



# 2020 Minerals Yearbook

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**SILVER [ADVANCE RELEASE]**

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# SILVER

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In 2020, the United States produced 1,030 metric tons (t) of silver, which was a 5% increase compared with production in 2019 (table 1). Silver was produced in 12 States in 2020, and Alaska remained the leading silver-producing State, followed by Nevada (table 2). Approximately 50% of domestic silver production was from primary silver ore at 4 mines, 42% of domestic silver was produced from base-metal ores at 12 mines, and the remaining was from gold ores (table 3).

The Engelhard price of silver averaged \$20.68 per troy ounce in 2020, a 35% increase compared with the 2019 average price of \$15.30 per troy ounce (table 1).

Traditional use categories for silver included coin and bar fabrication; industrial applications such as brazing alloys and solders, electrical and electronics components, ethylene oxide, photography, and photovoltaics; jewelry; non-coin investments; and silverware. Silver use in all categories, except for physical investment, decreased in 2020 from that in 2019 (Newman and others, 2021, p. 8).

In 2020, silver was mined in approximately 60 countries. Global production equaled 23,700 t, an 8% decrease from 25,700 t (revised) in 2019 (tables 1, 8). Mexico was the leading producer, followed by China, Peru, Chile, Russia, Australia, Poland, and the United States, in descending order of production. These eight countries, which all produced more than 1,000 t of silver, accounted for 79% of the global production of silver.

## Government Actions and Legislation

On September 30, the amount of Deep Storage and Working Stock custodial silver reserves held by the U.S. Mint was 498 t with a total market value of \$380 million at \$23.73 per fine troy ounce and a statutory value of \$20.7 million. As custodian, the U.S. Mint is responsible for safeguarding much of the Nation's gold and silver. In accordance with 31 U.S. Code § 5117(b) and 31 U.S. Code § 5116(b)(2), a statutory rate of no less than \$1.29292929 per fine troy ounce was used to value the custodial silver held by the U.S. Mint. Total silver bullion ounces sold increased by 28% in fiscal year 2020 compared with that in fiscal year 2019. Sales of the American Eagle silver dollar increased by 30%, and sales of the America the Beautiful silver dollar increased by 16% in fiscal year 2020 (U.S. Mint, 2020, p. 17–18, 51).

On March 15, the Board of Governors of the Federal Reserve System cut interest rates to a range of 0% to 0.25%, down from the previous range of 1.5% to 1.75% in January 2020, to stimulate the economy during the global coronavirus disease 2019 (COVID-19) pandemic. This decrease in Federal Reserve interest rates increased investment demand in silver and other precious metals. The increased silver demand caused increased silver prices (Board of Governors of the Federal Reserve System, 2020a, b; Newman and others, 2021, p. 8).

## Production

Domestic lode mine production data for silver were compiled by the U.S. Geological Survey from two separate voluntary monthly surveys of U.S. mining operations and from publicly available sources and represented 100% of U.S. mine production listed in table 1. Domestic mine production of silver increased by 5% in 2020 to 1,030 t, primarily because of increased production at the Greens Creek Mine in Alaska and the Lucky Friday Mine in Idaho. The increase in domestic silver production was offset slightly by decreased production at the Bingham Canyon Mine in Utah, the Red Dog Mine in Alaska, and the Rochester Mine in Nevada. Silver in the United States was produced mainly as a principal product, in descending order by quantity, at the Greens Creek, Rochester, Lucky Friday, and Galena Complex Mines. Silver was produced as a byproduct at other mines (table 3).

Hecla Mining Co.'s Greens Creek Mine, an underground silver-zinc mine on the Admiralty Island in southern Alaska near Juneau, produced 326 t of silver in 2020, a 6% increase in production compared with 308 t in 2019. This increase was due to higher silver ore grade (Hecla Mining Co., 2021, p. HL10-K 22, HL10-K 41).

At Hecla's Lucky Friday Mine, a silver mine in the Coeur d'Alene mining district in northern Idaho, a workers' strike began on March 13, 2017, after the previous 6-year contract expired in April 2016. In 2019, Lucky Friday installed a new remote vein miner to continue production with reduced personnel during the strike. The strike ended on January 7, 2020. Lucky Friday produced 63.2 t of silver in 2020, more than triple the 19.7 t of silver produced in 2019. This increase was due to the ramping up of operations at the end of the strike (Hecla Mining Co., 2017; 2021, p. HL10-K 23–25, HL10-K 43–44).

Coeur Mining, Inc.'s Rochester Mine near Lovelock, NV, a silver surface mine with gold byproduct, produced 98.7 t of silver in 2020, 16% less than the 2019 silver production of 117 t. The decreased silver production was due attributed to a combination of COVID-19 pandemic closures and the ongoing installation of a new leach pad, a crushing facility with two high pressure grind roll units, processing facilities, and related infrastructure (Coeur Mining, Inc., 2021, p. 12–13, 26–30).

