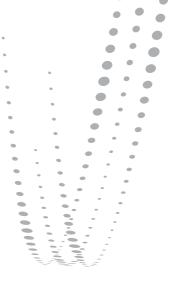




# WORLD SILVER SURVEY 2015 A SUMMARY

Produced for The Silver Institute by the GFMS team at Thomson Reuters



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# ABOUT THE MAJOR SPONSORS OF WORLD SILVER SURVEY 2015

## A-Mark Precious Metals, Inc.

A-Mark Precious Metals, Inc. is a full-service precious metals trading company and an official distributor for many government mints throughout the world. The company offers gold, silver, platinum and palladium in the form of bars, plates, powder, wafers, grain, ingots and coins. Its Industrial unit services manufacturers and fabricators of products utilizing or incorporating precious metals, while its Coin & Bar unit deals in over 200 coin and bar products in a variety of weights,



shapes and sizes for distribution to dealers and other qualified purchasers. The company operates trading centers in Santa Monica, California, and Vienna, Austria, for buying and selling precious metals. Customers of A-Mark include mints, manufacturers and fabricators, refiners, coin and metal dealers, banks and other financial institutions, jewelers, investors and collectors. For more information about A-Mark Precious Metals, visit **www.amark.com.** 

## Coeur Mining, Inc.

Coeur Mining, Inc. is the largest U.S.-based primary silver producer and a significant gold producer with five precious metals mines in the Americas employing approximately 2,100 people. Coeur produces from its wholly owned operations: the Palmarejo silver-gold mine in Mexico, the San Bartolomé silver mine in Bolivia, the Rochester silver-gold mine in Nevada, the Kensington gold mine in Alaska, and the Wharf gold mine in South Dakota. The Company also has a non-operating interest in the Endeavor mine in Australia in addition to royalties on the Cerro Bayo mine in Chile, the El Gallo complex in Mexico, the Zaruma mine in Ecuador, and the Correnso mine in New Zealand. In addition, the Company has two silver-gold feasibility stage projects - the La Preciosa project in Mexico and the Joaquin project in Argentina. The Company also conducts ongoing exploration activities in Alaska, Argentina, Bolivia, Mexico, and Nevada. The Company owns strategic investment positions in several silver and gold development companies with projects in North and South America.



#### Fresnillo Plc

Fresnillo plc is the world's largest primary silver producer and Mexico's second largest gold producer, listed on the London and Mexican Stock Exchanges under the symbol FRES. Fresnillo plc has six operating mines, all of them in Mexico - Fresnillo, Saucito, Ciénega (including the San Ramón satellite mine), Herradura, Soledad-Dipolos¹ and Noche Buena; one development project, San Julián and four advanced exploration prospects - Centauro



Deep, Juanicipio, Orisyvo and Las Casas Rosario as well as a number of other long term exploration prospects. In total, Fresnillo plc has mining concessions covering approximately 2.1 million hectares in Mexico. Fresnillo plc has a strong and long tradition of mining, a proven track record of mine development, reserve replacement, and production costs in the lowest quartile of the cost curve. Fresnillo plc's goal is to maintain the Group's position as the world's largest primary silver company, producing 65 million ounces of silver and 750,000 ounces of gold by 2018.

 $<sup>^{\</sup>mbox{\scriptsize 1}}$  Operations at Soledad and 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

#### 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.

## Pan American Silver Corp.

Pan American Silver Corp. is the second-largest primary silver producer in the world. Based in Vancouver, BC, the Company was founded in 1994 and today has seven mines in Mexico, Peru, Bolivia and Argentina, as well as a portfolio of exploration



and development projects in the Americas. In 2014, Pan American produced a record 26.11 million silver ounces and 161,500 gold ounces at cash costs of \$11.46 per ounce of silver, net of by-product credits, and All-in Sustaining Costs per Silver Ounce Sold ("AISCSOS") of \$18.62. In 2015, Pan American expects to produce 25.50 to 26.50 million silver ounces and 165,000 to 175,000 gold ounces at cash costs of \$10.80 to \$11.80 per silver ounce, net of by-product credits and AISCSOS of between \$15.50 and \$16.50. The Company plans to spend \$71.0 to \$84.0 million in sustaining capital as well as \$98.0 to \$109.0 million on long term development and expansion projects, the majority of which will be invested in the La Colorada expansion project and a new power line to the Dolores mine.

