



# Summary and Outlook

## Platinum

- **Platinum demand is forecast to increase slightly to 6.59 million oz in 2003 – the slowest growth in over a decade.**
- **Jewellery demand for platinum is expected to fall 13 per cent to 2.45 million oz due to lower purchases of metal by both Chinese and Japanese manufacturers.**
- **Demand from the autocatalyst industry will surge to 3.18 million oz as diesel car sales grow strongly in Europe and US auto makers use less platinum from inventories.**
- **Industrial applications are forecast to consume 1.6 million oz of platinum in 2003, almost the same as the previous year.**
- **Supplies of platinum will grow moderately to 6.11 million oz. South African output will rise, but by less than had been planned, while North American production will fall sharply.**
- **An increase in fund buying of platinum, plus the continuing market deficit, drove the price up in a series of rallies from \$600 in January to \$760 by the end of October.**

### Overview

Demand for platinum is forecast to grow slightly in 2003, rising by just 30,000 oz to 6.59 million oz. A fourth successive year of strong growth in purchases of platinum by the auto industry will largely be offset by reduced demand for platinum from jewellery manufacturers in the key markets of China and Japan.

Supplies of platinum are expected to grow by 140,000 oz to reach 6.11 million oz. South African output will rise by 4.5 per cent in 2003 and expansions in Zimbabwe have gathered pace. However, offsetting some of this growth will be a steep drop in North American production and a slight fall in Russian sales. Overall, supplies will rise by more than demand and the market deficit will narrow somewhat, but at 480,000 oz it will remain substantial.

The price of platinum has strengthened throughout much of the year to date, hitting \$760 by the end of October. Whilst the physical market remains fundamentally tight, much of the impetus for the rally has come from funds and speculators, and is representative of a marked increase in the flow of investment money into hard commodities as a whole during 2003.

Purchases of platinum by the **autocatalyst** sector are projected to surge by 540,000 oz in 2003 to reach a new high of 3.18 million oz. A conjunction of factors will be responsible for the growth: European demand will be driven by another rapid increase in diesel car sales; purchases of platinum by the US auto industry

will rise as less stockpiled metal is used; whilst in Japan, the retrofitting of catalysts and particulate filters to trucks and buses in the Tokyo area will push up platinum consumption. In addition, emissions regulations are continuing to tighten in many countries, leading to higher platinum loadings in some instances.

In contrast, demand for platinum from the **jewellery** industry is forecast to slip by 370,000 oz to 2.45 million oz in 2003. A combination of the SARS outbreak in the first half of the year and the strong rally in the platinum price since May will see demand from Chinese jewellery fabricators drop by 19 per cent, the first fall since development of the market began in the mid-1990s. In Japan, a substantial volume of platinum has been recycled from the inventories of bankrupt manufacturers.

Little year-on-year change is expected in demand for platinum in **industrial** applications, the total edging up to 1.6 million oz. Consumption of platinum in catalysts for the chemical industry is likely to be stable, reflecting the sluggish economic climate. Glass industry demand is forecast to be slightly lower than in 2002 as less new capacity comes on stream in Asia, whereas use of the metal in electrical applications will grow moderately.

As the platinum price climbed during the first nine months of 2003, net sales of **investment** bars back to the market in Japan increased, and are forecast to outweigh purchases made during the year. Purchases of platinum coins in the USA, meanwhile, have fallen behind the level of buying in 2002. Net demand for investment products in 2003, therefore, is projected to drop to just 10,000 oz.

Global **supplies** of platinum are forecast to rise by only 2 per cent to 6.11 million oz this year. South African output will again increase, advancing by 4.5 per cent to 4.65 million oz, and Zimbabwean production will expand significantly. Sales of platinum from Russia, however, are expected to ease back towards the level of mine production, as sales from government stocks decline. North American output will slide sharply due to a three-month strike at Inco's operations in Canada and the exhaustion of a pgm-rich ore-body at one of the company's mines.