In 2020, the Bingham Canyon Mine, near Salt Lake City, UT, owned by Rio Tinto plc, produced 68.6 t of silver, a 22% decrease compared with the 87.6 t of silver produced in 2019. The Bingham Canyon Mine is primarily a copper mine, but silver is produced as a byproduct with gold, molybdenum, and other minor metals (Rio Tinto plc, 2021, p. 340).

The Galena Complex silver mine, near Silverton, ID, owned by Americas Gold and Silver Corp., produced 28.9 t of silver in 2020 compared with 23.4 t in 2019, an increase of 24%. The increase was attributed to an increase in the amount of ore

milled and an increase in silver grade (Americas Gold and Silver Corp., 2021, p. 14–17).

## Consumption

Domestic consumption of silver for fabrication (not including silver investment except bars and coins) was 5,030 t in 2020, a 4% increase from 4,840 t (revised) in 2019. Global consumption of silver in 2020 for fabrication was 27,900 t, a 9% decrease from the revised total of 31,000 t in 2019. There were 26% and 48% decreases in consumption for jewelry and silverware, respectively, but these decreases were slightly offset by an 8% increase in consumption for physical investment in silver (Newman and others, 2021, p. 61, 65–67).

**Coin Fabrication.**—Approximately 740 t of silver was used for coins and medals in the United States in fiscal year 2020, a 28% increase from 577 t in fiscal year 2019. In fiscal year 2020, the U.S. Mint sold 684 t of American Eagle silver bullion coins, an increase of 30% from 528 t in 2019 and the sales of the America the Beautiful silver coin increased by 16% in 2020 to 55.9 t from 48.2 t in 2019 (U.S. Mint, 2020, p. 18).

**Industrial Applications.**—Silver consumed in domestic industrial applications increased by 3% to 3,930 t of silver in 2020 from the revised 2019 consumption of 3,830 t. The principal components of industrial consumption of silver were electrical components and electronics (1,970 t) and brazing alloys and solders (186 t) (Newman and others, 2020, p. 65–66).

In 2020, the domestic use of silver for electronic and electrical applications totaled 1,970 t, a slight increase from 1,940 t in 2019. This increase was attributed to increased demand for photovoltaic applications and ethylene oxide catalysts. The photovoltaic demand was driven by a rise in solar panel installations, which were caused by government-based green energy programs. In 2020, estimated domestic silver powder production for photovoltaic purposes was estimated to have increased by 14% to 480 t from 420 t in 2019 owing to the installation of photovoltaic cells. The increased demand for silver for ethylene oxide was because of new ethylene oxide plants and increased capacity. As a catalyst, silver can be used in the form of mesh screens or crystals to produce ethylene oxide and formaldehyde, both of which are essential ingredients in plastics. Approximately 90% of the silver used as an industrial catalyst was for the production of ethylene oxide from ethylene. In addition to plastics, ethylene oxide was used for antifreeze, detergents, and polyester fiber. Ethylene oxide catalyst use in the United States was estimated to have increased by 4% in 2020 to 110 t from 106 t in 2019. Recovery of silver from the production of ethylene oxide was estimated at 98% during an 18- to 36-month cycle, so demand for silver directly depends on the building of new capacity (Newman and others, 2021, p. 45–46).

One of silver's electrical applications was in batteries. The most common silver oxide battery was the small button-cell battery used in calculators, cameras, hearing aids, toys, and watches; these batteries contain about 35% silver by weight. Because of environmental and safety concerns, silver oxide batteries were being tested as a replacement for lithium-ion batteries in mobile phones and laptop computers. Silver-zinc batteries feature a water-based chemistry and contain no lithium

or flammable liquids. Some larger silver oxide and silver-zinc batteries were used in military applications. Silver also was used in conductors, contacts, fuses, switches, and timers (Silver Institute, The, undated).

Silver was one of the essential materials used in the manufacture of photographic films and papers. The decline in the use of silver for photography began in 2000 in response to the growth in digital camera technology and the decline in the production of color film and paper. The use of silver in film and paper for consumer applications declined more rapidly than its use in motion picture film because of the slower adoption of digital formats in motion picture production. Other broad photographic-use categories for silver-containing film and paper included commercial photography, graphic arts, and dental, industrial, and medical X-ray film. In 2020, domestic use of silver for photographic applications was estimated to be 350 t, a 16% decrease from 420 t in 2019 (Newman and others, 2021, p. 61).

Adding silver to solder or brazing alloys helps produce smooth, leak-tight, and corrosion-resistant joints. Silver brazing alloys were used widely in a variety of applications, including air conditioning and refrigeration and electric power distribution. They also were important in the aerospace and automobile industries. In 2020, 186 t of silver was used domestically in brazing alloys and solders, an 8% decrease from 202 t used in 2019 (Newman and others, 2021, p. 47, 66).

