PLATINUM QUARTERLY

Q2 2017

6th September 2017

World Platinum Investment Council

Contents

FOREWORD

When considering the best way to characterise current market dynamics for this edition of *Platinum Quarterly*, one word stands out: balance. Our rich data set, which is now edging towards a fourth year, shows a myriad of different trends and themes at work, all of which add up to a market in fundamental balance, albeit one with continuing supply constraints. The decision to place the Bokoni PGM mine in South Africa into care and maintenance in July, alongside similar decisions for a number of gold mines in the region, serves to illustrate tangible action by miners to pull back from uneconomic supply – a fact that many in the market seem to have underestimated. Meanwhile, it is pleasing to observe that the debate around emissions controls and air quality, which has so often been overly negative, is now more balanced. Evidence of this has come with the growing recognition that diesel cars contribute to lower fleet CO_2 emissions, something largely ignored as NO_x concerns have dominated negative attitudes towards diesel over the past two years.

From our increased investor interactions, we see growing recognition that platinum will continue to play a pivotal role in helping vehicle manufacturers to reduce harmful emissions. In particular, investors want to know the extent to which automakers are increasing platinum loadings on their diesel vehicles. This has become a key question in the wake of Daimler's momentous revelation, announcing a new low NO_x family of diesel engines, which took €3bn to develop. While there is growing anecdotal evidence, it is difficult to be precise about the extent of the increase in platinum loadings taking place. Indeed, it really isn't in the interests of the manufacturers to shine a light on this. Nevertheless, a welcome, low-NO_x strategy has emerged amongst carmakers. And where Daimler has led, others are likely to make similar announcements, with positive implications for the future of clean diesel and platinum demand.

While some balance has been injected into the emissions debate, the same cannot be said of electric vehicles (EVs). Here we believe there is significant overestimation of the negative impact of powertrain electrification on platinum demand. Part of the WPIC's mission is to provide investors with information to support informed investment decisions, hence we recently highlighted this confusion to investors. We sought to explain that different types of EVs have significantly different effects on platinum demand in our July 2017 Platinum Perspectives. This new series of monthly research insights reflects our enhanced Research and Investor Development efforts. We welcome feedback and thoughts on other areas we can scrutinize in the coming months.

Moving to the data contained in today's *Platinum Quarterly*, the second quarter ended in a modest surplus. Total platinum supply fell by 7% y/y, with mining supply down 9%. Recycling remained flat during the quarter. Automotive platinum demand fell slightly during the quarter, however, it remained robust over the first half of the year, up 5% on the second half of 2016. In Europe, while diesel's market share in smaller vehicle segments fell, it remains strong and as high as 80% in the larger, luxury and (multi-purpose vehicle) MPV segments.

Today's report also shows that second quarter jewellery demand was flat year-on-year. However, this masked intriguing regional dynamics, with a fall in Chinese demand offset by India and the U.S. Growth in platinum jewellery demand in India, accelerated by 48% y/y in the second quarter of 2017, according to Platinum Guild International (PGI). The WPIC also continues to support local investment marketing efforts in India, with a number of local partnerships. So, while we recognise investor concerns regarding the medium-term outlook for China jewellery demand, we do believe the negative impact upon overall platinum demand is overestimated (as flagged in our August 2017 Platinum Perspectives).

Today's data shows that investment performance in the second quarter of 2017 remained resilient. As we highlighted in March, the *Platinum Quarterly* investment demand forecast is necessarily conservative because investment demand is often uneven and tricky to forecast. Today's report shows investment demand for the period to the end of June coming at a run-rate that implies full-year demand will be in excess of the currently predicted 250 koz (with investment demand to the end of July at 220 koz). Investment demand was buoyed in the second quarter by increased ETF demand from South Africa, Switzerland and Japan.

Finally, the second quarter of 2017 saw a continuation of the WPIC market development programme that began the year so strongly. In May, the WPIC's partnership with the Royal Mint in the UK saw the launch of a new range of bullion platinum bars and coins, including 500g and Kilo platinum bars and a 1oz 'Queen's Beasts Lion of England' coin – the first platinum coin to be launched in the popular heraldic series. We see further developments on the horizon, with several additional deals possible before the end of 2017.

Paul Wilson, CEO

Table 1: Supply, demand and above ground stocks summary

	2015	2016	2017f	2016/2015 Growth %	2017f/2016 Growth %	Q1 2017	Q2 2017
Platinum Supply-demand Balance (koz)							
SUPPLY							
Refined Production	**6,150**	**6,035**	**5,970**	**-2%**	**-1%**	**1,410**	**1,485**
South Africa	4,465	4,255	4,240	-5%	0%	1,015	1,045
Zimbabwe	405	490	445	21%	-9%	115	105
North America	385	395	405	3%	3%	95	85
Russia	715	715	705	0%	-1%	140	205
Other	180	180	175	0%	-3%	45	45
Increase (-)/Decrease (+) in Producer Inventory	+45	+30	+10	-33%	-67%	-60	+70
Total Mining Supply	**6,195**	**6,065**	**5,980**	**-2%**	**-1%**	**1,350**	**1,555**
Recycling	**1,710**	**1,865**	**1,815**	**9%**	**-3%**	**420**	**480**
Autocatalyst	1,190	1,235	1,295	4%	5%	300	330
Jewellery	515	625	515	21%	-18%	120	150
Industrial	5	5	5	0%	0%	0	0
Total Supply	**7,905**	**7,930**	**7,795**	**0%**	**-2%**	**1,770**	**2,035**
DEMAND							
Automotive	**3,385**	**3,435**	**3,360**	**1%**	**-2%**	**890**	**850**
Autocatalyst	3,245	3,295	3,220	2%	-2%	845	815
Non-road	140	135	140	-4%	4%	35	35
Jewellery	**2,880**	**2,605**	**2,590**	**-10%**	**-1%**	**640**	**620**
Industrial	**1,670**	**1,775**	**1,610**	**6%**	**-9%**	**465**	**400**
Chemical	605	595	580	-2%	-3%	150	140
Petroleum	140	220	100	57%	-55%	45	10
Electrical	165	160	155	-3%	-3%	40	40
Glass	200	205	170	3%	-17%	85	50
Medical and Biomedical	230	235	240	2%	2%	55	70
Other	330	360	365	9%	1%	90	90
Investment	**305**	**505**	**250**	**66%**	**-50%**	**80**	**90**
Change in Bars, Coins	525	430				25	70
Change in ETF Holdings	-240	-10				65	20
Change in Stocks Held by Exchanges	20	85				-10	0
Total Demand	**8,240**	**8,320**	**7,810**	**1%**	**-6%**	**2,075**	**1,960**
Balance	**-335**	**-390**	**-15**	**16%**	**-96%**	**-305**	**75**
Above Ground Stocks **4,140***	**2,320**	**1,930**	**1,915**	**-17%**	**-1%**		

Source: SFA (Oxford). *As of 31st December 2012. NB: Numbers have been independently rounded.

Notes:
1. All estimates are based on the latest available information. They are subject to revision in our subsequent quarterly reports in the event that additional information is identified.

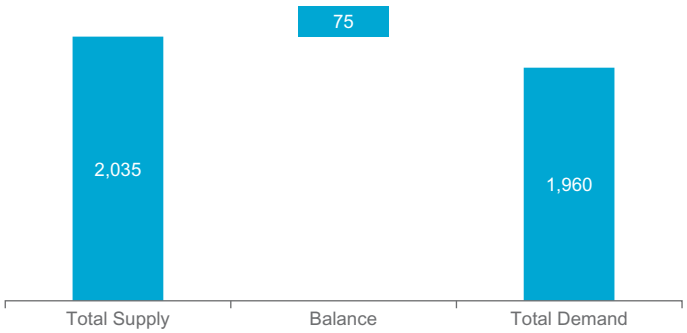
2. The WPIC did not publish quarterly estimates for 2013 or the first two quarters of 2014. However, quarterly estimates from Q3 2014 to Q2 2015 are contained in previously published PQs which are freely available on the WPIC website. Quarterly estimates from Q3 2015 and half-yearly estimates from H2 2015 are included in Tables 3 and 4 respectively, on pages 14-15 (supply, demand and above ground stocks).

