

# SUMMARY AND OUTLOOK

## PLATINUM

Demand for platinum is forecast to expand by 2 per cent in 2005 to reach a new high of 6.71 million oz. Purchases of platinum for use in autocatalysts will increase robustly, the sixth year of growth in succession. In contrast, however, higher platinum prices will result in purchases by the jewellery sector falling for the third consecutive year. Supplies of platinum are projected to total 6.59 million oz, also 2 per cent up on 2004, with slower growth in South African output than previously anticipated. With the platinum market again expected to be in moderate deficit, the price will remain strong.

Autocatalyst demand for platinum is forecast to increase by 300,000 oz in 2005 to reach a total of 3.86 million oz. European auto makers will purchase substantially more platinum as sales of diesel-powered light vehicles continue to grow, and as average diesel catalyst loadings increase to meet Euro IV emissions limits. Increased demand from diesel truck manufacturers in Japan; the retrofitting of catalysts to heavy duty diesel vehicles in the USA; and higher light vehicle production in Asia will also contribute to growth in platinum demand.

In contrast, purchases of platinum for jewellery manufacture are forecast to decline to 2.02 million oz, a fall of 140,000 oz. Demand in China will drop for the third year in a row, and is also expected to weaken in Japan and North America. The strength of the platinum price has led to a reduction in trade stocks of platinum jewellery and an increase in the volume of old pieces being recycled.

Demand for platinum in industrial applications is expected to grow by 80,000 oz to 1.615 million oz. Consumption of the metal in electrical applications will increase substantially this year thanks to rising production of hard disks. Demand from the glass industry is also forecast to be strong as manufacturers of glass for flat panel displays continue to invest in new capacity in Asia. At just 15,000 oz, however, sales of physical investment products will remain small.

Supplies of platinum are forecast to rise by 130,000 oz to 6.59 million oz this year. South African production will continue to expand but once again the rate of growth will fall short of previous expectations. Sales of metal from Russia are likely to edge upwards but should continue to closely reflect mine production, whilst output in Zimbabwe is expected to be a little higher than in 2004. North American supplies of platinum, however, will not match last year's total.

As in 2004 the platinum market is on course to record a moderate deficit this year; a fact that has been reflected in the strength of the price. However, the momentum that took platinum up out of its \$860 to \$880 trading range from mid-June onwards was much more a result of fund buying than physical demand.

The net non-commercial position in NYMEX futures, which broadly reflects the overall pattern of fund investment in platinum, climbed from a low of 130,000 oz in January to

- Demand for platinum is forecast to rise by 2 per cent to 6.71 million oz in 2005. Purchases by the autocatalyst sector will grow strongly but jewellery demand is set to weaken.
- Autocatalyst demand for platinum is projected to rise by 8 per cent to 3.86 million oz. Diesel car sales continue to climb in Europe, and regulation of emissions from both light and heavy duty diesel vehicles is tightening world-wide.
- Jewellery demand for platinum is forecast to drop by more than 6 per cent to 2.02 million oz as Chinese purchases of metal fall for the third year in a row.
- Demand for platinum in industrial applications is set to increase by 5 per cent to 1.615 million oz, with greater production of hard disks making the biggest contribution to growth.
- Supplies of platinum are forecast to edge up by 2 per cent to 6.59 million oz this year. Growth in South African output will be less than previously expected and North American production will fall.
- The price of platinum climbed from a low of \$843 in January to reach \$941 in mid-October. The rally was primarily driven by fund buying and investor interest in the metal remains high. Our forecast for the next six months is for platinum to trade between \$890 and \$1,030.

