

SUPPLIES, MINING & EXPLORATION

- Global platinum supplies should increase slightly to 5.74 million ounces in 2013, lifted by higher production in Zimbabwe.
- Platinum supplies from South Africa are forecast to be marginally up on last year, at 4.12 million ounces, despite a strike at Amplats in October.
- World supplies of palladium will decline modestly to 6.43 million ounces, as sales from Russian stocks drop to 100,000 oz.
- Output of pgm in Zimbabwe is forecast to rise by over 15%, reaching an all-time high, as Zimplats' Phase 2 expansion starts to ramp-up.

SOUTH AFRICA

Supplies of platinum from South Africa in 2013 are forecast to be little changed, at 4.12 million ounces. While the first half brought some evidence of a patchy recovery from the events of last year, output from a number of major operations (notably Impala Platinum's lease area and Anglo American Platinum's Amandelbult mines) remains well below pre-2012 levels. In addition, four mines which contributed to platinum supplies last year have been shut down, and more shaft closures are currently being implemented.

After the turmoil of 2012, interruptions to production were comparatively – and perhaps surprisingly – limited during the first half of this year. Northam's Zondereinde mine endured a three-week strike, but elsewhere industrial action was sporadic, while the incidence of safety stoppages has been generally stable (and much lower than in 2011). As a result, production losses in the January to June period were much reduced: an estimated 100,000 oz in total, compared with around 220,000 oz in the first half of 2012.

The final months of 2013 may prove more difficult. In early October, Anglo American Platinum (Amplats) lost some 44,000 oz of platinum production at its western Bushveld mines, the result of a strike in protest at retrenchments during the rationalisation of the company's marginal operations. There is also potential for industrial action over wage negotiations, with significant disparities between pay increases claimed by unions and those offered by producers, most of which are

under severe financial pressure due to the rapid increase in their cost base over the last few years.

Unless further prolonged stoppages take place, there should be no significant impact on our forecast of South African supplies this year. The industry added to refined stocks last year and this metal could be used to supplement sales in 2013.

Anglo American Platinum

Underlying platinum output at Amplats was flat at 1.18 million ounces in the first half of 2013. Intermittent industrial action cost the company some 20,000 oz of production, while the closure in mid 2012 of the Marikana Pool and Share operation reduced output by 26,000 oz. However, this was offset by improved performances at some mines, notably Kroondal and Bokoni, both of which saw production rise by 20% or more.

Refined platinum output was below the level of mine production, at 1.02 million ounces, due to maintenance at processing plants. However, the resulting build-up in stocks of unrefined pgm should be reversed by the year end.

In the year as a whole, Amplats plans to refine and sell 2.3 million ounces of platinum. If this is achieved, refined output will be a little down, but sales will be modestly higher than in 2012, when some 2.17 million ounces of platinum were shipped. (It should be noted that these totals include around 60,000 oz of annual output from Unki, which we report in our estimates of Zimbabwean supplies).

In August, Amplats announced its revised restructuring proposals, under which it aims to reduce baseline production capacity to 2.2–2.4 million ounces of platinum annually. This will involve the consolidation of the five existing Rustenburg mines into three operating units and the closure of three shafts, while the Union North and South mines will be combined into a single operation which will be sold in due course. The overall impact of the rationalisation will be a cut in production capacity of 250,000 oz in the immediate future, and a further 100,000 oz in the medium term. In early October, eleven days

PGM Supplies: South Africa
'000 oz

Supply	2011	2012	2013
Platinum	4,860	4,090	4,120
Palladium	2,560	2,320	2,350
Rhodium	641	577	574

of output were lost due to industrial action over the job cuts, but the company's inventory position enabled deliveries to customers to continue uninterrupted.

Impala Platinum

Impala Platinum was the first company to be hit by an unprotected strike in 2012, when rock drill operators at its Rustenburg lease area downed tools in January of that year. The resulting six week shutdown, followed by a slow post-strike build-up, ultimately resulted in the loss of 150,000 oz of platinum production. With no repeat of last year's events, output in the January to June 2013 period was bound to be higher, and indeed platinum production rose by 31% to 342,000 oz, helped by the refining of some in-process stocks that had accumulated at the end of last year.

However, this gain disguises an underlying downward trend in pgm production at the lease area, where in the five years prior to 2012 platinum output averaged over 950,000 oz annually. The operation is suffering from familiar platinum industry ills: depletion of shallow reserves, delays in the construction and commissioning of new shafts, difficult geology, and reduced productivity. This is being addressed via a focus on development activity at existing operations as well as at the newly commissioned 20 and 16 shaft complexes.

The immediate target is to increase annual mill throughput to 11.4 million tonnes of ore (from 10.9 million tonnes in the year to June 2013), which we estimate would yield up to 700,000 oz of platinum. As replacement shafts are brought on-stream, Impala intends to ramp up production to 850,000 oz of platinum annually by 2018.