The platinum **price** climbed rapidly from \$600 at the start of the year to reach \$700 in February and March, as funds and investors bought into the metal on the NYMEX and TOCOM futures exchanges. After the price dipped back towards \$600 in April, speculative fund

Platinum Supply and Demand '000 oz		
	2002	2003
<b>Supply</b>		
South Africa	4,450	4,650
Russia	980	950
North America	390	285
Others	150	225
<b>Total Supply</b>	<b>5,970</b>	<b>6,110</b>
<b>Demand</b>		
Autocatalyst: gross	2,640	3,180
recovery	(570)	(650)
Jewellery	2,820	2,450
Industrial	1,590	1,600
Investment	80	10
<b>Total Demand</b>	<b>6,560</b>	<b>6,590</b>
<b>Movements in Stocks</b>	<b>(590)</b>	<b>(480)</b>





buying of platinum resumed. This was primarily responsible for driving the price upwards from May through into October, although the market was also underpinned by a solid rate of physical demand from end users. By the end of October, the platinum price had reached \$760, its highest level since 1980.

The increase in speculative buying of platinum in 2003 has partly been a function of the move by fund managers to diversify away from equities and fixed income assets. In addition, industrial metals including platinum have been bought on the prospects for strengthening global economic growth. In the case of platinum, the possibility of a worsening supply/demand deficit should planned South African expansions be deferred or cancelled has also contributed to bullish investor sentiment.

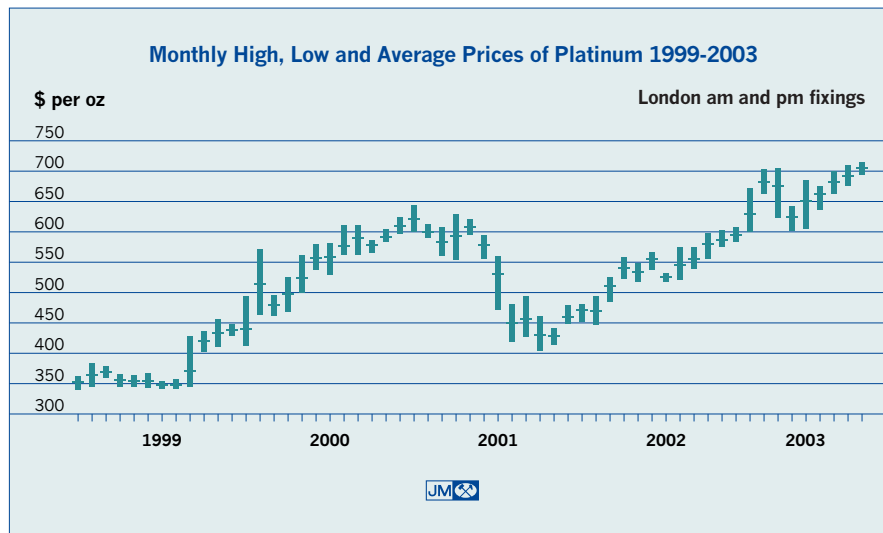
## Supply

Supplies of platinum from **South Africa** are forecast to increase by 200,000 oz to a new high of 4.65 million oz in 2003. Ongoing expansion projects at Anglo Platinum will help to raise the group's output to 2.3 million oz. This, however, will be 100,000 oz short of the level of production the group had anticipated. The simultaneous commissioning of new converting, slag cleaning, and smelting facilities tied up 164,000 oz of platinum temporarily in the processing pipeline. Most but not all of this metal will be released before the end of the year.

Impala's operations during the first half of the year were adversely affected by a 10-day strike, although the effects of this were offset by a subsequent increase in mining of Merensky Reef ore. The Crocodile River mine, however, has had an extremely difficult year, with numerous geological problems underground causing production to slump. Impala, which holds an 83 per cent interest in the operation, is evaluating the sale or closure of the mine.

Output from Lonmin's operations will grow substantially in 2003, despite the disruption caused by an explosion at its new smelter in December last year. Production from Northam should also strengthen, while Aquarius will produce higher volumes of platinum in concentrate as mining at its Marikana mine ramps up. Output is also building at SouthernEra's Messina mine.

**Russian** sales of platinum are predicted to slip to 950,000 oz in 2003, down from 980,000 oz the previous year. Mine production from Norilsk Nickel and the



alluvial producers in the east of Russia is expected to remain fairly stable but it appears likely that less metal will be sold from central government stocks this year.

Supplies of platinum from **North America** are forecast to fall by over 100,000 oz in 2003 to 285,000 oz. Inco is expected to ship less than half the volume of platinum that it produced in 2002, having exhausted a pgm-rich ore-body and suffering a three-month strike. Production of platinum in **Zimbabwe**, however, will almost double to 141,000 oz as a result of expansions implemented by ZCE Platinum and Zimbabwe Platinum Mines Ltd.

