World Silver Survey 2025

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Dear Reader,

Over the past 35 years, the Silver Institute's World Silver Survey has been a reliable source of information about the global silver market, widely quoted and referenced by industry, governments, media, and others.

The Survey offers market participants and observers a wide-ranging overview at the international silver market during the preceding year, with an in-depth look at the various components of silver demand and the areas that contribute to supplying the market with the indispensable precious metal, silver.

Conducting research and producing a report of this scale takes an experienced and knowledgeable team of professionals. Metals Focus, a leading precious metals consultancy, independently researched and produced this year's edition of the World Silver Survey; this is the 6th edition Metals Focus has produced for us. Metals Focus has over 30 staff and consultants in eight locations worldwide and has high-level contacts in virtually all aspects of the silver industry. Their team's breadth and depth make them uniquely qualified to produce this report.

One of my goals as Chair is to highlight our members' commitment to sustainability. Our members strategically contribute to the well-being of people through the sustainable mining of silver, all the while caring for our employees, partnering with our communities, and protecting the environment. Later this year, the Silver Institute will share our combined efforts by releasing a video and other materials on our commitment to sustainability.

Another goal is to continue highlighting silver as an essential and critical metal for the future, especially in green energy applications. We will continue to draw attention to silver's important role in decarbonization, health, water purification and industry.

I want to thank all our member companies and sponsors of the 2025 edition of the World Silver Survey for their financial support, which made this publication possible. We are grateful for your generosity and leadership.

We hope that you find this report both enjoyable and beneficial.

Octavio Alvidrez
Chair of the Silver Institute
Chief Executive Officer of Fresnillo plc

The Major Sponsors of World Silver Survey 2025

Coeur Mining, Inc.

Coeur Mining, Inc is a U.S.-based, well-diversified, growing precious metals producer with five wholly-owned operations: the Las Chispas silver-gold mine in Sonora, Mexico, the Palmarejo gold-silver complex in Chihuahua, Mexico, the Rochester silver-gold mine in Nevada, the Kensington gold mine in Alaska and the Wharf gold mine in South Dakota. In addition, the Company wholly-owns the Silvertip polymetallic exploration project in British Columbia.

Fresnillo plc

Fresnillo plc is the world's largest primary silver producer and Mexico's largest gold producer, listed on the London and Mexican Stock Exchanges under the symbol FRES. Fresnillo plc has eight operating mines, all of them in Mexico - Fresnillo, Saucito, Juanicipio, Ciénega, Herradura, Soledad-Dipolos[1], Noche Buena and San Julián (Veins and Disseminated Ore Body) and four advanced exploration projects - Orisyvo, Rodeo, Guanajuato and Tajitos as well as a number of other long term exploration prospects. Fresnillo plc has mining concessions and exploration projects in Mexico, Peru and Chile. Fresnillo plc's goal is to maintain the Group's position as the world's largest primary silver company and Mexico's largest gold producer.

[1]Operations at Soledad-Dipolos are currently suspended.

Industrias Peñoles, S.A.B. de C.V.

Peñoles is a mining group with integrated operations in smelting and refining non-ferrous metals, and producing chemicals. Peñoles is the world's top producer of refined silver, metallic bismuth and sodium sulfate, and the leading Latin American producer of refined gold and lead. The Company was founded in 1887 and it is part of "Grupo BAL", a privately held diversified group of independent Mexican companies. Peñoles' shares have traded on the Mexican Stock Exchange since 1968 under the ticker PE&OLES. Peñoles highlights:

- Began operations in 1887 as a mining company.
- Has integrated operations in the areas of exploration, mining, metallurgy and chemicals.
- Listed on the Mexican Stock Exchange since 1968; the stock is included in the IPC index.
- One of the largest net exporters in Mexico's private sector.

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Pan American Silver is a leading producer of precious metals with a diversified portfolio of silver and gold mines located across the Americas. We provide enhanced exposure to silver through large silver reserves and resources, as well as catalysts to grow silver production. We have been operating in the Americas for over three decades, earning an industry-leading reputation for sustainability performance, operational excellence and prudent financial management.

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Texas Precious Metals Depository is one of the largest precious metals facilities in the world. The 54,000-square-foot facility holds over 100M ounces of silver – fully segregated – for institutional clients, custodians, and the retail market. The company's online retail platform, texmetals.com, world-class depository, and fulfillment and logistics service center are globally recognized for their speed and attention to customer service. Texas Precious Metals offers a line of custom-minted products under the brand, Texas Mint, producing a wide variety of licensed products for Texas A&M University, the Professional Rodeo Cowboys Association, and other partners.

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Wheaton Precious Metals is the world's premier precious metals streaming company with the highest-quality portfolio of long-life, low-cost assets. Its business model offers investors commodity price leverage and exploration upside but with a much lower risk profile than a traditional mining company. Wheaton delivers amongst the highest cash operating margins in the mining industry, allowing it to pay a competitive dividend and continue to grow through accretive acquisitions. As a result, Wheaton has consistently outperformed gold and silver, as well as other mining investments. In addition, the company is committed to promoting responsible mining practices and giving back to the communities where Wheaton and its mining partners operate. Wheaton creates sustainable value through streaming.

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The World Silver Survey has been published annually by The Silver Institute since 1990. Hard copies of previous editions can be obtained by contacting The Silver Institute at the address and telephone number on the opening page. All previous editions are available for download at The Silver Institute's website. For copies outside of North America, contact Metals Focus at the address on the following page.

ISSN: 978-1-7394228-9-9 (Print)
ISSN: 978-1-0685120-0-1 (Online)
ISBN: 978-1-7394228-9-9 (Print)
ISBN: 978-1-0685120-0-1 (Digital)

This is the thirty-fifth annual edition of the World Silver Survey produced for The Silver Institute. World Silver Survey 2025 was produced by the Metals Focus team. The information contained herein is based in part on the analysis of publicly available data such as hallmarking series, trade statistics, company reports and other public-domain information. More importantly, it is also based on a large series of interviews with the industry's main players, carried out over the year by the team. This work generates the essential data to allow the compilation of reliable estimates for world supply and demand and inform the analysis of market structures, and the degree of significance of any changes and developments.

Metals Focus is grateful to the many miners, refiners, bullion dealers, bankers and fabricators throughout the world who have contributed their time and information to ensuring that the picture of the industry described in the World Silver Survey is as complete and accurate as possible.

Metals Focus
World Silver Survey 2025

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Chapter 1

- Silver saw its fourth year of a major deficit in 2024 as a slight 2% rise in supply and 3% dip in demand still meant a shortfall of around 150Moz (4,600t).
- On top of the deficit, supportive macro economic and geopolitical conditions boosted investment, helping lift the annual average silver price by 21%.
- Some investors were disappointed though by the high gold:silver ratio and the lack of fresh price highs as plentiful above-ground stocks and caution towards industrial metals in general curbed silver's upside.

Silver Prices & Gold:Silver Ratio*

*Quarterly averages
Source: Bloomberg

Summary

Introduction

2024 was an exceptionally good year for silver. Its price saw a 21% intra-year increase and an impressive 59% trough-to-peak rally, while the annual average rose by over a fifth to its highest since 2012. The fundamentals also remained robust, with the market registering its fourth consecutive deficit.

The strength of the silver price was primarily fueled by a positive macroeconomic and geopolitical backdrop for the wider precious metals complex. US monetary policy for instance was generally supportive for much of last year. The end of rate hikes and consensus expectations that cuts would come sooner or later were helpful throughout the year. So too were the 1% of policy rate cuts that did in fact materialize in the second half of 2024.

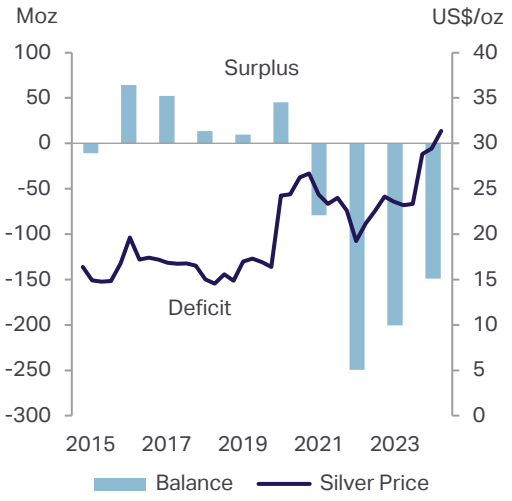
The exceptionally strong performance of US equities also helped silver prices, if largely indirectly. US stock markets benefited from the monetary policy backdrop discussed above, investor excitement towards artificial intelligence and the impact this had on tech stocks as well as the healthy state of the US economy. The resulting boost in wealth and portfolios led to diversification flows, mainly into gold but this also benefited silver.

Turbulent geopolitical conditions and policy uncertainty were two other factors supporting silver prices through their boost to safe haven investment. Among these, concerns that conflicts between Israel and its neighbors could trigger an all-out regional war stood out. Political uncertainty around the globe in the face of numerous elections also helped. While all this primarily boosted gold investment demand and prices, silver was also aided. Finally, while this has had no direct impact on silver, the boost that gold prices received from healthy central bank buying also gave silver some tailwinds.

Turning to silver's fundamentals, although its market deficit fell by 26% y/y last year, it remained high at 148.9Moz (4,632t), equivalent to 15% of global supply. Underpinning overall demand was another record high for industrial offtake, within which all major segments enjoyed gains. Further declines in bar and coin demand continued to offset this, however, resulting in a modest decline in total demand. Total supply rose by 2% last year, mainly due to higher recycling, although mine production was also up at the margin.

Notwithstanding all of this, many silver bulls remain disappointed with silver's price performance. This mostly reflects how it has fluctuated relative to gold. The received wisdom in the market has traditionally been that silver is a high-beta trade on gold, owing to its smaller, less liquid market and reflecting its higher price volatility. In rallying markets, therefore, there is an expectation that silver will tend to outperform gold. In addition, silver's exceptionally

Market Balance



Source: Metals Focus, Bloomberg

strong supply-demand conditions over the past few years should be all the more reason for the metal to outperform gold.

Silver failed to do this in 2024 however, just as it had done during the previous year. The gold:silver ratio moved sideways over much of 2024, mostly fluctuating between 80:1 and 90:1. While gold has broken a series of all-time records and in late March trades around 60% above its 2011 high, silver remains nearly one-third short of its respective peak during that year. In our view, silver's "failure to launch" is mainly due to the macro and geopolitical drivers of the past couple of years being primarily supportive of gold's more widely accepted quasi-monetary properties. Related to this, some of the key market participants of the past two years, for example macro/generalist funds and sovereigns, are comfortable with the gold's market depth and tradition as a diversifier, but less so with silver's smaller size and industrial attributes. Its strong supply-demand conditions also have had as yet a limited impact on its price, due to still plentiful above-ground stocks of silver.

Silver Supply and Demand

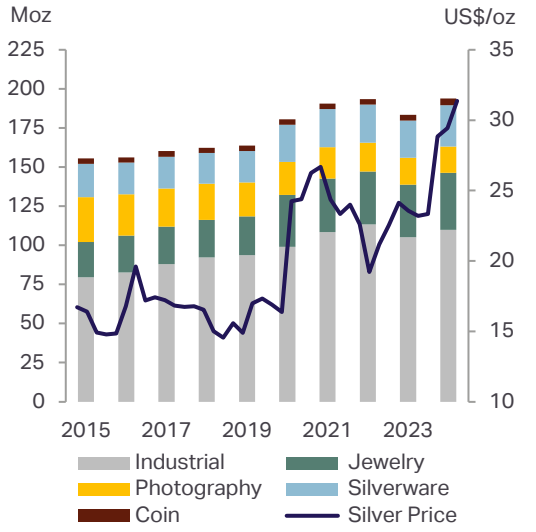
											Year on Year	
Million ounces	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025F	2024	2025F
Supply												
Mine Production	900.1	863.9	850.8	837.4	783.8	830.8	839.4	812.7	819.7	835.0	1%	2%
Recycling	156.3	160.2	162.3	163.8	180.5	190.7	193.5	183.5	193.9	193.2	6%	-0.4%
Net Hedging Supply	0.0	0.0	0.0	13.9	8.5	0.0	0.0	0.0	0.0	0.9	na	na
Net Official Sector Sales	1.1	1.0	1.2	1.0	1.2	1.5	1.7	1.6	1.5	1.5	-9%	4%
Total Supply	**1,057.4**	**1,025.1**	**1,014.3**	**1,016.2**	**974.0**	**1,023.1**	**1,034.6**	**997.8**	**1,015.1**	**1,030.6**	**2%**	**2%**
Demand												
Industrial (total)	491.0	528.0	525.8	525.4	511.9	564.1	592.3	657.1	680.5	677.4	4%	-0.5%
Electrical & Electronics	309.0	339.1	330.4	326.6	321.4	350.7	370.7	444.4	460.5	465.6	4%	1%
...of which photovoltaics	81.6	99.3	87.0	74.9	82.8	88.9	118.1	192.7	197.6	195.7	3%	-1%
Brazing Alloys & Solders	49.1	50.9	52.0	52.4	47.5	50.5	49.2	50.2	51.6	52.9	3%	3%
Other Industrial	132.9	138.0	143.5	146.4	142.9	162.9	172.4	162.6	168.4	158.9	4%	-6%
Photography	34.7	32.4	31.4	30.7	26.9	27.7	27.7	27.3	25.5	24.2	-7%	-5%
Jewelry	189.1	196.2	203.2	201.6	150.9	182.0	234.5	203.1	208.7	196.2	3%	-6%
Silverware	53.5	59.4	67.1	61.3	31.2	40.7	73.5	55.1	54.2	46.0	-2%	-15%
Coin & Net Bar Demand	212.9	155.8	165.9	187.4	208.1	284.3	338.3	244.3	190.9	204.4	-22%	7%
Net Hedging Demand	12.0	1.1	7.4	0.0	0.0	3.5	17.9	11.5	4.3	0.0	-62%	na
Total Demand	**993.3**	**972.9**	**1,000.8**	**1,006.4**	**929.0**	**1,102.4**	**1,284.2**	**1,198.5**	**1,164.1**	**1,148.3**	**-3%**	**-1%**
Market Balance	64.1	52.2	13.5	9.8	45.1	-79.3	-249.6	-200.6	-148.9	-117.6	-26%	-21%
Net Investment in ETPs	53.9	7.2	-21.4	83.3	331.1	64.9	-117.4	-37.6	61.6	70.0	na	14%
Market Balance less ETPs	**10.2**	**45.1**	**34.9**	**-73.5**	**-286.1**	**-144.3**	**-132.2**	**-163.0**	**-210.5**	**-187.6**	**29%**	**-11%**
Silver Price (US$/oz, London price)	17.14	17.05	15.71	16.21	20.55	25.14	21.73	23.35	28.27	-	21%	na

Source: Metals Focus

Global Supply

Source: Metals Focus, Bloomberg

Global Recycling, by Source



Source: Metals Focus, Bloomberg

Silver Supply in 2024

In 2024, global **mine production** rose by 0.9% y/y to 819.7Moz (25,497t). Supply from Mexico rebounded, with Newmont's Peñasquito mine returning to full production following the temporary suspension in 2023, while Fresnillo and MAG Silver's Juanicipio continued to improve recoveries. Output from Australia, Bolivia, and the US also increased. Primary silver supply continued its long-term downward trend, falling to 227.5Moz (7,076t). Silver from copper production also fell, down 1.8% y/y to 219.4Moz (6,824t) as output from several large mines dropped. Supply from lead/zinc mines remained the main source of silver in 2024, but output was flat year-on-year. Silver derived from gold mines recorded the strongest growth, up 12% (+13.9Moz, 432t) y/y to a three-year high. Virtually all of this came from Peñasquito, leading to a 2.1% y/y rise in Mexican production to 185.7Moz (5,775t).

In Australia (+6.2Moz, 192t) and Bolivia (+4.6Moz, 142t), growth came from lead/zinc mines. Whereas in the US (+3.2Moz, 98t), the ramp-up of Hecla's Keno Hill and Coeur Mining's Rochester expansion provided additional ounces. These increases were offset by lower supply from other countries, most notably Chile (-8.8Moz, 274t), where Kinross' La Coipa and Anglo American and Glencore's Collahuasi recorded lower year-on-year output.

Recycling in 2024 rose 6% to a 12-year high of 193.9Moz (6,032t). The biggest gains came from silverware (+11%) as high silver prices plus cost-of-living issues encouraged selling, particularly in the West. While volumes in India were restrained, western markets were also significant contributors to the 8% rise in jewelry scrap as some markets saw inventory melt by the trade. The largest increase in volume terms (+4.8Moz) came from industrial scrap, mainly driven by the processing of spent ethylene oxide (EO) catalysts.

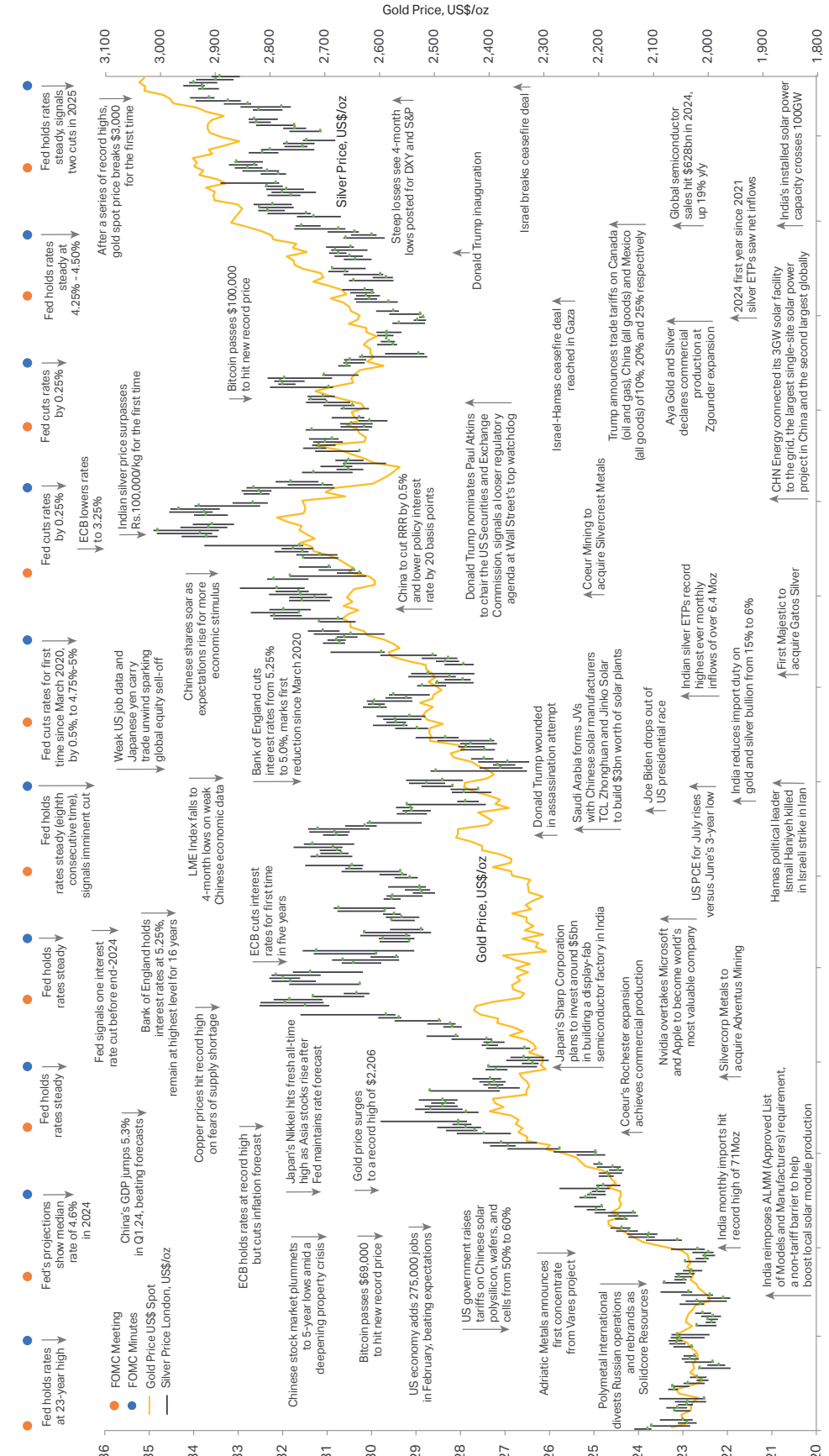
Net supply from the **official sector** fell by 9% in 2024. Nonetheless, absolute volumes remained trivial at just 1.5Moz (46t).

Silver Demand in 2024

Following a decline in 2023, total demand for silver fell further last year to 1,164.1Moz (36,207t), down 3% y/y. Much like in 2023, the drop was led by weakness in physical investment and silverware, while structural losses in areas such as photography continued. All of this was partially offset by the ongoing rise in industrial demand, which posted another record high in 2024.

Industrial offtake saw yet another record total last year, with demand up 4% to 680.5Moz (21,165t). While thrifting and substitution within the photovoltaic (PV) sector tempered growth compared to 2023, demand continued to benefit from the structural gains in the green economy, such as grid infrastructure and vehicle electrification, as well as PV. This PV growth was led by China where newly added capacity reached a record 278GW in 2024.

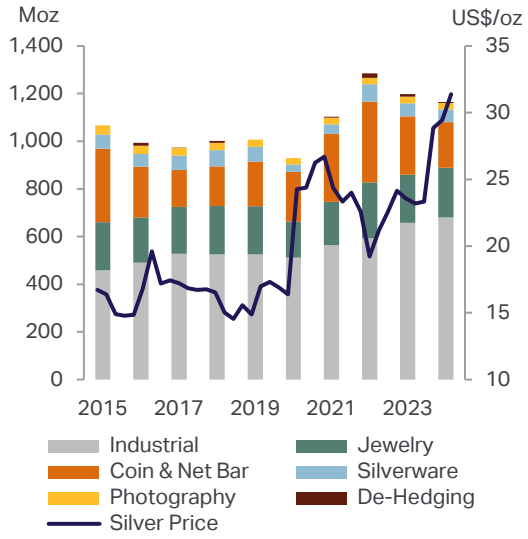
Silver vs Gold Price (London, $/oz) and Key Events in 2024-2025



NB: Black line indicates daily trading range

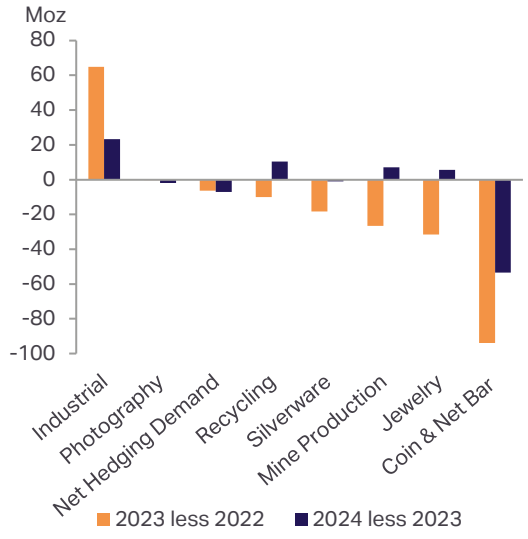
Source: Metals Focus, Bloomberg

Global Demand



Source: Metals Focus, Bloomberg

Supply/Demand Swings by Sector



Source: Metals Focus

Demand was also boosted by applications linked to artificial intelligence (AI), which contributed to growth in consumer electronics shipments. As a result, electronics & electrical demand posted another record high in 2024. The automotive and aerospace industries, among others, also underpinned growth in demand for brazing alloys. Despite a small drop in EO demand, our 'other industrial' demand category grew by 4%. In terms of the geographical split, China was the main contributor, with industrial offtake up 7% while India was up 4%. In the West, Europe was generally weak (barring one-off gains in the UK), while US demand fell 6% last year.

The ongoing structural decline saw **photographic** demand fall to a new multi-decade low of 25.5Moz (792t) in 2024. As before, the decline reflected ongoing structural losses in consumer and professional paper. Demand from the medical sector however improved, albeit from a historically low level.

After a notable slump in 2023, **jewelry** fabrication grew by 3% to 208.7Moz (6,491t). Primarily, this was due to gains in India where factors such as the bullion import duty cut, a healthy rural economy and the ongoing rise in purities lifted demand. Thailand was the other big winner (+13%), driven by increased exports to key Western markets such as the US, Germany and the UK. Consumption in Europe in total slipped a fraction, while the US was stable as supportive factors (such as branded silver's gains) offset negatives (notably cost-of-living issues). In contrast, a challenging economic backdrop and weak consumer sentiment meant that Chinese jewelry fabrication recorded its third consecutive year of losses.

Silverware demand in 2024 fell by 2% to a three-year low of 54.2Moz (1,684t). This was mostly due to modest losses in India where high prices hit the gifting segment. As with jewelry, losses were notable in China (-10%) due to poor consumer sentiment and a weak gifting market.

Coin and net bar demand saw another year of notable losses, falling 22% to a five-year low of 190.9Moz (5,939t) in 2024. All key Western markets saw declines, typically due to cost-of-living issues and profit-taking at higher prices. The fall was steepest in the US (-46%), due to investors' reaction to Trump's win and market saturation. In Germany, the negative impact of 2023's VAT increase on some silver products also still resonated in 2024. By contrast, India was the big outlier last year as its 21% rise took coin and bar demand to its highest level since 2015. Positive price expectations, combined with the import duty cut in July, were the main drivers. The rupee price continuing to make new highs also limited profit-taking as it reinforced bullish price expectations.

The global delta-adjusted producer **hedge** book fell by 4.3Moz (135t) to 4.5Moz (139t), its lowest point in decades. By end-2024, only three producers remained hedged, as the progression of projects from construction to commercial production reduced the need to protect cash flow.

Chapter 2

- Ongoing macroeconomic and geopolitical uncertainty, plus upcoming US rate cuts, are expected to sustain investor interest in precious metals, generating medium term price strength in silver.
- Later US policy clarity and an end to the rate cutting cycle point to an eventual easing in investor interest and prices.
- With supply only forecast to rise by 2% and demand to ease by 1%, 2025 is set for another major deficit (117.6Moz/3,659t), but silver may have to wait for above-grounds stocks to shrink further for notable outperformance of gold.

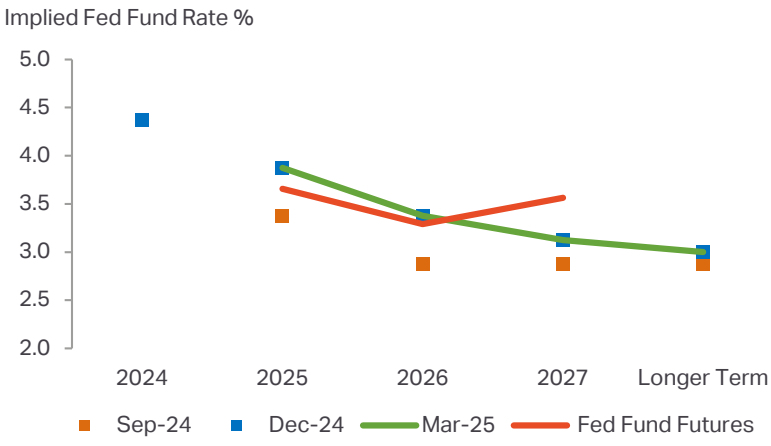
Market Outlook

Introduction

The drivers that underpinned precious metals prices throughout 2024 have carried over into the current year. Moreover, they have been supercharged by uncertainties surrounding US trade and foreign policy with the arrival of the new Trump Administration. As a result, silver has had a strong start to the year. Having opened 2025 at just under $29, its price had risen to over $34 by mid-March. The picture is somewhat less flattering when looking at silver's performance relative to gold. Having been left behind during the end-2024 rally, we had expected that silver would start catching-up with gold sooner or later. These expectations have so far not materialized. At the time of writing in late March, the gold:silver ratio is trading just over the 90:1 mark, which is very close to the year-to-date average for this measure and around 6% higher than the 2024 average of 84.8.

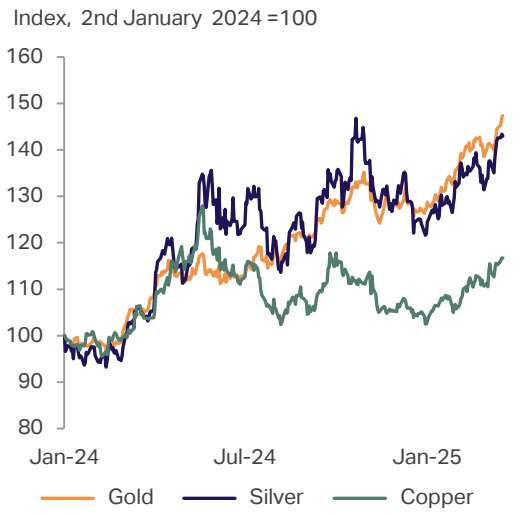
For the near future, we believe that conditions will remain positive for silver. Even if uncertainty has just been removed over the functioning of the CME, with silver's exemption from reciprocal tariffs, expectations remain that uncertainty over US trade and tariff policy will continue, but as importantly over US foreign policy. Furthermore, concerns about the health of the US economy, particularly in the face of the short-term impact that tariffs could have on local consumers and businesses, should solidify expectations that the Fed will make further cuts to US policy rates later in the year.

Interest Rate Expectations & the Fed's Dot Plot



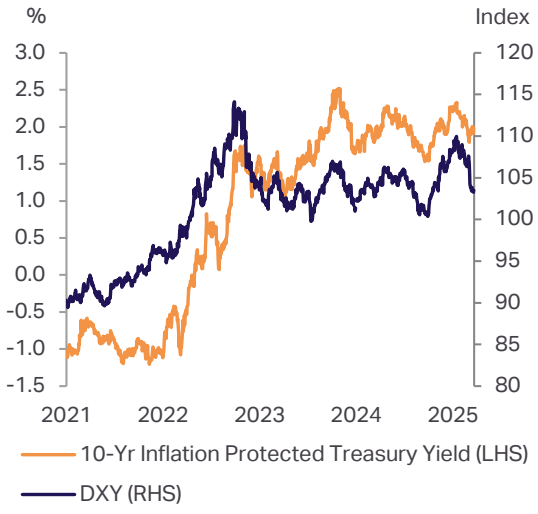
N.B. The red line denotes rates for each year-end as implied by Fed fund futures on March 19th 2025. The squares and the green line denote expectations of median interest rates for each year-end basis the Fed dot plot from the meeting held in each listed month.
Source: Bloomberg

Gold, Silver & Copper Prices



Source: Bloomberg, Metals Focus

US$ and 10-yr Treasuries



Source: Bloomberg

Concerns about the outlook for the US dollar are also being raised by US rate cuts, the new US Administration's aspirations to reduce the US trade deficit and boost the country's manufacturing sector and by ballooning US debt; all this should further boost the appeal of precious metals. In addition, geopolitical tensions are unlikely to be resolved any time soon, underpinning interest in safe haven assets. Finally, although this does not directly affect silver, the continued boost that we expect the gold price will receive from healthy central bank buying should also help silver prices somewhat.

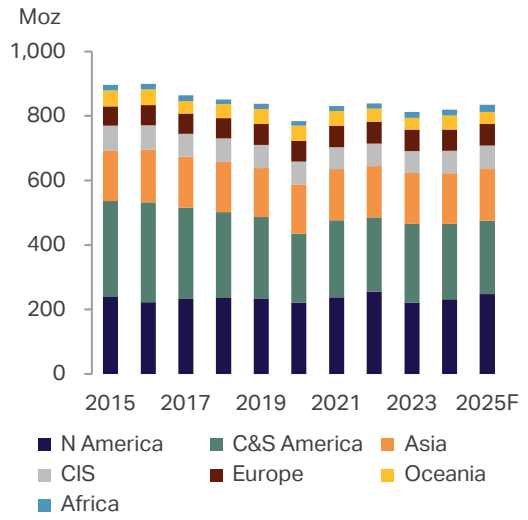
With all this in mind, we believe there is further upside for silver prices. We are confident that in the next few months we will see new cycle peaks, exceeding the 2024 high to levels not seen for many years. At some point, we also expect silver to catch up with gold thanks to investors looking for value given its recent underperformance. This may not be a story for 2025 however, given still adequate silver stocks and the current safe-haven bid on gold, which has pushed its price into uncharted territory. Towards year-end, if there are no further US policy shocks, the US escapes stagflation and the end to Fed cuts is clear, we expect precious metals will see a softer tone. While ongoing uncertainties elsewhere, along with silver's healthy supply-demand conditions will offer support, we do see prices easing back in late 2025.

Turning to silver's supply-demand conditions, we forecast another, if slightly smaller, deficit in 2025. The fall in the shortage is the result of a 2% rise in total supply and 1% decline in total demand. Higher supply will primarily come from a 2% rise in mine production, which we expect will be mainly due to gains in Mexican output, with smaller contributions from a number of other countries. In spite of the higher price environment, we see very little net hedging in 2025. Finally, recycling is expected to remain unchanged.

Turning to demand, following a series of all-time records in recent years, we expect industrial fabrication will be unchanged in 2025. This is mainly due to slower ethylene oxide (EO) capacity growth as well as thrifting in solar applications, which we expect will offset continued gains in automotive, power grid and consumer electronics. We expect losses in both jewelry and silverware, as high silver prices weigh on Indian demand. Finally, we expect that bar and coin demand will recover somewhat this year, following two years of weakness.

This will result in a 117.6Moz (3,659t) deficit for the year, 21% lower than the supply shortage we estimated for 2024 and less than half of the 2022 peak. As noted earlier, we do not expect this will make a material contribution to prices in 2025, with the heavy lifting left to professional investor activity fueled by macro factors. This is due to the still sizable stockpiles of silver, which should prevent a sustained physical squeeze. We very much expect such a dynamic will emerge eventually, but we feel that a few more years of deficits are needed first to further erode above-ground silver inventories.

Mine Production Forecast



Source: Metals Focus

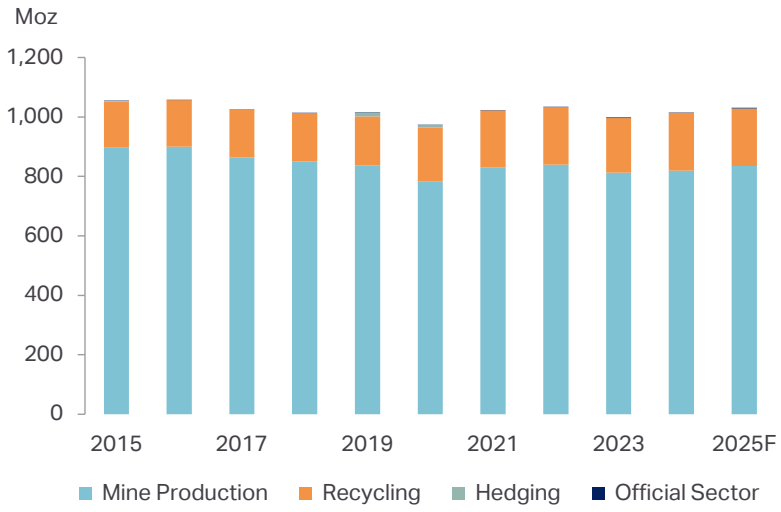
Supply Outlook

We anticipate global silver **mine supply** will rise 1.9% to 835.0Moz (25,972t) in 2025. Most of this growth will come from Mexico; output from Fresnillo and MAG Silver's Juanicipio is expected to peak, Peñoles' mines to return to full production following operational challenges in 2024 and Endeavour Silver's Terronera project to come onstream. Output is predicted to rise in numerous other countries. In Chile, it is likely that production from CODELCO and Kinross' La Coipa will return to higher levels and Gold Fields' Salares Norte will continue ramping up, lifting output by 3.5Moz (108t) to 46.6Moz (1,450t). In Russia, we forecast a 3.1Moz (97.4t) rise in supply as ore from Polymetal International's Prognoz will start to feed through to the Nezhda plant and MBC Corporation's Ozernoye ramps up to full capacity. Lower production from Australia (-5.4Moz, 169t) and Peru (-5.1Moz, 158t) will partially offset these gains. In Australia we expect reduced supply from South32's Cannington and MMG Mining's Dugald River, and in Peru there is lower forecast production at lead/zinc mines such as Nexa Resources' Cerro Lindo and El Porvenir. China is forecast to remain almost flat y/y at 110.4Moz (3,435t).

We expect **hedging** activity to remain flat year-on-year. With few projects coming on stream in the near term, the need to safeguard cash flow is diminished. Furthermore, it is clear that silver producers' current preference is to expose production to the higher silver price.

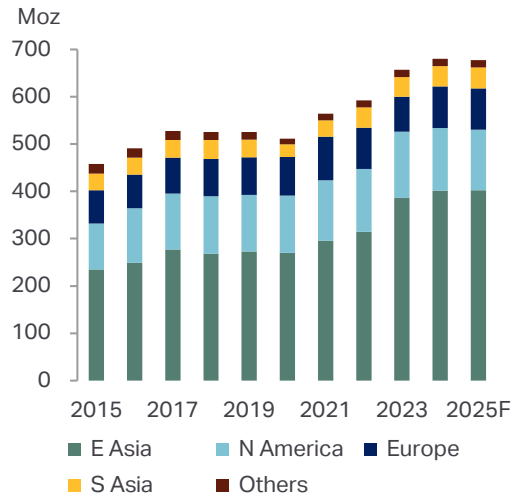
Recycling is set to be virtually flat y/y in 2025. Depleted near-market stocks of high grade material such as jewelry and silverware will weigh on supply in some markets but price-led gains in India mean these sectors globally should inch higher. In contrast, ongoing structural losses in photography and a slight dip for industrial recycling are also forecast.

Global Supply Forecast



Source: Metals Focus

Industrial Fabrication Forecast



Source: Metals Focus

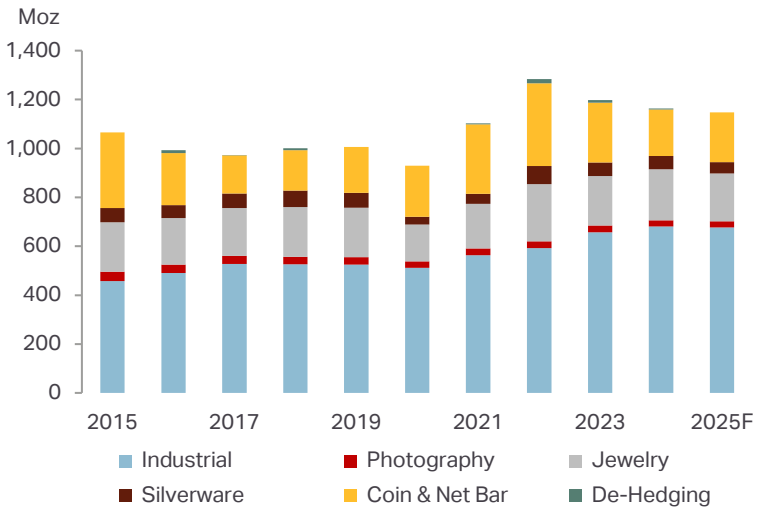
Demand Outlook

After making a series of record highs in the last four years, **industrial** demand is forecast to flat-line this year, assuming rising tariffs do not notably weaken global GDP. The PV sector is expected to see marginal losses as the decline in silver loadings will outweigh gains in cell production. Despite that, total electrical & electronics demand is expected to grow again this year, albeit marginally due to gains in automotive end-use, power grid investment and consumer electronics, in part fueled by AI. A slower pace of EO capacity additions however will lead to a 6% decline in other industrial demand. Thrifting and substitution should remain slight in most sectors, although the use of composite powders (mostly in PV today) could grow. The structural decline in **photographic** demand is also likely to continue in 2025

Jewelry fabrication is expected to fall 6% in 2025 to 196.2Moz (6,104t). Most of this is likely to be price-driven consumption losses, particularly in India (-15%), where re-stocking by the trade should also to be constrained by record high local prices. Western markets however are likely to be resilient with volumes in US and Europe expected to be virtually unchanged. A larger drop of 15% is expected in **silverware** demand, again driven primarily by India where the high silver price will continue to impact average weights.

