

SUMMARY

PLATINUM

- The deficit in the platinum market is set to increase to 605,000 oz in 2013, due to strong offtake by ETF investors and industrial users.
- Supplies of platinum will rise marginally to 5.74 million ounces, with hardly any recovery in South African output.
- Autocatalyst demand will fall by 2% to 3.13 million ounces, due to weakness in European diesel car markets.
- Industrial purchases will rebound strongly, up 12% to 1.79 million ounces, on strong chemical offtake and a recovery in the glass and electrical sectors.
- Gross purchases by jewellery makers will ease slightly but at 2.74 million ounces remain at historically high levels.
- Unprecedented offtake by ETF investors in South Africa will lift investment demand to a record 765,000 oz.

Gross demand for platinum is predicted to hit a record 8.42 million ounces in 2013, lifted by a strong recovery in sales to industrial users and unprecedented offtake by investors. This will more than compensate for a slight fall in purchases by the jewellery and autocatalyst sectors. With supplies recovering only very modestly from last year's steep decline, and little overall growth in recycling, the market is set to move further into deficit.

Global platinum supplies are expected to rise by 2% to 5.74 million ounces in 2013, with higher output in Zimbabwe contributing most of the increase. Based on information available to the end of September, our forecast envisages a marginal improvement in South African supplies. This could be jeopardised by strike action in the fourth quarter of 2013, unless producers maintain sales by dipping into inventories.

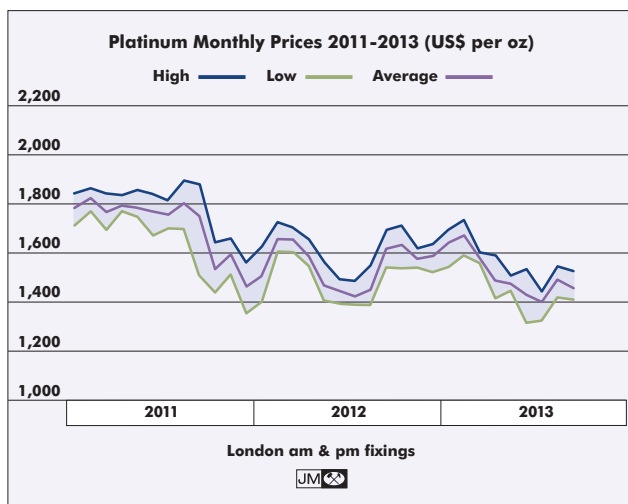
Operating conditions in the South African mining sector remain extremely challenging. Last year, some 750,000 oz of platinum were lost to legal and illegal strikes, safety stoppages and shaft closures. Sporadic industrial action has continued during 2013, but to date has been less extensive than last year.

Based on company data covering the January to June period, we estimate that production losses due to one-off factors such as strikes and safety stoppages totalled around 100,000 oz in the first half. However, disruption could rise in the final quarter: in October, Anglo American Platinum (Amplats) lost 44,000 oz of production during an 11 day strike over job cuts, and there is still a risk of industrial action over wage rises.

Underlying platinum production from South African mines was up an estimated 2% in the first six months of 2013. This gain was mainly due to higher output from Impala's Rustenburg lease area, which lost over six weeks of production to strikes in the January to June 2012 period but suffered no comparable disruption this year. Output at Lonmin declined slightly, but there were marginal gains at Anglo American Platinum (Amplats), due to good performances from joint venture and associate mines such as Modikwa, Kroondal and Bokoni, and at Northam Platinum, whose Booyensdal mine began producing in the second quarter.

Eastplats' Crocodile River ceased operations during the first half of 2013, and more mine closures are underway. Following consultations with stake-holders, Amplats' restructuring plan has been amended and will now result in the mothballing of three Rustenburg shafts and an eventual reduction of 350,000 oz in annual platinum production capacity.