3. The 2017 forecast is based on historical data and trends as well as modelling, with varying degrees of accuracy depending upon the supply or demand category. Investment demand is expected to be the least predictable segment. Some historical views are based on data and modelling that pre-date WPIC publication of PQ.

2017 SECOND QUARTER PLATINUM MARKET REVIEW

In the second quarter of 2017 total platinum supply was 2,035 koz, a 7% decline year-on-year, as mining supply dipped 9% (-155 koz), while recycling was flat. Global demand was 6% lower year-on-year at 1,960 koz, pulled down by weaker automotive (-45 koz) and industrial (-70 koz) demand, while jewellery and investment demand were unchanged year-on-year. Overall the market had a modest surplus of 75 koz in Q2'17 (Chart 1).

Chart 1: Supply-demand balance, koz, Q2 2017



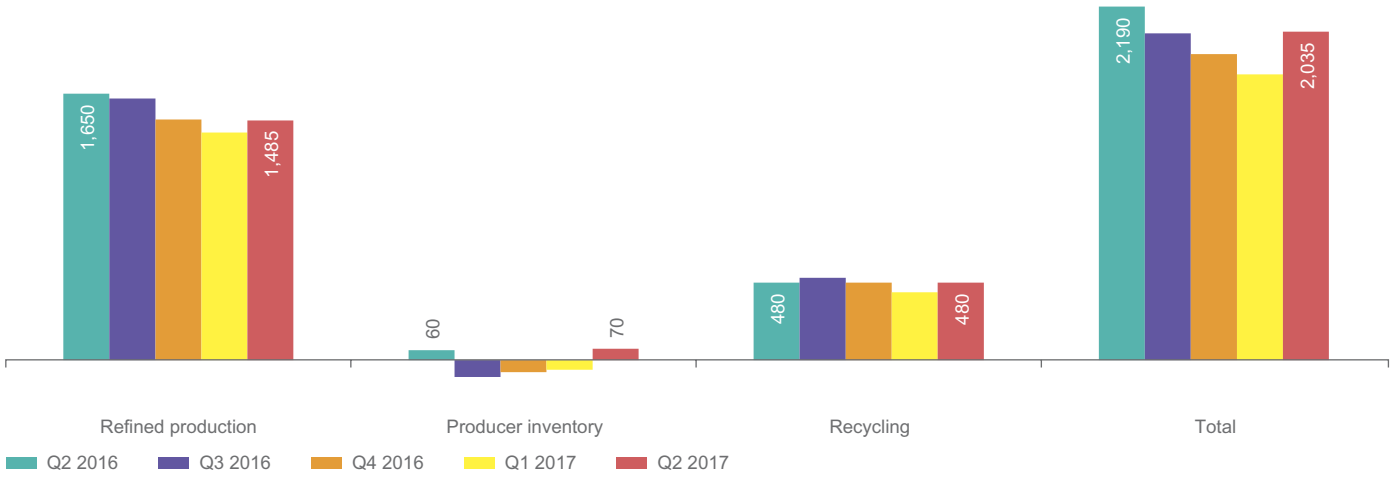
Source: SFA (Oxford)

Supply

Refined production grew to 1,485 koz in Q2'17 (+5% on the previous quarter), with output increasing in South Africa (+3%) and Russia (+46%). An improved quarter for a key Western Bushveld mine plus ramp-up of tailings operations lifted output in South Africa. In Russia, pipeline material accumulated during Q1'17 was processed during Q2'17, boosting volumes for the quarter. However, production for the first six months of 2017 was 7% lower (at 345 koz) than the corresponding period of 2016 (370 koz) for this region.

Global refined production for Q2'17 was 11% lower than in Q2'16 (1,650 koz). This is partly owing to a smelter run-out and rebuild in South Africa in late 2016 and early 2017, for which built-up volumes have yet to be processed. South African supply totalled 1,045 koz in Q2'17, a reduction of 155 koz (-13%) year-on-year.

Chart 2: Platinum supply, koz



Source: SFA (Oxford)

Supply from Zimbabwe decreased to 105 koz in Q2'17 (-9% on Q1'17 and -13% year-on-year), as output returned to planned levels after concentrate stock that built up following a smelter problem was processed in 2016. North American output is trailing 2016 levels so far this year (by 25 koz), following unplanned mine maintenance in Sudbury. The region produced 85 koz in Q2'17, down 20 koz on Q2'16.

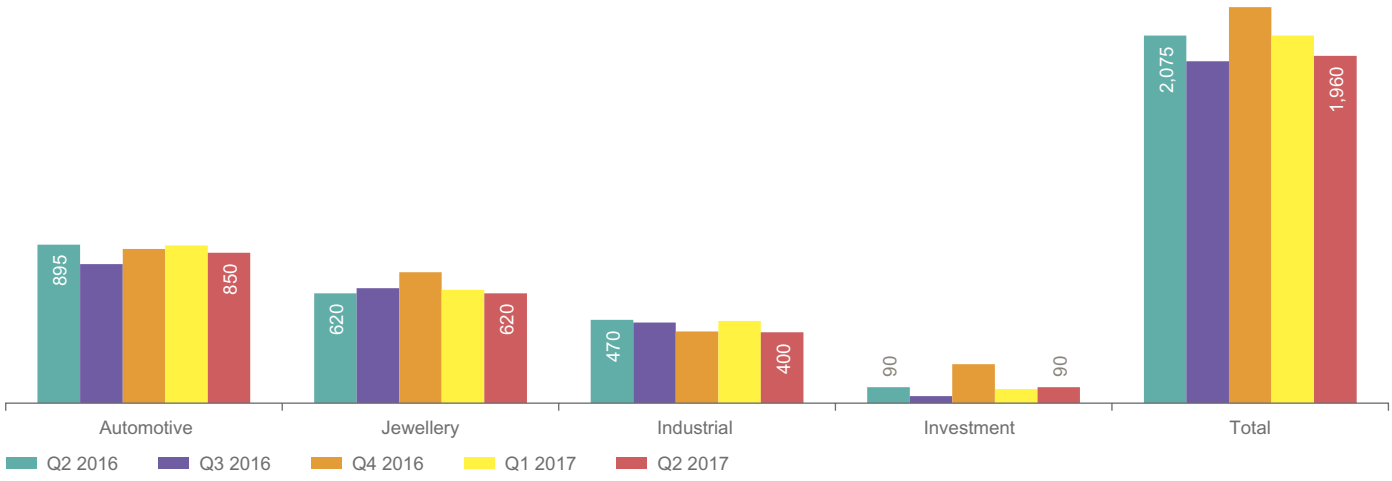
Producers sold 70 koz from stock in Q2'17, offsetting the 60 koz stock-build in Q1'17. Total mine supply is estimated at 1,555 koz for Q2'17, still representing a decrease of 9% (-155 koz) from Q2'16 when net stock sales totalled 60 koz. For the first six months of the year, total mine supply is estimated at 2,905 koz, a reduction of 230 koz (-7%) year-on-year, as mine production was augmented by stock sales of 210 koz in H1'16.