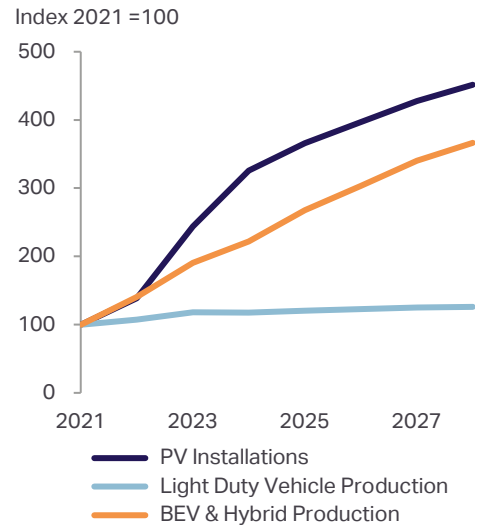
Coin and net bar demand is set to partially recover in 2025 after two years of weakness. Europe could see a slight recovery, led by Germany, where some normalcy returns after two years of heavy losses. The US should see far higher commemorative minting, which offsets ongoing weakness in bar and bullion coin demand. Losses are forecast for India as record high local prices induce profit-taking and outweigh new investment. Building on the gains seen in 2024, we expect a further rise of 70Moz (2,177t) for ETPs this year.

Global Demand Forecast



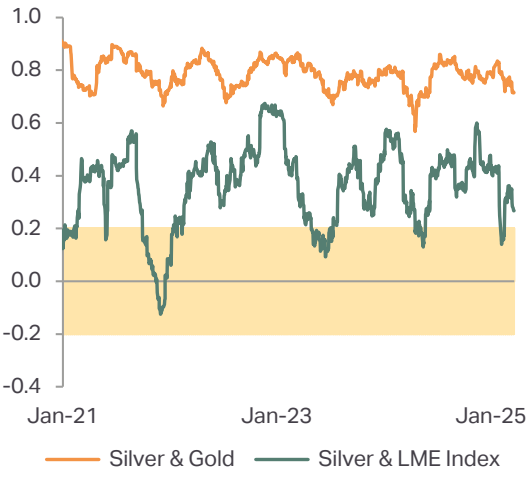
Source: Metals Focus

Longer-Term Industrial Demand Indicators



Source: GTM, Metals Focus, LMC Automotive, A GlobalData Company

Silver's Correlation with Gold & LME Index*



*Rolling 60-day correlation coefficients between log-returns in the average silver price and changes in the average gold price and the LME Index. Observations within the yellow box are not statistically significant, at a 10% significance level.
Source: Metals Focus, Bloomberg

The Longer-Term Outlook for Silver

2025 will mark the fifth year in a row of silver seeing a hefty deficit which, for 2021-25, totals almost 800Moz (25,000t). This is clearly unsustainable and so we set out below what may lie in store. We cannot expect much of a solution to this deficit position from **mine production** as this is expected to peak in 2026 and then to fall as several mines start to reach their end-of-life. If output is to be kept near current levels, it will need positive investment decisions on projects now at the development stage. Much of this expected slide stems from losses in Mexico, while gains are seen in numerous countries, such as Canada, Russia and the US. This country mix also explains why most losses will be from primary mines, with by-product silver from gold mines enjoying initial gains and output from base metal mines seeing growth further out.

Recycling will also be constrained by photographic scrap's structural decline and by depleted silverware stocks in the West. Some underlying gains could be seen for industrial scrap but, for the total to rise notably, we need much higher prices to elicit growth in Indian jewelry and silverware recycling.

At the same time, we remain optimistic for **industrial** demand. Short-term pressure could emerge if the world economy suffers from the escalating trade war. However, structural changes (often bound up with decarbonization such as a shift to BEVs and PV installations) should mean silver's industrial demand outperforms global GDP. Further support could also emerge if AI developments lift sales of novel electronic devices and as power hungry data centers continue to be built. The major unknown is thrifting and substitution, which could easily grow if prices strengthen. However, even without a rally, technological advances that allow for the wider use of composite powders (such as copper:silver) would hurt (mainly in PV). Rapidly evolving automotive designs could also mean stable or lower silver use per vehicle. **Photographic** fabrication should at least continue its slow structural decline in the next few years, but the sector is now too small to be material for the overall deficit.

Jewelry demand has the potential to rise on the back of a growing global economy. However, gains in weight terms may underperform as markets in the West, India and China drift to higher margin, lighter and/or branded pieces. This structural change would make the sector more price-resilient, but there is still plenty of scope for heavy losses (mainly in India) if a rally takes place. Any price impact would be greater in **silverware** (due to India's importance) but structural losses in other markets are now largely behind us.

The outlook for **coin & net bar demand** is tricky to call. On one hand, an uncertain macroeconomic backdrop will boost interest in safe havens and any ensuing rally could trigger trend following, especially early on. On the other, profit taking could grow, particularly in light of the hefty build-up in investor stocks in recent years and if risk-on sentiment returns. We should not forget that it was gains for coins and bars plus industrial offtake that drove overall deficits.

Chapter 3

- Coin & net bar demand weakened further last year, as retail purchases fell to a five-year low.
- Silver ETPs experienced a turnaround after two years of outflows, with total holdings increasing by 6.3% to 1,038Moz (32,295t) by end-2024.
- Expected US interest rate cuts, along with elevated economic and geopolitical uncertainties, should continue to fuel gold and silver investment.

Investment

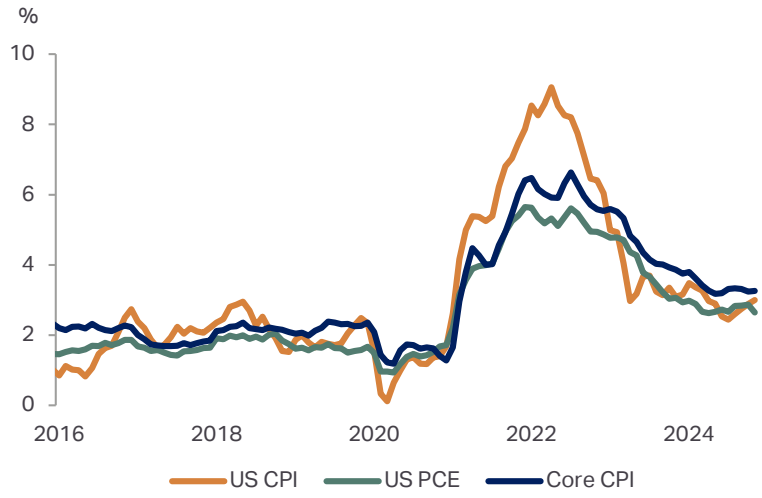
Introduction

Silver investment varied across different market segments and geographies in 2024. Institutional investment, for example, picked up and played a pivotal role in driving silver prices to 12-year highs. In this context, a surge in tactical interest in futures and options trading on commodity exchanges provided essential fuel. The over-the-counter (OTC) market saw modestly higher turnover, but growth in institutional interest appears limited. Silver ETP holdings posted their first annual rise in three years. By contrast, silver bar and coin purchases eased among Western retail investors for the second year in a row, although this was partially offset by firmer Indian buying.

Expectations that the Fed would start cutting policy rates were the principal driver behind improving institutional investment. Even though the first rate cut only emerged at the September 2024 FOMC meeting, the dollar and US Treasury yields had already started to retreat in April amid firm investor beliefs that easing was coming. Other macroeconomic and geopolitical factors were also supportive, including concerns over US government debt, worries about over-stretched US equity valuations, continued turmoil in the Middle East and uncertainties surrounding the US election later in the year.

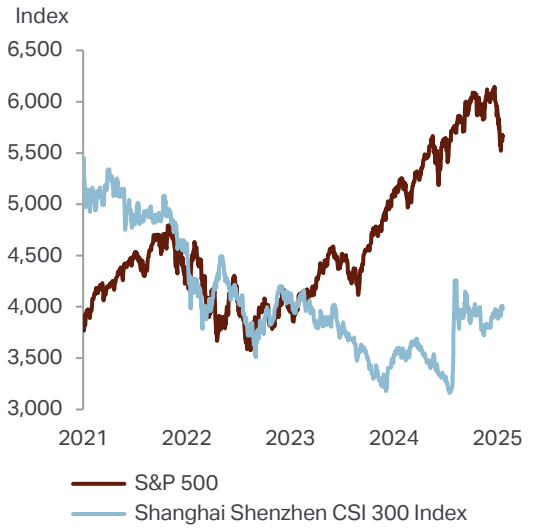
All the above led to significant inflows into gold by professional investors, which extended to silver. Following a series of record gold prices, the fact that silver remained below its peak prompted a sharp rebound in speculative interest on expectations that silver would eventually catch up. With technical indicators turning bullish, there was a rebound in inflows from tactical investors who had shunned silver in 2022-23 amid rangebound silver prices.

US Inflation



Source: Bloomberg

S&P 500 & CSI300 Share Indices



Source: Bloomberg

Annual Turnover on Major Commodity Exchanges & LBMA[1]

Million ounces	2023	2024	Y/Y
SHFE[2]	115,394	172,812	50%
CME	90,648	109,099	20%
LBMA	97,332	101,774	5%
MCX	4,899	5,157	5%
CME Micro[3]	2,680	4,824	80%
SGE T+D[2]	2,429	2,244	-8%

1. Turnover on all exchanges includes futures, spot or deferred contracts where applicable; turnover on LBMA includes spot, swaps and forwards.
2. The SHFE and SGE record each transaction twice, from the point of view of the buyer and also the seller. However, to compare these volumes with other exchanges, the reported figures have been halved (as shown above).
3. On the CME, 5,000oz for its standard futures contract & 1,000oz for micro futures contract

Source: Bloomberg, Respective Exchanges

That said, considering silver's high beta relationship to gold and its robust supply/demand fundamentals, the scale of fresh institutional investment in the white metal was arguably disappointing. Leaving aside a brief drop to the low 70s, the gold:silver ratio remained stubbornly high during 2024, largely oscillating in the same 80-90 band that had been in place over 2022-23.

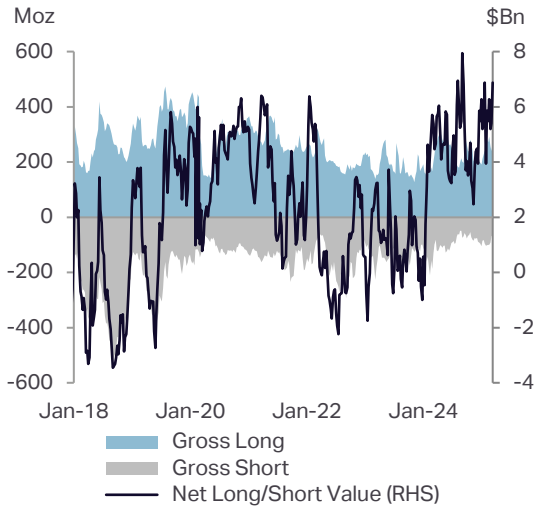
To a large extent, silver's struggle to outperform reflects gold's quasi-monetary attributes, which made it more attractive for portfolio diversification, both by central banks and those institutional investors with a long-term view. Furthermore, although silver's actual industrial demand remained robust, its industrial attributes meant that it was still affected by investors' growing caution towards the Chinese economy. After the US election, the threat of trade wars and their potential damage to the global economy created an additional headwind to investor confidence towards industrial metals in general, which negatively affected silver. Significant above-ground bullion inventories were another challenge facing silver investment. Although the silver market has witnessed hefty deficits since 2021, the release of these stocks has kept the silver market well supplied. With little signs of an imminent physical tightness, it is difficult for institutional investors to become too excited about silver's fundamentals.

In contrast, coin and net bar demand fell for the second consecutive year in 2024; over 2023-24, global retail investment fell by 44% to a five-year low. The vast majority of these losses occurred in the US where net investment fell by 46%. Late 2023 had already witnessed a marked slowdown as silver prices rose and this downturn accelerated into 2024. Other Western markets suffered, notably Germany and Australia, as market saturation, an absence of a new crisis and ongoing cost-of-living issues all weighed on retail investment. By contrast, India enjoyed a healthy rebound, thanks to bullish price expectations and the import duty cut on silver bullion.

Outlook

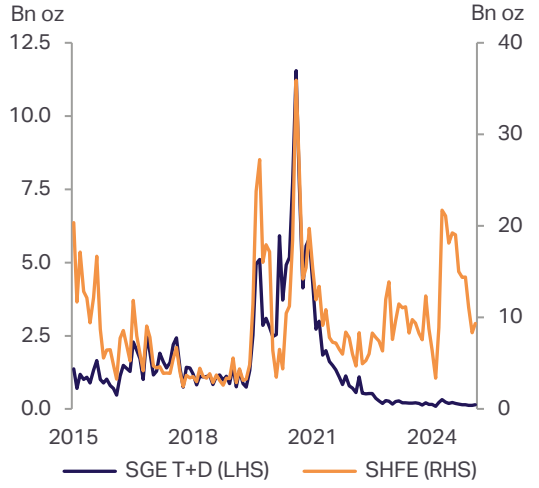
Silver investment has faced conflicting forces so far in 2025 due to its dual role as a precious and industrial metal. On the one hand, worries about escalating trade wars, a correction in US equities, recessionary fears and geopolitical tensions have all raised the need for portfolio diversification. Although gold investment has been the main beneficiary, silver has enjoyed positive spillovers. On the other hand, a weakening global economic outlook has remained a key drag on silver because of its industrial credentials. Going forward, expected US interest rate cuts, along with elevated economic and geopolitical uncertainties, should continue to fuel gold and silver investment. A still high gold:silver ratio should also help, as some investors may view the white metal as undervalued. However, if there are fewer US policy shocks, an end to Fed rate cutting is in sight and the US avoids a recession, demand for defensive assets should eventually start to slow later this year.

Investor Positions on the CME*



*Managed money positions; Source: CFTC

SGE & SHFE Silver: Monthly Turnover



Source: Shanghai Gold Exchange, Shanghai Futures Exchange

Institutional Investor Activity

Sentiment turned positive towards silver among institutional investors in 2024, a contrast to 2022-23 when they largely shunned the white metal. This improving appetite was particularly noticeable in the futures markets, as silver's decent price gains, along with rising volatility, boosted short-term speculative interest. By contrast, gains from investors with a medium-to-long term view were relatively limited, highlighted by modest inflows into silver ETPs and still lackluster interest in the OTC market.

Commodity Exchanges

In 2024, silver trading grew significantly on most exchanges. On the **CME**, turnover of its 5,000oz futures contract rose by 20% y/y to a four-year high, while volumes for the 1,000oz micro contract surged by 80%. This reflected improving investor interest in silver throughout the year.

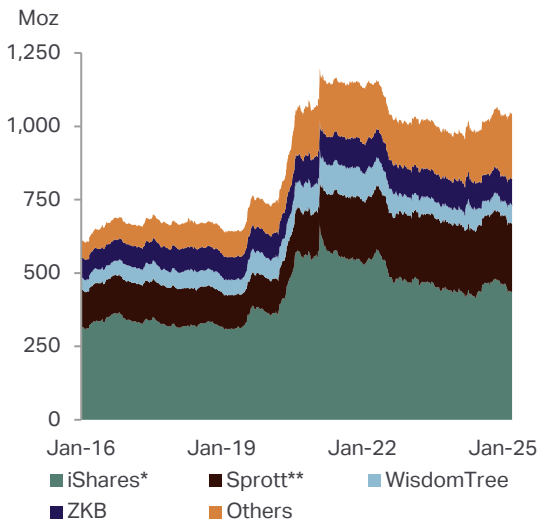
Several factors contributed to this trend, especially from April onwards. Notable here was improving sentiment towards gold. A series of record high gold prices and an elevated gold:silver ratio attracted speculative investors who expected silver to recoup lost ground against gold. Although affected by long liquidation and a slowdown in the Chinese economy during the summer, investment inflows into silver rebounded in Q3 before the US election. By late October, the net managed money position had risen to 228Moz (7,097t), driving silver to a 12-year high of $34.90.

Investor activity was also affected by the US election and anticipated policy changes. Following the election result, the net managed money position quickly pulled back as silver suffered from both inflationary expectations and the threat of trade wars. Moreover, with worries about the potential impact of tariffs on silver, stocks quickly aggregated at the CME. This year-to-date, silver has continued to take its cue from gold, with silver's net managed money position rising to 247Moz (7,696t) by late-March.

The **Shanghai Future Exchange** (SHFE) remains the world's leading exchange for silver trading, with its turnover surpassing 2020's record high. A price rise of 27% from March to end-2024 and high volatility attracted local tactical investors. A bullish outlook for silver industrial demand also supported sentiment towards the local price. This was evident by the short-term premium of local, VAT-exclusive prices over international prices. By contrast, Ag(T+D) contract turnover on the **Shanghai Gold Exchange** contracted by another 8% after falling to a 13-year low in the previous year.

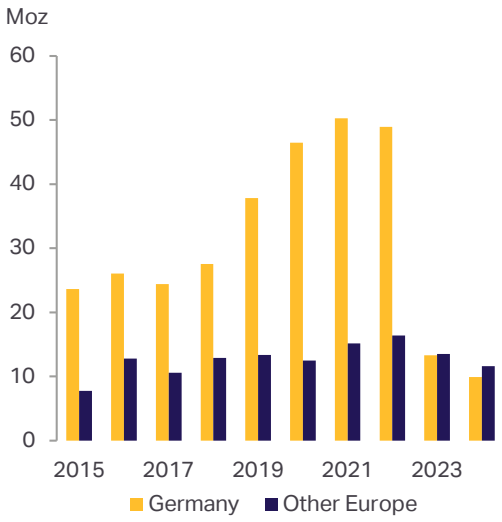
On the **Multi Commodity Exchange of India** (MCX), silver futures turnover rose by 5%, while options trading more than doubled year-on-year as high price volatility drove interest in flexible options contracts. Meanwhile, turnover on the **International Bullion Exchange** (IIBX) jumped significantly to 36.2Moz (1,127t) in 2024, representing 16% of total imports into the country.

Silver ETP Holdings



*iShares Silver Trust; **Combined holdings of the Sprott Gold & Silver and Sprott Silver
Source: Bloomberg, Respective Issuers

German and Other European Physical Investment



Source: Metals Focus

Over-the-Counter Market (OTC)

LBMA trading volumes, a proxy for OTC activity, rose by 5% in 2024. Similar to other investment segments, interest rate cuts and a supportive economic/geopolitical backdrop underpinned investor buying in the OTC market. This growth, however, fell significantly short of that seen on commodity exchanges. To some extent, this can be attributed to a shift away from the OTC to various exchanges. Options trading volumes on the CME, for instance, has enjoyed healthy gains in recent years.

The tepid growth on the OTC was also in line with feedback from our contacts that interest in silver remained low among institutional investors with a long-term view. Despite silver's strong supply/demand fundamentals, significant above-ground inventories have prevented a physical squeeze from emerging in the market. Growing caution towards the Chinese economy also affected sentiment, given silver's industrial credentials. Silver's underperformance relative to gold prices also disappointed some investors.

Exchange-Traded Products (ETPs)

In 2024, silver ETPs experienced a turnaround after two years of outflows. Combined holdings increased by 6.3% or 62Moz (1,914t) to 1,038Moz (32,295t) by end-2024, reversing most losses over the past two years.

Despite a 23% increase in silver prices, global ETP holdings remained largely stable during H1.24. A significant inflow of 30Moz in March effectively offset the losses in early 2024 but were then offset by the modest outflows in Q2. With silver peaking at an 11-year high of $32.52 in late May, this prompted some profit-taking among investors. The bulk of inflows appeared from July to October before the US election. On top of favorable macroeconomic conditions like rising expectations of faster rate cuts and improving sentiment towards base metals with China's stimulus package, the hefty price correction in late July prompted bargain hunting. Moreover, a rising gold: silver ratio led to inflows from medium-to-long-term investors who perceived silver as undervalued to gold. Global holdings reached a short-term peak of 1,066Moz in early November but declined after the US election.

The steady downward trend continued in early 2025, with North American-listed funds accounting for most outflows. Such losses were mitigated by inflows in European-listed funds and Indian ETPs. Indian ETPs, in particular, saw a remarkable 195% increase in holdings last year, followed by an additional 10% rise year-to-date, driven by positive local price expectations.

Coin & Net Bar Demand

Following a sharp drop in 2023, coin and net bar demand weakened further in 2024. With a 22% fall, this fell to a five-year low and was 44% below 2022's all-

Coin & Net Bar Demand Forecast

Million ounces	2024	2025F	Y/Y
Bars	96.1	91.8	-4%
Coins	94.8	112.6	19%
Global Total	**190.9**	**204.4**	**7%**

Source: Metals Focus

time high. Last year's weakness was dominated by the US where coin and bar purchases dropped by 46% to its lowest since 2019. Losses also emerged in the other key Western markets of Germany and Australia. India was the only major physical market to enjoy higher silver investment last year.

In **Europe**, retail investment saw a double-digit fall for the second year in a row, down by 20% to 21.5Moz (670t) to a new low in our series. In keeping with 2023, the absence of a new crisis in 2024 curtailed investor appetite for safe haven assets, particularly given that exceptionally strong investment over 2020-22 led to some market saturation. Ongoing cost-of-living issues also limited disposable incomes to invest in precious metals across the board. In Germany (the largest silver investment market in Europe), the damage to

The Growing Popularity of Silver ETPs in India

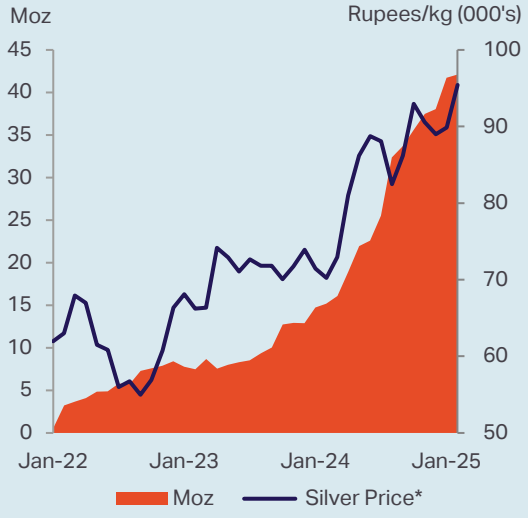
Silver exchange traded products (ETPs) in India were first launched in January 2022. This was much later than gold which saw ETPs announced in 2007. Locally, ETPs are units traded on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE), physically backed by LBMA-accredited silver stored in custodian vaults. Despite being a late entrant, silver ETPs have recently seen remarkable growth. Holdings surged by around 25Moz (783t) in 2024 to a record high of 38.6Moz (1,200t). To put this into context, the inflow in 2024 was equivalent to 42% of India's annual retail investment. The number of funds offering silver ETPs has also tripled in recent years, rising from just four at the end of 2022 to 12 now.

The growing interest in silver ETPs is due to several factors. First, silver's appeal lies in its inherent volatility and positive price expectations as it is seen as undervalued compared to gold which attracts those seeking potential gains. Second, concerns about physical storage have often deterred investors. The convenience and liquidity offered by silver ETPs address this challenge.

Third, rising financial awareness has been another key driver of growth. India has witnessed a sharp increase in retail trading accounts in the last five years, with the total number soaring from 41m in March 2020 to 185m by end-2024. Notably, in 2023 and 2024, 77m accounts were added. Finally, fueling the surge are inflows through Fund of Funds (FoFs). These are set up by mutual funds who, in turn, invest in their own ETPs. FoFs offer certain advantages over ETPs, such as allowing investors to participate without the need for a demat account (used for holding investments like shares, bonds, government securities and mutual funds), which is a key requirement for ETP investments. In addition FoFs offer systematic investment plans (SIPs), allowing investors to allocate funds gradually over time.

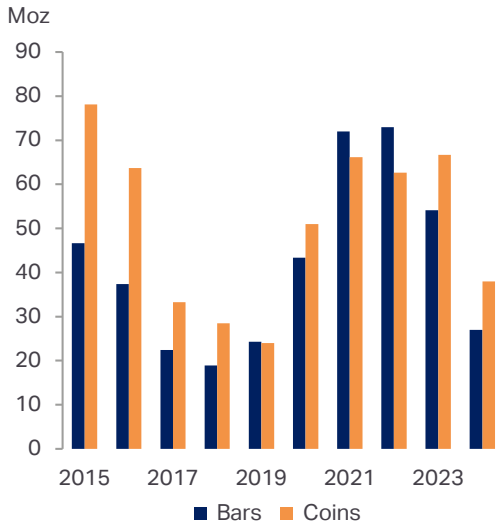
The absence of efficient alternative investment options for silver has enhanced the appeal of silver ETPs. While some companies have introduced digital silver, its growth has been limited by a lack of regulatory oversight. Thus, considering India's appetite for silver investment, we expect ETPs to continue attracting inflows in the coming years, driving India's share in the global ETP market beyond the current 4%.

Indian Silver ETP Holdings



*Monthly Average;
Source: Respective Issuers, Bloomberg, Metals Focus

US Physical Investment



Source: Metals Focus

investor sentiment from the government's increase for VAT on some silver products in 2023 still resonated in 2024. In addition to weak gross buying, last year's drop also reflected a pick-up in selling back of old bars and coins by retail investors, as silver's rally over the €800/kg threshold in April for the first time since 2013 triggered profit taking.

Following weak demand during much of 2024, silver investment improved towards year-end. However, this was mostly driven by wholesale activity, as the trade rushed to replenish certain silver coins before Poland abolished the margin tax on new silver bullion coins at year-end (some silver bullion coins attracted a lower VAT than bars under this margin tax regime). While retail investment also picked up in late 2024, the recovery was much more modest.

In 2024, the **US** experienced a 46% y/y collapse (-55.8Moz / -1,736t) in retail investment, leaving the total at a five-year low of 64.9Moz (2,020t). Even so, retail demand was still well above 2017-19's depressed totals, when purchases averaged 50.4Moz (1,569t). Last year's weakness can be traced back to 2023. Even though that year saw just an 11% y/y fall, it had benefited from the collapse of two regional US banks. Although the surge in demand lasted just two months, it hid growing signs of an underlying slowdown. Those became more noticeable during late-2023 as rising silver prices saw retail selling back emerge, which carried over into 2024, remaining a feature for much of last year. This has been accompanied by a steep fall in gross purchases by retail investors. However, the one area to see growth has been retirement accounts, but even here the gains have been quite more modest.

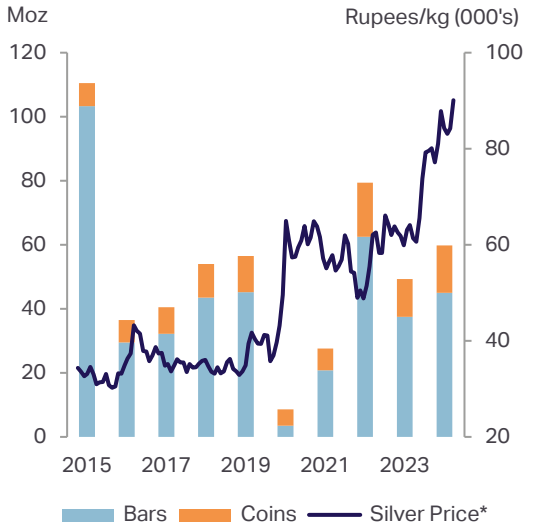
Several reasons help explain the downturn. The first is the scale of historic purchases. Between 2010-23 (2010 being the start of Metals Focus' series), 1.4bn oz (+44,000t) of silver bars and coins were acquired in the US. Second, these holdings have traditionally been very sticky. However, silver's price gains have led some investors to book profits. The third driver relates to the US presidential election. Although anecdotal, it appears that an important share of US silver retail investors tend to be Republican leaning. Last year, expectations were for a Trump win, which took away one reason to buy silver (the reasoning being that Republicans are better stewards of a low inflation economy). With the Republicans wining all three branches of government in November, this resulted in both less buying and some outright selling back.

Coin & Net Bar Demand

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Coin fabrication	139.2	124.3	82.8	85.4	96.2	128.3	153.5	158.1	125.2	94.8	-24%
Net bar purchases	170.1	88.6	73.0	80.5	91.2	79.8	130.9	180.2	119.1	96.1	-19%
Global Total	**309.3**	**212.9**	**155.8**	**165.9**	**187.4**	**208.1**	**284.3**	**338.3**	**244.3**	**190.9**	**-22%**

Source: Metals Focus

Indian Physical Investment



*Monthly Average
Source: Metals Focus, Bloomberg

Early this year, the gap between sales and buybacks narrowed further, with some dealers reporting net, negative demand. This was exacerbated by the rise in lease rates which led to de-stocking. However, at the time of writing, a partial recovery has emerged, with Trump's tariffs policy leading to concerns that both the economy might slow and inflation may pick up this year.

Following a notable drop in 2023, **Australian** physical investment saw another sharp loss (25%) in 2024 to 9.3Moz (289t). Much like 2023, gross sales fell, and buybacks touched record highs for many dealers. This partly reflected distress selling, triggered by the cost-of-living crisis. A strong real estate market was another headwind, along with increasingly popular cryptocurrencies. Given the high beta associated with cryptocurrencies and silver, investors in these tend to have a high risk appetite. Our research suggests that silver's relative underperformance saw some rotation into cryptos. Despite 2024's lower total, retail investment has been structurally higher since 2020 and was still double the 2010-19 average. This largely reflects growing precious metals investment in superannuation or retirement accounts, which now make up 15-20% of annual silver investment in Australia. For 2025, judging by the strong investor response so far, we expect physical investment to reverse the downtrend of the last two years.

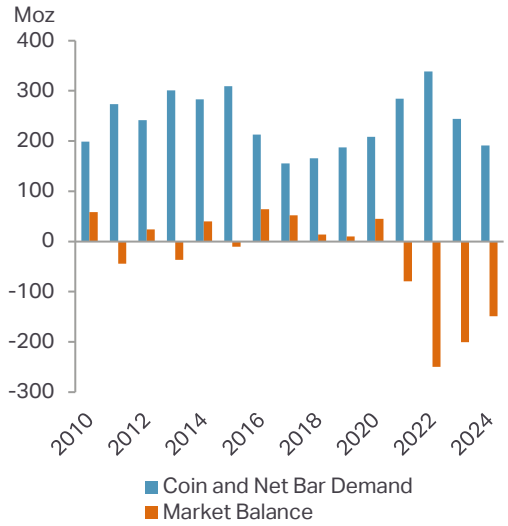
After a steep drop in 2023, **Indian** physical investment rebounded last year by 21% to 59.8Moz (1,859t). Leaving aside 2022's elevated level, this was the highest total since 2015. Turning to intra-year trends, the first half was weaker than the second. Price dips were often short-lived, providing confidence to local investors to buy as price expectations remained positive. This sentiment was reinforced as the local price achieved a record high in early July, falling just short of the psychologically important Rs.100,000/kg. This was followed by a surprise import duty cut on bullion in late-July (from 15% to 6%), which saw the rupee price fall sharply and, in turn, provided a fresh entry point to investors who had earlier missed out. Retail investment jumped in the

Physical Investment*

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
United States	124.8	101.1	55.7	47.4	48.2	94.3	138.2	135.6	120.8	64.9	-46%
India	110.4	36.5	40.5	54.0	56.5	8.7	27.6	79.4	49.3	59.8	21%
Germany	23.6	26.1	24.4	27.6	37.8	46.5	50.3	48.9	13.3	9.9	-25%
Australia	4.3	5.1	3.3	3.6	3.5	11.4	16.0	20.7	12.4	9.3	-25%
Canada	7.6	7.2	4.7	4.6	5.0	7.5	10.6	12.0	7.9	6.4	-18%
China	13.9	13.8	9.4	9.0	7.9	8.7	7.8	7.4	6.2	5.5	-10%
Other Europe	7.8	12.8	10.6	12.9	13.4	12.5	15.1	16.4	13.5	11.6	-14%
Other East Asia	8.3	8.7	6.9	7.3	13.6	13.4	12.8	12.0	9.9	10.8	9%
Others	1.8	1.9	1.7	1.6	1.2	3.3	3.5	5.2	5.0	5.0	0%
Global Total	**302.6**	**213.1**	**157.2**	**167.9**	**187.2**	**206.1**	**281.8**	**337.6**	**238.2**	**183.3**	**-23%**

Source: Metals Focus. *These figures differ to coin + net bar demand as they exclude commemorative coins and take into account swings in dealer stocks.

Coin & Net Bar Demand and Market Balance



Source: Metals Focus

immediate aftermath of the duty cut. Importantly, even as the price achieved a new and important level of Rs.100,000/kg in October, profit taking was very limited which suggested that investors expected the bull market to continue.

Typically, individuals involved in the jewelry and silverware trade are also big investors, often buying silver when prices are low to be fabricated later. The steep price drop after the duty cut saw many invest in silver, especially as the price correction occurred ahead of Q4's wedding and festive season. Last year also saw greater interest in physical silver due to more arbitrage opportunities, where investors buy physical and sell on the exchange to earn a yield (7-10% for 2024). For much of last year, this generated demand from high-net-worth individuals who tend to dominate this trade. That said, retail investment has faced rising competition from ETPs. Turning to 2025, we expect retail investment to ease. Given that the silver price has made fresh record highs in the local market this year and is likely to remain high, we expect profit-taking and sell-backs to outweigh fresh investment demand.

Physical investment in **China** fell by 10% to 5.5Moz (172t) as far weaker coin demand offset slightly higher bar sales. Due to silver's VAT treatment (13% applies to the total value), these markets are dominated by gifting and collectors. As the local price rallied by 37% in 2024, the issue prices and premiums on silver coins surged, hitting consumer interest. Another headwind was the growing preference for gold coins due to gold's increasing safe-haven appeal. Some collectors also sold back gold and silver coin sets to take profits as the gold price surged and so some silver coins saw a price fall. This led to a lack of consumer confidence in the value preservation merits of silver coins. In 2025, we expect retail silver investment to fall by 7% to 5.2Moz (161t), primarily because of the economic slowdown and weaker consumer sentiment in the country's gifting and collector market.

Coins & Medals Fabrication

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
United States	49.1	39.4	19.3	17.1	20.5	32.7	32.2	21.1	29.1	28.5	-2%
India	7.2	7.1	8.3	10.5	11.3	5.2	6.7	16.9	11.8	14.8	25%
Canada	35.4	33.6	18.9	18.4	23.0	28.8	36.4	35.8	23.4	14.1	-40%
Australia	12.7	13.2	10.7	10.4	12.7	17.3	20.0	24.1	15.4	10.0	-35%
UK	3.5	3.5	3.1	3.5	3.2	9.7	15.7	19.9	14.7	6.8	-54%
China	13.7	12.9	8.6	8.6	7.3	8.1	7.3	7.1	5.7	4.9	-15%
South Africa	0.6	0.0	1.2	3.7	3.6	7.9	10.3	7.7	3.4	2.7	-20%
Germany	1.9	4.3	4.0	4.0	3.9	3.9	3.9	3.9	2.9	2.6	-11%
Austria	7.3	3.4	2.1	2.1	2.9	7.2	12.3	12.2	10.0	2.1	-79%
Others	7.8	6.9	6.7	6.9	7.9	7.6	8.7	9.4	8.8	8.4	-4%
Global Total	**139.2**	**124.3**	**82.8**	**85.4**	**96.2**	**128.3**	**153.5**	**158.1**	**125.2**	**94.8**	**-24%**

Source: Metals Focus

Above-Ground Silver Stocks

Following the market developments of the past few months, any review of above-ground silver inventories must be dominated by the dramatic shifts of metal from London vaults to CME ones. This of course was fueled by concerns about the possibility of tariffs being placed on silver, which would make hedging CME futures positions with loco-London material (which is what market makers typically do) impossible. However, the US tariffs announcement on April 2nd made clear that silver would be exempt from reciprocal tariffs, which immediately removed the problem of delivery onto the CME. (Additional analysis of the impact this has had on price differentials between CME and loco-London silver and trade flows can be found in the relevant focus box in Chapter 6.)

These dynamics saw 100.6Moz (3,130t) of silver bullion move into CME depositories from the end of November 2024 through to end-February this year. Moreover, considering that during the same period, stocks in London vaults (reported on by the LBMA) fell by 128.5Moz (3,996t) and taking into account the time it takes for metal to be sea-freighted across the Atlantic, we are confident that the uptrend in CME stocks has continued.

Leaving this shift to one side, 2024 saw the fourth consecutive market deficit for silver, with supply falling short of demand by 148.9Moz (4,632t). The long-term trends in visible or reported in inventories of silver bullion have been broadly aligned with the last few years of market deficits. For instance, at end-2024, combined London vault and exchange stocks were 510.5Moz (15,877t) lower than their 2021 peak, which compares to a cumulative deficit of 678.4Moz (21,102t) over 2021-2024. In 2024 in isolation however, this was not the case. The year in fact saw reported inventories rise on a net basis by 16.3Moz (507t), in spite of the global market deficit.

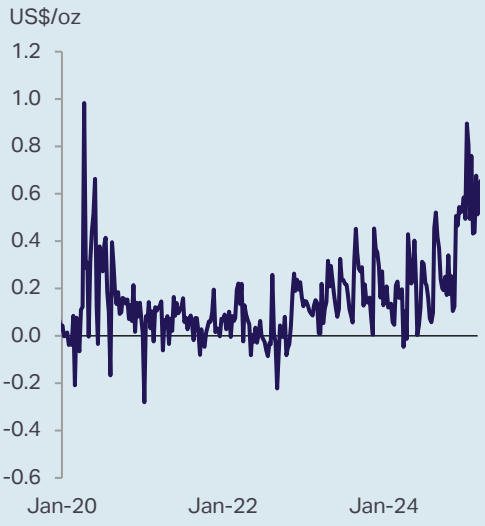
We believe that this reflected silver shifting from unreported inventories to those shown in the table above. Such shifts have been ongoing in the silver market for the past few years and we expect this to continue in the years ahead.

Identifiable Silver Bullion Inventories*

Million ounces	2022	2023	2024	Y/Y
London vaults	840.9	856.2	827.5	-3%
CME	299.0	277.9	318.6	15%
SHFE	69.2	38.2	43.9	15%
SGE	69.0	46.5	40.5	-13%
Other	7.4	4.1	8.6	109%
Total	**1,285.5**	**1,222.9**	**1,239.2**	**1%**

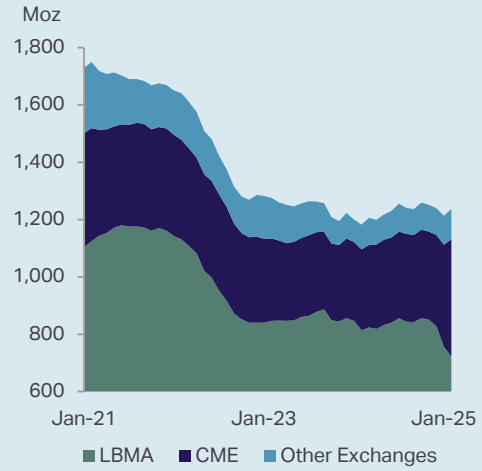
*Year-end; Source: Metals Focus, LBMA, CME, SGE, SHFE, MCX & OSE.

