

# SUMMARY AND OUTLOOK

## PLATINUM

In 2004, demand for platinum edged up by less than 1 per cent for the second year in succession, increasing by just 50,000 oz to 6.58 million oz. Although autocatalyst purchases of platinum again climbed strongly, and greater consumption was seen in several industrial applications, jewellery demand for platinum fell in reaction to higher metal prices. Supplies expanded more rapidly than demand, rising by 300,000 oz to 6.50 million oz and narrowing the market deficit to 80,000 oz.

Purchases of platinum for use in **autocatalysts** jumped by 240,000 oz to a new high of 3.51 million oz in 2004. Rising European demand was powered by higher diesel car sales and tightening diesel emissions limits. In Japan, the heavy duty diesel sector led growth in platinum demand as truck manufacturers introduced models fitted with diesel oxidation catalysts to comply with new emissions standards. North American auto makers,

however, purchased less platinum in 2004 than the year before as they continued to move to palladium in gasoline autocatalyst systems.

Purchases of platinum for **jewellery** manufacture dropped by 12 per cent last year, falling by 310,000 oz to 2.20 million oz. A 19 per cent reduction in demand for metal from Chinese jewellery manufacturers accounted for much of the decline, and was attributable to both the volatility and the strength of the platinum price. In Japan, sales of platinum jewellery were adversely affected by elevated metal prices and recycling of old jewellery stock throughout the trade persisted at high levels. North American retail sales of platinum jewellery also slipped lower, but in Europe the expansion of the UK market continued and demand for Swiss platinum watches was good.

**Industrial** demand for platinum climbed by 11 per cent to 1.53 million oz in 2004. Substantial investment in the construction of new glass production capacity in Asia led to a marked increase in demand for platinum fabrications. In the electrical sector, strong growth in sales of consumer electronics boosted shipments of hard disks, whilst consumption of platinum in the manufacture of catalysts for the bulk chemicals and petroleum refining industries also increased.

Net demand for physical platinum **investment** products improved from just 15,000 oz in 2003 to 40,000 oz last year. Although significant volumes of large bars were sold back to dealers in Japan during the first quarter of 2004, purchases throughout the remainder of the year outweighed further disinvestment.

**Supplies** of platinum increased by 300,000 oz to 6.5 million oz in 2004. South African output exceeded 5 million oz for the first time, despite operational and industrial relations difficulties at several mines. Platinum production in North America also recovered after a relatively poor 2003, while output in Zimbabwe was moderately higher. However, after significant sales from stocks the previous year, shipments of platinum from Russia fell back to closely reflect the level of mine production.


The **price** of platinum surged from \$815 to \$937 during the first four months of 2004. Although the market for physical metal was fairly tight, with short term lease rates of around 8 per cent at the start of the year, most of the impetus for the rally came from fund buying of futures on the NYMEX and TOCOM exchanges. This mirrored increased fund investment across the commodities market as a whole as investors sought to profit from the weakening of the US dollar. However, many buyers of physical metal, notably Chinese jewellery manufacturers, scaled back orders for platinum as the price climbed.

When funds liquidated long futures positions in late April the price fell back rapidly and subsequently dipped below \$800 on a number of occasions between May and July. Although renewed fund buying then came into the market, it was not sufficient to drive the price back over \$900 and from August onwards platinum largely traded between \$820 and \$880. The average platinum price over the year as a whole increased to \$845.75, a rise of 22 per cent compared with the previous year.

Platinum Supply and Demand '000 oz		
	2003	2004
<b>Supply</b>		
South Africa	4,630	5,030
Russia	1,050	850
North America	295	385
Others	225	235
<b>Total Supply</b>	<b>6,200</b>	<b>6,500</b>
<b>Demand</b>		
Autocatalyst: gross	3,270	3,510
recovery	(645)	(700)
Jewellery	2,510	2,200
Industrial	1,380	1,530
Investment	15	40
<b>Total Demand</b>	<b>6,530</b>	<b>6,580</b>
<b>Movements in Stocks</b>	<b>(330)</b>	<b>(80)</b>



- **Demand** for platinum increased marginally in 2004 to 6.58 million oz.
- Purchases of platinum for use in **autocatalysts** climbed to a record high of 3.51 million oz, primarily as a result of higher demand from the light duty diesel sector in Europe.
- **Jewellery** demand for platinum slid to 2.20 million oz in 2004 as the high and volatile price of the metal adversely affected Chinese purchases.
- Consumption of platinum in **industrial** applications grew substantially, rising to 1.53 million oz as use of the metal in the glass industry, hard disks and chemical catalysts increased.
- **Supplies** of platinum rose by 5 per cent to 6.50 million oz, as the expansion of production in South Africa accelerated and North American output improved.
- With the platinum market still in deficit, fund investment in the metal pushed the **price** to a peak of \$937 in April. The price subsequently fell back but remained well supported by both speculative and physical demand.