Total supply from recycling was 480 koz in Q2'17, flat on Q2'16. Autocatalyst recycling was down 3% year-on-year to 330 koz for Q2'17, but up 10% quarter-on-quarter after being flat quarter-on-quarter in Q1'17. Jewellery recycling is up 7% year-on-year to 150 koz with increases being seen in Japan, and also in China where the challenging jewellery market and the search for margin by smaller and independent jewellers have resulted in some of the jewellers removing their platinum displays, causing more metal to be recycled.

Demand

In Q2'17 global demand was 1,960 koz (Chart 3), down 6% (-115 koz) year-on-year, owing to lower industrial (-15%) and automotive (-5%) demand, while jewellery and investment demand were unchanged year-on-year in the second quarter.

Chart 3: Platinum demand, koz



Source: SFA (Oxford)

Automotive demand

Automotive platinum demand was down 4%to 850 koz in Q2'17, from 890 koz in Q1'17. The losses came mostly from Western Europe, Japan and India, with stable demand from the US, China and the RoW.

Despite the somewhat hostile press coverage to which the internal combustion engine continues to be subjected, especially diesel, autocatalyst demand for platinum has remained relatively robust through the first half of 2017, at 1,740 koz, up 5% from 1,655 koz in H2'16 and only 2% down from 1,770 koz in H1'16.

In H1'17, EU demand for passenger cars continued to rise, even after a long period of growth, up 4.7% to 8.2 million units (source: ACEA). Of the largest markets, Italy and Spain saw the strongest growth, helped by rental companies renewing their fleets for the tourist season. Diesel's share of the Western Europe light vehicle market is below 50% now, with demand damaged by negative press and consumer concerns over access to cities and apprehension over the residual value of diesel cars when they come to sell them in the future. In the UK, diesel powertrains accounted for 43.8% of registrations in H1'17, down from 47.9% in 2016 (source: SMMT). Gasoline powertrains gained significantly more than alternative powertrains of diesel's lost sales, indicating consumer confidence in the internal combustion engine, and wariness of electric technologies. Similarly in Germany, previously a strong diesel car market, diesel's share was 41.3% for H1'17, down from 46.9% H1'16 (source: KBA).

Jewellery demand

Second-quarter global jewellery demand was 620 koz, flat year-on-year and 3% lower quarter-on-quarter.

The National Bureau of Statistics of China reported sales of gold, silver and jewellery recovered 3.1% year-on-year in Q2'17. However, much of the gain was driven by gold investment products. Platinum Guild International (PGI) reported that platinum jewellery retail sales were down 6.6% in Q2'17. Some retailers maintained or increased the number of pieces sold, but as they were selling more lighter-weight pieces with good craftsmanship and higher margins, it resulted in fewer ounces being sold than the value of retail sales might suggest.

PGI reported Indian platinum jewellery retail sales accelerated by 48% year-on-year in Q2'17. PGI's marketing efforts are helping drive the rapid growth in platinum jewellery demand, although this very high growth rate is flattered by a comparison to a difficult Q2'16 when the jewellers' strike reduced demand. PGI said that the introduction of the new Goods and Services Tax (GST) from 1 July caused a rush to buy jewellery at the end of June to take advantage of the lower prices. This has pulled some sales into Q2'17 from Q3'17. The full effects of the GST are yet to be seen; the tax is 1-2% higher than previously, but having a standardised nationwide tax could improve supply chain efficiencies for larger retailers.

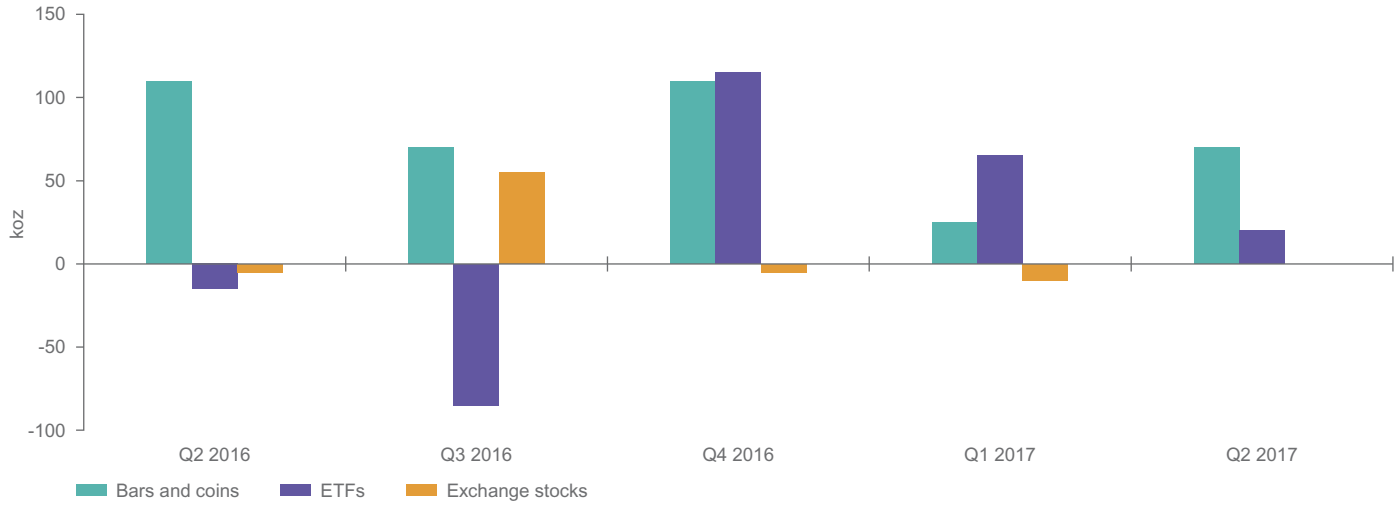
Industrial demand

Net platinum requirements for industrial applications decreased by 15% year-on-year (-70 koz) to 400 koz in Q2'17, largely owing to weaker demand for petroleum refining (-50 koz) and glass fabrication (-30 koz). New platinum purchases by the petroleum sector were reduced as metal recovered from shuttered refinery units in Western Europe and Japan was recycled, lowering net demand, along with lower demand for new capacity in China and North America versus Q2'16. The fewer number of plant start-ups scheduled for H2'17 compared to H2'16 also depressed new metal buying in the second quarter by glass fabricators, especially in China. Half-year industrial usage was down by 4% (-40 koz) at 865 koz, also weakened by the petroleum sector (-60 koz), but this was slightly offset by growth in medical (+10 koz) and other (+10 koz) end-uses, including fuel cells.

Investment demand

Global investment demand was 90 koz in Q2'17, with bars and coins and ETFs seeing gains while exchange stocks were unchanged (Chart 4).

Chart 4: Platinum investment



Source: SFA (Oxford)

Global platinum ETF holdings expanded by 20 koz in Q2'17, a slower pace than that seen in the first quarter. As is often the case, investors in different regions took differing views, so while South African, Swiss and Japanese investors added to their holdings, investors in the UK and US reduced theirs.

South African holdings grew by 62 koz in Q2'17, a significant improvement over the 15 koz rise seen in Q1'17, with most of the gains occurring in May as some investors took advantage of the lower platinum price, aided by a stronger rand. Investors in Swiss ETFs increased their holdings by a modest 5 koz, somewhat lower than the 14 koz seen in Q1'17 which was the largest quarterly gain since 2012. In Japan, the ETF gained 5 koz in the second quarter as holdings recovered from a similar decline in the first quarter. In the UK and US, investors changed course and reduced their ETF holdings by 45 koz and 4 koz respectively after increasing them in the first quarter.

