

FOREWORD

This edition of *Platinum Quarterly* presents platinum supply and demand developments for the fourth quarter of 2024, final estimates for 2024 and an updated forecast for 2025f. 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 6) are prepared independently for WPIC by Metals Focus.

The market deficits are substantially deeper than those forecast in the November *Platinum Quarterly*, at 995 koz in 2024 and 848 koz in 2025f. This is predominantly due to weaker recycling supply and strong investment demand, two themes that also look to be instrumental in determining the depth of the deficit in 2025f. Platinum is expected to remain in its third consecutive year of market deficit in 2025f. A significant focus is the potential for new US policies, particularly proposed tariffs, to disrupt the flow of PGMs into the US, and/or to damage consumer demand for vehicles. These concerns have driven some of the recent flows of platinum into the US and ultimately into NYMEX exchange stocks, which are captured in investment demand.

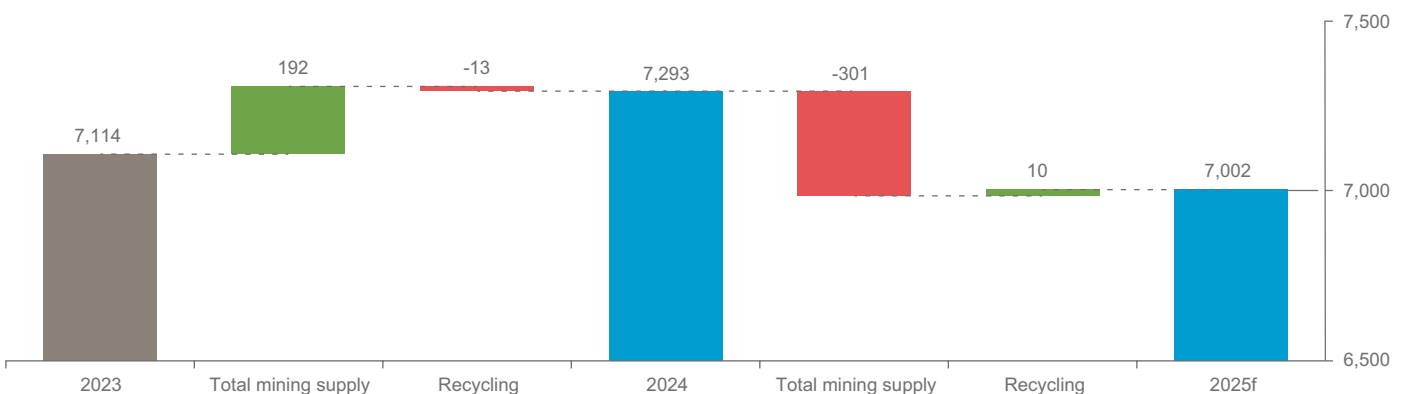
2024 deficit of 995 koz; significantly increased by Q4 investment inflows and ongoing recycling challenges

- Releasing final estimates for 2024, the platinum deficit has expanded by 313 koz to 995 koz, with the main driver being a 309 koz upward revision to investment flows, which picked up dramatically in the fourth quarter.
- Total supply is now estimated to have increased by +3% year-on-year to 7,293 koz in 2024, remaining highly constrained. Recycling supply continues to be a point of weakness and 2024 is the weakest year in our time series going back to 2013, a situation which looks set to persist into 2025.
- Total platinum demand of 8,288 koz in 2024 was up 5% versus 2023 and 336 koz higher than expected in our last *Platinum Quarterly*, boosted by significant investment inflows of 360 koz during the fourth quarter. As well as continued demand for bars and coins, 142 koz flowed into platinum ETFs in Q4 and 126 koz into Stocks Held by Exchanges (NYMEX and TOCOM).

Increased 2025f deficit of 848 koz to again be heavily influenced by investment flows and recycling weakness

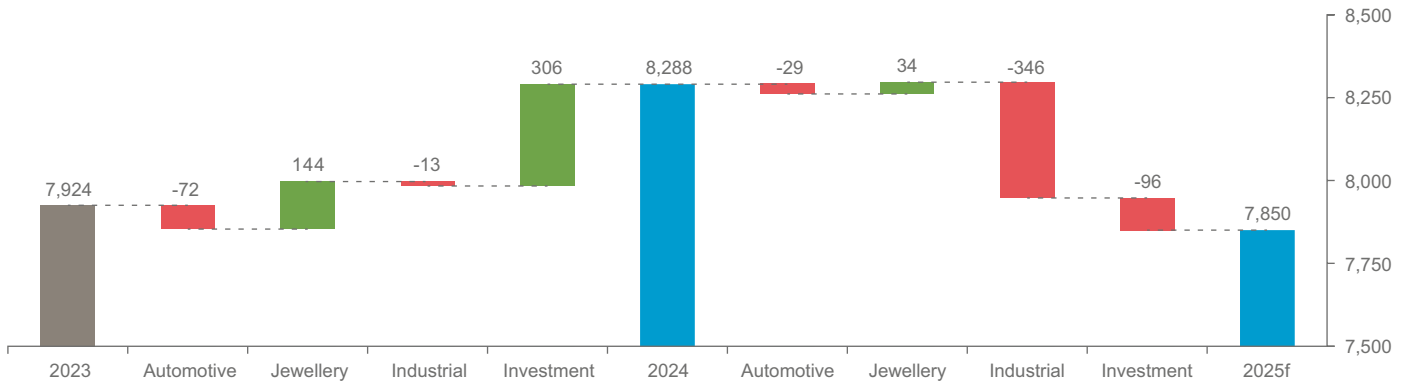
- The platinum market is expected to record a deficit of 848 koz in 2025f, up 309 koz from the forecast published in the Q3’2024 *Platinum Quarterly* published last November. The increased deficit is a function of a 322 koz reduction to the supply outlook, 278 koz of which is due to weaker recycling supply.
- Platinum supply is expected to shrink by 4% year-on-year to 7,002 koz, the second lowest number in our time series from 2013. Automotive recycling remains extremely weak due to an ongoing shortage of end-of-life catalytic converters, with total recycling at 1,496 koz, only 10 koz higher than the 12-year low seen in 2024. Forecast mine supply of 5,506 koz, down 5% year-on-year after recent restructuring, is 6% below the preceding 10-year average.
- At 7,850 koz, total demand is 13 koz lower than the 2025 forecast published in our last *Platinum Quarterly*, with lower automotive and industrial demand (-143 koz and -100 koz respectively) almost offset by higher jewellery and investment demand (+44 koz and +185 koz respectively). Investment demand is again boosted by net ETF and exchange stock inflows.

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



Source: Metals Focus prepared for World Platinum Investment Council

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



Source: Metals Focus prepared for World Platinum Investment Council

Investment demand drives Q4 2024 deficit of 256 koz

The final quarter of 2024 resulted in a platinum market deficit of 256 koz, which was significantly influenced by investment demand of 360 koz. On top of 92 koz of bar and coin demand, investment demand in Q4 was heavily boosted by 142 koz of ETF inflows and 126 koz of platinum moving into exchange stocks. Exchange stocks are platinum ounces held in approved storage facilities that serve as collateral for futures positioning. The unusually large exchange stock inflows in Q4 were the product of concerns around the then incoming US administration’s rhetoric on enacting trade tariffs that might result in a shortage of platinum availability in the US, at least at current prices. In combination with an associated need to back futures positions with locally held platinum, this created market distortions that attracted material into the US and in turn into NYMEX-approved storage.

Total platinum demand in Q4 came to 2,195 koz, up 22% year-on-year, with positive investment of 360 koz and jewellery demand of 520 koz (up 10% year-on-year), more than offsetting weaker automotive demand of 768 koz (down 6%) and industrial demand of 547 koz (down 8%). Total supply came to 1,938 koz, up 2% year-on-year, with total mining supply of 1,534 koz up 2% due to a release of work-in-progress inventory in South Africa. Recycling supply of 404 koz was up 1%, albeit remaining extremely depressed.

2024 review – platinum market deficit deepens to 995 koz

The estimated full year 2024 deficit is 995 koz, 313 koz deeper than expected at the time of our November *Platinum Quarterly*, which was predominantly due to the significant investment demand seen in the fourth quarter.

Total mining supply for 2024 came to 5,807 koz, up 3% on 2023, and only reaching that level due to releases from work-in-progress inventories. Excluding these releases, mining supply is continuing a multi-year trend of gradual decline in output. Recycling of 1,486 koz was down 1% year-on-year but undershot previous expectations by 100 koz, which resulted in 2024 being the lowest year in WPIC’s time series going back to 2013. Recycling struggled due to the ongoing challenges restricting the flow of end-of-life catalytic converters, as well as a lack of jewellery buybacks in Japan. Total supply came to 7,293 koz, up 3% year-on-year.

Total demand last year was 8,288 koz, up 5% versus 2023. Automotive demand totalled 3,130 koz, down 2% on 2023 due to a 2% decline in light-duty catalysed vehicle production (catalysed vehicles being pure internal combustion engine (ICE) plus hybrid vehicles) and a 5% decline in heavy-duty vehicle (HDV) production. Jewellery demand increased 8% year-on-year to 1,933 koz, boosted by record demand in Europe, strong demand in North America (despite a weak overall jewellery market there), a modest 1% improvement in China, where the market looks to have stabilised, and 31% year-on-year growth in India. The ongoing strong performance in India continues to benefit from an increasing number of jewellers displaying platinum jewellery, as well as strong export demand. Industrial demand declined 1% year-on-year, with a 26% fall in chemicals demand offsetting strength in demand from the other industrial sectors, particularly glass, which was up 29%, and hydrogen stationary and other, which was up 92%, albeit off a small base, to reach 44 koz. Investment demand was the real area of strength, up 77% to 702 koz. Total bar and coin demand was 356 koz, with total investment boosted by ETF holdings growing by 296 koz and exchange stocks by 50 koz.

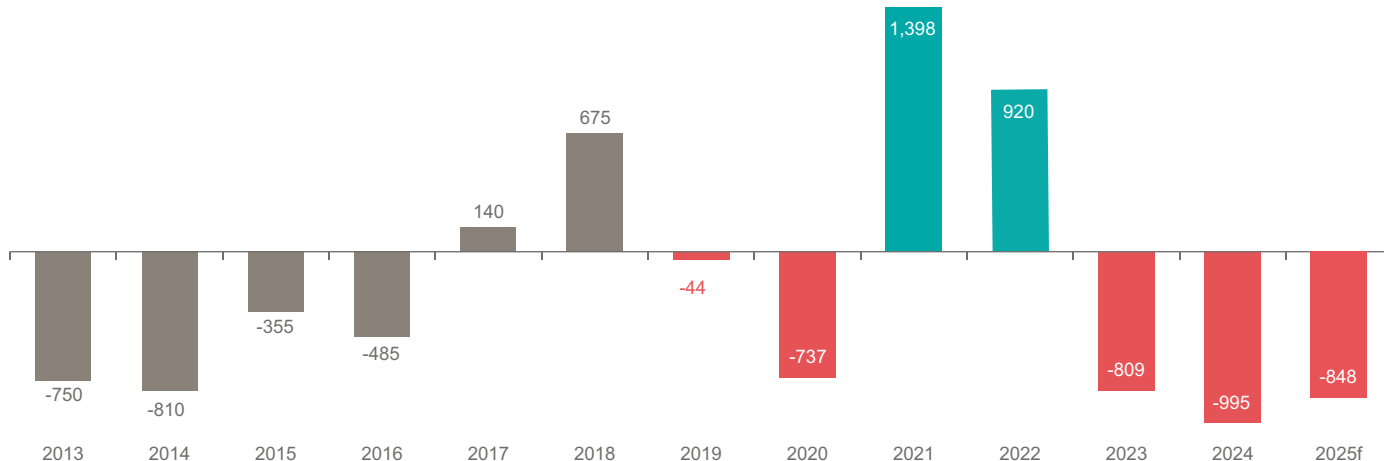
2025 deficit of 848 koz accentuated by sustained recycling weakness

Total supply is expected to decline 4% to 7,002 koz in 2025. This continues two themes. Firstly, a sustained multi-year erosion of mine supply, which is expected to decline 5% year-on-year to 5,506 koz, as a result of the ongoing restructuring and producers' focus on sustainability, as well as less material being released from work-in-progress inventories. Secondly, ongoing constraints on automotive and jewellery recycling; whilst total recycling is expected to increase 1% to 1,496 koz, it has been revised down by 278 koz since our November *Platinum Quarterly*. This cut to forecast recycling volumes is the most significant change to the 2025f dataset. Furthermore, total recycling remains almost 20% below the 10-year average. It is worth noting, however, that automotive deregistration rates have increased and so there is upside potential to recycling volumes if end-of-life catalytic converters manage to find their way through the system.