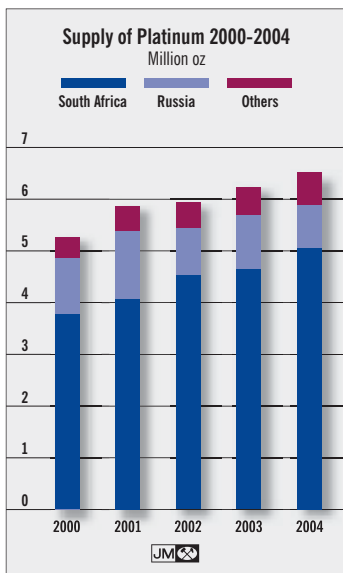


*Use of platinum in most industrial applications, including computer hard disks, increased in 2004.*

## Supply

Supplies of platinum from **South Africa** climbed by 400,000 oz to 5.03 million oz in 2004, an annual increase of 9 per cent. Output of refined platinum at Anglo Platinum reached the company's target of 2.45 million oz, up from 2.31 million oz the year before. Substantial new production came from the company's Rustenburg UG2 project and tailings retreatment plant on the western limb of the Bushveld Complex, as well as from the Modikwa joint venture mine on the eastern limb. However, platinum output at a number of Anglo Platinum's established mines, including Amandelbult, declined and the company suffered from industrial action at several operations during October.

The marked appreciation of the South African rand in 2004 caused problems for all of the country's pgm



producers, particularly with regard to planning and costing new projects. One of the consequences of the stronger rand was Anglo Platinum's decision to scale back its production target for 2006 to 2.7-2.8 million oz of refined platinum.

Production of platinum from Impala's core lease area on the western Bushveld increased by 5 per cent to 1.09 million oz last year. The effects of a strike in October were outweighed by higher mining and milling rates throughout the year as a whole.

However, at the developing Marula mine on the eastern Bushveld, geological difficulties meant that production fell behind schedule.

Sales of platinum by Lonmin grew to 943,000 oz in the year to September 2004. Although the tonnage of ore mined from underground operations declined, this was more than offset by greater production from a number of open pits.

Platinum output at Aquarius Platinum's Kroondal operation jumped by 17 per cent last year to 155,000 oz. Output at the company's developing Marikana mine also increased but by less than planned due to a combination of persistent heavy rain early in the year and poor ore quality in parts of the open pit.

For Northam Platinum, 2004 was marked by a serious fire at its mine; production was subsequently halted for three weeks and was adversely affected for several more. The effect of the fire on platinum output, however, was partially offset by a reduction of metal in the refining pipeline. The ramp up of production at Southern Platinum's Messina mine and at ARM Platinum's Modikwa joint venture with Anglo Platinum also continued, but the rate of development at both operations fell behind schedule.

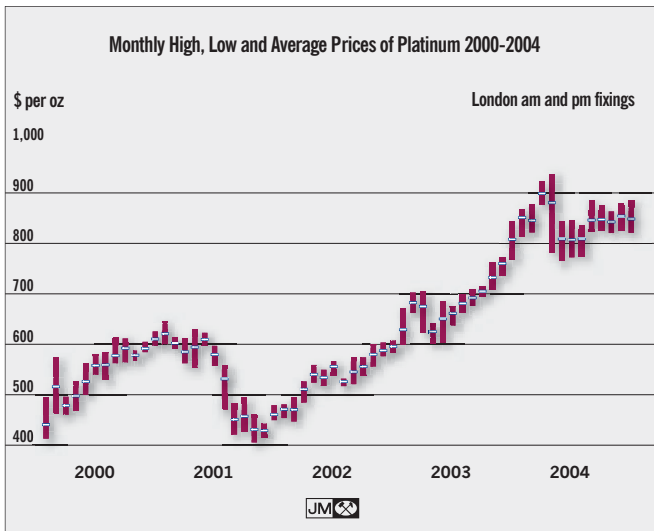
Shipments of platinum from **Russia** are estimated to have totalled 850,000 oz in 2004, close to the level of production from Norilsk Nickel and the alluvial mines in the Far East of the country. There was little evidence of sales of platinum from state stocks during the year. The Russian parliament passed a law in February 2004 declassifying information on companies' geological reserves, production, stocks and sales of pgm but it was not until March 2005 that President Putin signed a decree permitting the release of this data. Information on stocks of metal held by the Russian Treasury (Gokhran) or the Central Bank will, for the time being at least, remain confidential.

After a substantial drop in 2003, due largely to strike action at Inco, supplies of platinum from **North America** bounced back to 385,000 oz in 2004, up by a third on the year before. Supplies of platinum from **Zimbabwe** increased more slowly, rising by 5 per cent to 145,000 oz as a result of improved production at both the Mimoso and Ngezi mines.