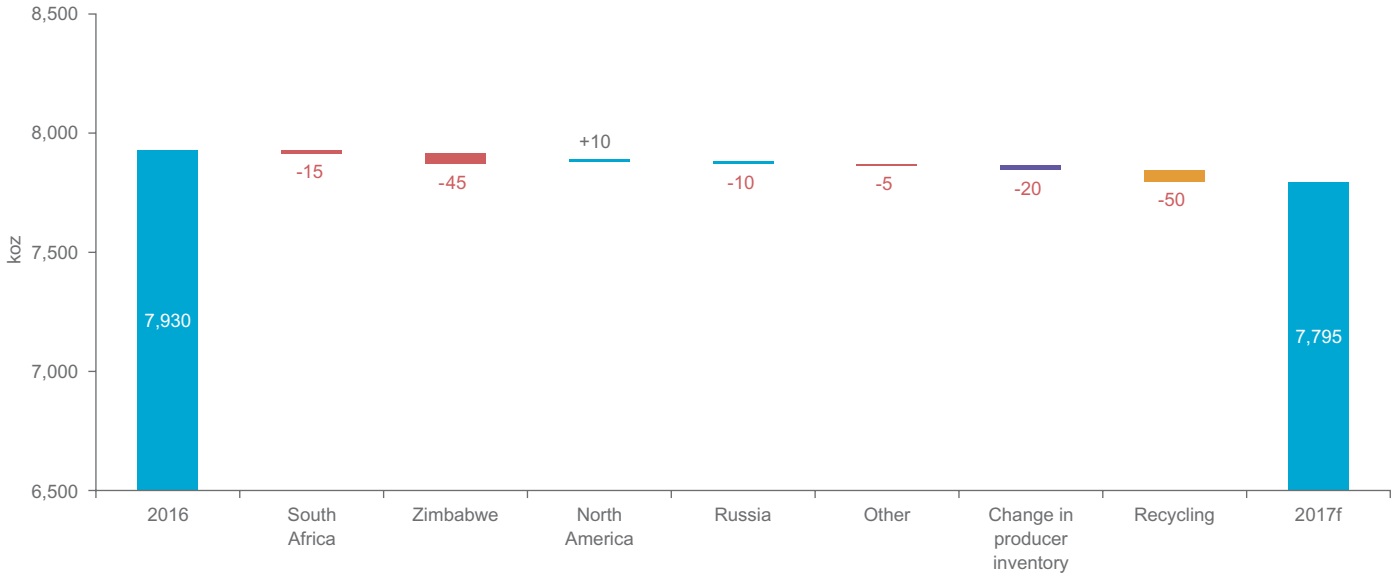
Bar and coin demand improved in the second quarter to 70 koz. Coin investment was lower quarter-on-quarter as the release of the platinum US American Eagle bullion 1 oz coin had boosted demand in Q1'17. However, bar sales rose, in particular in Japan, as Japanese investors took advantage of the relatively low and stable platinum price to increase their net purchases. In the UK, investors using BullionVault's service added 5 koz to their vaulted platinum bar holdings.

2017 FORECAST

Total platinum supply is expected to decrease by 2% year-on-year to 7,795 koz in 2017 (Chart 5), as both primary and secondary supply are anticipated to decline this year. Refined production is projected to fall by 1% to 5,970 koz as only North America sees an increase in output (+10 koz) this year, and this is outweighed by declines in South Africa (-15 koz), Zimbabwe (-45 koz), Russia (-10 koz) and Other regions (-5 koz).

Secondary supply is forecast to slip by 3% year-on-year to 1,815 koz (-50 koz) as a decline in jewellery recycling (-110 koz) outweighs gains from autocatalyst recycling (+60 koz). Excess retail stock was returned to manufacturers last year in China, boosting jewellery recycling, and this year it is expected to return to a more typical level.

Chart 5: Changes in total supply, 2017f vs. 2016



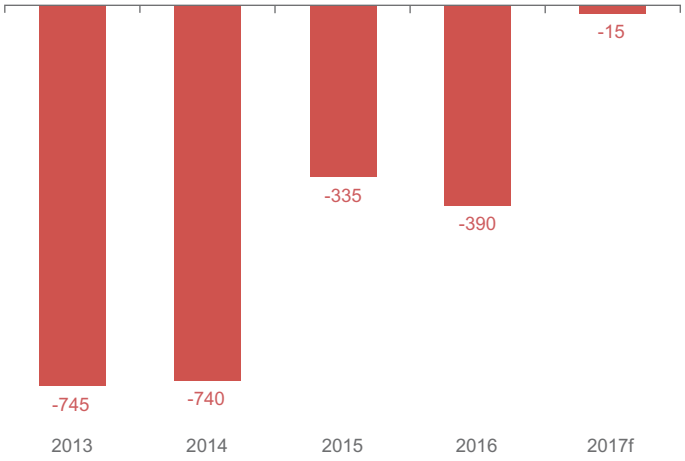
Source: SFA (Oxford)

Global demand is forecast to decline by 6% year-on-year to 7,810 koz (Chart 7 & 8) owing to contractions in each of the main demand sectors. Automotive demand is projected to slip by 2% (-75 koz) as, while some regions see increased platinum usage, Western Europe, the largest automotive demand region, and Japan have lower metal requirements. Jewellery consumption is forecast to slip 1% to 2,590 koz (-15 koz) as a decrease in China, which is the largest platinum jewellery market, outweighs gains in all other regions.

Industrial demand is expected to fall 9% (-165 koz) to 1,610 koz this year, mainly as a result of fewer glass facilities being built compared to 2016 and lower net demand from the petroleum industry as some refineries are closed down (with the metal from these facilities expected to be recycled during 2017). Investment demand is forecast to be 250 koz, notably lower this year than in 2016, mainly owing to reduced platinum bar purchases in Japan, which were unusually high in 2016 as the drop in the platinum price encouraged a significant increase in bar investment.

The market is expected to be close to balance this year, as, while both supply and demand are forecast to contract, the larger decline in global demand leaves it just 15 koz higher than supply (Chart 6).

Chart 6: Supply-demand balance, koz, 2013-2017f



Source: SFA (Oxford)

Mine supply

Global refined supply is forecast to fall by 1% to 5,970 koz in 2017. South African output is predicted to decline by 0.4% (-15 koz) to 4,240 koz this year. Mine restructuring and shaft closures announced to date are expected to result in a loss of 110 koz year-on-year, all taking place in South Africa. These losses should largely be offset by planned improved performances at some larger Western Limb mines, and continued ramp-up of chrome-PGM producing operations.

Production from Zimbabwe is estimated to fall by 9% to 445 koz. North American supply is forecast to rise by 3% to 405 koz with a planned increase in production at a US-based mine, while the Canadian operations are expected to record higher volumes in the second half of the year. Output from Russia is forecast to decline by 1% to 705 koz this year, with depletion at surface operations offsetting stable supply from underground mines.