## Demand

A record total of 3.18 million oz of platinum are forecast to be purchased for **autocatalyst** manufacture in 2003, up by 20 per cent on the previous year. A 310,000 oz surge in US purchases of platinum to 880,000 oz will lead the growth. Buying has increased because certain US auto companies have used far less platinum from inventories during 2003 than they did in 2002.

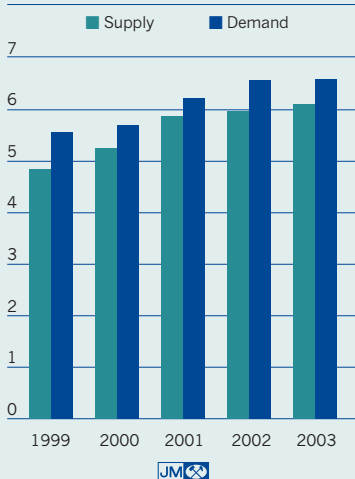
In addition, as a result of the sometimes considerable lead times required to implement changes to autocatalyst pgm ratios, platinum demand in the USA has continued to benefit this year from decisions taken in 2000 and 2001 to switch certain emissions systems from palladium-rich to platinum-rich catalyst formulations.

In Europe, autocatalyst demand for platinum will be powered to a new high of 1.37 million oz by another impressive rise in sales of diesel cars. Diesels are forecast to account for over 43 per cent of the new car market in 2003.



### Supply and Demand for Platinum 1999-2003

Million oz



The approach of more stringent emissions regulations in Europe will also contribute to the growth in platinum demand in 2003. An increasing number of new vehicle models already meet the Euro IV standards that will become effective in 2005. These will require substantial reductions in emissions of all major pollutants and in some cases auto manufacturers have increased overall pgm loadings across catalyst systems in order to achieve them. In the diesel sector, platinum-catalysed diesel particulate filters (DPF) are also being introduced on some larger, heavier car models to ensure compliance with tighter particulate matter emission limits.

Japanese autocatalyst demand for platinum will be boosted substantially in 2003 by a new regulation ordering the retrofitting of oxidation catalysts and DPF to heavy-duty diesel vehicles operating in the Tokyo metropolitan area. This will be largely responsible for total Japanese autocatalyst demand for platinum increasing by a predicted 14 per cent to 490,000 oz.

In the Rest of the World, rising light vehicle output and tightening emissions regulations (notably in China and India) are expected to produce a 16 per cent increase in autocatalyst demand for platinum to 440,000 oz.

Lower purchases of metal by Japanese and Chinese manufacturers are forecast to result in demand for platinum in **jewellery** fabrication dropping by 13 per cent in 2003 to 2.45 million oz. In China, demand for platinum for jewellery fabrication is projected to slide to 1.2 million oz – 280,000 oz lower than in 2002 but still the second highest year of demand on record. The SARS outbreak in the first half of the year caused a temporary slump in retail sales of virtually all non-essential items in China, including platinum jewellery. On top of this, many manufacturers of platinum jewellery have held back from purchasing metal on a number of occasions when Chinese retail prices have lagged behind the rapidly rising platinum spot price.

There has not, however, been any discernable weakening of Chinese consumers' demand for platinum jewellery. Leading jewellery stores noted a rebound in platinum sales over the summer once the SARS epidemic had faded. Trade was also reported to be good over the National Day holiday period in early October, despite higher retail prices.

Purchases of platinum by the Japanese jewellery industry are expected to tumble by 15 per cent in 2003 to 665,000 oz – around half the level of demand four

years ago. Although retail sales of platinum jewellery are predicted to fall year-on-year, the drop in platinum demand from the industry will mainly be due to an unexpectedly high level of platinum jewellery being recycled. In addition to further cuts in inventories held by the jewellery trade, stock liquidated from bankrupt companies has resulted in a substantial volume of secondary metal being reused. There is also evidence that sales back to the market of old jewellery by consumers have increased.

**Industrial** applications are expected to consume 1.6 million oz of platinum in 2003, broadly in line with 2002. The use of platinum-based process catalysts by the chemical industry will increase in Asia as demand for silicones grows. This, however, will be offset by softer demand for platinum catalysts from the bulk chemicals industry in Europe and USA. Consumption of platinum gauze by the nitric acid industry will also weaken – the net result is forecast to be a slight drop in total chemical demand for platinum to 325,000 oz.