Silver Exchange For Physical (EFP)*



*Weekly averages; Source: Bloomberg

London & Exchange* Vault Inventories



*London stocks include silver stored at LBMA-member custodian vaults; Exchanges stocks include silver stored at the CME Group, the SHFE, the SGE, the Tocom/OSE and MCX
Source: Metals Focus, LBMA, Respective Exchanges

Chapter 4

- Global mined supply rose 0.9% y/y to 819.7Moz (25,497t) in 2024, underpinned by a recovery in production from Mexico.
- Primary silver producers' all-in sustaining cost in 2024 fell for the first time since 2020 to $14.58/oz.
- Mined output is forecast to increase to 835.0Moz (25,972t) in 2025 due to higher output from Mexico, Chile and Russia.

Mine Supply

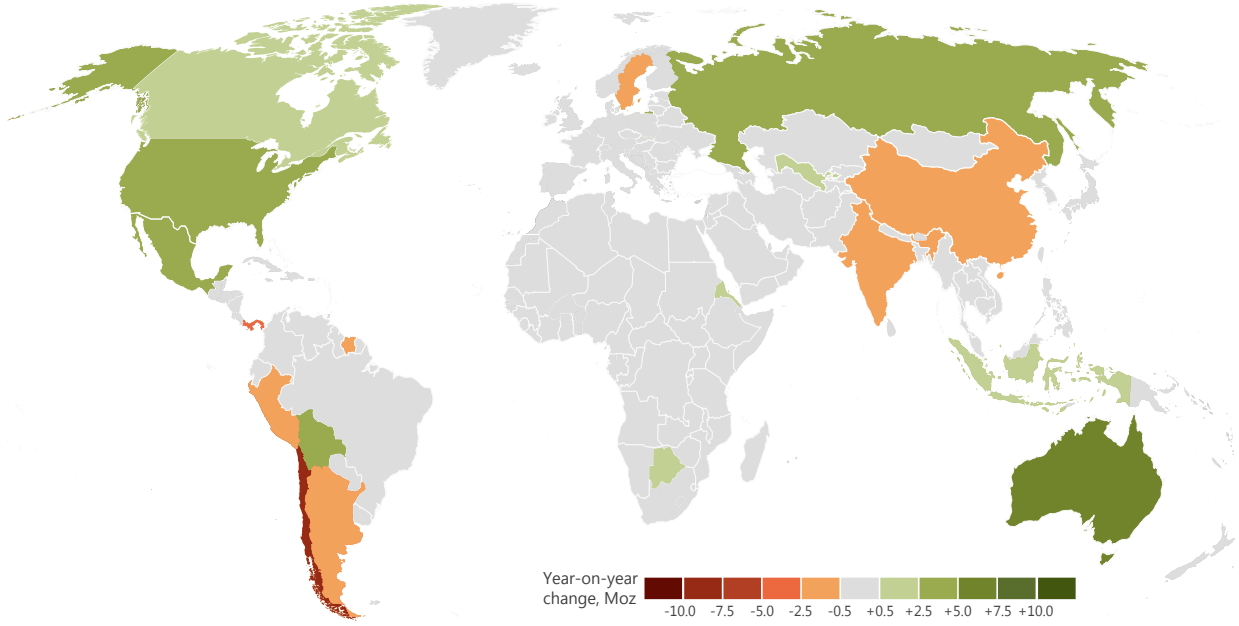
Mine Production

Global mined silver production rose by 0.9% y/y to 819.7Moz (25,497t), driven by higher output from lead/zinc mines in Australia and the recovery of supply in Mexico as Newmont's Peñasquito returned to full production. This figure was 3.8Moz (117t) below our forecast in last years' edition of the World Silver Survey, owing to lower than expected production from Mexico and Morocco.

Supply from primary silver mines continued to fall, easing 2% y/y to 227.5Moz (7,076t). Although lead/zinc mines were, once again, the largest source of silver, production from these mines remained flat year-on-year. Output from gold mines rose the most, up 13.9Moz (432t) y/y. Much of this was derived from the resumption of full production at Newmont's Peñasquito. On a country basis, increases from Australia (+6.2Moz, 192t), Bolivia (+4.6Moz, 142t), Mexico (+3.8Moz, 118t) and the US (+3.2Moz, 98t) were primarily offset by a drop in supply from Chile (-8.8Moz, 274t), as well as China (-1.4Moz, 45t), India (-1.3Moz, 39t) and Argentina (-1.1Moz, 33t).

In 2025, we expect mined silver output to rise by 2% to 835.0Moz (25,972t), driven by higher production in Mexico due to expected growth at Juanicipio and a recovery in output at Peñoles' operations following operational challenges in 2024. Supply from Chile and Russia is also expected to rise. In Chile, higher output is anticipated from La Coipa, CODELCO and Salares Norte and in Russia Prognoz ore will begin to feed into the Nezhda plant.

Major Changes to Global Mine Production, 2024 versus 2023



Source: Metals Focus

Top 20 Mine Producing Countries

Million ounces	2023	2024	Y/Y
Mexico	181.9	185.7	2%
China	111.6	110.1	-1%
Peru	108.9	108.0	-1%
Bolivia	43.2	47.8	11%
Chile	52.0	43.2	-17%
Poland	42.5	42.5	0%
Russia	38.3	41.0	7%
Australia	32.7	38.8	19%
United States	33.1	36.2	10%
Argentina	26.0	24.9	-4%
India	23.8	22.5	-5%
Kazakhstan	16.4	16.1	-2%
Sweden	12.6	11.6	-8%
Indonesia	10.9	11.5	5%
Canada	7.1	9.5	33%
Morocco	8.9	8.6	-4%
Uzbekistan	7.1	7.8	9%
Papua New Guinea	4.3	4.2	-3%
Spain	3.7	3.5	-5%
Portugal	3.4	3.5	3%
Others	44.4	42.8	-4%
Total	**812.7**	**819.7**	**1%**

Source: Metals Focus

North America

North American silver production rose by 4.2% y/y to 231.4Moz (7,197t) in 2024. All countries in the region recorded higher output, with Mexico accounting for the largest increase in terms of volume (+3.8Moz, 118t). Growth in supply from the US and Canada was more modest at 3.2Moz (98t) and 2.4Moz (74t), respectively.

Mexico's silver production increased by 2.1% y/y to 185.7Moz (5,775t). Growth was driven by a recovery in production at Newmont's Peñasquito operation, which was suspended from Q2 to Q4.23 due to union strike action. Fresnillo and MAG Silver's Juanicipio operation also reported higher production due to improved mill recovery following the ramp up and optimization of the processing plant. This offset a 29% y/y decline in production from Industrias Peñoles to its lowest level since 2012.

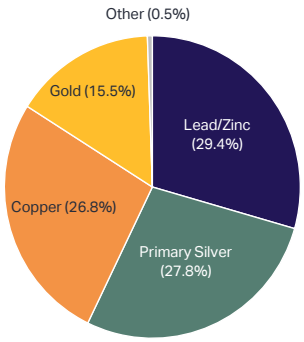
Silver output in the **US** rose by 9.6% y/y to 36.2Moz (1,127t). This was underpinned by higher production at Hecla's Lucky Friday mine, following the suspension in Q4.23 while a secondary egress was constructed after a fire. Coeur Mining reported higher silver supply at its recently expanded Rochester operation due to greater volumes of ore tons placed on the heap leach pad. This growth was partially offset by lower output at Hecla's Green Creek mine due to lower ore grade.

Silver supply from **Canada** reversed four consecutive years of lower annual output and jumped 33.3% y/y to 9.5Moz (295t). Production from primary gold and silver mines rose by 36.1% y/y to 6.3Moz (196t). This was largely accounted for by higher mill throughput at Hecla's Keno Hill operation. Conversely, output from lead/zinc operations fell 28.4% y/y to 1.2Moz (38t), following the closure of Trafigura's Myre Falls operation, which was placed on care and maintenance in Q4.23.

Silver Mine Production by Source Metal in 2024

Million ounces	Lead/Zinc	Primary Silver	Copper	Gold	Other
North America	22.1	135.9	13.9	59.2	0.2
Central & South America	74.7	47.3	75.6	36.2	0.0
Europe	11.5	1.6	51.3	1.6	0.0
Africa	3.0	6.3	5.6	3.5	0.0
CIS	11.4	14.6	29.7	11.2	2.7
Asia	100.3	8.1	37.7	9.6	1.5
Oceania	18.2	13.6	5.7	5.8	0.0
Total	**241.3**	**227.5**	**219.4**	**127.1**	**4.4**

Source: Metals Focus



Top 20 Silver Mining Companies

Million ounces	2023	2024	Y/Y
Fresnillo[1]	53.5	54.3	2%
KGHM Polska Miedz[2]	45.9	43.1	-6%
Newmont	18.0	33.0	83%
Hindustan Zinc[3,4,5]	23.8	22.5	-5%
Pan American Silver	20.4	21.1	3%
Southern Copper	18.4	21.0	14%
CODELCO[5]	19.2	19.9	4%
Polymetal JSC[5,6]	17.7	19.4	9%
Glencore	20.0	19.3	-4%
San Cristobal Mining	12.6	16.8	33%
Industrias Peñoles[7]	18.9	16.3	-14%
Hecla Mining	14.3	16.2	13%
Buenaventura	8.0	14.7	83%
Volcan Cia Minera	15.2	13.9	-9%
BHP[8]	11.8	13.2	12%
South32[8]	13.0	12.2	-6%
Nexa Resources	10.3	11.7	14%
Coeur Mining	10.3	11.4	11%
Boliden	10.4	11.2	8%
SSR Mining	9.7	10.5	8%

NB: 1 - Excludes Silverstream contract, 2 - KGHM Group figures including Polish and international operations, 3 - Hindustan Zinc is a Vedanta Group company, 4 - Refined Silver, 5 - Estimate, 6 - Polymetal JSC is a wholly-owned subsidiary of Mangazeya JSC, 7 - Excludes 100% Fresnillo, 8 - Payable Silver
Source: Company Reports, Metals Focus

Mine Production Forecast by Region

Million ounces	2024	2025F	Y/Y
N America	231.4	248.0	7%
C&S America	233.8	227.6	-3%
Asia	157.2	159.4	1%
CIS	69.5	73.2	5%
Europe	66.1	66.6	0.7%
Oceania	43.2	38.2	-12%
Africa	18.5	22.0	19%
Global Total	**819.7**	**835.0**	**2%**

Source: Metals Focus

Central & South America

In Central and South America, silver mine supply fell by 3.8% y/y to 233.8Moz (7,273t). This was largely due to reduced output in Chile (-8.8Moz, 274t) and Argentina (-1.1Moz, 33t), partly mitigated by rising production in Bolivia (+4.6Moz, 142t).

Silver production in **Chile** experienced a significant drop, falling 17% y/y to 43.2Moz (1,342). At Kinross Gold's La Coipa, output was halved (-3.8Moz, -119t) due to a substantial reduction in silver grades and a decrease in mill throughput. Similarly, anticipated lower grades processed at Anglo American and Glencore's Collahuasi negatively impacted its annual production (-0.9Moz, -27t). These lower grades are expected to persist in 2025. The reduced silver production from these operations was slightly offset by the growth in output at BHP's Escondida. The mine achieved its highest silver output (6.0Moz, 188t) in the last four years due to higher concentrator feed grade as mining progressed in high-grade areas.

In **Argentina**, silver output decreased to its second-lowest point since 2020. At Pan American Silver's Cerro Moro, production fell by 2.0Moz (-61t) y/y. This decrease is attributed to numerous factors such as the planned mining of lower-grade ores and delays in underground development. Other mines, for example McEwen Mining and Hochschild Mining's San Jose, also processed lower-grade ores, contributing to the overall drop in Argentina's production.

Bolivian production hit a record high, reaching 47.8Moz (1,486t) in 2024. The rise in silver output was mainly driven by higher silver by-products from lead and zinc operations. Additionally, production at primary silver mines rose due to the increased volume of processed ores and higher silver head grades. Key contributors to this growth included Silver Elephant Mining's Pulacayo-Paca and Pan American Silver's San Vicente mines.

Asia

Silver output in Asia fell for the third consecutive year, by 1% y/y to 157.2Moz (4,889t). This was driven by lower supply from the two largest producers in the region, China and India. **Chinese** production eased by 1% y/y to 110.1Moz (3,426t) as lower by-product silver output from copper and lead/zinc operations outstripped the increases at Silvercorp Metal's Ying and China Gold International's Jiama operations. **Indian** supply declined by 5% y/y to 22.5Moz (700t) due to lower mill throughput and silver production from Hindustan Zinc.

Higher output from **Indonesia**, up 5% y/y to 11.5Moz (357t), helped to offset this decline. Freeport McMoran reported higher by-product silver production from the recently expanded Grasberg mine, due to higher mill throughput and grade. This was supported by increased supply from **Mongolia**, as underground mining continues to ramp up at Rio Tinto's Oyu Tolgoi.

Mine Production

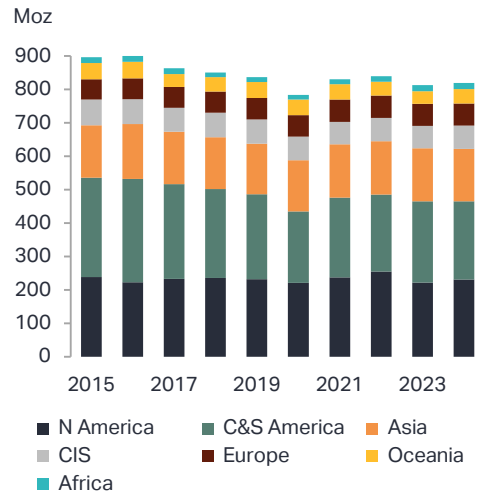
Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
North America											
Mexico	192.1	174.3	187.0	194.5	187.8	180.2	196.0	213.2	181.9	185.7	2%
United States	35.0	37.0	33.2	29.8	31.4	31.7	32.5	33.2	33.1	36.2	10%
Canada	11.9	11.6	12.7	11.8	13.5	9.4	9.1	8.7	7.1	9.5	33%
Sub-total	**239.0**	**222.8**	**232.8**	**236.1**	**232.6**	**221.3**	**237.7**	**255.0**	**222.1**	**231.4**	**4%**
Central & South America											
Peru	135.6	152.3	155.0	146.5	135.1	101.6	115.5	107.1	108.9	108.0	-1%
Bolivia	42.0	43.5	38.5	38.3	37.1	29.9	41.5	38.8	43.2	47.8	11%
Chile	48.1	46.6	40.4	40.0	38.2	47.4	41.2	41.5	52.0	43.2	-17%
Argentina	36.4	31.9	29.2	30.9	32.9	24.0	28.0	30.9	26.0	24.9	-4%
Brazil	1.6	2.5	2.8	2.3	2.2	2.2	2.2	2.1	3.1	3.3	7%
Dominican Republic	3.1	3.9	4.9	5.1	4.5	4.1	3.4	2.9	2.4	2.1	-13%
Panama	-	-	-	-	0.9	1.6	2.5	2.8	2.7	-	na
Guatemala	27.7	27.0	10.8	-	-	-	-	-	-	-	na
Others	2.6	2.0	2.0	2.5	3.0	3.0	4.2	4.3	4.6	4.6	-1%
Sub-total	**297.1**	**309.8**	**283.5**	**265.5**	**253.9**	**213.8**	**238.5**	**230.4**	**243.0**	**233.8**	**-4%**
Europe											
Poland	39.2	40.9	41.7	40.9	40.4	39.4	42.0	42.4	42.5	42.5	0%
Sweden	15.8	16.4	15.5	15.0	14.4	13.4	13.9	14.6	12.6	11.6	-8%
Spain	1.4	1.5	1.9	2.4	2.7	3.4	3.9	3.5	3.7	3.5	-5%
Portugal	1.5	1.4	1.3	2.9	3.1	3.1	3.1	3.1	3.4	3.5	3%
Finland	0.1	0.1	0.1	0.1	1.1	1.6	1.5	1.5	1.5	1.2	-20%
Others	2.4	2.3	2.4	2.0	2.7	3.1	2.7	2.4	3.1	3.8	20%
Sub-total	**60.3**	**62.6**	**62.9**	**63.3**	**64.3**	**64.0**	**67.2**	**67.6**	**66.9**	**66.1**	**-1%**
Africa											
Morocco	9.0	10.0	10.3	7.8	9.1	8.0	8.0	8.7	8.9	8.6	-4%
Botswana	0.1	0.1	0.0	0.0	0.0	0.0	0.6	1.7	2.5	3.0	23%
Eritrea	3.2	3.2	2.5	1.7	1.6	2.3	2.4	1.8	2.1	2.7	26%
South Africa	1.9	1.9	2.2	1.6	2.0	1.3	1.3	1.7	1.8	1.4	-21%
Others	3.5	2.2	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.8	5%
Sub-total	**17.7**	**17.5**	**17.4**	**13.6**	**15.2**	**14.1**	**15.0**	**16.6**	**17.9**	**18.5**	**3%**
Commonwealth of Independent States											
Russia	51.1	46.6	42.0	43.1	44.7	42.1	39.0	41.1	38.3	41.0	7%
Kazakhstan	16.1	17.4	18.9	19.8	17.0	17.4	15.0	15.4	16.4	16.1	-2%
Uzbekistan	5.9	5.9	5.9	5.9	6.1	6.3	6.8	7.0	7.1	7.8	9%
Armenia	2.5	2.4	2.6	2.0	2.4	2.6	2.5	2.5	2.2	2.1	-5%
Kyrgyzstan	0.2	0.4	0.4	0.4	0.5	0.4	2.2	2.1	2.1	1.7	-19%
Others	1.2	1.5	1.6	1.6	1.6	1.7	1.7	1.7	0.9	0.9	-3%
Sub-total	**77.0**	**74.3**	**71.5**	**72.9**	**72.3**	**70.5**	**67.3**	**69.8**	**67.0**	**69.5**	**4%**

Mine Production

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Asia											
China	119.1	121.3	116.4	110.6	111.5	109.5	112.9	111.8	111.6	110.1	-1%
India	12.0	14.0	16.9	21.2	20.4	21.6	22.2	22.3	23.8	22.5	-5%
Indonesia	9.9	11.0	10.3	10.5	7.8	9.6	10.3	11.5	10.9	11.5	5%
Turkey	6.6	6.7	4.9	4.7	3.2	4.0	5.5	4.7	2.9	3.3	11%
Iran	2.2	2.5	2.5	2.5	2.6	2.7	2.7	2.8	3.1	3.1	-1%
Mongolia	2.0	2.2	1.8	1.7	1.6	1.7	1.8	1.7	1.8	2.2	18%
Philippines	1.0	1.1	1.0	1.0	1.0	0.8	1.0	1.8	1.5	1.7	17%
Laos	1.7	1.6	1.4	1.2	1.1	0.9	0.9	0.7	0.6	0.6	0%
Myanmar	0.3	0.3	0.4	0.7	0.8	0.8	0.6	0.5	0.5	0.5	0%
Others	2.2	3.1	1.7	1.7	1.6	1.7	1.7	1.7	2.0	1.7	-17%
Sub-total	**156.8**	**164.0**	**157.3**	**155.8**	**151.6**	**153.2**	**159.5**	**159.4**	**158.7**	**157.2**	**-1%**
Oceania											
Australia	46.0	45.6	36.0	40.3	42.6	43.0	42.8	37.5	32.7	38.8	19%
Papua New Guinea	2.3	3.2	2.1	3.0	4.7	3.8	2.9	3.0	4.3	4.2	-3%
Others	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0%
Sub-total	**48.9**	**49.2**	**38.6**	**43.6**	**47.4**	**46.9**	**45.8**	**40.7**	**37.2**	**43.2**	**16%**
Global Total	**896.8**	**900.1**	**863.9**	**850.8**	**837.4**	**783.8**	**830.8**	**839.4**	**812.7**	**819.7**	**1%**

Source: Metals Focus

Global Mine Production



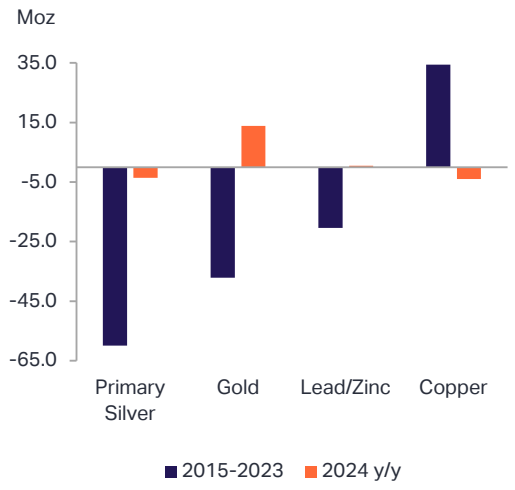
Source: Metals Focus

Other Regions

After three consecutive years of decreasing silver production, supply in Oceania rose 16% y/y to 43.2Moz (1,345t) in 2024. This was primarily due to higher output from **Australia**, up 19% y/y to 38.8Moz (1,208t). Operations such as MMG Mining's Dugald River and Rosebery increased mill throughput and processed higher-grade ore in-line with optimization initiatives to enhance processing efficiency.

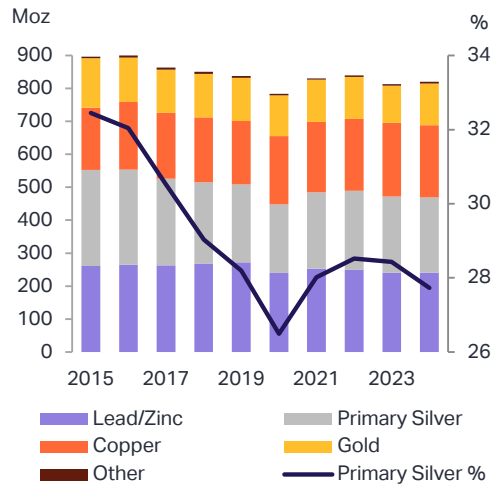
In the CIS, silver production climbed 4% y/y to 69.5Moz (2,162t) due to greater output at Kazzinc, underpinned by the ramp up of the Zhairem deposit in **Kazakhstan**. In Africa, silver output increased 3% y/y to 18.5Moz (574t) as Sandfire's Motheo in **Botswana** successfully commissioned and ramped up its processing facility. In contrast, in Europe, silver production fell by 1% y/y to 66.1Moz (2,056t). In **Poland**, output remained flat year-on-year but in **Sweden**, it was lower, down 8% y/y, as Boliden's Garpenberg processed lower milled volumes in-line with operational limits within its environmental permit.

Change in Mine Production by Source Metal



Source: ICSG, ILZSG, Metals Focus

Mine Production by Source Metal



Source: ICSG, ILZSG, Metals Focus

By-Product Analysis

Global silver mine production rose 0.9% y/y in 2024, even though primary silver mine output continued its decade-long decline. Instead, growth stemmed from rising by-product silver production, primarily from gold mining. Excluding the heavily COVID-disrupted year of 2020, the share of global silver output derived as a by-product reached a record 72% in 2024. This growing reliance on by-product output further weakens silver's direct price influence on supply, as mining economics are increasingly driven by gold, copper, and lead/zinc markets.

Lead/zinc mines were once again the top source of silver mine supply in 2024. Data from the International Lead and Zinc Study Group showed global lead production rose 2% y/y, while zinc declined 3% y/y, yet silver output from lead/zinc operations held steady at 241.3Moz (7,505t), accounting for 29% of total supply. While the global total remained virtually flat, there was regional movement with decreases from Peru and Mexico being offset by growth in Bolivia and Australia.

The higher gold price continued to support gold mine output, indirectly boosting by-product silver supply. However, global gold production remained broadly flat y/y due to disruptions and project delays. Silver output from gold mining recorded the strongest growth of all segments, rising 12% (+13.9Moz, 432t) y/y. Much of the increase stemmed from a single source: Peñasquito, Newmont's flagship Mexican mine. The mine has contributed around 4% of global silver output in recent years, giving it disproportionate influence on the global total. A four-month strike in 2023 curtailed output, while the resumption of full operations in 2024 lifted silver production by 17.2Moz (535t), the largest single change in global silver supply. This was partially offset by a 3.9Moz (121t) decline at Kinross' La Coipa mine in Chile, as mine sequencing moved through lower-grade silver zones. Excluding these two mines, by-product silver from gold mining was little changed, reflecting the underlying stability of gold sector output.

The robust, 8% increase in the annual average copper price to a three year high supported copper mine supply, which the International Copper Study Group estimated to have risen 2% y/y. However, silver production from copper mining declined 3.9Moz (122t) y/y, diverging from the broader trend, as output was shaped by a few key operations. Production from First Quantum's Cobre Panama dropped 2.7Moz (84t) after the mine was halted in Q4.23, following widespread environmental protests and a Supreme Court ruling that declared its concession unconstitutional. At MMG's Las Bambas mine in Peru, payable silver production fell 1.8Moz (56t) y/y, as 2023 figures had been inflated by the release of concentrate stockpiles built up in 2022 due to road blockages. Partially offsetting these declines, silver output at China Gold International's Jiama mine rose by an estimated 2.4Moz (75t) as operations resumed in 2024, following a temporary suspension in 2023.

Primary Silver Production Costs

US$/oz (by-product*)	2023	2024	Y/Y
North America			
Total Cash	9.47	7.51	-21%
All-In Sustaining	18.17	14.67	-19%
Central & South America			
Total Cash	9.27	8.84	-5%
All-In Sustaining	16.15	16.14	-0.1%
CIS			
Total Cash	12.93	12.58	-3%
All-In Sustaining	17.05	16.69	-2%
Asia			
Total Cash	0.37	-0.02	na
All-In Sustaining	8.76	9.55	9%
Oceania			
Total Cash	2.34	1.23	-47%
All-In Sustaining	8.79	5.78	-34%
Global Total			
Total Cash	**8.97**	**7.64**	**-15%**
All-In Sustaining	**16.78**	**14.58**	**-13%**

* Costs shown on a by-product accounting basis.
Source: Metals Focus Silver Mine Cost Service

Primary Silver Production Costs

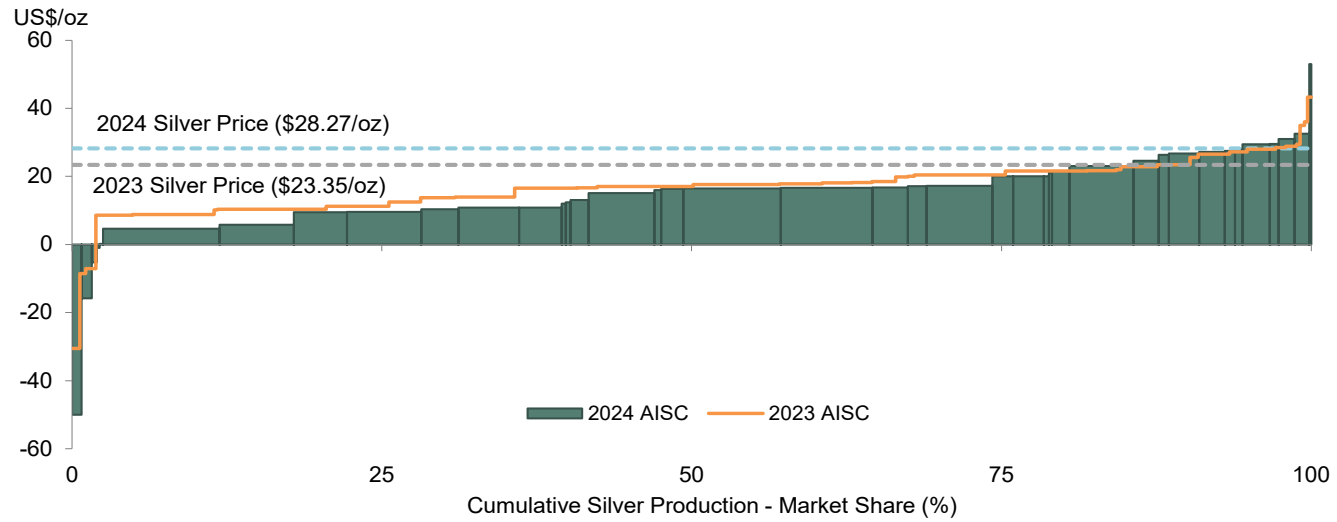
In 2024, primary silver mining all-in sustaining costs (AISC) fell for the first time since 2020, down 13% y/y to $14.58/oz. Underlying total cash costs (TCC) also dropped, by 15% y/y to $7.64/oz. Costs in most regions fell, driven by higher by-product credits, growth in production and lower inflation. This cost analysis covers 87% of primary silver supply.

Many silver mines are polymetallic. The by-product revenue from the other metals produced is credited towards cash operating costs. Rising metal prices in 2024 led to the largest contribution from by-product credits to AISC since our dataset began in 2010. Gold had the greatest input, up 22% y/y, followed by zinc, rising 21% y/y. Lead and copper by-products were less influential, up 4% and 13% y/y respectively, as prices receded in H2.24. Not surprisingly, the higher metal prices led to increased royalties, partially offsetting the benefit of the larger by-product credits.

In 2023, inflation was a significant factor behind the rise in AISC. It had less impact in 2024 as inflation eased in most major silver producing countries, with the consumer price index (CPI) falling below 3% in many of them. This was not the case for Mexico, however, where inflation remained above 4% for the fourth consecutive year.

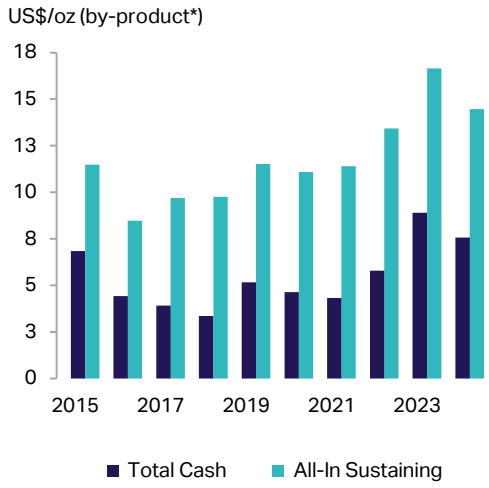
Other key factors influencing primary silver costs are labor, oil and gas prices, and consumables, such as cyanide. Labor accounts for a significant portion of operating costs but its influence in 2024 was variable, with a mix of lower and higher costs being reported. Brent crude prices remained in a similar

Global Primary Silver Mine Production Costs, 2024 vs. 2023



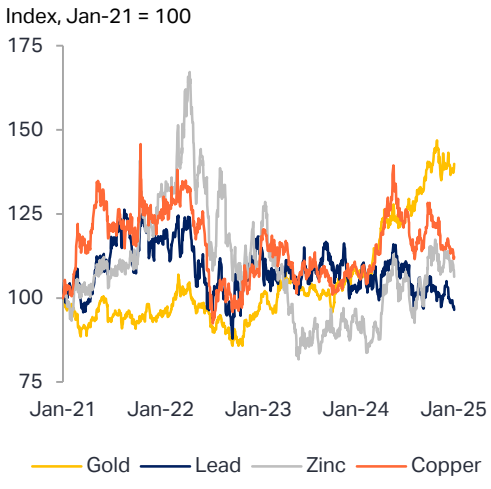
* Cost shown on a by-product accounting basis.
Source: Metals Focus Silver Mine Cost Service

Global Production Costs



*Cost shown on a by-product accounting basis
Source: Metals Focus Silver Mine Cost Service

By-Product Metal Prices



Source: Bloomberg, Metals Focus

range to 2023, with an annual average of $76.0/barrel. Natural gas prices however, despite reaching their lowest point since Q1.21, began climbing in H2.24 and have continued their upward trajectory into early 2025. Cyanide costs varied depending upon region. In North America, a key supplier to Mexico and South America, there were price fluctuations but, on the whole, the market was stable with sufficient feedstock available. In Europe and Asia however, disrupted supply chains and higher feedstock costs led to greater variability in price.

Lastly, numerous companies reported lower treatment and refining charges. As a general rule, an increase in the supply of lead and zinc leads to an increase in treatment charges, and vice versa. In 2024 global lead supply was lower than forecast and zinc output constrained, resulting in falling treatment charges, helping to reduce operating costs.

Regional Performances

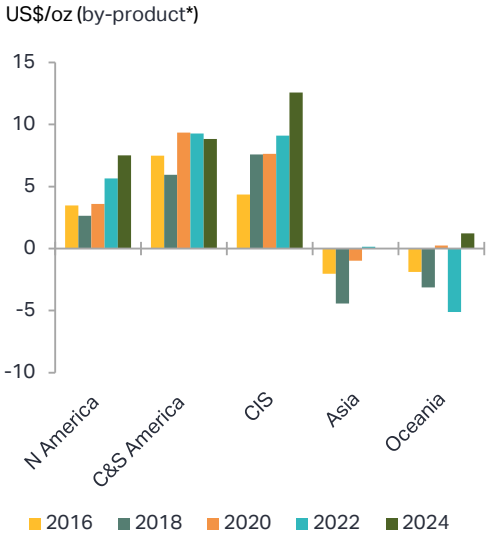
In 2024, the average TCC and AISC of operating primary silver mines in North America fell to $7.51/oz (-21% y/y) and $14.67/oz (-19% y/y), respectively. This decrease was driven by a rise in revenue from by-products. In particular, gold by-product credits increased by 32% y/y, while zinc credits rose by 27% y/y.

In Mexico, the average annual TCC and AISC dropped to $7.84/oz (-21% y/y) and $13.77/oz (-25% y/y) respectively as increased by-product revenues from gold and base metals lowered operating costs significantly. The decrease in AISC was driven by the lower TCC and reduced sustaining capital at several operations, including a 47% y/y drop in expenditure at Coeur Mining's Palmarejo mine to $18.3m.

In the US, TCC fell to $6.27/oz (-13% y/y), benefiting from lower local inflation, and increased by-product credits from gold and zinc. Despite the fall in TCC, AISC increased to $18.57/oz (9% y/y), which is primarily attributed to higher sustaining capital expenditures. Hecla reported a rise in AISC to $16.99/oz (+39% y/y) at its Lucky Friday operation in Idaho, reflecting costs associated with a full year of production, following the temporary suspension in 2023.

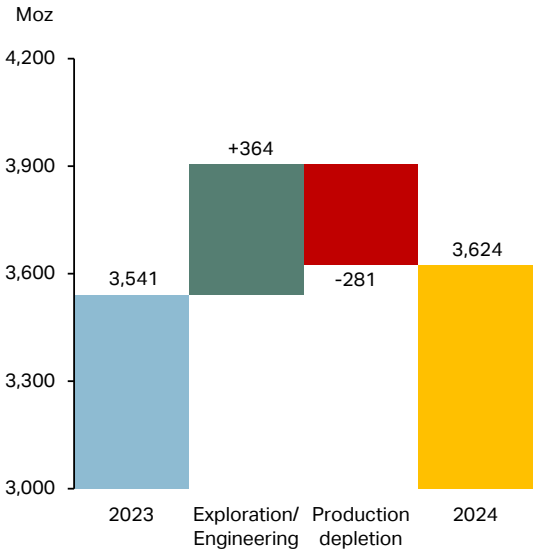
In Central and South America, TCC fell to $8.84/oz (-5% y/y), but the average AISC remained flat at $16.14/oz. In Peru, both TCC and AISC decreased to $5.00/oz (-8% y/y) and $13.65/oz (-10% y/y), respectively. Local inflation dropped, easing input cost pressure. Total silver sales also rose to 21.9Moz (+41% y/y), underpinned by greater production from Buenaventura's Uchucchacua. In contrast, Argentina's TCC and AISC increased to $10.56/oz (+16% y/y) and $17.18/oz (+13% y/y), respectively. Local inflation almost doubled to 229.8% and total silver sales fell to 13.3Moz (-12% y/y). At Pan American Silver's Cerro Moro, silver production fell due to mine sequencing and higher dilution in the underground mines, increasing both TCC and AISC.

Regional Total Cash Costs



* Cost shown on a by-product accounting basis.
Source: Metals Focus Silver Mine Cost Service

Reserve Replacement – Primary Silver Mines and Projects



Source: Metals Focus

In Australia, TCC decreased to $1.23/oz (-47% y/y), while AISC also fell to $5.78/oz (-34% y/y). Local inflation more than halved to 2.4%, easing input cost pressures. This was compounded by the weakening in the exchange rate against the US dollar. At South32's Cannington, TCC and AISC fell year-on-year as lower sustaining capital expenditure was supported by an 8% y/y increase in by-product credits from lead and zinc production.

Reserves & Resources

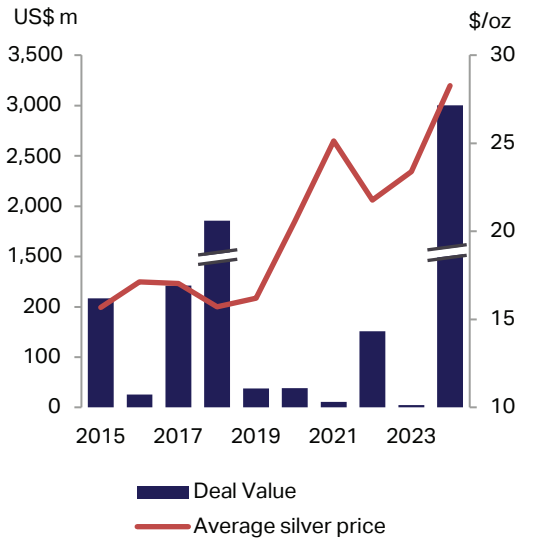
Mineral ore reserves at primary silver mines totaled 3,624Moz (112,713t) in 2024. This represents growth of 2.4% y/y or 83.3Moz (2,591t), which is attributed to new initial reserve estimates and successful resource conversion exceeding mining depletion. The total identified resources, excluding reserves, stood at 8,113Moz (252,339t), a marginal rise of 0.3% y/y from delineating new resources through exploration efforts.

AbraSilver Resources declared a maiden reserve estimate at Diablillos of 123Moz (+3,841t), the largest addition to global primary silver reserves in 2024. Similarly, Discovery Silver lifted ore reserves at Cordero by 35.5Moz (+1,105t). At Buenaventura, the company's attributable silver reserves rose by more than 40% y/y despite the exclusion of San Gabriel. The Uchucchacua-Yumpag, El Brocal Marcapunta, and Coimolache mines contributed significantly to this growth, with increases of 39.5Moz (+1,228t), 17.2Moz (+534t), and 1.7Moz (+54t), respectively. These gains substantially offset the reductions from mining extraction at other sites. Updates on reserve estimates at San Gabriel are currently underway.

Coeur Mining's acquisition of SilverCrest and its Las Chispas operations added to its total reserves, reaching 271Moz (8,414t) by the end of 2024 after net depletion from Palmarejo and Rochester mines. While reserves at Keno Hill increased, this was partly counterbalanced by losses at Greens Creek and Lucky Friday, leading to an overall rise of 1.6Moz(+49t) in Hecla's silver reserves. Meanwhile, Fresnillo's ore reserves at its primary silver mines continued to drop, down 17.1Moz (-534t) y/y, due to mining depletion and conservative economic parameters in estimations at San Julian. The loss of reserves at San Julian far exceeded increases from reserve replenishment of other operations.

Companies have been adjusting their reserve cut-off prices in response to higher silver market prices, allowing mining of high-cost ores to be economically viable. For instance, Buenaventura raised their silver reserves price from $23.0/oz to $25.0/oz, Coeur Mining from $21.0/oz to $23.5/oz, Fresnillo from $20.0/oz to $23.0/oz, and Hecla Mining with the lowest metal cut-off price of $17.0/oz to $22.0/oz from 2023 to 2024.