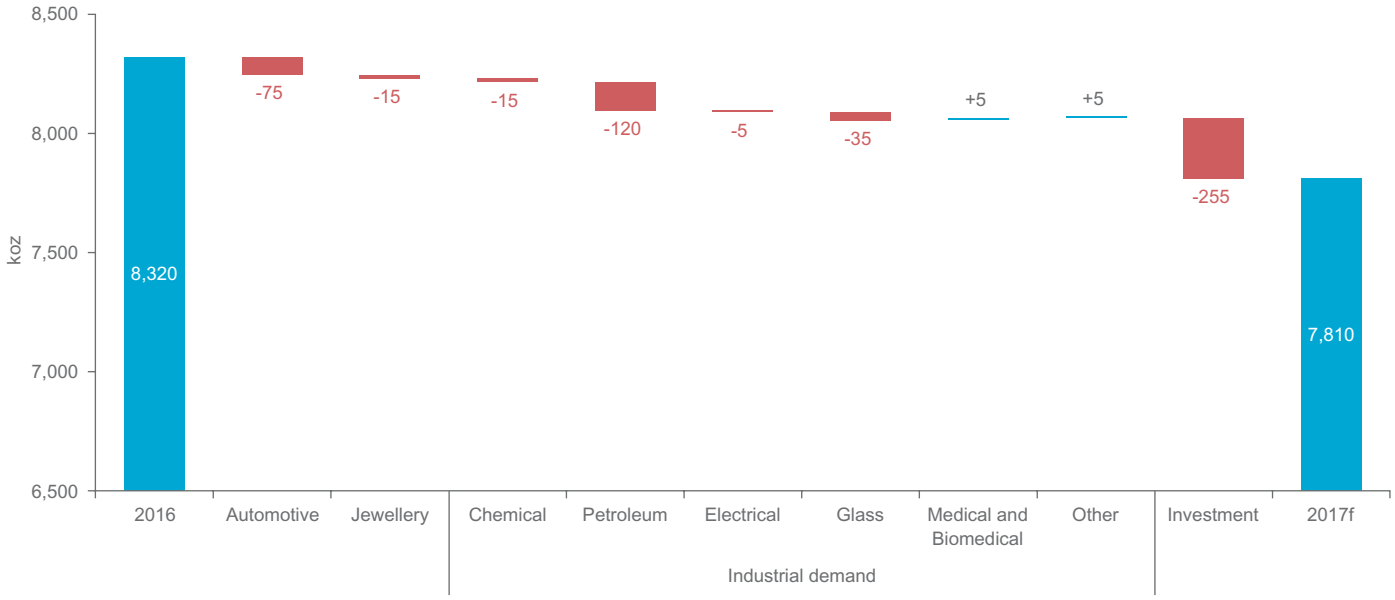
A net reduction in producer stocks is forecast this year, but is not anticipated to be significant at around 10 koz. There was a small net sale from stock in H1'17, indicating a potential restock in the second half of the year to maintain typical levels, if no issues arise. Total mine supply is estimated at 5,980 koz for 2017, down 1% from 2016 levels (6,065 koz).

Recycling

Recycling is forecast to drop 3% year-on-year to 1,815 koz in 2017. Jewellery recycling is set to fall 18% in 2017 after a 21% gain in 2016 which was due to Chinese destocking. Total jewellery recycling is now projected to be 515 koz this year as the level of recycling in H1'17 was slightly higher than expected.

Secondary supply from autocatalyst recycling is predicted to increase 5% year-on-year to 1,295 koz, with all regions except China expected to see growth. The scrap steel price held up well in the first half and has moved higher in Q3'17 which should help to maintain good scrappage volumes, and the high palladium price is an added incentive to recycle gasoline catalysts which also contain some platinum. There is potentially some upside in Europe if the diesel scrappage schemes that have recently been introduced by VW, BMW, Mercedes, Opel, Fiat-Chrysler and, most recently, Ford see a good response. Of these, Opel and Ford have committed to scrapping all cars that are traded in.

Chart 7: Changes in demand by category, 2017f vs. 2016



Source: SFA (Oxford)

Automotive demand

The full-year forecast is 3,360 koz, down just 2% on 2016 (3,435 koz) and very close to overall automotive demand in 2015 and 2014. Inevitably, Western Europe is expected to see the greatest decline in percentage terms, though it remains by far the largest market overall. Modest growth is anticipated from India, China and the RoW, though these are far smaller markets than Western Europe.

While diesel share in Europe continues to erode in the smaller and mid-sized vehicle segments, it remains robust and as high as ~80% in the larger, luxury and MPV segments, and fleet markets, where the cost of ownership including taxes, and CO_2 emissions benefits are still attractive for certain drivers. In India, market share has been eroded too, with relatively little prospect of government policy support ahead following the removal of tax relief on diesel fuel. However, the overall growth of the auto market will lead to modest growth in diesel passenger car sales.

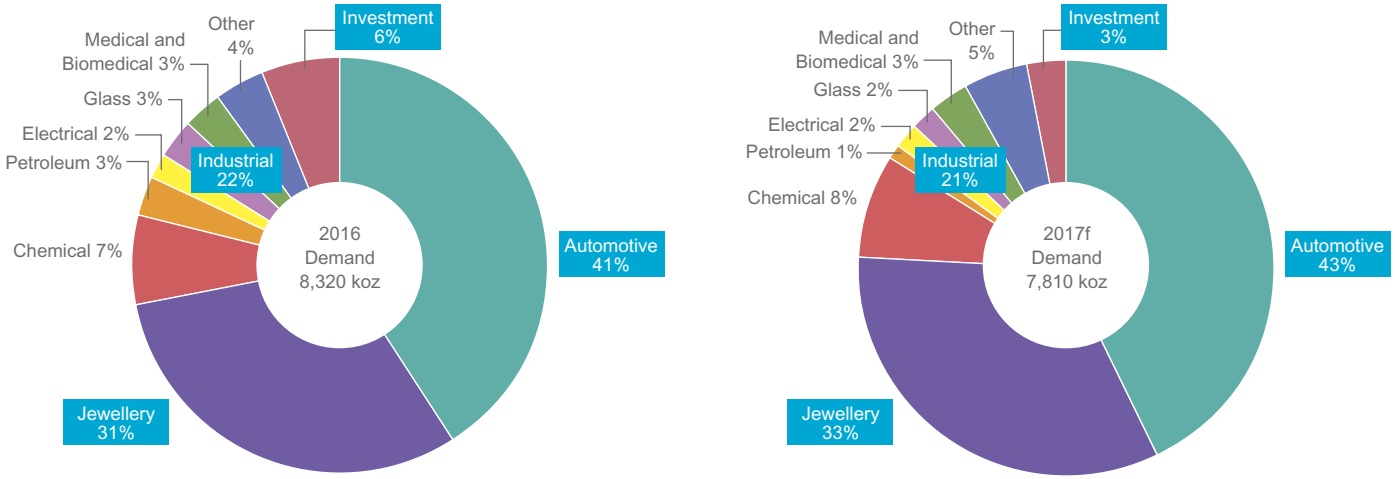
From September 2017, light vehicle emissions testing will begin to change; while this will ultimately bring greater clarity when comparing vehicles, and should thereby restore some consumer confidence in the internal combustion engine, there may initially be some confusion within the auto trade, media and consumers. The Worldwide Harmonized Light Vehicle Test Procedure (WLTP) will apply to all new types of car from September 2017, replacing the outdated New European Driving Cycle (NEDC). The WLTP is performed under more realistic testing conditions, including a wider range of driving situations and more typical temperatures. A much more accurate basis for calculating fuel consumption and emissions, the WLTP will be a significant step forward to ensure that laboratory tests more closely reflect the on-road emissions of a car.

Automakers continue to innovate and produce diesel vehicles that, through a combination of aftertreatment and combustion technologies, including around minimising the 'cold start' time when the bulk of emissions are produced, are able to meet the legislated NO_x and particulate levels under real-world driving conditions. The growth in the use of NO_x storage catalysts (NSC), which are similar in function to lean NO_x traps (LNT), in addition to SCR and DOC and DPF, appears to enable Euro 6 NO_x limits to be met under on-the-road driving conditions. The NSC adds some platinum content (though there may be thrifting elsewhere in the system), where the platinum is responsible for steps at the beginning of the storage process and at the end of the periodic regeneration process. BMW and Honda are among the mass-market automakers set to use this aftertreatment technology to ensure NO_x emissions compliance.

Diesel powertrains using 48 V mild hybrid technology will increasingly be seen, which will retain diesel's CO_2 emissions advantage over gasoline for only a small additional cost, making it a competitive offering for drivers with a higher CO_2 emissions profile. This hybridisation is expected to go some way towards stabilising diesel's declining share.