## Demand

Total purchases of platinum by the **autocatalyst** sector climbed by 7 per cent to 3.51 million oz in 2004. European autocatalyst demand for platinum again grew strongly, rising by 205,000 oz to reach a new high of 1.66 million oz. Much of the increase was due to further growth in sales of diesel cars, which accounted for more than 48 per cent of all new cars sold in the region during the year. At the same time, tightening emissions standards resulted in higher average diesel catalyst loadings, as well as the introduction of platinum-catalysed diesel particulate filters (DPF) as original equipment on some light vehicle models.

Purchases of platinum by Japanese vehicle manufacturers jumped by 90,000 oz to 590,000 oz in



2004. A significant proportion of the additional demand came from truck manufacturers, as the imminent introduction of tighter emissions regulations necessitated the introduction of oxidation catalysts (plus, in some cases, diesel particulate filters) on new heavy duty diesel vehicles. There also appeared to be a degree of pgm stock building by the Japanese auto industry last year, which contributed to the rise in purchases of platinum.

Elsewhere in Asia, growth in light vehicle production coupled with tightening emissions standards resulted in increased autocatalyst demand for platinum, notably in China where consumption climbed by 20 per cent to 75,000 oz. Although the introduction of restrictions on consumer credit in China slowed the rate of growth of car sales, the market remained relatively buoyant. At the same time, more stringent light vehicle emissions standards were introduced nationwide.

In contrast to all other major vehicle manufacturing regions, the North American auto industry purchased less platinum in 2004 than the year before. The major auto makers in the region continued to reduce their use of the metal, preferring to adopt palladium-based autocatalyst systems on new models, and so demand for platinum fell by almost 10 per cent to 800,000 oz.

In 2004, demand for platinum from the Chinese and Japanese **jewellery** industries dropped substantially for the second year in succession. This outweighed improved demand in Europe and the Rest of the World, resulting in a 12 per cent fall in total jewellery purchases of platinum to 2.20 million oz.

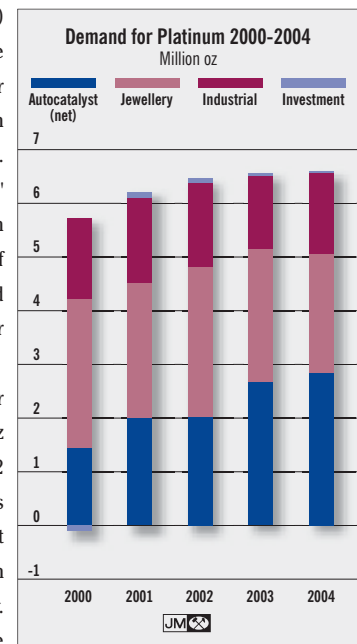
Purchases by Chinese jewellery manufacturers fell by 240,000 oz in 2004 to 1.01 million oz. The performance of the platinum price, particularly during the first four months of the year, had a pronounced effect on Chinese demand. The rise in the metal price increased the cost of financing inventories of platinum products throughout the industry, whilst the volatility of the price raised the financial risks of holding metal. The result was a noticeable upturn in the volume of old jewellery stock returned to manufacturers by wholesalers and retailers.

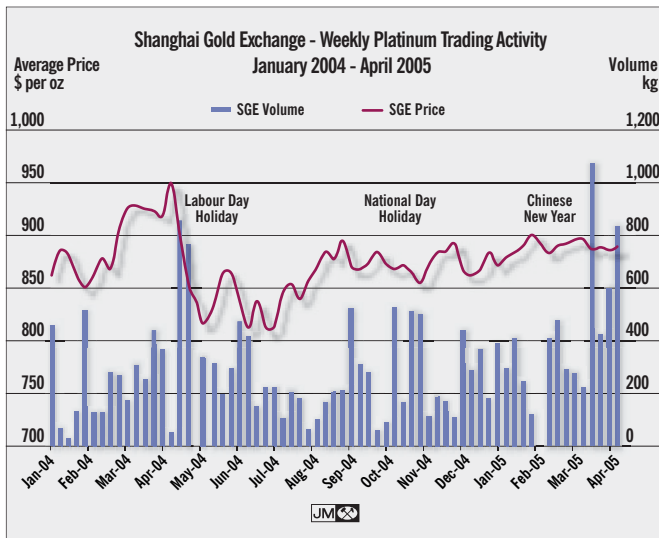
At the same time, manufacturer profit margins were squeezed by large retail chains and department stores, who were keen to hold retail prices of platinum jewellery down for as long as possible whilst at the same time protecting their own margins. Consequently, many manufacturers diverted resources from the production of platinum jewellery to higher margin white gold and palladium.

Although lagging behind changes in the metal price, retail prices of platinum jewellery were raised on several occasions throughout the year. As a result, platinum lost some market share to less expensive white gold and, especially in smaller provincial cities, to palladium jewellery.