Total demand is forecast to come to 7,850 koz, down 5% on 2024. Automotive demand is expected to total 3,102 koz, down 1% on 2024 due to declining diesel market share in Europe and lower HDV output in North America being largely offset by 6% year-on-year growth in the rest of the world due to increased production of catalysed vehicles. Continuing the improvement of 2024, jewellery demand is expected to grow 2% year-on-year, reaching 2,027 koz, the first time it has breached 2 Moz since 2019. Although varying by region, the general theme for jewellery is increased fabricator and retailer support for platinum due to higher margins associated with the price discount to gold, and in particular, the potential to gain market share from white gold. In contrast, industrial demand is expected to decline 14% year-on-year to 2,116 koz on a cyclical slowdown after a sustained period of exceptional capacity additions, particularly in glass. The most significant industrial changes are a 30% increase in petroleum demand for platinum on the coincidental timing of a large number of gas-to-liquid changeouts, a 35% increase in hydrogen stationary and other demand reaching 59 koz, and a 58% decline in glass demand to 284 koz. Whilst glass has pulled back significantly versus recent years, it is still at a level that would have been considered relatively normal prior to 2020. Investment demand is expected to fall 14% to 606 koz. Although a decline versus 2024, it represents a 185 koz positive revision since our last *Platinum Quarterly*, and includes robust demand for bar and coins, ETFs as well as exchange stock inflows.

The aggregate of supply and demand equates to a 2025 market deficit of 848 koz, which is 309 koz deeper than presented at our last *Platinum Quarterly*, predominantly due to the downward revision to recycling combined with an upward revision to investment demand. After the significant deficits of 2023 and 2024, the additional drawdown is expected to result in above ground stocks falling to only 2,535 koz by the end of the year, less than four months of demand.

Annual platinum supply/demand balances 2013-2025f (koz)



Source: SFA (Oxford) 2013 - 2018, Metals Focus 2019 - 2025f

The platinum investment case – structural deficits and discount to gold raising investor interest

The attraction of platinum as an investment centres around the ongoing strength in platinum demand, which in combination with constrained supply that has been consistently unable to satisfy demand since 2022, is resulting in sustained shortfalls and a market in structural deficit. The key point to highlight is that the robust demand comes despite the rather uncertain geopolitical and economic backdrop and despite previous expectations of rapid drivetrain electrification eroding automotive demand in the near-term. Indeed, forecast 2025 automotive demand for platinum remains 6% above the ten-year average, which incorporates a 22% year-on-year increase in BEV market share (despite growing consumer reluctance to adopt full battery electrification). It is notable that, at 848 koz, the magnitude of the deficit in 2025 is sufficient that only substantial, and probably unlikely, changes to the outlook would be needed to materially reduce it.

Investor interest is being piqued by 1) the ongoing deficits, 2) the resultant rapid depletion of above ground platinum stocks, and 3) the expectation of growing market tightness, as well as 4) platinum's growing price discount to gold. In addition, there is interest in platinum's potential to benefit from a slowdown in the growth of BEV market penetration rates and thereby higher-for-longer ICE demand. Interest in platinum as an investment is evident in strong total bar and coin demand for platinum which is being boosted by ETF flows. ETF holdings increased by 296 koz in 2024 and are expected to rise by a further 100 koz in 2025.

Beyond ETFs, investment demand is also being affected by one of the topics of the moment, namely the risk of punitive tariffs being applied by the US and the significant distortions to trade flows this is causing in commodity markets, including for platinum. There is still some uncertainty regarding which country's goods will be subject to import tariffs, and at what level tariffs will be set. However, the uncertainty and fear that certain commodities will therefore either be in short supply domestically, or available only at higher prices, has resulted in a local commodity price premium in the US that is attracting a flow of material into the country, particularly from Europe, ahead of tariffs potentially being enacted. The associated market tightness is also resulting in elevated platinum lease and Exchange of Futures for Physical (EFP) rates, driving platinum into NYMEX-approved storage facilities. This is reflected in our data in 'Stocks Held by Exchanges', which shows increases of 50 koz for 2024 and 150 koz for 2025.

Notably, at the time of writing, more than 271 koz of platinum has already flowed into exchange stocks this year-to-date; our full-year numbers therefore assume some unwinding of these holdings, without which, the projected deficit of 848 koz for 2025 will potentially be more substantial. Interestingly, the exchange stock inflows started in Q4'24, before the EFP rate materially increased in the New Year. There are a couple of final points to consider on exchange stocks. Firstly, as well as being recorded as a source of demand, they can also act as a source of supply, albeit only likely when concerns of in-country platinum availability are eased. Secondly, exchange stocks do not represent 'new' platinum ounces, but are in effect above ground stocks that have simply moved from non-visible to visible holdings.

One additional consideration is the question of Russian supply. With the US initiating peace talks with Russia raising the prospect of sanctions being lifted, there have been some reports that this will free up the availability of Russian-origin PGMs leading to increased supply. To be clear, we fully include Russian platinum production in our numbers as Russian platinum is not sanctioned for use (only for trading on official exchanges) and is therefore still finding its way to market even if Western users of PGMs may be 'self-sanctioning' with their procurement strategies. The lifting of sanctions or otherwise will therefore have no bearing on the market balance presented here.

In conclusion, the structural deficit in the platinum market is embedded and continues to deplete above ground stocks. This is an unsustainable situation which will not resolve itself without a price response as the market looks to self-solve by stimulating a supply response or disincentivising demand. We believe both supply and demand are relatively price inelastic, at least in the near-term, and this presents an attractive investment opportunity.

WPIC initiatives highlights

We continue to work closely with our wide and growing 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 all newly minted precious metals in 2024 was well below the exceptional levels seen over the three preceding years, increased interest is being fuelled by ongoing global uncertainty. While strong retail demand for gold is being partly met by high price-related selling back, platinum has been less affected.

In Europe and North America, heightened interest in platinum continues due to its increased discount to gold. The fact that platinum's compelling fundamentals are not yet reflected in price is a situation increasingly being seen by many investors as unsustainable. We expect the observable lift in platinum sales in Q4'24 that resulted from Costco selling platinum to continue into 2025. This has also resulted in more investors becoming aware that platinum can be included in retirement savings and WPIC has been collaborating with partners across these regions to encourage provision of platinum investment options to individual investors seeking to bolster their retirement savings. Our partner salesforce training yielded positive results in 2024 in terms of maintaining and developing knowledge around platinum investment and increased product sales.

In 2024, WPIC achieved a significant milestone in China with our product partners recording unprecedented sales, with 20% year-on-year growth. This success was fuelled by our strategic collaborations with key players and enhanced support for China Gold Coin Group (CGCG), Metalor China, Bai De Jin and Yue Heng. By helping them expand their platinum portfolios and develop innovative, cost-effective products, we leveraged the surge in the gold price to promote platinum. We also partnered with a museum and a production company to create small-sized platinum cards, appealing to younger consumers and boosting platinum's popularity. Co-hosting the China PGMs Market Annual Conference with the China Gold Association in December further solidified our influence in the gold market and encouraged more distributors to initiate platinum business.

In Japan, we welcomed Noguchi Coin, a leading online coin dealer, as a new partner. In November, our participation and well-received speech at the JBMA year-end event strengthened our network and market support.

We are delighted that two new members have joined WPIC. Bravo Mining Corp. is the first pre-production member of the WPIC and is advancing a PGM project in Brazil, while Podium Minerals is the first Australian PGM pre-production member to join.

Trevor Raymond, CEO

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PLATINUM QUARTERLY Q4 2024

Table 1: Supply, demand and above ground stock summary

	2021	2022	2023	2024	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q3 2024	Q4 2024
Platinum Supply-demand Balance (koz)									
SUPPLY									
Refined Production	6,295	5,520	5,604	5,766	5,506	3%	-5%	1,461	1,539
South Africa	4,678	3,915	3,957	4,132	3,899	4%	-6%	1,049	1,160
Zimbabwe	485	480	507	512	514	1%	0%	132	121
North America	273	263	275	254	216	-8%	-15%	60	63
Russia	652	663	674	677	686	0%	1%	172	146
Other	206	200	190	191	191	0%	0%	48	47
Increase (-)/Decrease (+) in Producer Inventory	-93	+43	+11	+41	+0	261%	-100%	-11	-4
Total Mining Supply	6,202	5,563	5,615	5,807	5,506	3%	-5%	1,450	1,534
Recycling	2,091	1,809	1,499	1,486	1,496	-1%	1%	342	404
Autocatalyst	1,602	1,368	1,098	1,113	1,129	1%	1%	254	310
Jewellery	422	372	331	298	286	-10%	-4%	68	74
Industrial	67	69	71	76	81	7%	7%	20	20
Total Supply	8,293	7,372	7,114	7,293	7,002	3%	-4%	1,792	1,938
DEMAND									
Automotive	2,432	2,734	3,202	3,130	3,102	-2%	-1%	743	768
Autocatalyst	2,432	2,734	3,202	3,130	3,102	-2%	-1%	743	768
Non-road	†	†	†	†	†	N/A	N/A	†	†
Jewellery	1,953	1,880	1,849	1,993	2,027	8%	2%	485	520
Industrial	2,514	2,353	2,475	2,462	2,116	-1%	-14%	557	547
Chemical	648	684	824	609	578	-26%	-5%	136	128
Petroleum	169	193	159	158	205	0%	30%	40	40
Electrical	135	106	89	94	96	5%	2%	24	24
Glass	751	533	517	670	284	29%	-58%	125	116
Medical	267	278	292	308	320	6%	4%	77	79
Hydrogen Stationary and Other	17	12	23	44	59	92%	35%	12	15
Other	528	548	571	579	573	1%	-1%	144	145
Investment	-3	-516	397	702	606	77%	-14%	-230	360
Change in Bars, Coins	349	259	322	194	181	-40%	-7%	65	54
China Bars ≥ 500g	27	90	134	162	175	20%	8%	30	38
Change in ETF Holdings	-241	-558	-74	296	100	N/A	-66%	-300	142
Change in Stocks Held by Exchanges	-139	-307	14	50	150	244%	200%	-25	126
Total Demand	6,895	6,452	7,924	8,288	7,850	5%	-5%	1,555	2,195
Balance	1,398	920	-809	-995	-848	N/A	N/A	237	-256
Above Ground Stocks	4,267**	5,187	4,378	3,383	2,535	-23%	-25%		

Source: Metals Focus 2021 - 2025f.

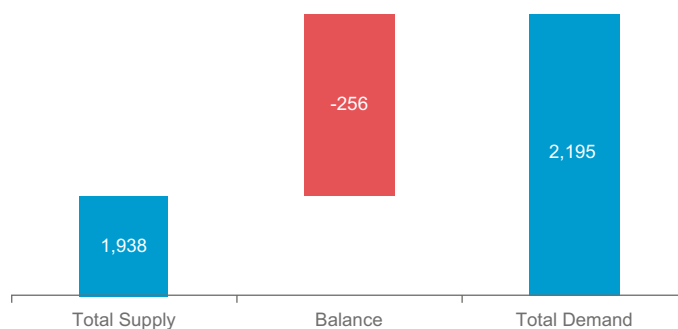
Notes:

- **Above Ground Stocks 3,650 koz as of 31 December 2018 (Metals Focus).
- † Non-road automotive demand is included in autocatalyst demand.
- All estimates are based on the latest available information, but they are subject to revision in subsequent quarterly reports.
- The WPIC did not publish quarterly estimates for 2013 or the first two quarters of 2014. However, quarterly estimates from Q3'14, to Q1'21 are contained in previously published PQs which are freely available on the WPIC website.
- Quarterly estimates from Q4'22 and half-yearly estimates from H2'2022 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 FOURTH QUARTER PLATINUM MARKET REVIEW

In a reversal of the Q3'24 trend (which saw an 11% year-on-year fall), total demand jumped 22% (+395 koz) in Q4'24 as the incoming US Administration's talk of tariffs resulted in the relocation of platinum warehouse stocks from Europe to the US and investors increased ETF holdings amid growing political uncertainty and opportunities presented by lower prices. Total demand reached 2,195 koz, while global supply grew by 2% (+31 koz) to 1,938 koz following flat mine output and marginally improved recycling.