Silver membrane switches were used in buttons on electronics such as computer keyboards, microwave ovens, telephones, televisions, and toys. Silver-based inks and films were applied to composite boards to create electrical pathways in printed circuit boards. Silver-based inks also were used in radio frequency identification (RFID) tags used in hundreds of millions of products to prevent theft and allow easy inventory control. Dental amalgam contains silver, but its use is declining because of concerns about its mercury content (U.S. Food and Drug Administration, 2021). Owing to silver's antibacterial properties, silver also was used in such products as clothing, laundry machines, shoes, and toothbrushes. Silver embedded in locker room surfaces was used to reduce staph infections, and silver-based disinfectants have been introduced as a low-cost, environmentally sensitive option for use in care centers and food-processing facilities (Silver Institute, The, undated).

**Jewelry and Silverware.**—In 2020, domestic consumption of silver for fabrication of jewelry and silverware, excluding scrap, was 367 t, a 17% decrease compared with the 441 t consumed in 2019. Silver consumption for jewelry decreased by 17% to 334 t in 2020 from 402 t in 2019, and silver consumption for silverware decreased by 17% to 33 t from 39 t (Newman and others, 2021, p. 54–59, 67).

## Prices

Silver prices increased by 47% during 2020. The price started the year with a downward trend that ended on March 19 at \$12.05 per troy ounce, which was the yearly low. The price then trended upward until it reached the yearly high of \$29.95 per troy ounce on December 11. The daily average price of silver was \$20.68 per troy ounce, a 35% increase compared with the daily average price of \$15.30 per troy ounce in 2019 (table 1).

## Foreign Trade

U.S. exports of silver contained in bullion, dore, and ore and concentrate decreased by 36% to 141 t in 2020 from 220 t in 2019. Principal destinations were Canada (71%), Mexico (8%), and Singapore and Switzerland (4% each). Exports of bullion and dore decreased by 31% and 65%, respectively. Canada (77%) and Mexico (7%) were the leading destinations for silver bullion, and Switzerland (48%) and Mexico (21%) were the leading destinations for silver dore. Exports of ore and concentrate more than doubled to 0.6 t, and 90% was to the Republic of Korea (table 4).

U.S. imports for consumption of silver contained in bullion, dore, and ore and concentrate increased by 41% to 6,740 t in 2020 from 4,770 t in 2019. The principal import sources were Mexico (37%), Canada (18%), the United Kingdom (9%), and Germany (8%). Imports of bullion and ore and concentrate increased by 54% and 23%, respectively, whereas imports of dore decreased by 7%. The leading sources of silver were Mexico, which supplied 31% of the bullion, 70% of the dore, and 14% of the ore and concentrate, and Canada, which supplied 20% of the bullion and 86% of the ore and concentrate. Argentina was the source for 16% of dore imports (table 6).

In 2020, the United States was a net importer (imports minus exports) of silver contained in bullion, dore, and ore and concentrate; net imports were 6,600 t, which was 45% greater than net imports in 2019 (tables 4, 6). Analysts believed this was caused by increasing demand for silver investment products because of COVID-19 pandemic-related concerns, temporary closures in the domestic mining industry, and increases in industrial uses (Newman and others, 2021, p. 16).

## World Review

World mine production of silver decreased to 23,700 t in 2020, a 8% decrease from 25,700 t (revised) in 2019. Mexico continued to be the leading producer of silver, accounting for 23% of world production, followed by China (14%), Peru (12%), Chile (7%), Australia and Russia (6% each), Poland (5%), Bolivia and the United States (4% each), Argentina and India (3% each), and Kazakhstan and Sweden (2% each). These 13 countries accounted for 91% of the global silver production. Silver production decreased in Argentina and Peru by 28% each. Other countries with significant decreases in production (more than 100 t) were Turkey (60%), Indonesia (31%), Bolivia (19%), and Mexico (5%). The only country that had a significant increase (more than 100 t) was Chile (20%) (table 8).

According to The Silver Institute's "World Silver Survey 2021," about 27% of global silver production was from silver ores, 32% from lead and zinc ores, 25% from copper ores, 16% from gold ores, and negligible totals from other types of mining operations (Newman and others, 2021, p. 27).

Global silver recycling increased by 7% to 5,660 t in 2020. The increase was mainly due to increased jewelry and silverware recycling in India because of higher silver prices. The leading countries for scrap recycling were the United States (1,760 t), China (740 t), Germany (476 t), India (314 t), Japan (311 t), and Russia (289 t) (Newman and others, 2021, p. 27, 39–40).

Global silver consumption decreased by 10% to 27,900 t in 2020 from 31,000 t in 2019. Industrial applications, accounting for 53% of the total global consumption, were the leading end uses of silver, followed by bars, coins, and medals (22%), jewelry (19%), and silverware (6%). Apart from bars, coins, and medals, which increased by 8%, silver use in all other categories decreased in 2020. Industrial consumption decreased by 5%, whereas jewelry and silverware consumption decreased by 26% and 48%, respectively. Industrial consumption of silver used in photovoltaics increased slightly to 3,140 t from 3,070 t in 2019, whereas photographic uses continued to decrease (decreasing since 2010) to 859 t from 1,020 t in 2019, a 16% decrease (Newman and others, 2021, p. 61).

