

SUPPLIES, MINING & EXPLORATION

- Global supplies of platinum, palladium and rhodium are forecast to increase in 2011.
- Platinum supplies from South Africa are set to rise by a modest 3% to 4.78 million ounces this year. South African palladium supplies are predicted to decline slightly.
- Sales of palladium from Russian state stocks are anticipated to total 750,000 oz this year, another substantial addition to palladium supplies.
- Shipments of platinum, palladium and rhodium from North America and Zimbabwe are forecast to rise in 2011.

SOUTH AFRICA

Supplies of platinum from South Africa are expected to rise only modestly in 2011, with most of the growth in global supplies coming from other regions. Output in South Africa suffered from poor productivity in the first half of this year due to safety stoppages and illegal strikes. Shipments of platinum were strong overall in the first half, supported by pipeline releases and refined stock sales. Palladium supplies are expected to decline this year as sales move into line with refined output, while rhodium supplies are set to increase. Unless otherwise stated, all comparisons are with the first half of 2010.

Anglo American Platinum

At Anglo American Platinum, the first half of 2011 was punctuated by frequent safety stoppages, with the result that equivalent refined platinum production (output in concentrate adjusted for standard smelting and refining recoveries) fell by 3% to 1.16 million ounces.

Many of the group's mines recorded falls in platinum output, but those on the western limb of the Bushveld were especially hard hit. For example, production fell by 20% at Bathoepole, 12% at Union, and 14% at Kroondal (the latter operates under a pool and share agreement with Aquarius Platinum). These losses were partly offset by strong performances elsewhere: Mogalakwena, the large open pit mine on the northern limb, recorded a 21% rise in platinum output.

Despite these operational difficulties, actual refined production climbed 17% to 1.17 million ounces. This was

PGM Supplies: South Africa '000 oz			
Supply	2009	2010	2011
Platinum	4,635	4,635	4,775
Palladium	2,370	2,640	2,610
Rhodium	663	632	650

made possible by the processing of pgm concentrate built up in 2010 due to furnace maintenance at the Polokwane and Waterval smelters. Strong refined output was reflected in platinum sales, which were up 13% to 1.23 million ounces in the January to June period. Anglo American Platinum remains optimistic that it will meet its sales and refined production target of 2.6 million ounces of platinum in 2011.

Impala Platinum

At Impala Platinum's Rustenburg lease area, the quantity of ore processed through the mills declined by 7% to 6.25 million tonnes in the first half of 2011. The company has experienced delays in its vertical shaft-sinking programme, due to unexpected geological difficulties, engineering issues, and lower-than-planned labour productivity. As a result, the opening of 20 shaft (the first of three new deep-level mines currently in construction) has been deferred for a year.

However, refined platinum output from the Rustenburg operations was stable at 441,000 oz in the first half. It was supported by an increase in the proportion of Merensky ore mined, which resulted in improved platinum yields. There were also gains in refining recoveries, while some additional platinum was extracted from shallow low-grade sources.

In view of the delay in its new shafts, Impala has reduced its forecast of platinum production from the lease area. Annual output is expected to be maintained at around 920,000 oz for the next two years, rising to 950,000 oz thereafter – 5% lower than the company's previous target. The Two Rivers mine, a joint venture (JV) with African Rainbow Minerals, is now operating at full capacity. Platinum production in the first half of 2011 was up 5% at 72,000 oz.

Lonmin

A steady recovery at Lonmin's Marikana division continued into 2011, despite an illegal strike at the Karee mine which cost the company an estimated 258,000 tonnes of ore production. In addition, some 180,000 tonnes of output was lost to safety

stoppages during the first half of 2011.

In total, the Marikana division milled 5.53 million tonnes of ore in the January to June period; although up 8%, lower grades dampened the increase in pgm output: production of platinum in concentrate was 327,000 oz, a rise of 3%. In addition, Lonmin produced 12,000 oz of platinum from the neighbouring Pandora JV, slightly up on last year.

These modest operational gains were overshadowed by very strong refined production and sales figures. Refined platinum output was up a remarkable 44% to 392,000 oz for the six months, compared to a very weak first half of 2010 during which smelter run-outs caused a build-up in unprocessed stocks of pgm. Half year platinum sales totalled 412,000 oz, up more than 50% year-on-year.

Northam

Refined production at Northam's Zondereinde mine has been slow to recover from a six-week strike last year. In the first six months of 2011, pgm output totalled 112,000 oz, down 14.5%, reflecting lower mill throughput and a sharp fall in grade.

At the company's new Booyensdal mine, underground development has begun, and surface infrastructure is under construction. Once the mine reaches steady state (scheduled for early 2014), it will extract 187,000 tonnes of UG2 a month, yielding an estimated 160,000 oz of pgm annually. Concentrator commissioning is due in early 2013, so the first pgm production from the mine should be seen towards the middle of that year.

Other Producers

At Xstrata's Eland Platinum mine an estimated 23,000 oz of platinum was produced in the first half of 2011, down by more than a third on the comparable period of last year. Production was inhibited by delays in the granting of minerals rights permitting the extension of the current open pit operations. As a result, mill throughput fell, while an increase in the mining of lower-grade oxidised ore affected recoveries.