Chart 1: Supply-demand balance, koz, Q4 2024



Source: Metals Focus prepared for World Platinum Investment Council

Supply

In Q4'24, global refined mine supply remained virtually unchanged year-on-year at 1,539 koz. Increases from South Africa were offset by declines from Zimbabwe and North America.

South African production rose 2% year-on-year, as an increase from Implats offset lower output from Anglo American Platinum. Anglo American Platinum's refined volumes fell as the company's drawdown of semi-finished inventory, which had boosted supply in Q4'23 and early 2024, was completed. Implats' refined output rose due to increased availability of processing capacity following a period of smelter rebuilds.

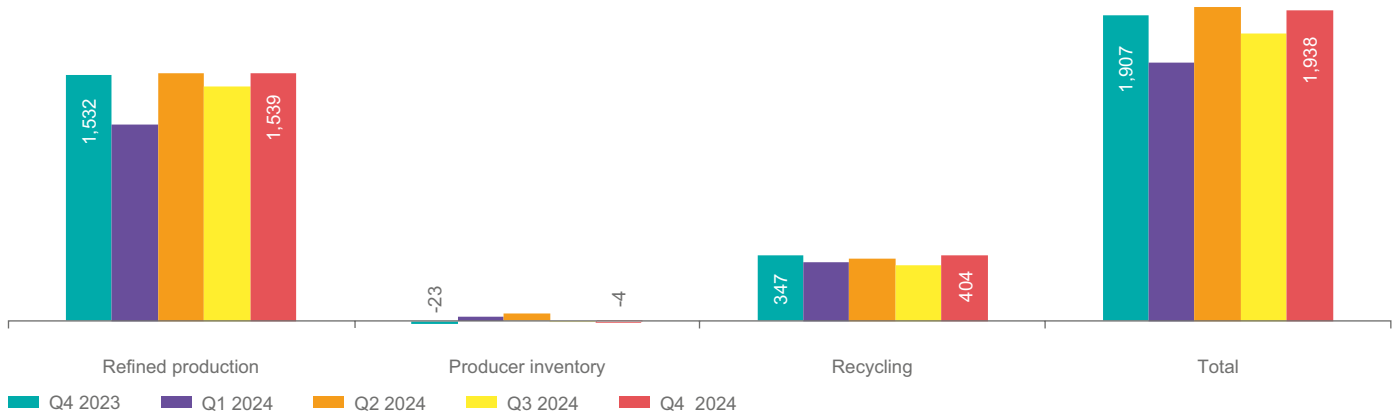
Zimbabwean production dropped 9% year-on-year to 121 koz, primarily due to the commissioning of the expanded Zimplats smelter, which led to a build-up of 14 koz in semi-finished inventory during H2'24. Additionally, intermittent power supply disruptions affected operations during the quarter.

Russian output climbed 7% year-on-year. Although repairs to flash smelting furnace #2 at Nornickel's Nadezhda Metallurgical Plant had some deferred impact, the year-on-year rise was primarily due to constrained ore mining in 2023. North American output was down 11% year-on-year, while Other mining supply was flat.

Recycling

Global recycling supply posted a modest year-on-year improvement to 404 koz (+6 koz), but remained anaemic in the context of recent levels. Autocatalyst recycling rose by 5%, primarily driven by a return to normal recycling levels in China following the easing of the autocatalyst recycling restrictions. Additionally, China began to see early benefits from the scrappage incentive introduced in H1'24, which was further increased in H2'24. Supply from second-hand jewellery sources fell by 13% (-11 koz), as both Japan and China reported lower recycling volumes. This marks the eighth consecutive quarterly year-on-year decline for Japanese jewellery recycling. In China, platinum jewellery scrap fell 9% year-on-year in Q4'24, largely due to continued price weakness. The extent of the decline was also due to a high base in Q4'23, due to destocking by jewellers shifting retail real estate to gold jewellery during that time. Electronic recycling increased by 10% (+2 koz), benefiting from the AI-driven acceleration in data centre upgrades.

Chart 2: Platinum supply, koz

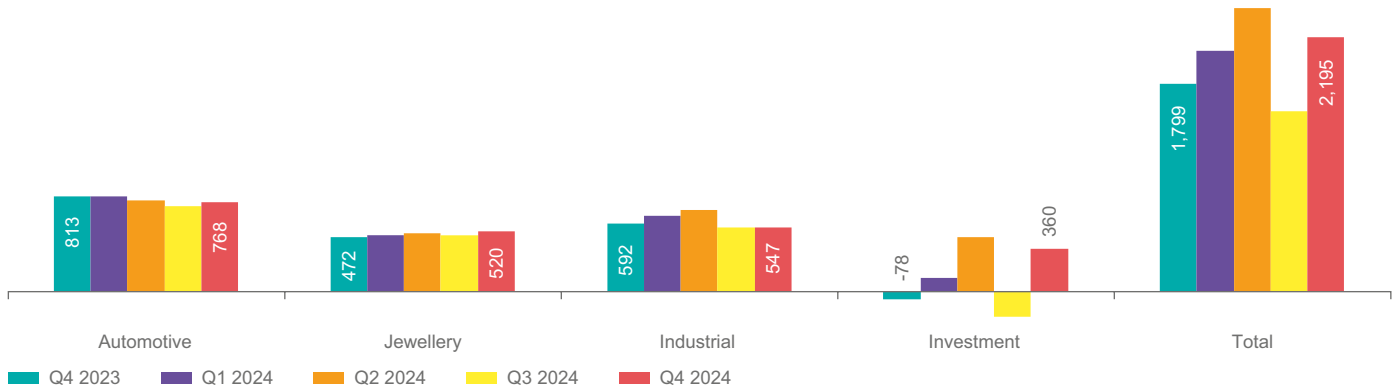


Source: Metals Focus prepared for World Platinum Investment Council

Demand

Global demand during Q4'24 rose by 22% (+395 koz) year-on-year to 2,195 koz, benefiting from significant investment flows. ETF investment swung from a -171 koz outflow in Q4'23 to a 142 koz inflow, while warehouse stocks, jumped to 275 koz (an increase of 126 koz) mostly due to flows to NYMEX vaults underpinned by US tariff concerns. While industrial demand was softer, mainly due to weaker glass demand, jewellery demand showed a double-digit gain.

Chart 3: Platinum demand, koz



Source: Metals Focus prepared for World Platinum Investment Council

Automotive demand

In Q4'24, global automotive platinum demand declined by 6% year-on-year (-45 koz) to 768 koz. While global vehicle production increased by 2% to 24.9M units, total catalysed vehicle production, which includes hybrid and pure internal combustion engine (ICE) vehicles, fell by 1%. In addition, global heavy-duty vehicle (HDV) production dropped by 14% to 739k units, impacted by earlier pre-emptive buying activities in Europe boosting comparable Q4'23 levels and weaker demand in China.

In Europe, platinum demand fell by 18% to 243 koz due to a 27% reduction in light-duty ICE vehicle production and a 28% decline in HDV output. Although hybrid vehicle production increased by 20% and that of fuel cell electric vehicles (FCEVs) nearly doubled, albeit from a low base, these gains were insufficient to offset the reduction in pure ICE production.

In North America, the growth in hybridisation continued to outpace battery electric vehicle production at a ratio of two to one. Despite a 3% decline in overall vehicle production, platinum demand increased by 4% to 110 koz. This was primarily due to the continued use of trimetallic catalysts, which have higher platinum loadings compared to other aftertreatment systems, as well as a consumer preference for larger-bodied vehicles. Without the 13% decline in HDV production that took place, demand would have been even higher.

In Japan, despite a 7% decline in light-duty vehicle (LDV) production, platinum demand increased by 5% to 82 koz. Lower ICE production was offset by increased FCEV production, which, despite being low in volume, requires significantly higher platinum loadings, with one FCEV equating to around ten ICE vehicles of platinum demand. HDV production remained stable, while diesel bus and coach production, which favours platinum, increased by 33% during the quarter.

In China, platinum demand softened by 1% to 140 koz, largely due to the composition of vehicle production. While overall production increased by 9%, driven by an aggressive government scrappage scheme, battery electric vehicle (BEV) penetration and thrifting among domestic brands weighed on platinum offtake. In addition, pick-up truck production fell by 25%, while van production declined by 16% in Q4'24.

In the rest of the world, platinum demand increased modestly by 2% to 193 koz, in line with a 2% increase in vehicle production.

Jewellery demand

Global jewellery demand increased by 10% year-on-year to 520 koz in Q4'24 (+49 koz).

Demand in Europe eased by 1% year on year in Q4'24, chiefly on account of losses in Switzerland (where watch hallmarking fell by 11%) while still recording the second highest level of fabrication over the quarterly data series since 2013. Top-end brands showed lacklustre performance but was mostly offset by an improvement in mass-market demand. In contrast, the mass market looks to have turned a corner, chiefly as wide price differentials to gold encouraged a modest amount of migration to platinum. For example, UK platinum hallmarking was up 5% in Q4'24, while UK gold hallmarking was down 1%.

Fabrication in North America is estimated to have grown by 2% year-on-year in Q4'24. Some of the uptick was due to the uncertainty of the US election having passed and tentative signs of growth for the engagement market. There was residual support from a yet wider price differential to gold (at the fine metal level) and earlier destocking by the retail supply chain appears to have wound down.

The theme of Japanese platinum jewellery demand benefiting from a high gold price continued into Q4'24. We saw retailers adjust their gold design price points upwards throughout the second half of the year and this has resulted in some shift to the white metal in the country. Coupled with a particularly low base in Q4'23, this saw demand rise by 18% during the quarter. Turning to China platinum jewellery, fabrication recorded a notable year-on-year increase of 20% in Q4'24, alongside a more moderate quarter-on-quarter growth of 7%. The strong annual expansion was primarily driven by the low base in Q4'23, when competition from the Chinese gold jewellery market dampened consumer demand and supply chain interest in platinum jewellery.

Indian platinum jewellery fabrication jumped by 12% year-on-year to a record level of 94 koz in Q4'24, taking the full-year total to 266 koz (+31% year-on-year). Fabrication in India continues to be supported by two factors: rising exports and store expansion. Although exports during the quarter were half those of Q3'24, higher store openings during the festive season and preparation for the India International Jewellery Show (IIJS) underpinned the gains. A drop in gold prices in November and the ongoing wedding season led to higher store footfall, which along with falling platinum prices supported demand.

Industrial demand

In Q4'24, platinum industrial demand fell 8% year-on-year to 547 koz, driven by weaker glass sector demand following exceptional volumes in 2023. This represented 25% of total demand for the quarter.

Chemical

Platinum chemical demand decreased by 3% year-on-year and 5% quarter-on-quarter to 128 koz in Q4'24. Continuing the trend in the previous quarter, an absence of new paraxylene (PX) plants coming on stream in China was the key factor behind weaker demand. While the ramp-up in propane dehydrogenation (PDH) capacity continued in China, the lift in platinum demand was not sufficient to compensate for the fall in the PX segment. In December, Sinopec completed a second-phase expansion at its integrated refining and petrochemical complex in Ningbo, which included PDH units. Platinum demand from the silicone industry remained steady, as positive demand from consumer products was mitigated by lower sales to the construction and automotive sectors. Meanwhile, nitric acid offtake eased modestly on a year-on-year basis, reflecting a slower capacity expansion in 2024.

Petroleum

The use of platinum in the petroleum industry remained unchanged from the previous quarter at 40 koz. On a year-on-year basis, volumes were up by just 2%. While global refining capacity continued to rise in 2024, tepid growth in demand saw refining margins fall to multi-year lows in H2'24. The impact of declining margins was most pronounced in Europe where platinum demand weakened. In November, Gunvor Group temporarily halted its production in Rotterdam. This followed announcements earlier in the year that two refineries in Europe will shut permanently. China recorded a modest drop, as the ongoing economic downturn there, and a rapid shift to electrical vehicles, dampened oil consumption. Oil refining capacity in China has also been affected by a slowdown in expansion of petrochemical units, as many of the newly built petrochemical plants are integrated with crude oil refining units. By contrast, in North America record US oil supply lifted demand slightly higher year-on-year.