Unusually, South Africa has also played an important role in the overall demand picture this year, with a new rand-denominated platinum exchange traded fund (ETF) accumulating 660,000 oz of metal between its launch in April and the end of September. This ETF is the first to be readily accessible to South African institutional investors, who are subject to limits on overseas investments, and it therefore benefited from considerable pent-up demand: over 360,000 oz of platinum were purchased in the first month. Including sales through ETFs in other regions, as well as bars and coins, we predict that total physical investment will reach 765,000 oz this



During 2013 the platinum price became increasingly unresponsive to supply side concerns. After rising above \$1,700 in February, platinum was dragged below \$1,400 following a sharp fall in the gold price.

year, an all-time record.

Autocatalyst demand for platinum is set to decline by 3% to 3.13 million ounces in 2013, on the back of a 2% decline in world production of light duty diesel vehicles. Europe is by far the world's largest market for diesel cars, accounting for over half of global output; here, platinum consumption has been hit by a continued fall in new registrations in France, Germany and Italy, where diesels account for a large proportion of the fleet. However, there will be additional offtake from the European heavy duty segment, with increasing numbers of trucks meeting Euro VI limits being sold this year.

Consumption on gasoline vehicles will fall again, down 6% in response to lower output of light duty gasoline vehicles in Japan – the only region where platinum is still widely employed in three way catalysts (TWCs) – and some additional thrifting and substitution.

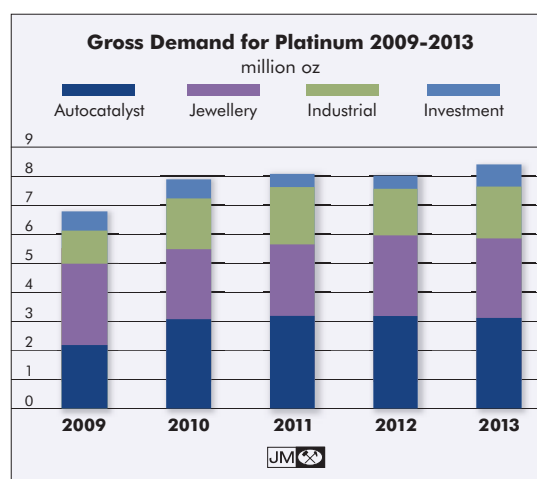
Global demand from the jewellery sector will fall slightly to 2.74 million ounces but remains at historically high levels. In China, sales to jewellery makers have been robust, albeit a little below last year's exceptional level. A sharp decline in the gold price has generated additional retail traffic, and this has supported platinum jewellery sales. The price difference between platinum and gold jewellery remains relatively narrow, enabling retailers to 'up-sell' to platinum.

Industrial demand is forecast to rise by 12% to 1.79 million ounces, with chemical manufacturers buying large quantities of platinum catalysts for polymer intermediates such as paraxylene and propylene, and the glass and electrical sectors recovering from last year's inventory reductions. In 2013, net sales to fibre glass producers will increase five-fold, boosted by some capacity additions in Asia, while purchases by hard disk manufacturers will recover to more normal levels following a period of destocking.

Recycling levels in 2013 will benefit from increasing availability of highly-loaded diesel catalyst scrap, improved collection efficiencies, and some destocking by collectors; we expect recoveries of platinum from end-of-life vehicles to rise by 13%. However, this will be partly offset by lower returns of old platinum jewellery in China and Japan, leaving total secondary supply up only modestly at 2.08 million ounces.

Concerns about labour unrest and capacity rationalisation in South Africa lifted the platinum price above \$1,700 in February. However, in April a sudden drop in the gold price dragged platinum downwards, after which the price became increasingly unresponsive to supply risks, hitting a low of \$1,323 in June. In early October, despite an 11 day strike at Amplats, platinum again slipped below \$1,400.