Apart from its pool and share mines, Aquarius Platinum has two other underground operations in South Africa, both of which have concentrate offtake agreements with Impala. The Blue Ridge mine was closed for redevelopment in September 2010. The ramp-up of production at the Everest mine continued during the first half of 2011, with output of platinum in concentrate rising to 31,000 oz, from 5,000 oz in the same period last year. In May, Aquarius announced the acquisition of the Booyensdal South project from Northam, at a cost of

South African producers had a poor first half in terms of underlying mined output but were able to draw on pipeline material and refined stocks.



R1.2 billion. This property is contiguous with Everest and can be mined using existing infrastructure.

Production at Eastern Platinum's Crocodile River mine was disrupted in May 2011 by illegal industrial action, during which underground infrastructure was damaged. Output of platinum fell by a quarter to 23,000 oz in the first half.

Platinum Australia's Smokey Hills project endured a difficult start to 2011. Production was disrupted by a series of illegal strikes, culminating in the death of an employee outside the mine. Underground production has been supplemented by treating chrome tailings through the plant, with the result that pgm output was flat in the first half.

The Pilanesberg open pit mine, operated by Platmin, produced 38,000 oz of pgm in the January to June period, up by more than 50%. This was despite illegal industrial action in June 2011, which resulted in some property damage and a two-week interruption of mining activities. It is likely that the stoppage will have an impact on output in the second half.

RUSSIA

In the first six months of 2011, Norilsk Nickel's Russian operations produced 1.36 million ounces of palladium (down 3%) and 347,000 oz of platinum (up 2%). These figures are in line with the company's current plan, which calls for output to total 2.7 million ounces of palladium and 670,000 oz of platinum in 2011, just slightly lower than in the previous year.

Platinum production also takes place in the Russian Far East, at the Kondjor and Korjak mines, as well as from small alluvial operations in the Urals. We expect platinum output from these

PGM Supplies: Russia '000 oz			
Supply	2009	2010	2011
Platinum	785	825	825
Palladium			
Primary Production	2,675	2,720	2,700
State Sales	960	1,000	750
Rhodium	70	70	68

sources in 2011 to be stable at 145,000 oz.

At the time of writing, no palladium shipments from state stocks had taken place in 2011 (we believe that a shipment of several tonnes of palladium recorded as entering Switzerland in August was a relocation of metal that had been sold previously). However, it is our belief that state stock sales will re-commence in October, and we allow for the shipment and sale of 750,000 oz of palladium this year.

NORTH AMERICA

Stillwater Mining Company reported strong first half pgm production from its mines in Montana, USA. Output of platinum and palladium rose by 13%, to 63,000 oz and 211,000 oz respectively, reflecting higher mined tonnage and ore grade. As a result, the company has slightly increased its mine production forecast for 2011, to 515,000 oz of pgm.

North American Palladium's Lac des Iles mine reopened in April 2010, after being closed due to low palladium prices. Output continued to increase during the first half of 2011, and a blend of newly-mined underground ore and material from surface stockpiles was fed to its concentrator. Palladium production this year is forecast to be 150,000 oz.

Xstrata Nickel produces pgm as by-products of its nickel mining activities in Canada. The new Nickel Rim South mine continues to ramp up, contributing to a 33% increase in the company's Sudbury nickel production in the first half of 2011. This mine exploits a polymetallic ore body containing

PGM Supplies: North America '000 oz			
Supply	2009	2010	2011
Platinum	260	200	360
Palladium	755	590	945
Rhodium	15	10	20

significant quantities of platinum and palladium.

Production of by-product pgm from Vale's Sudbury operations increased dramatically in the first half of 2011, as production recovered from a year-long strike that ended in July 2010. The company reported output of 108,000 oz of platinum and 144,000 oz of palladium, compared with 7,000 oz and 18,000 oz respectively in the same period of last year.

ZIMBABWE

Despite uncertainty caused by the government's indigenisation programme, Zimbabwe's platinum mining industry recorded an excellent performance in the first half of 2011. Both Zimplats and Mimosa are operating stably and at full capacity, while the new Unki mine is ramping up ahead of schedule. Platinum supplies this year are expected to total 335,000 oz, up 20% on last year.

At Zimplats, output of platinum in matte was up marginally at 93,000 oz. The company's Phase I expansion is now complete, with a third portal, the Bimha mine, attaining full capacity on schedule in May 2011. Output should reach or exceed the planned 180,000 oz level this year.

A second phase of expansion got underway in August last year. This project involves the development of a fourth underground operation, known as Mupfuti mine, and a new concentrator module, to be commissioned in April 2013. This project should contribute an additional 90,000 oz of platinum annually, bringing Zimplats' total annual output to 270,000 oz.

The Mimosa mine, a JV between Impala Platinum and Aquarius Platinum, reported a strong start to 2011. Platinum production was at record levels – up 7% to 54,000 oz – despite a deterioration in ground conditions during the second quarter.

Anglo American Platinum's Unki mine came on-stream and made its first contribution to platinum supplies in the first half of 2011. Some 22,000 oz of platinum in concentrate was shipped to the company's refineries in South Africa, significantly ahead of expectations. Unki is expected to reach steady state production levels of around 60,000 oz of platinum by the end of the year.

PGM Supplies: Zimbabwe and Others '000 oz			
Supply	2009	2010	2011
Platinum	345	390	435
Palladium	340	405	415
Rhodium	22	22	30