Medical

In Q4'24, platinum medical demand rose 9% (+7 koz) year-on-year to a record 79 koz. Growth was driven by increasing use of platinum-based stents and medical devices, rising cancer rates and expanding treatment availability, supported by better healthcare access, especially in emerging markets, and an ageing global population.

Glass

Platinum glass offtake in Q4'24 dropped 30% (-51 koz) year-on-year to 116 koz, its lowest since Q3'23. Platinum demand is closely tied to capacity changes, and peaked between Q4'23 and Q2'24. Consequently, this sharp decline mainly reflects significant Chinese LCD capacity expansions in Q4'23, with more moderate growth in Q4'24.

Electrical

Demand from the electronics segment in Q4'24 rose by 9% (+2 koz) year-on-year. This was driven by the resurgence of hard-disk drive (HDD) shipments, which were fuelled by infrastructure developments and upgrades in artificial intelligence, edge computing, and near-line storage. Additionally, increases in the average capacity of HDDs contributed to higher metal per unit loadings, further supporting platinum demand. Concurrently, ongoing strong demand for advanced semiconductor manufacturing processes (10nm and below), along with capacity expansions, led to increased demand for platinum alloy targets in chip manufacturing, further boosting metal demand in this sector.

Hydrogen: Stationary and Other

Demand for platinum in stationary and other applications jumped 46% year-on-year to 15 koz. While final investment decisions are lagging announced hydrogen production projects, leading to an overall downward revision in expectations, growth momentum remains, with several companies reporting still healthy increases in year-on-year revenue and orders during the quarter.

Other

Global other industrial demand declined by 3% (-4 koz) to 145 koz in Q4'24. In the automotive sector, the combined production of ICE and hybrid vehicles experienced a slight 2% decline year-on-year, and the aftermarket performance fell short of expectations, leading to reduced demand in both spark plugs and sensors segment.

Investment demand

During Q4'24, global bar and coin investment fell by 11% year-on-year (-7 koz) to 54 koz; it was also 17% lower against Q3'24. The year-on-year weakness was almost entirely due to a return to net disinvestment in Japan, which offset gains in North America and Europe.

The gains in North America were underpinned by the introduction during the quarter of platinum bars and coins at Costco in the US. This made up for the weakness in others parts of the North American market, which have witnessed weak gross sales to investors, for gold, silver and platinum, combined with elevated levels of retail liquidations. As discussed in recent issues of the *Platinum Quarterly*, the market has also had to digest a lack of US Platinum Eagles, the minting of which (for now at least) has ceased.

In Europe, demand more than doubled year-on-year and quarter-on-quarter to 11 koz in Q4'24, making it the highest figure since Q3'22. The recovery reflects improving interest in physical precious metals across the board. In the UK, improving demand was also assisted by a jump in demand for capital gains tax-free platinum bullion products before and in the aftermath of the government's budget.

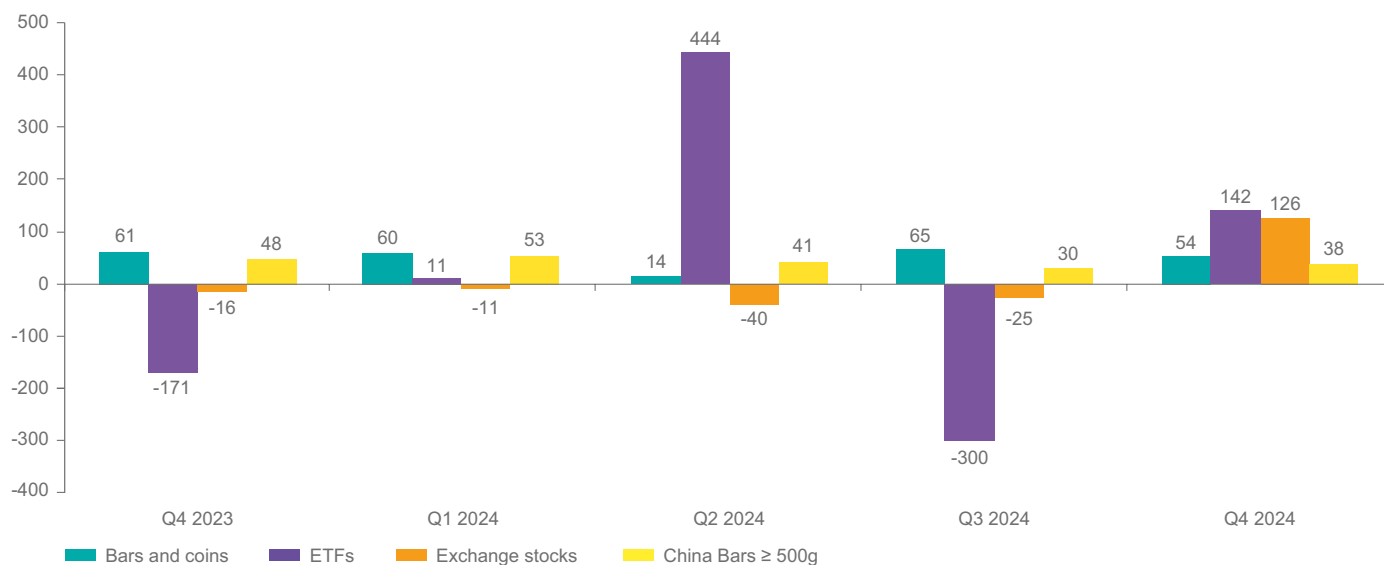
Chinese bar and coin demand in the smaller than 500g category posted a 3% year-on-year increase and a 27% quarter-on-quarter growth in Q4'24. We saw a growing number of small wholesaling counters, typically seen in the Shuibei area of Shenzhen, liquidating unsold gold jewellery inventory and effectively taking profits following price rallies, and building up stock of platinum retail investment bars in Q4'24, as they believed the white metal was undervalued.

Japan's move to disinvestment was very much fuelled by local price moves. Specifically, the rally that the Japanese yen platinum price enjoyed in October resulted in a spike in liquidations, which coupled with low volumes on both sides of the market over the rest of the quarter, saw the total for the period turn negative.

Platinum exchange-traded fund (ETF) holdings rose by 142 koz to 3,308 koz in Q4'24, largely driven by inflows from US-based funds. Although there was some trend-following investment into ETFs as platinum rallied over \$1,000 in the second half of October, most inflows occurred in the next two weeks as falling prices attracted opportunistic buying.

NYMEX and TOCOM warehouse inventories jumped by 126 koz Q4'24, the largest inflow since Q3'20. Concerns over proposed tariffs in the US, which would lead to higher metal prices in that market, drove these exceptional inflows, boosting premiums on domestically located material. The impact was reflected in a sharp rise in the exchange for physical (EFP)—the spread between US futures prices and the London spot price—which reached \$30 (and has since peaked over \$60 in early 2025), encouraging metal to flow onto the exchange.

Chart 4: Platinum Investment, koz

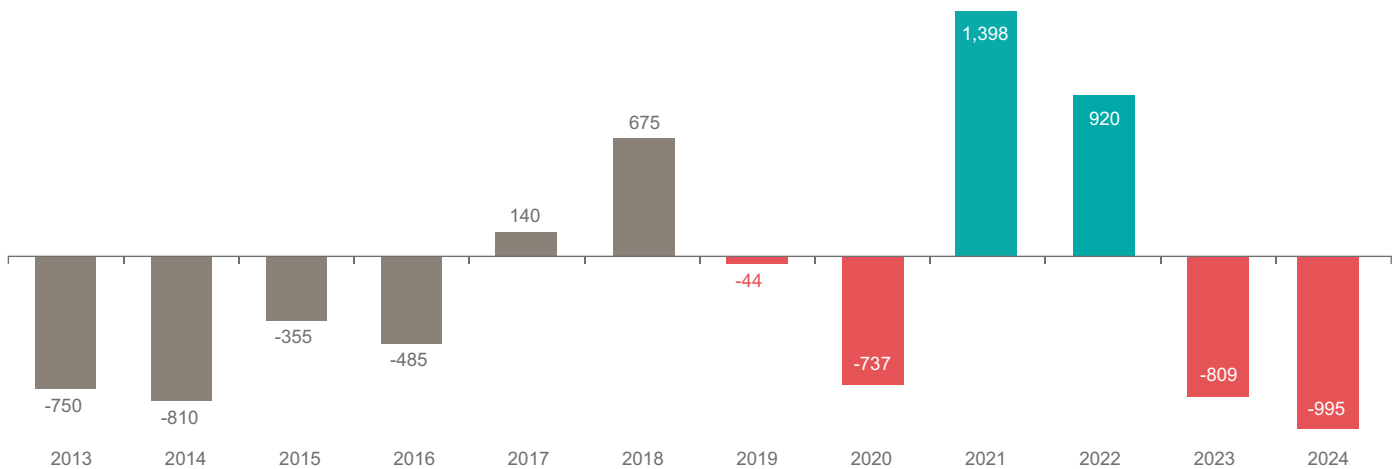


Source: Metals Focus prepared for World Platinum Investment Council

2024 REVIEW

The global economy grew at a marginally slower pace in 2024 than in 2023, recording a 3.2% gain according to the IMF. With no easing of geopolitical tensions, the prospect of a new US administration and the ensuing change in economic direction ensured that 2024 ended with rising concerns over trade wars, directly impacting many commodities, including platinum. Global platinum supply rose 3% to 7,293 koz, as the processing of semi-refined inventory boosted mine supply and offset a decline in recycled ounces. Demand exceeded 8 Moz for the first time since 2019, as investment flows and growth in jewellery demand pushed platinum demand to 8,288 koz, resulting in a deficit of 995 koz for the year.

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



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

Supply

Twelve months ago, Metals Focus' forecast, as outlined in the Q4'23 *Platinum Quarterly*, anticipated a 2% decline (-101 koz) in 2024 refined platinum mine supply. However, this decline did not materialise. Instead, mine supply rose 3% year-on-year, reaching a three-year high of 5,766 koz, driven by stronger-than-expected output from South Africa and Russia.

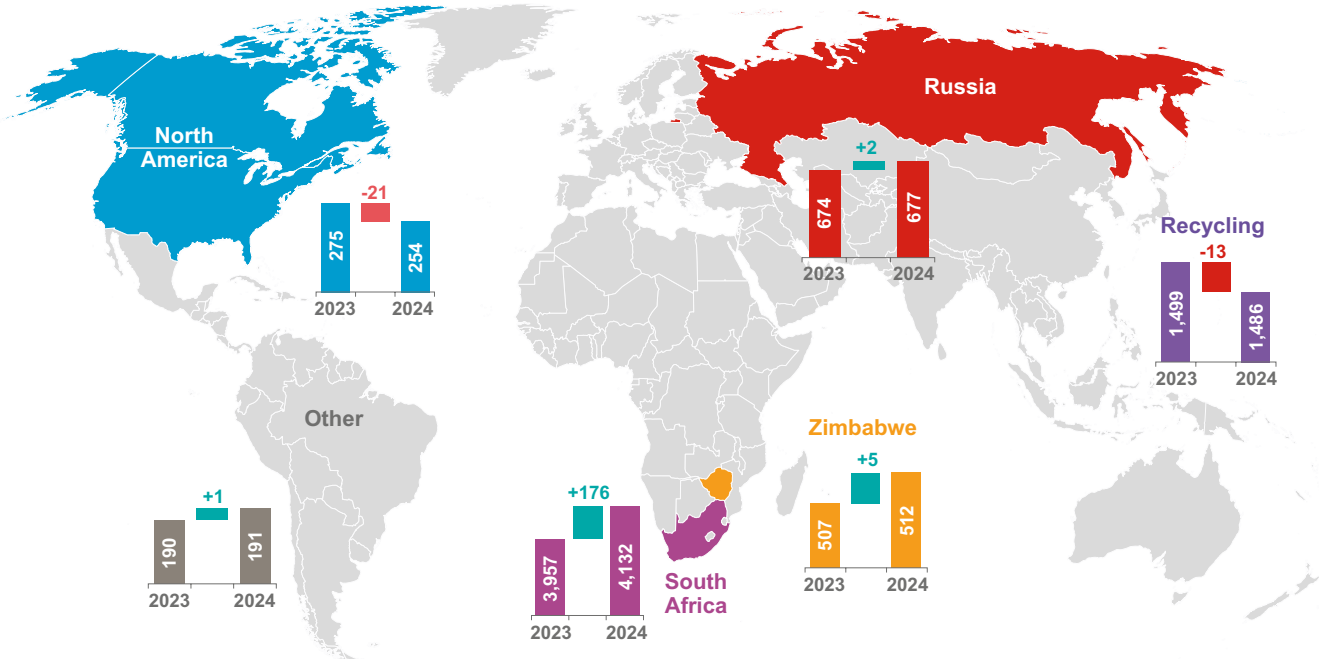
Despite a year-on-year decline in underlying mined PGM in concentrate output—driven by lower production from most miners except for Northam—South Africa's refined output rose in 2024. This was largely due to Anglo American Platinum processing semi-finished inventory, pushing national refined volumes above mined output. The inventory drawdown exceeded the company's expectations, allowing it to beat its initial 2024 production guidance. Meanwhile, reduced load curtailments and improved processing stability helped most other producers achieve their FY2024 guidance. As a result, South African refined production rose 4% year-on-year to 4,132 koz.