Platinum Supply and Demand '000 oz			
		2004	2005
<b>Supply</b>			
South Africa		4,970	5,120
Russia		850	860
North America		385	340
Others		255	270
<b>Total Supply</b>		<b>6,460</b>	<b>6,590</b>
<b>Demand</b>			
Autocatalyst:	gross	3,560	3,860
	recovery	(705)	(800)
Jewellery		2,160	2,020
Industrial		1,535	1,615
Investment		40	15
<b>Total Demand</b>		<b>6,590</b>	<b>6,710</b>
<b>Movements in Stock</b>		<b>(130)</b>	<b>(120)</b>



almost 550,000 oz during the first half of October. Funds have also been active on TOCOM throughout the year to date, with the net speculative long position estimated to have risen to the equivalent of 650-700,000 oz over the same period. As a result, the price moved up in a series of strong rallies, hitting \$941 on the London fixings in early October, the highest since March 1980.

Whilst the fundamentals are important in driving investment decisions, the increased fund exposure to platinum has also stemmed from the attraction of commodities as a means towards portfolio diversification, higher absolute returns and as a hedge against inflation and dollar depreciation.

## Supply

South African supplies of platinum are forecast to increase by 150,000 oz in 2005 to total 5.12 million oz. Output would have been higher but for the closure of Anglo Platinum's smelter in Polokwane for repairs following an explosion in September. The incident will result in the group's refined platinum output falling short of its target for the year of 2.6 million oz, perhaps by as much as 150,000 oz.

Platinum output from Impala's operations on the western limb of the Bushveld Complex increased by 4 per cent during the first half of 2005 thanks to increased productivity and higher mill throughput. The operation is on course to exceed 1.1 million oz of platinum production for the second year in a row. The rate of development at the company's Marula mine on the eastern Bushveld, however, has been constrained by the need to switch from mechanised to conventional mining methods.

Lonmin's production of platinum fell by 11 per cent during the first half of the year to 457,000 oz, largely due to the depletion of shallow UG2 reserves. However, the company's output during the second half should get a boost from the refining of pipeline stocks of metal that accumulated following a smelter shutdown in late 2004.

Platinum output at Northam reached 109,000 oz during the first six months of 2005, up by 12 per cent year-on-year. Greater production should also be seen from Aquarius Platinum's Kroondal and Marikana mines, which both now operate under pool and share agreements with Anglo Platinum.

Shipments of platinum from Russia this year are forecast to total 860,000 oz, marginally higher than in 2004. Norilsk Nickel published data on its output of platinum and palladium for the first time in September, revealing that it had produced 355,000 oz of platinum in the first six months of 2005 and estimating output for the full year of 730,000 oz. Production from the alluvial operations in the far east of Russia is likely to slip lower, whilst sales of metal from state stocks are again expected to be minimal.

North American supplies of platinum will fall to an estimated 340,000 oz in 2005: sales by Inco will decline due to the temporary closure of its smelter for scheduled maintenance, and production from North American Palladium will drop in line with reduced palladium output. Shipments of platinum from Zimbabwe, however, are expected to rise by 5 per cent to 155,000 oz as a result of higher production at both the Ngezi and Mimosa mines.

## Demand

Autocatalyst demand for platinum is forecast to climb by 8 per cent or 300,000 oz this year to set a new record of 3.86 million oz. The trend of strong annual growth in demand in Europe will continue, with auto makers in the region expected to purchase 1.94 million oz of platinum, up by more than 15 per cent compared with 2004. Sales of diesel cars are still growing, with the market share taken by diesels in Western Europe likely to near 50 per cent over the year as a whole. At the same time, the introduction of models that meet Euro IV emissions legislation will result in an increase in the average platinum loading per diesel vehicle.

Japanese auto industry purchases of platinum are forecast to slip by 25,000 oz to 580,000 oz in 2005 as vehicle manufacturers add less metal to inventories than the year before. However, the use of metal in catalysts is expected to increase as new emissions standards generate greater demand from the heavy duty diesel sector.

Auto industry demand for platinum in North America is forecast to edge up by 20,000 oz to 820,000 oz in 2005. The retrofitting of heavy duty diesel vehicles with exhaust after-treatment systems will generate a modest volume of additional platinum demand.

