

Supplies, Mining and Exploration

South Africa

In 2001, South African supplies of platinum are expected to rise by 7 per cent to exceed 4 million oz for the first time, as recent expansions in mining capacity begin to come on stream. Shipments of palladium will rise by 8 per cent to reach 2 million oz, but rhodium supplies will fall, with sales slightly below the actual level of production.

At 4.08 million oz, platinum supplies from South Africa will be 280,000 oz higher than in 2000 but will fall below earlier expectations. Some expansions have encountered delays in the build up to full production, while industrial action has also affected production, with mining operations at Northam being interrupted by a five week strike in August and September.

Further expansions and new projects were announced during the first nine months of 2001. If all current projects are brought into production as planned, they will add nearly 2 million oz of platinum per annum by the middle of the decade. However, it remains to be seen whether expansion programmes will be affected by recent steep declines in pgm prices. Projects on the Eastern Bushveld could be especially vulnerable, since UG2 ore in this area is particularly rich in palladium. Companies are likely to reassess their plans, and it is possible that some projects could be downscaled, delayed or even cancelled.

Anglo Platinum

At just over 1 million oz, refined platinum output at Anglo Platinum was up 15 per cent in the first half of 2001, with additional throughput coming from expansions at Amandelbult and

Lebowa, and the build up of underground operations at the new Bafokeng Rasimone Platinum Mine (BRPM). Production of palladium rose by 10 per cent to 479,000 oz, while that of rhodium was up 28 per cent to 94,000 oz, reflecting increasing production from the UG2 reef. For the year as a whole, refined platinum production should exceed the group's record of 2.02 million oz in 1999.

Anglo Platinum has released further details of its expansion programme, which is intended to lift the group's annual platinum capacity to 3.5 million oz by 2006. The Pandora joint venture with Lonmin Platinum was announced in April 2001; further details are given below. In July it was confirmed that Anglo Platinum is to double output at BRPM via the extension of mining onto the farm Styldrift, and in September the group announced its intention to develop a new mine, with a capacity of 160,000 oz of platinum per annum, on the farms Twickenham, Paschaskraal and Hackney on the Eastern Bushveld.

Impala Platinum

Output from Impala's mines in the Rustenburg area is expected to be around 1 million oz in 2001, little changed compared with last year. Although mill throughput has improved, output has been affected by a decline in recoveries during the commissioning of a new UG2 concentrator, while the head grade has been affected by the mining of narrower sections of Merensky Reef.

Impala will benefit this year from the start up of the redeveloped Crocodile River mine, owned by its 83 per cent subsidiary Barplats. However, pgm

output from the project has been lower than planned, at around 15,000 oz of platinum in concentrate during the first half of 2001.

Since the beginning of this year, Impala has announced three new projects in the form of joint ventures with other mining companies. Two of these involve mines in Zimbabwe; further details can be found on page 10. A third, the Two Rivers project with Anglovaal Mining, will involve the development of a 100,000 oz per annum platinum mine at Dwars Rivier on the Eastern Bushveld.

Lonmin Platinum

At Lonmin, a new UG2 concentrator stream at the Karee mine was commissioned in February 2001, adding around 1.5 million tonnes to annual milling capacity. We expect refined platinum production during this calendar year to approach 700,000 oz, and output is planned to reach 750,000 oz next year, following the commissioning of a new smelter during the last quarter of 2001. Lonmin's long-term target is to lift annual platinum production at its existing mines to 870,000 oz by 2007.

Lonmin will also benefit from additional production from the Pandora joint

PGM Supplies: South Africa '000 oz

	2000	2001
Platinum	3,800	4,080
Palladium	1,860	2,000
Rhodium	457	441





venture with Anglo Platinum, announced in April 2001. The Pandora mine will initially use infrastructure at Lonmin's Eastern Platinum mine to access adjacent reserves owned by Anglo. Later, a new decline shaft will be constructed, lifting the venture's annual production to 3.6 million tonnes of UG2 ore yielding 230,000 oz of platinum by 2008.

Northam Platinum

Following the start up of the company's UG2 expansion, total mill throughput at Northam exceeded 1 million tonnes during the first six months of 2001, an increase of 30 per cent compared with the same period of last year. However, there was a decline in the average head grade, mainly because the UG2 has a lower pgm content than the Merensky Reef on Northam's lease area. This contributed to a reduction in refined pgm output compared with the same period of 2000.

A strike halted mining operations at Northam for five weeks during August and September, and this will affect the mine's performance during the second half. We expect refined platinum production for 2001 to be at least 10 per

cent below last year's level. Output should improve significantly next year, as the UG2 expansion project contributes its first full year of production.

Aquarius Platinum

At Kroondal Platinum (of which Aquarius owns 95 per cent), production of pgm in concentrate rose by 41 per cent to 77,000 oz in the first six months of 2001. The mine should see a further increase in output during the second half, following the commissioning of a new flotation circuit and regrind mill in June. Platinum production for this calendar year should exceed 100,000 oz, up by around a third compared with 2000. The company expects to achieve full production of around 130-140,000 oz of platinum per annum in 2002.

At Aquarius' Marikana project, a mining licence was received in May 2001 and the company estimates that it will take 13 months to construct a new mine and processing plant. However, at the time of writing, the mine location had not yet been finalised: the original site was found to be unsuitable due to poor ground conditions.

