PLATINUM QUARTERLY

Q3 2024

26th November 2024

World Platinum Investment Council

FOREWORD

This edition of *Platinum Quarterly* presents platinum supply and demand developments for the third quarter of 2024, an updated outlook for 2024 and a first forecast for 2025. It also provides WPIC's views on relevant issues and trends for investors considering exposure to platinum as an investment asset, plus an update on how our product partnerships continue to benefit investors. The *Platinum Quarterly* data and commentary (starting on page 7) are prepared independently for WPIC by Metals Focus.

Platinum is expected to enter a third consecutive year of market deficits in 2025f. The platinum market deficit is expected to be 682 koz in 2024f and narrow to 539 koz in 2025f. Platinum's diverse uses across a number of end markets is a key theme supporting the metal's track record for consecutive market deficits. Versus 2024f, automotive, jewellery and investment demand are expected to increase in 2025f, which will broadly offset cyclically weak industrial platinum demand during 2025f. Indeed, automotive demand is projected to achieve an eight-year high in 2025f. Platinum supply estimates have been revised higher for 2024f to reflect a release of work-in-progress inventory in South Africa. In aggregate, platinum supply is forecast to remain stable in 2025f as growth in recycling offsets an erosion from mining supply.

2024f deficit decreases to 682 koz, equivalent to 9% of projected annual demand

- Updating the outlook for 2024f, the platinum deficit is 682 koz, which represents a decrease of 347 koz compared to the last *Platinum Quarterly*. The updated platinum market deficit reflects expectations for higher supply and lower demand.
- Total supply is now forecast to increase by +2% year-on-year to 7,269 koz in 2024f. Total supply has been revised by +180 koz mainly due to stronger than expected refined mine production in South Africa and Russia, where producers have raised full-year guidance on a release of work-in-progress inventory and swifter maintenance completion respectively.
- Total platinum demand of 7,951 koz in 2024f is expected to be in-line with 2023. However, demand expectations were revised lower (-166 koz) to reflect an outflow of platinum stocks held by exchanges (-85 koz) and a downward revision to automotive production numbers in response to weaker sales (-64 koz) as opposed to any acceleration in drivetrain electrification.

2025f expected to deliver another material platinum market deficit

- The platinum market is expected to record a deficit of 539 koz in 2025f. The deficit represents 7% of 2025f platinum demand with the market not expected to record large changes in either total supply (+1% year-on-year) or total demand (-1% year-on-year).
- Platinum supply is expected to increase by 55 koz to 7,324 koz in 2025f. Growth in recycled autocatalyst supply to 1,346 koz (+170 koz, +14% year-on-year) will underpin higher total platinum supply. In contrast, mine supply is expected to be lower in 2025f (-133 koz, -2% year-on-year) as the impacts of restructuring in South Africa and North America during 2024 begin to reflect in production.
- Total platinum demand is expected to decline by 88 koz to 7,863 koz in 2025f. While automotive, jewellery and investment demand are expected to increase, 2025f demand will be impacted by a 9% year-on-year decline in industrial demand predominantly due to negligible new glass capacity additions.

Platinum supply and demand – Q3 results and the read-throughs for the 2024 and 2025 full year outlooks

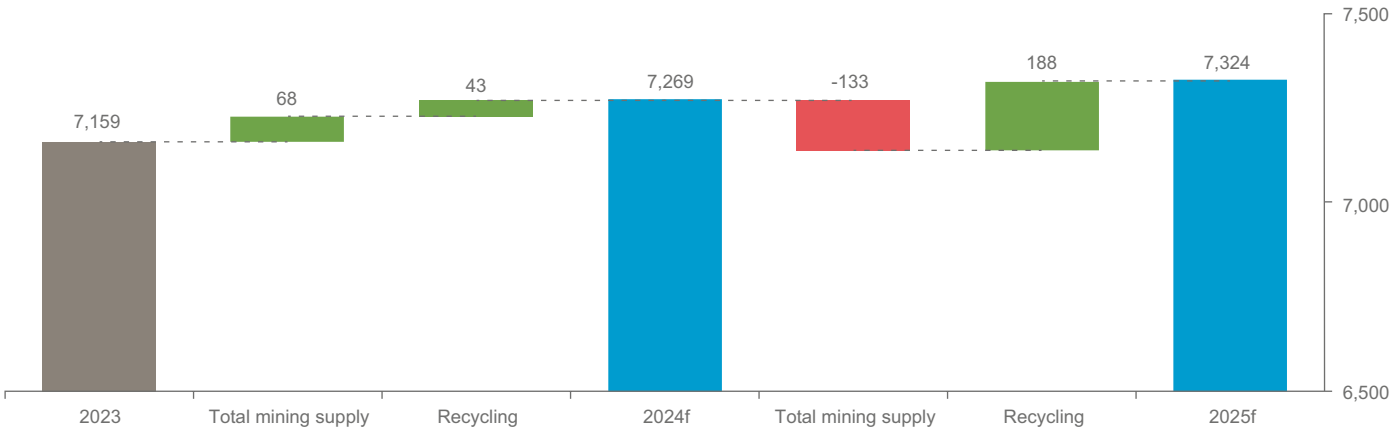
Q3 2024 surplus of 260 koz on exchange trade fund outflows

Quarterly platinum demand reached a two-year low of 1,567 koz in Q3 2024 as exchange traded fund (ETF) liquidations of 300 koz occurred. ETF investors appeared to take some profits in the quarter, as platinum prices gave back gains made during Q2 2024. Elsewhere, automotive platinum demand decreased by 3% year-on-year in Q3 2024. It must be stressed that declining automotive demand does not reflect a change in previously discussed drivetrain trends. The rate of battery electric vehicle (BEV) demand growth continues to decelerate. Hybrid demand is proving robust and pure Internal Combustion Engine (ICE) is declining slowly. Instead, Q3 2024 largely reflected a weaker European market where cost of ownership headwinds impacted the new vehicle market and offset demand growth across all other geographies. Elsewhere, quarterly platinum demand benefitted from year-on-year increased demand in the jewellery and industrial segments.

Total platinum supply increased by 5% year-on-year in the third quarter of 2024. Mine supply increased by 7% year-on-year to 1,479 koz in Q3 2024, largely driven by South Africa. The country benefitted from improved smelter availability supported by reduced electricity shortages during the quarter which together allowed for a release of work-in-progress inventory and more than offset some processing constraints in Zimbabwe. In Russia, a planned smelter rebuild was completed ahead of schedule while the effect of announced restructuring in North America did not have much impact on production in Q3. Recycling supply was flat year-on-year in Q3 2024. Although autocatalyst recycling supply increased by 2% year-on-year, messaging remains mixed with smaller scrapyards reportedly happy to hold material back in hopes of higher prices, while others maintain that there is simply a lack of available material due to weak new vehicle markets.

The net impact was a quarterly market surplus of 260 koz in Q3 2024 following two quarters of significant deficits, each approaching almost half a million ounces.

Annual total supply and changes 2023 to 2025f (koz)



Source: Metals Focus

Updated 2024 outlook – platinum market deficit of 682 koz reflects 9% of demand

The forecast deficit for full year 2024f is 682 koz. The 2024f deficit is smaller than the 759 koz deficit reported for 2023 as supply growth modestly outpaced demand growth (+1.5% versus +0.4% year-on-year).

The full year 2024 mine supply outlook is for +1% year-on-year growth to 5,683 koz. Compared to the last *Platinum Quarterly*, mine supply has been revised 175 koz higher in 2024f to reflect a drawdown on work-in-progress metal inventory in South Africa and negligible disruptions from planned smelter maintenance in Russia. Notably, South Africa's load curtailments in 2022 and 2023 were largely managed by flexing smelter utilisations. Now that miners are benefitting from stable power supply, smelter availability has improved. This together with fewer electricity shortages has enabled the release of pipeline inventory. Recycling supply saw negligible revisions and is forecast to increase by 3% year-on-year with a limited uptick in spent catalyst supply making its way to refiners. Total supply is expected to rise by 2% from 2023 to 7,269 koz.

Total platinum demand for 2024f has been revised down 166 koz to 7,951 koz from our September estimates, representing 33 koz of growth versus 2023. Automotive demand is now expected to decline by -2% year-on-year to total 3,173 koz. Automotive demand has been revised lower due to a reduction in absolute vehicle production forecasts as cost headwinds have negatively impacted vehicle sales and production (particularly in Europe). Nevertheless, the thematic of slowing BEV growth resulting in higher-for-longer ICE demand remains unchanged. Compared to expectations at the start of the year that BEV would achieve a 15% market share in 2024f, revised forecasts now anticipate only a 2024f BEV market share of 13% (2023: 12% per Global Data).

Investment demand is forecast to be 393 koz in 2024f and has been revised 124 koz lower since our last *Platinum Quarterly* due to disposals of metal held by exchanges. Elsewhere the themes in 2024 are broadly unchanged with weaker bar and coin demand being offset by ETF inflows.

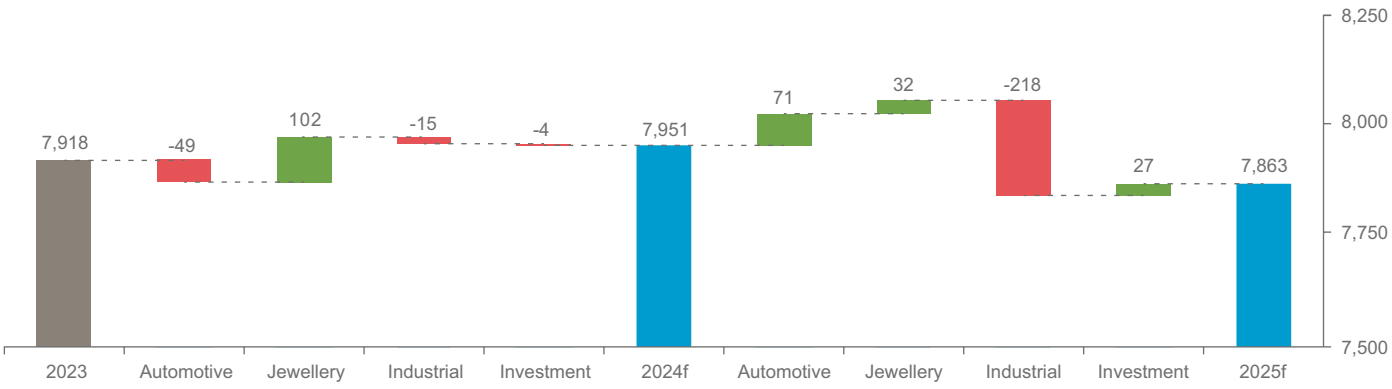
Industrial platinum demand is expected to decrease by 1% year-on-year in 2024f as fewer chemical plants commission in China. This will be partially offset by the glass segment commissioning new capacity. In jewellery, total platinum demand is forecast to be 5% higher in 2024f than in 2023 driven by broad-based growth everywhere except China which continues to see weak consumer spending on domestic economic concerns.

Combining upward supply revisions with downward demand revisions, the forecast deficit for 2024f has decreased from 1,028 koz (per the previous *Platinum Quarterly*) to 682 koz.

Initial 2025f forecasts – a third consecutive year of market deficits, further depleting above ground stocks

Some themes that have characterised the past two years are expected to continue into 2025f. Supply is expected to remain subdued in 2025f as lower mine production offsets growth in recycling. Total platinum demand will be resilient, benefitting from the diversity of platinum's end uses. Automotive, jewellery and investment demand are each expected to see single digit growth in 2025f, together helping to mitigate cyclical weakness in industrial platinum demand, which is dominated by the timing of glass capacity additions. Combining both weaker supply with subdued demand leads to a still substantial platinum market deficit of 539 koz in 2025f, which represents 7% of demand.

Annual total demand and changes 2023 to 2025f (koz)

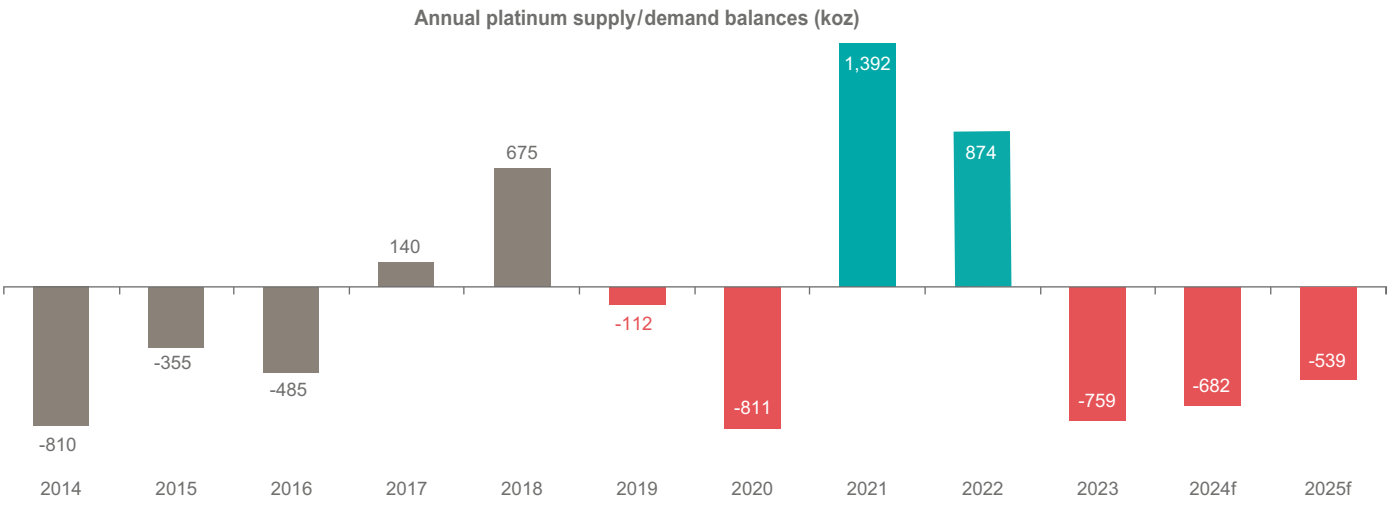


Source: Metals Focus

During 2025f, mined platinum supply is expected to decrease by 2% year-on-year to 5,550 koz due to lower output from South Africa and North America. South African production is forecast to be 2% (-71 koz) lower than in 2024f as the restructuring initiatives to curtail unprofitable ounces take effect. Additionally, South African supply is likely to see less benefit in 2025f from releasing pipeline stocks than 2024f. North America is the second largest contributor to lower mined supply, as the Stillwater West mine is placed on care and maintenance. Recycling supply is forecast to increase by 12% year-on-year in 2025f, on a recovery in end-of-life scrap vehicle availability. Notably, automotive recycling supply is still expected to be around 14% below the average supply from 2019 to 2021 (peak supply). Combining mine and recycled supply, total platinum supply is expected to be 7,324 koz in 2025f, around 5% below the ten-year average supply of 7,716 koz

Platinum demand is forecast to decrease by 88 koz or 1% year-on-year in 2025f. Platinum demand should benefit from diversification since a slowdown in new glass capacity start-ups is the single largest constituent impacting demand (-385 koz in 2025f versus 2024f). Elsewhere, platinum demand is proving resilient. Automotive demand is expected to increase by 2% year-on-year in 2025f as hybridisation, platinum for palladium substitution and commercial vehicle growth more than offset fewer pure-ICE passenger vehicles. Adding colour to the light-duty automotive market, combined ICE and hybrid vehicle production is expected to fall from 79 to 78 million units in 2025f, reflecting the continued growth of the BEV market share. Separately, the jewellery market will benefit from demand growth in the US, India and a modest recovery in China as high gold prices push consumers to platinum. Investment demand of 420 koz in 2025f reflects a slowdown in bar and coin purchases as well as ETF accumulations.