The company's two eastern Bushveld assets, the Marula mine and the Two Rivers joint venture (with African Rainbow Minerals), were spared significant disruption last year and both performed well in the first half of 2013. Impala's Zimbabwe operations also had a good first half, with Zimplats reporting a 30% increase in platinum output. This metal is refined in South Africa but categorised as Zimbabwe supplies in our tables.

Lonmin

At Lonmin Platinum, refined platinum output plunged by 20% in the first half of 2013, to 302,000 oz, due to temporary shutdowns at its Number One and Two furnaces. Underlying production also fell, but more modestly. Output was affected by the mothballing of the K4 shaft and by continued safety stoppages and labour disruption, which together cost around

25-30,000 oz of platinum. Including metal from the Pandora joint venture, Lonmin's production of platinum in concentrate totalled 367,000 oz in the January to June period, down 4%.

The company has maintained its production and sales guidance for the twelve months to September 2013, at 700,000 and 660,000 oz of platinum respectively. However, in the calendar year – barring increased disruption in the fourth quarter, or another smelter incident – we expect Lonmin to improve on last year's refined output of 709,000 oz.

Northam Platinum

Output of pgm in concentrate from Northam's Zondereinde mine was stable in the first half of 2013, despite a three week unprotected strike (the only prolonged stoppage at any producer in the first half) that resulted in the loss of around 9,000 oz of platinum. The company's Booyensdal mine on the eastern Bushveld is now in production: the permanent power supply to the concentrator was connected in March 2013 and around 15,000 oz of pgm (including an estimated 9,000 oz of platinum) were produced in concentrate form during the second quarter of this year. Production will continue to ramp up into 2014.

Northam has a concentrate offtake agreement with the Pilaesberg mine, owned by Sedibelo Platinum (formerly Platmin), which despatched nearly 28,000 oz of pgm in the first quarter of 2013, up 28% on the same period of last year. However, some of Pilaesberg's output in the second and third quarters was smelted elsewhere, following a four month shutdown at Northam's furnace for a rebuild due to erosion of the refractory lining.



Shaft development at Royal Bafokeng Platinum's new Styldrift mine.

Other Producers

Production of platinum from Eastplats' Crocodile River almost halved to just 13,500 oz in the first half of 2013, in line with an earlier decision to halt stoping activities at one of the mine's two sections. In April, the company announced its decision to suspend mining activities completely, citing low dollar pgm prices and the difficult operating environment in South Africa. Production ceased at the end of July.

Mining operations at the small Smokey Hills operation were terminated in August 2012, and the assets of its former owner, Platinum Australia, are due to be acquired by Jubilee Platinum. The latter plans to use the processing plant to treat tailings from the nearby Dilokong Chrome Mine, before recommencing underground operations. However, we do not expect any production from the mine in 2013.

Following the merger between Glencore and Xstrata, a review of the Eland Platinum project has been undertaken. In view of new drilling results and weak pgm prices, it has been decided to suspend operations at one of the two declines, with the result that the mine's target output has been reduced to 180,000 oz of pgm annually, from 260,000 oz previously. Full production is planned for 2019.

Two new mines are under construction on the western Bushveld, close to Royal Bafokeng Platinum's Bafokeng Rasimone Platinum Mine. The first into production should be the Western Bushveld Joint Venture (WBJV), between the Canadian company Platinum Group Metal Limited and its black economic empowerment partner, Wesizwe Platinum (in which China's Jinchuan group has a 45% stake). The first pgm concentrate from the WBJV could be seen as early as 2015; at full capacity, the mine is planned to extract 275,000 oz of pgm annually. Wesizwe Platinum is developing a neighbouring but significantly deeper project, the Bakubung Platinum Mine, scheduled to begin production in 2018.

RUSSIA

Russian shipments of platinum are expected to decline modestly in 2013, to 780,000 oz, reflecting lower output from Norilsk Nickel's Talnakh operations. Palladium supplies will decline by 190,000 oz to 2.70 million ounces, the lowest level for 11 years, as sales from government stocks fall to minimal levels.

Norilsk Nickel's Russian operations produced 1.3 million ounces of palladium and 315,000 oz of platinum in the first half of 2013, slightly down on the previous year. Production at the

PGM Supplies: Russia '000 oz

Supply	2011	2012	2013
Platinum	835	800	780
Palladium			
Primary Production	2,705	2,630	2,600
State Sales	775	260	100
Rhodium	70	90	85

Talnakh operations has been affected by unscheduled repair work at both the Oktyabrsky mine and the Nadezhda smelter, which contributed to a decrease in nickel output in the first half and is likely to have impacted pgm output too. For the year as a whole, Norilsk expects to refine around 2.6 million ounces of palladium and 640,000-650,000 oz of platinum, marginally lower than in 2012.