Nevertheless, Chinese jewellery demand for platinum held above 1 million oz for the fifth year in a row. Sales of platinum in the most affluent urban areas (notably Beijing and Shanghai) remained fairly robust, despite higher prices, and the markets for bridal and diamond set platinum jewellery continued to develop. From the manufacturers' perspective, margins on platinum improved during the second half of the year as the metal traded between \$830 and \$860 for prolonged periods.

Japanese jewellery demand for platinum contracted by 70,000 oz to 560,000 oz in 2004, a fall of 12 per cent. Higher metal prices translated into higher product prices, which resulted in a drop in retail sales of platinum jewellery. Sales at the upper end of the





The weekly volumes of platinum traded on the Shanghai Gold Exchange varied considerably in 2004, largely in relation to the metal's price.

market held up reasonably well, but Japanese manufacturers faced greater competition from imported designer-brand jewellery. The rising price of platinum also boosted the recycling of old platinum jewellery stock throughout the Japanese trade.

Retail sales of platinum jewellery in North America also fell in reaction to higher metal prices in 2004, and platinum demand slipped by 20,000 oz to 290,000 oz. However, this was partly offset by greater purchases of metal by European jewellery manufacturers. Sales of platinum jewellery in the UK continued on an upward trend, whilst orders for luxury Swiss watches were firm.

After a relatively weak 2003, **industrial** demand for platinum rebounded by 150,000 oz to 1.53 million oz last year. More than half of this growth was due to a surge in demand from the glass industry, which climbed by 80,000 oz to 290,000 oz. This, in turn, was a result of the construction of numerous new furnaces for the production of liquid crystal display (LCD) glass in Asia. Expansion of fibre glass and conventional television glass plants in China also contributed to higher platinum demand.

The consumption of platinum in electrical applications also grew firmly in 2004, reaching 295,000 oz. Increased production of hard disks for computers, MP3 music players and other consumer goods accounted for the lion's share of the growth, although use of platinum wire in high temperature thermocouples also expanded.

Demand for platinum in chemical applications climbed to 330,000 oz last year as higher production of

silicones in Europe and the construction of new paraxylene manufacturing facilities in Asia led to improved orders for platinum-based catalysts. This more than offset a moderate reduction in demand from the nitric acid industry. Purchases of metal for use in petroleum reforming and isomerisation catalysts also rose, advancing to 145,000 oz on the back of the construction of new refining capacity in Asia, Africa and the Middle East.

Total demand for platinum in other applications was stable in 2004 at 470,000 oz. Consumption of the metal in gas sensors, spark plugs, the biomedical sector and turbine blades increased steadily but the use of platinum in stationary emissions control catalysts fell.

## Outlook

Supplies of platinum are set to increase further in 2005, although not as rapidly as last year as the rate of growth in South African production slows. The outlook for demand is similar: autocatalyst purchases of platinum are expected to rise once again this year, but the increase will be less pronounced than in 2004. Jewellery demand may also improve, although this will depend heavily on the level of Chinese purchases.

The price of platinum has been less volatile to date in 2005 compared with the same period of 2004. Whilst this has allowed a degree of equilibrium to be restored between Chinese retail prices of platinum jewellery and the metal price, financing costs remain a deterrent to holding inventories, and both retailers and manufacturers can still earn more money on white gold and palladium. Nevertheless, the bridal and diamond-set sectors of the platinum market offer potential for growth, as well as higher margins than for plain platinum jewellery.

Japanese sales of platinum jewellery are likely to weaken again this year as white gold takes further market share, leading to a further fall in platinum purchases. Little change is forecast for European and North American jewellery demand for platinum in 2005. In both regions retail sales of platinum jewellery will continue to be pressured by lower priced white gold, although international brand name products should continue to sell well.

Autocatalyst demand for platinum is forecast to climb further in 2005, with growth again driven

primarily by the light duty diesel sector in Europe. Another increase in production and sales of diesel cars in the region appears certain, whilst the launch of additional Euro IV compliant models will see average diesel catalyst loading levels shift upwards. The fitment of catalysed particulate filters this year, both as original equipment and as optional extras, is also expected to rise as the focus on particulates as a cause of health problems intensifies.

Demand for platinum from the Asian autocatalyst sector (excluding Japan) is also forecast to grow in 2005. Additional increases in light vehicle production and sales are projected for China and India and the tightening of emissions limits across the region will continue. In South Korea, platinum demand will also get a boost from the lifting of restrictions on the sale of light duty diesel vehicles.

In Japan, demand for platinum from the heavy duty diesel sector should continue to be firm as the number of truck models that comply with tougher emissions legislation grows. North American autocatalyst demand for platinum, however, is expected to continue on a downward trend as the substitution of platinum by palladium in gasoline catalyst systems continues.