Platinum Supply and Demand '000 oz			
Supply	2011	2012	2013
South Africa	4,860	4,090	4,120
Russia	835	800	780
Others	790	760	840
Total Supply	6,485	5,650	5,740
Gross Demand			
Autocatalyst	3,185	3,190	3,125
Jewellery	2,475	2,780	2,740
Industrial	1,975	1,605	1,790
Investment	460	455	765
Total Gross Demand	8,095	8,030	8,420
Recycling	(2,060)	(2,040)	(2,075)
Total Net Demand	6,035	5,990	6,345
Movements in Stocks	450	(340)	(605)



PALLADIUM

- The gap between palladium supply and demand will narrow in 2013, but the market will still be in a substantial deficit of 740,000 oz.
- Primary supplies of palladium will decline slightly to 6.43 million ounces, due to lower Russian stock sales, but recycling will grow by 7% to 2.40 million ounces.
- A return to boom conditions in the Chinese car market will lift global palladium usage in autocatalysts by 4% to 6.97 million ounces.
- Total palladium demand will fall by 4% to 9.63 million ounces, as investment contracts sharply and industrial offtake is reduced.

Primary supplies of palladium are forecast to decline slightly to 6.43 million ounces in 2013, mainly due to a drop in sales from Russian government stocks. With a 3% decrease in gross demand to 9.63 million ounces, and a 7% jump in recycling, the gap between supply and demand will narrow somewhat, although the market will remain in significant deficit.

Mine production of palladium in South Africa is expected to rise marginally this year. We expect improved output from Amplats' large Mogalakwena open-cast mine, which exploits the palladium-rich Platreef, and there should be a recovery in output at Atlatsa's Bokoni operation, where the UG2 has a relatively high palladium content. At Nkomati Nickel, a joint venture between Norilsk Nickel and African Rainbow Minerals, an expansion is ramping up and output of by-product palladium was up strongly in the first half of 2013. However, these gains will be mostly offset by the loss of output due to a number of mine and shaft closures since the beginning of 2012, and lower production from large mining complexes on the western Bushveld.

Zimbabwe platinum ores are also comparatively rich in

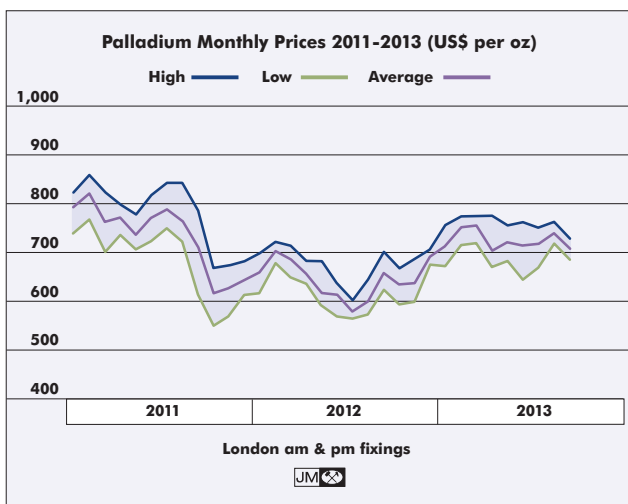
palladium. With Zimplats' Phase 2 expansion beginning to contribute to production this year, Zimbabwean supplies of palladium will rise by 17% to exceed 300,000 oz for the first time. Elsewhere, North American output will be up, reflecting increased recovery of palladium as a by-product of nickel mining, but Russian supplies will drop, due to a combination of lower primary output from Norilsk Nickel, and reduced stock sales. This year, we expect sales from Russian government-controlled inventories to total 100,000 oz.

Gross demand for palladium is set to fall in 2013, as further gains in the autocatalyst sector are offset by lower industrial use and a sharp contraction in investment offtake. With continuing strong growth in the recovery of palladium from autocatalyst scrap, net palladium demand will be down by 7%, but the market will nevertheless remain in significant deficit.