## Silver Wheaton Corp.

Silver Wheaton is the world's largest pure precious metals streaming company. The company offers investors cost certainty, leverage to increasing silver and gold prices, and a high-quality asset base. Its business model is based on paying low, predictable costs for precious metals streams from a diverse portfolio of mines, with any increases in precious metal prices flowing directly to the bottom line.



Silver Wheaton offers these benefits while at the same time seeks to reduce many of the downside risks faced by traditional mining companies. In particular, it offers its investors both capital and operating cost certainty. Other than the initial upfront payment, the company typically has no ongoing capital or exploration costs. Furthermore, operating costs have been historically fixed at around \$4 per ounce of silver produced and \$400 per ounce of gold produced, subject to inflationary adjustments.

# World Silver Survey 2015 has been kindly supported by the following companies

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Pan American Silver Corp.

Silver Standard Resources Inc.

Silver Wheaton Corp.

The *World Silver Survey* has been published annually by The Silver Institute since 1990. Copies of the 2015 edition, as well as previous editions, can be obtained by contacting The Silver Institute at the address and telephone number on the front cover.

#### **NOTES**

#### **UNITS USED:**

supply and demand data are given in units of million troy ounces (Moz) rounded to one decimal place.

1 Moz = 31.103 t (metric tons)

1 ton = 32,151 troy ounces

1 ton = 1,000,000 grams (g)

#### **TERMINOLOGY:**

"-" = Not available or not applicable.

"0.0" = Zero or less than 0.05.

"dollar", "\$" = US dollar unless otherwise stated.

#### **PRICES:**

Unless otherwise stated, US dollar prices are for the London Silver Market fixing prior to August 15 2015 and LBMA Silver Price thereafter.

#### **TABLE ROUNDING:**

Throughout the tables and charts, totals may not add due to independent rounding

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  contract or otherwise, even if foreseeable.

This report is a summary of World Silver Survey 2015. The World Silver Survey (WSS) is an annual review of the international silver market. It contains the only truly global analysis of the world's silver markets and has been produced by the GFMS team at Thomson Reuters, the leading analysts of global precious metals markets, on behalf of the Silver Institute in Washington DC since 1994. The WSS is a unique source of silver supply and demand statistics for more than sixty countries. It contains a comprehensive analysis of investor activity, worldwide silver stocks and bullion flows as well as a lucid and concise account of the financial, economic and social factors underlying market trends. Details on how to order the full 100-page survey can be found on page six.

# 1. REVIEW AND OUTLOOK

Silver price changes over the course of 2014 sparked a number of market reactions on both the supply and demand side of the market with a number of records broken. Overall this saw the market broadly balanced over the course of the year with a physical deficit of 4.9 Moz (152 t) recorded.

Prices themselves were driven by a combination of factors including a slowdown in Chinese growth, a continued move away from commodities as an asset class by institutional investors and a stronger U.S. dollar in the second half of the year. Importantly, despite this negative backdrop, coin and bar purchases remained at historically high levels. Likewise, ETF holdings also remained sturdy at 635.5 Moz (19,728 t) the highest recorded year-end level.

Silver extended its popularity in the jewelry and silverware markets as fashions continued to target bigger and heavier pieces. The trend away from plated material towards sterling silver also continued. The major exception to this was in China where the entire jewelry market suffered a slowdown last year; indeed excluding China, jewelry consumption increased by 12.9% or 19.3 Moz (599 t), providing a potential boon to silver demand should Chinese purchasing rebound. Industrial demand held broadly flat over the year with notable increases from the photovoltaic sector (the first in three years) and the brazing alloys sector. This was offset by modest declines in the electronics and photographic sectors and overall industrial fabrication was 594.9 Moz (18,504 t).