The global platinum market will record a third year of deficits at 539 koz, equivalent to 1,980 koz of above ground stock drawdown over this three-year period, representing a continuation of tight fundamentals.



Source: SFA (Oxford) 2014 - 2018, Metals Focus 2019 - 2025f

The platinum investment case – muted supply and resilient demand reiterate risk of metal shortages

Platinum's market trends are entrenching themselves to support a third year of consecutive deficits. Platinum demand is proving resilient against the backdrop of global uncertainty while, platinum supply shows no sign of returning to pre-pandemic levels as PGM basket prices are not incentivising investment in growth. The result of ongoing deficits is rapidly depleting above-ground stocks, which, are forecast to decline by 40% over the three years to 2025f.

The economic outlook as it pertains to platinum demand has improved since our previous *Platinum Quarterly*, albeit there are several moving parts. Firstly, central banks have begun cutting interest rates as inflation has trended to targets. Easing monetary policy is likely to be supportive of new vehicle purchases or larger industrial investments as financing headwinds reduce. Secondly, China has announced its intentions to support its economy through stimulus. It is worth noting that China is the world's single largest platinum end-market, and demand may be a beneficiary of pro-growth policies.

Finally, the US elections have concluded with the Republicans taking the White House. The incoming government could be an obstacle for developing the US' nascent hydrogen industry, given prior criticism of the Inflation Reduction Act (IRA). However, it is unclear whether hydrogen incentives are to be scrapped given Republican states have been greater beneficiaries of the IRA. Nevertheless, our expectations are that the hydrogen opportunity in China and the EU is larger than the US. Moreover, any rolling back of environmental legislation in the US is likely to impact the automotive sector in two ways. First due to a slower rate of BEV adoption and second as a result of less stringent or delays in implementing emissions legislation. Accordingly, PGM demand would likely be a net beneficiary in the short and medium-term.

Focussing on the automotive sector, platinum demand is forecast to decrease by 2% year-on-year in 2024f and increase by 2% year-on-year in 2025f. The drivetrain narrative continues to reflect slowing BEV demand growth with consumers preferring the intermediary electrification step of hybrids. The global market share of passenger BEVs is now forecast to increase by a modest 1% from 12% in 2023 to 13% in 2024f. Tellingly, BEV demand growth is expected to re-accelerate in 2025f. As less expensive BEV models are launched and fleet wide CO_2 emission targets penalise ICE-based vehicles, BEV production is forecast to increase by 31% year-on-year. While recent history suggests there are downside risks to BEV growth rates, the negative implication for ICE-based passenger vehicle production (including hybrids) is modest with volumes only falling by 2m units over two-years from 80m units to 78m units in 2025f. Declining volumes are partially offset by vehicle hybridisation (where PGM loadings are higher) and continued platinum for palladium substitution. Elsewhere, platinum demand will benefit from growth in the heavy-duty vehicle segment in 2025f as the market benefits from declining financing costs.

Turning to industrial platinum demand, end-markets can be described as healthy despite elevated global interest rates and broader economic uncertainty. The challenge for 2025f, where industrial demand is forecast to decline by -9% year-on-year, is mostly a timing issue with respect to the glass segment and plant start-ups. Glass capacity additions that were previously expected in 2025f, are now expected in Q4 2024f. Hence, the glass segment is going from its second-best year on record for platinum demand in 2024f to its weakest year since 2019 in 2025f. Excluding the glass segment, industrial demand would be forecast to increase by 9% year-on-year underpinned by double-digit growth in chemicals, petroleum, and the hydrogen stationary and other segments.

Rounding out the demand side of platinum's investment case, platinum jewellery demand should continue to move beyond the trough of 2023, with a second consecutive year of demand growth forecast for 2025f. Chinese jewellery demand is expected to show some recovery in 2025f along with ongoing growth in India. Notably, price sensitive consumers are finding better value in platinum given rising gold prices. Investment demand could surprise as sentiment improves. Platinum, as a non-yielding asset, should become more attractive with declining interest rates. Moreover, market development activity is making platinum bar and coin investment more accessible with notable developments being the launch of platinum bar sales at Costco in the US and the launch of additional platinum products by China Gold Coin Group (CGCG) in China.

The other main component of platinum's investment case is its uncertain supply outlook. Over the past 12-months platinum miners have announced restructuring initiatives which have included headcount reductions, curtailing unprofitable supply and deferring future growth and replacement projects. Mine supply of 5,550 koz in 2025f represents approximately 577 koz less annual supply that the average between 2015 and 2019. While restructuring is for the time being expected to be completed by the end of 2024, the fundamental reason for restructuring has not changed. Although the ZAR denominated PGM basket price has been stable for around a year, prices remain too low to incentivise new investment. With mining inflation expected to drive production costs higher, there remains a scenario where further measures may be required to help support the industry's financial sustainability. Accordingly, platinum supply risks remain elevated in our view.

Overall, investor sentiment appears to be improving, attracted by strengthening fundamentals. While a price response is not yet forthcoming, market deficits stemming from higher-for-longer automotive demand and ongoing supply challenges have already resulted in above-ground stocks becoming the supply of last resort. The depletion of these stocks (-40% between 2022 to 2025f) should eventually help physical markets tighten and translate into renewed upward pressure on the platinum price.

WPIC initiatives highlights

We continue to work closely with our wide global network of product partners which provides us with the ability to support new platinum investment product development and also to identify market developments and appropriate strategies to increase investment in platinum. While demand for precious metals has dipped below the exceptional levels seen over the past three years, its resilience is being maintained by ongoing global uncertainty and the start of interest rate reductions.

In Europe and North America, we have witnessed heightened interest in platinum since its discount to gold has deepened following the significant rise in the gold price. The fact that platinum's compelling fundamentals are not yet reflected in price is a situation increasingly being seen by many investors as unsustainable. Growing awareness of platinum's attractiveness has undoubtedly been bolstered by the significant news flow associated with Costco launching platinum bar and coin sales. Not only has this contributed to a widespread increase in platinum product sales by our partners, but it has also had the beneficial effect of significantly raising awareness of the possibility of including physical platinum in an individual retirement savings accounts in the US. Further, our partner salesforce training continues to yield positive results in terms of maintaining and developing knowledge around platinum investment and increased product sales.

In China, direct sales by our product partners to the end of Q3 grew by 38% year-on-year. This was helped by our ongoing support of our partners in China in expanding their platinum offerings and the design of new products – including those with gifting and collectible features that appeal to a wider range of customers. China Gold Coin Group (CGCG) has confirmed plans to double its production of the 30g Platinum Panda Coin for 2025, alongside its Year of the Snake platinum bars and coins. CGCG also introduced a signature product, launched at the Beijing National Coin Exposition in October, its first-ever 1 kg minted platinum bar with a distinctive Chinese cultural design. Shenzhen fabricator Yue Heng reported a significant increase in platinum orders from gold distributors, who shifted focus to promote more affordable platinum as gold sales slowed due to heightened prices.

In Japan, we collaborated with Rakuten on a marketing campaign from July to September, receiving positive feedback in terms of both sales growth and investor retention.

As the year draws to a close, we are pleased to note an increase in the simultaneous launch of new 2025 platinum bullion coins together with their gold and silver coin counterparts across all major markets.

Trevor Raymond, CEO

Contents

Table 1: Supply, demand and above ground stock summary

	2021	2022	2023	2024f	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q2 2024	Q3 2024
Platinum Supply-demand Balance (koz)									
SUPPLY									
Refined Production	**6,295**	**5,520**	**5,604**	**5,626**	**5,550**	**0%**	**-1%**	**1,541**	**1,479**
South Africa	4,678	3,915	3,957	4,000	3,929	1%	-2%	1,128	1,073
Zimbabwe	485	480	507	504	522	-1%	3%	126	126
North America	273	263	275	252	232	-8%	-8%	59	60
Russia	652	663	674	678	676	1%	0%	181	172
Other	206	200	190	191	191	0%	0%	48	48
Increase (-)/Decrease (+) in Producer Inventory	-93	+43	+11	+57	+0	>±300%	-100%	+35	+0
Total Mining Supply	**6,202**	**5,563**	**5,615**	**5,683**	**5,550**	**1%**	**-2%**	**1,576**	**1,479**
Recycling	**2,106**	**1,762**	**1,544**	**1,587**	**1,774**	**3%**	**12%**	**388**	**348**
Autocatalyst	1,618	1,322	1,143	1,176	1,346	3%	14%	297	260
Jewellery	422	372	331	335	347	1%	4%	72	68
Industrial	67	69	71	76	81	8%	6%	19	20
Total Supply	**8,308**	**7,326**	**7,159**	**7,269**	**7,324**	**2%**	**1%**	**1,964**	**1,827**
DEMAND									
Automotive	**2,441**	**2,751**	**3,223**	**3,173**	**3,245**	**-2%**	**2%**	**805**	**750**
Autocatalyst	2,441	2,751	3,223	3,173	3,245	-2%	2%	805	750
Non-road	†	†	†	†	†	N/A	N/A	†	†
Jewellery	**1,953**	**1,880**	**1,849**	**1,951**	**1,983**	**5%**	**2%**	**497**	**478**
Industrial	**2,526**	**2,336**	**2,449**	**2,434**	**2,216**	**-1%**	**-9%**	**667**	**565**
Chemical	658	694	786	563	656	-28%	17%	140	137
Petroleum	169	193	161	161	211	0%	31%	40	40
Electrical	135	106	89	90	92	1%	2%	23	24
Glass	753	505	521	671	286	29%	-57%	225	125
Medical	267	278	292	303	314	4%	4%	77	78
Hydrogen Stationary and Other	17	12	29	64	84	123%	32%	14	17
Other	528	548	571	582	574	2%	-1%	148	144
Investment	**-3**	**-516**	**397**	**393**	**420**	**-1%**	**7%**	**462**	**-226**
Change in Bars, Coins	349	259	322	171	151	-47%	-12%	17	69
China Bars ≥ 500g	27	90	134	157	170	17%	8%	41	30
Change in ETF Holdings	-241	-558	-74	150	50	N/A	-67%	444	-300
Change in Stocks Held by Exchanges	-139	-307	14	-85	50	N/A	N/A	-40	-25
Total Demand	**6,917**	**6,451**	**7,918**	**7,951**	**7,863**	**0%**	**-1%**	**2,431**	**1,567**
Balance	**1,392**	**874**	**-759**	**-682**	**-539**	**N/A**	**N/A**	**-467**	**260**
Above Ground Stocks	**4,119****	**4,993**	**4,235**	**3,553**	**3,014**	**-16%**	**-15%**		

Source: Metals Focus 2020 - 2025f.

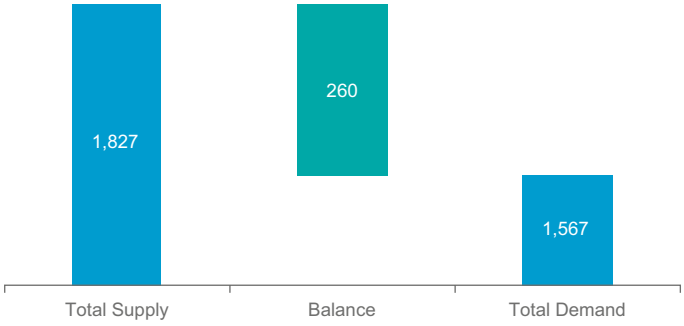
Notes:

1. **Above Ground Stocks 3,650 koz as of 31 December 2018 (Metals Focus).
2. † Non-road automotive demand is included in autocatalyst demand.
3. All estimates are based on the latest available information, but they are subject to revision in subsequent quarterly reports.
4. The WPIC did not publish quarterly estimates for 2013 or the first two quarters of 2014. However, quarterly estimates from Q3 2014, to Q2 2022 are contained in previously published PQs which are freely available on the WPIC website.
5. Quarterly estimates from Q3 2022 and half-yearly estimates from H1 2022 are included in Tables 3 and 4 respectively, on pages 23 and 24 (supply, demand and above ground stocks). Details of regional recycling supply in Table 6 on page 26 are only published from 2019.