Consumption of platinum in industrial applications is expected to grow again this year. The expansion of the LCD glass manufacturing industry in Asia is continuing at a rapid pace, and demand from the hard disk sector is also forecast to remain robust. Orders for platinum-based catalysts from the chemicals industry are expected to increase further in 2005 as new



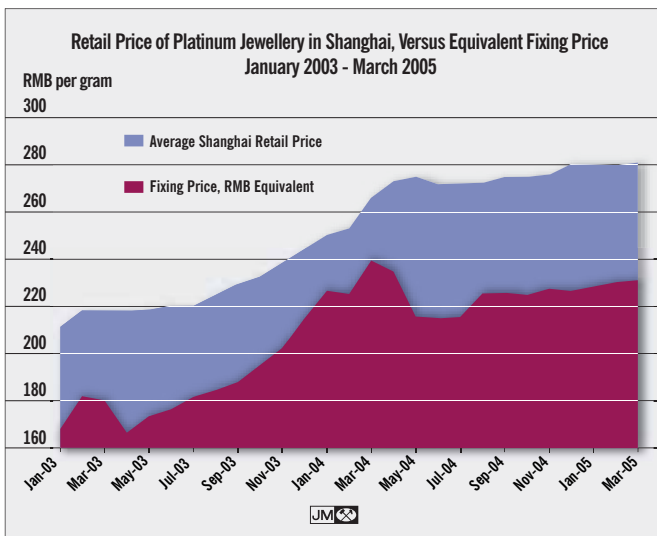
Sales of Swiss platinum watches, such as the Opus V shown left, are set to remain firm in 2005, but jewellery demand for platinum in Europe as a whole is likely to be flat.

manufacturing capacity is commissioned in Asia.

Supplies of platinum are forecast to expand once again this year, but not by as much as previously anticipated. The rate of growth in South African output will slow, largely as a result of Anglo Platinum scaling back its production target for the year to 2.6 million oz. At the same time, North American platinum production is likely to slip behind last year's total, with Inco not scheduled to produce as much by-product pgm from its base metal mines in Canada. Shipments of platinum from Russia are forecast to be largely stable, continuing at or close to the level of mine production.

In conclusion, if Chinese purchases of platinum for jewellery in 2005 are similar to last year's level of demand, we would expect the overall platinum market to be more or less in balance. This suggests that the price will continue to trade around levels seen in the first quarter of the year. However, as in 2004, the actions of hedge funds and other investors may well have a greater impact than the fundamentals of supply and demand, and could again result in wide fluctuations in the price. The level of fund activity in platinum (as for other dollar-denominated commodities) will in turn continue to be closely linked to the strength or weakness of the US dollar, and particularly to the \$:rand exchange rate. With this in mind, we have set our forecast price range for platinum for the next six months at \$830 to \$930.

Margins on the manufacture of platinum jewellery have been largely stable in China since the middle of 2004, but metal funding costs remain high.



## PALLADIUM

**Demand for palladium climbed steeply in 2004, rising by 22 per cent to 6.6 million oz. The rapid development of palladium jewellery manufacturing in China had a pronounced impact on demand, and use of the metal in all of its other main applications (autocatalysts, electronics and dental alloys) increased.**

The growth in demand, however, was almost exactly matched by a substantial rise in supplies of palladium. Mine production in South Africa and North America expanded, and a considerable volume of Russian metal was sold from stocks. As a result, total supplies jumped to 7.62 million oz and a market surplus of over 1 million oz was recorded for the second year in a row. Consequently, with the exception of a fund-driven rally in March and April, the price was soft and palladium ended December at \$184, \$10 below the year's opening fixing.

**Autocatalyst** demand for palladium climbed by 360,000 oz to 3.81 million oz in 2004, a rise of 10 per cent. There was a substantial increase in purchases of metal in North America as, unlike the previous year, US car companies did not consume significant quantities of palladium from inventories. Japanese auto manufacturers made greater use of palladium-based catalyst systems on gasoline light vehicle models, whilst demand elsewhere in Asia expanded in line with higher light vehicle output and tighter emissions standards. In Europe, however, autocatalyst demand for palladium continued to follow gasoline car production downwards, falling by 5 per cent.

Demand for palladium in **electronic** applications grew to 955,000 oz in 2004, an annual rise of 55,000 oz. Use of the metal expanded in all sectors of the market, driven by strong growth in production of electronic consumer goods and the increasing use of electronic systems in automobiles. The relatively low price of palladium also gave it an advantage in plating applications where it competes with gold.

In 2003, approximately 250,000 oz of palladium was consumed in the production of white gold and platinum jewellery alloys, primarily in Europe and Japan. In 2004, **jewellery** demand for the metal soared to 920,000 oz as a result of the remarkably rapid development of palladium jewellery manufacturing in China. Jewellery consequently overtook the dental sector as the third largest market for palladium.