Supply to the market reached its highest level since 2010 at 1,061.8 Moz (33,027 t), driven higher by increased output from primary silver mines. Mine production reached a

#### WORLD SILVER SUPPLY AND DEMAND (MOZ)

(million ounces)	2013	2014			
Supply					
Mine Production	835.3	877.5			
Net Government Sales	7.9	-			
Scrap	192.7	168.5			
Net Hedging Supply	-35.4	15.8			
Total Supply	1,000.5	1,061.8			
Demand					
Jewelry	212.1	215.2			
Coins & Bars	243.6	196.0			
Silverware	58.8	60.7			
Industrial Fabrication	597.9	594.9			
of which Electrical & Electronics	266.2	263.9			
of which Brazing Alloys & Solders	63.1	66.1			
of which Photography	48.0	45.6			
of which Photovoltaic	55.8	59.9			
of which Other Industrial	164.7	159.4			
Physical Demand	1,112.4	1,066.7			
Physical Surplus/Deficit	-111.9	-4.9			
ETF Inventory Build	1.6	1.4			
Exchange Inventory Build	8.8	-8.9			
Net Balance	-122.3	2.6			
Silver Price, \$ per oz.	23.79	19.08			
© GFMS, Thomson Reuters / The Silver Institute					

record high at 877.5 Moz (27,293 t), an increase of 5.0% year-on-year. Scrap supply meanwhile experienced the perfect storm as low prices, the impact of previous thrifting and depleted near-to-market stockpiles combined to push processed scrap to its lowest level in over a decade at 168.5 Moz (5,242 t). Supply to the market was rounded off by a modest return to net producer hedging at 15.8 Moz (492 t).

# 2. SILVER PRICES

Two major themes are central to understanding silver price movements in 2014. First, currency weakness came to the fore as the tapering of U.S. quantitative easing, announced in December 2013, led to concerns over some economies' reliance on cheap money stemming from previous U.S. economic policy. There was also growing concern about China's ability to drive growth via domestic consumption in the face of weak export markets and a closing gap between production costs in China and the rest of the world.

While the impact of a slowdown in China on silver demand and price is straightforward, the influence of U.S. policy is more nuanced. Firstly, a stronger U.S. economy in relation to Europe and Japan, and monetary loosening in both of these major economies, helped lead to a strengthening dollar in the second part of the year. Secondly, the more U.S. economic data improved, the stronger the stock market and the greater the expectation of higher interest rates. The S&P 500 gained 12% over the course of the year while silver fell 19.9% on an intra-year basis.

Interrupting this broad downward trend were two rallies. The first, in February 2014, was prompted by a covering of short positions built up in late 2013 and a short-lived rally across the precious metals complex as more money moved into physical assets on the back of weak emerging markets. Silver was also buoyed by riding on gold's political risk coattails in this period as Russia moved to annex Crimea and tensions with the West grew. On February 24th the spot silver price reached \$22.16/oz on an intra-day basis, the highest level it would reach all year. The second rally started in June, backed by positive data releases from China and supported by an increase in speculative long positions in COMEX silver. Indeed the Managed Money long position (futures and options) reached an all time high in mid-July.

The rally was to be short-lived however as macro-economic news soon overtook the market with the ECB cutting interest rates and increased speculation that the Eurozone would introduce more quantitative easing. The U.S. dollar appreciated rapidly and undermined the dollar silver price. From July 1st the U.S. dollar became an increasingly decisive factor in both how silver traded on a daily basis and its general direction. Indeed in the third quarter the negative correlation between the two increased to 0.97.

# THE SILVER FIX COMES TO A CLOSE AFTER 117 YEARS

The first auction of the newly constituted LBMA Silver Price was held on August 15th 2015 and this price has replaced the now defunct Silver Fix as a reference in both physical markets and for derivatives contracts. As of April 2015 there were six banks accredited as participants in the LBMA Silver Price auction, these were: HSBC Bank USA NA; JPMorgan Chase Bank; Mitsui & Co Precious Metals Inc; The Bank of Nova Scotia – ScotiaMocatta; The Toronto Dominion Bank and UBS.

The U.S. Dollar Index increased from 80.05 at the beginning of July to 89.99 by the end the year. The value of the U.S. dollar continued to rise into the first quarter of 2015, with the dollar index reaching 100 in March, its highest level since 2003. This was not just down to the relative health of the U.S. economy but also the loosening of monetary policies and expansion of quantitative easing programs in the Eurozone and Japan, which account for 57.6% and 13.6% of the dollar index respectively.

Speculators built up another large COMEX short position, which pushed the price back below \$16.00/oz briefly in December. The unwinding of this position would see a small short-covering rally over the course of January 2015 before the metal set into more range-bound trading.

