190	215	225	235	250	260	265	270
	Electronics	405	485	250	210	215	185	195	190	190	200
	Jewellery	10	10	10	10	10	10	20	40	55	75
	Investment	0	0	0	0	30	200	220	50	(20)	40
	Other	50	5	15	45	65	30	215	30	40	40
	Total	**4,255**	**3,445**	**2,715**	**935**	**1,550**	**1,845**	**2,025**	**1,565**	**1,745**	**1,450**
China[9]	Autocatalyst: gross	0	15	40	55	90	105	170	220	325	410
	recovery	0	0	0	0	0	0	0	0	(5)	(5)
	Chemical	30	30	30	40	40	50	55	65	80	90
	Dental	0	0	0	0	5	5	5	5	5	5
	Electronics	150	175	100	75	240	275	275	315	325	355
	Jewellery	40	20	25	30	25	700	1,200	760	500	550
	Investment	0	0	0	0	0	0	0	0	0	0
	Other	5	5	5	5	5	10	5	10	10	10
	Total	**225**	**245**	**200**	**205**	**405**	**1,145**	**1,710**	**1,375**	**1,240**	**1,415**
Rest of the World[9]	Autocatalyst: gross	260	410	440	465	385	500	630	695	785	895
	recovery	(5)	(10)	(10)	(25)	(30)	(35)	(40)	(50)	(60)	(70)
	Chemical	50	45	60	50	65	80	95	95	100	125
	Dental	35	20	10	10	10	10	10	10	15	15
	Electronics	200	245	25	250	135	110	155	320	295	330
	Jewellery	30	30	30	30	30	30	30	25	25	25
	Investment	0	0	0	0	0	0	0	0	0	0
	Other	20	15	15	15	15	15	15	10	15	15
	Total	**590**	**755**	**570**	**795**	**610**	**710**	**895**	**1,105**	**1,175**	**1,335**

Rhodium Supply and Demand

	'000 oz	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Supply[1]	South Africa	410	457	452	490	544	587	627	666	696	620
	Russia[8]	65	290	125	90	140	100	90	100	90	90
	North America	18	17	23	25	26	17	20	17	20	19
	Others	8	3	4	10	14	16	17	19	18	19
	Total Supply	**501**	**767**	**604**	**615**	**724**	**720**	**754**	**802**	**824**	**748**
Demand by Application[2]	Autocatalyst: gross[3]	509	793	566	599	660	758	829	863	879	829
	recovery[4]	(65)	(79)	(88)	(99)	(124)	(140)	(137)	(171)	(172)	(184)
	Chemical	34	39	44	39	39	43	48	49	66	72
	Electrical	6	7	6	6	6	8	10	9	9	10
	Glass	35	42	41	37	26	46	57	65	52	57
	Other	9	10	10	10	13	14	20	23	24	26
	Total Demand	**528**	**812**	**579**	**592**	**620**	**729**	**827**	**838**	**858**	**810**
	Movements in Stocks[5]	**(27)**	**(45)**	**25**	**23**	**104**	**(9)**	**(73)**	**(36)**	**(34)**	**(62)**
	Average Price (US$)[6]	**907**	**1,998**	**1,604**	**838**	**530**	**986**	**2,056**	**4,552**	**6,191**	**8,163**

NOTES TO TABLES

[1]**Supply** figures represent estimates of sales by the mines of primary pgm. Additionally, we continue to report sales of metal which we do not believe has previously been priced – principally sales of Russian state stocks – as supplies.

[2]With the exception of the autocatalyst sector, **demand** estimates are net figures: i.e. demand in any individual sector is the total of purchases by consuming industries less any sales back to the market. Annual demand totals therefore represent purchases of new primary metal by consumers in a given year but do not include forward purchases of metal.

[3]**Gross autocatalyst demand** represents purchases of pgm by the auto industry for the manufacture of catalytic converters and is allocated to the region where the vehicle is manufactured.

[4]**Autocatalyst recovery** is metal recovered from scrapped catalytic converters and is allocated to the region in which the converter was scrapped as a negative contribution to demand.

[5]**Movements in stocks** in any given year reflect changes in stocks held by fabricators, dealers, banks and depositories but excluding stocks held by primary refiners and final consumers. A positive figure (sometimes referred to as a 'surplus') reflects an increase in market stocks. A negative value (or 'deficit') indicates a decrease in market stocks.

[6]**Average price** figures for platinum and palladium are the mean of all daily fixing values in a given year except for 2008 where they cover the period January to September. Average price figures for rhodium are based on Johnson Matthey base prices.

CHANGES TO TABLES

[7]The **investment** demand category combines the previous **investment: small** and **investment: large** categories for platinum. This category now comprises the long-term holding of coins and minted bars of 1 kg or less; investments held in allocated accounts for subscribers to accumulation plans; and metal held in exchange traded funds. For palladium, investment figures are now shown separately, having previously been included in the **other** demand category.

[8]Prior to 2006, **Russian supply** figures are net of Russian and ex-CIS states' demand. From 2006 onwards, Russian supply figures represent the total pgm shipped to all regions including Russia and the ex-CIS. Demand in Russia and the ex-CIS states is included in the Rest of the World region from 2006 onwards.

[9]Demand for platinum and palladium in **China** has been separated from demand in the Rest of the World region for the whole of the 1999-2008 period.

GLOSSARY

4E	*Four Element (Pt, Pd, Rh and Au)*
BEE	*Black Economic Empowerment*
CIS	*Commonwealth of Independent States*
CO	*Carbon Monoxide*
CSF	*Catalysed Soot Filter*
DMFC	*Direct Methanol Fuel Cell*
DOC	*Diesel Oxidation Catalyst*
DPF	*Diesel Particulate Filter*
ETF	*Exchange Traded Fund*
FY	*Financial Year*
g	*Gram*
HC	*HydroCarbons*
HDD	*Heavy Duty Diesel*
HIC	*Hybrid Integrated Circuit*
jv	*Joint Venture*
kg	*Kilograms*
LCD	*Liquid Crystal Display*
Merensky	*A platiniferous ore body in South Africa*
MLCC	*Multi-Layer Ceramic Capacitor*
NOx	*Oxides of nitrogen*
NYMEX	*New York Mercantile Exchange*
OBD	*On-Board Diagnostics*
oz	*Ounces troy*
PDP	*Plasma Display Panels*
PEMFC	*Proton Exchange Membrane Fuel Cell*
PET	*PolyEthylene Terephthalate*
pgm	*Platinum Group Metal(s)*
Platreef	*A platiniferous ore body in South Africa*
PM	*Particulate Matter*
PMR	*Perpendicular Magnetic Recording*
ppm	*Parts Per Million*
ppt	*Parts Per Thousand*
PTA	*Purified Terephthalic Acid*
SCR	*Selective Catalytic Reduction*
SUV	*Sports Utility Vehicle*
TOCOM	*Tokyo Commodity Exchange*
ton	*Short ton (2,000 pounds or 907 kg)*
tonne	*1,000 kg*
TWC	*Three-Way Catalyst*
UG2	*A platiniferous ore body in South Africa*
ULEV	*Ultra Low Emissions Vehicle*
VAM	*Vinyl Acetate Monomer*

NOTE ON PRICES

All prices are quoted per oz unless otherwise stated.

R	*South African Rand*
£	*UK Pound*
$	*US Dollar*
¥	*Japanese Yen*
€	*Euro*
RMB	*Chinese Renminbi*

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