Purchases of platinum by auto manufacturers in China

are forecast to climb by 30,000 oz this year to 110,000 oz, in line with further strong growth in car production and tighter vehicle emissions limits. The same factors will push autocatalyst demand for platinum in the Rest of the World up by 4 per cent to 410,000 oz.

Purchases of platinum for jewellery manufacture are forecast to decline by just over 6 per cent in 2005 to 2.02 million oz. Demand in China is almost certain to fall for the third year in succession, and purchases by jewellery manufacturers in Japan and North America are also likely to weaken. In all regions the increased price of platinum has had a detrimental effect on demand for the metal.

Chinese purchases of platinum for the manufacture of jewellery are projected to drop by 100,000 oz to 910,000 oz this year, more than 500,000 oz below the peak level of demand seen in 2002.

The rising cost of financing inventories of platinum jewellery and the volatility of the platinum price have led to an ongoing reduction in stock levels throughout the Chinese jewellery trade, with most manufacturers now only producing platinum pieces to order. Output of diamond set jewellery has dropped particularly sharply this year, a reflection of previously over-optimistic levels of production.

Palladium jewellery has won a greater share of retail counter space this year, contributing to the reduction in platinum jewellery inventories. Meanwhile, higher platinum prices have led to an upturn in the number

of consumers trading in old items of platinum jewellery in exchange for new, rather than buying new pieces outright.

Nevertheless, the situation at the retail level remains very mixed. In Shanghai the majority of leading jewellery and department stores have not introduced palladium, and while there is some palladium on display in Beijing it has received little interest from consumers. In both cities, sales of platinum jewellery have held up well despite higher retail prices.

In North America, the increased price of platinum has



*Increased production of diesel oxidation catalysts and diesel particulate filters will generate substantial growth in demand for platinum in 2005.*

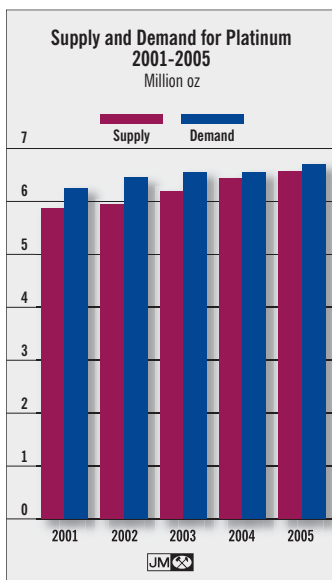
also resulted in inventories being reduced throughout the trade. With retail sales also facing strong competition from white gold, purchases of platinum are forecast to drop by 10 per cent to 260,000 oz.

Purchases of platinum for jewellery manufacture in Japan are projected to weaken by 10,000 oz to 550,000 oz in 2005, a smaller rate of decline than in the previous two years. The volume of metal being recycled from trade inventories appears to have stabilised but the strong platinum price has encouraged more consumers to trade-in and pawn old pieces of jewellery.

Platinum purchases for use in industrial applications are forecast to climb by 5 per cent to 1.615 million oz in 2005. Demand for platinum in electrical applications is on course to reach 355,000 oz this year, an annual increase of 55,000 oz. The growth will be driven by the hard disk sector, with manufacturing rates pulled sharply upwards by substantially higher sales of computers and consumer electronics.

Glass industry purchases of platinum are forecast to increase by almost 9 per cent to 315,000 oz. Substantial investment continues to be made in the construction of new plants in Asia for the manufacture of high quality glass for flat panel displays.

In the chemicals sector, purchases of platinum are expected to soften to 320,000 oz, with less paraxylene capacity scheduled to come on stream this year than in 2004. Demand for platinum used in petroleum refining



catalysts, on the other hand, is projected to increase by 7 per cent to 160,000 oz, benefiting from high operating rates within the industry.

## Outlook

Platinum demand is expected to extend its decade-long upward trend in 2006, with growth likely to accelerate compared with 2005. The autocatalyst market will continue to generate much of the forecast additional demand, with purchases of platinum expected to climb in Europe, North America and Asia.