Value of Completed Deals*



* Values aggregated in the year deals are announced.
Source: Bloomberg

Corporate Activity

In a stark contrast to 2023, 2024 was a busy year with regards to mergers and acquisitions. Thirty two deals were announced, totaling $3.0Bn, leading to substantial consolidation. This was the highest total since our dataset began in 2006 and far outstripped the previous high of $1.9Bn in 2018.

The biggest transaction was Coeur Mining's acquisition of SilverCrest Metals in Q4.24, valued at $1.5Bn. The deal adds the low cost Las Chispas mine into Coeur's portfolio, which will potentially contribute 4.8Moz (149t) of silver to Coeur's forecast production in 2025. In Q3.24, First Majestic Silver entered into a definitive merger agreement with Gatos Silver, valued at $893m. Cerro los Gatos is expected to substantially boost First Majestic's silver production in 2025, with forecast output of 7.5Moz (233t). Both deals were completed in Q1.25. During Q2.24, Silvercorp Metals acquired Adventus Mining for $119.9m, giving Silvercorp ownership of two projects in Ecuador. The El Domo copper-gold project is under construction and the earlier stage Condor project has indicated and inferred resources of 30.9Moz (961t) of silver. Finally, although not a silver deal, it is worth mentioning Solidcore Resources' divestment of its Russian assets, including Dukat, Nezhda and Prognoz. The deal was valued at $3.7Bn. The assets, collectively known as Polymetal JSC, were acquired by Mangazeya JSC.

The Role of M&A in Resource Accumulation

In recent years, most of the mergers and acquisition (M&A) activity within the primary silver sector has focused on increasing reserves and resources. Accumulating resources in this way eliminates much of the risk of greenfields exploration. It also has the potential to offer the benefit of economies of scale if the newly acquired resource is in close proximity to existing operations.

In 2022, Endeavour Silver's acquisition of Pitarilla, significantly increased its silver resources. Pitarilla accounts for 99%, or 591Moz (18,382t), of the contained silver within Endeavour's silver-lead-zinc resources.

In the last two years, several deals have not just provided the acquiring company a boost to their reserves and resources, they have also added near-term or producing operations to their portfolios. In 2022, Hecla acquired Alexco Resource Corp, increasing Hecla's silver reserve base by 37%, or 174Moz (5,412t), based on 2024 reported reserves and resources. It also provided Hecla with a near-term production opportunity as the mine was commissioned in 2023. Most recently, in 2024, Coeur Mining and First Majestic Silver added considerable silver reserves and resources. As part of the SilverCrest deal, Coeur acquired Las Chispas in Mexico. This raised its silver reserve base by 14%, or 33.5Moz (1,042t), to 271Moz (8,414t). The Gatos Silver deal increased First Majestic's attributable silver reserves by 70%, or 39.4Moz (1,225t), to 95.6Moz (2,972t) with the addition of the operating Cerro los Gatos mine and the Esther deposit.

Lastly, not all the action occurred within North America. In Q2.24, Silvercorp Metals acquired Adventus Mining. As part of this deal, Silvercorp will gain ownership of the Condor project in Ecuador. The Condor project is at a relatively early stage of the development pipeline. The most recent preliminary economic assessment reported the project hosts 30.9Moz (961t) of silver within its resources and anticipates a life of mine production of 9.1Moz (283t).

Hedge Book Composition*

Million ounces	2023	2024	Y/Y
Forwards	6.5	1.8	-71%
Options	2.3	2.6	13%
Total	**8.8**	**4.5**	**-49%**

*Estimated delta-adjusted positions at year-end
Source: Metals Focus

Producer Hedging

The global delta-adjusted producer hedge book reached a multi-decade low in 2024. Contracts covered just 4.5Moz (139t) by year-end, a drop of 49% y/y. The progression of several projects from construction to commercial production has led to lower capital expenditure and hence reduced the need for companies to protect cash flow. Additionally, the climbing silver price will have raised premiums on options making them more expensive. At year-end, only three companies, Harmony, KGHM and Peñoles, held open hedge positions. These hedges cover production for the next two years, reversing the preference for shorter length contracts which became more commonplace in 2023.

The volume of forward contracts fell by 4.6Moz (143t) y/y to 1.8Moz (57t). In Q2.24, Coeur Mining closed their hedge book once the Rochester expansion project had reached commercial production. This left Peñoles as the sole producer with open forward positions at year end. Peñoles reported bought forwards for 0.3Moz (9t) and sold forwards for 2.1Moz (67t) which cover production throughout 2025. The average strike prices were $29.4/oz and $29.9/oz respectively.

The Changing Landscape of Mining Legislation

Amid global challenges, the mining industry is experiencing significant legislative changes. Governments are revising laws to address sustainability, resource security and social responsibility. Understanding these updates is crucial for industry stakeholders to navigate market complexities.

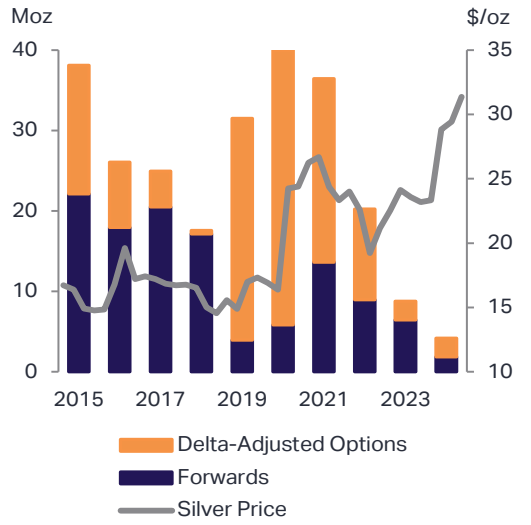
In Q1.24, former Mexican president, Andrés Manuel López Obrador, proposed constitutional reforms to ban open-pit mining, aiming to reduce environmentally damaging activities like water exploitation. However, in Q4.24, the new incumbent, Claudia Sheinbaum Pardo, announced a review of the bill, emphasizing the importance of open-pit mining.

We estimate 27% (51Moz, 1,577t) of total Mexican silver mine supply was derived from open pit operations in 2024, of which 88% was associated with by-product silver operations. Nevertheless, this remains a significant volume of production, equivalent to the fourth largest output by any country in 2024. The sentiment towards open-pit mining appears to be more positive under the current administration, although permitting is expected to remain slow while the review process continues. However, the government has stressed that mining developments should not come at the expense of environmental stewardship, highlighting the continued importance of ESG in mine operation and project development.

In Q4.24, El Salvador's government lifted a seven-year mining ban, granting itself sole authority over mining activities and designating certain areas as protected reserves. This change could expand the project development pipeline, but any supply growth is not likely in the near-term.

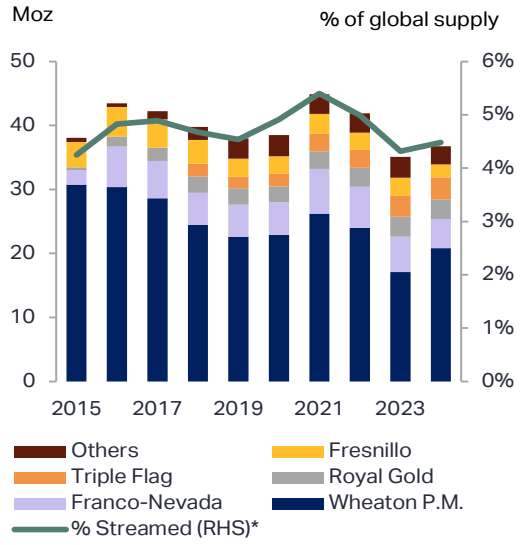
Finally, in Q1.25, the Trump administration announced regulatory rollbacks, including reduced waterway protections, to streamline project development. While it is unclear if these changes will become law, project developers in the US (the ninth-largest silver producer in 2024) could benefit from faster permitting timelines.

Hedge Book Evolution*



* Estimated delta adjusted position at year-end
Source: Metals Focus

Silver Royalty and Streaming



*Percentage of global mine supply covered by royalty and streaming agreements.
Source: Metals Focus

Delta-adjusted options, the more favored method of silver hedging, rose by 13% y/y to 2.6Moz (82t). Harmony increased their silver collars to a nominal 2.4Moz (75t), with average floor and ceiling prices of $29.2/oz and $32.5/oz respectively. These options cover production out to H1.26. The ongoing stage 8 cutback at Hidden Valley has led to higher capital expenditure and the need to protect cash flow in the near term. KGHM entered into new collars in Q2.24 to safeguard finances as outfitting of the GG-1 and 2 shafts and the raising of the Żelazny-Most tailings facility continued. At year end, KGHM had a nominal 2.1Moz (65t) of collars outstanding with average prices of $26.4/oz and $40.3/oz for the puts and calls respectively. Most notably, Minera Frisco and Peñoles did not enter into any new option contracts, the first time in over six years.

Silver Streaming

Silver produced under streaming and royalty contracts rose 5% y/y to 36.7Moz (1,143t) in 2024. This was almost entirely due to Peñasquito returning to full-year production after a four-month strike in 2023. Even so, total streaming and royalty volumes in 2024 remained well below 2022 levels. Output from Antamina remained constrained and, with the exception of growth at Triple Flag and Empress Royalty, all streaming and royalty companies recorded lower volumes.

Increased production from Wheaton PM's agreement, which covers 25% of Peñasquito's silver, helped the company regain some market share, accounting for 57% of volumes. This remained below the 75% share Wheaton averaged between 2010 and 2020. The 4.3Moz (134t) y/y uplift, combined with growth at Constancia and Zinkgruvan, offset losses of 0.9Moz (28t) at Aljustrel and 0.1Moz (3.1t) at Antamina.

Franco-Nevada, the second-largest silver streaming and royalty company, reported a 0.9Moz (28t) y/y decline due to the 2023 closure of Cobre Panama. Operations were suspended in Q4.23 after extensive environmental opposition and a Supreme Court decision that deemed the mining concession unconstitutional. The mine remains on care and maintenance with no clear path to restart. Triple Flag increased silver sales by 0.2Moz (6.2t) y/y, supported by higher output at Northparkes and Cerro Lindo. Empress Royalty grew volumes by 0.1Moz (3.1t) y/y, benefiting from its entitlement to 100% of payable silver at Tahuehueto.

In 2025, silver output under streaming and royalty contracts is expected to remain finely balanced. A decline at Peñasquito is likely to be offset by the anticipated restart of the Aljustrel mine and higher grades at Antamina. With a small number of mines contributing the majority of volume, any operational disruption is likely to drive year-on-year change.

Chapter 5

- Silver recycling rose by 6% in 2024 to a 12-year high of 193.9Moz (6,032t), with gains in all sectors except for photography.
- Industrial scrap grew by 5%, with much of the uplift coming from EO catalysts.
- Jewelry and silverware recycling saw price-led major increases, with most of the gains in the West as India's growth was modest and China saw losses.
- Recycling in 2025 is forecast to dip by 0.4%, partly through depleted near-market stocks in several countries.

Recycling

Introduction

Recycling last year grew by 6% to a 12-year high of 193.9Moz (6,032t). The largest increase in volume terms came from industrial sources (+5%), itself mainly driven by the processing of spent ethylene oxide (EO) catalysts. A larger percentage gain (+11%) was seen for silverware, with consumers in western markets responding to higher prices. Jewelry scrap also rose notably (+8%) as price gains and a faltering economic backdrop triggered inventory melt by the trade in the West. In contrast, Indian scrap from both sources only grew modestly due to prices falling after the mid-year duty cut and to bullish price expectations. Photographic recycling saw its structural slide continue (-2%), while the niche of coin scrap rose by almost a fifth due to a price-led spike in the melt of old commemorative and circulating coins.

With near-market stocks of high grade material in many markets now depleted, jewelry, silverware and coin scrap could stagnate this year. Together with ongoing losses in photography and a slight dip for industrial recycling, global scrap this year may flatline despite the price rally.

Industrial

Industrial recycling rose by 5% in 2024 to 109.9Moz (3,419t). Much of this was driven by the processing of spent EO catalysts, whose flow is price independent. However, there were signs of growth in other areas. A whole myriad of end-uses can see greater attention when prices look promising and cleaning out warehouses becomes worthwhile.

A more tangible field is e-scrap. Here, the gross volume has been rising steadily, in part as the pool of product grows. Sources in China for example estimate that the gross weight generated there rose by 3.5% in 2024. However, the share processed in formal channels there and elsewhere remains low. This share matters as recovery rates in informal channels are much lower. A second factor driving down the fine weight recovered is the slide in yields as newer generation equipment (especially motherboards in PCs) have a lower silver content. A similar trend is visible for the gold content which impacts the profitability of regular recycling channels. One area becoming more visible is the recovery of silver from photovoltaic panels. At present, almost all is from utilities (e.g. panels that have been damaged, say in a hailstorm) and manufacturers (usually faulty items). Volumes however are small, partly as utility capacity is too young to need massive replacement programs. Second, panel recycling is unprofitable and a technological breakthrough may be needed to change that.

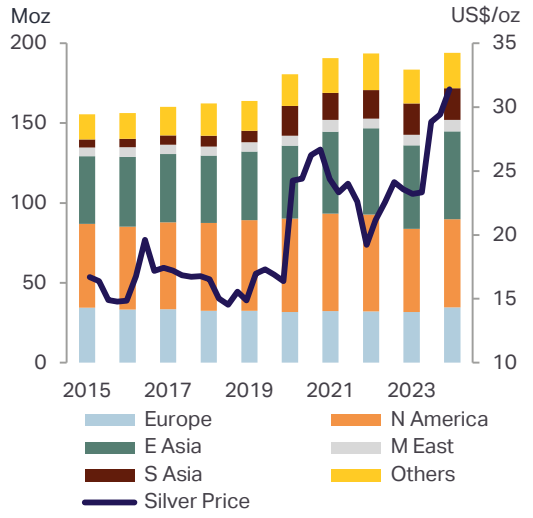
We expect industrial scrap to dip a fraction this year, as yields continue to decline, despite firmer EO recycling and the benefit of yet higher prices.

Global Recycling Forecast by Region

Million ounces	2024	2025F	Y/Y
Europe	34.8	33.8	-3%
North America	55.0	51.7	-6%
Middle East	7.2	7.6	4%
South Asia	19.8	21.5	8%
East Asia	55.0	56.1	2%
CIS	13.0	13.6	5%
Other	9.2	9.0	-1%
Global Total	**193.9**	**193.2**	**-0.4%**

Source: Metals Focus

Global Recycling



Source: Metals Focus, Bloomberg

Jewelry

Jewelry scrap rose by a robust 8% in 2024 to a 12-year high of 36.4Moz (1,133t). People might expect India to have led the charge but the cut in the bullion import duty in July meant a drop in the local price and this plus bullish price expectations curbed selling. Chinese scrap even fell due to unattractive re-sell margins in a declining sector. Other normally price-sensitive markets, such as the Middle East, still saw strong gains. Some Western markets also saw growth on the back of firm prices and a poor economic backdrop but much was from the trade (per piece prices are still far too low for a consumer to consider selling back). For 2025, the absence of this Western surge helps explain why global jewelry scrap stagnates, despite the price in India moving above Rs.100,000/kg in March and fears about a slowdown in GDP growth.

Silverware

Silverware recycling rose a marked 11% last year to an 11-year high of 26.4Moz (822t). Much of the growth was driven by the double-digit gains in Europe and North America where buoyant prices and cost of living issues encouraged heavy selling. It had been expected that limited near-market stocks might constrain volumes, but enough of these consumer goods emerged to cause capacity constraints at several refiners. In India, a similar price dynamic to that noted above for jewelry weighed on recycling, but a stronger rise is forecast this year. Flatlining Western volumes however mean the global total may only rise by 2% in 2025.

Photography

Photographic silver scrap fell again in 2024, if only by 2%, to 16.7Moz (521t). The decline remains firmly driven by the earlier shift to digital medical x-rays, with this trend becoming more visible in emerging markets (such as India). The drop was also fueled by the shift within old x-rays from wet-film to the dry-view variety, which has a lower silver yield. That said, higher silver prices did stimulate flows in some countries. Yet higher prices this year will help, but we still expect structural forces to easily outweigh any rally and so volumes are forecast to slip by another 3% to just 38% of levels back in 2010.

Recycling by Source

											Year on Year	
Million ounces	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025F**	**2024**	**2025F**
Industrial	82.7	88.0	92.2	93.6	99.1	108.4	113.4	105.1	109.9	109.2	5%	-1%
Jewelry	23.5	23.9	24.1	24.9	33.2	34.4	33.8	33.6	36.4	36.6	8%	0%
Photographic	26.4	24.5	23.1	21.6	21.0	20.0	18.5	17.2	16.7	16.2	-2%	-3%
Silverware	20.4	20.2	19.6	20.2	23.9	24.4	24.3	23.9	26.4	26.9	11%	2%
Coin	3.3	3.6	3.3	3.4	3.4	3.5	3.6	3.7	4.4	4.3	19%	-3%
Global Total	**156.3**	**160.2**	**162.3**	**163.8**	**180.5**	**190.7**	**193.5**	**183.5**	**193.9**	**193.2**	**6%**	**-0.4%**

Source: Metals Focus

Recycling

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Germany	9.9	9.7	9.4	9.8	9.9	9.6	9.7	9.8	10.3	12.1	18%
Italy	5.8	5.5	5.2	5.0	5.1	4.8	4.8	4.6	4.6	5.2	13%
UK	5.6	5.4	5.3	5.1	5.0	4.8	4.5	4.3	4.1	4.0	-3%
Spain	2.7	2.9	3.0	3.0	3.2	3.5	3.9	4.2	3.8	4.0	5%
Others	10.5	9.9	10.5	9.5	9.4	9.1	9.5	9.2	8.9	9.5	7%
Sub-total	**34.5**	**33.4**	**33.4**	**32.5**	**32.6**	**31.7**	**32.4**	**32.1**	**31.7**	**34.8**	**10%**
CIS											
Russia	6.7	6.5	7.9	10.0	8.5	9.3	10.3	11.3	10.2	10.7	5%
Others	1.4	1.4	1.7	1.9	1.8	2.0	2.2	2.4	2.2	2.3	5%
Sub-total	**8.1**	**8.0**	**9.6**	**11.9**	**10.3**	**11.3**	**12.5**	**13.7**	**12.3**	**13.0**	**5%**
North America											
United States	48.3	47.8	50.5	51.0	52.6	54.4	56.7	56.1	47.8	50.5	6%
Others	4.1	4.1	4.0	4.0	4.1	4.2	4.4	4.5	4.3	4.5	4%
Sub-total	**52.4**	**51.9**	**54.5**	**55.0**	**56.7**	**58.5**	**61.0**	**60.5**	**52.1**	**55.0**	**6%**
Middle East											
Turkey	2.5	2.5	2.5	2.7	2.7	2.5	2.7	2.2	2.3	2.4	6%
Others	3.0	3.5	3.5	3.0	3.2	3.8	4.6	4.0	4.3	4.8	12%
Sub-total	**5.5**	**6.0**	**6.0**	**5.7**	**5.9**	**6.3**	**7.3**	**6.2**	**6.6**	**7.2**	**10%**
South Asia											
India	4.6	4.9	5.4	6.3	6.6	15.9	14.7	15.4	17.0	17.1	1%
Others	0.3	0.3	0.4	0.5	0.5	2.6	2.2	2.3	2.6	2.7	3%
Sub-total	**5.0**	**5.2**	**5.8**	**6.8**	**7.1**	**18.5**	**16.9**	**17.8**	**19.6**	**19.8**	**1%**
East Asia											
China	24.1	24.0	23.7	24.0	24.7	27.3	32.8	37.2	37.4	39.7	6%
Japan	11.0	11.4	11.4	10.9	10.5	10.0	9.5	9.1	8.7	8.3	-4%
Taiwan	2.6	3.0	2.8	2.6	2.9	2.9	3.0	2.7	2.3	2.6	11%
Others	4.6	5.3	4.7	4.7	4.9	5.4	6.0	5.1	4.1	4.5	10%
Sub-total	**42.3**	**43.7**	**42.6**	**42.2**	**42.9**	**45.6**	**51.3**	**54.0**	**52.4**	**55.0**	**5%**
Other Regions											
C&S America	3.1	3.4	3.5	3.5	3.6	3.8	4.2	4.4	4.0	4.0	1%
Africa	2.8	2.8	2.9	2.8	2.9	3.0	3.6	3.2	3.3	3.6	7%
Oceania	2.0	2.0	1.9	1.9	1.9	1.7	1.6	1.6	1.5	1.6	6%
Sub-total	**7.8**	**8.2**	**8.3**	**8.3**	**8.3**	**8.6**	**9.3**	**9.2**	**8.8**	**9.2**	**4%**
Global Total	**155.5**	**156.3**	**160.2**	**162.3**	**163.8**	**180.5**	**190.7**	**193.5**	**183.5**	**193.9**	**6%**

Source: Metals Focus

Chapter 6

- The silver EFP jumped in December, peaking at around $1/oz, driven by concerns about the US' tariff strategy, sparking a surge of inflows into CME vaults.
- Indian silver imports jumped by 115% to 247.4Moz (7,695t) in 2024, the second highest total on record.
- Hong Kong bullion imports rose by 23% y/y to a record high of 145Moz (4,509t) last year, with China being the largest supplier at 110.6Moz (3,440t).

Bullion Trade

Introduction

Last year, two issues underpinned many of the changes in silver bullion flows compared to 2023: trends in physical investment and, even though it only emerged towards year-end, the prospect of US tariffs. The latter was arguably more eye-catching, epitomized by the price dislocation between London's OTC market and the CME in the US, which emerged last December and continued until the end of the first quarter of this year. This translated into a sharp rise in metal being delivered into the US, mostly from London. This in turn generated a 12% y/y rise in total, full year UK silver bullion exports, which had been 3% lower y/y over the January-November period. Even so, the surge in deliveries onto the CME could not prevent US bullion imports from dropping in 2024 by 12%, a reflection both of the country's weak retail investment and lower imports from Mexico.

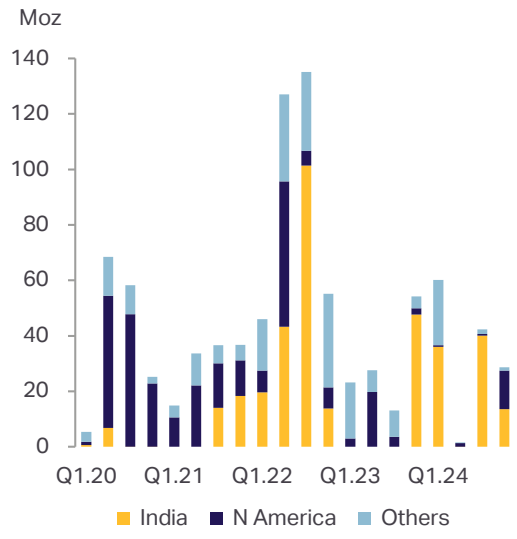
Staying with physical investment, a partial recovery in the Indian silver bar and coin market in 2024 contributed to the country's second highest bullion imports on record, of 247.4Moz (7,695t). It was also the largest annual rise globally in 2024. This was all the more noteworthy given that Western physical investment had slumped by 40% last year. The second largest increase in bullion imports emerged in Japan, generating a three-year high of 59.0Moz (1,836t), despite a slight fall last year in the country's silver industrial demand. On the downside, one of the largest declines globally emerged in Turkey (for both its bullion imports and exports). The country had benefited from the surge in US silver bar demand during 2021-23, but with that market now far softer, imports from Turkey collapsed in 2024.

Europe

Last year, European silver bullion exports hit a four-year high. Unsurprisingly, this was influenced by UK-US flows. London Good Delivery 1,000-ounce bars are acceptable on the CME and so the metal could be shipped directly from London. This contrasted with gold, where there was a drive to have metal first re-cast into kilobars, often in Switzerland, before being delivered into CME-approved vaults. As touched on above, these flows were so pronounced that last December, when they first emerged, they accounted for 47% of the UK's total exports, against an average of 10% during the preceding 11 months. For January 2025 (the latest available UK trade data), shipments to the US made up 61% of total UK deliveries.

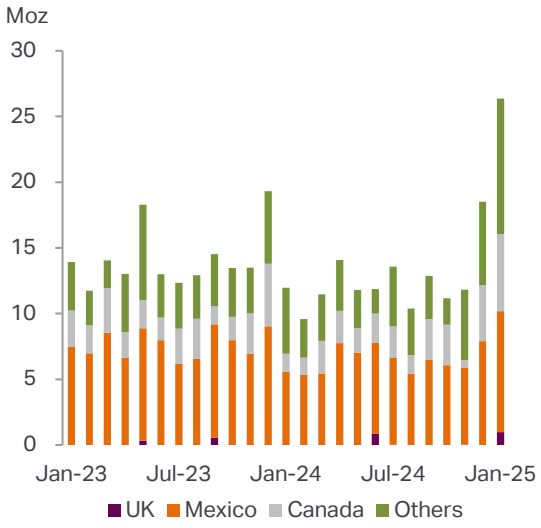
Leaving aside the impact of tariff concerns, although Swiss silver bullion exports were little changed year-on-year in 2024, at 64.0Moz (1,991t), they still reflected the weakness of Western physical investment. In particular, exports to Austria collapsed to a five-year low, while those to Germany have not been so weak since 2015. Unsurprisingly, shipments to the UK more than

UK Bullion Exports*



Source: Metals Focus, S&P Global; *Gross weight

US Bullion Imports*



Source: Metals Focus, S&P Global; *Gross weight

trebled (this being the market of last resort) to their highest since 2017. One interesting development last year was a jump in metal bound for the United Arab Emirates (UAE). This was entirely related to the UAE's trade deal with India (see below for more on this). Even though the UAE was the fifth largest destination for Swiss silver exports in 2024, these shipments were concentrated in Q1.24. Furthermore, with India's unprecedented import duty reduction in July, it was no longer profitable to ship silver from the UAE into India, and so bullion exports from Switzerland to the UAE subsequently collapsed.

North America

The tariff/exchange-for-physical (EFP)-related bullion inflows into the US have been well documented elsewhere in this chapter. Overall, US imports in 2024 dropped by 12% to a 15-year low of 149.1Moz (4,636t). Two countries accounted for this weakness, Mexico and Turkey. Deliveries from the former fell by 16% to 76.3Moz (2,374t), their lowest since 2009, in part reflecting a decline in Industrias Peñoles' outturn. With regards to Turkey, shipments to the US effectively disappeared last year, falling to a paltry 3koz (91kg). This compares with an annual average of 10Moz (310t)

Tariff Concerns Fuel Price Dislocations and Metal Flows

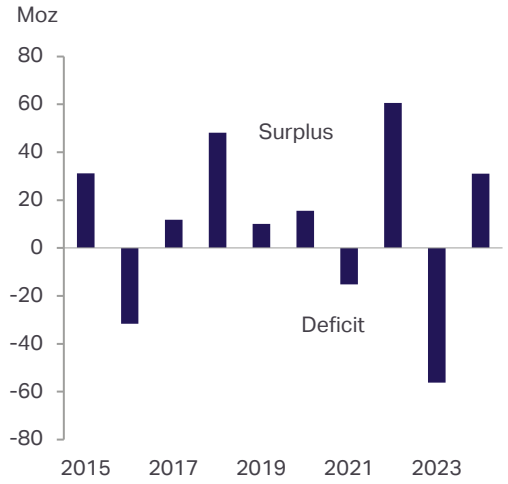
Trump's election win in November has crystallized one of his election campaign promises, a far greater focus on tariffs than the previous administration. In late November, Mexico and Canada were first threatened with 25% tariffs, with fears quickly growing in the market that other countries from which the US imports metals could be targeted, especially Europe.

In the context of precious metals, the immediate concern focused on the CME, and the ability to hedge and physically settle contracts on metals that might be subject to tariffs. Given that much of US futures positions are hedged in London, this quickly created a dislocation in pricing with the CME. This was reflected in a jump in the exchange-for-physical (EFP) premium, which typically reflects the cost of converting bars (if needed) and moving metal from London into a CME-approved vault.

For silver, the EFP jumped in December, to around $1. It remained high in Q1, before collapsing in April following the US announcement that silver would be exempt from reciprocal tariffs. The spike in the EFP led to a jump in metal being delivered into CME vaults, to take advantage of the EFP and also to have metal placed on warrant before Trump's inauguration on January 20th. That said, deliveries into these vaults continued through to at least late-March (the time of writing), with CME silver stocks hitting a record high of 456Moz (14,198t) by March 20th, up 48%, or 147Moz (4,575t), since November 20th when the US election result was declared.

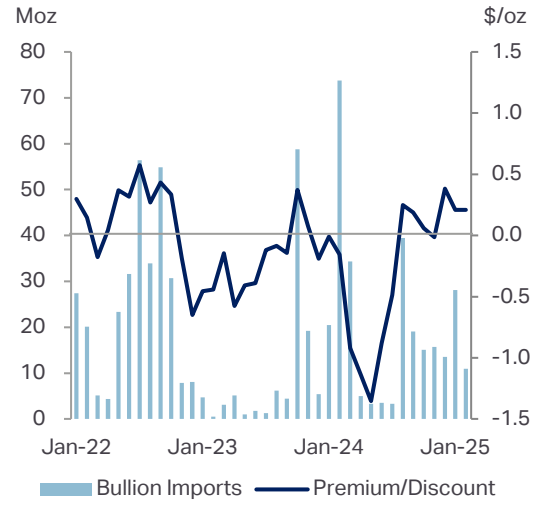
The need to deliver metal onto the CME as quickly as possible, either before tariffs were imposed or the EFP collapsed, meant that some silver was delivered by air freight, rather than the more usual sea container option (arriving in Canada, and then by road to CME vaults), whether this involved requisitioning an entire flight, or using the more traditional passenger cargo. Overall though, the vast majority was still delivered by sea, which helps explain the apparent mismatch between the LBMA vault data and CME stocks. The former is available through to end-February and reveals a 128Moz (3,996t) decline from end-November (the closest month-end to the US election result) to end-February. This compares with an increase in CME stocks over the same timeframe of just 100Moz (3,130t).

Indian Silver Net Balance*



*Balance = net bullion imports + scrap + mine production – all fabrication – physical investment
Source: Metals Focus

Indian Silver Bullion Imports*



Source: Metals Focus, S&P Global; *Gross weight

during 2021-23, when strong US retail investment had attracted imports from Turkey, a dynamic that has not played out before (or since). Turning to US bullion exports, these fell in 2024 by 34% to a seven-year low of just 14.3Moz (445t), the result of shipments to Canada more than halving year-on-year.

Middle East

Bullion exports across the Middle East rose by 42% to 82.2Moz (2,556t) in 2024, having already increased by 79% the previous year. This was entirely due to a dramatic rise in exports from the UAE, mainly to India, thanks to the Comprehensive Economic Partnership Agreement (CEPA) between the two countries. The bulk of exports to India took place in Q1.24, totaling 58.5Moz (1,821t), before slowing markedly after the Indian import duty reduction in July. Elsewhere, Turkish exports collapsed by 86% to just 3.9Moz (120t), with shipments to the US almost disappearing and those to the UAE falling by 83%. That said, the region's total imports remained robust in absolute terms, but fell by 15% to 56.7Moz (1,763t), with the drop in Turkish inflows partially offset by an increase in UAE demand.

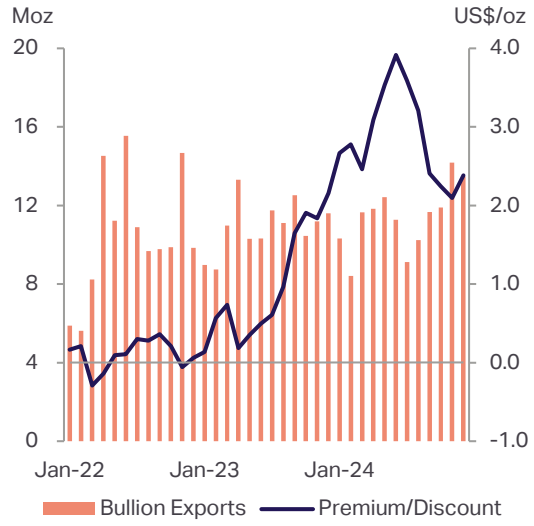
South Asia

India's silver imports surged by 115% in 2024, rising from 114.9Moz (3,574t) in 2023 to 247.4Moz (7,695t), marking the second highest level of imports on record. This sharp increase was driven by strong investment demand, covering bars, coins, and exchange-traded products (ETPs), which saw an extraordinary 195% jump to 38.0Moz (1,183t).

Intra-year trends in 2024 revealed that a price correction in January and February, along with expectations of higher silver prices, led to a surge in imports, with more than half of the year's total arriving in Q1.24. As silver prices rose, imports then slowed but a surprise 9% import duty cut on bullion in July from 15% to 6% rekindled demand, bringing in over 106Moz (3,300t) in the second half of the year. The India-UAE CEPA, signed in 2022, significantly reshaped India's silver import landscape. Due to the earlier duty advantage under the CEPA, the UAE's share of Indian silver imports surged from just 1% in H1.23 to nearly 50% in H1.24. However, last year's duty cut in July eliminated this advantage overnight, shifting the balance back to traditional bullion suppliers to India, such as the UK and Hong Kong, whose combined share rose from 44% in H1.24 to 71% in H2. In terms of the import composition, 38% of silver arrived as grain (the majority being three 9s purity), 50% in three 9s bars, and 12% in four 9s bars.

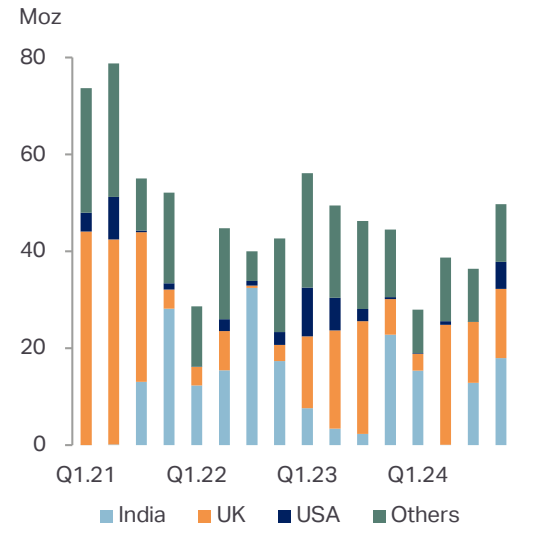
Moving to 2025, imports have so far slowed considerably, with January-February volumes of just 38.9Moz (1,210t), a sharp 59% decline from the previous year. This is largely due to a combination of stock being carried over from 2024 and waning demand in the jewelry and silverware segments because of elevated prices. As a result, 2025 imports are expected to fall below last year's levels.

Chinese Bullion Exports*



Source: Metals Focus, S&P Global; *Gross weight

Hong Kong Bullion Exports*



Source: Metals Focus, S&P Global; *Gross weight

East Asia

China has traditionally been a net exporter of silver due to the metal's structural oversupply in the local market. This is fueled by large volumes of refined silver recovered from imported base metal concentrates and domestic mines, whose output ranks second globally.

Bullion exports from mainland China rose by 4% in 2024 to 136.5Moz (4,247t), the second highest total on record. This reflected both greater local refinery capacity, and a further drop in lead and zinc concentrate treatment charges, which encouraged refineries to import more silver concentrates to boost profits. This business is often conducted via 'processing trades', from which refineries can benefit from zero import VAT being applied to the silver content as long as they re-export the refined silver bullion (otherwise, 13% import VAT is levied on the total value of the silver content). China became the largest bullion supplier to the UK last year, with shipments rising by 8% to a new record high of 54.9Moz (1,709t). Even though the local premium spiked from May to July, exports over these months remained solid as metal was delivered to London when Indian demand collapsed. Despite the strong outflows, combined Shanghai Gold Exchange and Shanghai Futures Exchange stocks fell by only 285koz (9t) by end-2024. This mostly reflected the 39% y/y drop in 2023, when inventories on these exchanges had slumped to a six-year low.

From May to July, local prices traded at a high premium over loco-London. As a result, local refineries re-imported refined silver derived from imported concentrates from the free-trade zone (FTZ) vaults. As such, imports from the FTZs were around seven times that of 2023, totaling 7.6Moz (236t) in 2024. China's official reported bullion imports for 2024 rose by 47% to 15.3Moz (477t). However, Metals Focus' estimates of bullion imports include adjustments to specific reported flows, such as the deduction of imports from China's FTZs. This means that our estimates of China's bullion imports actually fell by 18% in 2024 to 7.7Moz (240t).

Hong Kong bullion imports rose by a further 23% to a new record high of 145.0Moz (4,509t). Mainland China remained the largest bullion supplier to the Hong Kong market, with shipments from there up by 32% or 26.7Moz (830t) to 110.6Moz (3,440t). These gains offset the slump in shipments from Taiwan, Russia and Japan. In contrast, bullion exports recorded a notable decline of 22% to 152.8Moz (4,753t). The UK remained Hong Kong's largest export destination, as bullion banks sent Good Delivery bars to London when Indian demand slumped in Q2.24 after local silver prices rallied strongly and peaked in May. That said, shipments to the UK were still down by 16% to 55.1Moz (1,713t) because of the increasing share of the UK's imports from mainland China. Even so, full year overall exports to India recorded a notable recovery of 28% from 2023's low base, reaching 46.4Moz (1,442t) in 2024.

Chapter 7

Industrial & Photography

- Industrial silver fabrication increased by 4% to a new record high of 680.5Moz (21,165t) in 2024.
- Most of the uplift came from electronics & electrical demand's 4% rise, which benefited from gains linked to green economy investments and AI advances.
- Brazing alloy offtake grew by 3%, while other industrial demand was up 4%, despite a dip in EO fabrication.
- Industrial demand is forecast to ease by 0.5% this year, chiefly as the massive gains in PV offtake ease.

Industrial Demand

Introduction

Industrial silver demand rose by 4% to another record of 680.5Moz (21,165t) in 2024. This was primarily driven by structural gains in the green economy flowing through from the photovoltaic (PV) and automotive sectors, as well as grid infrastructure development. Demand was also boosted by applications linked to artificial intelligence (AI), which contributed to growth in consumer electronic shipments. While very limited in most sectors, there was notable progress in thrifting and substitution within PV, resulting in a sharp drop in silver loadings. This helps explain why total industrial demand's growth rate slowed sharply from 11% in 2023 to last year's 4%.

Electronics & electrical demand posted another record high, thanks to the above supportive factors, even if its growth slowed more sharply from 2023's 20% to 4% in 2024. Brazing alloy demand rose by a similar 3%, buoyed by gains in major industries, such as automotive and aerospace. Lastly, our 'other industrial' demand category also grew by 4%, even with a slight drop in ethylene oxide (EO) demand.

Looking ahead, electrical & electronics demand is expected to grow by a slight 1% this year as gains in automotive end-use, power grid investment and consumer electronics just outweigh the dip for PV. Demand for brazing alloys is projected to grow by 3%, while a slower pace of EO capacity additions leads to a 6% decline in other industrial demand. This means that total industrial offtake dips by just 0.5% and is still the second highest total ever. We should caution, however, that this forecast is arguably more uncertain than normal due to rapid technological change, supply chain restructuring, trade disputes and geopolitical tensions.

Europe

The headline figure of 18% growth for European industrial fabrication might imply a boom year. However, that growth was primarily a function of one-off factors that affected the UK in 2023 and a more representative change is Europe's 88.0Moz (2,738t) of demand last year being 1% up on 2022.