Output from alluvial operations located mainly in the far east of Russia is expected to be stable. The largest of these miners, Kondyor, produced around 120,000 oz of platinum last year, with output being maintained in the face of declining grades thanks to significant increases in the volume of sands removed – up by a factor of five in the last five years. Operations were previously conducted only in the May to November period but now continue year round.

Sales of palladium from Russian state stocks are now an insignificant part of the overall palladium supply picture. We expect supplies of palladium from this source to fall to just 100,000 oz in 2013, down from 250,000 oz last year.

NORTH AMERICA

North American producers should supply a little more palladium in 2013, as lower output from the Lac des Iles mine is more than offset by additional recovery of by-product palladium from nickel ores. Platinum output is forecast to be little changed.

Production from North American Palladium's Lac des Iles (LDI) mine is expected to decrease this year. The mine sold

PGM Supplies: North America '000 oz

Supply	2011	2012	2013
Platinum	350	310	315
Palladium	900	895	930
Rhodium	23	22	24

72,000 oz of palladium in the first half of 2013, a decline of 11% on the previous year. The fall was primarily due to a reduction in underground mining volumes, accompanied by a fall in grade, as ore reserves accessible via the existing ramp system have been depleted. A new shaft is being developed but is not expected to enter production until late 2013; this will allow LDI to extract deeper ore reserves from a palladium-rich deposit known as the Offset Zone.

Stillwater Mining Company, which operates two pgm mines in Montana, reported a 2% rise in platinum and palladium output in the first half, with a strong increase in mill throughput being partly offset by lower grades. The company expects pgm production to remain flat at around 500,000 oz both this year and in 2014.

PGM are also extracted as by-products from the Canadian nickel operations of Glencore Xstrata and Vale. The former's Integrated Nickel Operations reported a 5% increase in nickel output from its Canadian mines in the first half of 2013, largely due to a 24% improvement in production at its Raglan operation in northern Quebec. Raglan ore typically contains significant quantities of palladium, but only minor amounts of platinum. We would therefore expect the company's palladium output to grow in 2013.

Vale reported a 17% jump in pgm output from its Sudbury mines in the first half of 2013, along with a 14% hike in copper production, probably reflecting an increase in the mining of copper-rich ores which often contain relatively high pgm values. Output this year will also be boosted by the implementation of the CORE (Challenging Ore Recovery) project, involving the construction of a new mill and flotation circuit at the existing Clarabelle plant. The company's new Totten mine is due on stream towards the end of this year, but a lengthy refining pipeline means that it is unlikely to contribute to supplies until 2014.

ZIMBABWE

Zimbabwe's platinum operations are on course to deliver another all-time production record, despite continuing uncertainty over the indigenisation process in the country's mining sector.

In the first half of 2013, total platinum production from the country rose by 15% to nearly 210,000 oz. This figure includes some 18,000 oz of platinum which remained unprocessed at the end of 2012 due to a shutdown at the Zimplats smelter, but which has since been refined. We expect full year supplies from Zimbabwe to reach – and perhaps exceed – 400,000 oz of

PGM Supplies: Zimbabwe
'000 oz

Supply	2011	2012	2013
Platinum	340	340	400
Palladium	265	265	310
Rhodium	29	29	33

platinum for the first time.

This increase reflects the ramp up at Zimplats' Phase 2 expansion. The new concentrator plant was commissioned in the second quarter of 2013, and the build-up of ore reserves at the Mupfuti portal is on target. The project will add 90,000 oz of platinum production capacity, taking Zimplats' annual total to 270,000 oz by 2015.

Platinum is extracted at two other operations in Zimbabwe: the Mimosa mine, a joint venture between Aquarius Platinum and Impala Platinum, and Amplats' Unki project. Both of these are operating at or close to full capacity and we do not expect any significant changes to output levels in 2013.

The indigenisation process continues to create uncertainty for the platinum mining sector, and this is likely to inhibit investment in new expansions. Proposed indigenisation plans submitted by the companies remain under discussion with ministers. In March, Zimplats lodged a formal objection to the expropriation of some of its land holdings by the government.

OTHERS

Other supplies of platinum are forecast to increase this year, to 125,000 oz, largely due to the ramp up at the new Kevitsa mine in Finland, where the extraction of nickel ores yielded 13,000 oz of platinum by-product in the first half.

Kevitsa also produces some palladium, but the additional supply from this source will not be sufficient to offset declining output from Tati Nickel in Botswana, where a sharp fall in grades caused first half palladium production to decline by 30%. We expect other supplies of palladium to decrease to 140,000 oz this year.

PGM Supplies: Others
'000 oz

Supply	2011	2012	2013
Platinum	100	110	125
Palladium	155	160	140
Rhodium	2	3	5