Sales of light duty diesel vehicles in Europe are set to continue to rise, with higher fuel prices reinforcing the advantage of better fuel efficiency that they have over gasoline vehicles. At the same time the fitment of catalysed diesel particulate filters (DPF) will increase, pushing the average platinum loading per vehicle upwards. The majority of auto makers now offer DPF as optional extras and one European manufacturer has already begun fitting them as standard equipment.

In North America, new demand from the heavy duty diesel sector is expected to provide a boost to platinum purchases next year. Truck manufacturers serving the US market will begin producing models that comply with strict new emissions legislation, which necessitates the use of diesel oxidation catalysts and, on some vehicles, particulate filters. The impact of this on platinum demand will outweigh by a considerable margin the effects of the ongoing switch to palladium-based catalysts for gasoline light vehicles.

Further growth in platinum demand will stem from higher production of light vehicles in China, India and South East Asia and the tightening of emissions limits in several major vehicle markets.

In contrast, in the current price environment jewellery demand for platinum will remain vulnerable. A further contraction in stocks held by retailers and an increase in recycling is probable in China. There is also the possibility that growth in retail sales of palladium jewellery may occur partly at the expense of platinum.

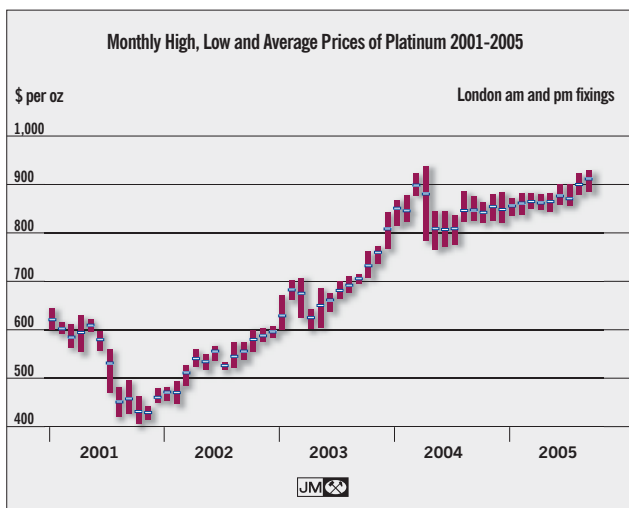
The outlook for purchases of platinum for jewellery in other markets is also uncertain – it is possible that demand in Europe, Japan and North America will stabilise at current levels but platinum will continue to face strong competition from other white metals.

The prognosis for the use of platinum in industrial applications is positive. Further growth in production of hard disks and additional investment in new LCD glass manufacturing plants in Asia should see demand from the electrical and glass sectors rise again; and consumption of the metal in catalysts for the chemicals industry is also forecast to increase, primarily due to investment in new manufacturing capacity in China.

As with demand, supplies of platinum are set to grow more rapidly next year than this, barring any further disruptions to production in South Africa. The ongoing expansion of mining operations should deliver a greater increase in refined platinum output next year. This, plus the release of any metal that builds up in Anglo Platinum's process pipeline as a result of the temporary closure of its Polokwane smelter, is expected to result in a more meaningful increase in supplies from South Africa.

North American output should also improve in 2006 and production in Zimbabwe is likely to continue growing slowly. Russian sales of platinum are forecast to be maintained at or close to the rate of mine production.

Supplies of platinum and demand for the metal are projected to grow at similar rates in 2006, and the market is therefore set to remain in deficit. With fund interest in precious metals still high and the fundamentals supportive, the price of platinum could trade up to as much as \$1,030 during the next six months. Conversely, we do not expect platinum to fall below \$890 unless demand from jewellery manufacturers contracts more substantially than current trends suggest.



## PALLADIUM

Demand for palladium is forecast to rise by 410,000 oz in 2005 to 6.89 million oz. Most of the growth will be due to a surge in purchases of the metal for the manufacture of jewellery in China. Supplies of palladium, however, will drop by an estimated 370,000 oz to 7.54 million oz. The surplus between supply and demand is forecast to fall by more than 50 per cent to 650,000 oz as a result.