2024 THIRD QUARTER PLATINUM MARKET REVIEW

In Q3'24, the platinum market swung into a surplus of 260 koz for the first time this year. This resulted from improved supply, especially refined mine production, and lower demand. South African miners accelerated work in process inventory release to see global mine supply increase by 7% year-on-year (+92 koz) to 1,479 koz, while supply from scrap sources remained flat. More robust quarterly demand in other industrial sectors offset weaker automotive markets. However, global demand declined 11% (-190 koz) to 1,567 koz as ETF liquidations and exchange stock movements resulted in disinvestment for the quarter.

Chart 1: Supply-demand balance, koz, Q3 2024



Source: Metals Focus

Supply

Global refined mine supply grew by 7% year-on-year to 1,479 koz, primarily driven by increased output from South Africa, while other regions experienced only modest changes.

For the second consecutive quarter, the release of semi-finished inventory from Anglo American Platinum (Amplats) was the main driver of global supply growth. The absence of load curtailment by Eskom allowed uninterrupted processing operations, with refined output surpassing underlying mine production. The release of semi-finished inventory has been faster than anticipated, with Amplats increasing its full-year production guidance.

Impala Platinum's (Implats) refined production in South Africa decreased due to scheduled smelter maintenance and a water outage that impacted refining activities. Output from Sibanye-Stillwater's Marikana operation remained stable year-on-year. Production losses due to the downsizing of the Rowland shaft and the closure of the 4B shaft—part of cost-driven restructuring—were offset by increased output from the ramp-up of the K4 shaft.

Overall, South Africa's output rose by 9% year-on-year to 1,073 koz. National production has now exceeded 1 Moz for two consecutive quarters, marking the first such occurrence since 2021.

In Zimbabwe, output declined by 5% year-on-year to 126 koz, primarily due to the commissioning of the expanded Zimplats smelter. While mined output remained steady, the smelter's commissioning led to a build-up of semi-finished inventory, impacting refined output.

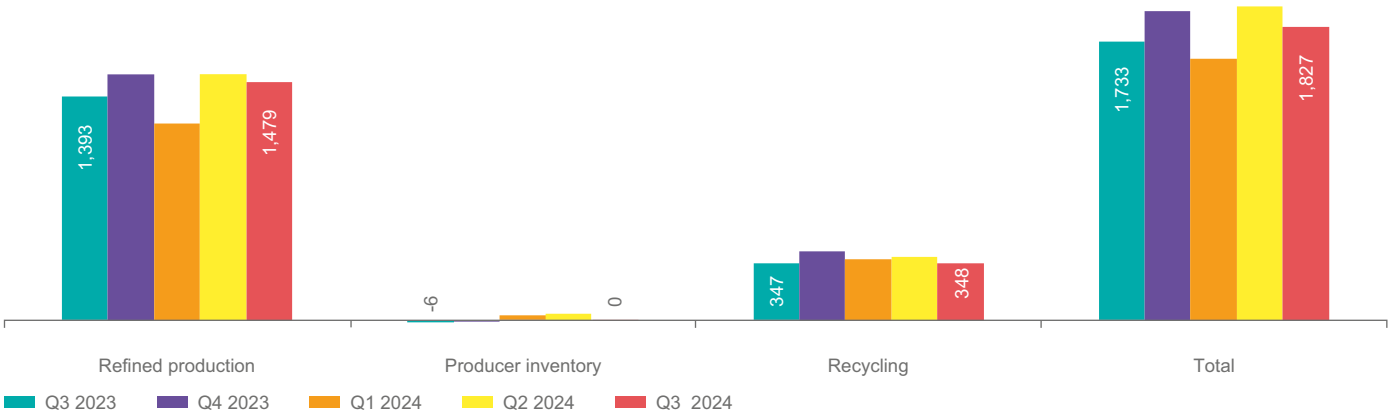
Russian production rose by 2% year-on-year to 172 koz, despite some impact from the reconstruction of smelting furnace #2 at the Nadezhda Metallurgical Plant. Production in Q3'23 was hampered by lower PGM content in mined ore.

In North America, production was unchanged year-on-year at 60 koz, with little variation across the region's primary contributors: Sibanye-Stillwater's US operations, Canadian by-product nickel producers, and Impala Canada. Despite an improvement in mined PGM grades at Sibanye-Stillwater's US operations, a cyber-attack in July disrupted processing operations at the Columbus metallurgical complex, leading to a build-up of semi-finished inventory.

Recycling

Q3'24 supply from secondary sources remained flat year-on-year, reaching 348 koz. This stable result was underpinned by a 2% (+6 koz) increase in spent autocatalyst supply, as recyclers reported stable levels of supply. However, some hoarding and lower inventories of end-of-life vehicles (ELVs), driven by consumers either holding on to their vehicles for longer or opting to buy second-hand rather than new, especially amid stubbornly higher new vehicle prices, is holding back recovery in supply. Jewellery recycling declined 10% year-on-year due to price weakness and the absence of destocking which was prevalent in Q3'23, when jewellers shifted away from platinum to gold in that quarter, especially in China. Electronic recycling increased by 14% (+2 koz), in part supported by data centres upgrading to accommodate newer, faster technologies.

Chart 2: Platinum supply, koz

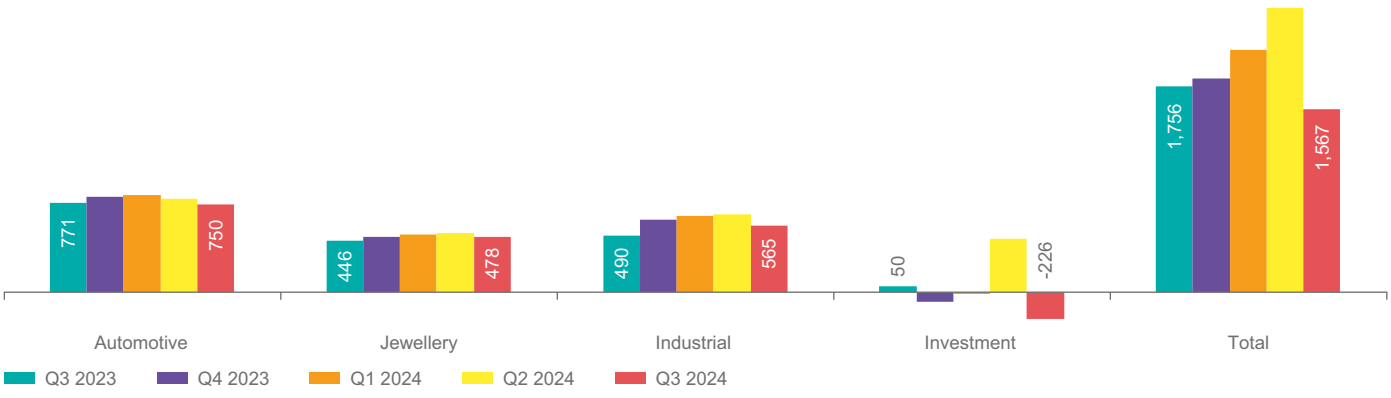


Source: Metals Focus

Demand

Global demand declined by 11% year-on-year to 1,567 koz as a spell of disinvestment and weaker vehicle sales weighed on platinum demand. Industrial demand improved year-on-year, but this comparison is skewed by weakness in Q3'23.

Chart 3: Platinum demand, koz



Source: Metals Focus

Automotive demand

In Q3'24, global automotive platinum demand declined by 3% (-21 koz) year-on-year as growth in demand from regions outside Europe was insufficient to offset the European downturn. Global Light-Duty Vehicle (LDV) production also fell by 3%, with a 28% increase in hybrid vehicle output unable to counterbalance a 12% decline in pure Internal Combustion Engine (ICE) vehicle manufacturing, thereby weighing on platinum demand.

Global Heavy-Duty Vehicle (HDV) production dropped by 7% globally, reflecting the effects of pre-buy activities in Europe during 2023, when fleet operators accelerated purchases ahead of the European Union's General Safety Regulations, effective from July 2024, to avoid associated cost increases. Meanwhile, Non Road Vehicle (NRV) production varied across sectors during this quarter. Following aggressive post-COVID stimulus programmes that boosted agricultural machine output and purchases, high farming input costs and disappointing yields have led farmers to delay new equipment orders. In contrast, demand for construction equipment, driven by global housing needs, saw this segment increase by 11%.

In Europe, demand declined by 14% (-36 koz) during the quarter as diesel LDV production dropped 14%, while gasoline vehicle production fell by 2%. Production has been scaled back in response to weak sales rates, driven by record-high vehicle prices and a challenging economic backdrop.

North American demand increased by 1% (+2 koz) despite a 5% year-on-year decline in LDV production and an 11% year-on-year decline in HDV production. A combination of increased hybridisation and higher platinum loadings helped counter the decline in the HDV and NRV sectors.

In Japan, platinum demand increased 4% (+3 koz), despite the headwinds that continued to plague the country in the quarter, namely supply disruptions following irregularities related to testing procedures for safety equipment as well as incorrect reported safety and emissions data. Increased production of hybrid and fuel cell vehicles as well as steady HDV production offset the impact of declining ICE production.

Chinese platinum demand rose by 4% (+5 koz) as hybrid vehicle production kept pace with BEV production. Hybrid production surpassed 1 million units in Q4'22 and has since then steadily grown to match the BEV production numbers. Additionally, the government's decision at the end of July to double trade-in subsidies has benefited all powertrain categories.

Elsewhere, vehicle production and platinum demand were flat in the quarter. The modest decline in ICE vehicle production (-2%) was adequately offset by the 27% increase in hybrid vehicles.

Jewellery demand

Global jewellery demand increased by 7% year-on-year to 478 koz in Q3'24 (+32 koz).

Demand in Europe grew by a modest 3% year-on-year in Q3'24, although results varied considerably between sectors and countries. On the one hand, the mass market and bridal remained disappointingly soft, due to cost-of-living issues (as illustrated by UK hallmarking falling by 1%). However, the luxury sector saw further gains, as suggested by Swiss platinum hallmarking being up 44% in Q3'24.

North American fabrication also rose by 3% in Q3'24, with support coming from the now familiar mix of widening price differentials to white gold and lower diamond prices (reducing the total price of gem set items). Cost-of-living issues are less of a feature at platinum's price points in North America, although a soft engagement market was still apparent.

Q3'24 saw robust Japanese jewellery demand, which came at a stark contrast to the sharp drop we saw in gold jewellery fabrication. The exceptionally high gold price compared to what is perceived to be a reasonable or even attractive platinum one, has seen the white metal gain market share from gold in this segment. The local gold price hit a new record in July whereas the platinum price spent the quarter only a little higher than its historical average and was sharply lower than its 2008 peaks. This 10% growth in demand came in spite of the continued weakness of the bridal sector.

In China, after the encouraging performance in Q2'24, platinum jewellery fabrication fell by 8% year-on-year and 6% quarter-on-quarter in Q3'24. Negative consumer sentiment, slower economic growth and caution about spending on discretionary items remained the biggest headwind. In addition, the support from retailers' and showrooms' inventory restructuring (shifting some gold

jewellery to platinum jewellery on the back of the gold price rallying) that we saw in Q2'24, ran out of steam. Feedback from the supply chain suggests that leading retailers are now confronted with great pressure from lacklustre gold jewellery demand and have focused on network management. Only after achieving retail store consolidation will the leading retailers start to consider product inventory replenishment.

Indian platinum jewellery fabrication grew by 68% year-on-year to 66 koz in Q3'24, marking the second highest quarterly figure since 2018. This impressive growth was primarily driven by the strength in exports to the US, UK, and UAE, with an almost sevenfold increase compared to the same period last year. This was primarily for inventory building ahead of the Thanksgiving and Christmas festivities in western countries. Additionally, the increasing price difference between platinum and gold has supported demand in Western markets. Domestically, the growth in fabrication was supported by stock building ahead of the key wedding and festive season, combined with the continued addition of new stores by organised retailers.

Industrial demand

Industrial demand grew 15% (+76 koz) year-on-year in Q3'24, although the scale of this increase is flattered by softer glass demand in Q3'23.

Chemical

Platinum chemical offtake slipped by 2% quarter-on-quarter and 7% year-on-year to 137 koz in Q3'24, making it the lowest quarterly level since Q3'22. The drop reflects significantly lower demand from Chinese paraxylene (PX) manufacturers. Following record capacity additions in 2023, there have been no new PX units coming on stream so far this year. The picture is more positive when it comes to propane dehydrogenation (PDH) capacity additions in the country, as Q3'24 saw the start-up of two PDH plants. The lift to platinum demand, however, was not sufficient to make up for losses in the PX segment. Platinum demand from the silicone industry remained steady, as positive demand from consumer products was mitigated by lower sales to the construction sector. Meanwhile, nitric acid offtake remained broadly steady compared with the previous quarter.

Petroleum

Despite escalating turmoil in the Middle East, global oil supply was little affected in Q3'24. Against this backdrop, platinum demand held steady quarter-on-quarter at 40 koz in Q3'24. On a year-on-year basis, volumes were up by 3%. Similar to the previous quarter, North America posted year-on-year gains, as monthly US oil production hit fresh record highs. By contrast, China recorded a modest drop as a result of lower oil consumption in the country and a slowdown in expansion of petrochemical capacities (many of the newly built petrochemical plants are integrated with crude oil refining units). In Europe, refining activity also weakened, a reflection of growing pressure from international rivals and weak economic activity in the region.

Medical

In Q3'24, platinum demand in the medical sector achieved a year-on-year increase of 10% (+7 koz), totalling 78 koz. Advances in medical technologies, particularly those in cancer treatments and medical devices, have fuelled this steady rise, underpinned by a growing elderly population and expanded healthcare accessibility in both developed and emerging markets.