World consumption of silver for silverware decreased by 48% in 2020 to 1,014 t from 1,931 t in 2019. This was the lowest consumption of silver for silverware since 2010. This decrease was driven by a drop in consumption in India, which was reported to be caused by three factors: COVID-19 pandemic-related cancellations of weddings and social events, where silverware was given as gifts; a decrease in silverware as a business gift since people began to work from home; and silver price and Indian rupee volatility (Newman and others, 2021, p. 58, 67).

World consumption for jewelry decreased by 26% in 2020 to 4,622 t from 6,229 t. This decrease was due to the COVID-19 pandemic, which closed retailers and factories, and had economic effects that decreased consumption. India had the largest decrease in jewelry consumption, decreasing by 41%, by weight, in 2020, caused by increased local prices owing to the slowing Indian economy and the COVID-19 pandemic-related lockdowns that caused cancelled weddings, social events, and business gifts (Newman and others, 2021, p. 53–58, 67).

**Argentina.**—In 2020, silver production in Argentina decreased by 28% to a 768 t from 1,070 t (revised) in 2019 owing to decreased output caused by a countrywide Government-mandated shutdown on March 20. However, during the second quarter of 2020, mining was established as an essential business activity and allowed to resume. SSR Mining Inc.'s Chinchillas Mine, which is part of its Puna operations, halted its operations again in September 2020 to reduce the risk of transmission of the coronavirus. The Chinchillas Mine produced 174 t of silver in 2020, down from 239 t of silver produced in 2019. Production from Yamana Gold Inc.'s Cerro Moro Mine produced 169 t of silver in 2020, a 14% decrease from 197 t produced in 2019. Hochschild Mining plc's San Jose Mine produced 128 t of silver, a 40% decrease from 213 t of silver produced in 2019 (Hochschild Mining plc, 2021; SSR Mining Inc., 2021 p. 52; Yamana Gold Inc., 2021).

**Australia.**—In 2020, silver production in Australia was essentially unchanged at 1,343 t compared with 1,325 t (revised) produced in 2019. The coronavirus was detected in Victoria on January 25, but mining was declared an essential industry on January 29, thus allowing mining to continue without interruption. South32 Ltd.'s Cannington Mine in Queensland State produced an estimated 367 t of silver in the 2020 Australian financial year (July 1, 2020, to June 30, 2021), a 3% decrease from the estimated 379 t of silver produced in the 2019 Australian financial year. Glencore plc's Mount Isa Mine in Queensland State produced 180 t of silver in concentrate

in 2020, an increase of 5% from 171 t produced in 2019. This increase was due to increased processing of stockpiles of higher grade ore. MMG Ltd.'s Rosebery Mine in Tasmania State produced 85.3 t of silver in 2020, a 20% increase from 71.1 t of silver produced in 2019. This increase was due to higher ore grades and recoveries (Cholteeva, 2020; Parliament of Australia, 2020; South32 Ltd., 2020a–c, 2021; Glencore plc, 2021b; MMG Ltd., 2021).

**Bolivia.**—Silver production in Bolivia in 2020 was 930 t, a 19% decrease compared with 1,150 t (revised) in 2019. This decrease was primarily due to the COVID-19 pandemic-related lockdowns that started on March 12 and lasted until May 2 for the mining sector. Andean Precious Metals Corp.'s San Bartolome Mine in Potosi Department produced 170 t of silver in 2020, a 4% increase from 163 t of silver produced in 2019. Pan American Silver Corp.'s San Vicente Mine in Potosi Department produced 72 t of silver in 2020, a 34% decrease from 110 t of silver produced in 2019 (Ministerio de Minería y Metalurgia, 2020; Andean Precious Metals Corp., 2021; Pan American Silver Corp., 2021).

**Canada.**—Silver production in concentrate in Canada, on a preliminary basis, was 295 t in 2020, a 16% decrease from 350 t (revised) in 2019. This decrease was partially attributed to the global COVID-19 pandemic and Coeur placing the Silvertip Mine in northern British Columbia Province on care-and-maintenance status in February 2020 owing to poor market conditions (Newman and others, 2021, p. 28). Most of the silver in Canada was produced as a coproduct with or byproduct of other metals in 35 mines. Glencore's Kidd Creek operation produced 66 t of silver in 2020, an increase of 28% from 51 t of silver produced in 2019. Hudbay Minerals Inc.'s Manitoba Bay operations produced 35 t of silver in 2020, a 4% increase from 33.6 t of silver produced in 2019. This increase was due to higher silver head grades and recoveries at the Stall concentrator compared with those in 2019. Teck Resources' Trail operation produced 358 t of refined silver in 2020, an 18% decrease from its 2019 production of 435 t. This decrease was due to lower silver content in its purchased concentrates. Vale S.A.'s Sudbury operations produced 69 t of silver in 2020, 22% greater than the 57 t of silver produced in 2019 (Glencore plc, 2021a, p. 30–31, 68; Hudbay Minerals Inc., 2021; Teck Resources Ltd., 2021, p. 18; Vale S.A., 2021, p. 106).