With few legislative changes affecting palladium loadings this year, demand from the automotive industry will broadly follow trends in light duty gasoline vehicle production. Outside Europe, we estimate that over 90% of autocatalyst demand for palladium is derived from its use in three way catalysts for the light duty gasoline sector, where most auto makers favour palladium-rhodium formulations. Thus, palladium consumption will be supported by higher output of gasoline vehicles in China, North America and some Rest of World countries. The biggest gain will be seen in China, where double digit growth in the light duty gasoline sector will lift purchases of palladium by local auto makers above 1.5 million ounces for the first time.

Tighter legislation will play only a minor role in this year's increase in demand, with changes to gasoline emissions limits restricted to the Rest of the World region. In 2013, Euro 4 equivalent legislation has been enforced on all light vehicles in both Thailand and Russia, with a resulting increase in palladium loadings in both countries.

In Europe, palladium enjoys substantial use in the light duty diesel sector – in excess of half a million ounces in each



Palladium traded over \$700 for most of the first nine months of 2013, supported by the prospect of long-term market deficits, and positive economic and auto sales data from the USA and China.

of the last three years, more than a third of total automotive palladium usage in this region. There has been some further substitution of platinum with palladium in this segment, but weakness in European diesel sales has restricted demand growth. However, early sales of Euro VI compliant trucks, ahead of the January 2014 deadline, has boosted the use of palladium in heavy duty applications, albeit off a low base.

In other industries, demand has been lacklustre in 2013. Palladium jewellery has seen further erosion of its market share in China: gross sales to the jewellery trade are set to fall 23% to 185,000 oz and – after taking into account recycling of old stock – net demand will total just 20,000 oz this year. With consumer demand drying up, few retailers are prepared to stock palladium jewellery, and manufacturers are cutting or ceasing production. Outside China, use of palladium – mainly as an alloying element in white gold and platinum alloys, and for men's wedding bands – will be stable.

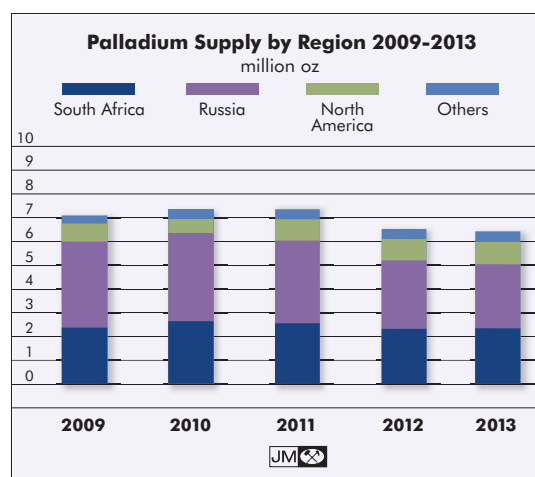
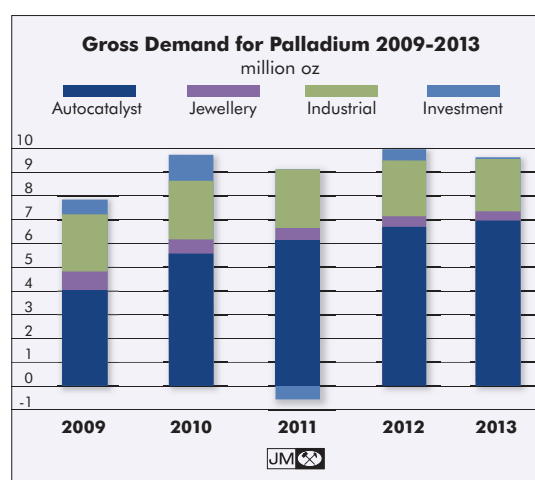
Substitution will again be a key feature of industrial demand, with palladium being replaced by base metals as the electrode material for multi-layer ceramic capacitors (MLCC), and by ceramics and non-precious metal alloys in dentistry. However, purchases of palladium by the chemical industry remain unusually strong by historical standards, reflecting further investment in new capacity for the manufacture of PTA, a precursor of polyester.