Glass

In Q3'24, platinum glass offtake was up 96% (+62 koz) year-on-year to 125 koz. This large percentage increase is largely due to a relatively weak comparable quarter in Q3'23, which saw net negative platinum demand from LCDs following a plant closure in South Korea. Quarter-on-quarter demand was down 44%, as Chinese LCD capacity expansions did not repeat the exceptional performance seen in Q1'24–Q2'24.

Electrical

Demand from the electronics segment in Q3'24 rose by 10% (+2 koz) year-on-year. This growth was primarily driven by infrastructure upgrades for the extensive data storage, analysis and training models necessary for the development of artificial intelligence (AI)-related applications. There has been a significant increase in demand for edge computing and nearline storage, which has continued to boost hard disk drive (HDD) shipments and increase the proportion of mass-capacity drives. Meanwhile, the robust demand for advanced semiconductor processes (10nm and below), combined with the capacity expansion, have led to a growing need for platinum alloy targets in chip manufacturing, driving metal offtake in this sector.

Hydrogen: Stationary and Other

While demand for platinum remains modest, it continues to gain traction resulting in an increase of 10 koz platinum demand over Q3'23. Notably, BMW, Toyota, and Hyundai announced advancements in their fuel cell vehicle strategies in Q3'24, signalling positive momentum for the broader hydrogen value chain (larger number of fuel cell vehicles on the road should stimulate demand for green hydrogen). However, challenges in the investment landscape are causing hydrogen production and transportation projects to advance more slowly than previously anticipated.

Other

Global other industrial demand grew by 3% (+5 koz) to 144 koz in Q3'24. In the automotive sector, as the EV market experienced slower-than-expected growth, the production of ICE and hybrid vehicles remained stronger than expected, underpinning production of spark plugs and sensors. This growth was further supported by a steady expansion in the aftermarket sector amid an increase in vehicle ownership, which has consolidated metal offtake in the spark plug and sensor segment.

Investment demand

During Q3'24, global retail investment weakened by 20% year-on-year (-17 koz) to 69 koz. However, it was up 51 koz on Q2'24. The year-on-year decline owed much to a further softening in North America, whereas the improved quarterly performance was the result of a swing to net positive investment in Japan, following heavy liquidations there the previous quarter.

In essence, there was little change in the US during Q3'24. Retail activity remained exceptionally weak, with an estimated two-thirds decline (-29 koz) to a multi-year low of just 14 koz. As Metals Focus highlighted in the previous *Platinum Quarterly*, this reflected challenges for precious metals investment as a whole as gold and silver also suffered from both weak retail purchases and relatively high levels of investor liquidations. Finally, the absence of a platinum bullion Eagle coin weighed on the market.

In Europe, retail investment dropped by 28% year-on-year and 35% quarter-on-quarter to 5 koz in Q3'24. In keeping with H1'24, this weakness reflected a subdued appetite for physical precious metals across the board, as high interest rates, ongoing cost of living issues and crisis fatigue continued to weigh on retail investors.

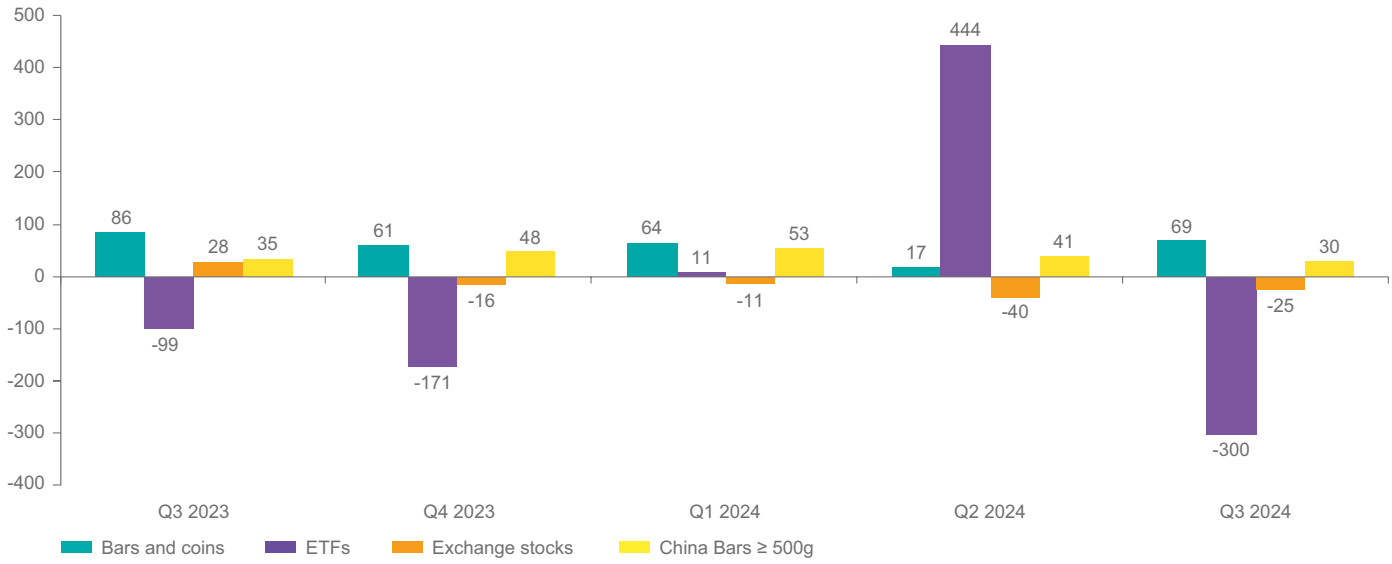
Similar to jewellery, Japanese platinum bar demand is benefiting from the perceived value platinum prices offered compared to gold during Q3'24. To be clear, absolute gross purchase volumes remained low by historical standards, however they inched up compared to earlier in the year. Crucially, liquidations were particularly low. As a result, we saw a massive swing from the 42 koz of disinvestment we recorded in Q2'24 to 29 koz of net investment during this past quarter.

In China, local retail investment demand enjoyed a 10% year-on-year rebound but a 14% quarter-on-quarter decline in Q3'24. Some of those investors who had seen platinum prices undervalued (on the back of the historically high spread between gold and platinum prices) and had carried out bargain hunting activities in Q2'24, were disappointed about the white metal's sideways price performance compared to the outstanding gold price rallies in Q3'24.

In Q3'24, platinum exchange-traded fund (ETF) holdings dropped by 300 koz to 3,221 koz, due to a number of selling events during the quarter. Market turbulence following the Bank of Japan's early August interest rate hike contributed to this selloff of European-held platinum funds. Ahead of the September Federal Reserve meeting, European funds were, again, particularly impacted by substantial outflows.

NYMEX and TOCOM warehouse inventories fell for the fourth consecutive quarter in Q3'24 to 149 koz, their lowest level since August 2011.

Chart 4: Platinum Investment, koz



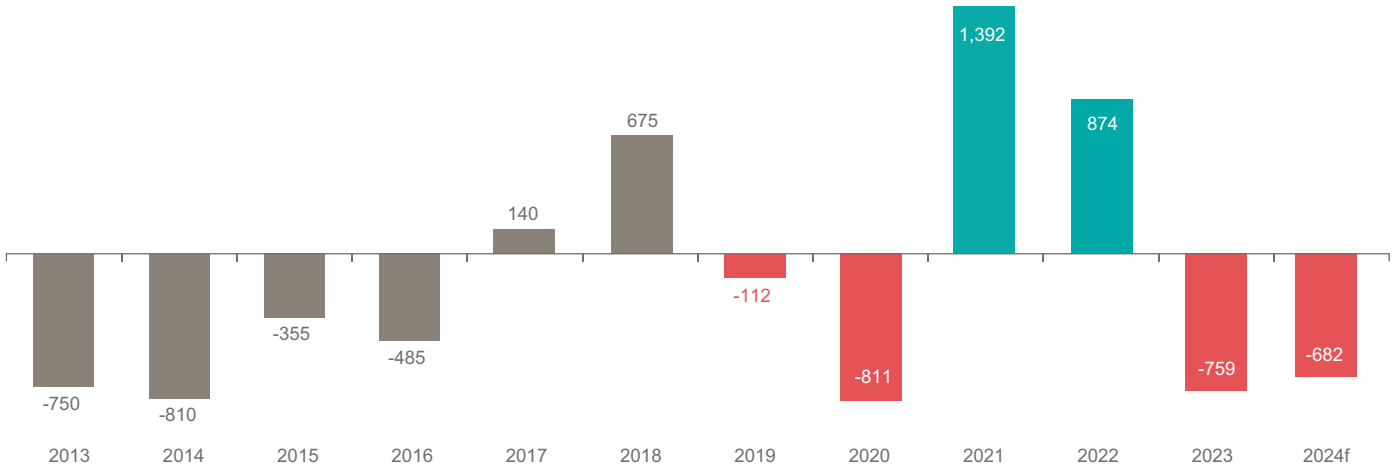
Source: Metals Focus

2024 OUTLOOK

The IMF characterises global economic performance in 2024 as underwhelming. While some countries, such as the US, have experienced upward revisions for 2024, Europe and the Middle East face headwinds due to ongoing conflicts and disruptions in shipping and supply chains. Despite persistently low PGM basket prices, mine supply remains resilient, prompting an upward revision in our full-year forecast. We now estimate mine supply to increase by 1%, reaching 5,683 koz. Scrap supply is also expected to grow, increasing 3%, bringing total global platinum supply to 7,269 koz.

Following a downward revision in vehicle production forecasts this year, and after two years of robust growth in chemical applications, both automotive and industrial demand for platinum are expected to decline. Investment demand is similarly forecast to dip slightly. In contrast, stronger demand in the jewellery sector more than compensates for weaknesses in other areas, leaving total global demand stable at 7,951 koz. This balance results in an expected deficit of 682 koz for the full year.

Chart 5: Supply-demand balance, koz, 2013-2024f



Source: SFA (Oxford) 2013 - 2018, Metals Focus 2019 - 2024f

Supply

Thus far, 2024 mine supply has been notably stable, lacking the large-scale disruptions that have characterised platinum mine production in recent years. South African supply has benefited from improved energy security. As concerns over the country's energy crisis fade, loadshedding is having negligible impact on mine supply this year. All major producers are on track to meet or exceed their full year output guidance. This outperformance partly reflects conservative guidance, set in anticipation of potential load curtailment.

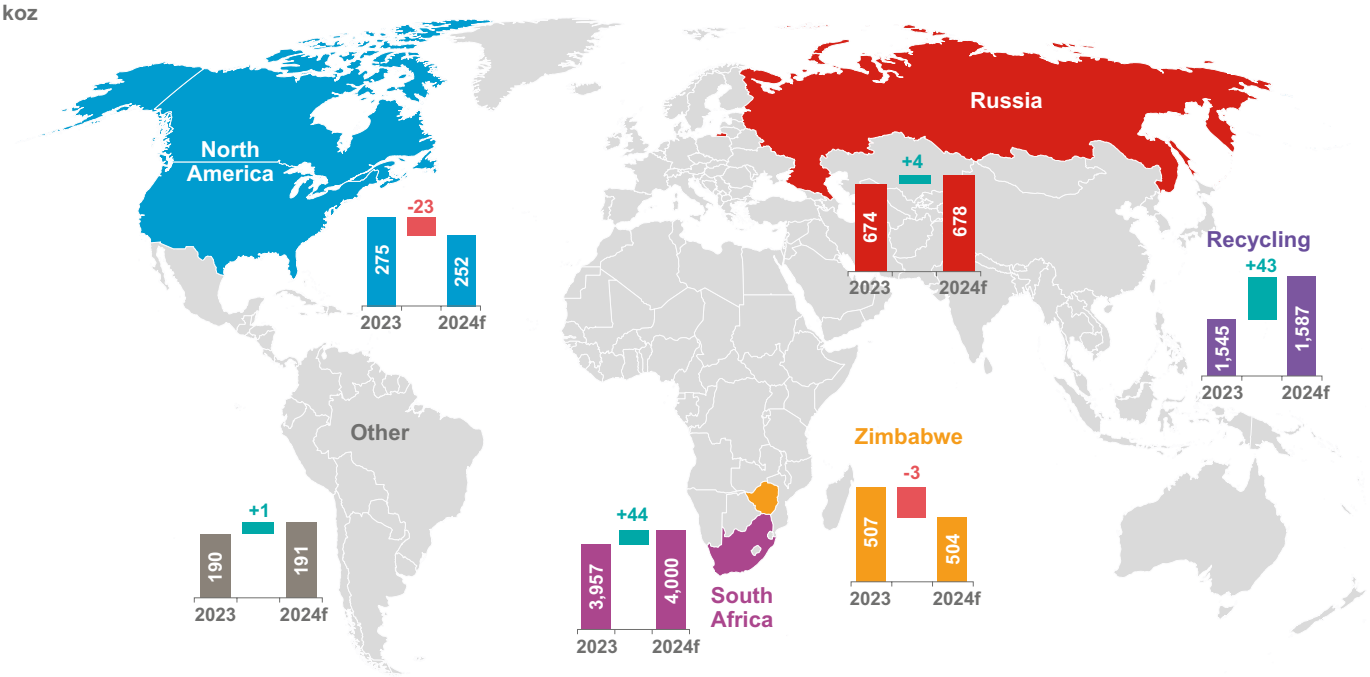
The recent program of smelter rebuilds undertaken by several producers is largely complete, providing greater stability to processing operations and, in some cases, increasing smelting capacity. This additional capacity enables producers to make up losses when disruptions occur. South Africa's refined volumes have benefited from this processing stability, allowing Amplats to release semi-finished inventory ahead of schedule. Consequently, in Q3'24, Amplats raised its full-year guidance by approximately 140 koz.

Reflecting this performance, we have revised our South African forecast, raising it by 117 koz to a total of 4,000 koz for 2024, representing a 1% year-on-year increase. While year-to-date refined volumes have been bolstered by the release of semi-finished inventory, underlying mined output remains constrained. Most operations reported lower metal-in-concentrate production, which is expected to result in lower refined volumes once the current semi-finished inventory is depleted.