Electrical and electronic demand was stable last year (+2% versus 2022), although that still meant volumes were at their second highest level since 2012, while brazing alloy offtake grew by 1% (-2% compared to 2022). One of the main factors constraining growth last year was the currently moribund state of the local economy, in particular Germany (the power house of industrial silver in Europe), and caution over short to medium term prospects. One key way in which this impacted demand was through a sluggish

Global Industrial Demand Forecast

Million ounces	2024	2025F	Y/Y
Europe	88.0	87.2	-1%
North America	132.4	128.7	-3%
South Asia	42.9	44.1	3%
East Asia	401.7	402.2	0%
Others	15.4	15.2	-1%
Global Total	**680.5**	**677.4**	**-0.5%**

Source: Metals Focus

Industrial Demand

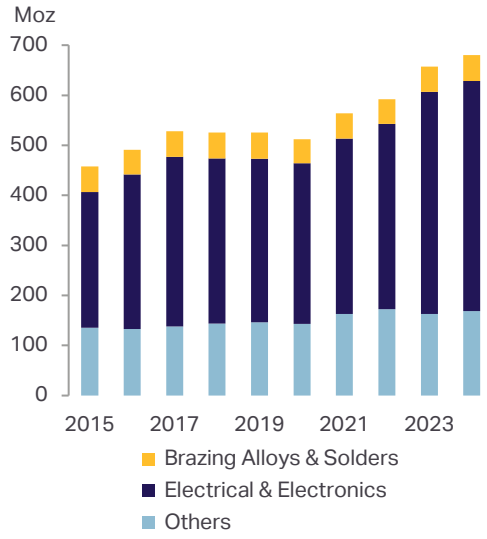
Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Germany	26.1	26.3	27.0	27.9	26.0	30.5	35.5	30.9	31.2	31.3	0%
United Kingdom	14.8	15.8	19.1	20.1	22.2	23.2	25.6	23.2	9.5	22.9	141%
France	8.6	8.4	8.7	9.1	9.3	8.5	9.6	10.3	10.9	11.1	2%
Italy	8.5	8.4	8.7	9.1	9.2	7.8	9.2	9.6	9.6	9.4	-2%
Others	11.9	12.0	12.4	12.7	12.6	11.6	12.9	13.1	13.1	13.3	2%
Sub-total	**70.0**	**70.9**	**76.0**	**78.9**	**79.4**	**81.5**	**92.8**	**87.1**	**74.3**	**88.0**	**18%**
North America											
United States	91.3	109.4	112.6	115.8	113.7	116.3	122.7	127.8	133.9	126.0	-6%
Others	5.7	6.0	5.6	5.7	5.9	5.0	5.4	5.7	6.1	6.4	6%
Sub-total	**97.0**	**115.4**	**118.2**	**121.5**	**119.6**	**121.2**	**128.1**	**133.6**	**140.0**	**132.4**	**-5%**
South Asia											
India	35.7	35.9	37.3	40.2	37.8	26.7	34.2	42.6	41.4	42.9	4%
Sub-total	**35.7**	**35.9**	**37.3**	**40.2**	**37.8**	**26.7**	**34.2**	**42.6**	**41.4**	**42.9**	**4%**
East Asia											
China	114.3	115.0	129.1	134.7	135.6	132.9	152.3	183.7	257.4	275.4	7%
Japan	90.5	104.6	118.3	103.2	108.7	109.5	113.3	98.4	98.1	94.8	-3%
South Korea	19.0	18.0	19.1	19.1	18.4	17.4	18.7	20.2	19.5	20.1	3%
Taiwan	10.2	10.0	9.4	9.7	8.8	9.0	9.5	9.9	9.4	10.0	7%
Others	1.2	1.3	1.2	1.2	1.3	1.1	1.2	1.3	1.4	1.5	6%
Sub-total	**235.1**	**248.9**	**277.1**	**268.1**	**272.8**	**270.0**	**295.1**	**313.5**	**385.8**	**401.7**	**4%**
Other Regions											
C&S America	6.9	7.2	6.5	4.1	2.8	1.6	1.8	1.9	2.0	2.1	6%
Middle East	6.4	5.8	6.0	6.0	5.7	4.9	5.2	5.9	6.4	6.2	-4%
Oceania	4.3	4.4	4.2	4.4	4.5	3.6	4.2	4.5	4.4	4.5	3%
CIS	1.5	1.6	1.6	1.7	1.8	1.5	1.8	1.5	1.6	1.6	5%
Africa	1.0	0.9	0.9	1.0	1.0	0.9	0.9	1.0	0.9	0.9	-2%
Sub-total	**20.1**	**19.9**	**19.3**	**17.1**	**15.8**	**12.4**	**13.8**	**14.8**	**15.4**	**15.4**	**0%**
Global Total	**458.0**	**491.0**	**528.0**	**525.8**	**525.4**	**511.9**	**564.1**	**592.3**	**657.1**	**680.5**	**4%**

Breakdown of Industrial Demand by Sector

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Electrical/Electronics	271.6	309.0	339.1	330.4	326.6	321.4	350.7	370.7	444.4	460.5	4%
Brazing Alloys	51.1	49.1	50.9	52.0	52.4	47.5	50.5	49.2	50.2	51.6	3%
Other Industrial	135.3	132.9	138.0	143.5	146.4	142.9	162.9	172.4	162.6	168.4	4%

Source: Metals Focus

Global Industrial Demand



Source: Metals Focus

construction industry, while another was the 5% drop in vehicle production (within this, battery electric vehicle, BEV, output was down 1%). Price spikes did not help, but this often just led to order postponement, so only curtailing demand in the short run. There was also negligible substitution and/or thrifting, even with the euro silver price rising by 21% last year.

The above did not turn into active losses, however, because of several supportive factors. One obvious example is the increasing amount of silver being used on a per vehicle basis. As before, this relates to increasing vehicle sophistication and BEVs' higher silver usage, even if technical developments meant that the extra needed in each BEV proved lower than once expected.

Another was broader decarbonization programs, such as the installation of PV panels and heat-pumps. Results for the latter were not uniform as the introduction or withdrawal of government subsidies can have a clear impact on silver offtake. Government support for the nuclear industry also fed through to higher silver needs, even if this area is best seen as a niche. There was some growth in end-use for data centers and AI technologies, although the scale of gains here was small compared to other regions. Lastly, medical end-use of silver is reported to have continued steadily growing.

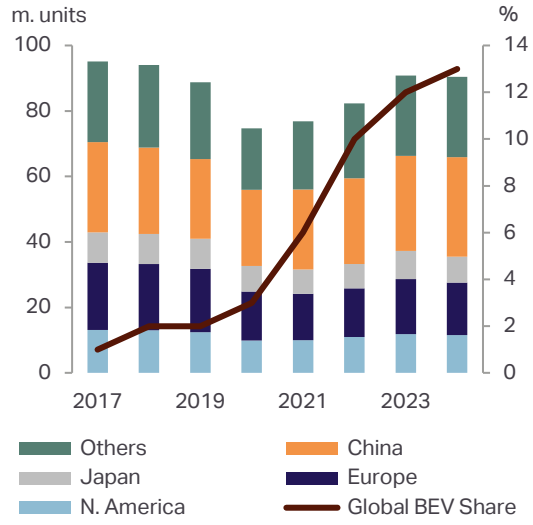
European industrial demand is forecast to ease by 1% in 2025, although much of that is due to normalization in UK volumes. If we exclude that country, offtake actually rises by 1%. The projected dip of 1% in vehicle output will not help matters, although the 41% jump for BEV numbers should prove beneficial (source GlobalData). Ongoing decarbonization efforts, such as wind farm investment, should also prove supportive. However, we might need the region's economy to show more vigor before stronger industrial silver demand materializes. One development to watch is the recently agreed government expenditure package in Germany and the broader rise in defense expenditure, particularly if this is accompanied by on-shoring.

Electrical & Electronics Demand

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
China/Hong Kong	67.2	71.0	85.2	88.7	88.1	80.8	90.0	124.4	195.6	211.4	8%
Japan	75.8	91.0	104.2	88.9	94.3	96.6	98.7	83.3	82.6	78.9	-5%
United States	46.9	65.0	66.9	68.7	65.6	66.6	70.8	73.9	75.6	78.0	3%
Germany	17.3	17.7	18.3	19.0	17.1	21.4	25.7	20.6	20.9	21.0	0%
India	13.6	13.8	14.3	15.3	13.6	11.7	14.9	17.2	18.2	19.1	5%
South Korea	8.5	8.3	8.6	8.4	7.9	7.4	7.9	8.7	8.6	8.3	-3%
Others	42.1	42.4	41.6	41.4	40.0	36.9	42.6	42.6	42.9	43.8	2%
Global Total	**271.6**	**309.0**	**339.1**	**330.4**	**326.6**	**321.4**	**350.7**	**370.7**	**444.4**	**460.5**	**4%**
of which Photovoltaics	59.6	81.6	99.3	87.0	74.9	82.8	88.9	118.1	192.7	197.6	3%

Source: Metals Focus

Global Light Duty Vehicle Production & BEV share



Source: LMC Automotive, a GlobalData Company

North America

Industrial fabrication in North America fell by 5% last year to 132.4Moz (4,117t). Demand remained high historically due to gains in the majority of end-uses, but these could not outweigh the pullback in EO-related offtake.

The largest component, electronics & electrical, for example saw growth of 3% to a 13-year high in 2024. A fair portion of this increase came from a jump in PV demand (as indicated by higher silver powder exports), but levels in this sector remain way down on historic volumes due to market share loss. Offtake in other segments on the electrical side, for example contacts, saw growth broadly in line with GDP gains, However, others saw yet faster gains. Good examples here are the power connections needed to run the growing number of data centers with their air-conditioning needs and also the connections needed for the growing number of PV panel installations.

Additional areas, more on the electronic side, often saw stronger gains than GDP growth. One instance worth highlighting is silver going into the automotive sector, even with the 2% drop in vehicle output. There was also specific disappointment in terms of growth in end-use from BEVs, not only due to optimistic output forecasts, but also through technical developments in this rapidly evolving field that point to lower than expected silver use per BEV. Fortunately, all this was outweighed by the steady rise in sophistication as cars become equipped with newer features (such as sensors) or established features (such as heated car seats). Other fields where robust growth was noted were installations of 5G transmission equipment and the defense / aerospace industry. Some newer areas arguably disappointed though, including the still small scale of the wearables market and the lack of progress in silver replacing indium-tin oxide in touch screens.

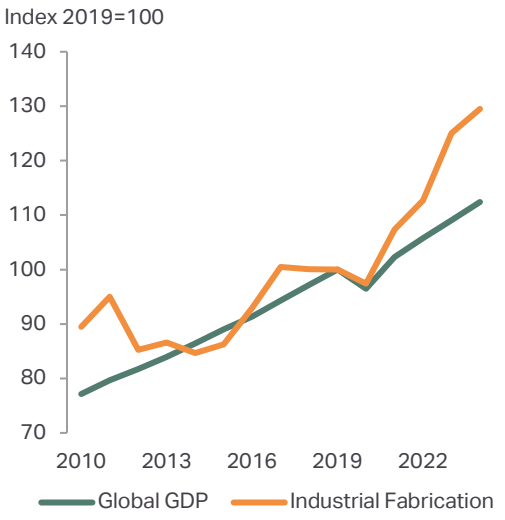
Brazing alloy demand saw modest growth of 2% in 2024. There were some gains in the general construction industry but yet faster growth occurred in end-use by the mining and energy industries. Elsewhere at the sectoral level,

Brazing Alloys & Solder Demand

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
China	25.5	24.1	24.5	24.8	25.1	22.5	22.1	19.5	20.4	21.1	3%
United States	5.7	5.9	6.2	6.4	6.5	6.0	6.5	6.8	6.9	7.0	2%
Germany	4.4	4.3	4.2	4.2	4.1	4.3	4.7	5.0	5.1	5.1	1%
India	2.1	2.2	2.2	2.3	2.2	1.7	2.7	3.0	3.1	3.3	6%
South Korea	2.6	2.3	2.4	2.4	2.3	2.1	2.2	2.3	2.4	2.6	6%
Japan	1.8	1.8	2.0	2.1	2.1	1.9	2.1	2.2	2.2	2.2	2%
Others	9.0	8.7	9.3	9.8	10.1	8.9	10.0	10.4	10.0	10.2	2%
Global Total	**51.1**	**49.1**	**50.9**	**52.0**	**52.4**	**47.5**	**50.5**	**49.2**	**50.2**	**51.6**	**3%**

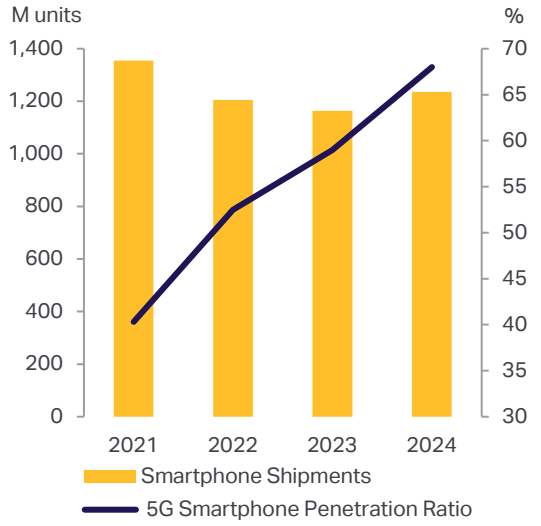
Source: Metals Focus

Industrial Silver Fabrication versus Global GDP



Source: IMF, Metals Focus

5G Smartphone Shipments



Source: Statista, IDC, Market Intelligence & Consulting Institute, Metals Focus

news was mixed. Offtake by the medical industry for instance was broadly stable while sputtering targets for the construction industry saw losses.

Demand would have been all the higher but for certain industries running down their inventory due to such factors as order postponement whenever the silver price spiked. Offtake was at least spared overt thrifting and / or substitution despite the price rise as established areas have long since moved to the lowest silver use per unit. There was also no material adoption of composite powders (such as silver:copper) as concerns over their use in real world applications still confine them to the trial stage (outside of PV).

We forecast a 3% dip for North American industrial fabrication in 2025, chiefly on account of another modest loss for EO demand. Other sectors in contrast are forecast to see gains. The year has begun well for some due to drivers such as re-construction orders in the wake of last year's hurricane season and pre-tariff stock build. There is of course the risk that the overall US economy disappoints (vehicle output for instance is already forecast to contract by 1%) but silver's new(er) uses and the lack of thrifting could still allow for industrial demand to outperform GDP.

South Asia

After declining by 3% in 2023, industrial silver demand in India recovered last year, rising by 4% y/y to 42.9Moz (1,335t), bringing volumes close to 2012 levels. The uptick came despite silver prices touching record highs in the domestic market. Total offtake in the electrical and electronics, and brazing alloys and soldering segments continued to hit new record levels in our series (starting from 2010). The 'other industrial' segment showed 2% growth last year, but volumes were down 28% from their peak in 2011.

The electrical & electronics sector accounted for nearly 60% of the total growth. This marks the fourth consecutive year of expansion for this sector, with demand rising 5% to 19.1Moz (594t). The segment's share of total industrial demand has steadily increased from 35% in the early 2010s to 45% in 2024, driven primarily by India's expanding electricity production and distribution network. India's power generation capacity has gone up by more than 50% to 466GW in the last 10 years (with last year adding around 5%). The addition of distribution lines and the building of the necessary infrastructure for electrification have also helped increase silver offtake. Moreover, the real estate boom has increased demand for low-voltage applications, such as miniature circuit breakers (MCBs), thereby generating healthy demand for silver for electrical contacts. Increased contact exports to the US and Europe further benefited local fabrication. Electronics demand has also seen strong momentum, fueled by emerging applications in data centers and artificial intelligence, along with robust demand from electronic manufacturing service companies. For instance, India's cell phone manufacturing rose by 12% to $49bn in 2024.

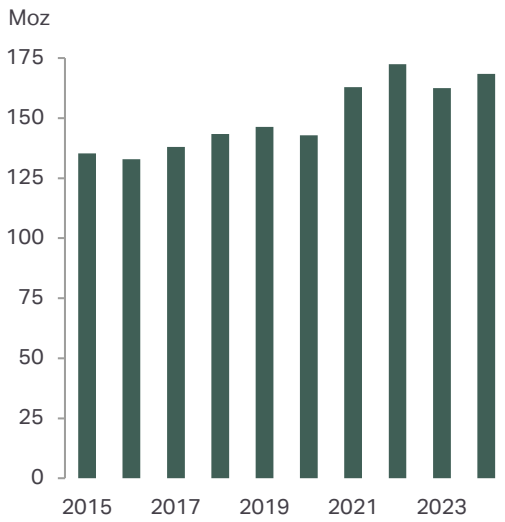
Novel Applications in New & Established Fields

The indispensability of silver in the industrial sector has elevated its importance in innovative applications, both in established and emerging fields, with aerospace and automotive prime examples. Silver is already widely used in electrical systems, bearings and processors, due to its corrosion resistance and thermal conductivity. The surge in the unmanned aerial vehicle (UAV or drone) market, driven in part by geopolitical tensions, provides clear scope for demand gains. Drones are now central to modern warfare and EMI (electromagnetic interference) shielding using silver paste and ink coatings enables the necessary communications technology. EMI shielding is also vital for the growing civilian drone market. Geosurveys, non-destructive testing and field monitoring are increasingly used in industries such as mining, oil and gas. Silver is also present in various components, notably in cameras, sensors, fuses, switches, electronic control units, radar and displays.

Elsewhere, promising developments in silver plating technology will further embed its use, notably in space where silver is already widely present due to its ability to withstand harsh environments. The space economy is expected to grow at a CAGR of some 9% over the next decade and silver offtake will benefit. This will partly be felt in established uses, notably plating components, such as nuts and bolts (to prevent them from fusing). These gains will be amplified by developments in nanoscale plating, which allows for a high degree of control over the thickness required for delicate electronic components. Developments in electroless plating, meanwhile, allow plating on the highly complex parts that are emerging in newly engineered systems. This could not be achieved conventionally, hence represents a new source of demand for silver. In satellites, silver plating of interior electronics reflects incoming heat radiation while transferring and dissipating heat from interior equipment.

In autos, silver use is also rising, in part due to new uses for silver inks. On top of their entrenched use in de-fogging rear windshields, silver inks are increasingly used in antennae, de-fogging wires in sensors, sensors for detecting window breakages, and heating (steering wheels and seats). Some electric vehicles use inks to pre-heat batteries in cold environments. These emerging growth areas highlight the substantial potential of silver in industrial applications.

Other Industrial Demand



Source: Metals Focus

Brazing alloys and soldering demand saw slightly faster growth of 6%, taking this segment to a record high of 3.3Moz (102t). The continued expansion of India's HVAC sector, driven by urbanization, has played a key role in sustaining demand. Railway modernization, including new track installations and efficiency improvements in traction motors, has further supported general silver usage, while a greater adoption of air-conditioning in train coaches has benefited demand for brazing alloys. The 'other industrial' segment only saw marginal growth of 2% to 20.5Moz (639t) in 2024. The various fields within this segment saw contrasting trends. Demand from the plating industry for example strengthened. Record-high silver prices dampened jewelry demand and impacted purchases of gifting-related silver articles. In response, consumers increasingly turned to silver-plated alternatives, boosting offtake in this segment. In contrast, the zari (silver thread) market remained weak as imitation alternatives gained traction, while there was a notable decline in varakh (silver foil) demand.

For 2025, we expect industrial demand to grow by 3% to 44.1Moz (1,372t), due mainly to the above growth areas. Several global electronics manufacturers for example have announced expansion plans for India and, even if the short run impact is limited, clear long-term benefits are expected.

The Potential for Composite Silver Powders

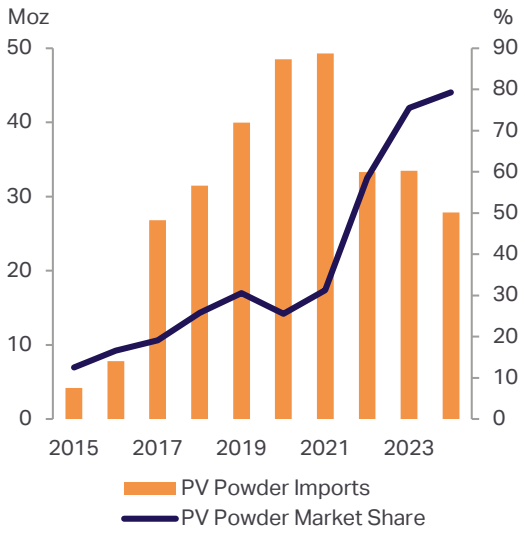
With the rapid evolution of many technologies and increasing demands for enhanced material performance and cost-effectiveness, single-material solutions are quickly revealing some limitations. Pure silver is widely recognized for its exceptional electrical conductivity, but its comparatively high cost poses significant challenges. In this context, composite powders have been developed, including silver-nickel and silver-graphite. Here we review the prospects for perhaps the most promising, silver-coated copper powder (SCCP), which strives to combine the affordability of copper and performance of silver. With a copper core encased in a layer of silver, SCCP aims to strike an optimal balance between conductivity, corrosion resistance and cost.

SCCP is used in various industries, with one of its main applications being an electrode paste in heterojunction (HJT) solar cells, where it forms conductive lines through the screen-printing process. Notably, the photoelectric conversion efficiency of SCCP is only a marginal 0.2-0.4% lower than pure silver paste while simultaneously reducing silver consumption by 30-50%. This reduction goes further when combined with the zero-busbar (0BB) technology, where less silver paste is required.

In the electronics sector, SCCP is used in conductive adhesives and packaging materials, such as LED packaging and chip bonding. Its low resistance minimizes signal loss in high-frequency communication. SCCP can also provide electromagnetic shielding coatings, which mitigate electromagnetic interference for base stations and antennae. Its heat dissipation and antibacterial properties also resonate with bio-applications on textiles and medical devices. Currently, SCCP stands out as an obvious cost reduction solution in the PV and electronics industries, with global demand projected to exceed (a still modest) 10Moz (300t) in 2025.

Overall, SCCP is revolutionizing multiple industries by providing a balanced approach to performance and cost. Its copper core structure significantly reduces reliance on precious metals, especially against the backdrop of rising silver prices. That said, challenges in material reliability remain, particularly as regards the risk of oxidation which would kill conductivity and lead to product failure. As a result, SCCP is still in only the trial stage in many markets for many products. As coating technology continues to advance, SCCP may be poised to transition from an alternative solution to a mainstream option, helping to alleviate the structural deficit in the silver supply chain.

Chinese Silver Powder Imports



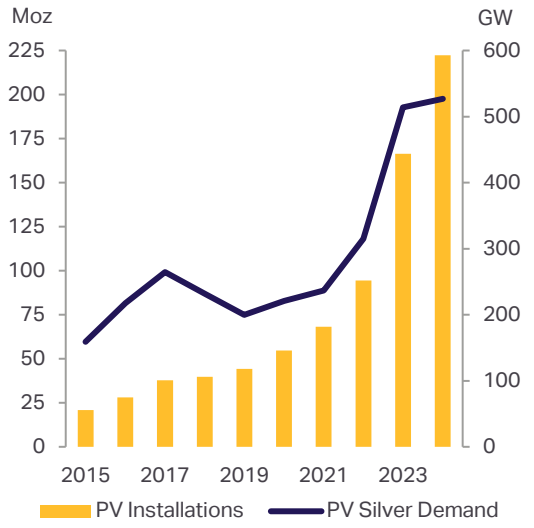
Source: S&P Global, Metals Focus. Share = locally fabricated powder as a % of Chinese PV powder consumption

East Asia

Industrial silver demand in East Asia rose by 4% to 401.7Moz (12,496t) in 2024. The most significant contributions come from applications related to the green economy and AI. This was reflected in record PV installations, grid infrastructure development, resurgent consumer electronics shipments and growing automotive electrification. These factors helped offset some of the weaknesses in the Chinese domestic market, hit by a downturn in real estate. Significant advancements in thrifting and substitution, especially in PV, also contributed to a deceleration in annual growth from 2023's +23%.

Chinese industrial demand grew by 7% to 275.4Moz (8,567t) in 2024. This growth was driven by increased exports and various stimulus measures. However, this achievement masks the challenge of an underlying imbalance of industrial output and exports being strong (driven by technological advances and investment incentives), but domestic consumption remaining sluggish. This is primarily due to weakness in the real estate market, which has spread to related industries.

Global PV Installations and Silver Powder Demand



Source: BNEF, Metals Focus

Consumer Electronics Shipments

*Million square inches
Source: Canalys, SEMI, Metals Focus

Electrical & electronics offtake rose by 8% to 211.4Moz (6,577t) as the launch of numerous AI-featured products has encouraged upgrades by consumers and enterprises and through further gains in PV. In 2024, shipments of major applications, such as PCs, laptops and smartphones, returned to growth. While sales within China have remained weak, strong export performances provided an offset. This, along with steady growth in the automotive electronics sector, supported overall demand. Despite ongoing challenges posed by a sluggish real estate market affecting sales of high and low-voltage devices, the electrical industry has benefited from increased investments in power grids and advancements in 5G/6G infrastructure.

China's newly added PV capacity reached a record 278GW in 2024, up 29% y/y. This lifted global installed capacity to nearly 600GW. However, collapsing prices and the strategy of prioritizing inventory drawdown fed through to China's module and cell production growth of 11% and 13% respectively last year - far lower than global installation gains. While tariffs imposed by the US have prompted some capacity migration, China's extensive production capabilities, established supply chains, and technological advances ensure its leading role remains in the global solar landscape.

In terms of technological evolution, the rapid fall in module prices due to overcapacity has accelerated silver reduction measures. These include employing LECO (laser enhanced contact optimization) technology and improving printing equipment accuracy to produce narrower finger widths. Advances in cell structure (such as the super multi-busbar (SMBB) and zero-busbar (0BB) designs) and the greater use of low-temperature silver pastes made of silver-coated copper powder for HJT cells collectively led to an annual reduction of over 20% in unit silver loadings last year. Local powder suppliers have continued to gain market share in high-end N-type cell pastes, owing to optimized production technologies and competitive pricing. Looking ahead, global PV installation capacity is projected to continue growing, albeit at a slower pace, reaching 650-700GW in 2025. However, the widespread adoption of 0BB and the maturation of metal plate printing technology are set to further reduce finger widths. It is therefore expected that loadings could fall by 10-12% this year, which just outpaces cell production, leading to a marginal decline in silver PV demand in 2025.

Despite the above thrifting, market share gains in the local powder market, plus a modest recovery in consumer electronics and a steady expansion in power grids and high-speed networks, mean overall demand in China's electrical & electronics sector is expected to grow further in 2025.

Brazing alloy demand rose 3% to 21.1Moz (658t) in 2024, although results varied significantly across applications. The HVAC sector saw a downturn due to a weaker real estate market and the shift towards lower silver content alloys. In contrast, brazing alloys for high-power insulated-gate bipolar

New Tariffs Reconstruct Global Supply Chains

The subsides that emerged from the US Inflation Reduction Act (IRA) in 2022 and the rise in US tariffs in 2024 have prompted a significant restructuring of global industries. This dual policy has not only reshaped the US domestic manufacturing landscape but also triggered a strategic shift in cross-border supply chains. This has had a significant impact on major industries, such as electronics, automobiles, and photovoltaics.

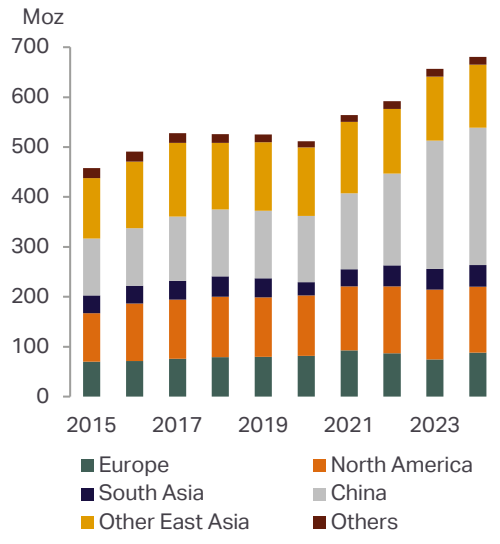
The IRA, with its production tax credits, has significantly boosted US solar module production capacity, from 7.5GW in 2022 to 31GW by 2024, with ambitions to achieve 50GW by 2030. However, domestic manufacturing faces structural challenges due to elevated electricity and labor costs. Consequently, the US solar market remains heavily reliant on imports from south-east Asia for solar cells and modules. This is also due to the US producing less than 30% of the required polysilicon, while 90% of auxiliary materials, like silver paste, are imported.

In 2024, the US significantly increased tariffs on Chinese imports, notably raising rates on solar cells and modules from 25% to 50%. Tariffs on lithium-ion batteries and related components also rose, prompting production shifts to south-east Asia and India. This has led to "transnational tax avoidance," with south-east Asia's module production largely fueled by Chinese investment and exports to the US via regional trade agreements. Consequently, the US expanded tariff regulations to include the ASEAN region.

Policy uncertainty remains a critical challenge. The suspension of IRA subsidies by the Trump Administration has already caused US clean energy investments to drop by 40%. Businesses are re-evaluating supply chains, especially in the semiconductor and automotive sectors, due to reciprocal tariffs. However, the reliance on foreign materials underscores the limitations of achieving full industrial autonomy. In the automotive sector for example, the US relies heavily on imports from Mexico (40%) and Canada (20%). A 25% tariff is expected to raise car prices, slow the market and impact platinum group metal demand in emission systems.

Effective supply chain restructuring must balance the cost advantages of regional production capacities while addressing technological advancements and tariff challenges. Despite progress in enhancing local manufacturing, the US continues to depend on China for essential materials in some spheres. Moving forward, the adaptability and flexibility of global supply chains will be crucial in successfully navigating the evolving trade landscape.

Industrial Demand by Region



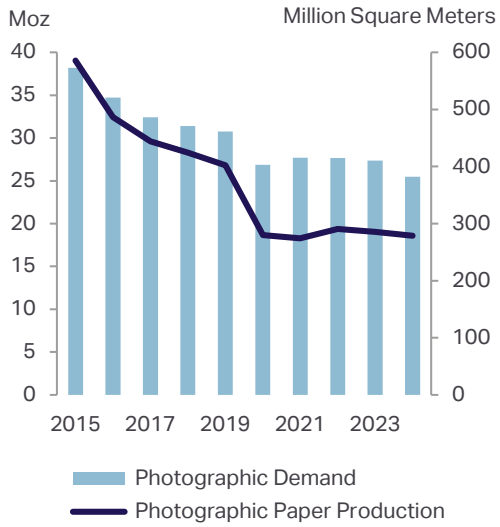
Source: Metals Focus

transistor (IGBT) modules witnessed major growth, driven by robust demand from the automotive and energy storage sectors. Record completions in shipbuilding and growth in aerospace also helped. These two trends are poised to continue in 2025, with support from increased investments in strategic fixed assets aimed at reinforcing the domestic economy.

The weakness of **Japanese** industrial demand in 2024 was due to fierce competition in PV powder by Chinese fabricators. As the Chinese silver price typically trades at a discount to the international price and given the earlier noted advances in technology that Chinese powder makers achieved last year, it was increasingly hard for Japanese producers to compete. Outside of PV, fabrication in Japan remained healthy, with robust global demand for end-uses such as consumer electronics, AI, data centers, power infrastructure and automotive. Overall, industrial offtake fell by 3% in 2024, dragged down by a 5% decline in electronics. We expect that 2025 will see a similar decline, again due to ongoing competition from Chinese fabricators.

South Korea's industrial offtake rose by 3% last year, driven by robust semiconductor and consumer electronic exports, along with a healthy

Photographic Demand & Paper Production



Source: Metals Focus, Photofinishing Newsletter

maritime industry. However, this growth was tempered by weaknesses in the automotive sector due to greater competition from Chinese manufacturers. Looking ahead, the export landscape for South Korea is expected to face severe challenges, including domestic political instability and international trade barriers. **Taiwan's** industrial offtake rose by 7%, benefiting from its integrated advanced semiconductor industry chain. This, combined with strong demand for AI technologies, has played a key role in seeing the country's industrial silver demand grow, which should continue this year.

Photographic Demand

Silver fabrication in photographic applications continued to weaken in 2024, falling by 7% to a new multi-decade low of 25.5Moz (792t). In keeping with previous years, the decline reflected further structural losses in demand for consumer and professional paper, which fell by another 4% in 2024. Sales of color negative paper also slipped by 2%.

This decline was amplified by an ongoing shift to dry photo paper, which uses inkjet technology instead of traditional silver halide photographic printing. For both printing methods, costs and finished quality are similar, but dry photo paper seems to be easier to process for many photographic labs. The growing popularity of dry paper photos has been particularly noticeable in the US in recent years. That said, traditional silver halide printing has remained the preferred method in Europe and Japan.

By contrast, demand from the medical sector improved in 2024 from a historically low level. Some of our contacts expressed cautious optimism that this recovery may continue for some time to come. To some extent, this reflects surprisingly resilient demand in the industrialized world. Even with a switch to digital radiography, printing of analog X-ray films is often required for diagnosis. In emerging markets, silver demand benefited from growing access to healthcare in a number of locations where silver halide use is still prevalent, such as Asia and Africa. Finally, offtake for non-destructive testing (NDT) x-rays remained stable, as radiographic testing is still the preferred method for equipment inspections.

Photographic Demand

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe & N America	27.2	24.3	22.4	21.4	20.6	20.4	20.4	19.8	19.6	17.8	-9%
East Asia	9.6	9.0	8.7	8.4	8.3	6.5	7.3	7.8	7.8	7.7	-1%
Others	1.3	1.4	1.4	1.6	1.8	-	-	-	-	-	n/a
Global Total	**38.2**	**34.7**	**32.4**	**31.4**	**30.7**	**26.9**	**27.7**	**27.7**	**27.3**	**25.5**	**-7%**

Source: Metals Focus

Chapter 8

Jewelry & Silverware

- Jewelry fabrication in 2024 rose by 3% to 208.7Moz (6,491t).
- This was largely through gains in India (due to such factors as the bullion duty cut) and Thailand (mainly through higher exports).
- Western consumption was broadly steady as positives such as branded silver's gains balanced negatives such as cost of living issues.
- Modest declines in most countries led to a 2% dip in global silverware demand in 2024 but 2025 is forecast to fall by 15% as heavy price-driven losses hit India.

Jewelry

Introduction

Jewelry fabrication in 2024 staged a partial recovery from the previous year's heavy losses, growing by 3% to 208.7Moz (6,491t), despite the jump in silver prices. Much of this rise emerged in India, which enjoyed a 5% gain due to a variety of factors. These included July's bullion import duty cut, a healthy rural economy, trade re-stocking, a swing to higher purities within silver jewelry, further growth for fashion jewelry and some diversion from gold due to its record high price. There was also a notable increase in Thailand because of higher exports to Europe and North America plus some gains in local consumption. Another bright spot was gains for branded silver jewelry in Europe and North America. While this helped the sales value, branded jewelry struggled to offset the fine weight losses in mass market Western jewelry (which helps explain the dip in Italian fabrication), often as the scale of switching from gold to silver remained slight. A larger drop was seen in China due to the poor economic backdrop and consumer sentiment, and to the growing focus on gold jewelry. A weak Turkish economy also helped push losses in the Middle East into double-digit territory.

Even if some markets show resilience this year, notable price-led losses in India look likely to trim 2025's global figure by 6% to a four-year low.

Europe

European silver jewelry **fabrication** last year dipped by 2% to 30.7Moz (955t), which means offtake has broadly flatlined since 2014 (if we exclude a COVID-struck 2020). This relative stability contrasts with gold, which saw more of an uptrend through to 2023 before clearer losses began last year. One of the main themes here relates to branded jewelry. For gold, this is largely fabricated in Europe and so it accrued almost all of the gains in global sales that took place up to 2023, before weakness emerged last year. A good portion of the branded silver in contrast is fabricated outside of Europe and so underlying growth in largely Western sales often benefited other regions. Another point of difference is that 2024 witnessed further sales growth for branded silver. (Sales by Pandora were up 4% last year, although that was almost exclusively driven by gains in Germany.) On top of jewelry brands, we hear feedback of a steadily rising number of fashion brands keen to offer silver jewelry as an accessory to compliment their clothing lines.

Greater stability is linked to a second factor that benefits all silver jewelry - relative affordability. Karat gold may have been largely priced out of ranges retailing at €200 or under but silver has not. That said, higher silver prices have hurt demand, especially for unbranded items and sales to lower income

Global Jewelry Fabrication Forecast

Million ounces	2024	2025F	Y/Y
Europe	30.7	30.6	-0.4%
North America	18.2	18.1	-0.4%
Middle East	9.5	9.2	-4%
South Asia	91.4	78.3	-14%
East Asia	50.7	51.5	2%
CIS	4.1	4.5	10%
Others	4.1	4.1	-0.2%
Global Total	**208.7**	**196.2**	**-6%**

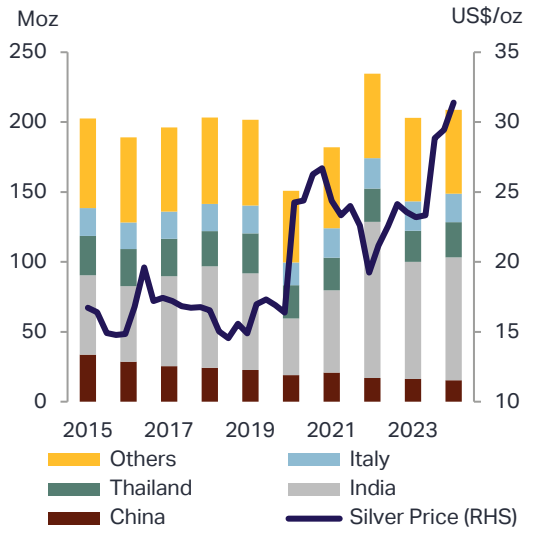
Source: Metals Focus

Jewelry Fabrication

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Italy	20.0	18.8	19.5	19.3	19.9	16.2	21.1	21.8	21.1	20.5	-3%
Germany	3.5	3.4	3.4	3.5	3.5	3.1	3.6	3.4	3.3	3.4	5%
France	2.0	2.0	1.9	1.9	1.8	1.6	1.7	1.9	2.0	2.0	-1%
Others	4.7	4.6	4.7	4.6	4.7	3.8	4.6	4.9	5.0	4.8	-4%
Sub-total	**30.2**	**28.7**	**29.5**	**29.3**	**29.9**	**24.7**	**31.0**	**32.0**	**31.3**	**30.7**	**-2%**
North America											
United States	13.6	12.9	13.2	13.0	12.9	11.5	13.2	12.8	11.2	11.3	1%
Canada	3.5	3.6	3.4	3.2	3.2	2.7	3.7	3.7	4.1	4.3	5%
Mexico	5.7	5.8	4.9	5.0	4.5	3.1	2.2	2.3	2.5	2.6	6%
Sub-total	**22.9**	**22.3**	**21.5**	**21.2**	**20.6**	**17.3**	**19.1**	**18.8**	**17.7**	**18.2**	**3%**
Middle East											
Turkey	6.7	4.9	4.9	5.9	6.0	4.4	6.9	7.2	6.9	6.2	-10%
Others	3.1	3.0	2.8	3.6	3.2	2.8	3.3	3.9	4.0	3.3	-18%
Sub-total	**9.8**	**7.8**	**7.7**	**9.5**	**9.2**	**7.2**	**10.2**	**11.2**	**10.9**	**9.5**	**-13%**
South Asia											
India	56.6	53.9	64.2	72.5	69.0	40.5	58.7	111.6	83.7	87.9	5%
Others	2.1	2.0	2.4	2.7	2.5	1.5	2.1	3.4	3.3	3.5	8%
Sub-total	**58.7**	**55.9**	**66.5**	**75.2**	**71.6**	**42.0**	**60.8**	**115.1**	**87.0**	**91.4**	**5%**
East Asia											
Thailand	28.2	26.6	26.9	25.2	28.5	23.9	23.4	23.7	22.2	25.1	13%
China	33.8	28.7	25.5	24.3	22.8	18.9	20.8	17.1	16.2	15.4	-5%
Indonesia	4.9	5.2	5.1	5.3	5.6	4.8	3.7	4.1	4.7	4.7	2%
South Korea	3.1	2.7	2.7	2.5	2.5	2.0	2.3	2.2	2.1	2.2	6%
Japan	1.4	1.4	1.5	1.6	1.7	1.5	1.4	1.3	1.3	1.3	0%
Others	1.5	1.5	1.6	1.7	1.8	1.5	1.6	1.8	1.9	1.9	3%
Sub-total	**72.9**	**66.2**	**63.3**	**60.5**	**62.8**	**52.7**	**53.2**	**50.2**	**48.3**	**50.7**	**5%**
Other Regions											
CIS	4.5	4.3	4.1	3.7	3.5	3.7	3.9	3.4	3.7	4.1	10%
C&S America	2.0	2.0	1.9	2.0	2.1	1.8	2.1	2.2	2.3	2.4	4%
Africa	1.1	1.0	1.0	1.1	1.1	0.9	1.0	1.0	1.0	1.0	-4%
Oceania	0.6	0.6	0.7	0.7	0.7	0.5	0.6	0.7	0.7	0.7	5%
Sub-total	**8.1**	**8.1**	**7.8**	**7.5**	**7.5**	**7.0**	**7.6**	**7.3**	**7.7**	**8.2**	**6%**
Global Total	**202.5**	**189.1**	**196.2**	**203.2**	**201.6**	**150.9**	**182.0**	**234.5**	**203.1**	**208.7**	**3%**

Source: Metals Focus

Global Jewelry Fabrication



Source: Metals Focus, Bloomberg

Italian Jewelry Fabrication

Source: Metals Focus, Bloomberg

groups hit by cost-of-living issues. The 'yellow look' in jewelry also remains popular. However, as karat gold became more expensive, there has only been a slight increase in interest in gold-plated sterling silver. Sources feel that this highlights how gold has benefited from the idea of a store of value in a way that silver jewelry (with its much higher margins) tends not to.