Nornickel had forecast a year-on-year decline in 2024 platinum production due to geopolitical uncertainty, economic challenges, and repairs to furnace #2 at the Nadezhda Metallurgical Plant. However, with repairs completed 30 days ahead of schedule, output exceeded expectations, holding steady year-on-year at 677 koz.

Output from Zimbabwe at 512 koz increased 1% year-on-year reaching an all-time high. Reduced output from Zimplats, due to the commissioning of its expanded smelter, was offset by an increase from Unki.

North American platinum production saw the largest regional decline, falling 8% year-on-year to 254 koz, driven by lower Canadian by-product nickel output.

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



Source: Metals Focus prepared for World Platinum Investment Council

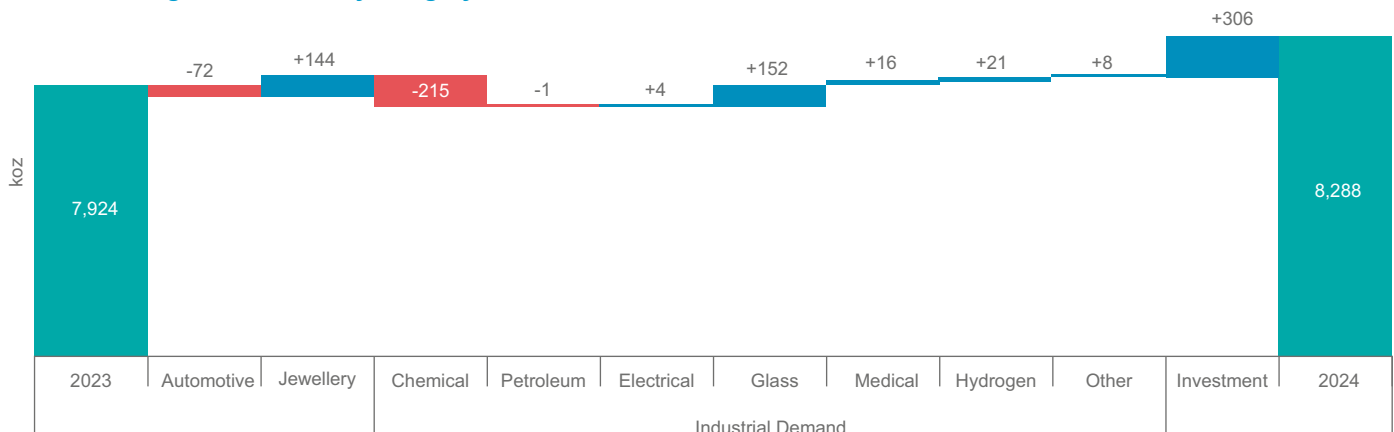
Recycling

Global recycling declined 1% to 1,486 koz in 2024, the lowest level in our time series going back to 2013. However, autocatalyst recycling recorded a modest increase of 1%, reaching 1,113 koz. After two years of significant decline, the flow of end-of-life vehicles appears to have stabilised albeit at extremely depressed levels. In China, the scrappage scheme and a significant expansion in smelting capacity led to a 59% improvement in recycling. Jewellery scrap declined 10%, driven by a lack of buybacks in Japan, while platinum destocking in China appears to have run its course. Supply from electronic scrap benefited from upgrades to data centres, with an estimated 7% increase (+5 koz) to 76 koz.

Demand

Global demand improved 5% (+364 koz) as investment grew 77% and jewellery demand posted an 8% increase to reach 1,993 koz. The industrial sector edged lower as the jump in glass demand fell short of the contraction in chemical demand over the year.

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



Source: Metals Focus prepared for World Platinum Investment Council

Automotive demand

In 2024, global LDV production (all LDV types) contracted year-on-year by a fraction of a percentage to 90.4M units. The lower growth rate was mainly due to the downward revision in BEV production which came in at 11.5M units compared to the 12.7M that was expected at the start of the year. Meanwhile, catalysed vehicle production declined by 2% year-on-year to reach 78.8M cars. HDV production declined by 5% as freight volumes declined in 2024, while the trucking sector experienced an oversupply of capacity. As a result, global platinum automotive demand fell 2% to 3,130 koz.

In Europe, vehicle selling rates remained lacklustre throughout the year. Political instability and a weak economy meant consumers were hesitant to make significant purchases. As a result, European demand declined by 11% (-133 koz) year-on-year. This comes on the back of an 18% decline in ICE vehicle production and a 11% decline in diesel-fuelled cars that favour higher platinum loadings. The 21% decline in HDV production, also biased toward diesel and platinum, further exacerbated weakness in platinum demand.

By contrast, in North America, demand increased by 8% to 483 koz. A combination of higher platinum loadings, a result of the growth in trimetallic aftertreatment systems installed, slightly higher diesel-fuelled vehicles sales and a higher growth rate in larger-bodied vehicles, supported platinum demand.

Japanese vehicle production, plagued by production stoppages on the back of non-compliance concerns related to incorrect testing (mainly on safety and crash features), fell by 8%. Despite this, demand saw a modest 1% uptick (+3 koz), largely due to the improvement in diesel-fuelled vehicle production and steady full year FCEV production levels.

Turning to China, the aggressive scrappage scheme launched in April 2024 resulted in a 5% year-on-year increase in 2024 production and a more modest 2% lift in gasoline-fuelled cars. However, with aggressive thrifting campaigns, particularly by local vehicle brands, which represented 63% of car production, platinum demand declined by 1% (-7 koz). In the Rest of the World, platinum demand rose 4% (+28 koz), mainly as overall catalysed vehicle production remained flat year-on-year while catalyst loadings increased due to tighter emissions regulations coming into force in several countries. For the full year, we estimate that platinum for palladium substitution reached 720 koz.

Jewellery demand

Global jewellery demand increased 8% year-on-year (+144 koz) to 1,993 koz in 2024.

European fabrication last year rose by 3% to a record high for Metals Focus' series back to 2010. The rise was concentrated in the top-end brands, where growth was skewed to the first half of the year, offsetting weakness in the final six months. Much of the second-half weakness in this sector related to the entry level brands. Platinum's skew to higher-end jewellery in Europe largely explains why it outperformed gold. This is because mass market and bridal demand in Europe does not have as big an impact on platinum demand, as it does for gold. However, given that disposable incomes in Europe remained under pressure, and as this market is traditionally not as sensitive to the price differential between platinum and gold as we see in the US, platinum demand outside of the brands remained stable last year.

The year closed with a 2% rise for North American fabrication. That may sound modest, but the level attained was a record high and the result stands in marked contrast to gold jewellery's 4% decline. Some of platinum's gains were due to a shift from white gold to platinum, as the fine metal discount surged, while lower diamond prices (both lab-grown and mined) freed up consumer spending power for heavier and bigger platinum mounts for rings. The lower-end jewellery market often has a lesser impact on platinum compared to gold which means that platinum was less affected by affordability concerns and cost-of living challenges when compared to gold demand within this category.

Japanese jewellery demand rose by 11% to 376 koz. A combination of high gold prices boosting platinum's market share, rising tourist arrivals in the country and a recovery, albeit disappointing, in bridal demand and inventory build all underpinned demand. The large percentage increase was also a reflection of the still low base in 2023, as the country's industry took longer to recover from the pandemic than other markets.

Chinese platinum jewellery demand improved 1% year-on-year reaching 412 koz. This marks a slight turnaround after consecutive years of decline dating back to 2014. A key factor supporting Chinese platinum jewellery demand was the easing headwind from the gold jewellery market. Weak gold jewellery demand, which fell by 32% year-on-year between Q2'24 and Q4'24, led some jewellery wholesalers and regional retailers to scrap unsold gold jewellery. A portion of the capital this generated was then used to partially re-

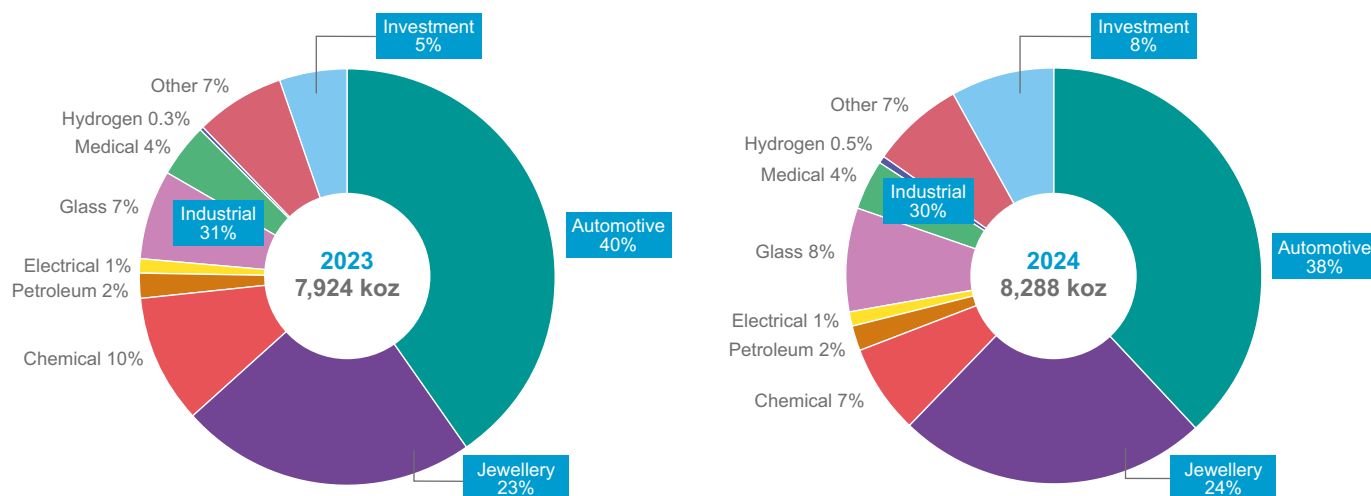
build platinum jewellery stocks. However, feedback from the supply chain indicated that stock-building support for platinum jewellery remained limited. Ultimately, consumer sentiment remained weak, with slower economic growth and increasing caution around discretionary spending presenting significant headwinds for jewellery consumption more generally. Additionally, leading retailers continued to prioritise network consolidation, further limiting platinum jewellery stock build. For example in 2024, Chow Tai Fook undertook significant optimisation of its retail network in mainland China. In the six months to 30th September 2024, the company reported a net closure of 239 stores, primarily franchised locations, reducing its total to approximately 7,000 points of sale.

Finally, Indian fabrication grew by 31% year-on-year in 2024, to 266 koz, more than the 248 koz forecast in the last edition of *Platinum Quarterly*. This was driven by the strength in exports, especially to the US, the UK, and the UAE, which accounted for around 38% of total fabrication. The growth in deliveries to the UAE was fuelled by initiatives focused on platinum jewellery marketing in the Middle East. Indian fabrication also benefited from the addition of new stores by organised retailers and a growing number of existing stores displaying platinum jewellery (to help boost their profits with high-margin offerings).

Industrial demand

Industrial demand in 2024 is estimated to have edged down by less than 1% year-on-year to 2,462 koz, as declining chemicals demand outweighed growth in glass, hydrogen, and medical applications. Industrial demand contributed 30% to total demand for the year, down one percentage point on 2023.