#### THE SILVER PRICE AND THE US DOLLAR



Source: GFMS, Thomson Reuters

# WORLD SILVER SURVEY: SUPPLY AND DEMAND METHODOLOGY

Physical surpluses and deficits in the silver market help to determine lead times, margins and premia and can also impact upon price direction. It is not always the key price determinant, however, as unlike the purely industrial metals there is also significant demand for silver as an investment product. We estimate that in 2014, 18% of demand for new silver came from the physical coin and bar sector as investors increased holdings.

In addition to this silver has an active Over-the-Counter (OTC) market owing, primarily, to its role as an institutional investment product. OTC trade can have a large impact upon the silver market and in 2014 the volumes of silver transferred, as reported by London Bullion Market Association clearing members, totaled approximately 36,450 Moz (1.13 M t), with a value of \$693 billion. Even this figure does not represent the total value of global silver transactions. As a rule of thumb, the net-transfers are roughly one half of the total loco London market volume, which in turn is approximately 90% of the total going through the market. In 2014, therefore, total volume was of the order of 81,000 Moz (2.52 M t) with a value of \$1.5 trillion; this is equivalent to over 90 times 2014 silver mine production.

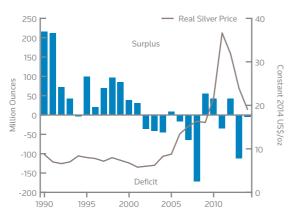
So while not as liquid as the gold market, there is a significant flow of transfers and trade that will also impact upon silver price movements. A good indication of investor interest is provided in the Exchange Traded Fund (ETF) data that are released to the market and this highly

visible data is also included in our supply-demand balance along with published levels of physical inventory at silver futures exchanges.

The final element that differentiates silver from purely industrial metals is that the metal is commonly recycled or held as an above-ground asset by private and institutional investors as well as by industry. Indeed, old jewelry scrap, coins and bars make up a significant part of the scrap pool (and they are arguably the only really price-sensitive elements in this market) as opposed to scrap collected from recycled electronics, for example.

Thomson Reuters' supply and demand data are collected and collated by our team of research analysts based in Australia, China, Europe, India and the USA within an extensive field research program that involves interviewing stakeholders across the supply chain. In order to build up a picture of supply and demand in the silver market Thomson Reuters maintains individual demand databases for over 85 countries globally and for almost 600 mines and projects on the supply-side. As part of the primary research exercise, the Thomson Reuters analysts collect information on iewelry fabrication: coin fabrication: silverware; bar investment; industrial uses and the amount of old silver scrap entering the supply chain. In addition to this, on a global basis, Thomson Reuters also collects net government sales and purchases information and collates producer hedging and de-hedging levels.

#### SILVER PHYSICAL SURPLUS / DEFICIT



Source: GFMS, Thomson Reuters

#### WORLD SILVER SUPPLY



Source: GFMS, Thomson Reuters

# 3. SUPPLY

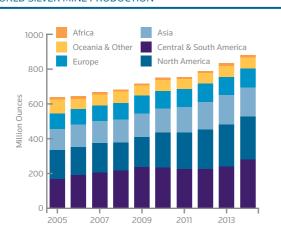
- Global mine production increased for a twelfth consecutive year to reach a record level of 877.5 Moz (27,293 t).
- Gains in mine supply were partially offset by weak scrap supply, falling by 12.5% year-on-year and representing a 24.1 Moz (750 t) decline.

Silver **mine production** increased by 42.2 Moz (1,311 t) last year, as new projects came on-line and with a more important contribution originating from assets that were ramping up, having entered production in 2013 or earlier. The latter category saw meaningful contributions from Escobal in Guatemala, which shipped first concentrate in October 2013 and produced over 20 Moz (632 t) of silver last year. Saucito in Mexico continued to deliver growth, along with Concheño. In the United States, Lucky Friday ramped back up, following downtime for shaft maintenance, and in the Dominican Republic, Pueblo Viejo delivered appreciable silver as a by-product of gold mining. Projects that provided meaningful first contributions

#### SILVER OUTPUT BY SOURCE METAL

(million ounces)	2013 Output	% of Total	2014 Output	% of Total	Change y-o-y
Primary	248.5	30%	269.5	31%	8%
Gold	107.1	13%	110.1	13%	3%
Lead/Zinc	304.1	36%	310.6	35%	2%
Copper	168.5	20%	179.8	20%	7%
Other	7.1	1%	7.5	1%	5%
Source: GFMS, Th	nomson Reu	ters			

#### WORLD SILVER MINE PRODUCTION



in 2014 included Ministro Hales (Chile), Cerro Negro (Argentina) and Toromocho (Peru).