Purchases of palladium for use in **dental** alloys totalled 850,000 oz in 2004, an improvement of 3 per cent on the year before, as the low and relatively stable palladium price fed through to greater demand for palladium alloys.

Demand for palladium in **other** applications jumped to 595,000 oz in 2004, climbing from 405,000 oz the previous year. This was primarily a result of a surge in sales of palladium bullion bars and coins to North American investors. Demand for palladium-based catalysts from the chemicals industry also improved.

**Supplies** of palladium leapt by 1.17 million oz to 7.62 million oz in 2004, well above the level of mine production. Much of the additional metal was Russian material that entered the market late in the year, after having been imported into Switzerland, and was most probably sold on behalf of either the Russian Treasury (Gokhran) or the Central Bank. Additional Russian palladium was sold by Stillwater Mining, which began regular deliveries to customers

- **Demand** for palladium jumped by 22 per cent to 6.6 million oz in 2004.
- **Autocatalyst** purchases of palladium climbed by 10 per cent to 3.81 million oz. US automakers bought more metal, having run down stocks the previous year, and the substitution of platinum in gasoline autocatalysts continued.
- Demand for palladium in **electronics** increased to 955,000 oz, influenced by strong sales of electronic goods and the low palladium price.
- Use of palladium in **jewellery** soared to 920,000 oz in 2004 as large scale production of palladium jewellery began in China.
- **Supplies** of palladium surged to 7.62 million oz, an annual rise of 18 per cent, as substantial sales of Russian metal were made from stocks. Mine production in South Africa and North America also increased significantly.
- Supplies exceeded demand by more than 1 million oz for the second year in succession. Consequently, the palladium **price** was weak for much of the year, despite substantial fund investment, ending 2004 at \$184.

Palladium Supply and Demand '000 oz		
	2003	2004
<b>Supply</b>		
South Africa	2,320	2,500
Russia	2,950	3,800
North America	935	1,055
Others	245	265
<b>Total Supply</b>	<b>6,450</b>	<b>7,620</b>
<b>Demand</b>		
Autocatalyst: gross	3,450	3,810
recovery	(410)	(530)
Dental	825	850
Electronics	900	955
Jewellery	250	920
Other	405	595
<b>Total Demand</b>	<b>5,420</b>	<b>6,600</b>
<b>Movements in Stocks</b>	<b>1,030</b>	<b>1,020</b>



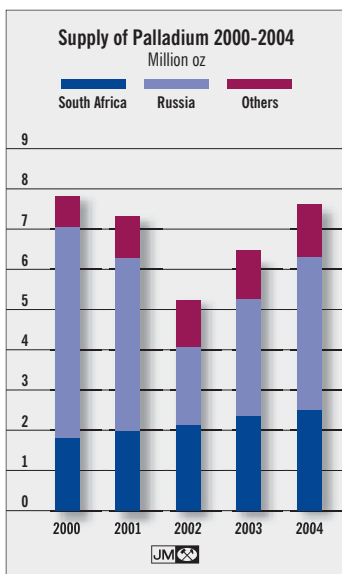
from the inventory that it received when Norilsk Nickel acquired a majority shareholding in 2003.

A potent combination of fund buying, expanding demand for metal from Chinese jewellery manufacturers, and an announcement regarding the potential use of palladium in diesel autocatalysts propelled the **price** of palladium from \$192 on the 2nd of January to a peak fixing of \$333 on the 13th of April. At that point the net long position held by funds on NYMEX was equivalent to almost 987,000 oz, up from just over 532,000 oz at the start of the year. However, with plenty of metal available to cover both speculative and end user demand, the price collapsed when funds started taking profits, falling to less than \$240 before the end of the month.

After a brief rebound in May, the price slipped back and traded steadily between \$200 and \$240 from early June through to November, despite renewed fund buying. Towards the end of the year, the volumes of physical metal offered increased considerably. This, combined with year-end profit taking by funds, resulted in the palladium price sliding below \$200 and ending 2004 weakly at \$184.

### Supply

**Russian** supplies of palladium jumped to 3.80 million oz in 2004, up from 2.95 million oz the year before, as mine production was supplemented with the sale of substantial volumes of metal from stocks.



Sales of Russian palladium accelerated in the final two months of 2004, coinciding with the transfer of over 1 million oz of Russian metal into Switzerland in November and a further 657,000 oz in December. The sudden surge of Russian metal flowing into Zurich was probably related to the fact that Gokhran and the Russian Central Bank did not receive palladium export quotas for 2004 until late in the third quarter of the year. A significant proportion of this palladium is believed to have then been sold into the market.