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



Source: Metals Focus prepared for World Platinum Investment Council

Glass

Glass demand jumped 29% (+152 koz) in 2024 to 670 koz, a three-year high, driven by cyclical Chinese LCD capacity expansions, particularly in H1'24. Chinese demand totalled 738 koz, the second highest on record for our series, behind 2021 (757 koz). The 68 koz shortfall between China and the global total reflected plant closures in South Korea, Taiwan, and, to a lesser extent, Japan. Platinum fibreglass offtake held steady year-on-year, as European closures in 2023 were largely offset by greater capacity growth elsewhere.

Medical

In 2024, platinum medical demand rose by an estimated 6% (+16 koz) to 308 koz. Demand for platinum in cancer treatments rose the fastest in percentage terms, while medical devices remained the largest contributor to overall volume and absolute growth. This surge in oncological platinum use was supported by rising cancer rates, improved healthcare access, and significant funding for the oncology field.

Chemical

Chemical demand fell by 26% year-on-year to 609 koz in 2024, making it the lowest level in five years. Significantly lower demand from the Chinese petrochemical industry, for PX plants, accounted for the vast majority of losses last year. However, this sharp decline should be viewed in the context of the extraordinary growth in the country's PX capacity since the late 2010s, after petrochemical self-sufficiency became one of the key themes in the Chinese Five-Year Plan (2016-20). Given the historical, heavy reliance on imported PX for downstream applications, there have been sizeable investments in new PX capacity. However, with domestic PX manufacturing capacity more than tripling over 2019–23, this has already resulted in a sharp fall in PX imports, which naturally leads to a slowdown in new investment. Demand for platinum in other chemical sectors also faced challenges, though losses were fairly modest. In the silicone industry, much of the fall owed to a weak economic backdrop, in China and Europe in particular, with lower demand from industries such as automotive and construction. In terms of the fertiliser industry, capacity expansion remained slow, which in turn restrained demand for platinum bearing catalysts.

Petroleum

Petroleum demand remained flat in 2024 at 158 koz in 2024, even though global refining capacity maintained a steady and modest increase. On a regional level, the small increase in the US was attributed to record high oil production in 2024. Africa and the Middle East saw a continued rise in refining capacity. In China, demand for platinum-bearing catalysts fell, the result of weaker demand for fuel consumption, as well as a slowdown in capacity expansion in the petrochemical industry. In Europe, falling margins, increased competition from overseas suppliers and a continued shift from fossil fuels, led to operation cuts by oil refineries.

Electrical

The proliferation of data, especially from AI applications and video surveillance, necessitated expanded storage solutions, which in turn supported HDD shipments. This increase in data storage capacity contributed to the 5% (+4 koz) improvement in platinum demand.

Hydrogen Stationary and Other

Platinum demand from stationary and other hydrogen applications increased to 44 koz last year, although this was lower than expected as several electrolyser producers experienced delays in order finalisation as companies in turn struggled to secure the necessary funding for their projects. That said, demand is still double that of 2023 and fabricators' order pipelines are increasing for implementation further out.

Other

While full-year catalysed vehicle production saw a slight dip in spark plug and sensor demand for new vehicles, aftermarket demand sustained modest growth. Aerospace and defence activities remained stable, contributing to the 1% (+8 koz) increase recorded for 2024.

Investment demand

Last year, global platinum bar and coin investment demand (excluding $\geq 500\text{g}$ bars in China) is estimated to have dropped by 40% (-128 koz) to a 10-year low of just 194 koz. This reflected both the return to net disinvestment in Japan, together with a slide in demand in North America.

Purchases of platinum bars and coins in North America are estimated to have weakened sharply in 2024, dropping by 32% (-54 koz) to just 115 koz, their weakest performance since 2017. As touched on above, in the Q4'24 review, this owed much to the overall weakness in precious metals retail demand in North America. The challenges facing the market were compounded by the lack of US Mint platinum Eagle bullion coins in 2024, which were produced during the previous eight years. However, one bright spot was the successful launch by Costco of platinum investment products last year (adding to the gold and silver it already offers).

In Europe, platinum bar and coin demand rose by 34% year-on-year in 2024, though this came from a low base. In spite of improvements, the 2024 total was still the second lowest in seven years. For much of 2024, platinum investment remained depressed, due to the metal's unexciting prices and generally weak investor interest in all precious metal bullion products. It was not until Q4'24 that demand eventually started to pick up, as the recovery in gold and silver investment also extended to platinum.

In China, in spite of the Q4 slow-down, the healthy gains seen in prior quarters saw total bar and coin demand for the full year rise by 24% year-on-year to 64 koz in 2024. As discussed in earlier editions of the *Platinum Quarterly*, successful market development efforts coupled with attractive platinum prices and concerns about the outlook for other investment alternatives in China fuelled continued gains in Chinese investment demand in physical platinum. After recording substantial year-on-year growth of 84% in H1'24, demand for Chinese Bars 500g \geq declined by 19% in H2'24. That said, it still represents a healthy 20% year-on-year growth for the full year.

Price-related liquidations in the second and final quarter resulted in net disinvestment of 24 koz in 2024 in Japan. Leaving the overall figure to one side, gross buying and selling volumes were low for much of the year, reflecting local precious metals investors focus on the gold market, which in turn was the result of that metal's relentless local price rally.

In 2024, platinum ETF holdings increased by 296 koz to 3,308 koz, their largest annual inflow since 2020. Investment peaked in April and May, with inflows of 204 koz and 233 koz, respectively. During these months, European funds led the buying, driven by platinum's relative underperformance against record-breaking gold prices and improving investor confidence in platinum's fundamentals. While some profit-taking occurred later in the year, these supportive factors continue to sustain elevated global ETF holdings.

ABOVE GROUND STOCKS

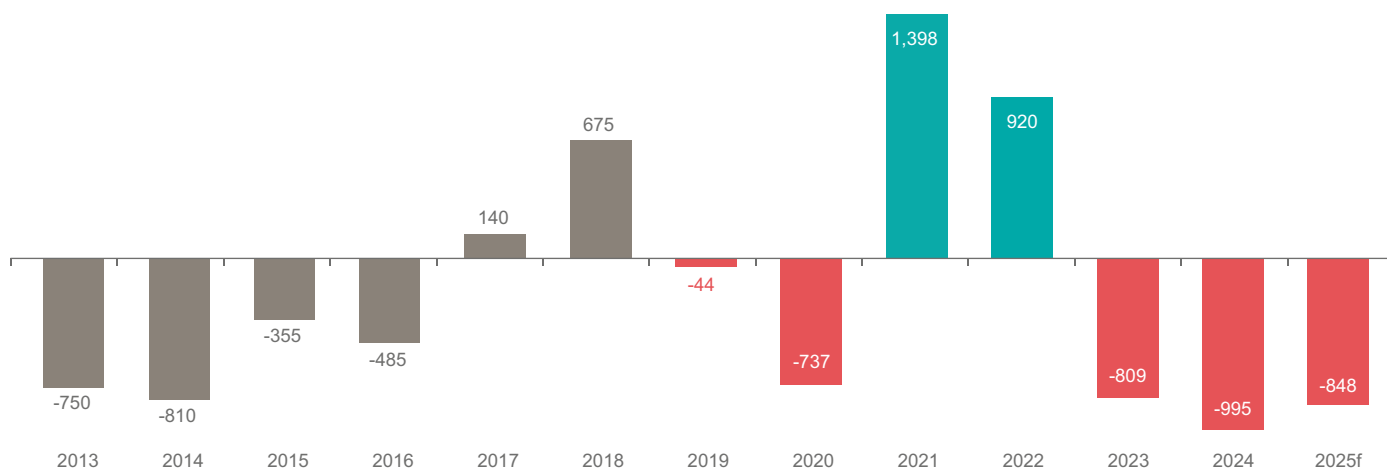
Due to a deficit of 995 koz in 2024, above ground stocks are estimated to have declined to 3,383 koz by year-end, amounting to just short of five months' worth of demand cover.

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

Global supply is forecast to contract by 4% (-291 koz) to 7,002 koz in 2025, as mine supply falls short of last year's total and recycling remains largely flat. Mine output will decline as work-in-progress inventory has largely been depleted in previous years, while secondary supply from jewellery continues to fall and flow of spent autocatalyst material remains limited. Demand is also expected to contract by 5% (-437 koz), driven by lower inflows into ETFs and softer bar and coin demand, alongside weaker glass demand following a year of exceptional capacity expansion in 2024. While the full impact of the rollback of BEV incentives in the US and the possible introduction of import tariffs on cars and parts remains uncertain, global automotive demand for platinum is currently expected to decline by 1%. However, jewellery demand is forecast to rise by 2%, surpassing 2 Moz for the first time since 2019. The platinum market will remain in structural deficit, with a shortfall of 848 koz.

Chart 9: Supply-demand balance, koz, 2013-2025f



Source: SFA (Oxford) 2013 - 2018, Metals Focus 2019 - 2025f

Supply

Global platinum mine supply is expected to resume its multi-year structural decline in 2025, falling by 260 koz to 5,506 koz. With Anglo American Platinum's semi-finished inventories depleted, refined production in 2025 is expected to align more closely with mined output, which remains in structural decline. However, Implats and Northam, following recent smelter maintenance, hold some excess semi-finished inventory totalling around 230 koz. Both companies estimate up to three years to fully release these stocks, though the pace of release in 2025 will influence overall mine supply.

In South Africa, while input cost inflation stabilised in 2024, persistently low PGM prices continue to put pressure on higher-cost producers. As a result, major projects that were originally expected to contribute to production, such as the Two Rivers Merensky and Platreef projects, have been deferred or placed on care and maintenance. Cost-cutting measures have been widespread, with approximately 9,000 jobs lost across the PGM mining sector. So far, significant mine supply has already exited the market, and 2025 output is projected to be around 0.5 Moz below pre-pandemic levels. Capital expenditure has been insufficient to sustain historical production rates, and new projects have not replaced declining output from ageing infrastructure and depleting shafts. At current PGM prices, profitability remains marginal for several operations, increasing price sensitivity. Further declines in PGM or by-product prices such as chrome could trigger additional restructuring, posing a downside risk to 2025 mine supply forecasts. As it stands, South African mine supply is expected to decline by 6% year-on-year to 3,899 koz.

In Russia, Nor Nickel continues to face equipment and reagent procurement challenges following the exit of key Western suppliers, while access to international banking and debt markets remains restricted. In response, the company has withdrawn its medium-term production guidance, signalling difficulties in achieving previous expansion plans. As a result, Russian platinum mine supply is expected to remain essentially flat in 2025.

In the US, declining palladium prices have pressured Sibanye-Stillwater's profitability, leading to a series of restructurings. In September, the company announced a revised plan to cut 2025 production by approximately 45%, including suspending operations at Stillwater West and reducing mining at East Boulder. As a result, North American output is set to decline 15% year-on-year.

Recycling

We have revised our recycling outlook down since the Q3'24 *Platinum Quarterly* release, as the supply of spent autocatalysts remains constrained despite increased deregistration data noted from global vehicle registration systems. With recyclers originally expecting to see some recovery back towards 2021 levels, expectations have been moderated down from 14% growth to just a 1% growth. The Chinese authorities' announcement to extend its vehicle scrappage scheme throughout the year and expand incentives to capture China IV-compliant vehicles, may offset some of the declines expected elsewhere as recycling in China is expected to increase. Jewellery recycling is set to decline further, while electronic scrap, driven by the AI technology revolution, is forecast to grow by 7%. As a result, global recycling is expected to improve by 1% to reach 1,496 koz.

Demand

Global platinum demand is expected to contract 5% (-437 koz) to 7,850 koz as industrial demand sheds 346 koz largely due to a lack of glass capacity expansions. Metals Focus also expects to see slower warehouse inflows as clarity is gained on the implications of tariffs.

Automotive demand

Based on current light-duty vehicle production expectations of 91.9M units, of which 77.8M will be catalysed, we forecast a 1% drop in global automotive platinum demand to 3,102 koz. Note that the 14.1M BEVs expected to be produced in 2025 would represent a 22% increase on output in 2024. In Europe, platinum demand is expected to fall below 1 Moz to 954 koz, marking a 7% decline. Combined hybrid and ICE vehicle production is projected to drop by 6%, while diesel-powered car production will decline by 15%, bringing overall diesel share down to 21% in Europe as a whole (East and West Europe combined). A major driver of this decline is the anticipated 41% growth in BEV production, as manufacturers accelerate electrification efforts to mitigate stricter carbon dioxide penalties which tighten from 95 g/km to 93.6 g/km this year.