While these innovations are unlikely to restore diesel to its previous market share heights, this progress can be expected to rehabilitate diesel cars' reputation and popularity to some extent, particularly as their contribution to lowering fleet CO_2 emissions is beginning to be recognised once again. Indeed, France, Germany and the UK, the European countries with the highest diesel car sales volumes, have seen CO_2 emissions from new car sales rise slightly or stay constant so far in 2017, in contrast to the declining trend seen over recent years.

Chart 8: Demand end-use shares, 2017f vs. 2016



Source: SFA (Oxford)

Jewellery demand

Global platinum jewellery consumption is estimated to fall 1% to 2,590 koz in 2017, with a decline in demand from China mostly offset by increases in all other regions. There have been upward revisions to the jewellery demand forecast in India and Japan after strong H1'17 performances, with India being less impacted by demonetisation than anticipated and Japan having healthy improvements in high-end platinum jewellery sales and an improving economy which is expected to continue in the second half of the year. India saw strong H1'17 fabricator demand but H2'17 is likely to be only modestly higher as the introduction of the GST could hold back sales growth in the second half because jewellery prices are expected to be higher and the GST's introduction pulled forward some sales into Q2'17. The tax change is unlikely to change the benefit to retailers of higher margins achieved on sales of platinum jewellery compared to gold jewellery.

Relatively stable economic growth in the US and Europe is supporting the forecast for steady growth in platinum jewellery demand. China's consumption is expected to decline by 8% this year. The retail jewellery environment continues to be challenging, but customer traffic has recovered somewhat and with the wedding season coming up in H2'17, retailers are optimistic that trade will improve, particularly those with new product launches and promotions planned for the second half. However, the broad Chinese economy is predicted to see slower growth in the second half of the year, which could prolong the difficult trading environment.

Industrial demand

A significant drop in net petroleum requirements (-120 koz) is forecast to help lower industrial platinum demand by 9% year-on-year (-165 koz) to 1,610 koz in 2017, following high demand levels last year, as slower capacity growth, and refinery curtailments and closures, which result in metal being recycled, reduce net demand in most regions. Platinum usage is also anticipated to fall in the glass (-35 koz), chemical (-15 koz) and electrical (-5 koz) sectors this year, strongly outweighing minor growth in medical applications (+5 koz) and other industrial end-uses (+5 koz).

Chemical

Platinum usage in chemical catalysts is expected to fall by 3% (-15 koz) to 580 koz in 2017, principally owing to lower demand for nitric acid production, as well as fewer requirements for new dehydrogenation capacity in China. Nitric acid consumption is likely to be weaker in most regions this year, caused partly by a decline in demand for its primary end-use, ammonium nitrate fertiliser, and partly by slower nitric acid capacity expansion, whilst recent delays to major dehydrogenation projects are set to slow capacity growth in China in 2017, further reducing platinum requirements compared to last year. However, rising demand for platinum-cured silicone products in China and new paraxylene capacity in the RoW is expected to partially offset demand losses elsewhere.

Petroleum

Refining capacity reductions in Japan during H1'17 and in Western Europe late last year are expected to return metal to market throughout 2017, pushing both regions into net negative demand territory, which, when combined with slower capacity growth in China and North America, is set to reduce the petroleum sector's platinum requirements to 100 koz (-55%) this year. The fall in demand is at least likely to be moderated by strong growth in the RoW, with new capacity due to come on-stream this year across the Middle East, India and Southeast Asia.

Electrical

Platinum usage in electrical applications is estimated to decline by 3% (-5 koz) to 155 koz in 2017, weakened by falling HDD shipments. Although H1'17 HDD deliveries were slightly higher than predicted at an estimated 195 million drives, this was still 2% below the H1'16 figure and the full-year forecast remains largely unchanged at close to 400 million units (down 6% year-on-year). However, an increase in average drive capacity (more platters, higher PGM content) plus growing demand for other electrical end-uses should somewhat offset demand lost through fewer HDD shipments.

Glass

Reduced platinum requirements for new glass fabrication capacity in China and the US are likely to lower net glass demand by 17% (-35 koz) to 170 koz this year, following robust capacity growth in both nations in 2016. Platinum usage in the RoW is likely to remain at relatively high levels, maintained by further expansion in Africa and Asia, although in Japan the recovery of metal from closed liquid-crystal display (LCD) plants should keep the country's requirements net negative in 2017.

Other

Growth in the fuel cell sector, particularly in Japan, is expected to lift platinum consumption in other industrial end-uses by 1% to 365 koz in 2017, with greater demand anticipated in both the stationary (power generation) and transport (buses, HCVs and non-road) markets. Meanwhile, platinum requirements for automotive sensors and plugs, and turbine engines are set to remain fairly flat year-on-year.

Investment demand

Platinum investment demand is forecast to be 250 koz in 2017, as stronger investment than last year is anticipated in ETFs, while bar and coin demand is expected to be lower mostly due to Japan, which is the largest platinum bar market, where bar purchases are expected to drop from the high level seen in 2016 as the yen is forecast to weaken which will lift the local platinum price. Global coin sales are estimated to be similar to those seen last year. The US Mint has already released the same mintages of bullion and proof platinum US American Eagle bullion 1 oz coins as in 2016.

ABOVE GROUND STOCKS

The market is anticipated to have a slight deficit of 15 koz in 2017, which will reduce above ground stocks to 1,915 koz at the end of the year.

The WPIC definition of above ground stocks is: the year-end estimate of the cumulative platinum holdings not associated with exchange-traded funds, metal held by exchanges or working inventories of mining producers, refiners, fabricators or end-users.

Table 2: Supply, demand and above ground stocks summary – annual comparison

	2013	2014	2015	2016	2017f	2016/2015 Growth %	2017f/2016 Growth %
Platinum Supply-demand Balance (koz)							
SUPPLY							
Refined Production	**6,070**	**4,880**	**6,150**	**6,035**	**5,970**	**-2%**	**-1%**
South Africa	4,355	3,115	4,465	4,255	4,240	-5%	0%
Zimbabwe	405	405	405	490	445	21%	-9%
North America	355	400	385	395	405	3%	3%
Russia	740	740	715	715	705	0%	-1%
Other	215	220	180	180	175	0%	-3%
Increase (-)/Decrease (+) in Producer Inventory	-215	+350	+45	+30	+10	-33%	-67%
Total Mining Supply	**5,855**	**5,230**	**6,195**	**6,065**	**5,980**	**-2%**	**-1%**
Recycling	**1,980**	**2,035**	**1,710**	**1,865**	**1,815**	**9%**	**-3%**
Autocatalyst	1,120	1,255	1,190	1,235	1,295	4%	5%
Jewellery	855	775	515	625	515	21%	-18%
Industrial	5	5	5	5	5	0%	0%
Total Supply	**7,835**	**7,265**	**7,905**	**7,930**	**7,795**	**0%**	**-2%**
DEMAND							
Automotive	**3,180**	**3,310**	**3,385**	**3,435**	**3,360**	**1%**	**-2%**
Autocatalyst	3,035	3,155	3,245	3,295	3,220	2%	-2%
Non-road	140	150	140	135	140	-4%	4%
Jewellery	**2,945**	**3,000**	**2,880**	**2,605**	**2,590**	**-10%**	**-1%**
Industrial	**1,520**	**1,545**	**1,670**	**1,775**	**1,610**	**6%**	**-9%**
Chemical	535	555	605	595	580	-2%	-3%
Petroleum	115	65	140	220	100	57%	-55%
Electrical	185	190	165	160	155	-3%	-3%
Glass	145	175	200	205	170	3%	-17%
Medical and Biomedical	220	220	230	235	240	2%	2%
Other	320	340	330	360	365	9%	1%
Investment	**935**	**150**	**305**	**505**	**250**	**66%**	**-50%**
Change in Bars, Coins	-5	50	525	430			
Change in ETF Holdings	905	215	-240	-10			
Change in Stocks Held by Exchanges	35	-115	20	85			
Total Demand	**8,580**	**8,005**	**8,240**	**8,320**	**7,810**	**1%**	**-6%**
Balance	**-745**	**-740**	**-335**	**-390**	**-15**	**16%**	**-96%**
Above Ground Stocks 4,140*	**3,395**	**2,655**	**2,320**	**1,930**	**1,915**	**-17%**	**-1%**

Source: SFA (Oxford). *As of 31st December 2012. NB: Numbers have been independently rounded.