The use of platinum in electrical applications is forecast to rise by 4 per cent to 395,000 oz due to small but growing consumption of the metal in fuel cell development programmes and an upturn in demand for high temperature thermocouples. Purchases by the glass industry will soften but remain good by historical standards. Use of platinum in petroleum reforming catalysts and most other applications is projected to be stable in 2003.

The rising price of platinum during the first 10 months of 2003 led to an increase in sales back to the market of large **investment** bars of platinum in Japan. Over the course of the year, the rate of disinvestment is expected to outweigh new purchases of the metal. Higher platinum prices have also reduced sales of coins to collectors in North America and the net level of demand for physical investment products is predicted to drop to 10,000 oz.

## Outlook

In the autocatalyst market, another rise in diesel car sales in Europe is expected to drive a further strong increase in demand for platinum in the region in 2004. The tightening of emissions regulations in Europe, Japan, China and elsewhere is also expected to lead to higher average loadings of platinum, particularly on light-duty diesel vehicles as particulate matter emissions become more closely controlled. In the USA, however, thrifting is continuing at some



manufacturers and is likely to lead to a reduction in the underlying consumption of platinum on autocatalysts in 2004. There is also a question mark over how well light vehicle sales will hold up in the USA next year, particularly if interest rates start to rise or if auto makers scale back their incentive programmes.

The price differential of over \$500 between platinum and palladium has led to the assumption that auto manufacturers will change pgm ratios on gasoline vehicle catalyst systems in favour of palladium at the expense of platinum, reversing the trend of the past two years. This may occur to a certain extent but changes are likely to be phased in gradually as new car models are launched; the cost involved in recalibrating and recertifying existing models is often prohibitive.

Furthermore, the attitude of auto companies to pgm purchasing and use varies considerably. Many remain wary of becoming too heavily dependent on palladium in light of the volatile behaviour of its price over the last four years. In addition, the cost of the entire emissions system and its durability and performance are of greater concern than short-term changes in the relative prices of platinum and palladium.

A resumption of growth in demand for platinum from Chinese jewellery fabricators in 2004 will depend to a large extent on the relationship between the platinum spot price and retail prices of jewellery in the country. When retail prices are static and the spot price rises, manufacturers' margins become squeezed and they tend to defer purchases of platinum until either the spot price of the metal falls or retail prices are raised.

It would be surprising if purchases of platinum by Japanese jewellery manufacturers did not improve in 2004, following the exceptionally high level of stock recycling seen this year. At the retail level, however, further increases in the platinum price would put more pressure on sales of lower-priced fashion products. That is also true of the US market, where the popularity of platinum bridal jewellery has been growing but retailers face having to cut margins on fashion items in order to accommodate higher metal prices. The UK market remains the high point in Europe, where sales of platinum engagement rings and wedding bands continue to grow.

Demand for platinum-based chemical catalysts and from most other industrial applications is expected to be more or less flat in 2004. On the investment side, further increases in the platinum spot price could lead

to a greater volume of sales back to the market of investment bars in Japan and the start of significant disinvestment in the USA.

Platinum supplies from South Africa are projected to increase substantially in 2004, as all the major producers raise output from both existing and developing operations. The outlook is clouded by some uncertainty, however, as the appreciation of the South African rand in 2003 and the proposed Royalty Bill are causing companies to re-evaluate a number of potential new projects.

North American production of platinum should also improve markedly in 2004 as Inco's output this year has been badly affected by a three-month strike. Russian sales are expected to be at or close to the level of mine production. Data on the latter are likely to be declassified in 2004, enabling Norilsk Nickel to publish pgm production figures for the first time.

Overall, we expect supplies to rise faster than the growth in platinum demand in 2004, leading to a continuing but substantially reduced market deficit. Fund activity is likely to continue to have a major, if unpredictable, influence on the platinum price in the short term, whether through additional buying of the metal or liquidation of existing long positions. We therefore expect prices to trade between \$700 and \$820 over the next six months.

*Sales of diesel cars have continued to climb in Europe, spurring autocatalyst demand for platinum.*





## Palladium

- Demand for palladium is forecast to rebound by more than 16 per cent in 2003 to 5.65 million oz.
- Purchases of palladium for autocatalyst manufacture are projected to jump by 19 per cent to 3.67 million oz as auto makers source much less metal from stocks than in 2002.
- At 985,000 oz, demand for palladium from the electronics industry will also rise substantially in 2003, stocks having been exhausted the previous year.
- The use of palladium in dental alloys will improve by 6 per cent to 815,000 oz as lower prices enable the metal to regain some market share.
- Supplies of palladium will surge to a forecast 6.32 million oz in 2003 as Russian sales bounce back to become more closely aligned with production.
- With the market increasingly oversupplied, the palladium price slid from a high of \$271 in January to \$144 in April. Strong speculative buying by funds then fuelled a rally that peaked at \$232 in September.