All the above leads us to see silver jewelry **consumption** in Europe last year as having also dipped slightly in fine weight terms (although the swing to branded jewelry and higher silver prices suggest a rise in value terms). This is supported by the UK silver hallmarking statistics, which show a fall of 2% last year. The fact that there was little difference between results for consumption and fabrication rests on two factors. First, there was no sign of heavy destocking last year by retail chains (a feature of 2023). Second, jewelry exports outside of Europe were stable. Shipments by Italy (Europe's largest fabricator) outside of the region in fine weight terms for instance we estimate to have fallen by less than 1%. The trade data points to marked contrasts between these destinations (for example, decent growth for the US and double-digit losses for Latin America). However, sources are wary of these extremes and see real world results as somewhat flatter.

We currently forecast continued stability for European fabrication this year, with a trivial fall of just 0.4%. This reflects the benefits of relative affordability and further gains for branded pieces being broadly balanced by uncertain consumer sentiment and a higher silver price.

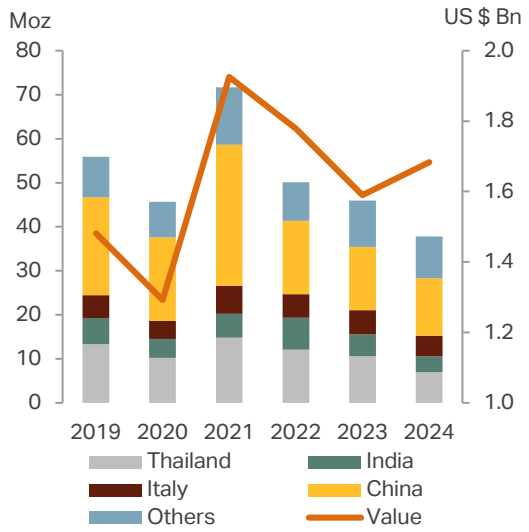
North America

Our field research points to **US** jewelry consumption holding broadly stable in fine weight terms in 2024. This therefore meant that the US market remained the second largest globally (after India), at a little over 33Moz (1,000t).

Supportive factors included a still robust jobs market and the avoidance of a recession. However, it is hard to turn the macroeconomic backdrop into a true positive as cost-of-living issues hit spending on discretionary goods by lower income groups. This is evidenced by feedback of jewelry sales in higher income areas performing better than in poorer districts. Branded silver also had another good year. For example, sales in the US by leading retailer Pandora rose by 8% in 2024. That however does not necessarily translate into a rise in fine weight terms, for two key reasons. First, a shift from generic to branded jewelry means proportionately less expenditure on fine metal and more on intangibles (such as design) and other materials (notably semi-precious stones). Second, some of the rise in expenditure on branded silver would have been absorbed by the higher silver price.

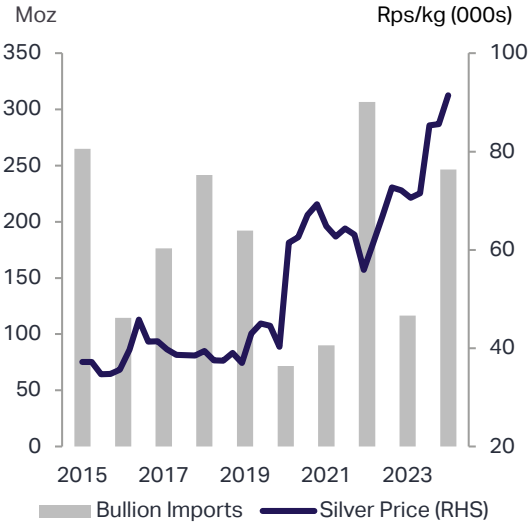
Some may also have expected record gold prices to drive consumers in a significant way to more affordable options in silver. However, there is little sign of this having happened to any great degree. Purchases of silver

US Jewelry Imports



*Gross Weight
Source: Metals Focus

Indian Bullion Imports



Source: Metals Focus, S&P Global, Bloomberg

remained seen as dominated by self-purchase of a lifestyle accessory and they were crimped by the ongoing popularity of the 'yellow look'. That could have fed through to higher sales of gold-plated sterling silver jewelry, but that was only said to have occurred at the margin. Instead, those wanting to buy gold, especially if motivated by the notion of a store of value, merely bought less or postponed their purchase of the yellow metal. Some had worried that an election year might mean trouble for all jewelry. However, nerves soon eased after the Presidential election result and sources typically reported that Q4 sales were better than expected and that sentiment had improved compared to a more gloomy Q3.

It was helpful that general feedback was fairly uniform as publicly available statistics might seem to pull the result in quite different directions. Silver jewelry imports for example fell by 18% in gross weight terms and our analysis of the data points to the drop in the fine weight being similar. We do not see this as explained by heavy destocking by the supply chain nor was there a marked shift to locally fabricated items. Instead, it may just reflect the potential unreliability of trade data. By way of example, the US statistics for imports from Italy show year-on-year losses in both 2023 and 2024, whereas Italian data on exports to the US show increases in both years. On the other hand, government data on total jewelry and watch sales and other companies' figures on independent retailers' sales show a rise of a few percent. However, that is in value terms and we do not see this feeding through to a higher fine weight given the rise in markups and the silver price.

We are expecting a slight dip in silver jewelry consumption (and fabrication) this year as a higher silver price and the recent drop in consumer sentiment easily counter any migration from gold on affordability grounds and further gains for branded silver.

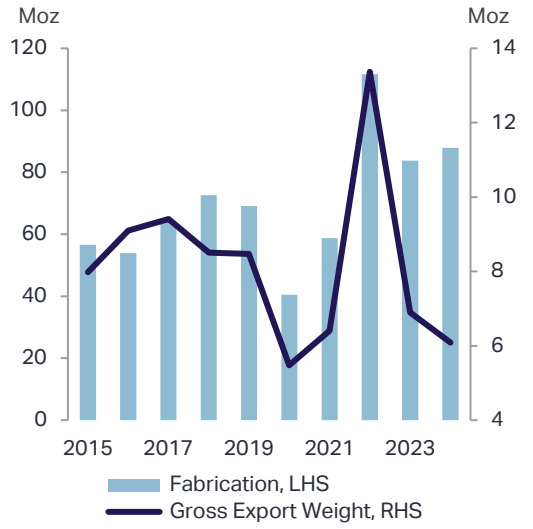
Middle East

Jewelry demand in the Middle East fell by 13% in 2024 to 9.5Moz (296t). **Turkey**, the largest fabricator, saw a 10% drop which was due to an 8% fall in consumption (exports rose by 4%). Local sales fell as a result of persistently high inflation, a rising cost-of-living and falling net incomes. In contrast, the country saw a big jump in jewelry imports of 23%. This highlights how higher production costs for locally produced jewelry have made this less affordable. Looking at the top origins, low cost Thai imports rose by 11%, while imports from Italy fell by 16%. For 2025, we forecast a 4% drop in regional offtake as exports are expected to weaken.

South Asia

After slumping in 2023, **Indian** silver jewelry fabrication partially recovered by a modest 5% last year to 87.9Moz (2,734t). While the 2024 total was down 21% compared to 2022's record total, fabrication last year was still the second highest on record, with offtake up 34% compared to the average of

Indian Jewelry Fabrication



Source: Metals Focus, S&P Global

the previous ten years. Importantly, this came against the backdrop of record high rupee silver prices; the average annual local price was up 18% y/y.

Several factors contributed to the recovery in jewelry fabrication last year. Aside from the unexpected and large import duty cut in July, a modest recovery in India's rural sector, re-stocking by the trade and the record high gold price all played a role. In terms of the intra-year trends, 2024 started on a strong note as the festive and wedding season in the first quarter, combined with a softer silver price, fueled demand, particularly in rural areas. This improvement in India's rural sector reflected higher farm output in several regions, which helped lift rural incomes and in turn their appetite for silver. Re-stocking by retailers after a relatively weak 2023 also helped fabrication jump during the initial months of 2024.

With the local silver price then rising swiftly and touching new record highs by early July, sentiment was notably impacted and retailers turned cautious ahead of the interim budget. However, the Indian government's surprise decision to cut the import duty on silver bullion from 15% to 6% in late July spurred a sharp recovery in demand as the domestic silver price fell notably. This in turn led the trade to re-stock aggressively as consumers rushed to buy in order to take advantage of the lower silver prices. Following this mixed

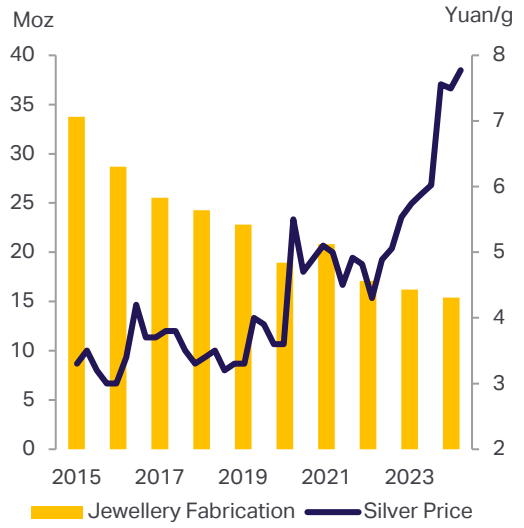
Contrasting Types of Silver Jewelry within India

Newer Styles

Traditional Styles

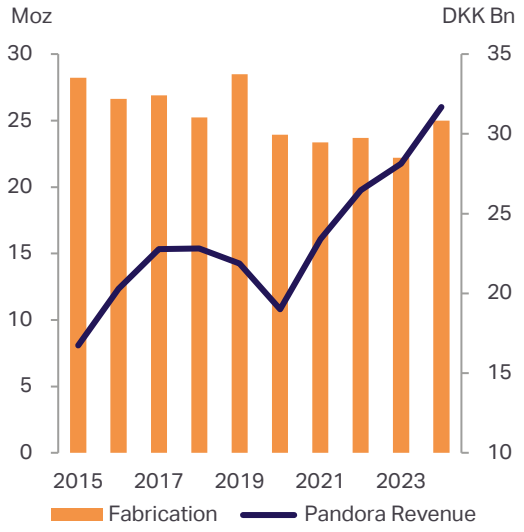
Images courtesy of Purple Jewels

Chinese Jewelry Fabrication



Source: Metals Focus, Bloomberg

Thai Jewelry Fabrication



Source: Metals Focus, Pandora A/S

H1.24, the second half of last year was generally stronger and in turn pushed the full-year total higher.

Some of the positive trends of the last few years also continued in 2024. One example is rising purities, due to higher penetration of 925 sterling silver in urban and semi-urban markets. Another is the still growing popularity of fashion silver jewelry. These often light-weight pieces, targeting the young urban consumer, continue to see very high growth rates. Gains in this segment have also been boosted by online retailers. Although not increasing at the same pace as daily wear fashion jewelry, demand for gold-plated silver jewelry also remained strong, a trend which we expect to continue given the surge in gold prices and the improved design offerings in this segment.

All of this has led to a growing number of stand-alone silver stores in India. Moreover, with organized gold retailers increasingly adding silver offerings to their showcases, this has helped fabrication as these retailers have aggressively increased their store count in recent years. That said, the rising silver price has weighed on certain categories of silver jewelry. For instance, for payals (an anklet), which have a dominant share in India's silver jewelry demand, higher prices have led fabricators to either opt for light-weighting or to reduce silver purities to offset the price impact.

This year, we expect fabrication to decline by a notable 15% to 74.7Moz (2,324t), a four-year low, as local silver prices achieve new highs and so consumers hold back on purchases. After a relatively strong 2024, restocking by retailers is also likely to be hit if silver prices continue to rise.

East Asia

Chinese silver jewelry fabrication recorded its third consecutive year of losses in 2024, falling by 5% to 15.4Moz (479t). The key headwinds were the (related) deteriorating economic outlook, impaired consumer sentiment and consumers' cautious spending on non-essential items. In addition, consumer attention increasingly centered on gold. Although China's gold jewelry consumption fell by 24% y/y in tonnage terms last year, demand in value terms only posted a mild decline of 3% and this was from 2023's record high. Furthermore, silver jewelry exports suffered a hefty decline, with most of the drop seen in shipments going to the US and Hong Kong.

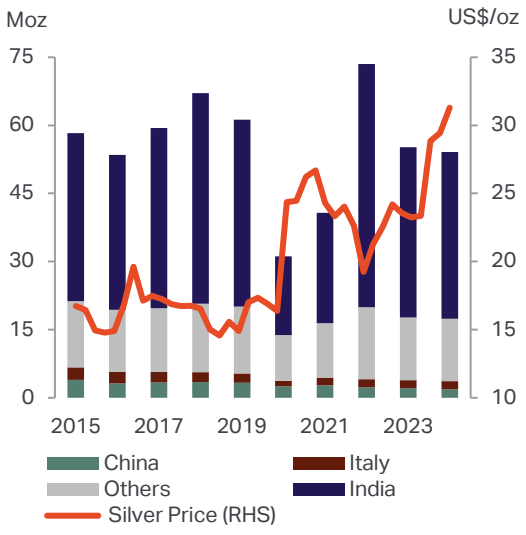
Demand losses were worst for retail stores as online channels continued to fare better due to price advantages, fashionable designs and the growing popularity of livestream sales. The resultant price competition led to further consolidation among retail stores, which meant many outlets being closed. There were also areas of outperformance at the product level, such as bangles for children, and designs with pearls and zircon. In addition and mirroring the growing popularity of yellow metal jewelry, there was a healthy rise in demand for gold-plated silver jewelry (mainly pieces similar to 24K gold

Global Silverware Fabrication Forecast

Million ounces	2024	2025F	Y/Y
Europe	3.2	3.2	-2%
North America	1.8	1.7	-1%
Middle East	2.6	2.4	-5%
South Asia	42.0	34.2	-18%
East Asia	3.5	3.4	-1%
CIS	0.7	0.6	-10%
Others	0.4	0.4	-1%
Global Total	**54.2**	**46.0**	**-15%**

Source: Metals Focus

Global Silverware Fabrication



Source: Metals Focus, Bloomberg

jewelry designs). For 2025, we expect a 3% fall in silver jewelry demand due to consumers' ongoing focus on gold, the supply chain's lower investment in marketing and product development, and an economic slowdown.

After declining in 2023, **Thai** silver jewelry fabrication rose by 13% to 25.1Moz (779t), its highest since 2019. This was driven by increased demand from key Western markets such as the US, Germany and the UK. Discussions with Thai factories indicated that a relative improvement in consumer sentiment and retailer restocking contributed to this rebound. This marks a turnaround from the prior two years when many Western retailers were cautious about building inventory, causing stocks to fall below average.

Another key trend was India's emergence as a top buyer of Thai silver jewelry. In 2024, India imported $367m worth of silver jewelry, up 78% y/y and 280% higher on 2022. This reflected the impact of the India-ASEAN Free Trade Agreement, which allows duty-free imports of Thai silver jewelry, versus a 20% duty on jewelry and 6% on bullion. While much of this jewelry is for domestic consumption, some is reportedly being melted into bars for resale in the local market. A third supportive factor was consumption in Thailand remaining strong for a second consecutive year, in part as high gold prices have encouraged some consumers to shift to fashion silver jewelry. Looking ahead, silver jewelry fabrication in Thailand is expected to grow by 3% in 2025, driven by sustained demand from Western and Indian markets.

Indonesian jewelry demand rose for the third year in a row, by 2% to 4.7Moz (147t), although that is still below pre-pandemic levels. Western purchases slowed but Indian buying grew. Under the India-ASEAN FTA, Indian importers pay 0% duty on Indonesian pieces, compared to 20% from elsewhere.

Silverware

Silverware fabrication in 2024 eased by just 2% to a three-year low of 54.2Moz (1,684t). Much of the fall was due to the modest 2% dip in India, but many other countries (for example Turkey) saw heavy, often price-driven losses. That said, some countries (for example Nepal) saw gains. This overall resilience looks set to fade this year, with demand currently forecast to fall by a notable 15% (mostly through price-led losses in India).

India's silverware demand in 2024 fell for a second consecutive year (if at a slower pace), dipping by 2% to 36.7Moz (1,143t). While down, demand is perhaps best viewed as surprisingly resilient given record-high silver prices. The annual average domestic price rose by 18% and briefly crossed the psychological threshold of Rs.100,000/kg. The market showed two contrasting trends. Consumer demand (which is largely driven by gifting) was severely impacted by high prices. To manage costs, buyers opted for lighter-weight pieces, and fabricators adapted by promoting hollow items

Examples of Indian Silverware

Photos courtesy of Purple Jewels.

over solid ones, particularly in the artifacts category. This shift led to a 5-7% reduction in the average weight. In contrast, demand from the trade remained strong. Over the past few years, standalone silver jewelry and silverware stores have expanded rapidly in tier-1 and tier-2 cities. This trend accelerated in 2024, supporting fabrication activity. Many new retailers are also focusing exclusively on 925 sterling silver products, further boosting silver consumption. The outlook for 2025 appears challenging. With prices expected to remain above Rs.100,000/kg and sentiment already weak, retailers are likely to hold back on expansion plans. We expect a steeper 22% decline in demand this year to 28.7Moz (892t), its lowest since 2021.

Nepal's silverware offtake grew by 13% to 4.9Moz (153t) mainly as gifting demand shifted from gold to silver, especially for weddings. Better availability of silver, after an increase in import quotas, also helped. This momentum should continue in 2025 with growth of 8% forecast.

Chinese demand fell by 10% in 2024 to 1.9Moz (59t) due to poor consumer sentiment and a weak gifting market, and despite online livestream sales continuing to improve. Some daily-use products also outperformed thanks to marketing activities centered on silver's antibacterial characteristics. For 2025, we expect another 5% decline in demand due to economic weakness.

European demand fell by a further 4% in 2024 to a level less than half that of 2010. All research contacts reported ongoing losses for mainstream items due to structural factors, which were only made worse by price strength. Some noted resilience for high end branded items however. **US** demand also flatlined as structural factors and the price hit offtake. Western fabrication is forecast to fall further this year, with the price again a key driver.

In the **Middle East**, silverware fabrication declined by 16% in 2024 to 2.6Moz (80t) due to a noteworthy drop in Turkish and Israeli demand of 12% and 26% respectively, chiefly because of falling export demand.

Silverware Fabrication

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
India	37.0	34.1	39.7	46.4	41.2	17.4	24.4	53.6	37.5	36.8	-2%
Nepal	4.3	4.0	4.6	5.4	4.8	2.0	2.8	6.2	4.3	4.9	13%
China	3.9	3.1	3.4	3.5	3.3	2.5	2.7	2.3	2.1	1.9	-10%
Italy	2.7	2.5	2.3	2.2	2.0	1.3	1.7	1.7	1.8	1.8	-1%
United States	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1%
Others	9.0	8.5	8.2	8.4	8.7	6.7	7.8	8.3	8.0	7.4	-7%
Global Total	**58.3**	**53.5**	**59.4**	**67.1**	**61.3**	**31.2**	**40.7**	**73.5**	**55.1**	**54.2**	**-2%**

Source: Metals Focus

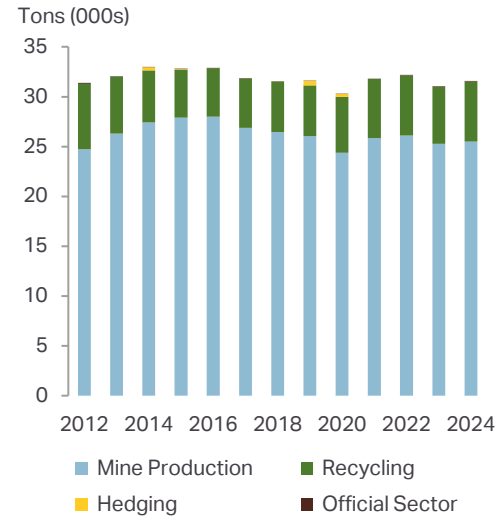
Appendices

Appendix 1 - Silver Supply and Demand

Tons	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025F	Year on Year 2024	Year on Year 2025F
Supply												
Mine Production	27,996	26,869	26,463	26,046	24,379	25,842	26,107	25,278	25,497	25,972	1%	2%
Recycling	4,861	4,984	5,049	5,095	5,615	5,932	6,020	5,708	6,032	6,009	6%	-0.4%
Net Hedging Supply	-	-	-	434	264	-	-	-	-	27	na	na
Net Official Sector Sales	33	33	37	32	37	48	54	51	46	48	-9%	4%
Total Supply	**32,890**	**31,886**	**31,549**	**31,606**	**30,296**	**31,821**	**32,181**	**31,037**	**31,574**	**32,056**	**2%**	**2%**
Demand												
Industrial (total)	15,273	16,421	16,354	16,342	15,921	17,546	18,422	20,439	21,165	21,070	4%	-0.5%
Electrical & Electronics	9,612	10,546	10,275	10,160	9,997	10,908	11,529	13,822	14,323	14,483	4%	1%
...of which photovoltaics	*2,537*	*3,088*	*2,706*	*2,330*	*2,575*	*2,766*	*3,672*	*5,993*	*6,147*	*6,086*	*3%*	*-1%*
Brazing Alloys & Solders	1,527	1,582	1,617	1,629	1,479	1,570	1,529	1,561	1,605	1,646	3%	3%
Other Industrial	4,134	4,293	4,462	4,553	4,445	5,067	5,363	5,056	5,237	4,941	4%	-6%
Photography	1,080	1,009	977	956	836	862	860	851	792	751	-7%	-5%
Jewelry	5,883	6,103	6,322	6,270	4,694	5,661	7,295	6,316	6,491	6,104	3%	-6%
Silverware	1,664	1,848	2,086	1,906	969	1,267	2,286	1,715	1,684	1,432	-2%	-15%
Coin & Net Bar Demand	6,621	4,844	5,160	5,828	6,474	8,844	10,522	7,599	5,939	6,359	-22%	7%
Net Hedging Demand	374	35	230	-	-	110	557	357	135	-	-62%	na
Total Demand	**30,896**	**30,260**	**31,129**	**31,302**	**28,894**	**34,289**	**39,943**	**37,276**	**36,207**	**35,716**	**-3%**	**-1%**
Market Balance	**1,995**	**1,625**	**421**	**304**	**1,402**	**-2,468**	**-7,762**	**-6,240**	**-4,632**	**-3,659**	**-26%**	**-21%**
Change in ETP Holdings	1,676	223	-666	2,590	10,299	2,020	-3,650	-1,171	1,914	2,177	na	14%
Market Balance less ETPs	**319**	**1,403**	**1,086**	**-2,286**	**-8,897**	**-4,488**	**-4,112**	**-5,069**	**-6,547**	**-5,837**	**29%**	**-11%**
Silver Price (US$/oz)*	17.14	17.05	15.71	16.21	20.55	25.14	21.73	23.35	28.27	-	21%	na

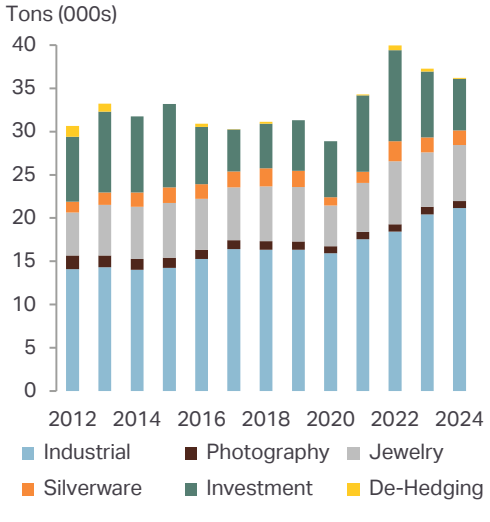
*London Price. Source: Metals Focus

Global Supply



Source: Metals Focus

Global Demand



Source: Metals Focus

Appendix 2 - Mine Production

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
North America											
Mexico	5,975	5,421	5,815	6,049	5,840	5,605	6,097	6,630	5,658	5,775	2%
United States	1,090	1,150	1,031	926	976	986	1,012	1,032	1,028	1,127	10%
Canada	369	361	393	368	419	293	284	269	221	295	33%
Sub-total	**7,433**	**6,931**	**7,240**	**7,343**	**7,235**	**6,884**	**7,392**	**7,932**	**6,907**	**7,197**	**4%**
Central & South America											
Peru	4,218	4,737	4,820	4,556	4,202	3,160	3,593	3,332	3,388	3,359	-1%
Bolivia	1,306	1,353	1,196	1,192	1,153	930	1,292	1,207	1,345	1,486	11%
Chile	1,496	1,448	1,257	1,243	1,189	1,474	1,281	1,290	1,616	1,342	-17%
Argentina	1,133	993	908	960	1,025	748	870	961	808	775	-4%
Brazil	49	77	86	71	69	67	69	64	97	103	7%
Dominican Republic	95	122	152	159	141	129	106	89	75	66	-13%
Panama	-	-	-	-	27	50	78	87	85	-	na
Guatemala	863	840	337	-	-	-	-	-	-	-	na
Others	80	64	62	77	92	93	129	134	144	142	-1%
Sub-total	**9,241**	**9,635**	**8,819**	**8,258**	**7,898**	**6,651**	**7,417**	**7,165**	**7,557**	**7,273**	**-4%**
Europe											
Poland	1,218	1,272	1,297	1,272	1,257	1,226	1,307	1,319	1,323	1,321	-0.1%
Sweden	492	511	484	467	446	417	432	456	392	362	-8%
Spain	44	46	59	75	84	107	123	108	115	110	-5%
Portugal	46	43	40	91	95	96	98	96	105	108	3%
Finland	3	3	3	2	33	50	46	46	46	37	-20%
Others	74	71	74	62	85	95	85	75	98	117	20%
Sub-total	**1,876**	**1,946**	**1,957**	**1,969**	**2,000**	**1,990**	**2,091**	**2,101**	**2,080**	**2,056**	**-1%**
Africa											
Morocco	281	311	319	243	284	249	248	271	277	266	-4%
Botswana	4	4	0	0	0	0	20	51	77	95	23%
Eritrea	98	98	79	54	50	72	75	55	66	83	26%
South Africa	58	60	68	51	62	39	41	52	55	44	-21%
Others	109	69	74	75	78	78	81	85	83	87	5%
Sub-total	**551**	**543**	**540**	**424**	**474**	**438**	**465**	**515**	**557**	**574**	**3%**
Commonwealth of Independent States											
Russia	1,590	1,450	1,305	1,341	1,391	1,309	1,212	1,280	1,191	1,275	7%
Kazakhstan	500	542	589	615	530	541	466	479	510	500	-2%
Uzbekistan	182	185	185	185	189	195	212	219	221	242	9%
Armenia	77	74	82	63	75	82	79	78	68	65	-5%
Kyrgyzstan	8	13	13	14	15	12	69	64	65	53	-19%
Others	38	47	49	50	50	52	53	52	29	28	-3%
Sub-total	**2,395**	**2,311**	**2,223**	**2,268**	**2,249**	**2,192**	**2,092**	**2,172**	**2,084**	**2,162**	**4%**

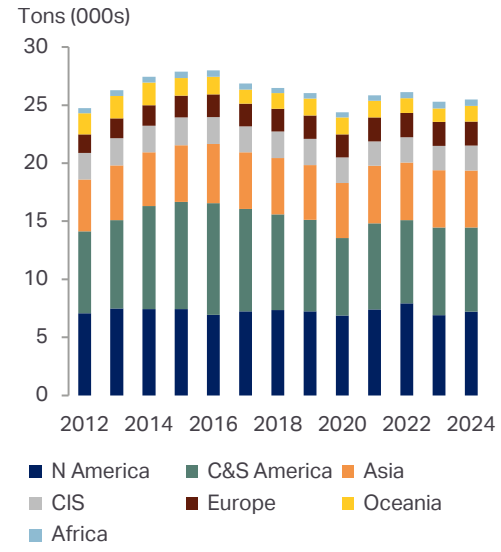
Source: Metals Focus

Appendix 2 - Mine Production (continued)

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Asia											
China	3,705	3,774	3,620	3,439	3,468	3,407	3,511	3,478	3,471	3,426	-1%
India	374	436	526	658	633	671	689	694	739	700	-5%
Indonesia	308	343	321	327	242	298	322	357	338	357	5%
Turkey	205	209	152	147	99	123	170	146	91	101	11%
Iran	67	77	79	79	82	84	85	86	97	96	-1%
Mongolia	62	68	54	53	51	51	55	51	57	67	18%
Philippines	30	35	32	30	31	24	31	56	46	54	17%
Laos	52	51	43	37	34	29	27	22	18	18	0.1%
Thailand	24	39	4	4	4	4	4	4	14	18	27%
Others	51	67	61	71	69	74	67	65	66	52	-22%
Sub-total	**4,878**	**5,100**	**4,891**	**4,845**	**4,714**	**4,765**	**4,960**	**4,958**	**4,937**	**4,889**	**-1%**
Oceania											
Australia	1,430	1,418	1,120	1,254	1,325	1,337	1,330	1,167	1,016	1,208	19%
Papua New Guinea	72	100	66	93	146	119	91	94	135	130	-3%
Others	17	13	13	9	5	2	3	4	6	7	15%
Sub-total	**1,520**	**1,531**	**1,199**	**1,356**	**1,476**	**1,459**	**1,424**	**1,265**	**1,156**	**1,345**	**16%**
Global Total	**27,894**	**27,996**	**26,869**	**26,463**	**26,046**	**24,379**	**25,842**	**26,107**	**25,278**	**25,497**	**1%**

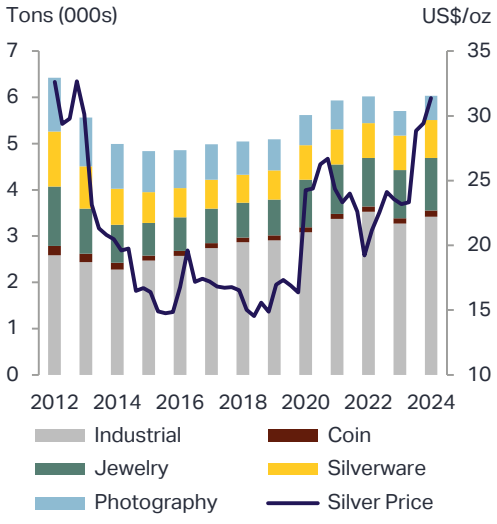
Source: Metals Focus

Mine Supply by Region



Source: Metals Focus

Recycling by Source



Source: Metals Focus, Bloomberg

Appendix 3 - Recycling

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Germany	307	303	291	306	307	297	302	304	321	377	18%
Italy	182	171	163	156	158	150	149	142	143	161	13%
UK	174	168	163	159	156	148	141	135	127	124	-3%
France	118	106	101	98	97	97	104	99	98	101	3%
Other	293	291	321	291	295	294	310	319	296	317	7%
Sub-total	**1,073**	**1,038**	**1,039**	**1,011**	**1,013**	**987**	**1,007**	**999**	**986**	**1,081**	**10%**
CIS											
Russia	208	203	246	310	264	290	319	351	316	332	5%
Others	43	45	54	59	57	63	69	75	68	71	5%
Sub-total	**251**	**247**	**300**	**369**	**321**	**353**	**388**	**426**	**384**	**403**	**5%**
North America											
United States	1,503	1,486	1,570	1,587	1,637	1,691	1,762	1,744	1,486	1,572	6%
Others	127	127	126	125	126	130	135	140	133	139	4%
Sub-total	**1,630**	**1,613**	**1,696**	**1,712**	**1,763**	**1,821**	**1,898**	**1,883**	**1,619**	**1,710**	**6%**
Middle East											
Turkey	77	78	78	83	83	77	84	67	71	75	6%
Others	94	109	108	95	100	119	144	124	134	150	12%
Sub-total	**171**	**187**	**185**	**177**	**183**	**197**	**228**	**192**	**205**	**225**	**10%**
South Asia											
India	144	153	167	196	205	495	457	480	529	533	1%
Others	10	10	13	14	15	80	69	73	81	84	3%
Sub-total	**154**	**163**	**180**	**210**	**220**	**576**	**526**	**553**	**610**	**617**	**1%**
East Asia											
China	750	747	738	746	769	848	1,019	1,157	1,162	1,233	6%
Japan	343	354	354	340	326	310	296	282	270	259	-4%
Taiwan	81	93	88	81	89	91	93	84	72	80	11%
Others	143	163	146	146	152	168	187	158	126	139	10%
Sub-total	**1,317**	**1,358**	**1,326**	**1,312**	**1,335**	**1,417**	**1,594**	**1,680**	**1,630**	**1,711**	**5%**
Other Regions											
C&S America	95	105	109	110	112	118	129	136	123	124	1%
Africa	86	89	90	89	89	95	112	101	103	111	7%
Oceania	61	61	60	60	58	53	49	49	47	50	6%
Sub-total	**242**	**254**	**258**	**258**	**260**	**266**	**291**	**286**	**273**	**285**	**4%**
Global Total	**4,837**	**4,861**	**4,984**	**5,049**	**5,095**	**5,615**	**5,932**	**6,020**	**5,708**	**6,032**	**6%**

Source: Metals Focus

Appendix 4 - Industrial Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Germany	812	818	841	868	809	948	1,104	962	972	973	0%
United Kingdom	461	492	595	626	692	721	797	722	295	712	141%
France	269	262	270	283	290	263	300	319	338	346	2%
Italy	264	261	271	282	286	242	286	299	299	293	-2%
Others	370	373	386	396	393	360	401	407	407	415	2%
Sub-total	**2,176**	**2,206**	**2,363**	**2,456**	**2,470**	**2,535**	**2,887**	**2,708**	**2,311**	**2,738**	**18%**
North America											
United States	2,840	3,404	3,502	3,601	3,535	3,616	3,815	3,975	4,166	3,918	-6%
Others	178	187	175	177	184	155	169	179	188	199	6%
Sub-total	**3,019**	**3,591**	**3,678**	**3,778**	**3,719**	**3,771**	**3,984**	**4,154**	**4,354**	**4,117**	**-5%**
East Asia											
China	3,555	3,576	4,017	4,191	4,218	4,133	4,738	5,739	8,014	8,567	7%
Japan	2,814	3,255	3,681	3,211	3,381	3,407	3,525	3,060	3,051	2,948	-3%
South Korea	590	561	593	595	571	541	582	629	607	625	3%
Taiwan	318	310	292	302	275	281	295	308	292	311	7%
Others	37	39	36	38	40	36	39	41	43	46	6%
Sub-total	**7,313**	**7,741**	**8,620**	**8,338**	**8,486**	**8,398**	**9,179**	**9,775**	**12,007**	**12,496**	**4%**
Other Regions											
South Asia	1,110	1,116	1,162	1,250	1,175	832	1,065	1,324	1,288	1,335	4%
Middle East	200	181	187	186	176	151	161	184	200	192	-4%
Oceania	133	136	132	136	139	111	131	140	137	141	3%
C&S America	215	223	201	128	88	49	55	60	63	67	6%
CIS	47	50	51	53	56	48	55	46	49	51	5%
Africa	31	29	29	30	32	27	28	30	29	29	-2%
Sub-total	**1,737**	**1,735**	**1,761**	**1,782**	**1,667**	**1,218**	**1,495**	**1,784**	**1,766**	**1,814**	**3%**
Global Total	**14,244**	**15,273**	**16,421**	**16,354**	**16,342**	**15,921**	**17,546**	**18,422**	**20,439**	**21,165**	**4%**

Appendix 5 - Electrical & Electronics Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
China/Hong Kong	2,092	2,207	2,649	2,759	2,741	2,514	2,801	3,869	6,084	6,577	8%
Japan	2,358	2,830	3,241	2,765	2,934	3,004	3,070	2,592	2,570	2,453	-5%
United States	1,460	2,021	2,080	2,136	2,040	2,072	2,203	2,300	2,350	2,425	3%
Germany	539	550	569	592	533	666	799	639	649	652	0%
India	424	428	444	475	422	365	464	534	566	594	5%
South Korea	265	259	268	262	246	229	247	270	267	259	-3%
Others	1,310	1,318	1,294	1,286	1,244	1,147	1,324	1,326	1,336	1,362	2%
Global Total	**8,447**	**9,612**	**10,546**	**10,275**	**10,160**	**9,997**	**10,908**	**11,529**	**13,822**	**14,323**	**4%**

Source: Metals Focus

Appendix 6 - Brazing Alloys & Solder Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
China	792	749	761	772	781	701	689	606	635	658	3%
United States	177	182	192	198	202	186	203	210	215	219	2%
Germany	137	133	132	130	126	135	146	156	158	159	1%
India	66	67	69	71	68	54	85	94	96	102	6%
South Korea	80	70	75	74	71	66	70	72	76	80	6%
Others	337	325	355	371	381	336	377	391	381	388	2%
Global Total	**1,589**	**1,527**	**1,582**	**1,617**	**1,629**	**1,479**	**1,570**	**1,529**	**1,561**	**1,605**	**3%**

Appendix 7 - Photographic Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe & N. America	847	755	696	666	641	634	636	617	609	552	-9%
East Asia	299	280	270	262	259	202	226	243	241	240	-1%
Others	41	45	42	49	56	-	-	-	-	-	
Global Total	**1,188**	**1,080**	**1,009**	**977**	**956**	**836**	**862**	**860**	**851**	**792**	**-7%**

Appendix 8a - Physical Investment*

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
United States	3,882	3,144	1,732	1,475	1,501	2,933	4,297	4,218	3,756	2,020	-46%
India	3,435	1,136	1,259	1,680	1,757	269	858	2,470	1,534	1,859	21%
Germany	735	810	760	857	1,177	1,445	1,564	1,522	414	308	-25%
Australia	133	158	104	111	109	354	497	644	385	289	-25%
Canada	237	225	147	142	156	232	329	374	244	200	-18%
China	434	429	292	280	245	269	243	229	192	172	-10%
Other Europe	242	398	330	402	416	389	471	510	420	362	-14%
Other Asia	258	269	214	227	423	415	397	374	307	336	9%
Others	56	60	53	49	38	103	109	161	155	155	0%
Global Total	**9,411**	**6,629**	**4,891**	**5,223**	**5,824**	**6,410**	**8,765**	**10,501**	**7,408**	**5,701**	**-23%**

Appendix 8b - Coins & Medals Fabrication

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
United States	1,527	1,225	601	532	637	1,018	1,001	656	905	888	-2%
India	224	220	257	328	351	161	210	524	367	459	25%
Canada	1,102	1,045	588	572	716	897	1,132	1,114	728	439	-40%
Australia	394	409	333	325	394	537	622	751	478	311	-35%
United Kingdom	109	109	96	109	99	302	489	620	458	211	-54%
China	426	400	268	269	226	251	227	219	178	151	-15%
South Africa	18	0	36	116	112	244	320	238	105	84	-20%
Germany	60	135	125	125	120	120	120	120	90	80	-11%
Austria	227	107	64	65	90	224	382	381	311	64	-79%
Others	243	216	207	216	247	237	272	293	274	262	-4%
Global Total	**4,328**	**3,867**	**2,575**	**2,656**	**2,993**	**3,991**	**4,774**	**4,918**	**3,894**	**2,949**	**-24%**

Source: Metals Focus. *These figures differ to coin + net bar demand as they exclude commemorative coins but take into account swings in dealer stocks.