Sales of palladium to investors are forecast to contract sharply this year. Although there were significant inflows into palladium ETFs in the first two months of 2013, there was a prolonged period of disinvestment in mid-year, leaving net investment in the nine months to September at just under 50,000 oz. For the full year we forecast that physical investment will total 75,000 oz.

At present, there is no palladium equivalent of the Absa platinum ETF. However, in September 2013, Absa Capital received regulatory approval for a proposed Johannesburg-listed palladium fund, which will be backed by palladium sourced in South Africa. At the time of writing, a launch date had not yet been fixed, and our forecast does not allow for any offtake via the new Absa product this year.

Palladium traded at over \$700 for most of the first nine months of 2013, with strong speculative interest resulting in net longs on NYMEX reaching a series of all-time highs. Speculators were influenced by the belief that the market is in long-term deficit, and by shorter-term considerations including positive economic and auto sales data out of the USA and China. The price averaged \$725 in the first nine months of the year, up 13% on the same period of 2012.

Palladium Supply and Demand '000 oz			
Supply	2011	2012	2013
South Africa	2,560	2,320	2,350
Russia	3,480	2,890	2,700
Others	1,320	1,320	1,380
Total Supply	7,360	6,530	6,430
Gross Demand			
Autocatalyst	6,155	6,705	6,970
Jewellery	505	445	390
Industrial	2,465	2,350	2,195
Investment	(565)	470	75
Total Gross Demand	8,560	9,970	9,630
Recycling	(2,385)	(2,290)	(2,460)
Total Net Demand	6,175	7,680	7,170
Movements in Stocks	1,185	(1,150)	(740)



OTHER PGM

- The rhodium market will record a 14,000 oz deficit in 2013, as demand reaches a six year high.
- Gross rhodium consumption will exceed one million ounces, with auto makers, glass manufacturers and investors all buying more metal.
- Primary rhodium supplies will be flat at 721,000 oz, but recycling will grow at double digit rates.
- Despite some recovery in ruthenium and iridium demand both markets are in oversupply and prices have fallen to multi-year lows.

Rhodium

With mine production flat, recycling will assume greater significance than ever in the rhodium market, accounting for a record 28% of combined primary and secondary production. Nevertheless, supplies of rhodium will fall short of gross demand, which should exceed one million ounces for the first time since 2007.

Output of rhodium in South Africa is expected to decline slightly this year, reflecting sporadic industrial action and the closure of UG2 shafts in the last two years. (UG2 typically has a higher rhodium content than other platinum-bearing reefs mined in South Africa). Sales out of Russia are also expected to be lower in 2013, although the processing of stocks of rhodium-rich pyrrhotite concentrate continues to support production at Norilsk Nickel. These declines will be matched by higher output elsewhere, with an expansion at Zimplats beginning to contribute to supplies.

There is little immediate prospect of a return to growth in primary rhodium supplies, with more shaft closures being implemented in South Africa, and the gradual depletion of stored pyrrhotite concentrate at Norilsk. However, the outlook

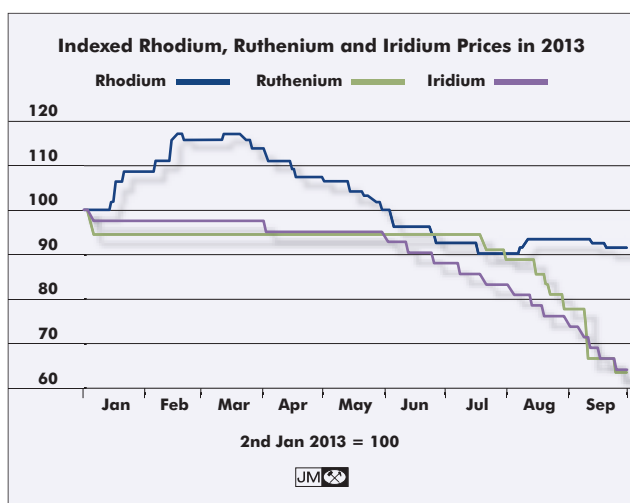
for recycling of rhodium from secondary material is positive. We expect double digit growth in recoveries from spent autocatalysts both this year and next, as collection efficiencies improve in most regions, and as the rhodium content of catalyst scrap increases.