On November 24, 2020, Alexco Resources Corp. commissioned the Keno Hill District Mill. The Keno Hill Mine, located in Yukon Territory, had an 8-year mine life and was expected to produce 124 metric tons per year (t/yr) of silver in lead-silver and zinc concentrates (Alexco Resources Corp., 2020).

**China.**—Silver production in China was 3,378 t in 2020, a slight decrease from 3,443 t in 2019. Mine closures owing to the COVID-19 pandemic led to decreased lead and zinc output, which affected silver production. About 90% of the silver produced in the country was produced as a byproduct of copper, lead, and zinc mining, and about 9% from primary silver mines. Jewelry consumption in China in 2020 was 589 t, a decrease of 17% from 709 t in 2019. Silverware consumption in China in 2020 was 77 t, a decrease of 25% from 103 t in 2019. Both decreases were attributed to the COVID-19 pandemic, which heavily affected first quarter consumption. Leading silver-

producing projects included China Gold International Resources Corp. Ltd.'s Jiamal Mine, a copper-molybdenum-gold mine that produced 226 t of silver, a 92% increase from 118 t produced in 2019, owing to higher mined tonnage, ore grades, and recovery rates; and Silvercorp Metals Inc.'s Ying project, a silver project that produced an estimated 174 t of silver in the 12 months ending March 31, 2020 (China Gold International Resources Corp. Ltd., 2021, p. 44–45; Newman and others, 2021, p. 31, 57–59, 67; Silvercorp Metals Inc., 2021).

**Mexico.**—In 2020, Mexico was the leading producer of silver in the world; production was 5,541 t, a 5% decrease from 5,840 t (revised) in 2019. The decrease in production was attributed to COVID-19 pandemic-related temporary mine closures. To prevent the COVID-19 pandemic from spreading, the Government of Mexico announced a nationwide lockdown on March 30, 2020, and, during the next few months, a few mines were given authorization to resume operations. By the end of May, all mining activities were authorized to resume at normal rates. The largest disruption to production took place at Pan American Silver's La Colorada Mine, which produced 156 t in 2020, a 39% decrease from 255 t produced in 2019. Another major decrease was at Minera Fresnillo plc's Saucito Mine, which produced 483 t of silver in 2020, a 9% decrease from 534 t produced in 2019. Leading silver-producing projects in 2020 included Newmont Corp.'s Penasquito project, which produced 865 t; and Fresnillo plc's Saucito, San Julian, and Fresnillo projects, which produced 483 t, 414 t, and 406 t of silver, respectively (Fresnillo plc, 2021, p. 52, 54, 57; Newmont Corp., 2021, p. 1; Pan American Silver Corp., 2021).

**Peru.**—In 2020, Peru was the second leading producer of silver in the world; production was 2,771 t, a 28% decrease from 3,860 t produced in 2019. The leading silver-producing mines were Compañía Minera Antamina S.A.'s Antamina Mine (510 t), Compañía de Minas Buenaventura S.A.A.'s Uchucchacua Mine (156 t), Volcan Compania Minera S.A.A.'s Yauli unit (155 t), and Hochschild's Inmaculada Mine (125 t) and Pallancata Mine (114 t). Mining operations in Peru were suspended from mid-April to late May because of the COVID-19 pandemic (Newman and others, 2021, p. 9, 28).

The Antamina Mine's silver production was 510 t in 2020, an increase of 10% from 465 t produced in 2019. This increase was due to higher ore grades but was partially reduced by the COVID-19 pandemic-related shutdown in Peru. Compañía Minera Antamina S.A. owned and operated the Antamina Mine, which was co-owned by BHP Billiton plc (33.75%), Glencore (33.75%), Teck Resources (22.5%), and Mitsubishi Corporation (10%) (Glencore plc, 2021b, p. 4; Teck Resources Ltd., 2021, p. 12, 17).

Silver production at Buenaventura's Uchucchacua Mine decreased to 156 t, 53% less than 331 t in 2019. This decrease was attributed to a decrease in workforce and the COVID-19 pandemic-related shutdown. Buenaventura also produced silver at the El Brocal (109 t), Julcani (52 t), and Tambomayo (52 t) Mines (Compañía de Minas Buenaventura S.A.A., 2021).

Volcan Compania Minera's Yauli unit produced 156 t of silver in 2020, a decrease of 29% from 218 t of silver produced in 2019. The Yauli unit is made up of four mines: Andaychagua, Carahuacra, San Cristobal, and Ticlio. The production decrease

was due to the COVID-19 pandemic-related protocols in Peru (Volcan Compania Minera S.A.A., 2021, p. 65–66).

Production of silver at Hochschild's Inmaculada Mine in 2020 was 125 t, a 30% decrease from 179 t of silver produced in 2019. The mine's production was affected by two shutdowns related to the COVID-19 pandemic, one from mid-March until May and the second in July. Silver ore grades also were slightly lower than expected. Production of silver at the Pallancata Mine in 2020 was 114 t, a 49% decrease from 226 t produced in 2019. The Pallancata Mine had lower silver ore grade veins than expected and was affected by two shutdowns in 2020 (Hochschild Mining plc, 2021).