Appendix 9 - Jewelry Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
Europe											
Italy	622	586	605	601	619	504	655	677	655	637	-3%
Germany	108	104	107	108	109	95	112	107	101	106	5%
Others	209	204	205	203	203	169	197	211	218	211	-3%
Sub-total	**938**	**894**	**917**	**912**	**931**	**768**	**964**	**995**	**974**	**955**	**-2%**
North America											
United States	425	403	410	404	402	359	412	398	348	352	1%
Canada	110	112	105	101	101	83	115	114	127	133	5%
Mexico	177	180	153	155	139	97	68	72	77	81	6%
Sub-total	**711**	**695**	**668**	**659**	**642**	**539**	**595**	**584**	**552**	**566**	**3%**
Middle East											
Turkey	208	152	153	184	186	138	215	225	214	193	-10%
Others	97	92	87	112	100	87	104	122	126	104	-18%
Sub-total	**305**	**244**	**240**	**296**	**286**	**225**	**318**	**347**	**340**	**296**	**-13%**
South Asia											
India	1,760	1,677	1,995	2,256	2,148	1,260	1,827	3,472	2,604	2,734	5%
Others	65	62	73	83	79	46	65	107	102	110	8%
Sub-total	**1,825**	**1,739**	**2,069**	**2,339**	**2,227**	**1,307**	**1,892**	**3,579**	**2,706**	**2,844**	**5%**
East Asia											
Thailand	877	828	837	785	886	745	726	737	691	779	13%
China	1,050	893	794	755	709	589	648	531	504	479	-5%
Indonesia	152	163	157	163	175	149	117	128	145	148	2%
Others	187	177	179	179	183	157	165	166	164	170	4%
Sub-total	**2,267**	**2,060**	**1,967**	**1,881**	**1,953**	**1,639**	**1,656**	**1,562**	**1,504**	**1,576**	**5%**
Other Regions	**253**	**251**	**243**	**234**	**232**	**216**	**236**	**227**	**240**	**254**	**6%**
Global Total	**6,300**	**5,883**	**6,103**	**6,322**	**6,270**	**4,694**	**5,661**	**7,295**	**6,316**	**6,491**	**3%**

Appendix 10 - Silverware Demand

Tons	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Y/Y
India	1,151	1,061	1,236	1,442	1,282	541	758	1,667	1,167	1,143	-2%
Nepal	134	123	143	167	149	63	88	193	135	153	13%
China	122	98	105	107	103	77	85	72	65	59	-10%
Italy	86	78	71	68	63	39	53	54	56	55	-1%
United States	40	40	40	39	39	40	41	43	43	43	1%
Turkey	19	17	17	22	29	26	39	47	49	43	-12%
Others	262	248	236	241	240	183	204	211	200	188	-6%
Global Total	**1,813**	**1,664**	**1,848**	**2,086**	**1,906**	**969**	**1,267**	**2,286**	**1,715**	**1,684**	**-2%**

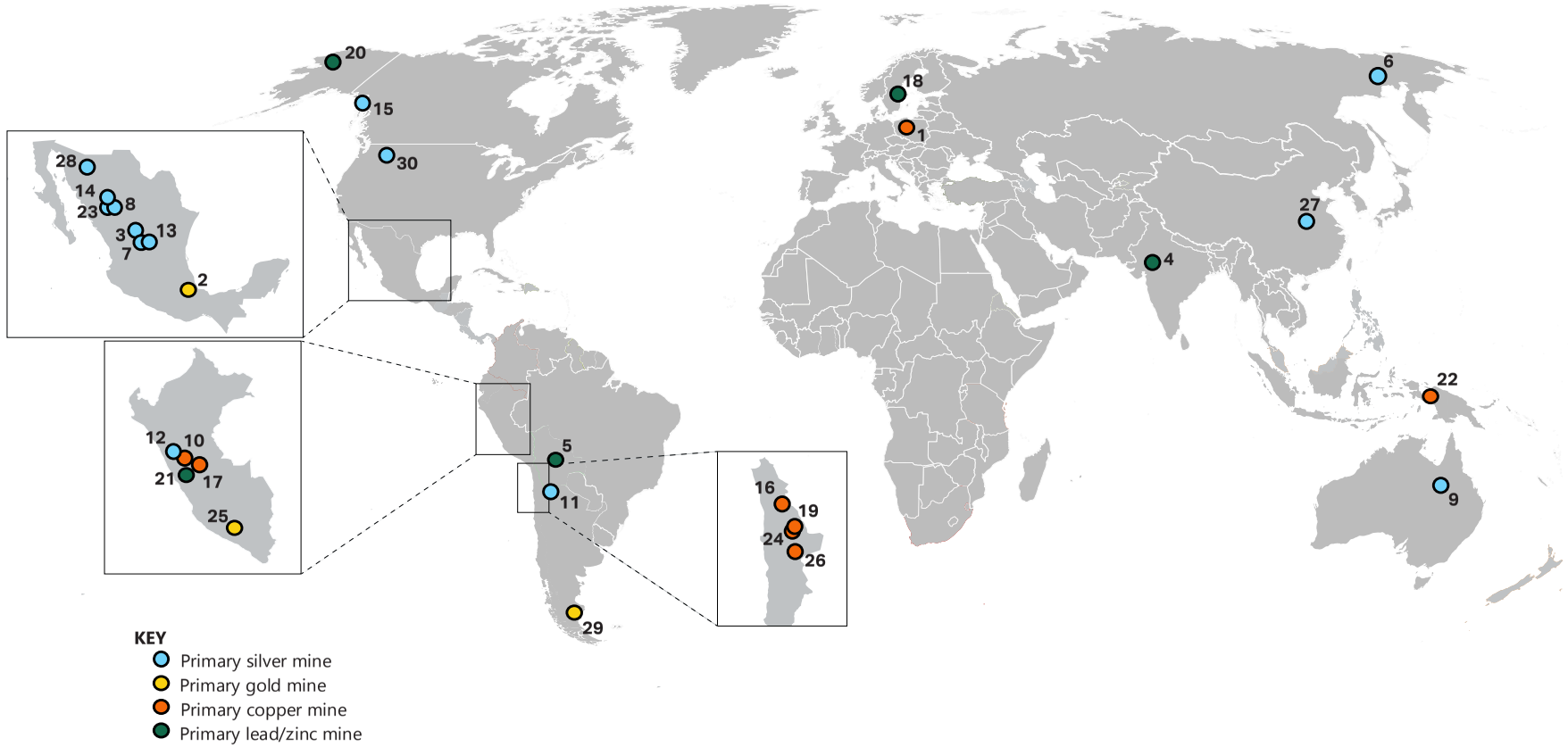
Source: Metals Focus

Appendix 11 - Top 30 Silver Producing Mines

				Million ounces		
	Mine	**Country**	**Ownership**	**2023**	**2024**	**Y/Y**
1	KGHM Consolidated[1]	Poland	KGHM Polska Miedź (100%)	41.1	41.0	0%
2	Peñasquito	Mexico	Newmont (100%)	18.0	33.0	83%
3	Juanicipio	Mexico	Fresnillo (56%) / MAG Silver (44%)	16.8	18.6	10%
4	Sindesar Khurd[2,3]	India	Hindustan Zinc (100%)	19.0	18.0	-5%
5	San Cristobal	Bolivia	San Cristobal Mining (100%)	12.6	16.8	33%
6	Dukat[2]	Russia	Polymetal JSC (100%)	14.9	14.6	-2%
7	Saucito	Mexico	Fresnillo (100%)	12.1	14.5	20%
8	San Julian	Mexico	Fresnillo (100%)	13.3	11.8	-11%
9	Cannington[1]	Australia	South32 (100%)	12.4	11.6	-7%
10	Antamina	Peru	Glencore (33.75%) / BHP (33.75%) / Teck Resources (22.5%)[4]	11.6	11.4	-2%
11	Puna	Argentina	SSR Mining (100%)	9.7	10.5	8%
12	Uchucchacua	Peru	Buenaventura (100%)	2.6	10.5	304%
13	Fresnillo	Mexico	Fresnillo (100%)	12.8	10.2	-20%
14	Cerro Los Gatos	Mexico	Gatos Silver (70%) / Dowa Metals and Mining (30%)	9.2	9.7	5%
15	Greens Creek	United States	Hecla Mining (100%)	9.7	8.5	-13%
16	Collahuasi	Chile	Glencore (44%) / Anglo American (44%) / Mitsui & Co (12%)	9.2	8.3	-9%
17	Toromocho	Peru	Chinalco (100%)	7.1	8.3	16%
18	Garpenberg	Sweden	Boliden (100%)	7.4	8.2	11%
19	Chuquicamata[1]	Chile	Codelco (100%)	7.9	8.2	4%
20	Red Dog[2]	United States	Teck Resources (100%)	6.7	7.3	8%
21	Yauli	Peru	Volcan Compañía Minera (100%)	7.8	7.0	-10%
22	Grasberg[6]	Indonesia	Government of Indonesia (51.2%)[6]	6.0	6.9	15%
23	Palmarejo	Mexico	Coeur Mining (100%)	6.6	6.8	3%
24	Ministro Hales[2]	Chile	Codelco (100%)	6.2	6.5	4%
25	Inmaculada	Peru	Hochschild Mining (100%)	5.5	6.4	15%
26	Escondida	Chile	BHP (57.5%) / Rio Tinto (30%) / JECO (10%) / JECO 2 Ltd (2.5%)	4.9	6.0	23%
27	Ying	China	Silvercorp Metals (77.5%)[7]	5.6	5.9	6%
28	Las Chispas[2]	Mexico	SilverCrest Metals (100%)	5.7	5.7	0%
29	Cerro Vanguardia[2]	Argentina	AngloGold Ashanti (92.5%) / Formicruz (7.5%)	4.6	5.2	13%
30	Lucky Friday	United States	Hecla Mining (100%)	3.1	4.9	58%

NB: All numbers are silver contained in concentrate or doré unless stated otherwise, 1: Payable metal, 2: Estimate, 3: Refined silver, 4: Mitsubishi Corporation (10%), 5: Silver sold, 6: Freeport McMoRan Copper & Gold (48.8%), 7: Henan Non-Ferrous Geological & Mineral Resources Co (22.5%)

Appendix 11 - Top 30 Silver Producing Mines



Source: Company Reports, Metals Focus

Appendix 12a - Top 20 Producing Companies

Tons	2023	2024	Y/Y
Fresnillo[1]	1,663	1,688	2%
KGHM Polska Miedz[2]	1,428	1,341	-6%
Newmont	560	1,026	83%
Hindustan Zinc[3,4,5]	739	700	-5%
Pan American Silver	636	655	3%
Southern Copper	573	653	14%
CODELCO[5]	596	617	4%
Polymetal JSC[5,6]	551	602	9%
Glencore	622	600	-4%
San Cristobal Mining	391	523	33%
Industrias Peñoles[7]	589	508	-14%
Hecla Mining	446	503	13%
Buenaventura	249	456	83%
Volcan Cia Minera	473	432	-9%
BHP[8]	368	411	12%
South32[8]	404	379	-6%
Nexa Resources	320	364	14%
Coeur Mining	319	355	11%
Boliden	322	348	8%
SSR Mining	301	327	8%

NB: 1 - Excludes Silverstream contract, 2 - KGHM Group figures including Polish and international operations, 3 - Hindustan Zinc is a Vedanta Group company, 4 - Refined Silver, 5 - Estimate, 6 - Polymetal JSC is a wholly-owned subsidiary of Mangazeya JSC, 7 - Excludes 100% Fresnillo, 8 - Payable Silver
Source: Company Reports, Metals Focus

Appendix 12b - Top 20 Producing Countries

Tons	2023	2024	Y/Y
Mexico	5,658	5,775	2%
China	3,471	3,426	-1%
Peru	3,388	3,359	-1%
Bolivia	1,345	1,486	11%
Chile	1,616	1,342	-17%
Poland	1,323	1,321	0%
Russia	1,191	1,275	7%
Australia	1,016	1,208	19%
United States	1,028	1,127	10%
Argentina	808	775	-4%
India	739	700	-5%
Kazakhstan	510	500	-2%
Sweden	392	362	-8%
Indonesia	338	357	5%
Canada	221	295	33%
Morocco	277	266	-4%
Uzbekistan	221	242	9%
Papua New Guinea	135	130	-3%
Spain	115	110	-5%
Portugal	105	108	3%
Others	1,381	1,332	-4%
Global Total	**25,278**	**25,497**	**1%**

Source: Metals Focus

Appendix 12c - Mine Production Forecast by Region

Tons	2024	2025F	Y/Y
N America	7,197	7,715	7%
C&S America	7,273	7,079	-3%
Asia	4,889	4,957	1%
CIS	2,162	2,277	5%
Europe	2,056	2,071	1%
Oceania	1,345	1,189	-12%
Africa	574	686	19%
Global Total	**25,497**	**25,972**	**2%**

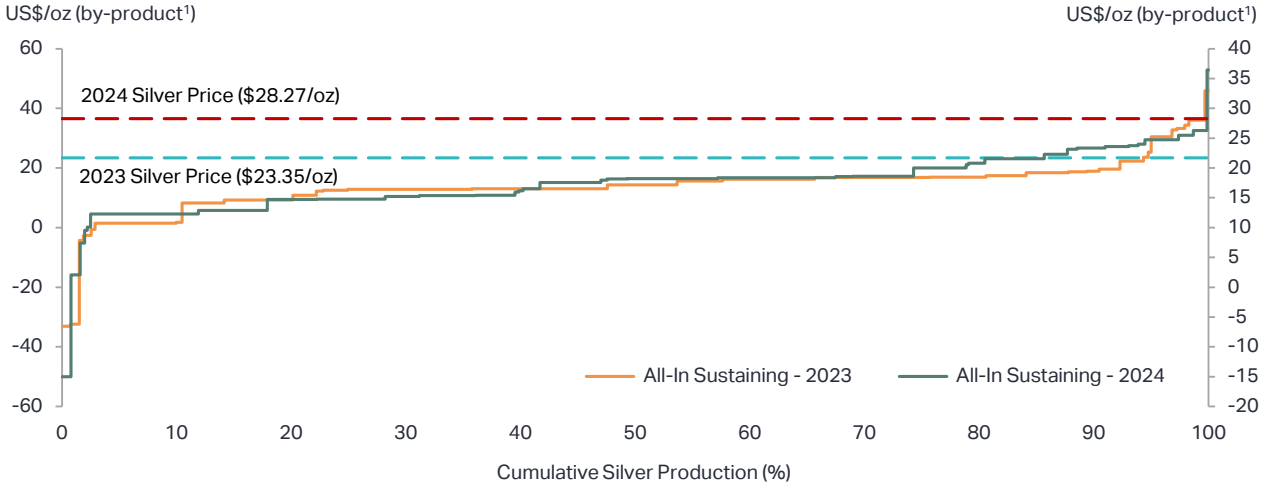
Source: Metals Focus

Appendix 13 - Primary Silver Production Costs (by-product[1])

US$/oz (by-product)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Year on Year 2023	Year on Year 2024
North America												
Total Cash Cost	6.43	3.47	2.17	2.64	4.27	3.61	4.11	5.65	9.47	7.51	68%	-21%
Total Production Cost	11.66	8.56	8.09	8.44	10.73	10.04	10.56	11.54	15.68	13.91	36%	-11%
All-In Sustaining Cost	12.55	8.51	9.20	10.53	12.17	10.96	13.13	14.56	18.17	14.67	25%	-19%
Central & South America												
Total Cash Cost	9.62	7.50	7.65	5.96	7.51	9.36	8.78	9.28	9.27	8.84	0%	-5%
Total Production Cost	13.97	10.49	10.65	9.10	11.28	14.26	12.49	12.47	13.31	12.82	7%	-4%
All-In Sustaining Cost	14.60	11.73	12.61	11.30	12.44	16.02	14.19	15.56	16.15	16.14	4%	-0.1%
CIS												
Total Cash Cost	4.98	4.35	6.98	7.60	8.54	7.64	5.71	9.10	12.93	12.58	42%	-3%
Total Production Cost	6.39	5.81	9.19	10.28	10.34	9.31	7.88	12.09	15.92	15.56	32%	-2%
All-In Sustaining Cost	6.41	5.85	9.46	9.76	11.28	9.81	8.93	12.88	17.05	16.69	32%	-2%
Asia												
Total Cash Cost	1.11	-2.02	-4.58	-4.42	-2.36	-0.99	-0.32	0.14	0.37	-0.02	171%	na
Total Production Cost	4.92	0.88	-1.84	-1.29	0.84	2.66	3.72	3.40	3.64	3.24	7%	-11%
All-In Sustaining Cost	9.59	3.53	3.61	1.51	3.65	5.60	6.09	7.49	8.76	9.55	17%	9%
Oceania												
Total Cash Cost	2.16	-1.89	-2.12	-3.12	3.46	0.24	-6.52	-5.12	2.34	1.23	na	-47%
Total Production Cost	4.59	1.23	2.19	0.55	8.66	14.84	12.53	5.48	8.30	8.78	51%	6%
All-In Sustaining Cost	5.52	1.23	2.83	2.66	9.14	6.71	-2.90	1.45	8.79	5.78	506%	-34%
Global Total												
Total Cash Cost	6.90	4.47	3.95	3.38	5.21	4.68	4.36	5.85	8.97	7.64	53%	-15%
Total Production Cost	11.10	8.20	8.39	7.96	10.33	10.83	10.66	11.13	14.36	13.20	29%	-8%
All-In Sustaining Cost	11.58	8.55	9.78	9.84	11.61	11.19	11.49	13.54	16.78	14.58	24%	-13%

Source: Metals Focus

Global Primary Silver Mine Production Costs (by-product), 2024 vs. 2023



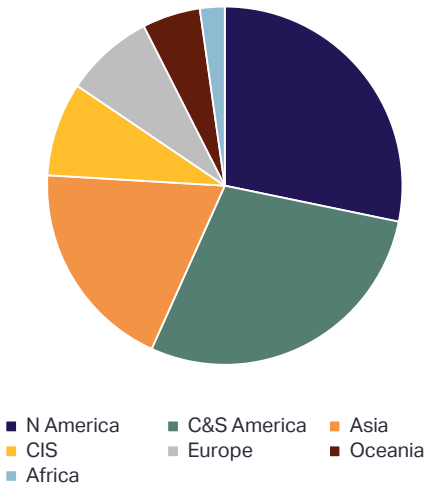
1: Costs shown on a by-product accounting basis; Source: Metals Focus Silver Mine Cost Service

Appendix 14 - Mine Production by Region & Primary Metal

Million ounces	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Year on Year 2023	Year on Year 2024
Regional Breakdown												
North America	239.0	222.8	232.8	236.1	232.6	221.3	237.7	255.0	222.1	231.4	-13%	4%
C&S America	297.1	309.8	283.5	265.5	253.9	213.8	238.5	230.4	243.0	233.8	5%	-4%
Asia	156.8	164.0	157.3	155.8	151.6	153.2	159.5	159.4	158.7	157.2	-0.4%	-1%
CIS	77.0	74.3	71.5	72.9	72.3	70.5	67.3	69.8	67.0	69.5	-4%	4%
Europe	60.3	62.6	62.9	63.3	64.3	64.0	67.2	67.6	66.9	66.1	-1%	-1%
Oceania	48.9	49.2	38.6	43.6	47.4	46.9	45.8	40.7	37.2	43.2	-9%	16%
Africa	17.7	17.5	17.4	13.6	15.2	14.1	15.0	16.6	17.9	18.5	8%	3%
Global Total	**896.8**	**900.1**	**863.9**	**850.8**	**837.4**	**783.8**	**830.8**	**839.4**	**812.7**	**819.7**	**-3%**	**1%**
Global Breakdown												
Primary Silver	291.0	288.4	263.6	247.0	236.1	207.7	232.7	239.3	231.1	227.5	-3%	-2%
Gold	150.4	135.0	131.1	131.4	130.9	123.5	127.8	127.7	113.2	127.1	-11%	12%
Copper	188.9	205.5	199.6	197.3	192.8	207.5	213.6	217.8	223.3	219.4	3%	-2%
Lead/Zinc	261.3	264.7	262.8	268.0	272.5	240.3	252.4	250.2	240.9	241.3	-4%	0%
Other	5.3	6.5	6.7	7.0	5.1	4.8	4.2	4.3	4.2	4.4	-3%	6%
Global Total	**896.8**	**900.1**	**863.9**	**850.8**	**837.4**	**783.8**	**830.8**	**839.4**	**812.7**	**819.7**	**-3%**	**1%**
Global Breakdown (Percentage)												
Primary Silver	32.4%	32.0%	30.5%	29.0%	28.2%	26.5%	28.0%	28.5%	28.4%	27.8%		
Gold	16.8%	15.0%	15.2%	15.4%	15.6%	15.8%	15.4%	15.2%	13.9%	15.5%		
Copper	21.1%	22.8%	23.1%	23.2%	23.0%	26.5%	25.7%	25.9%	27.5%	26.8%		
Lead/Zinc	29.1%	29.4%	30.4%	31.5%	32.5%	30.7%	30.4%	29.8%	29.6%	29.4%		
Other	0.6%	0.7%	0.8%	0.8%	0.6%	0.6%	0.5%	0.5%	0.5%	0.5%		

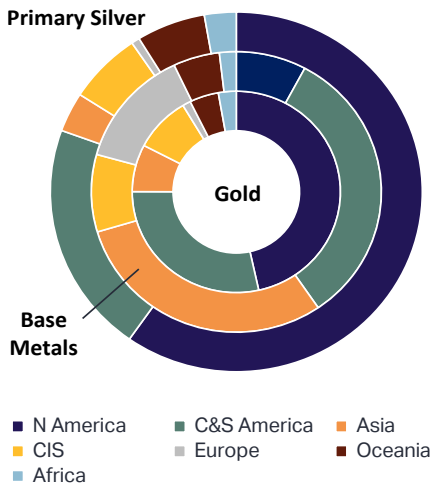
Source: Metals Focus

Mine Production by Region in 2024



Source: Metals Focus

Mine Production by Source Metal and Region in 2024



Source: Metals Focus

Appendix 15 - LBMA & CME Silver Prices

US$/oz	LBMA[1]			CME[2]		
Year/Month	**Low**	**High**	**Average**	**Low**	**High**	**Average**
2007	11.67	15.82	13.38	11.50	15.55	13.47
2008	8.88	20.92	14.99	8.79	20.79	15.00
2009	10.51	19.18	14.67	10.44	19.33	14.71
2010	15.14	30.70	20.19	14.83	30.94	20.26
2011	26.16	48.70	35.12	26.81	48.60	35.27
2012	26.67	37.23	31.15	26.29	37.21	31.19
2013	18.61	32.23	23.79	18.55	32.44	23.78
2014	15.28	22.05	19.08	15.41	22.09	19.07
2015	13.71	18.23	15.68	13.70	18.36	15.68
2016	13.58	20.71	17.14	13.75	20.70	17.18
2017	15.22	18.56	17.05	15.43	18.51	17.08
2018	13.97	17.52	15.71	13.98	17.62	15.72
2019	14.38	19.31	16.21	14.32	19.55	16.24
2020	12.01	28.89	20.55	11.77	29.26	20.72
2021	21.53	29.59	25.14	21.49	29.42	25.17
2022	17.77	26.18	21.73	17.67	26.90	21.82
2023	20.09	26.03	23.35	20.15	26.23	23.58
2024	22.09	34.51	28.27	22.15	35.04	28.53
Jan-24	22.20	23.95	22.95	22.30	23.95	23.02
Feb-24	22.09	23.23	22.68	22.15	23.48	22.80
Mar-24	22.72	25.43	24.45	23.36	25.38	24.71
Apr-24	25.65	29.03	27.58	25.07	29.13	27.68
May-24	26.24	32.01	29.40	26.69	32.43	29.61
Jun-24	28.84	30.44	29.59	29.07	31.37	29.84
Jul-24	27.76	31.06	29.75	27.87	31.69	29.96
Aug-24	26.93	29.90	28.52	26.94	30.45	28.84
Sep-24	28.08	32.48	30.01	28.18	32.43	30.42
Oct-24	30.67	34.51	32.41	30.60	35.04	32.64
Nov-24	29.99	32.84	31.13	30.43	32.78	31.34
Dec-24	28.80	31.90	30.46	29.24	32.97	30.95
Jan-25	29.41	31.61	30.37	29.90	32.49	31.03
Feb-25	31.14	33.11	32.18	31.50	33.81	32.73

1: Prices are based on the daily London Silver Fixing and (since 08/15/2014) the daily LBMA Silver Price.
2: Prices are based on the generic 1st futures contract.
Source: LBMA, CME Group, Bloomberg

Appendix 16 - Nominal Silver Prices

Year	Average[1] US$/oz	Low[2] US$/oz	High[2] US$/oz	€/kg[3]	CNY/kg[4]	INR/kg	JPY/g	A$/oz	MXN/oz	PEN/oz
1992	3.95	3.65	4.34	96.01	701.10	3,563	16.08	5.37	12.21	5.95
1993	4.31	3.56	5.50	116.86	801.22	4,334	15.33	6.34	13.43	8.60
1994	5.28	4.54	5.95	141.23	1,462.51	5,335	17.36	7.22	17.90	11.61
1995	5.20	4.32	6.15	125.98	1,394.85	5,419	15.71	7.01	33.34	11.71
1996	5.20	4.68	5.88	129.41	1,389.91	5,917	18.16	6.64	39.48	12.69
1997	4.90	4.18	6.40	139.28	1,305.19	5,726	19.09	6.59	38.78	13.01
1998	5.54	4.60	7.93	160.42	1,473.76	7,322	23.31	8.80	50.66	16.21
1999	5.22	4.84	5.81	157.47	1,388.99	7,227	19.08	8.09	49.85	17.65
2000	4.95	4.56	5.56	172.64	1,318.16	7,152	17.16	8.51	46.85	17.28
2001	4.37	4.04	4.86	156.90	1,162.98	6,628	17.06	8.44	40.79	15.33
2002	4.60	4.23	5.15	156.79	1,223.84	7,185	18.50	8.45	44.46	16.17
2003	4.88	4.34	6.01	138.66	1,297.84	7,294	18.14	7.47	52.65	16.96
2004	6.66	5.46	8.45	172.08	1,771.68	9,693	23.12	9.03	75.16	22.71
2005	7.31	6.33	9.27	189.58	1,924.82	10,378	25.97	9.59	79.63	24.10
2006	11.55	8.69	15.22	295.04	3,091.08	16,831	43.17	15.33	125.96	37.81
2007	13.38	11.06	16.22	314.15	3,029.76	17,779	50.64	15.95	146.26	41.87
2008	14.99	8.46	21.36	324.36	3,014.45	20,648	50.16	17.59	167.31	43.81
2009	14.67	10.35	19.46	336.95	2,810.23	22,768	44.01	18.50	198.11	44.16
2010	20.19	14.66	30.95	489.62	3,920.91	29,632	56.54	21.93	255.04	57.03
2011	35.12	26.09	49.80	809.49	6496.25	52,523	89.92	34.00	437.00	96.70
2012	31.15	26.15	37.48	778.30	5,532.74	53,380	79.93	30.07	409.80	82.17
2013	23.79	18.22	32.46	576.50	4,132.84	44,480	74.25	24.58	303.63	64.32
2014	19.08	14.42	22.18	460.87	3,421.89	37,405	64.64	21.14	254.00	54.17
2015	15.68	13.65	18.49	454.23	2,918.65	32,289	61.00	20.84	249.01	49.95
2016	17.14	13.75	21.14	497.60	3,262.84	37,004	59.56	23.03	320.28	57.83
2017	17.05	15.19	18.65	486.59	3,356.49	35,700	61.46	22.23	322.44	55.59
2018	15.71	13.90	17.70	427.23	3,094.63	34,462	55.73	21.01	302.06	51.63
2019	16.21	14.29	19.65	465.80	3,416.90	36,719	56.77	23.31	311.99	54.08
2020	20.55	11.64	29.86	575.02	4,149.86	48,907	70.33	29.73	441.46	71.82
2021	25.14	21.42	30.10	682.61	4,608.13	59,729	88.66	33.46	509.90	97.66
2022	21.73	17.56	26.94	662.22	4,176.88	54,813	91.33	31.28	437.06	83.34
2023	23.35	19.90	26.14	694.09	4,919.81	61,981	105.56	35.14	414.20	87.40
2024	28.27	21.93	34.90	840.14	6,390.26	76,069	137.82	42.86	518.21	106.11

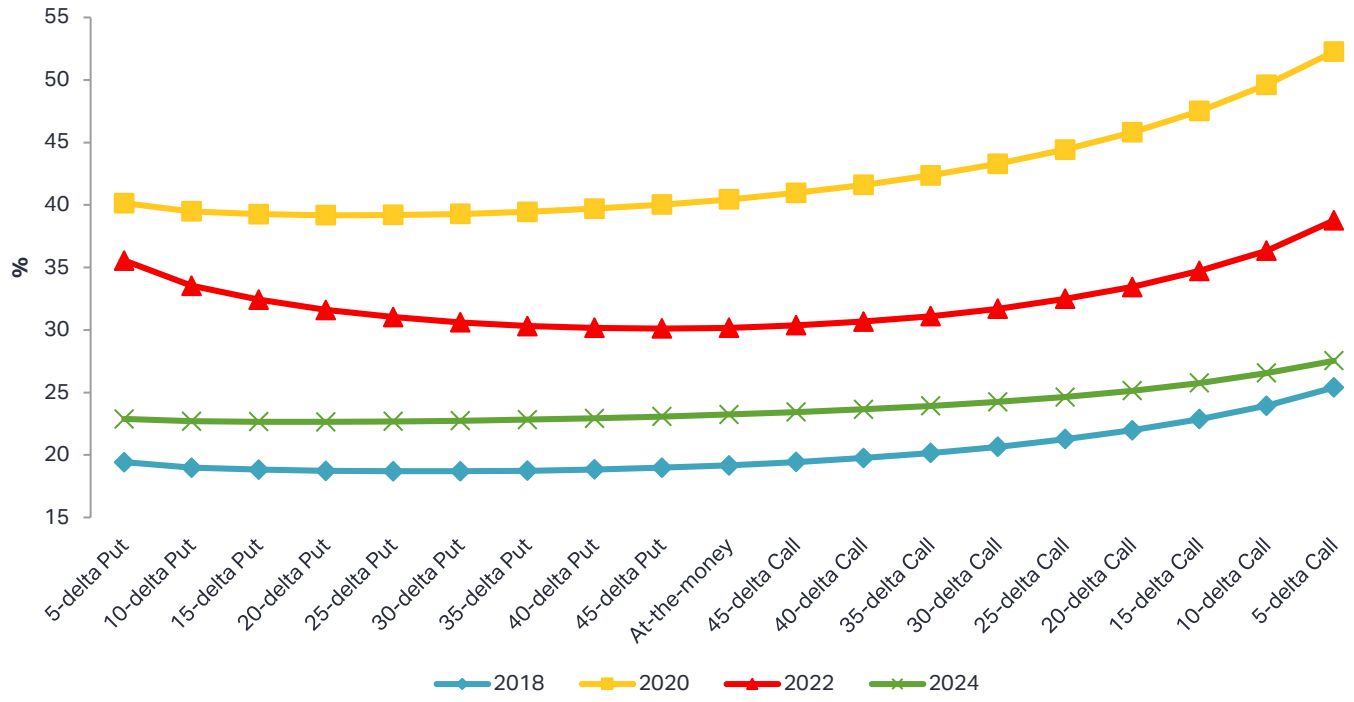
1: Average US$ prices are based on the daily London Silver Fixing and (since 08/15/2014) the daily LBMA Silver Price. Unless otherwise specified, these US$ prices in conjunction with Bloomberg Closing exchange rates have been used to illustrate annual average prices in other currencies.
2: High and low derived from intra-day spot prices
3: Euro price based on euro-quoted LBMA PM Fix from 1999 onwards and the dollar price converted into euros using Bloomberg synthetic exchange rates prior to that time
4: CNY price is the SGE AG (T+D) from 2006 onwards and based on London Silver Fixing converted into renminbi using Bloomberg exchange rates prior to that time. VAT has been subtracted from the quoted price.
Currency key: € - Euro, CNY - Chinese Yuan, INR - Indian Rupee, JPY - Japanese Yen, AUD - Australian dollar, MXN - Mexican peso, PEN - Peruvian nuevo sol
Source: Metals Focus, Bloomberg

Appendix 17 - Real Silver Prices (Inflation Adjusted)

Year	Average[1] US$/oz	Low[2] US$/oz	High[2] US$/oz	€/kg[3]	CNY/kg[4]	INR/kg[5]	JPY/g	A$/oz	MXN/oz	PEN/oz
1993	9.34	7.71	11.91	222.66	2,086.51	31,760	17.79	14.44	133.87	n/a
1994	11.14	9.57	12.54	260.95	3,068.25	35,461	20.00	16.02	166.54	35.04
1995	10.69	8.88	12.64	225.95	2,499.41	32,678	18.17	14.81	204.42	32.02
1996	10.35	7.96	11.70	227.80	2,299.39	32,741	20.88	13.82	189.41	31.07
1997	9.58	7.58	12.52	241.58	2,100.59	29,568	21.56	13.74	160.68	29.89
1998	10.66	8.46	15.27	276.18	2,390.83	33,389	26.17	18.09	177.08	35.22
1999	9.79	9.07	10.90	266.48	2,285.62	31,483	21.66	16.31	155.10	36.89
2000	8.98	7.31	10.87	285.05	2,160.08	29,956	19.57	16.23	133.75	34.80
2001	7.81	7.09	8.80	253.85	1,892.70	26,750	19.67	15.61	111.59	30.91
2002	8.02	7.38	8.98	247.92	2,007.83	27,806	21.40	15.19	115.01	32.13
2003	8.35	7.45	10.29	215.01	2,104.00	27,193	21.07	13.10	131.00	32.89
2004	11.04	9.05	14.01	260.78	2,764.40	34,825	26.80	15.45	177.80	42.56
2005	11.73	10.14	14.86	280.96	2,950.28	35,765	30.23	15.95	182.34	44.49
2006	18.06	13.36	23.80	429.10	4,667.46	54,826	50.09	24.67	277.11	69.00
2007	20.11	16.62	24.37	443.30	4,365.41	54,443	58.39	24.96	310.14	73.53
2008	22.50	12.70	32.06	450.59	4,101.55	58,357	57.60	26.54	332.95	72.14
2009	21.45	15.10	28.44	463.78	3,850.94	58,035	51.39	27.35	380.75	72.54
2010	29.08	21.11	44.56	659.35	5,201.54	67,443	66.23	31.55	469.44	91.77
2011	49.11	36.48	69.65	1,060.87	8,177.22	109,762	105.56	47.49	774.84	148.57
2012	42.82	35.95	51.52	997.87	6,787.79	101,895	94.03	41.10	701.58	122.99
2013	32.22	24.68	43.96	732.92	4,941.62	77,175	85.98	32.70	500.14	93.59
2014	25.64	19.39	29.81	586.92	4,011.28	60,844	73.09	27.65	401.82	76.36
2015	20.92	18.21	24.67	577.01	3,374.09	50,065	68.83	26.81	385.75	67.44
2016	22.40	17.97	27.63	625.24	3,698.05	54,671	67.00	29.19	479.98	75.64
2017	21.83	19.45	23.88	603.29	3,744.52	51,045	68.45	27.65	452.67	71.73
2018	19.73	17.46	22.24	521.75	3,380.90	47,407	61.88	25.66	404.41	65.19
2019	19.91	17.56	24.13	561.41	3,632.98	48,696	62.53	27.97	406.33	67.01
2020	24.89	14.11	36.18	694.89	4,299.17	60,831	78.41	35.36	557.33	87.27
2021	28.45	24.25	34.07	785.90	4,731.20	70,665	98.05	38.45	599.61	111.50
2022	23.11	18.67	28.65	698.21	4,204.07	60,778	97.12	33.34	476.70	87.73
2023	24.02	20.48	26.89	710.99	4,940.57	65,051	109.41	36.00	431.65	89.11
2024	28.27	21.93	34.90	840.14	6,390.26	76,069	137.82	42.86	518.21	106.11

Based on respective countries' CPI. €/kg based on Eurozone CPI Index (Values until 1996 calculated using the Harmonized Index of Consumer Prices).
1: Average US$ prices are based on the daily London Silver Fixing and (since 08/15/2014) the daily LBMA Silver Price. Unless otherwise specified, these US$ prices in conjunction with Bloomberg Closing exchange rates have been used to illustrate annual average prices in other currencies.
2: High and low derived from intra-day spot prices
3: Euro price based on euro-quoted LBMA PM Fix from 1999 onwards and the dollar price converted into euros using Bloomberg synthetic exchange rates prior to that time.
4: CNY price is the SGE AG (T+D) from 2006 onwards and based on London Silver Fixing converted into renminbi using Bloomberg exchange rates prior to that time. VAT has been subtracted from the quoted price.
Currency key: € - Euro, CNY - Chinese Yuan, INR - Indian Rupee, JPY - Japanese Yen, AUD - Australian dollar, MXN - Mexican peso, PEN - Peruvian nuevo sol
Source: Metals Focus, Bloomberg

Appendix 18 - Year-End One-Month Silver Option Volatility Skew



Source: Bloomberg

Appendix 19 - CME Activity & Inventories

Moz	Futures		Managed Money Positions in CME Futures				
Year/Month	**Volume[1]**	**Open Interest[2]**	**Long[2]**	**Short[2]**	**Net[2]**	**Net Change[3]**	**CME Inventories[2]**
2020	130,633	857	361	131	230	-64	397
2021	98,348	701	252	165	87	-143	356
2022	85,383	649	225	81	144	57	299
2023	90,648	671	183	99	84	-60	278
2024	109,099	755	191	105	86	2	319
Jul-24	8,291	756	189	68	121	-41	303
Aug-24	9,707	659	215	49	166	45	306
Sep-24	7,711	723	281	65	216	50	304
Oct-24	8,779	776	271	72	199	-17	309
Nov-24	9,040	664	193	77	116	-83	308
Dec-24	6,037	755	191	105	86	-30	319
Jan-25	6,249	838	233	104	130	44	356
Feb-25	8,450	731	257	92	165	35	409

1: Aggregate volume over the period, 2: Position at end-period, 3: Net change versus previous end-period
Source: CME Group, CFTC, Bloomberg

Appendix 20 - LBMA Silver Trading Volumes

Moz	Spot	Swap & Forward	Option	Loan, Lease & Deposit	Total
Year/Month					
2020	72,050	30,250	3,304	2,401	108,004
2021	62,451	29,164	4,288	4,526	100,430
2022	62,291	29,524	2,661	8,981	103,457
2023	66,352	30,980	2,607	6,910	106,849
2024	72,327	29,447	2,536	7,803	112,113
Oct-24	5,648	2,098	225	610	8,581
Nov-24	5,844	1,678	156	709	8,387
Dec-24	7,705	2,509	142	618	10,974
Jan-25	7,544	2,237	165	802	10,748
Feb-25	4,355	1,223	118	293	5,989

Source: LBMA, Nasdaq, Bloomberg

Appendix 21 - Chinese Silver Exchanges' Activity

Moz	Shanghai Gold Exchange		Shanghai Futures Exchange		
Year/Month	**Ag (T +D) Volume[1]**	**Ag99.99 Volume[1]**	**Futures Volume[1]**	**Futures Open Interest[2]**	**SHFE Inventories[2]**
2019	27,824	3.7	68,878	370	63
2020	67,191	5.7	172,279	349	95
2021	22,150	4.3	111,623	321	76
2022	5,872	3.1	91,037	464	69
2023	2,429	3.0	115,394	433	38
2024	2,244	2.2	172,812	333	44
Jul-24	226	0.1	19,242	406	34
Aug-24	196	0.1	19,018	366	32
Sep-24	171	-	15,001	336	36
Oct-24	150	0.7	14,367	394	40
Nov-24	145	0.3	14,428	352	38
Dec-24	126	0.2	11,147	333	44
Jan-25	128	0.3	8,347	284	45
Feb-25	150	0.0	9,339	357	41

1: Aggregate volume over the period, 2: Position at end-period;
N.B. Both the SGE and SHFE record each transaction twice, from the point of view of the buyer and also the seller. However, to compare these volumes with other exchanges, such as the CME, the figures in the table have been halved (as shown above). From 2020 onward, SHFE has been reporting the trading volume and open interest single-sided.