In our last *Platinum Quarterly*, we highlighted potential upside if Nornickel completed the reconstruction of Furnace #2 at the Nadezhda Metallurgical Plant ahead of schedule. The reconstruction was completed in 60 days rather than the planned 90 days, enabling Nornickel to raise its full-year platinum production guidance by approximately 66 koz. Consequently, we have increased our outlook for Russia's 2024 platinum supply by 32 koz to 678 koz, which is virtually unchanged year-on-year.

North American supply is expected to decline 8% year-on-year to 252 koz as modest growth from Sibanye-Stillwater's US operations is offset by a decline from Vale's Canadian nickel operations. In Zimbabwe, output is expected to remain stable with a forecast of 504 koz for 2024.

Chart 6: Changes in supply, 2023 vs. 2024f



Source: Metals Focus

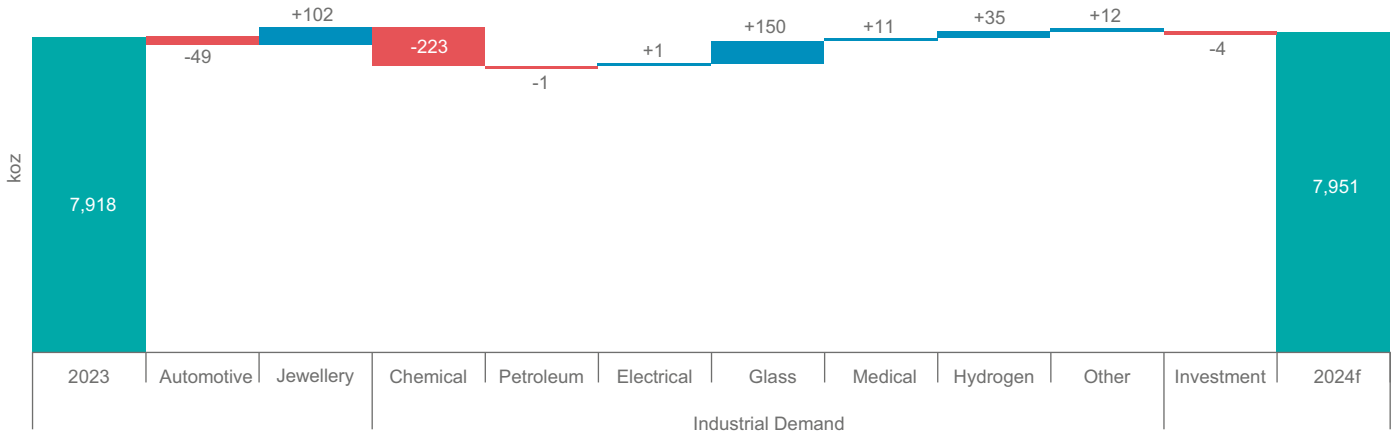
Recycling

For the full year we are seeing stability in the spent autocatalyst market, after two years of pronounced declines. Several of the factors that previously impeded the flow of materials from consumers to scrapyards, and subsequently from scrapyards to refiners, have either improved or are beginning to dissipate. New vehicle inventories have increased, allowing consumers to replace their vehicles more easily, with minimal waiting periods. In some regions vehicle prices are trending downwards, and there is an expectation that interest rates (and by extension, car leasing rates) will also fall. These conditions are likely to drive higher volumes of end-of-life vehicles into the recycling pipeline. Supply from secondary sources is expected to increase by 3% to 1,587 koz (+43 koz), driven largely by improvements in spent autocatalyst supply. Jewellery scrap is forecast to decline 10% due to higher prices and delays in restocking in China as well as a reduction in buybacks in Japan. Supply from electronic scrap is benefiting from upgrades to data centres and here we estimate an increase of 8% (+6 koz) to 76 koz.

Demand

At 7,951 koz, global demand is estimated to increase by just 33 koz year-on-year as the 5% (+102 koz) growth in the jewellery market offsets weaker automotive, industrial and investment demand.

Chart 7: Changes in demand by category, 2023 vs. 2024f



Source: Metals Focus

Automotive demand

For a third consecutive quarter, LDV production has been revised downwards. Global LDV production in 2024 is now expected to reach 90.4M, 1% lower than in 2023. The weakness is largely due to slower demand especially in Europe and North America. In Europe, the downturn is concentrated in Western European plants, which are particularly affected by the slower-than-expected BEV market. Vehicle affordability remains a hurdle, yet prices have stayed persistently high throughout 2024, as OEMs work to protect margins amid low utilisation rates, strict cost controls, challenging export markets, and sluggish BEV sales. Turning to HDV production, with backlogs largely cleared after two years of supply-driven production to meet delayed orders, HDV production is now slowing as new orders come in at a slower rate. NRV production will be lower for the third year in a row as stimulus packages and pre-buying behaviour have resulted in an excess of vehicles in the fleet. In this context, we forecast a 2% (-49 koz) decline in automotive platinum demand reaching 3,173 koz.

European demand will decline by 12% (-141 koz) as the drop in pure ICE vehicle manufacturing will outweigh the growth in hybrid vehicle production. The decline in HDV production will further exacerbate the lower demand for platinum. Western European diesel passenger vehicle demand continues to slip, and production is forecast to decline a further 14%.

While North American vehicle production is also expected to slip 1%, the combination of hybridisation, increased production of larger engine capacity SUVs and pickups as well as fitment of trimetallic catalysts with higher platinum loadings will see platinum demand increase 6%.

Japanese vehicle production will be impacted by vehicle testing irregularities related to airbag testing procedures as well as the integrity of safety and emissions related data, which resulted in plant stoppages and recalls with overall production down 9% year-on-year. ICE vehicle production is expected to contract by 14% for 2024 but hybrid vehicle product will grow by 2%. The growth in diesel vehicle production also mitigates the impact of overall lower ICE production. Despite the setbacks experienced during the year, platinum demand is expected to increase by 2% (+5 koz).

Chinese demand will be boosted by the doubling of the scrappage incentives set to run for the rest of the year. Platinum demand is forecast to increase 5% (+30 koz). In the Rest of the World, platinum demand is expected to rise by 20 koz up 4% on 2023 as hybrid vehicle production is set to increase 25% and gasoline fuelled vehicle production increases 2%, countering the decline in diesel vehicle production. For the full year, we forecast that the introduction of trimetallic catalyst will result in 751koz of substitution of platinum for palladium.

Jewellery demand

Global jewellery demand is expected to rise by 5% (+102 koz) year-on-year to 1,951 koz in 2024.

Steady results for Europe in Q4 should bring about a 3% rise for the full year. The mass market and bridal sector have underperformed, due to such drivers as the slower uptake of lab grown diamonds than in the US, but the top end remains robust. This might surprise given talk of weakness in China hitting the luxury brands, but it is the entry level ones that have suffered, with the very top (where platinum is more prevalent) proving resilient.

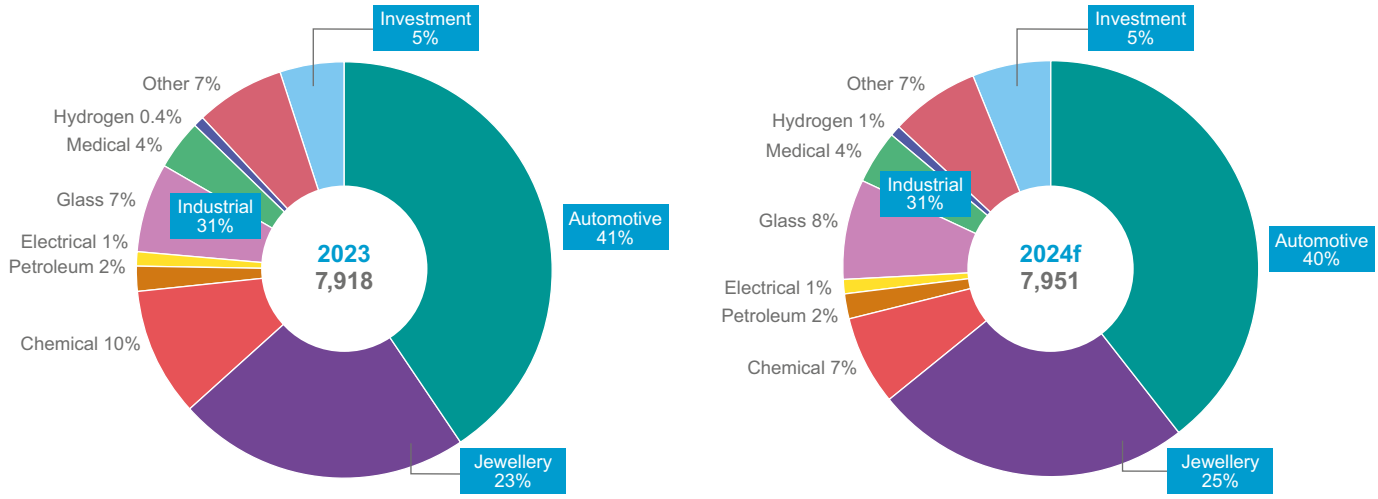
North America is expected to see slightly stronger growth in quarter four as the above positive factors remain in play and as some are expecting the start of an uptick in the engagement market. Destocking is also no longer a negative, but the election cast a cloud over October sales. As such, we see the full year up 2% to almost match the 2022 high.

In Japan expectations that the current healthy conditions for non-bridal jewellery demand will continue, coupled with a weak Q4 in 2023, point to a strong year-on-year increase in the final three months of the year. We forecast total demand from that market in 2024 to increase by 8% year-on-year to 365 koz, the highest since 2019.

In China, platinum jewellery fabrication over Q1-Q3 recorded a 4% year-on-year decline. Economic uncertainties and weak consumer sentiment are unlikely to change materially in Q4'24. Given the already extraordinarily low quarterly demand in Q4'23 (due to local players' high destocking of platinum as they shifted to gold jewellery), we forecast demand to remain flat y/y in Q4'24, leaving annual fabrication in 2024 down by 3% at 394 koz.

Indian platinum jewellery fabrication is estimated to grow by 22% year-on-year to 248 koz (+45 koz) driven by exports and the aggressive expansion of retail stores. That said, this has been revised lower from our earlier estimate mainly due to our expectations that the pace of exports for the rest of the year are unlikely to match the spurt that we have seen so far in 2024. That aside, the broader story supporting the growth in platinum fabrication remains intact. We continue to believe that the expansion of retail networks into tier 2 and 3 cities is unlocking new consumer segments, enabling platinum to reach beyond the major urban centres. Rising income levels and a young population with brand awareness are driving a clear shift towards more frequent and personal celebration purchases, thus creating opportunities for platinum consumption. Additionally, as mid-size jewellers adopt platinum jewellery to increase their profits with higher-margin products, this may attract a new group of customers and generate incremental demand.

Chart 8: Demand end-use shares, 2023 vs. 2024f



Source: Metals Focus

Industrial demand

After 2 years of exceptional growth, industrial demand looks set to contract by 1% to 2,434 koz as softer chemical demand offsets expansion in glass demand.

Glass

We estimate platinum glass demand will rise by 29% in 2024 to 671 koz—its second highest annual total for our series after 2021 (753 koz). Chinese LCD capacity expansions remain the primary driver of growth, as they did in 2021, more than compensating for plant closures in Japan, South Korea, and Taiwan. Fibreglass demand is stable year-on-year. While European plant closures reduced last year's demand, this is not expected to be repeated in 2024, though slower capacity expansions elsewhere limit overall growth.

Medical

In 2024, platinum medical demand is estimated to rise by 4% (+11 koz) to 303 koz. While medical devices remain the largest segment for platinum, cancer treatments are set to experience the fastest relative growth, spurred by increased funding, advancements in oncology and higher cancer rates globally.

Chemical

Demand for platinum from the chemical industry is expected to remain soft in Q4'24. The full year total for 2024 is on track to post a 28% decline to a six-year low of 563 koz. In a similar way that hefty investment in new PX and PDH plants in China provided a strong boost to platinum catalysts over 2019-23, a slowdown in capacity expansion in the country is the key driver behind this year's weaker platinum demand. Lower demand is also seen in the use of platinum in the nitric acid industry in 2024. To some extent, this reflects a degree of demand normalisation after a sharp rebound in 2023 when the industry recovered from major disruptions in 2022 following the Russia-Ukraine war and a surge in energy costs. Falling fertiliser prices and rising project costs have weakened the investment case to add new plants. By contrast, demand for platinum from the silicone industry is expected to hold steady.

Petroleum

Petroleum demand is expected to remain flat at 161 koz in 2024. This steady overall outcome, however, hides contrasting results across key markets. Oil refineries in the US, for instance, are expected to benefit from record oil output in 2024. New refineries in Africa and the Middle East have also underpinned demand for platinum catalysts. By contrast, platinum demand from China has weakened, a reflection of decelerating growth in oil consumption and fewer additions of integrated oil-to-petrochemical capacities this year. Lower volumes are also expected in Europe, where falling profitability has forced oil refineries to cut operations.

Electrical

The rapid advancement of AI has significantly alleviated the pressures on the HDD market from solid-state drives (SSDs). Total shipments this year are likely to show growth, marking the first year of annual shipment growth since the peak in 2010. The cost-performance advantage of HDDs is expected to persist over the next two years, especially with the introduction of energy-assisted magnetic recording technology for mass production, which can effectively increase data density and reduce per-unit storage costs. As it stands, the apparent outlook for infrastructure upgrades to provide AI services next year looks promising, which also bodes well for HDD demand for platinum.

Hydrogen Stationary and Other

Despite deployment delays due to high capital costs and challenges associated with the timing of government funding and subsidies, platinum demand in this segment is projected to rise to 64 koz this year. Production of hydrogen-fuelled FCEVs in the heavy-duty segment has surpassed 1,000 units each quarter this year, marking a 72% increase on 2023. While PGM demand for vehicles are not contained in this reporting category, the expansion in vehicle deployment is important to the entire value chain and supports the need for the extension of the hydrogen network and advancing green hydrogen production.