**Poland.**—In 2020, Poland produced 1,218 t of silver, a slight decrease from the revised total of silver produced in 2019. The global leading silver-producing mine was the KGHM Polska Miedź S.A. Group project, a polymetallic copper mine, which produced 1,218 t of silver, slightly less than the 1,249 t produced in 2019. The decrease was due to reduced amounts of silver in the ores (KGHM Polska Miedź S.A. Group, 2021).

**Russia.**—Silver production in Russia was 1,380 t, a slight decrease from 1,407 t (revised) in 2019. The leading silver-producing mine in Russia was Polymetal International plc's Dukat Mine. Silver production at the Dukat Mine in 2020 was 448 t, a 9% decrease from 491 t produced in 2019. This decrease was due to reduced ore grades. Production at Polymetal's Lunnoye silver mine in 2020 was 115 t, a 7% increase from 109 t produced in 2019. This increase was due to improved ore grades and recoveries (Polymetal International plc, 2020, p. 11, 37).

## Outlook

The outlook for silver is difficult to determine in the short term, but if the world economy remains affected by the COVID-19 pandemic, physical investment in silver is expected to be higher than 2020 investment.

Silver use is expected to increase in low-carbon energy infrastructure. Consumption is expected to increase significantly, as 30 countries have set goals for reduced or zero carbon emissions in the next decade. Silver consumption in photovoltaics reached 3,142 t in 2020, and this happened with an 80% decrease in silver consumption per cell during the past decade. Silver consumption is expected to increase owing to growth in demand for electronics in automobiles in developing countries, as well as demand in more advanced vehicles that use more silver because of its electrical properties and resistance to oxidation. Consumption of silver in the automotive sector is expected to approach 2,800 t/yr of silver within 5 years (Newman and others, 2021, p. 16, 48).

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TABLE 1  
SALIENT SILVER STATISTICS<sup>1</sup>

		2016	2017	2018	2019	2020
United States:						
Mine production:						
Quantity	metric tons	1,150	1,030	934	981	1,030
Value	thousands	\$632,000	\$566,000	\$473,000	\$502,000	\$680,000
Refinery production:						
Domestic and foreign ore and concentrate	metric tons	1,530	1,420	1,420	1,420	1,420 <sup>c</sup>
Scrap (old and new)	do.	866	490	632	643	640 <sup>c</sup>
Exports:						
Ore and concentrate	do.	16	16	8	(2)	(2)
Bullion and dore	do.	273	141	595	219	140
Imports for consumption:						
Ore and concentrate <sup>3</sup>	do.	5	7	8	7	9
Bullion and dore	do.	6,160	5,040	4,830	4,760	6,730
Stocks, December 31:						
Industry	do.	140	150	170	52	60 <sup>c</sup>
COMEX	do.	5,710	7,570	9,150	9,860	12,300
U.S. Department of the Treasury	do.	498	498	498	498	498
Bullion coin production <sup>4</sup>	do.	1,370	746	461	577	740
Price, average <sup>5</sup>	dollars per troy ounce	17.14	17.08	15.73	15.30	20.68
Employment, mine and mill workers <sup>6</sup>		1,206 <sup>r</sup>	1,027 <sup>r</sup>	971 <sup>r</sup>	995 <sup>r</sup>	1,177
World, mine production <sup>7</sup>	metric tons	28,600 <sup>r</sup>	26,700 <sup>r</sup>	26,200 <sup>r</sup>	25,700 <sup>r</sup>	23,700

<sup>c</sup>Estimated. <sup>r</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through November 10, 2021. Data are rounded to no more than three significant digits, except "Price" and "Employment."

<sup>2</sup>Less than 1/2 unit.

<sup>3</sup>Includes silver content of ash and residues.

<sup>4</sup>Source: U.S. Mint. Production is based on fiscal year, with an ending date of September 30 of the year shown.

<sup>5</sup>Price data are the annual Englehard quotations published in S&P Global Platts Metals Week.

<sup>6</sup>Employment data are from the U.S. Department of Labor, Mine Safety and Health Administration, for mines classified as (active and temporarily idle) silver mines; data adjusted by the U.S. Geological Survey.

<sup>7</sup>May include estimated data.

TABLE 2  
MINE PRODUCTION OF SILVER IN THE UNITED STATES, BY STATE<sup>1</sup>

(Kilograms)

State	2018	2019	2020
Alaska	465,000	540,000	575,000
Arizona	58,000	64,700	70,700
Nevada	247,000	190,000	165,000
Other <sup>2</sup>	164,000	186,000	217,000
Total	934,000	981,000	1,030,000

<sup>1</sup>Table includes data available through November 10, 2021. Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes California, Colorado, Idaho, Missouri, Montana, New Mexico, South Carolina, South Dakota, and Utah.