Source: SGE, SHFE, Bloomberg

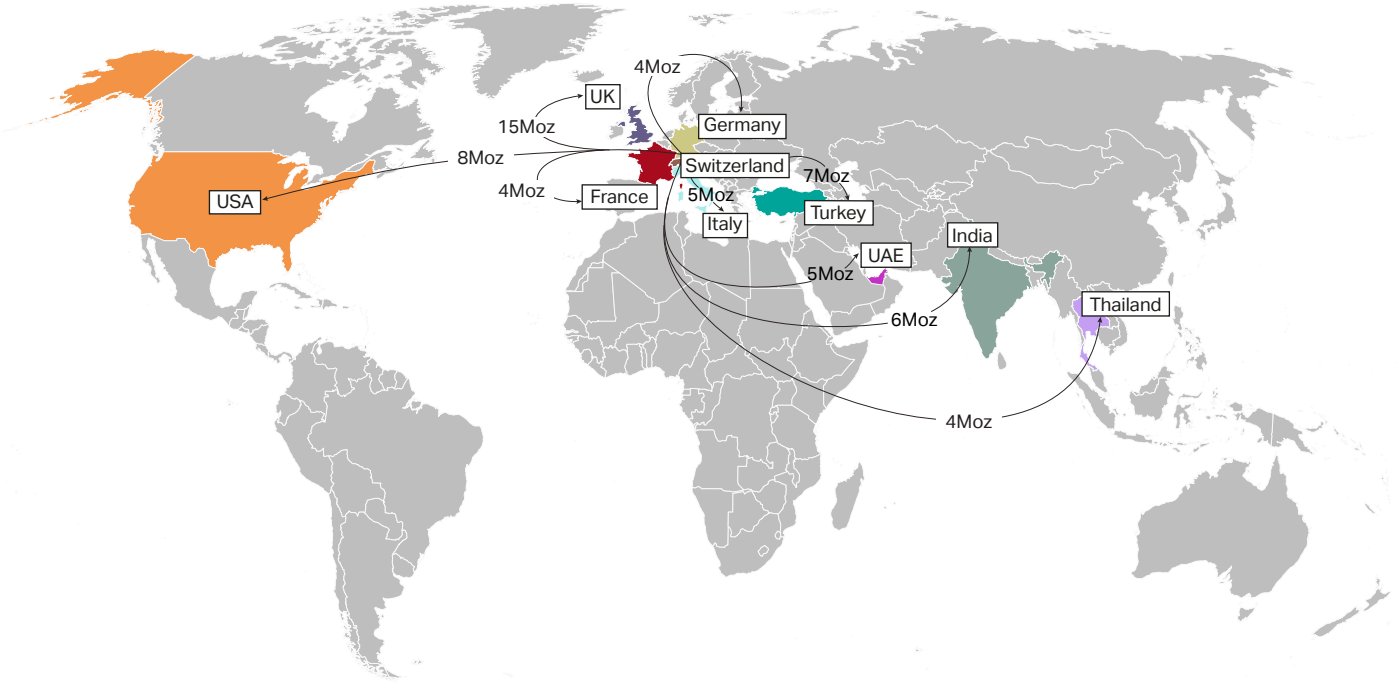
Appendix 22 - Physically Backed Silver Exchange-Traded Product Holdings*

Moz Year/Month	iShares Silver Trust	ZKB	WisdomTree	Sprott Silver	Sprott Gold & Silver	India	Others	Total Holdings (Moz)	Total Value ($M)
2015	318	69	41	49	77	n/a	59	613	8,469
2016	341	72	53	56	76	n/a	69	667	10,827
2017	321	80	60	56	75	n/a	82	674	11,364
2018	317	79	52	56	64	n/a	84	652	10,090
2019	363	83	69	60	58	n/a	103	736	13,276
2020	559	93	94	91	60	n/a	170	1,067	28,255
2021	531	100	95	154	60	n/a	191	1,132	26,127
2022	467	96	61	171	58	8	153	1,014	24,290
2023	437	100	53	171	57	13	146	977	23,237
2024	462	87	48	181	54	38	168	1,038	30,013
Jan-23	478	96	60	171	58	8	156	1,026	23,584
Feb-23	479	95	57	171	58	7	157	1,024	21,017
Mar-23	465	97	59	173	58	9	156	1,018	24,309
Apr-23	468	96	59	175	58	8	158	1,021	25,292
May-23	468	96	57	175	58	8	160	1,021	23,749
Jun-23	468	96	55	175	58	8	159	1,019	22,895
Jul-23	452	96	56	175	58	9	156	1,002	24,393
Aug-23	439	95	55	176	58	9	153	986	24,193
Sep-23	442	94	54	172	58	10	151	982	22,653
Oct-23	442	94	54	172	58	13	148	981	22,764
Nov-23	434	94	53	171	58	13	145	968	24,212
Dec-23	437	100	53	171	57	13	146	977	23,237
Jan-24	440	99	53	171	57	15	147	982	22,649
Feb-24	431	98	51	171	56	15	147	969	21,658
Mar-24	424	95	85	170	56	16	154	999	24,527
Apr-24	427	91	71	170	56	19	152	986	26,272
May-24	414	90	75	171	56	22	151	978	30,588
Jun-24	437	89	57	171	55	23	151	984	28,898
Jul-24	463	89	58	172	55	26	154	1,017	29,044
Aug-24	466	90	50	177	55	32	152	1,022	30,116
Sep-24	469	90	49	178	55	34	153	1,029	31,977
Oct-24	481	89	59	180	55	36	161	1,061	35,631
Nov-24	473	87	54	180	55	37	167	1,055	32,379
Dec-24	462	87	48	181	54	38	168	1,038	30,013
Jan-25	446	87	52	181	54	42	171	1,033	32,638
Feb-25	438	87	58	181	53	**42	187	1,046	32,311

*Holdings at end-period; value calculated basis end-period price, ** One element estimated.

Source: Respective ETP providers, Bloomberg

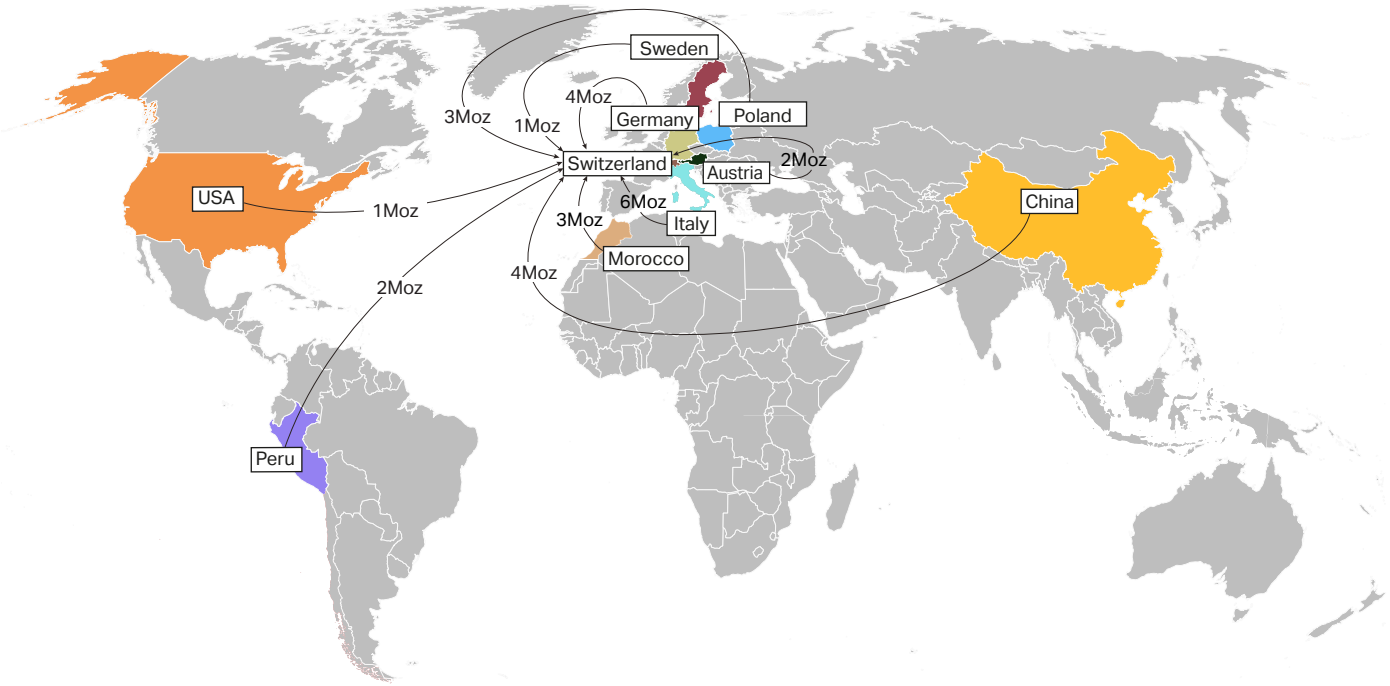
Appendix 23a - Selected Swiss Silver Bullion Exports in 2024



NB: In gross weight terms, exports shown account for 92% of total Swiss silver bullion exports in 2024.

Source: Swiss Customs Administration, Metals Focus

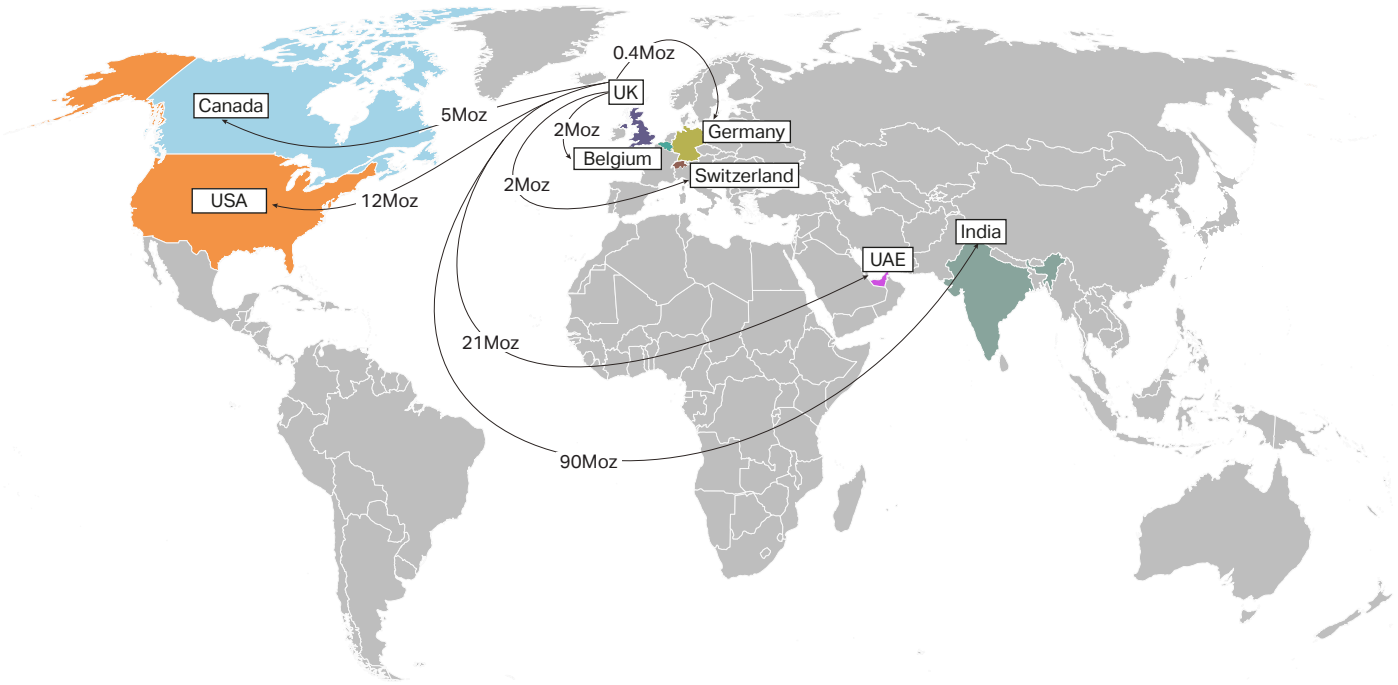
Appendix 23b - Selected Swiss Silver Bullion Imports in 2024



NB: In gross weight terms, imports shown account for 81% of total Swiss silver bullion imports in 2024.

Source: Swiss Customs Administration, Metals Focus

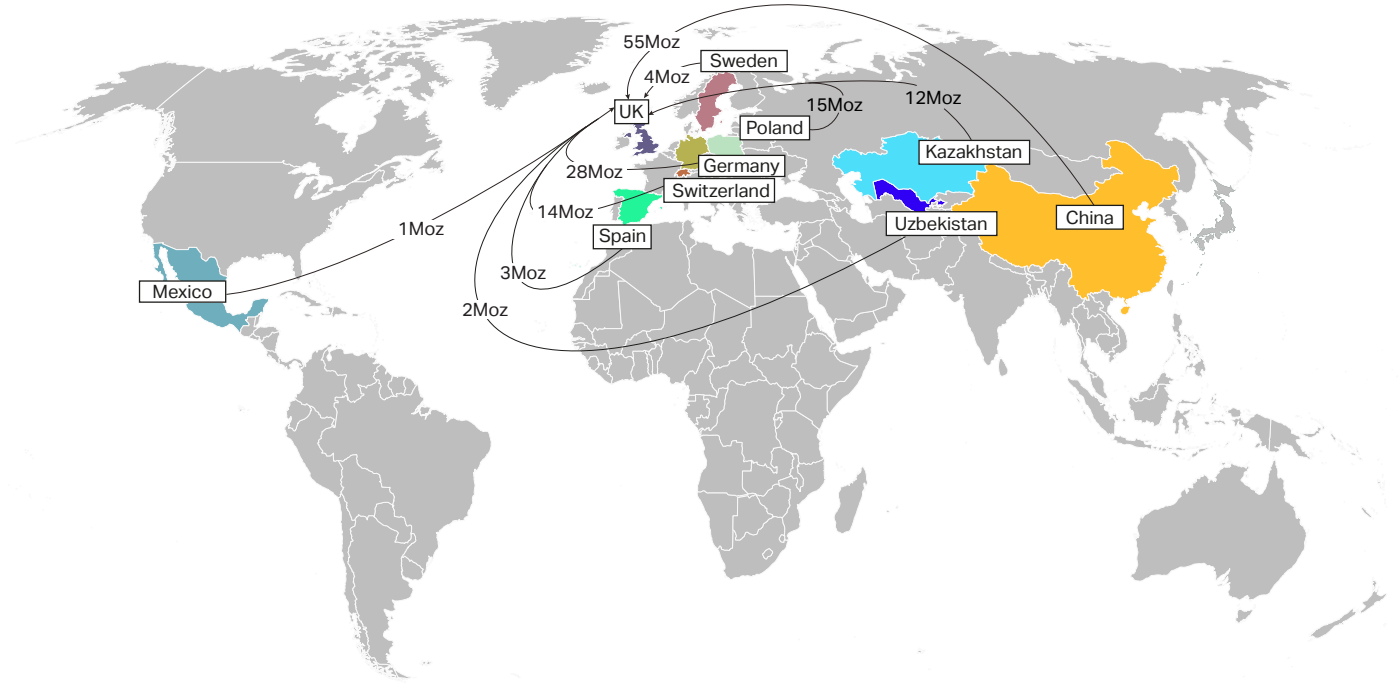
Appendix 24a - Selected United Kingdom Silver Bullion Exports in 2024



NB: In gross weight terms, exports shown account for 99% of total UK silver bullion exports in 2024

Source: HM Customs & Excise, Metals Focus

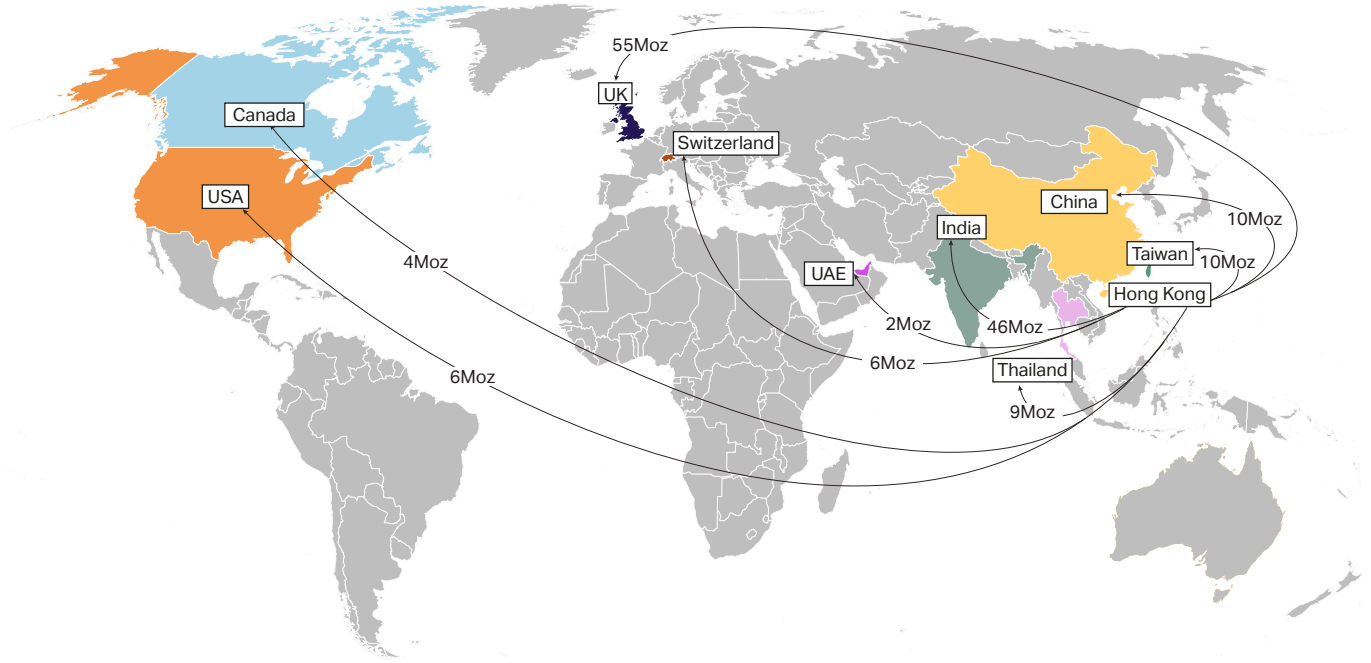
Appendix 24b - Selected United Kingdom Silver Bullion Imports in 2024



NB: In gross weight terms, imports shown account for 93% of total UK silver bullion imports in 2024

Source: HM Customs & Excise, Metals Focus

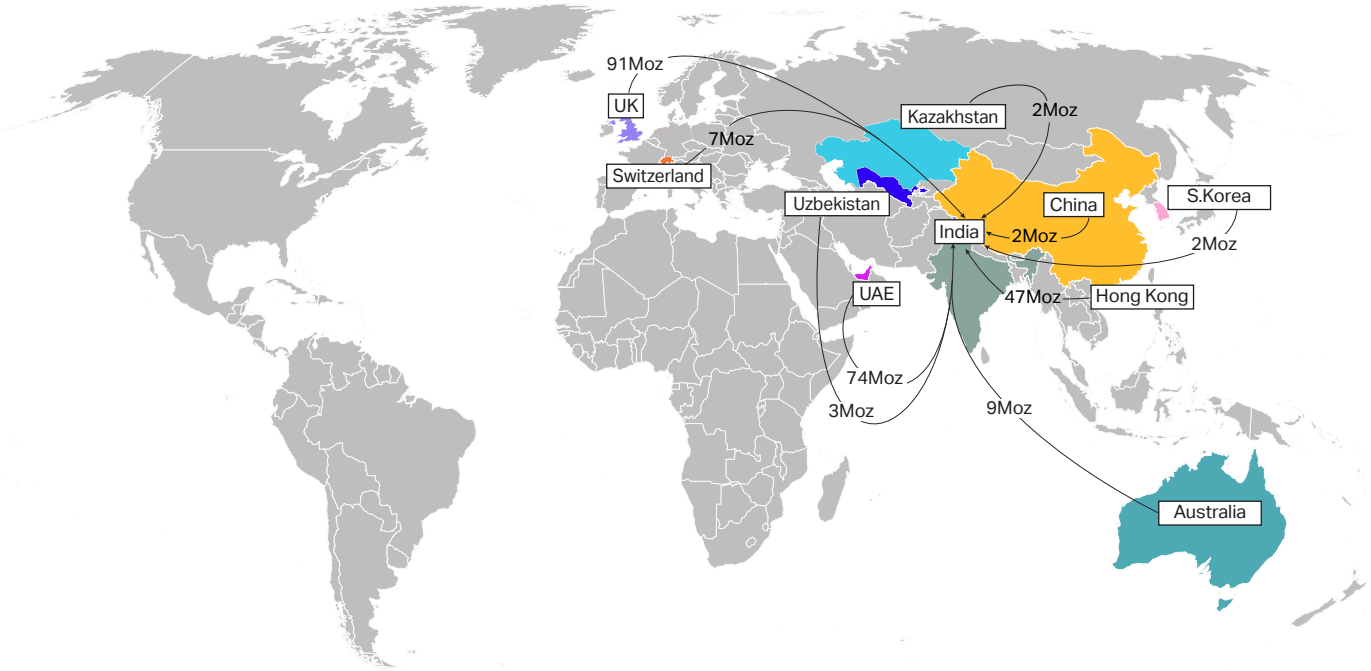
Appendix 25 - Selected Hong Kong Silver Bullion Exports in 2024



NB: In gross weight terms, exports shown account for 97% of total Hong Kong silver bullion exports in 2024

Source: Hong Kong Census & Statistics Department, Metals Focus

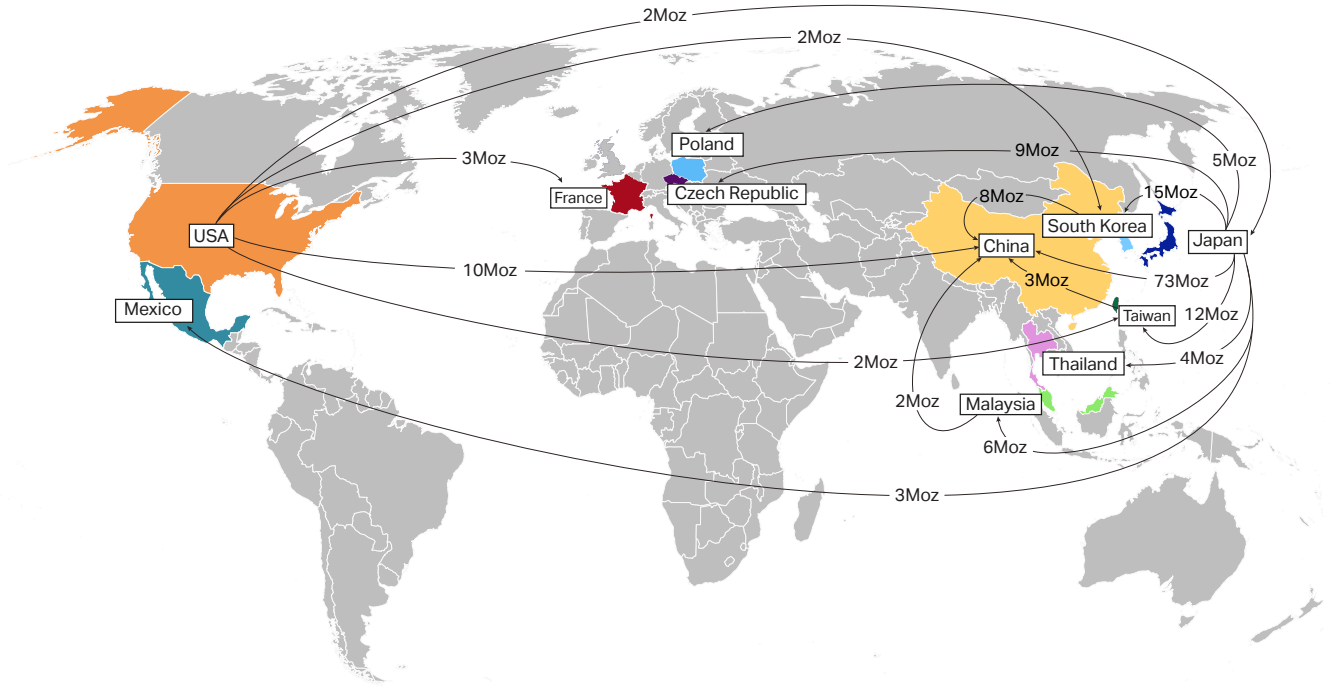
Appendix 26 - Selected Indian Silver Bullion Imports in 2024



NB: In gross weight terms, imports shown account for 96% of total Indian silver bullion imports in 2024

Source: Indian Ministry of Commerce, Metals Focus

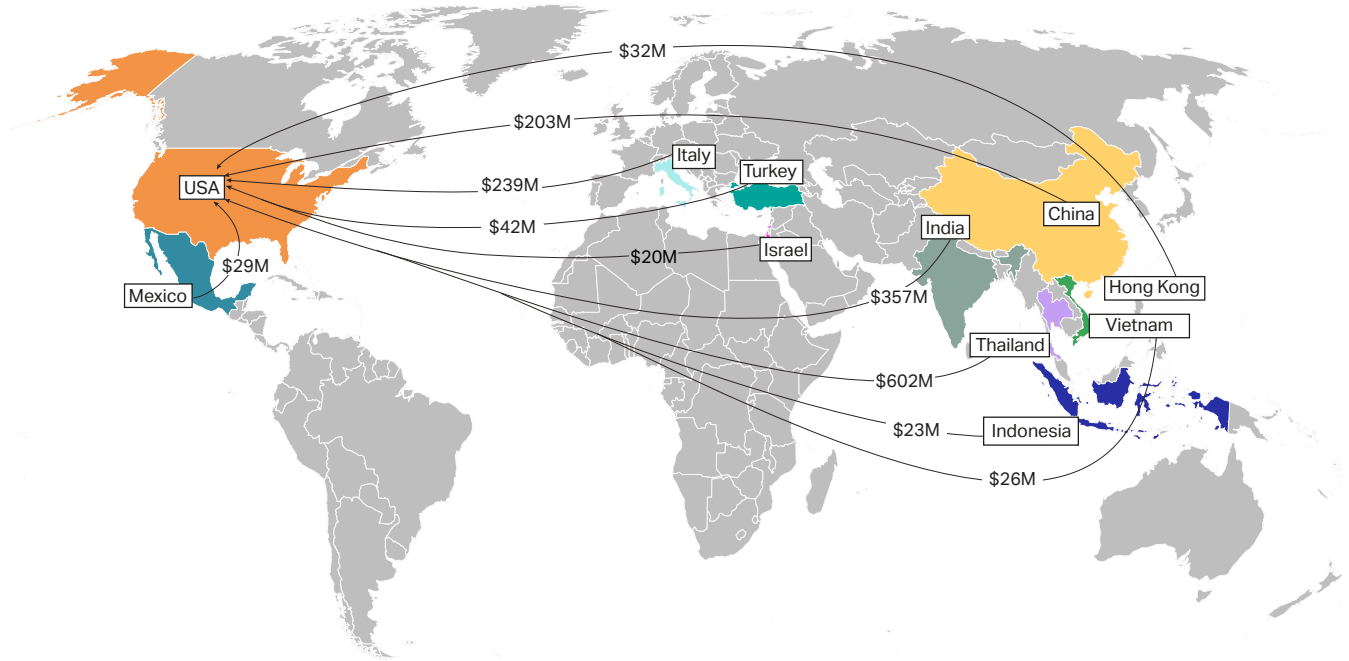
Appendix 27 - Selected Silver Powder Trade Flows in 2024



NB: Figures stated represent reported gross volumes of material shipped

Source: Various, Metals Focus

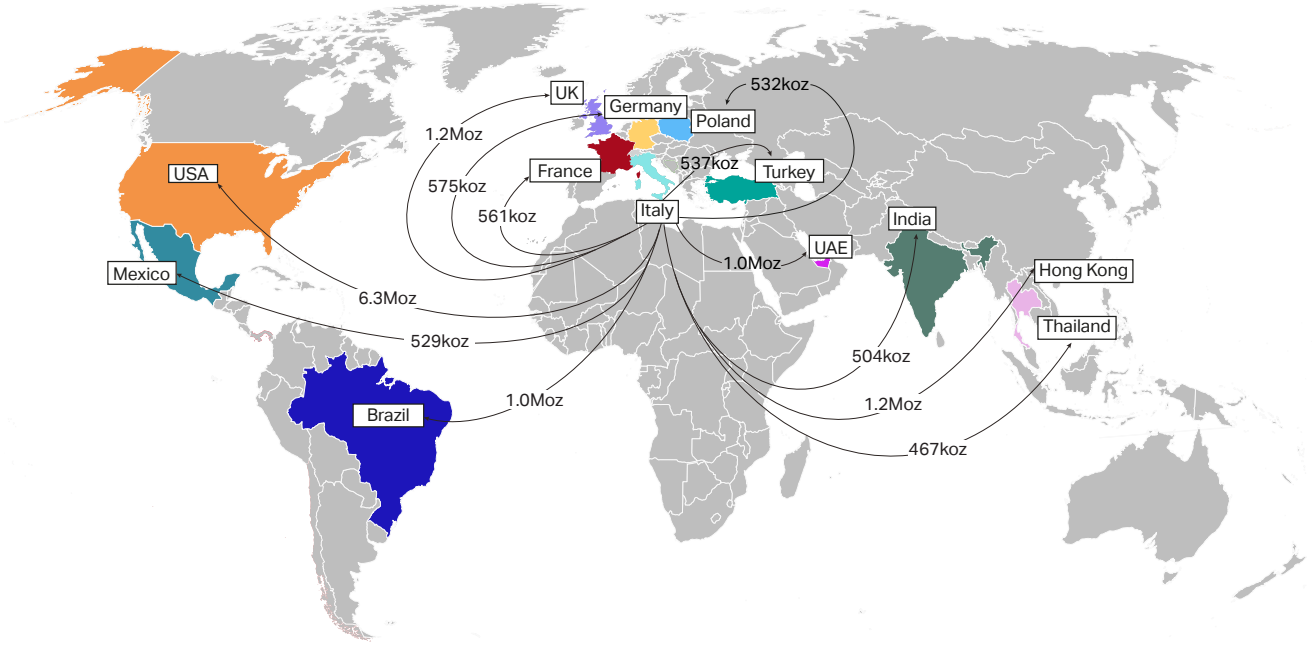
Appendix 28 - Value of Selected US Silver Jewelry Imports in 2024



NB: Imports shown represent around 94% of the total value of US silver jewelry imports in 2024.

Source: Various, Metals Focus

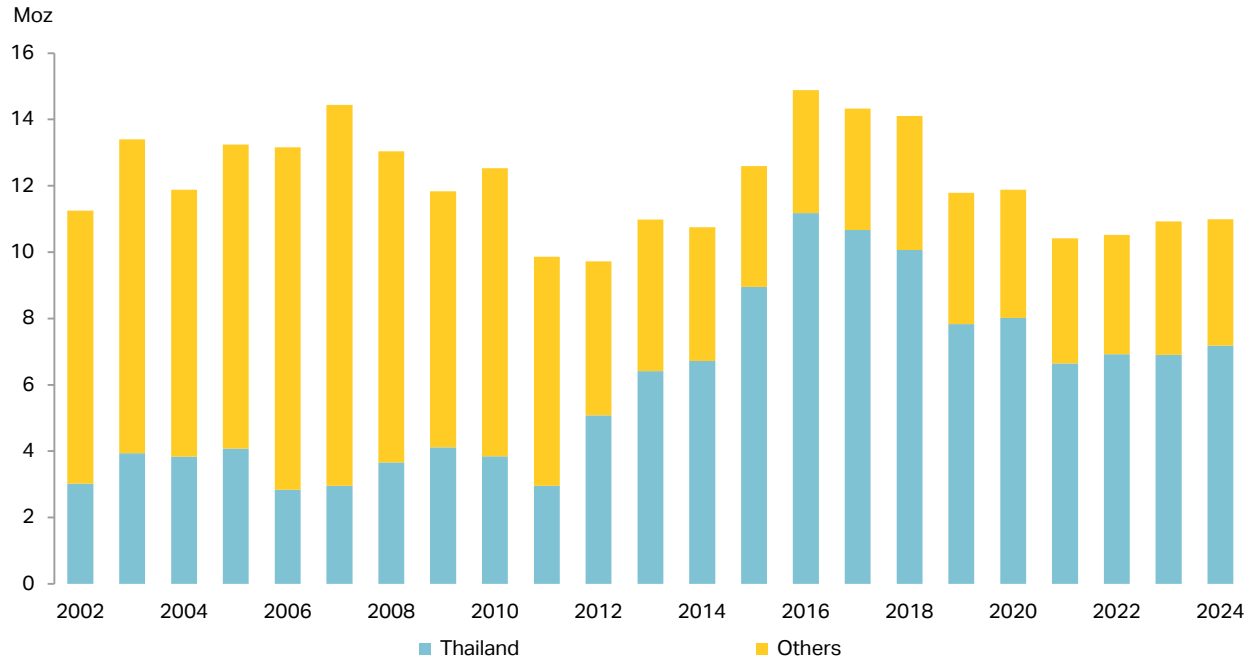
Appendix 29 - Selected Italian Silver Jewelry Exports in 2024



NB: In gross weight terms, excluding re-exports. Shipments shown account for 78% of total Italian silver jewelry exports in 2024.

Source: Metals Focus, S&P Global

Appendix 30 - German Silver Jewelry Imports



NB: In gross weight terms. Source: Metals Focus, S&P Global

Notes & Definitions

Notes

Throughout the tables, totals may not add up due to independent rounding.

What one country reports as an export to another may be different to the imports reported by the receiving country for a variety of reasons, including conflicting rules of origin, classifications and timing. As a result, similar flows on different maps and/or tables may not be reciprocal due to reporting variations. The tonnage figures shown are fine weights calculated by Metals Focus from the data provided by each origin for exports and by each destination for imports.

Units

Troy ounce (oz)	One troy ounce - 31.103 grams
Ton (t)	One metric ton - 1,000 kilograms (kg) or 32,151 troy ounces
Grade (g/t)	Grams per metric ton of rock
Dollar ($)	US dollar unless otherwise stated

Definitions

Fabrication	Captured in the country where the first transformation of silver bullion or grain into semi-finished and/or finished products takes place (such as silver nitrate or silver oxide).
Consumption	The sum of domestic jewelry fabrication plus imports, less exports, adjusted for changes in trade stocks.
Physical Investment	The sum of net purchases of small investment bars (one kilogram or less) and the net purchase of bullion coins by retail investors.
Coin & Net Bar Demand	The sum of the fabrication of bullion and commemorative coins, plus net small bar purchases by retail investors.
Recycling	Covers the recovery of silver from fabricated products, including unused trade stocks. Excludes scrap generated during manufacturing (known as production or process scrap). The recycling is captured in the country where the scrap is generated, which may differ from where it is refined. The one exception is ethylene oxide, where the recycling of silver is measured at the point of recovery.
Mineral Resources	A concentration of material in, or on, the earth's crust of such grade or quantity where there is a reasonable prospect for economic extraction.
Mineral Reserves	The economically mineable part of a measured or indicated mineral resource demonstrated by at least a preliminary feasibility study.
By-Product Costs	Revenue generated from additional metals produced at a mine alongside the primary metal. This revenue is subtracted from costs as a by-product credit.
Total Cash Costs	Includes all direct and indirect mine site cash costs related directly to the physical activities of producing metals, including mining, ore processing on-site general and administrative costs, third-party refining expenses, royalties and production taxes, net of by-product revenues.
Total Production Costs	Total cash costs, plus depreciation, amortization and reclamation and closure cost obligations relating to each operating unit.
All-In Sustaining Costs	The sum of total cash costs plus community costs, sustaining capital expenses, corporate, general and administrative expenses (net of stock option expenses) and exploration expenses.

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With a global footprint and over 60 years of experience in the precious metals industry, MKS PAMP – part of the MKS PAMP Group – is dedicated to creating a sustainable future with precious metals products and services. The company provides financial and physical trading services and operates a state-of-the-art precious metals refinery and mint in Switzerland. As an industry leader, MKS PAMP offers the world's most extensive range of durable, innovative and responsibly sourced precious metal products and services. The company builds on leading artisan savoir-faire and Swiss engineering to manufacture a wide range of products in all four precious metals and in various forms, and provides precious metals services such as trading, refining, vaulting and storage, treasury and mine financing.

Still managed by the founding family, MKS PAMP is an advocate for long-term thinking, responsible sourcing, sustainability and ethics, working closely with its stakeholders to set the highest codes of conduct in the industry. MKS PAMP developed Provenance, a traceability solution that utilizes blockchain to trace precious metals along the supply chain and guarantee responsible sourcing globally. To further its long-term commitment to environmental sustainability, MKS PAMP announced its SBTi-validated targets for 2030, for scope 1, 2 and 3. MKS PAMP aims to create value by leveraging its technical expertise, innovations and global infrastructure to be an indispensable global partner and the most sustainable organization in the industry.

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