Messina Platinum

At the Messina mine, which is being redeveloped by the Canadian company SouthernEra, small-scale mining and processing has commenced and the first pgm concentrate was produced in June 2001. However, platinum output will be small this year, at under 10,000 oz.

Development of a full-scale mine at Messina is continuing. In June 2001, SouthernEra announced that it had raised R345 million in debt finance in order to complete the project, which is due to enter production towards the end of next year. Annual pgm production is planned to be 160,000 oz.

Russia

Sales of pgm by Russia in 2001 are expected to be lower than last year. Although there were large shipments of Russian palladium into Switzerland in the first quarter of the year it seems probable that, in the face of weak demand, not all of this metal has been sold to consumers. Supplies of rhodium are expected to be sharply lower than in 2000, when a large amount of metal was sold from stocks.

As in each of the past four years, the early months of 2001 were marked by speculation about when export quotas for pgm would be signed by the President. In the event, it was not until March that this happened and platinum and rhodium did not begin to flow out of Russia until April. In contrast, Norilsk Nickel was able

PGM Supplies: Russia
'000 oz

	2000	2001
Platinum	1,100	1,050
Palladium	5,200	4,600
Rhodium	290	100



to export palladium from January under its ten year quota granted in 1999.

In addition, very large quantities of palladium, reported to be of Russian origin, were imported into Switzerland and the USA in the first quarter of the year. It seems likely that these shipments were of metal owned by either the Russian Government or Central Bank. Although the imports coincided with substantial offerings of palladium, especially on the London fixings, the quantities sold appear to have been much less than the reported imports. However, the increased liquidity in the palladium market from late February suggests that some of the unsold metal may have been available for leasing.

In June a new decree regulating Russian imports and exports of precious metals and stones was signed by President Putin. This came into effect in late August, but there was a hiatus in exports as not all the necessary regulating structure had been put in place; this was remedied in mid September. A more significant interruption in supplies was a voluntary one by Norilsk Nickel, which in early August indicated that it was unhappy with the fall in the price of palladium in the preceding months. As a result, the company said it intended to restrict its spot sales of palladium, although it would continue to supply metal under existing long-term contracts.

As part of its ten year development plan, in September Norilsk Nickel announced that contracts worth \$250 million had been signed with Outokumpu to construct a new concentrator at Norilsk, replacing the present facility that was built in 1948, and to expand the concentrator at Talnakh. These facilities should enable the company to treat more disseminated ore and to process tailings accumulated from mining in earlier years, allowing it to increase its output of pgm without necessarily expanding its production of nickel and other base metals.

This year has seen the alluvial producers in the Far East of Russia – at Kondyor and Koryak – obtain export quotas in their own right for the first time. However, current production levels at these operations are believed to be at lower levels than in the late 1990s.

North America

Supplies of pgm from North America are forecast to rise sharply in 2001, with higher output from all producers. Platinum shipments are expected to increase by 19 per cent to 340,000 oz, while those of palladium will jump by 28 per cent to 815,000 oz.

At the North American Palladium mine in Canada, a new 15,000 tonne per day concentrator was commissioned at the beginning of June and is expected to reach design capacity by the end of this year. Palladium production is predicted to approach 150,000 oz in 2001, up from 85,000 oz last year.

We also expect an increase in output of by-product pgm from Canada's nickel mines. Inco forecasts that its total pgm output (which includes some metal from secondary sources) will rise to 416,000 oz in 2001, compared with 344,000 oz last year. At Falconbridge, a seven month strike that ended in late February has affected production, but refined pgm output is nevertheless expected to rise in 2001. Metallurgical problems led to a build up in stocks of unrefined metal last year, and the release of pgm from the refining pipeline should help to offset the effects of the strike.

At Stillwater Mining Company's Nye mine in Montana, USA, combined palladium and platinum output totalled 247,000 oz during the first six months of 2001, compared with 210,000 oz the previous year. This rise is the result of a 19 per cent increase in mill throughput during the period. The company expects to produce around 500,000 oz of pgm this year.

Zimbabwe

Supplies of pgm from Zimbabwe are set to increase significantly over the next few years. A new project at Ngezi is under development and expansion at Mimosa should proceed next year.

The expansion of Zimbabwe's only functioning platinum mine, Mimosa, now seems likely to go ahead. In July 2001, it was announced that Impala Platinum had purchased a 35 per cent stake in Mimosa Mining Company for \$30 million, providing most of the capital necessary for an increase in platinum output to 70,000 oz per annum, up from around 15,000 oz at present.

By the beginning of next year, Zimbabwe will have a second operating platinum mine: Zimplats' open-cast project at Ngezi. It was announced in March 2001 that financing had been raised, with Impala taking a 30 per cent share in the venture for \$30 million. A further \$30 million in debt finance is to be provided by South African bank ABSA. In addition, Impala and ABSA have each purchased a 15 per cent equity stake in Zimplats.

Mine development at Ngezi commenced in June 2001. Ore will be transported to the Selous Metallurgical Complex (at the mothballed Hartley Platinum mine) for processing, and the resulting smelter matte will be refined by Impala in South Africa. At full capacity, Ngezi's annual output is planned to be 208,000 oz of pgm.

PGM Supplies: North America		
	'000 oz	
	2000	2001
Platinum	285	340
Palladium	635	815
Rhodium	16	22