Other

In 2024 we estimate that the demand for spark plugs, sensors and other PGM containing after-market components will increase by 2%. The increase in hybridisation as well as the extension of vehicle lifespans plus the growth due to regulatory monitoring equipment in marine and burgeoning aerospace industries are also helping to offset the decline in ICE vehicle production.

Investment demand

This year, global platinum bar and coin investment demand is estimated to almost halve (-151 koz) to a 10-year low of just 171 koz. This mostly reflects the return to net disinvestment in Japan, along with far weaker demand in North America.

Retail bar and coin demand in North America is on course for a 30% decline (-51 koz) to a seven-year low of 119 koz. As highlighted in the quarterly text above, the weakness experienced in the platinum market also extends to gold and silver. Furthermore, 2024 marks the first time a platinum Eagle bullion coin has not been struck since 2015. At its height in 2022, this accounted for 80 koz but last year saw just 13 koz minted. However, while not fully included in our base assumptions at this time, there should be some offset from the recent introduction at Costco of platinum investment products, alongside the gold and silver bars and coins they already offer.

In Europe, platinum investment is expected to remain muted in Q4'24, as the factors that have undermined interest in precious metal bullion products 2024-to-date are likely to persist. This will leave the full year total for 2024 little changed from a depressed 2023.

A return to net selling seems likely in Q4'24 in Japan, given the higher local platinum price. We forecast 40 koz of net disinvestment for the full year, suggesting we will see net selling of around 30 koz in the final three months of the year.

We have revised our forecast for retail investment in China from growth of 20% to 18% in 2024. Following disappointment that platinum did not follow gold's rally, but kept trading mostly sideways, has resulted in platinum demand losing some momentum.

In 2024, we expect that platinum ETFs will increase their holdings by 150 koz for the full year, around level with their current year-to-date inflows.

ABOVE GROUND STOCKS

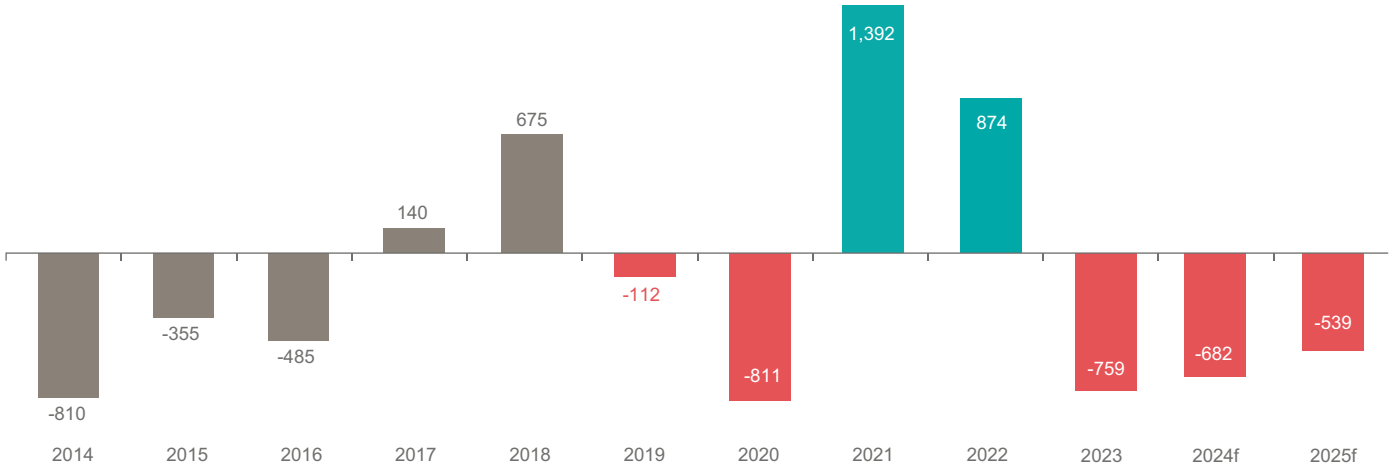
Due to a projected deficit of 682 koz in 2024, above-ground stocks are expected to decline to 3,553 koz by year-end, resulting in just over five months' worth of demand cover.

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.

2025 OUTLOOK

Looking ahead to 2025, the focus will remain on the impact of shifts in political leadership across various regions and the implications of that for both financial and precious metals markets. From a platinum supply perspective, with much of the restructuring completed in 2024, a period of consolidation is expected. Supply from secondary sources is anticipated to recover to levels much closer to pre-pandemic ones and mine supply is expected to contract modestly by 2% to 5,550 koz. On the demand side, vehicle production is projected to improve as inflation stabilises and interest rates ease. However, following several years of growth in the industrial sector, we do not expect the elevated levels of demand seen from the glass sector in 2023 and 2024 to continue. Investment demand is likely to strengthen, particularly with sustained interest from China. Consequently, we forecast a deficit of 539 koz for 2025.

Chart 9: Supply-demand balance, koz, 2014-2025f



Source: SFA (Oxford) 2014 - 2018, Metals Focus 2019 - 2025f

Supply

Total platinum supply is expected to increase 1% year-on-year in 2025, reaching 7,324 koz. Refined mine supply in 2025 is expected to depend heavily on the volume of semi-finished inventory that South African producers are able to release. Both Implats and Northam, following recent smelter maintenance, currently hold excess semi-finished inventory. As of the end of Q3'24, Implats reported holding around 230 koz, while Northam reported approximately 60 koz. Both companies estimate it may take up to three years to fully release this inventory, but the rate of release in 2025 will play a significant role in shaping global mine supply levels.

In South Africa, while input cost inflation has stabilised in 2024, persistently low PGM prices continue to challenge higher-cost producers. Due to the low pricing, major projects originally scheduled to contribute production, such as the Two Rivers Merensky project and the Platreef project, have been deferred or placed on care and maintenance. Across the sector, cost-cutting measures have been widely implemented, with around 9,000 positions eliminated within the PGM mining industry. At current PGM prices, the profitability of several operations remains marginal, introducing heightened price sensitivity. Should PGM prices decline further, additional restructuring may become necessary, posing a downside risk to 2025 mine supply forecasts.

In Russia, Nornickel faces ongoing procurement challenges, as some key Western suppliers have exited the Russian market, and access to international banking and debt markets remains restricted. Given these challenges, Nornickel has withdrawn its medium-term production guidance, indicating that prior expansion plans may be difficult to achieve. As a result, Russian platinum mine supply is expected to remain stable in 2025.

In the US, the decline in palladium prices has impacted profitability at Sibanye-Stillwater's operations, prompting a series of restructurings. In September, the company announced a revised plan, which is expected to reduce production by approximately 45% in 2025. This plan includes suspending operations at Stillwater West and reducing mining at East Boulder and will result in reduced output from North America.

Overall, platinum mine supply in 2025 is projected to decline by 1% year-on-year, to 5,550 koz. In 2025, with new vehicle supply no longer constrained and drivers for hoarding (caused by political uncertainty and expectations of higher prices) diminishing, we anticipate a return to more typical levels of spent autocatalyst recycling. Additionally, increased vehicle scrappage, following significant natural disasters, as well as potential extensions of government incentives, may further boost recycling volumes. Jewellery scrap is forecast to rise by 4% in 2025, largely driven by price rallies.

Demand

Global platinum demand is expected to contract 1% (-88 koz) to 7,863 koz as industrial demand contracts. In the automotive sector the production growth initially anticipated for 2024 has been deferred to 2025. As a result, global automotive demand for platinum is now forecast to reach 3,245 koz in 2025, reflecting a 2% increase. Global LDV production is estimated to reach 92.7M units, up 3% from this year while total catalysed vehicle production will decline by 1%. With interest rates easing and OEMs adjusting strategies to boost both BEV and hybrid vehicle sales to mitigate some regulatory challenges platinum demand will increase. For example, in the context of impending CO_2 penalties in Europe where fleet average requirements is set to achieve a 15% reduction on the emissions baseline of 2021, hybrid vehicle production is projected to rise by 17%. In the US, the introduction of LEV IV beginning with Model Year 2026, means that we could see fitment of new after treatment systems with higher PGM loadings from mid-year 2025, which depending on the technical solution, could offer down or upside risk to platinum. Meanwhile growth in hybrid vehicle production ahead of BEV production in China, along with a 13% growth in HDV production there should boost platinum requirements.

In the jewellery sector, we expect to see a modest 2% (+32 koz) lift in demand next year to 1,983 koz. Jewellery demand for platinum is expected to rise modestly across key regions next year. In Europe, demand is forecast to increase, with the mass market seeing slight gains thanks to a favourable price differential to white gold and potential improvements in consumer sentiment. However, high-end sales remain uncertain, and cautious stock management may constrain fabrication growth. North America is projected to see demand increase, driven by optimism in the engagement market and positive post-election sentiment among consumers and the trade, supported by stable diamond prices. In China, platinum jewellery fabrication is expected to grow, spurred by leading retailers replenishing stock and product innovations appealing to diverse demographics, including menswear and unisex designs. In India, as platinum continues to gain popularity in smaller cities, aided by lower domestic prices following a recent duty cut, a further increase in demand is forecast for 2025, although growth may moderate as the market matures and the expansion of organised retail slows.

Industrial platinum demand is expected to contract by 218 koz to 2,216 koz in 2025. We forecast a 57% year-on-year (-385 koz) drop in platinum glass demand to 286 koz - its lowest level since 2019. Regional LCD capacity expansions are cyclical, as they leverage economies of scale and natural demand cycles. Following a major pullback in 2024, platinum offtake from the chemical industry is expected to recover some lost ground in 2025, up by 17% to 656 koz. A pick-up in demand for platinum catalysts from the petrochemical industry will contribute a good part of next year's growth. Platinum offtake from the petroleum industry is expected to rise by 31% year-on-year to 211 koz in 2025. This growth will be dominated by gas-to-liquid (GTL) catalyst changeouts that were absent in 2022-23. (With a limited number of GTLs globally, catalyst changeouts at these plants tend to result in volatile fluctuations in annual platinum demand). Excluding the impact of GTLs demand, platinum offtake in reforming and isomerisation units is expected to edge higher on the back of ongoing additions to refining capacities. However, growth will be fairly limited, as tepid demand for oil and rising oil supply will continue to weigh on refining margins. Platinum medical demand is forecast to continue its current trend into 2025. We expect demand will rise another 4% (+11 koz) to 314 koz, underpinned by demographics and wider growth of healthcare.

Next year, global bar and coin investment demand is forecast to ease back by 12% (-20 koz) to 151 koz, an 11-year low. This will be underpinned by higher net liquidations in Japan offsetting improved activity in every other key market. Retail buying in North America is forecast to return to growth in 2025 for the first time in three years, although it will still remain well below the highs of 2020-22. While retail investment is forecast to improve, just as important will be the lack of year-on-year losses due to there being no platinum Eagle bullion coin, with the programme having been suspended in 2023. We expect Chinese retail investment demand to post another 10% increase in 2025. Our price projection of higher platinum price for 2025, the lack of alternative investment assets and investors' increasing awareness of platinum will remain the main drivers. We expect that somewhat higher platinum prices, yet lacking a more material rally to excite investors, will see some of the volumes that were accumulated during the spike of bar and coin demand in Japan roughly ten years ago being liquidated in 2025. As such, we forecast net disinvestment of 80 koz in the country next year. In 2025, we expect platinum ETF holdings to rise by 50 koz, as continued European outflows, driven by some profit taking, are more than offset by investors looking to bet against electrification, particularly in North American funds.

ABOVE GROUND STOCKS

Due to a projected deficit of 539 koz in 2025, above-ground stocks are expected to decline to 3,014 koz by year-end, resulting in just over four months' worth of demand cover.

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 stock summary – annual comparison