Table 3: Supply, demand and above ground stocks summary – quarterly comparison

	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q2'17/Q2'16 Growth %	Q2'17/Q1'17 Growth %
Platinum Supply-demand Balance (koz)										
SUPPLY										
Refined Production	**1,650**	**1,610**	**1,275**	**1,650**	**1,620**	**1,490**	**1,410**	**1,485**	**-10%**	**5%**
South Africa	1,210	1,190	810	1,200	1,180	1,065	1,015	1,045	-13%	3%
Zimbabwe	115	110	130	120	120	120	115	105	-13%	-9%
North America	90	100	100	105	100	85	95	85	-19%	-11%
Russia	190	160	190	180	175	170	140	205	14%	46%
Other	45	50	45	45	45	50	45	45	0%	0%
Increase (-)/Decrease (+) in Producer Inventory	+30	-40	+150	+60	-105	-75	-60	+70	17%	N/M
Total Mining Supply	**1,680**	**1,570**	**1,425**	**1,710**	**1,515**	**1,415**	**1,350**	**1,555**	**-9%**	**15%**
Recycling	**415**	**375**	**395**	**480**	**510**	**480**	**420**	**480**	**0%**	**14%**
Autocatalyst	295	270	280	340	315	300	300	330	-3%	10%
Jewellery	120	105	115	140	195	180	120	150	7%	25%
Industrial	0	0	0	0	0	0	0	0	N/M	N/M
Total Supply	**2,095**	**1,945**	**1,820**	**2,190**	**2,025**	**1,895**	**1,770**	**2,035**	**-7%**	**15%**
DEMAND										
Automotive	**815**	**845**	**875**	**895**	**785**	**870**	**890**	**850**	**-5%**	**-4%**
Autocatalyst	780	815	840	860	760	835	845	815	-5%	-4%
Non-road	35	35	35	35	30	35	35	35	0%	0%
Jewellery	**795**	**675**	**600**	**620**	**650**	**740**	**640**	**620**	**0%**	**-3%**
Industrial	**430**	**430**	**435**	**470**	**455**	**405**	**465**	**400**	**-15%**	**-14%**
Chemical	160	130	145	140	170	135	150	140	0%	-7%
Petroleum	35	35	55	60	55	55	45	10	-83%	-78%
Electrical	40	40	40	40	40	40	40	40	0%	0%
Glass	70	70	60	80	60	5	85	50	-38%	-41%
Medical and Biomedical	45	65	50	65	45	70	55	70	8%	27%
Other	80	90	85	85	85	100	90	90	6%	0%
Investment	**285**	**-95**	**155**	**90**	**40**	**220**	**80**	**90**	**0%**	**13%**
Change in Bars, Coins	180	220	140	110	70	110	25	70	-36%	180%
Change in ETF Holdings	110	-345	-25	-15	-85	115	65	20	N/M	N/M
Change in Stocks Held by Exchanges	-5	30	40	-5	55	-5	-10	0	N/M	N/M
Total Demand	**2,325**	**1,855**	**2,065**	**2,075**	**1,930**	**2,235**	**2,075**	**1,960**	**-6%**	**-6%**
Balance	**-230**	**90**	**-245**	**115**	**95**	**-340**	**305**	**75**		

Source: SFA (Oxford). NB: Numbers have been independently rounded. N/M means not meaningful.

Table 4: Supply, demand and above ground stocks summary – half-yearly comparison

	H2 2015	H1 2016	H2 2016	H1 2017	H1'17/H1'16 Growth %	H1'17/H2'16 Growth %
Platinum Supply-demand Balance (koz)						
SUPPLY						
Refined Production	**3,260**	**2,925**	**3,110**	**2,895**	**-1%**	**-7%**
South Africa	2,400	2,010	2,245	2,060	2%	-8%
Zimbabwe	225	250	240	220	-12%	-8%
North America	190	205	185	180	-12%	-3%
Russia	350	370	345	345	-7%	0%
Other	95	90	95	90	0%	-5%
Increase (-)/Decrease (+) in Producer Inventory	-10	+210	-180	+10	N/M	N/M
Total Mining Supply	**3,250**	**3,135**	**2,930**	**2,905**	**-7%**	**-1%**
Recycling	**790**	**875**	**990**	**900**	**3%**	**-9%**
Autocatalyst	565	620	615	630	2%	2%
Jewellery	225	255	375	270	6%	-28%
Industrial	0	0	0	0	N/M	N/M
Total Supply	**4,040**	**4,010**	**3,920**	**3,805**	**-5%**	**-3%**
DEMAND						
Automotive	**1,660**	**1,770**	**1,655**	**1,740**	**-2%**	**5%**
Autocatalyst	1,595	1,700	1,595	1,660	-2%	4%
Non-road	70	70	65	70	0%	8%
Jewellery	**1,470**	**1,220**	**1,390**	**1,260**	**3%**	**-9%**
Industrial	**860**	**905**	**860**	**865**	**-4%**	**1%**
Chemical	290	285	305	290	2%	-5%
Petroleum	70	115	110	55	-52%	-50%
Electrical	80	80	80	80	0%	0%
Glass	140	140	65	135	-4%	108%
Medical and Biomedical	110	115	115	125	9%	9%
Other	170	170	185	180	6%	-3%
Investment	**190**	**245**	**260**	**170**	**-31%**	**-35%**
Change in Bars, Coins	400	250	180	95	-62%	-47%
Change in ETF Holdings	-235	-40	30	85	N/M	N/M
Change in Stocks Held by Exchanges	25	35	50	-10	N/M	N/M
Total Demand	**4,180**	**4,140**	**4,165**	**4,035**	**-3%**	**-3%**
Balance	**-140**	**-130**	**-245**	**-230**		

Source: SFA (Oxford). NB: Numbers have been independently rounded. N/M means not meaningful.