TABLE 3  
LEADING SILVER-PRODUCING MINES IN THE UNITED STATES IN 2020, IN ORDER OF OUTPUT<sup>1</sup>

Rank	Mine	County and State <sup>2</sup>	Operator	Source of silver
1	Greens Creek	Southeastern Region, AK	Hecla Mining Co.	Silver-zinc ore.
2	Red Dog	Northern Region, AK	Teck Alaska Inc.	Zinc-lead ore.
3	Rochester	Pershing, NV	Coeur Mining, Inc.	Silver ore.
4	Bingham Canyon	Salt Lake, UT	Rio Tinto Kennecott Corp. <sup>3</sup>	Copper-molybdenum ore.
5	Lucky Friday	Shoshone, ID	Hecla Mining Co.	Silver ore.
6	Mission Complex	Pima, AZ	ASARCO LLC <sup>4</sup>	Copper ore.
7	Galena Complex	Shoshone, ID	Americas Silver Corp.	Silver ore.
8	Bagdad	Yavapai, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper-molybdenum ore.
9	Phoenix	Lander, NV	Nevada Gold Mines LLC <sup>5</sup>	Gold-copper ore.
10	Continental Pit	Silver Bow, MT	Montana Resources LLP	Copper-molybdenum ore.
11	Round Mountain	Nye, NV	Kinross Gold Corp.	Gold ore.
12	Soledad Mountain	Kern, CA	Falco Resources Ltd. (50%) <sup>6</sup> and Gauss LLC (50%)	Do.
13	Carlin Mines Operations	Elko, Eureka, and Humboldt, NV	Nevada Gold Mines LLC <sup>5</sup>	Do.
14	Pinto Valley	Gila, AZ	Capstone Mining Corp.	Copper-molybdenum ore.
15	Haile	Lancaster, SC	OceanaGold Corp.	Gold ore.
16	Moss	Mohave, AZ	Northern Vertex Mining Corp.	Gold-silver ore.
17	Rawhide	Mineral, NV	Coral Reef Capital LLC	Gold ore.
18	Morenci	Greenlee, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper-molybdenum ore.
19	Wharf	Lawrence, SD	Coeur Mining, Inc.	Gold ore.
20	Cortez Operations	Eureka and Lander, NV	Nevada Gold Mines LLC <sup>5</sup>	Do.
21	Chino	Grant, NM	Freeport-McMoRan Copper & Gold Inc.	Copper ore.
22	Ray	Pinal, AZ	ASARCO LLC <sup>4</sup>	Do.
23	Betze-Post	Eureka, NV	Nevada Gold Mines LLC <sup>5</sup>	Gold ore.
24	Viburnum (#29 and #35)	Washington and Iron, MO	Doe Run Resources Corp.	Lead ore.
25	Fletcher	Reynolds, MO	do.	Do.

Do., do. Ditto.

<sup>1</sup>Table includes data available through November 10, 2021. The mines on this list accounted for more than 99% of U.S. mine production in 2020.

<sup>2</sup>For Alaska, mines are located by geographic region, as delineated by the Alaska Division of Geological & Geophysical Surveys in its Special Report 76, Alaska's mineral industry 2020.

<sup>3</sup>Wholly owned subsidiary of Rio Tinto Group.

<sup>4</sup>Wholly owned subsidiary of Grupo México, S.A.B. de C.V.

<sup>5</sup>Nevada Gold Mines LLC is a joint venture between Barrick Gold Corp. (61.5%) and Newmont Mining Corp. (38.5%).

<sup>6</sup>On March 27, 2020, Falco Resources Ltd. acquired all shares of Golden Queen Mining Consolidated Ltd.

TABLE 4  
U.S. EXPORTS OF REFINED SILVER, BY COUNTRY OR LOCALITY<sup>1</sup>

Year and country or locality	Ore and concentrate		Bullion		Dore		Total	
	Silver content (kilograms)	Value (thousands)						
2019	231	\$112	190,000	\$95,900	29,900	\$18,100	220,000	\$114,000
2020:								
Australia	11	7	2,640	2,330	--	--	2,650	2,340
Canada	20	10	99,700	59,900	--	--	99,800	59,900
Cayman Islands	--	--	217	249	--	--	217	249
Chile	--	--	1,480	1,410	--	--	1,480	1,410
Czechia	--	--	3,710	2,710	--	--	3,710	2,710
Germany	--	--	3,810	2,610	705	466	4,520	3,070
Hong Kong	--	--	114	120	9	8	123	128
India	--	--	450	310	203	117	653	427
Israel	--	--	141	144	--	--	141	144
Italy	--	--	63	31	668	376	731	407
Korea, Republic of	503	307	46	48	11	3	560	358
Mexico	14	8	9,460	7,360	2,240	1,380	11,700	8,750
Panama	--	--	333	679	--	--	333	679
Singapore	--	--	4,490	3,320	1,530	889	6,020	4,210
Switzerland	--	--	80	61	5,060	6,200	5,140	6,260
Thailand	--	--	325	646	3	3	328	649
United Kingdom	--	--	1,370	1,170	--	--	1,370	1,170
Other	14	8	1,380	1,390	56	44	1,450	1,440
Total	562	341	130,000	84,400	10,500	9,490	141,000	94,300

-- Zero.