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024f	2025f	2024f/2023 Growth %	2025f/2024f Growth %
Platinum Supply-demand Balance (koz)														
SUPPLY														
Refined Production	**4,875**	**6,160**	**6,145**	**6,130**	**6,125**	**6,074**	**4,988**	**6,295**	**5,520**	**5,604**	**5,626**	**5,550**	**0%**	**-1%**
South Africa	3,135	4,480	4,365	4,385	4,470	4,374	3,298	4,678	3,915	3,957	4,000	3,929	1%	-2%
Zimbabwe	405	405	490	480	465	458	448	485	480	507	504	522	-1%	3%
North America	395	365	390	360	345	356	337	273	263	275	252	232	-8%	-8%
Russia	740	710	715	720	665	716	704	652	663	674	678	676	1%	0%
Other	200	200	185	185	180	169	200	206	200	190	191	191	0%	0%
Increase (-)/Decrease (+) in Producer Inventory	+350	+30	+30	+30	+10	+2	-84	-93	+43	+11	+57	+0	>±300%	-100%
Total Mining Supply	**5,225**	**6,190**	**6,075**	**6,160**	**6,135**	**6,076**	**4,904**	**6,202**	**5,563**	**5,615**	**5,683**	**5,550**	**1%**	**-2%**
Recycling	**2,055**	**1,720**	**1,860**	**1,915**	**1,955**	**2,110**	**1,996**	**2,106**	**1,762**	**1,544**	**1,587**	**1,774**	**3%**	**12%**
Autocatalyst	1,255	1,185	1,210	1,325	1,430	1,565	1,508	1,618	1,322	1,143	1,176	1,346	3%	14%
Jewellery	775	515	625	560	505	476	422	422	372	331	335	347	1%	4%
Industrial	25	20	25	30	30	69	66	67	69	71	76	81	8%	6%
Total Supply	**7,280**	**7,910**	**7,935**	**8,075**	**8,090**	**8,186**	**6,900**	**8,308**	**7,326**	**7,159**	**7,269**	**7,324**	**2%**	**1%**
DEMAND														
Automotive	**3,220**	**3,245**	**3,360**	**3,300**	**3,115**	**2,691**	**2,193**	**2,441**	**2,751**	**3,223**	**3,173**	3,245	**-2%**	**2%**
Autocatalyst	3,080	3,105	3,225	3,160	2,970	2,691	2,193	2,441	2,751	3,223	3,173	3,245	-2%	2%
Non-road	140	140	135	140	145	†	†	†	†	†	†	†	N/A	N/A
Jewellery	**3,000**	**2,840**	**2,505**	**2,460**	**2,245**	**2,106**	**1,830**	**1,953**	**1,880**	**1,849**	**1,951**	**1,983**	**5%**	**2%**
Industrial	**1,720**	**1,875**	**2,020**	**1,900**	**2,040**	**2,237**	**2,105**	**2,526**	**2,336**	**2,449**	**2,434**	**2,216**	**-1%**	**-9%**
Chemical	540	515	560	570	565	784	637	658	694	786	563	656	-28%	17%
Petroleum	60	170	220	120	235	219	109	169	193	161	161	211	0%	31%
Electrical	215	205	195	210	205	144	130	135	106	89	90	92	1%	2%
Glass	225	300	320	260	275	228	473	753	505	521	671	286	29%	-57%
Medical	225	240	235	235	235	277	256	267	278	292	303	314	4%	4%
Hydrogen Stationary and Other	†	†	†	†	†	29	28	17	12	29	64	84	123%	32%
Other	455	445	490	505	525	556	473	528	548	571	582	574	2%	-1%
Investment	**150**	**305**	**535**	**275**	**15**	**1,264**	**1,582**	**-3**	**-516**	**397**	**393**	**420**	**-1%**	**7%**
Change in Bars, Coins	50	525	460	215	280	278	593	349	259	322	171	151	-47%	-12%
China Bars ≥ 500g	†	†	†	†	†	16	23	27	90	134	157	170	17%	8%
Change in ETF Holdings	215	-240	-10	105	-245	991	507	-241	-558	-74	150	50	N/A	-67%
Change in Stocks Held by Exchanges	-115	20	85	-45	-20	-20	458	-139	-307	14	-85	50	N/A	N/A
Total Demand	**8,090**	**8,265**	**8,430**	**7,935**	**7,415**	**8,298**	**7,710**	**6,917**	**6,451**	**7,918**	**7,951**	**7,863**	**0%**	**-1%**
Balance	**-810**	**-355**	**-485**	**140**	**675**	**-112**	**-811**	**1,392**	**874**	**-759**	**-682**	**-539**	**N/A**	**N/A**
Above Ground Stocks	**2,580***	**2,225**	**1,740**	**1,880**	**2,555**	**3,538****	**2,728**	**4,119**	**4,993**	**4,235**	**3,553**	**3,014**	**-16%**	**-15%**

Source: Metals Focus 2019 – 2025f, SFA (Oxford) 2014 - 2018.

Notes:

1. Above Ground Stocks: *4,140 koz as of 31st December 2012 (SFA (Oxford)). **3,650 koz as of 31 December 2018 (Metals Focus).
2. † Estimates for this item in this period are either negligible, or captured respectively in autocatalyst demand or other industrial demand.
3. Data from Metals Focus and SFA (Oxford) may not have been prepared on the same or directly comparable basis.
4. Prior to 2019 SFA (Oxford) data is independently rounded to the nearest 5 koz.

Table 3: Supply and demand summary – quarterly comparison

	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q3'24/Q3'23 Growth %	Q3'24/Q2'24 Growth %
Platinum Supply-demand Balance (koz)											
SUPPLY											
Refined Production	**1,390**	**1,328**	**1,192**	**1,486**	**1,393**	**1,532**	**1,225**	**1,541**	**1,479**	**6%**	**-4%**
South Africa	978	931	778	1,051	984	1,143	795	1,128	1,073	9%	-5%
Zimbabwe	116	123	116	126	132	133	132	126	126	-5%	1%
North America	67	65	71	73	60	72	71	59	60	0%	2%
Russia	179	160	180	190	168	136	178	181	172	2%	-5%
Other	51	49	48	46	48	48	48	48	48	-2%	0%
Increase (-)/Decrease (+) in Producer Inventory	-2	+23	+33	+8	-6	-23	+22	+35	+0	N/A	-100%
Total Mining Supply	**1,387**	**1,351**	**1,226**	**1,494**	**1,387**	**1,509**	**1,246**	**1,576**	**1,479**	**7%**	**-6%**
Recycling	**419**	**428**	**400**	**383**	**347**	**415**	**377**	**388**	**348**	**0%**	**-10%**
Autocatalyst	313	320	287	290	254	312	275	297	260	2%	-13%
Jewellery	90	92	95	76	75	85	85	72	68	-10%	-5%
Industrial	17	17	17	17	17	18	17	19	20	14%	6%
Total Supply	**1,807**	**1,780**	**1,626**	**1,877**	**1,733**	**1,923**	**1,624**	**1,964**	**1,827**	**5%**	**-7%**
DEMAND											
Automotive	**669**	**715**	**816**	**817**	**771**	**819**	**831**	**805**	**750**	**-3%**	**-7%**
Autocatalyst	669	715	816	817	771	819	831	805	750	-3%	-7%
Non-road	†	†	†	†	†	†	†	†	†	N/A	N/A
Jewellery	**476**	**458**	**458**	**473**	**446**	**472**	**479**	**497**	**478**	**7%**	**-4%**
Industrial	**552**	**556**	**606**	**740**	**490**	**613**	**650**	**667**	**565**	**15%**	**-15%**
Chemical	120	275	269	220	147	150	157	140	137	-7%	-2%
Petroleum	49	52	42	41	39	39	40	40	40	3%	0%
Electrical	26	24	23	23	22	22	22	23	24	10%	5%
Glass	151	2	56	234	64	167	204	225	125	96%	-44%
Medical	69	69	76	72	71	72	72	77	78	10%	1%
Hydrogen Stationary and Other	3	3	4	5	7	12	12	14	17	131%	25%
Other	135	132	137	145	139	150	142	148	144	3%	-3%
Investment	**-226**	**-30**	**229**	**195**	**50**	**-77**	**117**	**462**	**-226**	**N/A**	**N/A**
Change in Bars, Coins	103	2	128	47	86	61	64	17	69	-20%	296%
China Bars ≥ 500g	23	23	31	20	35	48	53	41	30	-14%	-26%
Change in ETF Holdings	-217	-62	40	155	-99	-171	11	444	-300	N/A	N/A
Change in Stocks Held by Exchanges	-134	7	29	-27	28	-16	-11	-40	-25	N/A	N/A
Total Demand	**1,471**	**1,699**	**2,110**	**2,226**	**1,756**	**1,826**	**2,077**	**2,431**	**1,567**	**-11%**	**-36%**
Balance	**336**	**80**	**-484**	**-348**	**-23**	**97**	**-454**	**-467**	**260**	**N/A**	**N/A**

Source: Metals Focus 2022 - 2024.

Note:

1. † Non-road automotive demand is included in autocatalyst demand.

Table 4: Supply and demand summary – half-yearly comparison

	H1 2022	H2 2022	H1 2023	H2 2023	H1 2024	H1'24/H1'23 Growth %	H1'24H2'23 Growth %
Platinum Supply-demand Balance (koz)							
SUPPLY							
Refined Production	**2,802**	**2,718**	**2,679**	**2,925**	**2,766**	**3%**	**-5%**
South Africa	2,007	1,908	1,829	2,127	1,923	5%	-10%
Zimbabwe	241	239	242	265	258	7%	-3%
North America	131	132	143	132	130	-9%	-1%
Russia	324	339	370	304	359	-3%	18%
Other	100	100	94	96	96	2%	0%
Increase (-)/Decrease (+) in Producer Inventory	22	21	41	-30	57	38%	N/A
Total Mining Supply	**2,825**	**2,739**	**2,720**	**2,895**	**2,823**	**4%**	**-3%**
Recycling	**914**	**848**	**783**	**761**	**765**	**-2%**	**0%**
Autocatalyst	689	632	577	565	573	-1%	1%
Jewellery	191	181	171	160	156	-9%	-2%
Industrial	34	34	35	36	36	4%	1%
Total Supply	**3,739**	**3,587**	**3,503**	**3,657**	**3,588**	**2%**	**-2%**
DEMAND							
Automotive	**1,367**	**1,385**	**1,633**	**1,589**	**1,636**	**0%**	**3%**
Autocatalyst	1,367	1,385	1,633	1,589	1,636	0%	3%
Non-road	†	†	†	†	†	N/A	N/A
Jewellery	**946**	**934**	**932**	**918**	**976**	**5%**	**6%**
Industrial	**1,228**	**1,108**	**1,346**	**1,103**	**1,317**	**-2%**	**19%**
Chemical	300	395	489	297	297	-39%	0%
Petroleum	92	101	83	78	80	-3%	3%
Electrical	57	49	45	44	45	0%	2%
Glass	353	153	290	231	430	48%	86%
Medical	139	138	149	144	149	0%	4%
Hydrogen Stationary and Other	6	6	9	20	26	189%	32%
Other	282	266	282	289	290	3%	0%
Investment	**-260**	**-256**	**424**	**-27**	**580**	**37%**	**N/A**
Change in Bars, Coins	154	105	175	147	82	-53%	-44%
China Bars ≥ 500g	45	45	51	83	94	84%	13%
Change in ETF Holdings	-278	-280	196	-270	455	133%	N/A
Change in Stocks Held by Exchanges	-181	-127	2	12	-51	N/A	N/A
Total Demand	**3,281**	**3,171**	**4,335**	**3,583**	**4,508**	**4%**	**26%**
Balance	**458**	**416**	**-832**	**74**	**-921**	**N/A**	**N/A**

Source: Metals Focus 2019 - 2024.

Notes:

1. † Non-road automotive demand is included in autocatalyst demand.

Table 5: Regional demand – annual and quarterly comparison

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024f	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024
Platinum Gross Demand (koz)																			
Automotive	**3,220**	**3,250**	**3,350**	**3,290**	**3,115**	**2,691**	**2,193**	**2,441**	**2,751**	**3,223**	**3,173**	**3,245**	**-2%**	**2%**	**771**	**819**	**831**	**805**	**750**
North America	455	480	410	390	390	312	268	341	413	449									
Western Europe	1,395	1,450	1,630	1,545	1,340	1,356	980	919	972	1,161									
Japan	585	510	450	435	425	289	225	253	250	296									
China	125	145	195	230	220	156	240	331	404	550									
India	170	180	170	175	200	††	††	††	††	††									
Rest of the World	490	485	495	515	540	579	480	597	712	768									
Jewellery	**3,000**	**2,840**	**2,505**	**2,460**	**2,245**	**2,106**	**1,830**	**1,953**	**1,880**	**1,849**	**1,951**	**1,983**	**5%**	**2%**	**446**	**472**	**479**	**497**	**478**
North America	230	250	265	280	280	341	277	409	448	438									
Western Europe	220	235	240	250	255	237	196	260	301	319									
Japan	335	340	335	340	345	372	316	298	333	338									
China	1,975	1,765	1,450	1,340	1,095	871	832	703	484	408									
India	175	180	145	175	195	109	59	123	171	203									
Rest of the World	65	70	70	75	75	176	151	159	144	144									
Chemical	**540**	**515**	**560**	**570**	**565**	**784**	**637**	**658**	**694**	**786**	**563**	**656**	**-28%**	**17%**	**147**	**150**	**157**	**140**	**137**
North America	55	55	50	50	50	81	103	109	110	137									
Western Europe	105	75	110	115	105	123	111	115	106	115									
Japan	10	10	15	15	15	66	62	65	66	61									
China	215	230	225	220	215	299	214	221	258	290									
Rest of the World	155	145	160	170	180	214	146	148	154	184									
Petroleum	**60**	**170**	**220**	**120**	**235**	**219**	**109**	**169**	**193**	**161**	**161**	**211**	**0%**	**31%**	**39**	**39**	**40**	**40**	**40**
North America	25	-25	90	55	55	30	5	32	44	44									
Western Europe	-20	35	10	5	20	14	11	18	30	22									
Japan	-35	5	0	-20	5	7	6	12	7	7									
China	-5	45	80	45	10	66	35	39	26	24									
Rest of the World	95	110	40	35	145	103	52	67	86	64									
Electrical	**215**	**205**	**195**	**210**	**205**	**144**	**130**	**135**	**106**	**89**	**90**	**92**	**1%**	**2%**	**22**	**22**	**22**	**23**	**24**
North America	15	15	10	15	15	38	35	35	28	24									
Western Europe	10	10	10	10	10	27	23	25	20	16									
Japan	15	15	15	15	15	20	16	17	14	12									
China	70	70	80	90	85	28	31	31	23	19									
Rest of the World	105	95	80	80	80	31	25	26	22	18									
Glass	**225**	**300**	**320**	**260**	**275**	**228**	**473**	**753**	**505**	**521**	**671**	**286**	**29%**	**-57%**	**64**	**167**	**204**	**225**	**125**
North America	5	0	10	5	5	-78	-25	17	26	42									
Western Europe	10	5	5	5	20	63	35	6	21	-85									
Japan	-10	0	-10	-10	0	-38	-63	7	-151	5									
China	175	195	225	165	120	175	385	757	524	571									
Rest of the World	45	100	90	95	130	106	142	-35	85	-11									
Medical	**225**	**240**	**235**	**235**	**235**	**277**	**256**	**267**	**278**	**292**	**303**	**314**	**4%**	**4%**	**71**	**72**	**72**	**77**	**78**
Other industrial	**455**	**445**	**490**	**505**	**525**	**556**	**473**	**528**	**548**	**571**	**582**	**574**	**2%**	**-1%**	**139**	**150**	**142**	**148**	**144**
Hydrogen Stationary & Other	**†**	**†**	**†**	**†**	**†**	**29**	**28**	**17**	**12**	**29**	**64**	**84**	**123%**	**32%**	**7**	**12**	**12**	**14**	**17**
Bar & Coin Investment	**50**	**525**	**460**	**215**	**280**	**278**	**593**	**349**	**259**	**322**	**171**	**151**	**-47%**	**-12%**	**86**	**61**	**64**	**17**	**69**
North America						155	234	256	258	169									
Western Europe						52	75	61	44	24									
Japan						46	240	-26	-114	54									
China						15	23	26	38	52									
Rest of the World						9	21	33	33	23									
China Bars ≥ 500g						**16**	**23**	**27**	**90**	**134**	**157**	**170**	**17%**	**8%**	**35**	**48**	**53**	**41**	**30**
ETF Investment	**215**	**-240**	**-10**	**105**	**-245**	**991**	**507**	**-241**	**-558**	**-74**	**150**	**50**	**N/A**	**-67%**	**-99**	**-171**	**11**	**444**	**-300**
North America						125	524	-6	-102	-61									
Western Europe						508	237	56	-313	-99									
Japan						-13	58	-23	-28	12									
Rest of the World						370	-312	-268	-116	74									
Change in Stocks Held by Exchanges	**-115**	**20**	**85**	**-45**	**-20**	**-20**	**458**	**-139**	**-307**	**14**	**-85**	**50**	**N/A**	**N/A**	**28**	**-16**	**-11**	**-40**	**-25**
Investment																			
Total Demand	**150**	**305**	**535**	**275**	**15**	**1,264**	**1,582**	**-3**	**-516**	**397**	**393**	**420**	**-1%**	**7%**	**50**	**-77**	**117**	**462**	**-226**
	8,090	**8,270**	**8,410**	**7,925**	**7,415**	**8,298**	**7,710**	**6,917**	**6,451**	**7,918**	**7,951**	**7,863**	**0%**	**-1%**	**1,756**	**1,826**	**2,077**	**2,431**	**1,567**

Source: Metals Focus 2019 - 2025f, SFA (Oxford) 2014 - 2018.