Table 5: Regional demand – annual and quarterly comparison

	2013	2014	2015	2016	2017f	2016/2015 Growth %	2017f/2016 Growth %	Q3 2016	Q4 2016	Q1 2017	Q2 2017
Platinum gross demand (koz)											
Automotive	**3,180**	**3,310**	**3,385**	**3,435**	**3,360**	**1%**	**-2%**	**785**	**870**	**890**	**850**
North America	425	465	470	425							
Western Europe	1,360	1,450	1,555	1,645							
Japan	580	590	525	485							
China	130	125	130	170							
India	160	160	175	165							
Rest of the World	525	520	530	545							
Jewellery	**2,945**	**3,000**	**2,880**	**2,605**	**2,590**	**-10%**	**-1%**	**650**	**740**	**640**	**620**
North America	200	230	250	265							
Western Europe	220	220	235	240							
Japan	335	335	340	335							
China	1,990	1,975	1,765	1,450							
India	140	175	220	245							
Rest of the World	60	65	70	70							
Chemical	**535**	**555**	**605**	**595**	**580**	**-2%**	**-3%**	**170**	**135**	**150**	**140**
North America	55	55	65	55							
Western Europe	110	105	105	120							
Japan	15	15	10	15							
China	200	220	260	250							
Rest of the World	155	160	165	155							
Petroleum	**115**	**65**	**140**	**220**	**100**	**57%**	**-55%**	**55**	**55**	**45**	**10**
North America	40	25	-25	90							
Western Europe	-45	-15	70	10							
Japan	10	-35	5	0							
China	80	-5	45	80							
Rest of the World	30	95	45	40							
Electrical	**185**	**190**	**165**	**160**	**155**	**-3%**	**-3%**	**40**	**40**	**40**	**40**
North America	10	15	10	10							
Western Europe	5	10	10	10							
Japan	10	15	15	15							
China	75	70	60	60							
Rest of the World	85	80	70	65							
Glass	**145**	**175**	**200**	**205**	**170**	**3%**	**-17%**	**60**	**5**	**85**	**50**
North America	5	10	0	20							
Western Europe	-10	15	10	5							
Japan	0	-25	-5	-10							
China	90	85	95	100							
Rest of the World	60	90	100	90							
Medical and Biomedical	**220**	**220**	**230**	**235**	**240**	**2%**	**2%**	**45**	**70**	**55**	**70**
North America	90	90	90	90							
Western Europe	75	75	75	80							
Japan	20	20	20	20							
China	15	15	20	20							
Rest of the World	20	20	25	25							
Other industrial	**320**	**340**	**330**	**360**	**365**	**9%**	**1%**	**85**	**100**	**90**	**90**
Investment	**935**	**150**	**305**	**505**	**250**	**66%**	**-50%**	**40**	**220**	**80**	**90**
Total Demand	**8,580**	**8,005**	**8,240**	**8,320**	**7,810**	**1%**	**-6%**	**1,930**	**2,235**	**2,075**	**1,960**

Source: SFA (Oxford). NB: Numbers have been independently rounded.

GLOSSARY OF TERMS

Above ground stocks

The year-end estimate of the cumulative platinum holdings not associated with: exchange-traded funds, metal held by exchanges or working inventories of: mining producers, refiners, fabricators or end-users. Typically, unpublished vaulted metal holdings from which a supply-demand shortfall can be readily supplied or to which a supply-demand surplus can readily flow.

BDH

Butane dehydrogenation; catalytic conversion of isobutane to isobutylene.

Bharat Stage III/IV standards (BS-III, BS-IV)

Bharat Stage III is equivalent to Euro 3 emissions legislation. Introduced in 2005 in 12 major cities across India and enforced nationwide from April 2010. Bharat Stage IV is equivalent to Euro 4 emissions legislation. Introduced in 2010 in 14 major cities across India and set to be enforced nationwide from April 2017.

Bharat Stage V/VI standards (BS-V, BS-VI)

Early in 2016 the Indian government announced the intention to 'leapfrog' Bharat Stage V and move directly to Bharat Stage VI, equivalent to Euro 6, in 2020.

Conformity factor (CF)

The EU is to allow automakers to exceed current Euro 6 NO_x limits, giving time to adapt to new real-world driving emissions rules. From September 2017 for new models and from September 2019 for new vehicles, a CF of up to 2.1 (110%) will be allowed over the 80 mg/km NO_x limit. This CF will be phased out at the latest in 2021, then from January 2020 (new models) and January 2021 (new vehicles) a lower CF of 1.5 will be allowed, reflecting statistical and technical uncertainty of the tests.

Diesel oxidation catalyst (DOC)

A DOC oxidises harmful carbon monoxide and unburnt hydrocarbons, produced by incomplete combustion of diesel fuel, to harmless carbon dioxide and water.

Diesel particulate filter (DPF) and catalysed diesel particulate filter (CDPF)

A DPF physically filters particulates (soot) from diesel exhaust. A CDPF adds a PGM catalyst coating to facilitate oxidation and removal of the soot. The terms are often used interchangeably.

Emissions legislation

Tailpipe regulations covering emissions of particulate matter, hydrocarbons and oxides of nitrogen.

ETF

Exchange-traded fund. A security that tracks an index, commodity or basket of assets. Platinum ETFs included in demand are backed by physical metal.

Euro V/VI emission standards

EU emission standards for heavy-duty vehicles. Euro V legislation was introduced in 2009 and Euro VI in 2013/2014; will be widely adopted later in other regions.

Euro 5/6 emission standards

EU emission standards for light-duty vehicles. Euro 5 legislation was introduced in 2009 and Euro 6 in 2014/2015; will be widely adopted later in other regions.

Form factor

The size of a hard disk drive (e.g. 2.5-inch or 3.5-inch) which varies depending on the device the drive is used in.

GTL

Gas-to-liquids is a refinery process that converts natural gas to liquid hydrocarbons such as gasoline or diesel fuel.

HDD

Hard disk drive.

HDV

Heavy-duty vehicle.

koz

Thousand ounces.

LCD

Liquid-crystal display used for video display.

LCV

Light commercial vehicle.

Lean NO_x traps (LNT)

Rhodium-based, catalyses the chemical reduction of NO_x in diesel engine exhaust to harmless nitrogen.

Metal-in-concentrate

PGMs contained in the concentrate produced after the crushing, milling and froth flotation processes in the concentrator. It is a measure of a mine's output before the smelting and refining stages.

moz

Million ounces.

Net demand

A measure of the theoretical requirement for new metal, i.e. net of recycling.

Non-road engines

Non-road engines are diesel engines used, for example, in construction, agricultural and mining equipment, using engine and emissions technology similar to on-road heavy-duty diesel vehicles.

NO_x storage catalyst (NSC)

Used in light duty diesel aftertreatment to convert harmful oxides of nitrogen to harmless nitrogen and carbon dioxide. The PGM content is mainly platinum, with some rhodium. NSCs may be used in conjunction with SCR technology to minimise NO_x emissions.

OECD

Organisation for Economic Co-operation and Development, consisting of 34 developed countries.

oz

A unit of weight commonly used for precious metals. 1 troy ounce = 1.1 ounces.

Paraxylene

A chemical produced from petroleum naphtha extracted from crude oil using a platinum catalyst. This is used in the production of terephthalic acid which is used to manufacture polyester.

PDH

Propane dehydrogenation, where propane is converted to propylene.

PGMs

Platinum-group metals.

Producer inventory

As used in the supply-demand balance, the change in producer inventory is the difference between reported refined production and metal sales.

RDE

Real Driving Emissions - the term used by the EU to define the testing protocol that will measure pollutants emitted from cars, including NO_x, while driven on the road. It is in addition to laboratory tests. RDE testing will be implemented in September 2017 for new types of cars and will apply to all registrations from September 2019.

Refined production

Processed platinum output from refineries.

Secondary supply

Recycling output.

Selective catalytic reduction (SCR)

PGM-free, converts harmful NO_x in diesel exhaust to harmless nitrogen, via a tank of urea solution. Used in heavy-duty diesel vehicles, increasingly competes with LNT in light-duty diesel vehicles. Contained within an aftertreatment system which normally requires a platinum-containing oxidation catalyst ahead of the SCR unit.

SGE

Shanghai Gold Exchange.

SSD

Solid-state drive.

Stage 4 regulations

European emission standards implemented in 2014 for non-road diesel engines.

Three-way catalyst

Used in gasoline cars to remove hydrocarbons, carbon monoxide and NO_x. Largely palladium-based now, some rhodium.

Tier 4 stage

Emissions standards phased in between 2008 and 2015 in the US for non-road vehicles.

WLTP

Worldwide Harmonized Light Vehicles Test Procedure is a laboratory test to measure pollutant emissions and fuel consumption. WLTP replaces the New European Drive Cycle (NEDC).

WPIC

The World Platinum Investment Council.

Ounce conversion

1 million ounces = 31.1 tonnes.

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