Autocatalyst demand for palladium is projected to slip by 1 per cent to 3.69 million oz in 2005. The effects of lower gasoline vehicle output in Europe and thrifting in the USA will outweigh greater purchases in Asia.

In contrast, purchases of palladium for the manufacture of jewellery are forecast to soar to 1.43 million oz, an increase of more than 500,000 oz compared with 2004. Almost all of the growth will stem from increased production of palladium jewellery in

China. Demand from the electronics sector should rise to 970,000 oz on the back of greater use of the metal in plating solutions, whilst consumption in other applications will be broadly stable.

Less palladium is expected to enter the market from Russian stocks this year, whilst a drop in mine production in North America is forecast to outweigh higher output in South Africa. Supplies of the metal are therefore set to fall by 5 per cent to 7.54 million oz.

During the first nine months of the year firm physical demand helped to underpin the palladium price at around \$180, whereas very substantial fund buying failed to lift it above \$200 for any sustained period. Lease rates of the order of 1 per cent were indicative of the large volume of metal available to the market.

- Palladium demand is forecast to grow by 6 per cent to 6.89 million oz in 2005.
- The manufacture of jewellery will be the second largest application for palladium in 2005 as demand surges to 1.43 million oz; a result of a more than 70 per cent increase in the production of palladium jewellery in China.
- Autocatalyst demand for palladium is expected to weaken to 3.69 million oz due to lower production of gasoline vehicles in Europe and thrifting in the USA.
- Electronics demand for palladium is forecast to improve by 2 per cent to 970,000 oz this year.
- Supplies of palladium are projected to fall by 5 per cent to 7.54 million oz, primarily due to reduced sales of metal from Russia.
- The palladium price was confined between \$180 and \$200 for much of the first nine months of 2005, despite heavy speculative investment. However, with the outlook for the metal's fundamentals improving, we expect palladium to trade in a wider \$190 to \$270 range for the next six months.

Palladium Supply and Demand  
'000 oz

	2004	2005
<b>Supply</b>		
South Africa	2,510	2,600
Russia	4,100	3,730
North America	1,035	925
Others	265	285
<b>Total Supply</b>	<b>7,910</b>	<b>7,540</b>
<b>Demand</b>		
Autocatalyst: gross	3,720	3,690
recovery	(535)	(680)
Dental	850	860
Electronics	920	970
Other	1,525	2,050
<b>Total Demand</b>	<b>6,480</b>	<b>6,890</b>
<b>Movements in Stock</b>	<b>1,430</b>	<b>650</b>



### Supply

Sales of Russian palladium are forecast to total 3.73 million oz in 2005, considerably less than 4.10 million oz the year before. Shipments from Norilsk Nickel are likely to be close to 3 million oz, whilst Stillwater Mining is scheduled to sell almost 440,000 oz of palladium from the stock it gained when Norilsk took a majority share in the company in 2003.

Very substantial exports of palladium were made from Russia to Switzerland in the final two months of 2004, most probably on behalf of Gokhran (the State Treasury), and some of this metal entered the market in the first quarter of this year. Since then, however, there has been little evidence of further sales from stocks by either Gokhran or the Central Bank.

South African supplies of palladium are projected to rise by almost 4 per cent to reach 2.60 million oz this year, but North American output will fall due to lower production at Inco and North American Palladium.

### Demand

European autocatalyst demand for palladium is expected to drop to just over 1 million oz this year, the lowest level for almost a decade. Consumption of palladium in the region will again be adversely affected by a fall in production of gasoline light vehicles. North

American demand for palladium in autocatalysts is also forecast to slide as the effect of thrifting outweighs the continuing switch towards greater use of palladium-based catalyst systems on gasoline light vehicles. On the positive side, however, higher vehicle production rates in China and the Rest of the World will lead to increased autocatalyst demand for palladium.