Notes:

1. † Hydrogen and Stationary Other demand is included in Other industrial demand prior to 2019.
2. †† India automotive demand is included in Rest of the World.
3. Data from Metals Focus and SFA (Oxford) may not have been prepared on the same or directly comparable basis.
4. Prior to 2019 SFA data is independently rounded to the nearest 5 koz.

Table 6: Regional recycling – annual and quarterly comparison

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024f	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024
Platinum recycling supply (koz)																			
Automotive	**1,255**	**1,185**	**1,210**	**1,325**	**1,420**	**1,565**	**1,508**	**1,618**	**1,322**	**1,143**	**1,176**	**1,346**	**3%**	**14%**	**254**	**312**	**275**	**297**	**260**
North America						520	458	504	395	351									
Western Europe						785	815	835	676	590									
Japan						116	109	117	85	73									
China						36	36	59	55	25									
Rest of the World						108	90	103	110	104									
Jewellery	**775**	**515**	**625**	**560**	**505**	**476**	**422**	**422**	**372**	**331**	**335**	**347**	**1%**	**4%**	**75**	**85**	**85**	**72**	**68**
North America						3	3	3	3	3									
Western Europe						4	4	3	4	4									
Japan						187	162	160	165	136									
China						276	248	250	195	183									
Rest of the World						5	5	5	6	5									
Industrial	**25**	**20**	**25**	**30**	**30**	**69**	**66**	**67**	**69**	**71**	**76**	**81**	**8%**	**6%**	**17**	**18**	**17**	**19**	**20**
North America						15	12	12	13	12									
Western Europe						11	10	11	11	13									
Japan						34	34	34	34	34									
China						7	7	8	9	9									
Rest of the World						2	2	2	2	2									

Source: Metals Focus 2019 - 2025f, SFA (Oxford) 2014 - 2018.

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.

ADH

Alkane dehydrogenation: catalytic conversion of alkanes to alkenes. Broad term encompassing BDH and PDH.

BDH

Butane dehydrogenation; catalytic conversion of isobutane to isobutylene.

BEV

A Battery Electric Vehicle uses an electric motor exclusively powered by rechargeable batteries for propulsion.

Bharat

The Government of India introduced Bharat emission standards (BSES) to reduce and regulate the output of air pollutants from internal combustion and spark-ignition engine equipment, including motor vehicles.

Bharat Stage VI standard (BS-V, BS-VI)

Bharat Stage VI standard is the equivalent of Euro 6 and was rolled out in India between 2018 and 2020.

China Bars ≥ 500g

Net China demand for platinum bars of 500g or larger in size, excluding bars identified as being sold to investors mostly associated with industrial companies.

China Vehicle Emission Standards

China's vehicle emission standards are set nationally by the Ministry of Environmental Protection and are regionally and locally enforced by Environmental Protection Bureaus.
A number of cities and provinces in China continue the historic practice of early introduction of new standards.

China 6

As of December 2016, China adopted China 6 standards that apply nationwide to light-duty passenger vehicles from July 2020 (China 6a) and July 2023 (China 6b). These standards incorporate elements of Euro 6 and U.S. Tier 2 regulations for tailpipe and evaporative emissions. China 6b includes mandatory on-road emissions testing modelled after the EU RDE regulation (also known as Euro 6d TEMP) with a few enhancements and modifications.

China VI

China VI standards have applied to all new heavy-duty diesel vehicles since July 2023.

Compounds (Platinum based)

Platinum combines with other elements to form chemical mixtures that are used as catalysts in chemical processes as well as in plating, metal deposition and other industrial processes.

Diesel oxidation catalyst (DOC)

A DOC oxidises harmful carbon monoxide and unburnt hydrocarbons, produced by incomplete combustion of diesel fuel, to non-toxic 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.

Electrolysis of water

Water electrolysers are electrochemical devices used to split water molecules into hydrogen and oxygen. An electrical current is applied to the electrolyser cell, and water is split into oxygen and hydrogen. The electrolysis system comprises of the system, the stack, and the cell.

Emissions Legislation

Regulations that necessitate the fitment of autocatalyst systems dealing with the treatment of vehicle tailpipe emissions such as carbon monoxide (CO), particulate matter, hydrocarbons, and oxides of nitrogen (NO_x). There are a range of standards specific to various regions and countries with varying minimum emissions targets and deadlines for compliance.

EPA

Environmental Protection Agency regulating the US vehicle and engine emission standards for pollutants.

EREV

An Extended Range Electric Vehicle is a BEV with a gasoline ICE which cannot drive the wheels directly (unlike in a PHEV, for example), but acts as a generator to charge the battery giving a greater driving range.

HEV

A Hybrid Electric Vehicle has an internal combustion engine that can drive the wheels directly or act as a generator to charge the battery. Energy can also be recovered to the battery from regenerative braking. The electric only driving range is typically a few kilometres.

Hydrogen Production Methods

In recent years, colours have been used to refer to different hydrogen production routes. There is no international agreement on the use of these terms as yet, nor have their meanings in this context been clearly defined but the following colour key provides a guideline of most widely use reference to the various production methods.

white – naturally occurring or produced as industrial by-product

black or brown – coal gasification

grey – steam methane reforming turquoise – methane pyrolysis

blue – steam methane reforming plus carbon capture

green – water electrolysis with renewable energy sources

pink – nuclear power

yellow – solar power or mix of multiple sources.

ICE

Internal combustion engine.

IoT

Internet of Things. Networking system that allows data to be sent to and received from objects and devices through internet.

ISC

In Service Conformity which requires vehicles to not only conform with exhaust emission standards when they are new but also while in use.

Jewellery alloys

The purity of platinum jewellery is invariably expressed in parts per 1,000. For example, the most common variant, pt950, is 95% fine platinum, with the rest of the jewellery alloy made up of other metals such as cobalt or copper. Different markets would typically prescribe the purity levels for qualification and hallmarking of the jewellery as platinum jewellery.

Jewellery demand

Captures the first transformation of unwrought platinum into a semi-finished or finished jewellery product.

koz

Thousand ounces.

LCD

Liquid-crystal display used for video display.

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 (LPPM good delivery bars stored in a secure vault approved by the listing exchange).

Euro VI emission standards

EU emission standards for heavy-duty vehicles Euro VI was introduced in 2013/2014; similar standards have later been adopted in some other countries.

Euro 6 emission standards

EU emission standards for light-duty vehicles Euro 6 legislation was introduced in 2014/2015. The limits set in Euro 6 have remained unchanged, but the measuring methods have become more stringent progressively including Euro 6 a, b, c, d, and Euro 6d-Temp, now in place. For CO_2, the laboratory based WLTP and for NO_x RDE.

Euro 7 emission standards

Euro 7 regulations will keep the existing Euro 6 exhaust emission limits for LVs and LCVs but introduce stricter requirements for solid particles, as well as stricter lifetime requirements in terms of both mileage and lifetime. The new regulations are expected to be phased in from the start of 2027.

Euro VII emission standards

Euro VII regulations on HDVs imposes more stringent limits for various pollutants, including some that have not been regulated until now, such as nitrous oxide (N2O), as well as stricter lifetime requirements. The new standards are expected to be phased in from the start of 2027.

FCM

Fuel Consumption Monitoring describes the recording of actual consumption during the life of the vehicle. Applicable under Euro 6d to all new vehicles from 1/01/2020 and all new registrations from 1/01/2021.

FCEV

Instead of batteries, Fuel Cell Electric Vehicles use hydrogen in a platinum containing fuel cell to generate electricity to drive electric motors.

Forward prices

The price of a commodity at a future point in time. Typically comprises of the spot price as well as the risk-free interest rate and cost of carry.

GTL

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

HDD

Hard disk drive. Data storage device that stores digital data by magnetic platers.

HDV

Heavy-duty vehicle.

NEDC

New European Driving Cycle vehicle emissions test set out in United Nations Vehicle Regulation 101 maintained by the United Nations Economic Commission for Europe and updated and reviewed from time to time. The WLTP is aimed to significantly enhance and replace this regulation.

Net demand

A measure of the 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, often using engine and emissions technology similar to on-road heavy-duty diesel vehicles.

Ounce conversion

One metric tonne = 1,000 kilogrammes (kg) or 32,151 troy ounces.

oz

A unit of weight commonly used for precious metals. 1 troy oz = 31.103 grams.

PDH

Propane dehydrogenation, where propane is converted to propylene.

PEM Electrolyser Technology

One of four key water electrolyser technologies. The electrode on oxygen side (anode) contains iridium oxide while the electrode on hydrogen side (cathode) typically contains platinum. Transport layers are platinum-coated sintered porous titanium, and the bipolar plates would typically have platinum on with other metals.

PGMs

Platinum group metals.

PHEV

Plug in Hybrid Electric Vehicles can be plugged in to a power supply to charge a medium sized battery but also contain an ICE that can drive the wheels directly or charge the battery. The electric only driving range is typically 30-80km.

PMR

Precious metals refinery.

Pricing benchmarks

A price for a commodity that is traded on a liquid market that is used as a reference for buyers and sellers. In the case of platinum, the most commonly referenced benchmark is the LBMA Platinum Price, which is administered and distributed by the London Metals Exchange. The LBMA Platinum Price is discovered through an auction process.

Producer inventory

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

PX

Paraxylene ('PX') is 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.

Refined production

Processed platinum output from refineries typically of a minimum 99.95% purity in the form of ingot, sponge, or grain.

RDE

The Real Driving Emissions (RDE) test measures the pollutants such as NO_x, emitted by cars while driven on the road. It is in addition to laboratory tests. RDE testing was implemented in September 2017 for new types of cars and has applied to all registrations from September 2019.

Secondary supply

Covers the recovery of platinum from fabricated products, including unused trade stocks. Excludes scrap generated during manufacturing (known as production or process scrap). Autocatalyst and jewellery recycling are shown in the country where the scrap is generated, which may differ from where it is refined.

Selective catalytic reduction (SCR)

Selective Catalytic Reduction (SCR) is an emissions control technology system that injects a liquid-reductant agent (urea) into the outlet stream of a diesel engine. The automotive-grade urea, known by the trade name AdBlue. The system typically requires a platinum bearing DOC ahead of the SCR unit.

SGE

Shanghai Gold Exchange.

SSD

Solid-state drive. Data storage device that uses memory chips to store data, typically using flash memory.

Stage 4 regulations

Non-road mobile machinery (NRMM) is regulated by increasingly stringent regulations set out in tiers from Stage 1 to 5. This was last reviewed in May 2018 with deadlines set for 2020 and 2021. A submission by industry bodies requesting a delay in implementation as yet to be ruled on.

Three-way catalyst

Used in gasoline cars to remove hydrocarbons, carbon monoxide and NO_x. Platinum for palladium substitution has seen some platinum incorporated into the largely palladium-based catalyst, they also include some rhodium.

US Vehicle Emission Standards

US vehicle and engine emission standards for pollutants, are established by the US Environmental Protection Agency (EPA) based on the Clean Air Act (CAA). The State of California has the right to introduce its own emission regulations. Engine and vehicle emission regulations are adopted by the California Air Resources Board (CARB), a regulatory body within the California EPA. Vehicles can in every year be certified in different emission classes, called “bins.” The fleet average emissions over all “bins” are then regulated.

Tier 3

Emission regulation issued by EPA. The regulation defines common targets until 2025 in the USA.

Tier 4 stage

Non-road mobile machinery (NRMM) in Europe is regulated by increasingly stringent regulations set out in tiers from Stage 1 to 5. This was last reviewed in May 2018 with deadlines set for 2020 and 2021. A submission by industry bodies requesting a delay in implementation yet to be ruled on.

Washcoat

The layer that contains the active catalytic materials, such as PGMs, that is applied on the inactive, often ceramic, substrate within an autocatalyst block or component.

WIP

Work-in-progress.

WLTP

Worldwide Harmonised Light Vehicle Test Procedure is a laboratory test to measure pollutant emissions and fuel consumption. WLTP replaces the New European Driving Cycle (NEDC). It became applicable to new car types from September 2017 and new registrations from September 2018.

WPIC

The World Platinum Investment Council.