### Overview

Global demand for palladium is forecast to recover to 5.65 million oz in 2003, an increase of 800,000 oz on the previous year. Most of the growth, however, will result from much lower use of stockpiled palladium by the auto industry – actual consumption of the metal is projected to weaken by 5 per cent as thrifting continues in the autocatalyst and electronics markets.

Supplies of palladium are expected to surge compared with 2002, when little Russian metal was sold on the spot market. Russian sales will more closely match production in 2003 and total supplies will rise by 20 per cent to 6.32 million oz. As a result, the surplus of supply over demand will expand to 670,000 oz.

The palladium spot price fell from \$271 in early January to \$144 in April, a reflection of the weak market fundamentals. Speculative buying by funds then produced a rally to \$232 in September.

Purchases of palladium for autocatalyst manufacture are forecast to climb by 580,000 oz to 3.67 million oz in 2003. US auto makers have continued to run down stocks of palladium but the rate of inventory use has been far lower than in 2002. However, ongoing thrifting programmes will reduce actual use of palladium on autocatalysts. In Europe, demand for palladium will fall due to lower gasoline vehicle production as diesel car sales continue to grow.

In the electronics industry, component manufacturers ran down excess palladium inventories in

2002 and so purchases of the metal are projected to increase by 31 per cent this year to 985,000 oz. The use of palladium in component production, however, will decrease as thrifting and miniaturisation continue.

The use of palladium in dental alloys is expected to improve to 815,000 oz in 2003 as the fall in the price of the metal (and the rise in that of gold) has enabled palladium alloys to regain market share.

In contrast to 2002, Norilsk Nickel is expected to sell all of its palladium production in 2003 and so supplies from Russia are forecast to jump to 2.95 million oz. Growing output in South Africa and Zimbabwe will outweigh a fall in North American production.

With total supplies rising faster than purchases, the palladium price fell sharply during the first four months of 2003. Thereafter, the price has been influenced more by fund activity; speculative purchasing of futures, options and physical metal propelled the palladium price from \$144 in April to \$232 in September. A degree of long liquidation during the first half of October, however, pushed the price back under \$200.

### Supply

In an effort to support the palladium price, Norilsk Nickel held back from the spot market in 2002. This year, however, Norilsk expects to sell its full production of palladium and so total Russian shipments are forecast to rebound by 53 per cent to 2.95 million oz.

South African supplies of palladium are projected to rise to 2.28 million oz in 2003, with an increasing contribution from projects mining UG2 ore. The UG2 ore generally has a higher palladium content than the Merensky Reef, particularly on the Eastern Bushveld where several major new mines are being developed.

Palladium output will also rise significantly in Zimbabwe, in line with growing platinum production, but will fall in North America due to lower output from both Stillwater Mining and Inco.

Stillwater gained just over 877,000 oz of palladium when the acquisition by Norilsk Nickel of a majority shareholding in the company was completed in June 2003. This metal had not been sold by mid-October and is not included in our supply figures.

### Demand

Total demand for palladium used in autocatalysts is forecast to jump by 19 per cent to 3.67 million oz in 2003. We predict that US auto makers will use around 1 million oz less palladium from stocks in 2003

Palladium Supply and Demand '000 oz		
	2002	2003
<b>Supply</b>		
South Africa	2,160	2,280
Russia	1,930	2,950
North America	990	850
Others	170	240
<b>Total Supply</b>	<b>5,250</b>	<b>6,320</b>
<b>Demand</b>		
Autocatalyst: gross	3,090	3,670
recovery	(370)	(410)
Dental	770	815
Electronics	750	985
Other	610	590
<b>Total Demand</b>	<b>4,850</b>	<b>5,650</b>
<b>Movements in Stocks</b>	<b>400</b>	<b>670</b>





than they did last year. Purchases of metal by the US auto industry, therefore, will rise dramatically from 640,000 oz in 2002 to 1.31 million oz in 2003.

Although light vehicle sales have held up well in the USA in 2003, vehicle production is set to fall year-on-year as inventories of new cars at showrooms are reduced. In Europe, production of gasoline light vehicles will also fall as diesels take further market share, leading to a drop in palladium demand.