Norilsk Nickel's production of palladium was relatively stable, the company producing in the region of 2.7 million oz from its nickel-pgm mines in northern Siberia and the Kola Peninsula. Norilsk stated that it would sell its full output during the year and is believed to have done so, delivering the majority of its production under contracts with end users.

Our total Russian supply figure for 2004 also includes 375,000 oz of metal that Stillwater Mining sold to end users during the year from the inventory of 877,169 oz of palladium that it gained when Norilsk took a majority shareholding in the company.

**South African** output of palladium increased by 8 per cent to 2.50 million oz in 2004, in line with higher platinum production from most of the major pgm companies. **North American** shipments also rose substantially, climbing by 13 per cent to 1.055 million oz. Inco's production more than doubled as the company processed pipeline stocks that had accumulated during the previous year's three month strike. North American Palladium also reported higher output as it mined higher-grade zones of ore and increased mill throughput. These increases far outweighed slightly weaker production at Stillwater Mining.

### Demand

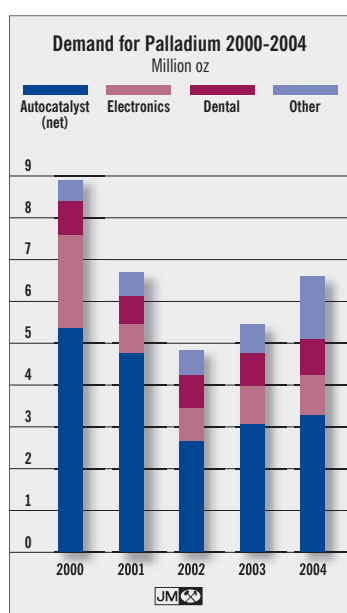
Demand for palladium from the **autocatalyst** sector grew by more than 10 per cent to 3.81 million oz in 2004. The largest increase in purchases came from the North American auto industry, up almost 20 per cent to 1.445 million oz. In contrast to 2003, when substantial volumes of palladium were drawn down from inventories, there was little evidence of further consumption of metal from stocks in 2004.

The actual use of metal on catalysts, however, continued to fall as a result of programmes to thrift pgm loading levels by US auto makers. In North America, the average palladium loading on a light duty vehicle catalyst system halved from around 6 grams per vehicle in 2000 to just over 3 grams in 2004 (this average covering a very broad range of loading levels on individual vehicle models). The negative effects of thrift continued to outweigh the positive impact on metal demand of further switching from platinum-based catalysts to those using palladium.

Japanese purchases of palladium for use in

autocatalysts rose substantially in 2004, reaching 675,000 oz. Much of this growth was attributable to increased use of palladium-based autocatalysts on new vehicle models in response to the widening and persistent difference between the prices of platinum and palladium. At the same time, the ongoing tightening of emissions regulations in Japan led to a rise in average pgm loading levels.

Autocatalyst demand for palladium in China and elsewhere in Asia also expanded in 2004, in line with higher light vehicle production and tighter emissions standards. In Europe, however, demand fell for the



fourth year in succession as sales of gasoline-powered cars continued to trend downwards.

Demand for palladium from the **electronics** industry grew by 6 per cent to 955,000 oz last year. Rapid growth in sales of consumer goods and increased use of electronics in the auto industry led strong demand for components using palladium. The weak price of the metal was also a significant factor in generating greater demand from the plating sector. On the down side, continued thrifting, miniaturisation and substitution of palladium by nickel suppressed growth in consumption in multi-layer ceramic capacitors.

The use of palladium in **jewellery** soared to 920,000 oz in 2004, up from 250,000 oz the year before, driven almost entirely by the introduction of palladium products in China.

Early in the year, disillusioned with the poor profitability of platinum jewellery, a number of leading Chinese manufacturers began producing pieces in palladium, on which they could make substantially higher margins. As a growing number of wholesalers and retailers in smaller provincial cities established stocks of product, and as more manufacturers began producing palladium jewellery, demand for the metal jumped. Imports of palladium into Hong Kong during March and April alone totalled 314,000 oz, compared with just 64,000 oz in the same two months the previous year. Although the rate of purchasing subsequently

eased back from those exceptional levels, it remained firm throughout 2004, Chinese jewellery demand for palladium totalling 700,000 oz for the year as a whole.

Chinese retail outlets promoted palladium jewellery on its low price, its purity, and the metal's close association with platinum. This mix of attributes proved to be appealing to consumers aspiring to pure white precious metal jewellery but who could not afford platinum. The low up-front costs of establishing inventory and the attractive potential profit margins meant that palladium jewellery was given significant display space by those retailers choosing to stock it, taking market share not only from plain platinum jewellery and white gold, but also from traditional yellow gold products.