Purchases of palladium for jewellery manufacture in China are forecast to jump by a remarkable 71 per cent to 1.20 million oz this year as the trade pipeline continues to fill and retail sales develop. For jewellery manufacturers the much lower metal costs associated with palladium compared to platinum, plus the relative stability of the palladium price, are major advantages. For retailers in China, palladium jewellery has the additional benefit of carrying significantly higher profit margins per piece than platinum. As a result, the numbers of stores stocking palladium and the amount of counter space apportioned to it have increased.

Demand for palladium in electronics applications is forecast to rise by 5 per cent to 970,000 oz in 2005 as a result of strong growth in consumption of the metal in plating solutions. The use of palladium in most other applications, including dental alloys and catalysts for chemicals manufacture, is expected to rise slightly.

### Outlook

Autocatalyst demand for palladium is forecast to return to growth in 2006. The ongoing move away from platinum-based autocatalysts to those using palladium

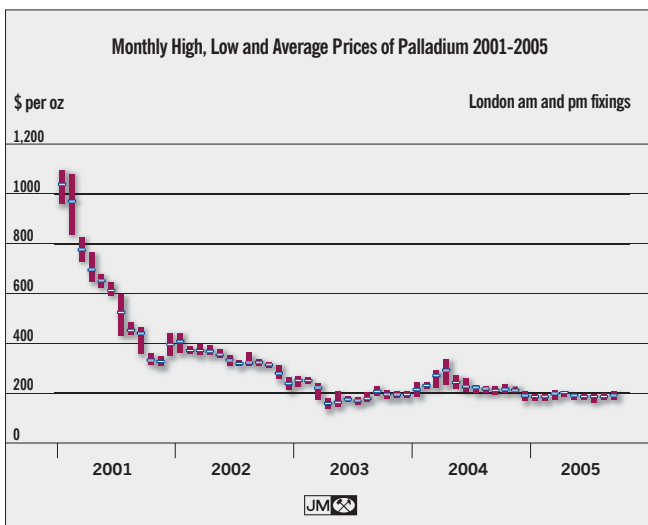
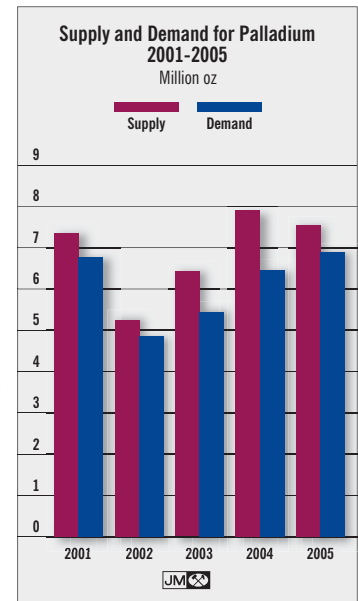
in North America should have a more substantial effect on purchases of the metal, whilst the negative effect of thrifting is expected to diminish.

Autocatalyst demand for palladium in Japan is also projected to expand as a greater proportion of light vehicles produced for both the domestic and European markets will meet more stringent emissions limits. Purchases of palladium for autocatalysts in China and elsewhere in Asia will continue to rise as light vehicle output grows but will decline again in Europe as diesels gain additional market share.

Palladium has expanded the market for white precious metal jewellery in China by offering less affluent consumers a high purity but relatively affordable product. How the market continues to develop will depend upon numerous factors, including the amount of promotion undertaken, the price of the metal, and whether it becomes available to trade on the Shanghai Gold Exchange. On balance we believe that jewellery demand for palladium has the potential to increase further in 2006, but as expansion of the trade pipeline is expected to slow, the rate of growth is forecast to be much less dramatic than this year.

If no sales are made from Russian state stocks next year, total palladium supplies will decline again. South African production should increase significantly and North American output is also forecast to improve, but Stillwater Mining will have fully sold its inventory of Russian metal by the end of the first quarter.