As hinted at by the locations of these above-mentioned projects, growth last year was focused in South America, with the primary silver sector showing especially strongly. Producers' costs, expressed in U.S. dollar terms, were reined in substantially, the global average for primary mines registering a drop of 16% to \$7.74/oz on the basis of total cash costs, in large part thanks to producers' currencies depreciating against the dollar.

Lower prices also saw lower levels of **scrap** entering the market with processors sometimes holding back material in the hope of higher prices. In addition, the impact of previous thrifting (the trend to use less silver per item) in the electronics sector impacted upon recovery rates. Scrap supply fell to its lowest since 1996 at 168.5 Moz (5,242 t).

Representing a switch from the past two years of activity, producers added hedge contracts to more than double the volume of the silver **hedge book**, contributing 15.8 Moz (492 t) of accelerated supply last year. The majority of producer hedging entered into was undertaken by base metals producers, with primary silver producers continuing to prefer not to hedge silver output.

# SILVER MINE PRODUCTION - WHERE IT COMES FROM

Geographically, nearly half of mined silver comes from the Americas. Indeed six of the ten largest producing countries are in this region, including the two biggest, Mexico and Peru. Of greater market relevance is the type of mine that silver comes from – most silver emerges as a by-product of the mining of other metals. Most substantially, silver production comes from lead/zinc operations.

Only around 30% of output comes from so-called primary silver mines, where silver is the main source of revenue. This is noteworthy given that the impact of the price of silver is most acute on primary silver production, whereas by-product silver production is in large part a function of the price of the other metals, with which silver is mined.

# 4. DEMAND

- Total physical demand fell by 4% last year, as a decline in retail investment offset gains from jewelry, silverware and the photovoltaic sector.
- Jewelry fabrication rose to a new record level of 215.2 Moz (6,693 t) in 2014, helped by lower silver prices and a strong rebound in Indian demand.
- Industrial fabrication was marginally lower, with notable gains made in demand from the photovoltaic and brazing alloys and solders sectors.
- Silverware consumption rose to its highest level since 2006 as producers moved away from using plated material.
- Despite the 20% drop in coin and bar investment, last year's figure was still the second highest on record.

Total **physical demand** saw a 4% decline in 2014, falling to a two-year low of 1,066.7 Moz (33,179 t). Some of this was due to the structural factors hitting photographic and other industrial demand, but more important was the fall from 2013's record levels of coin and bar demand. Significantly, however, demand for silver for physical investment remained inflated by historical standards.

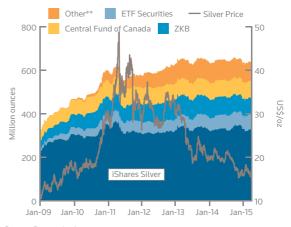
Global **industrial** offtake in 2014 remained broadly unchanged, falling by less than 1% to 594.9 Moz (18,504 t), the lowest level since 2009, as gains in brazing alloys & solders, photovoltaic and the ethylene oxide industry were slightly offset by lower demand in photography, electrical

#### WORLD SILVER DEMAND



Source: GFMS, Thomson Reuters

#### SILVER ETE HOLDINGS



Source: Respective Issuers

& electronics and other industrial applications. While the global economic backdrop continued to improve, thrifting remained the key factor limiting industrial demand growth last year, although the rate of thrifting declined in light of markedly lower silver prices. On a regional basis, a modest increase in industrial offtake in developing countries, led by the 4% growth in China, was offset by weaker demand in the advanced economies.

Silver used in **photographic** applications continued to decline, falling by 5% in 2014, to 45.6 Moz (1,419 t), the lowest level in our series, which began in 1990. To put this into perspective, last year's level was down by 78% from the record high at the start of the millennium. That said, it is worth emphasizing that the pace of decline slowed considerably, to its slowest rate since 2004, which was aided by the sustained weakness in the silver price.