Gross demand for rhodium is forecast to increase by 4% to 1.02 million ounces this year, the highest level since 2007. In the last few years, there has been aggressive thrifting of rhodium by auto makers in North America, Europe and Japan, with the result that auto demand in these regions remains significantly below pre-financial crisis levels. In 2013, combined production of light duty gasoline vehicles in these markets will be about 8% lower than in 2007, but rhodium demand will be 37% below the level seen six years ago. There is now much less potential for thrifting, and total rhodium demand from these regions will stabilise in 2013. Sales to Rest of World auto makers will also stagnate, with lower demand in Korea and India offsetting small growth in other countries.

With consumption elsewhere flat, a return to boom conditions in the Chinese auto market will drive rhodium demand growth this year. Production of light duty gasoline vehicles is forecast to rise at double digit rates, and rhodium usage will expand accordingly.

Historically, the use of rhodium in light duty diesel applications has been almost non-existent. However, the introduction of Euro 6 legislation for new models from September 2014 will generate measurable use of rhodium in diesel catalysts for the first time. The new emissions limits specify a 55% reduction in NOx emissions for diesel-powered cars, and will usually require the addition of NOx aftertreatment to emissions control systems. Smaller vehicles are likely to use lean NOx traps containing rhodium, but many larger cars and light commercial vehicles will use base metal SCR catalysts in conjunction with pgm-containing oxidation catalysts.

In 2012, net demand for rhodium from the glass sector was depressed by sales of metal from obsolete marble melt facilities. This year, purchases by the industry will rise by nearly



Rhodium, ruthenium and iridium prices descended to multi-year lows in 2013, with all three markets suffering from overhangs of surplus metal from previous years.

a third, with the low rhodium price prompting glass fibre manufacturers to adopt platinum alloys with a higher rhodium content. Sales of rhodium to the chemicals sector will remain high, supported by purchases of rhodium process catalysts for use in new oxo-alcohol and acetic acid plants.

With the rhodium price weak, the Deutsche Bank rhodium ETF saw further net inflows during the first nine months of 2012: investors purchased an additional 41,000 oz during this period to lift total holdings to 94,000 oz at the end of September. There was also some fresh demand for small rhodium bars from North American and European investors. We include investment in our estimate of other demand.

Rhodium fell to a nine year low of \$975 in July 2013 and remained below \$1,000 at the time of writing in October. In a context of stagnating primary supplies and rising demand, the lacklustre price performance may appear surprising, but reflects the large hangover of surplus metal that accumulated between 2008 and 2011. While we are now recording small market deficits, this is entirely due to the movement of market stocks into physically-backed investment products; industrial consumption of rhodium remains below the level of combined primary and secondary supplies.

Other PGM

Despite a strong recovery in demand for ruthenium and a modest improvement in consumption of iridium, the prices of both metals have fallen steeply during 2013 due to a long-term imbalance between primary production and consumer offtake.

For most of the last decade, mine output of ruthenium and iridium has been more than sufficient to meet the needs of industrial consumers. Demand for ruthenium temporarily exceeded mine production when hard disk offtake peaked in 2006 and 2007, while that of iridium was propelled above the level of underlying supplies in 2010 and 2011, due to heavy buying of iridium crucibles. However, in the last two years both metals have been in oversupply despite considerable disruption to mining in South Africa.

This year, there has been some recovery in sales of ruthenium to hard disk manufacturers, while iridium has benefited from good demand in the spark plug sector, but overall demand has been insufficient to soak up offers from producers. This has been reflected in a downward trend in the price of both metals. At the end of September ruthenium stood at an eight year low of \$57, while iridium was at a three year low of \$675.