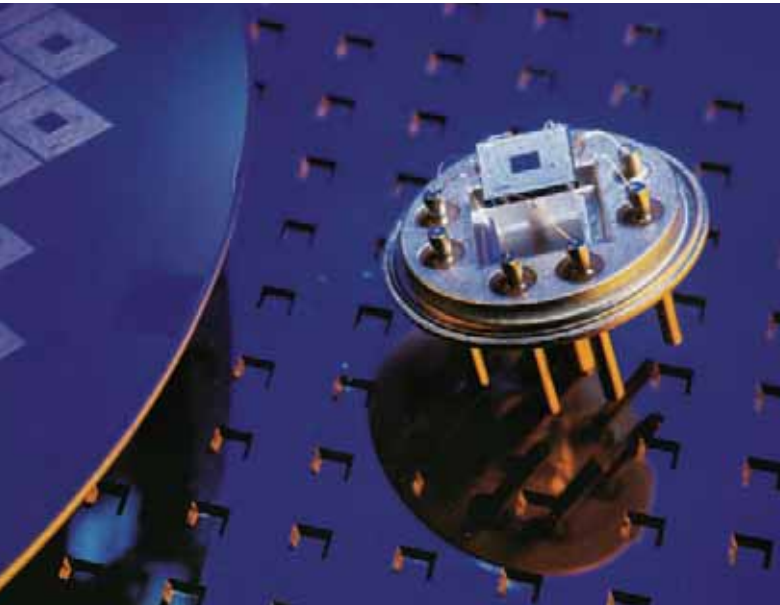
In the most affluent urban centres, however, and particularly in Beijing and Shanghai, few stores were willing to stock palladium jewellery. In these areas platinum has established a strong position in the market, supported by co-ordinated promotion and marketing, and retailers have been wary about detracting from this by introducing palladium.

The low and relatively stable price of palladium, particularly from May onwards, led to an improvement in consumption of palladium in **dental** alloys last year. Demand rose by 3 per cent to 850,000 oz as use of palladium alloys made modest gains in Europe, Japan and North America.

Purchases of palladium for **industrial** and **other** applications increased by 47 per cent in 2004, reaching 595,000 oz. Sales of palladium coins and small bars in North America surged to an estimated 200,000 oz, a result of both effective marketing and the perception amongst individual investors that the metal had the potential to appreciate substantially in price. Greater use of palladium-based catalysts pushed demand from the chemicals industry up by 15 per cent to 305,000 oz.

## Outlook

Autocatalyst demand for palladium is forecast to be stable in 2005. With no distortion expected from year-to-year changes in inventory use, North American purchases will reflect consumption of metal on catalysts this year, which we expect to increase as switching from platinum continues and the impact of thrifting moderates. Demand in China and the Rest of



*Use of palladium in hybrid integrated circuits and other electronic components should continue to grow in 2005.*

the World region should also grow, again driven by higher light vehicle production and tightening emissions regulations.

However, these increases in autocatalyst purchases are forecast to be countered by another fall in European demand, as gasoline light vehicles lose further market share to diesels. The development of diesel autocatalysts in which palladium substitutes for a proportion of the platinum currently used is continuing, but will not have a discernible effect on demand for either metal this year.

Palladium has established a clear presence in the Chinese jewellery market, and there is certainly potential for retail sales to increase in 2005. However, it is uncertain whether higher retail sales will translate directly into year-on-year growth in metal purchases, given that a significant amount of the palladium bought in 2004 supported an initial stock build across the jewellery trade.

Demand for palladium from the electronics sector is forecast to grow further this year, so long as the global economy continues to expand at its present rate. Use of palladium in dental alloys is also expected to show another modest improvement. We would be surprised, however, if demand for physical investment products were to match the high rate of sales seen in 2004.

On the supply side, South African production of palladium should increase once again as platinum output continues to rise. North American sales are

expected to fall short of last year's high level, whilst Russian shipments of palladium remain unpredictable. In March 2005, President Putin signed a decree that will permit Norilsk Nickel to release data on its geological reserves, production, stocks and sales of pgm, and the company may publish its first set of figures later this year. However, information regarding metal held by the Russian state, whether by Gokhran or the Central Bank, will remain confidential. What is certain is that between them, these two organisations still own a very substantial volume of palladium, and further sales from these stocks could occur during 2005.

In 2004, palladium demand increased for the third year in succession, with substantial new sales to the Chinese jewellery industry, increased investor buying of physical products in the USA, higher purchases of metal for autocatalysts, and improved electronics and dental demand. There was also very substantial investment in palladium derivatives by funds throughout much of the year. At the same time, however, supplies of palladium also increased due to rising mine production, the release of metal from stocks, and greater recovery of palladium from scrapped autocatalysts. Consequently, availability of palladium was high, and is likely to remain so during 2005.

The palladium market, therefore, is projected to continue in surplus. In light of this, the prospect of a sustained rally in the palladium price appears remote, unless there is further substantial speculative buying. We therefore forecast that palladium will trade between \$160 and \$230 over the next six months.

