SUPPLIES, MINING & EXPLORATION

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

SOUTH AFRICA

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

Anglo Platinum

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

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

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

PGM Supplies: South Africa
'000 oz

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

JM

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

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

Impala Platinum

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

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

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

Lonmin

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

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

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

Other Producers

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

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

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

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

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

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

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

RUSSIA

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

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

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

PGM Supplies: Russia
'000 oz

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

JM

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

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

NORTH AMERICA

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

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

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

PGM Supplies: North America
'000 oz

	2007	2008
Platinum	325	340
Palladium	990	950
Rhodium	20	19

JM

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

ZIMBABWE

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

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

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

PGM Supplies: Zimbabwe and Others
'000 oz

	2007	2008
Platinum	290	305
Palladium	285	295
Rhodium	18	19

JM

South African Electricity Supply

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

THE CAUSES

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

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

PRODUCTION LOSSES

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

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

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

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

THE FUTURE

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

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

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

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

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