In North America, platinum demand is forecast to decline by 5%, or 23 koz, to 460 koz. While LDV demand is expected to remain stable, a decline in HDV demand will weigh on overall demand. With original equipment manufacturers holding record HDV inventory levels and uncertainty surrounding the US government's policies, market sentiment remains cautious.

In Japan, following a challenging production year, platinum demand is expected to rise by 1% as improvements in LDV production offset a decline in HDV production.

In China, demand is set to improve by 2%, supported by a 1% increase in LDV production and a 5% rise in HDV production. This growth is driven by a series of economic stimulus policies which are expected to support freight and road haulage activity. In the rest of the world, platinum demand continues to rise, growing by 6% in 2025, with India expected to see a 71% increase in hybrid vehicle production, while combined catalysed vehicle production elsewhere is forecast to increase by 4%.

Overall we estimate that for 2025 substitution of palladium for platinum will peak this year reaching 860 koz.

Jewellery demand

Jewellery demand is set to breach 2 Moz for the first time since 2019, to reach 2,027 koz.

Fabrication in Europe is forecast to see further, if slower, growth of 1% to yet another record. The gains on this occasion are expected to come from modest gains in bridal / mass market on the back of price differentials. Indeed, some manufacturers who had previously ignored platinum have come round to the metal. The outlook for the top-end is mixed. Some brands are investing in further growth, but such plans could prove tricky, should China and other export markets tip into a tariff-driven recession and if current economic and political uncertainty fails to lift.

North American demand this year is forecast to see repeat growth of 2% to another record high. A yet wider differential to gold plus still weak diamond prices continue to provide support and we should see a better year for engagements given the statistical average of first meeting to progression to engagement. Some sources note structural change in the bridal category which could hit fine metal offtake and, if that occurs, wedding and engagement numbers could undershoot current expectations. At present, we expect stock levels to remain flat but retain some caution given the risk of inflationary harm to the US economy from the new administration's policies.

We forecast a small decline in Japanese jewellery, even though many of the positive themes we saw in the market, most notably gains at the expense of gold due to the latter's high price, will remain in place. We feel that offtake in 2024 received an additional boost from stock-building and we also have some concerns about consumer sentiment in the country. Still, at 368 koz the 2025 total we forecast will be well above the previous 15 years' average.

Our expectation of a 5% increase in Chinese platinum jewellery fabrication for 2025, reaching 433 koz, remains unchanged. Growth will be driven by leading retailers replenishing platinum jewellery stocks following network consolidation. Additionally, successful product development by key manufacturers, strong demand for menswear and unisex designs, and increased retailer promotions through live broadcasting platforms will further support expansion.

In India, we expect fabrication to grow at 7% and reach above 280 koz. The store expansion by both existing and new retailers, along with increasing consumer awareness will continue to support local manufacturing. Additionally, the notable changes in income tax outlined in the budget, which substantially lower the tax burden on the middle class, should boost disposable incomes and support discretionary spending. Also, the rising price gap between platinum and gold continues to entice consumers towards the white metal.

Industrial demand

Industrial demand is projected to drop by 14% in 2025 to 2,116 koz, the lowest level since 2020. After exceptional cyclical glass capacity expansions over the past five years, demand is expected to fall this year, alongside further declines in chemicals offtake. Although gains are expected in petroleum, medical and hydrogen, they will not offset the above losses. Industrial demand is therefore forecast to make up 27% of total demand in 2025, down from 30% in 2024.

Glass

In 2025, platinum glass demand is forecast to drop 58% (-385 koz) to 284 koz, its lowest level since 2019 and a return to non-expansion levels. This reflects a natural slowdown after last year's exceptional Chinese LCD capacity expansions. Glass offtake outside China is set to improve, with net negative platinum demand easing from 68 koz to 25 koz. While further LCD plant closures are expected in Japan this year, no additional reductions are anticipated in Taiwan or South Korea, leading to an overall improvement on 2024. The growth in fibreglass offtake is projected to slow slightly, with China remaining the dominant market, following strong growth from 2021 to 2024.

Chemical

Platinum chemical demand is expected to extend its losses in 2025, although the scale will be far more limited at 5%. A further decline in demand from the Chinese petrochemical industry will remain the key driving force. The current project pipeline indicates a pick-up in PX capacity additions in China this year, but these gains will be more than offset by fewer new PDH plants. Expansion in the fertiliser industry will also remain slow, with US tariffs adding additional uncertainty, given their potential impact on fertiliser prices and affordability to farmers. By contrast, demand for silicone products is expected to post a modest recovery, albeit from a relatively low base.

Petroleum

Petroleum demand is forecast to rise by 30% year-on-year to 205 koz, a six-year high. This will almost entirely be due to coincidental higher planned catalyst changeouts at gas-to-liquid (GTL) plants. Excluding the impact of this, the use of platinum in catalytic reforming and isomerisation units will remain steady. With weaker global oil demand and the continued rise in oil supply, margin pressure is likely to be sustained for the refining industry. In addition to operation cuts, two refineries are scheduled for permanent closure in Europe. Despite higher oil supply, the latest forecast by the US Energy Information Administration points to slightly lower refining capacity for 2025, due to pressure on margins and expected refinery closures. These losses will be offset by continued, healthy growth in capacity additions in Africa and the Middle East.

Medical

Platinum medical offtake is expected to grow by 4% (+12 koz) to 320 koz in 2025, driven by rising demand for cancer treatments globally and medical devices in emerging markets. Increasing cancer incidence and greater oncology funding will fuel the former, while expanding healthcare access and higher medical spending will support the latter.

Electrical

Demand for massive data storage, driven by artificial intelligence requirements, has extended the service life of HDD products and alleviated the competitive pressure from SSDs. Further, the technological roadmap for enhancing HDD capacity will prioritize increasing storage density over adding more disks and consequently, the metal loading per drive is expected to increase marginally in the future. It is therefore expected that HDD shipments will remain stable in 2025, while demand for semiconductors will remain robust, resulting in a 2% increase in electrical demand.

Hydrogen Stationary and Other

The slowdown in final investment decisions globally has impacted near-term deployment expectations for electrolyser capacity, alongside the potential rollback of incentives under the Inflation Reduction Act aimed at promoting green hydrogen in the US. Despite this, we forecast a 35% increase in platinum demand, driven by electrolyser capacity expansion and also by the growing deployment of stationary fuel cell applications, particularly as back-up power for large data centres.

Other

For 2025, we estimate that demand for spark plugs, sensors, and other PGM-containing aftermarket components will decline by 1%, driven by the reduction in ICE production. However, the rise in hybridisation and the extension of vehicle lifespans, along with increasing demand for advanced spark plugs to optimise engine performance and fuel efficiency, as well as the expansion of sensors driven by regulatory monitoring requirements in the marine and aerospace industries, will soften the decline to some extent.

Investment demand

This year global bar and coin investment demand is forecast to drop by 7% (-13 koz) to 181 koz, its lowest level since 2014. The decline follows the already low total realised last year, of 194 koz. This performance will be driven by noteworthy net liquidations in Japan, which are forecast to offset year-on-year gains in every other important retail market.

On a positive note, North America is set to return to growth, following two consecutive years of softer demand. Even though Metals Focus does not expect minting of the Eagle bullion coin to resume this year, additional gains are expected at the US retailer Costco.

In Europe, we forecast further improvements in 2025, as falling interest rates and high macroeconomic uncertainty will lift demand for physical precious metals. However, with platinum prices expected to continue trading rangebound for much of 2025, the extent of this recovery will be limited this year.

We expect Chinese demand (excluding China Bars \geq 500g) to record a milder growth of 8% in 2025. The smaller scale of growth partly reflects the higher base compared to previous years. Meanwhile, given our conservatively positive price projections for 2025, investor confidence in platinum investment is expected to remain restrained. That said, the limited availability of alternative investment assets and increasing investor awareness of platinum will continue to provide some support to demand.

In Japan, we maintain the view that elevated yen-denominated platinum prices, at least compared to the previous few years, coupled with investor fatigue towards the metal's underperformance compared to gold, will drive some modest net liquidations of physical platinum by Japanese investors, adding up to a forecast 80 koz in 2025 overall.

In 2025, platinum ETF holdings are expected to rise by 100 koz, bolstered by platinum's solid fundamentals and a persistent, exceptional discount to gold.

ABOVE GROUND STOCKS

Due to a projected deficit of 848 koz in 2025, above ground stocks are expected to decline to just 2,535 koz by year-end, resulting in just under 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.

PLATINUM QUARTERLY Q4 2024

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

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025f	2024f/2023 Growth %	2025f/2024f Growth %
Platinum Supply-demand Balance (koz)													
SUPPLY													
Refined Production	6,160	6,145	6,130	6,125	6,074	4,988	6,295	5,520	5,604	5,766	5,506	3%	-5%
South Africa	4,480	4,365	4,385	4,470	4,374	3,298	4,678	3,915	3,957	4,132	3,899	4%	-6%
Zimbabwe	405	490	480	465	458	448	485	480	507	512	514	1%	0%
North America	365	390	360	345	356	337	273	263	275	254	216	-8%	-15%
Russia	710	715	720	665	716	704	652	663	674	677	686	0%	1%
Other	200	185	185	180	169	200	206	200	190	191	191	0%	0%
Increase (-)/Decrease (+) in Producer Inventory	+30	+30	+30	+10	+2	-84	-93	+43	+11	+41	+0	261%	-100%
Total Mining Supply	6,190	6,075	6,160	6,135	6,076	4,904	6,202	5,563	5,615	5,807	5,506	3%	-5%
Recycling	1,720	1,860	1,915	1,955	2,149	2,028	2,091	1,809	1,499	1,486	1,496	-1%	1%
Autocatalyst	1,185	1,210	1,325	1,430	1,603	1,540	1,602	1,368	1,098	1,113	1,129	1%	1%
Jewellery	515	625	560	505	476	422	422	372	331	298	286	-10%	-4%
Industrial	20	25	30	30	69	66	67	69	71	76	81	7%	7%
Total Supply	7,910	7,935	8,075	8,090	8,225	6,932	8,293	7,372	7,114	7,293	7,002	3%	-4%
DEMAND													
Automotive	3,245	3,360	3,300	3,115	2,685	2,188	2,432	2,734	3,202	3,130	3,102	-2%	-1%
Autocatalyst	3,105	3,225	3,160	2,970	2,685	2,188	2,432	2,734	3,202	3,130	3,102	-2%	-1%
Non-road	140	135	140	145	†	†	†	†	†	†	†	N/A	N/A
Jewellery	2,840	2,505	2,460	2,245	2,106	1,830	1,953	1,880	1,849	1,993	2,027	8%	2%
Industrial	1,875	2,020	1,900	2,040	2,213	2,069	2,514	2,353	2,475	2,462	2,116	-1%	-14%
Chemical	515	560	570	565	801	638	648	684	824	609	578	-26%	-5%
Petroleum	170	220	120	235	219	109	169	193	159	158	205	0%	30%
Electrical	205	195	210	205	144	130	135	106	89	94	96	5%	2%
Glass	300	320	260	275	187	436	751	533	517	670	284	29%	-58%
Medical	240	235	235	235	277	256	267	278	292	308	320	6%	4%
Hydrogen Stationary and Other	†	†	†	†	29	28	17	12	23	44	59	92%	35%
Other	445	490	505	525	556	473	528	548	571	579	573	1%	-1%
Investment	305	535	275	15	1,264	1,582	-3	-516	397	702	606	77%	-14%
Change in Bars, Coins	525	460	215	280	278	593	349	259	322	194	181	-40%	-7%
China Bars ≥ 500g	†	†	†	†	16	23	27	90	134	162	175	20%	8%
Change in ETF Holdings	-240	-10	105	-245	991	507	-241	-558	-74	296	100	N/A	-66%
Change in Stocks Held by Exchanges	20	85	-45	-20	-20	458	-139	-307	14	50	150	244%	200%
Total Demand	8,265	8,430	7,935	7,415	8,268	7,669	6,895	6,452	7,924	8,288	7,850	5%	-5%
Balance	-355	-485	140	675	-44	-737	1,398	920	-809	-995	-848	N/A	N/A
Above Ground Stocks	2,225*	1,740	1,880	2,555	3,606**	2,869	4,267	5,187	4,378	3,383	2,535	-23%	-25%

Source: SFA (Oxford) 2015 – 2018, Metals Focus 2019 – 2025f.