Silver consumed in **ethylene oxide (EO)** production was up 6% year-on-year. Much of this was due to gains in China, the largest source of silver demand in the EO industry, adding 4.4 Moz (138 t) to its production capacity thanks to newly commissioned plants.

Silver **jewelry** fabrication rose for the second consecutive year, hitting a fresh record of 215.2 Moz (6,693 t) in 2014. This was largely thanks to a strong performance in India, which surged by 47% last year to the highest level on record, surpassing demand in China. Lower silver prices, which led to high levels of restocking, was the most important factor contributing to last year's impressive growth. If we exclude this country from the global total, jewelry offtake in the rest of the world dropped by 10%.

This was primarily due to a steep decline in demand in China, where jewelry fabrication registered a 26% year-on-year drop, the first annual decline in our series. Slowing economic activity and a lack of confidence in the silver price outlook helped to explain last year's weakness. Meanwhile, improving economic sentiment and weaker silver prices led to healthy gains in the industrialized world, helping somewhat to mitigate the losses elsewhere.

Identifiable Investment, which includes physical bar investment, coins & medals and ETF inventory build, contracted by 20% last year, to a two-year low of 197.3 Moz (6,138 t). A close analysis of individual components of our identifiable investment figure reveals that last year's fall was primarily due to a steep decline in coin and bar investment, which recorded a 20% year-on-year decline

to 196 Moz (6,095 t). While this was considerably lower than the record high of 2013, last year's figure was still the second highest on record. Meanwhile, ETF investment held up relatively well, rising by 1.4 Moz (43 t) over the course of the year and finishing the year at 635.5 Moz (19,766 t), the highest year-end level on record.

Demand for **coins & medals** eased by 8% to hit 107.6 Moz (3,346 t), the lowest level since 2012. It is worth emphasizing though that silver coin fabrication remained relatively robust compared to gold coin offtake, which dropped by a more pronounced 37% last year. This was largely a reflection of fresh investor interest for silver bullion coins, particularly in Europe and North America, later in the year in response to a sharp drop in the price.

#### SILVER'S FABRICATION USES

**Industry**: Silver is the best electrical and thermal conductor of all metals and so is used in many electrical applications, particularly in conductors, switches, contacts and fuses. Contacts provide junctions between two conductors that can be separated and through which current can flow, and account for the largest proportion of electrical demand. The most significant uses of silver in electronics are in the preparation of thick-film pastes, in multi-layer ceramic capacitors, in the manufacture of membrane switches, silvered film in electrically heated automobile windshields and in conductive adhesives. Silver used in the fabrication of photovoltaic cells is seen as an area of rapid growth in the short to medium term. Other industrial uses for silver include as a coating material for compact disks and digital video disks, mirrors, glass coatings and cellophane and batteries.

Jewelry and Silverware: Silver possesses working qualities similar to gold, enjoys greater reflectivity and can achieve the most brilliant polish of any metal. Consequently, the silversmith's objective has always been to enhance the play of light on silver's already bright surface. Pure silver (999 fineness) does not tarnish easily but to make it durable for jewelry, it is often alloyed with small quantities of copper. It is also widely used with base metals in gold alloys. Sterling silver, at a fineness of 925, has been the standard of silverware since the 14th

century, particularly in the manufacture of "hollow-ware" and "flatware". Plated silverware usually has a coating of 20-30 microns, while jewelry plating is 3-5 microns.

Photography: The photographic process is based on the presence of light sensitive silver halide crystals, prepared by mixing a solution of soluble silver, usually silver nitrate, with a soluble alkali metal halide such as sodium chloride or potassium bromide. These grains are then suspended in the unexposed film. The effect of light on the silver halide disturbs the structure of this compound, rendering it selectively reducible to metallic silver by reducing agents called developers. The resulting negative image is converted to the positive by repeating the process under specific conditions. Photographic film is used in radiography, the graphic arts and in consumer photography. Photographic film manufacturers demand very high purity silver.

Coins: Historically, silver was more widely used in coinage than gold, being in greater supply and of less value, thus being practical for everyday payments. Most nations were on a silver standard until the late 19th century with silver coin forming the main circulating currency. But after the gold rushes, the silver standard increasingly gave way to gold. Silver was gradually phased out of regular coinage, although it is still used in some circulating coins and especially in American, Australian, Canadian, Mexican and Austrian bullion coins for investors.