In Japan, higher average palladium loadings to meet lower emissions targets will contribute to a moderate increase in demand. In the Rest of the World, thrifting and lower gasoline vehicle production in countries such as Mexico and South Korea will outweigh the effect of higher car output in China and India.

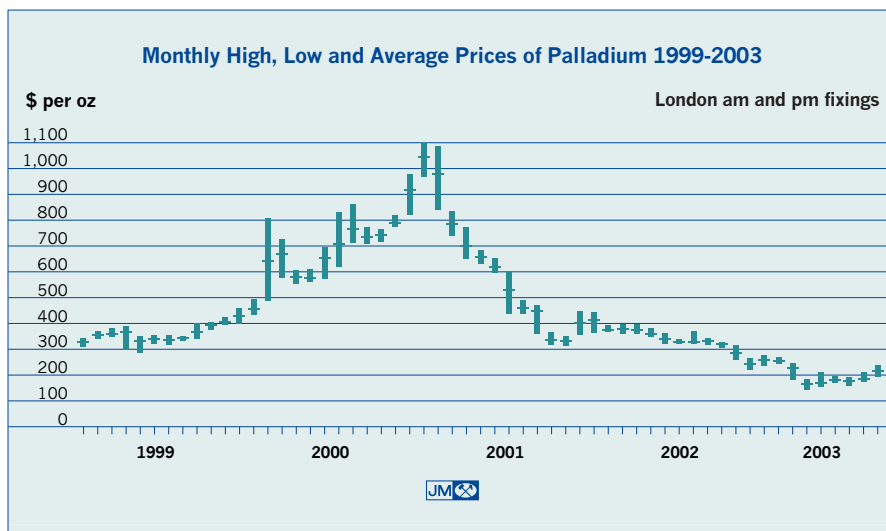
Demand for palladium from the **electronics** industry is projected to improve by almost a third in 2003 to 985,000 oz – a consequence of the fact that substantial inventories were worked off during 2002 and so manufacturers have purchased more metal this year. However, the underlying use of palladium in electronics will weaken due to thrifting and a reduction in the average size of components. In addition, nickel-based multi-layer ceramic capacitors (MLCC) have continued to increase their market share.

**Dental** alloys based on palladium will regain some ground in 2003, and total demand is expected to recover to 815,000 oz. The fall in the price of palladium (coupled with the strength of the gold price) has improved the competitiveness of palladium alloys.

## Outlook

Auto industry demand for palladium is forecast to increase further in 2004. Average loading levels are expected to rise in Europe and Japan in the run up to the introduction of tighter emissions regulations. With inventories reduced sharply, purchases by US auto makers are likely to increase again.

A shift towards greater use of palladium in preference to platinum on gasoline vehicle autocatalysts by a number of auto companies is also likely to provide a moderate boost to palladium demand in Europe and Asia in 2004. In Europe, however, output of gasoline cars is expected to fall once again as diesel sales continue to rise and this will offset some of the growth expected through switching. Some US auto manufacturers may also shift pgm ratios more in favour of palladium but this will be substantially outweighed by further thrifting.



In the electronics industry, component orders are expected to accelerate, but a combination of further thrifting, miniaturisation and substitution of palladium by nickel in MLCC will reduce demand for palladium.

Supplies of palladium are forecast to rise rapidly in 2004 as output accelerates from new mines in South Africa. North American demand should also rebound as Inco's pgm output recovers from the effects of a three-month strike this year.

Russian palladium shipments are again expected to be broadly in line with mine production in 2004. Norilsk Nickel may soon be able to release detailed figures on its reserves, production and sales of pgm following the passage of a bill through the Russian parliament in October 2003. This will now be sent to the President for final approval. Data on government stocks of pgm will remain classified for the time being.

Fund purchasing of palladium provided considerable support to the price during the second and third quarters of 2003 and undoubtedly led to the build up of substantial inventories of palladium through over-the-counter trades. A further 195,000 oz were held in NYMEX warehouse stocks as of October 2003, and the 877,000 oz of metal transferred from Norilsk to Stillwater Mining earlier in the year remained unsold.

As mine supply is forecast to rise faster than demand in 2004, the palladium market surplus will increase further. With the potential of long liquidation of fund positions, and the sale of metal from Russian government and other stocks also possible, little upside to the price is foreseen. Consequently, we expect palladium to trade between \$140 and \$220 for the next six months.