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, other industrial demand, or change in bars, coins.
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.

PLATINUM QUARTERLY Q4 2024

Table 3: Supply and demand summary – quarterly comparison

	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	Q4'24/Q4'23 Growth %	Q4'24/Q3'24 Growth %
Platinum Supply-demand Balance (koz)											
SUPPLY											
Refined Production	1,328	1,192	1,486	1,393	1,532	1,225	1,541	1,461	1,539	0%	5%
South Africa	931	778	1,051	984	1,143	795	1,127	1,049	1,160	2%	11%
Zimbabwe	123	116	126	132	133	132	126	132	121	-9%	-8%
North America	65	71	73	60	72	71	59	60	63	-11%	5%
Russia	160	180	190	168	136	178	181	172	146	7%	-15%
Other	49	48	46	48	48	48	48	48	47	0%	0%
Increase (-)/Decrease (+) in Producer Inventory	+23	+33	+8	-6	-23	+22	+35	-11	-4	N/A	N/A
Total Mining Supply	1,351	1,226	1,494	1,387	1,509	1,246	1,576	1,450	1,534	2%	6%
Recycling	454	386	374	341	399	359	381	342	404	1%	18%
Autocatalyst	345	274	281	248	295	257	291	254	310	5%	22%
Jewellery	92	95	76	75	85	84	72	68	74	-13%	9%
Industrial	17	17	17	17	18	17	19	20	20	10%	3%
Total Supply	1,806	1,612	1,868	1,727	1,907	1,606	1,957	1,792	1,938	2%	8%
DEMAND											
Automotive	711	810	813	766	813	825	795	743	768	-6%	3%
Autocatalyst	711	810	813	766	813	825	795	743	768	-6%	3%
Non-road	†	†	†	†	†	†	†	†	†	N/A	N/A
Jewellery	458	458	473	446	472	485	503	485	520	10%	7%
Industrial	531	644	751	487	592	658	700	557	547	-8%	-2%
Chemical	244	309	234	148	133	167	178	136	128	-3%	-5%
Petroleum	52	41	41	38	39	40	40	40	40	2%	0%
Electrical	24	23	23	22	22	22	23	24	24	9%	0%
Glass	8	55	233	63	167	204	225	125	116	-30%	-7%
Medical	69	76	72	71	72	75	77	77	79	9%	3%
Hydrogen Stationary and Other	3	3	4	6	10	8	9	12	15	46%	21%
Other	131	137	145	139	150	142	148	144	145	-3%	1%
Investment	-30	229	195	50	-78	113	459	-230	360	N/A	N/A
Change in Bars, Coins	2	128	47	86	61	60	14	65	54	-11%	-17%
China Bars ≥ 500g	23	31	20	35	48	53	41	30	38	-22%	26%
Change in ETF Holdings	-62	40	155	-99	-171	11	444	-300	142	N/A	N/A
Change in Stocks Held by Exchanges	7	29	-27	28	-16	-11	-40	-25	126	N/A	N/A
Total Demand	1,670	2,142	2,233	1,750	1,799	2,081	2,457	1,555	2,195	22%	41%
Balance	135	-530	-365	-22	108	-475	-499	237	-256	N/A	N/A

Source: Metals Focus 2022 - 2024.

Note:

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

PLATINUM QUARTERLY Q4 2024

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

	H2 2022	H1 2023	H2 2023	H1 2024	H2 2024	H2'24/H2'23 Growth %	H2'24/H1'24 Growth %
Platinum Supply-demand Balance (koz)							
SUPPLY							
Refined Production	2,718	2,679	2,925	2,766	3,000	3%	8%
South Africa	1,908	1,829	2,127	1,923	2,209	4%	15%
Zimbabwe	239	242	265	258	254	-4%	-2%
North America	132	143	132	130	124	-6%	-5%
Russia	339	370	304	359	318	5%	-11%
Other	100	94	96	96	95	-1%	-1%
Increase (-)/Decrease (+) in Producer Inventory	21	41	-30	57	-16	N/A	N/A
Total Mining Supply	2,739	2,720	2,895	2,823	2,984	3%	6%
Recycling	882	760	739	740	746	1%	1%
Autocatalyst	666	555	543	549	564	4%	3%
Jewellery	182	171	160	156	142	-11%	-9%
Industrial	34	35	36	36	40	12%	12%
Total Supply	3,620	3,480	3,634	3,563	3,730	3%	5%
DEMAND							
Automotive	1,376	1,623	1,579	1,620	1,510	-4%	-7%
Autocatalyst	1,376	1,623	1,579	1,620	1,510	-4%	-7%
Non-road	†	†	†	†	†	N/A	N/A
Jewellery	934	932	918	987	1,006	10%	2%
Industrial	1,091	1,396	1,080	1,358	1,104	2%	-19%
Chemical	364	543	281	345	264	-6%	-24%
Petroleum	101	82	77	79	79	3%	0%
Electrical	49	45	44	45	48	9%	7%
Glass	166	288	229	429	241	5%	-44%
Medical	138	149	144	152	156	9%	2%
Hydrogen Stationary and Other	6	7	16	18	27	66%	51%
Other	266	282	289	290	289	0%	0%
Investment	-256	424	-27	572	130	N/A	-77%
Change in Bars, Coins	105	175	147	75	119	-19%	60%
China Bars ≥ 500g	45	51	83	94	68	-19%	-28%
Change in ETF Holdings	-280	196	-270	455	-159	N/A	N/A
Change in Stocks Held by Exchanges	-127	2	12	-51	101	>±300%	N/A
Total Demand	3,145	4,374	3,549	4,538	3,750	6%	-17%
Balance	476	-895	85	-975	-20	N/A	N/A

Source: Metals Focus 2022 - 2024.

Notes:

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

PLATINUM QUARTERLY Q4 2024

Table 5: Regional demand – annual and quarterly comparison

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	
Platinum Gross Demand (koz)																			
Automotive	3,250	3,350	3,290	3,115	2,685	2,188	2,432	2,734	3,202	3,130	3,102	-2%	-1%	813	825	795	743	768	
North America	480	410	390	390	312	268	340	413	447	483									
Western Europe	1,450	1,630	1,545	1,340	1,356	980	920	972	1,159	1,026									
Japan	510	450	435	425	286	223	248	247	292	295									
China	145	195	230	220	156	240	331	396	541	534									
India	180	170	175	200	††	††	††	††	††	††									
Rest of the World	485	495	515	540	576	477	592	707	763	791									
Jewellery	2,840	2,505	2,460	2,245	2,106	1,830	1,953	1,880	1,849	1,993	2,027	8%	2%	472	485	503	485	520	
North America	250	265	280	280	341	277	409	448	438	445									
Western Europe	235	240	250	255	237	196	260	301	319	328									
Japan	340	335	340	345	372	316	298	333	338	376									
China	1,765	1,450	1,340	1,095	871	832	703	484	408	412									
India	180	145	175	195	109	59	123	171	203	266									
Rest of the World	70	70	75	75	176	151	159	144	144	166									
Chemical	515	560	570	565	801	638	648	684	824	609	578	-26%	-5%	133	167	178	136	128	
North America	55	50	50	50	81	103	109	110	121	103									
Western Europe	75	110	115	105	124	112	115	106	113	101									
Japan	10	15	15	15	66	62	65	66	61	58									
China	230	225	220	215	314	213	215	227	357	172									
Rest of the World	145	160	170	180	215	148	143	174	172	175									
Petroleum	170	220	120	235	219	109	169	193	159	158	205	0%	30%	39	40	40	40	40	
North America	-25	90	55	55	30	5	32	44	44	56									
Western Europe	35	10	5	20	14	11	18	30	22	21									
Japan	5	0	-20	5	7	6	12	7	5	5									
China	45	80	45	10	66	35	39	26	24	17									
Rest of the World	110	40	35	145	103	52	67	86	64	60									
Electrical	205	195	210	205	144	130	135	106	89	94	96	5%	2%	22	22	23	24	24	
North America	15	10	15	15	38	35	35	28	24	25									
Western Europe	10	10	10	10	27	23	25	20	16	17									
Japan	15	15	15	15	20	16	17	14	12	13									
China	70	80	90	85	28	31	31	23	19	20									
Rest of the World	95	80	80	80	31	25	26	22	18	20									
Glass	300	320	260	275	187	436	751	533	517	670	284	29%	-58%	167	204	225	125	116	
North America	0	10	5	5	-78	-25	17	26	42	15									
Western Europe	5	5	5	20	63	35	6	21	-85	5									
Japan	0	-10	-10	0	-38	-63	7	-151	5	-9									
China	195	225	165	120	175	385	757	524	571	738									
Rest of the World	100	90	95	130	65	106	-37	113	-15	-79									
Medical	240	235	235	235	277	256	267	278	292	308	320	6%	4%	72	75	77	77	79	
Other industrial	445	490	505	525	556	473	528	548	571	579	573	1%	-1%	150	142	148	144	145	
Hydrogen Stationary & Other	†	†	†	†	29	28	17	12	23	44	59	92%	35%	10	8	9	12	15	
Bar & Coin Investment	525	460	215	280	278	593	349	259	322	194	181	-40%	-7%	61	60	14	65	54	
North America					155	234	256	258	169	115									
Western Europe					52	75	61	44	24	32									
Japan					46	240	-26	-114	54	-24									
China					15	23	26	38	52	64									
Rest of the World					9	21	33	33	23	7									
China Bars ≥ 500g					16	23	27	90	134	162	175	20%	8%	48	53	41	30	38	
ETF Investment	-240	-10	105	-245	991	507	-241	-558	-74	296	100	N/A	-66%	-171	11	444	-300	142	
North America					125	524	-6	-102	-61	165									
Western Europe					508	237	56	-313	-99	163									
Japan					-13	58	-23	-28	12	-6									
Rest of the World					370	-312	-268	-116	74	-26									
Change in Stocks Held by Exchanges	20	85	-45	-20	-20	458	-139	-307	14	50	150	244%	200%	-16	-11	-40	-25	126	
Investment																			
Total Demand	305	535	275	15	1,264	1,582	-3	-516	397	702	606	77%	-14%	-78	113	459	-230	360	
	8,270	8,410	7,925	7,415	8,268	7,669	6,895	6,452	7,924	8,288	7,850	5%	-5%	1,799	2,081	2,457	1,555	2,195	

Source: SFA (Oxford) 2015 – 2018, Metals Focus 2019 – 2025f.

Notes:

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

PLATINUM QUARTERLY Q4 2024

Table 6: Regional recycling – annual and quarterly comparison

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025f	2024f/2023 Growth %	2025f/2024f Growth %	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	
Platinum recycling supply (koz)																			
Automotive	1,185	1,210	1,325	1,420	1,603	1,540	1,602	1,368	1,098	1,113	1,129	1%	1%	295	257	291	254	310	
North America					520	484	488	455	308										
Western Europe					786	815	833	678	573										
Japan					137	92	114	81	73										
China					34	66	74	56	49										
Rest of the World					126	83	94	98	95										
Jewellery	515	625	560	505	476	422	422	372	331	298	286	-10%	-4%	85	84	72	68	74	
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	20	25	30	30	69	66	67	69	71	76	81	7%	7%	18	17	19	20	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: SFA (Oxford) 2015 – 2018, Metals Focus 2019 – 2025f.

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.

Catalysed vehicle

A catalysed vehicle refers to a vehicle equipped with a catalytic converter, a device in the exhaust system that reduces harmful emissions by converting pollutants such as carbon monoxide (CO), nitrogen oxides (NO_x), and unburned hydrocarbons (HC) into less harmful gases like carbon dioxide (CO₂), nitrogen (N₂), and water vapour (H₂O). Both pure internal combustion engine vehicles and hybrid vehicles that burn fossil fuels will be fitted with a PGM based catalyst.

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 electrolyzers 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. It is a flat-panel display technology that uses liquid crystals sandwiched between two layers of glass or plastic and manipulated by electric fields to control the passage of light

LDV

Light-duty vehicle.

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 CO₂, 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 platters.

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.

Tri-metallic catalyst

In the context of automotive emissions control, a tri-metallic catalyst typically refers to a catalytic converter that uses a combination of three platinum group metals (PGMs)—platinum (Pt), palladium (Pd), and rhodium (Rh)

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.

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