After five years of significant surpluses, the palladium market could move close to balance in 2006. Market stocks of metal, however, remain substantial and so the direction of the price will continue to rest largely with funds. The improving fundamentals of the palladium market should keep sentiment positive and may draw in sufficient additional speculative investment to push the price upwards, particularly if gold and platinum also rally. We therefore forecast that palladium will trade between \$190 and \$270 for the next six months.



# SUPPLIES, MINING & EXPLORATION

## SOUTH AFRICA

**Supplies of platinum from South Africa are forecast to total 5.12 million oz in 2005, up by 3 per cent compared with last year. A three month shut-down at Anglo Platinum's Polokwane smelter is expected to reduce the group's output, which is now unlikely to reach the target of 2.6 million oz. Most other producers are expected to achieve modest growth in pgm production.**

## Anglo Platinum

At Anglo Platinum's Amandelbult mine, pgm output fell sharply during the first six months of this year due to difficult geological conditions at the No.2 shaft; production also declined at the Rustenburg Merensky operations. However, these losses were offset by an increase in output from the Rustenburg UG2 project, greater production from the developing Modikwa mine (a joint venture with ARM Platinum), and by the processing of the first concentrate under the Kroondal Pool and Share Agreement (P&SA) with Aquarius Platinum. A second concentrator was commissioned at Kroondal in March 2005 and production from this plant will be refined by Anglo Platinum.

Anglo Platinum announced two new joint ventures during the first nine months of 2005. In July, a second P&SA with Aquarius was unveiled, under which the

two companies will pool mineral reserves in the vicinity of the existing Marikana operation. Under the deal, total pgm output should reach a rate of 250,000 oz per annum by the end of 2006.

In August the Mototolo joint venture with Xstrata was

confirmed. A new mine on the eastern limb of the Bushveld Complex will exploit ore reserves owned by the two companies. At full production the mine is expected to produce 132,000 oz of platinum and 82,000 oz of palladium in concentrate each year; first production is expected towards the end of 2006.

Following an explosion at its Polokwane smelter in September 2005, Anglo Platinum announced that the plant would be shut for three months. Although the group currently has excess smelting capacity, and

will be able to divert much of its Polokwane feed to its Waterval smelter, the incident will result in a build-up of untreated concentrate. Unless this material is toll-processed, Anglo Platinum's output could be reduced to around 2.45 million oz of platinum this year, 150,000 oz below the previous target of 2.6 million oz. Any stocks of untreated concentrate will then be smelted and refined during the first half of 2006.

## Impala Platinum

During the first half of 2005, output of platinum from the Impala lease area rose by 4 per cent to 567,000 oz. The increase in output was principally due to higher mill throughput as production from the mechanised section at No.12 shaft improved, and the company exploited ore reserves left behind in previously mined sections. Productivity is being enhanced via an expansion of mechanised mining and the introduction of new mining technology such as drill jigs. The operation is on target to reach a production level of over 1.1 million oz of platinum this year.

Production of platinum at Impala's Marula mine on the eastern Bushveld was unchanged at 13,000 oz in the first half of 2005. The mine's slow progress has resulted from the need to change from mechanised room and pillar mining to conventional narrow-stopping methods. This has delayed the build-up of production but will ultimately result in better grades and higher annual output.

## Lonmin Platinum

At Lonmin's western Bushveld operations, mill throughput in January to June 2005 fell by 10 per cent relative to the same period in 2004, primarily because of a substantial reduction in the volume of open pit ore mined. Shallow UG2 reserves amenable to open-casting have largely been depleted, and the near-surface Merensky reserves are less attractive. The company therefore opted to reduce open-cast mining in order to focus on higher grade underground ore. Output of platinum fell 11 per cent to 457,000 oz. Stocks of unrefined metal, however, remained higher than usual during the period, following a smelter shutdown in late 2004. Lonmin expects this material to be processed before the end of 2005.

PGM Supplies: South Africa '000 oz		
	2004	2005
Platinum	4,970	5,120
Palladium	2,510	2,600
Rhodium	576	616