<sup>1</sup>Table includes data available through July 21, 2021. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 5  
U.S. EXPORTS OF SILVER, BY COUNTRY OR LOCALITY<sup>1</sup>

Year and country or locality	Other unwrought silver		Metal powder		Silver nitrate		Semimanufactured forms <sup>2</sup>		Waste and scrap	
	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)
2019	240,000 <sup>r</sup>	\$134,000	595,000	\$366,000	46,300 <sup>r</sup>	\$8,290 <sup>r</sup>	435,000	\$248,000	18,500,000	\$2,750,000
2020:										
Australia	158	5,730	136	67	856	184	1,330	688	47	4
Belgium	--	--	4,140	3,210	--	--	--	--	4,100,000	242,000
Brazil	--	--	1,530	1,460	669	113	770	465	81	2,330
Canada	908,000	665,000	16,000	12,700	16,800	4,120	355,000	243,000	1,650,000	263,000
Cayman Islands	78	124	--	--	--	--	3,880	2,710	--	--
Chile	819	574	1	3	20	4	365	186	--	--
China	8,630	4,840	58,600	45,400	162	37	16,300	10,300	16,400	667
Costa Rica	360	487	141	121	291	19	1,440	843	--	--
Dominican Republic	380	250	162	185	66	24	513	321	--	--
Finland	--	--	10	14	--	--	19,700	9,630	16,800	318
France	201	96	62,500	43,000	--	--	4,640	2,840	64	828
Germany	295	384	14,500	10,100	196	57	3,480	3,160	2,870,000	739,000
Hong Kong	1,370	685	31,300	23,700	--	--	3,230	2,550	4,830	6,860
Hungary	--	--	1,030	1,020	--	--	842	590	--	--
India	16,000	17,200	517	438	261	73	8,710	5,640	--	--
Israel	363	117	105	88	--	--	420	377	--	--
Italy	2	5	4,240	3,080	--	--	1,050	737	1,970,000	869,000
Japan	220	204	50,000	38,400	130	11	38,000	22,100	5,140,000	296,000
Korea, Republic of	30	28	35,800	26,800	266	60	14,300	11,900	95,000	13,100
Malaysia	175	71	2,910	2,610	51	33	3,100	2,120	19	20
Mexico	7,630	5,900	20,200	15,700	5,120	1,680	67,000	37,200	23,800	3,640
Netherlands	198	214	13,500	10,200	--	--	18	12	13,000	168
Philippines	240	410	--	--	177	115	2,170	1,670	13	5
Romania	--	--	1,730	1,520	--	--	69	42	--	--
Russia	149	26	50	31	--	--	87	48	327	5,340
Saudi Arabia	--	--	--	--	23	19	2,220	1,080	6,290	1,370
Singapore	163	193	91,400	58,400	9,400	4,300	14,600	8,470	50	46
South Africa	--	--	100	39	23	14	105	70	10,300	1,940
Spain	--	--	230	148	--	--	6,970	3,720	--	--
Sweden	--	--	--	--	--	--	390	164	2,390,000	63,200
Switzerland	1,870	2,060	22	12	--	--	6,440	4,340	5,760	40,300
Taiwan	4	11	184,000	141,000	1,110	46	1,110	1,570	--	--
Thailand	2,170	1,190	4	16	453	93	4,450	3,070	11	11
United Kingdom	816	643	17,400	12,800	3	5	49,500	35,900	406,000	1,020,000
Vietnam	1,180	276	--	--	57	11	1,110	577	1	9
Other	1,000	604	370	274	375	81	8,980	5,870	3,950	1,430
Total	952,000	707,000	612,000	453,000	36,500	11,100	642,000	424,000	18,700,000	3,570,000

<sup>1</sup>Revised. --Zero.<sup>1</sup>Table includes data available through July 21, 2021. Data are rounded to no more than three significant digits; may not add to totals shown.<sup>2</sup>Contains 99.5% or more silver by weight.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF REFINED SILVER, BY COUNTRY OR LOCALITY<sup>1</sup>

Year and country or locality	Ore and concentrate, ash and residues		Bullion		Dore		Total	
	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)	Silver content (kilograms)	Value (thousands)
2019	7,290	\$1,880	3,790,000	\$1,970,000	973,000	\$844,000	4,770,000	\$2,810,000
2020:								
Argentina	--	--	--	--	147,000	93,600	147,000	93,600
Australia	--	--	1,200	924	--	--	1,200	924
Belgium	--	--	77,800	50,300	--	--	77,800	50,300
Bolivia	--	--	30,000	20,000	17,600	11,800	47,500	31,900
Canada	7,720	2,980	1,180,000	752,000	835	497	1,190,000	755,000
Chile	--	--	149,000	111,000	43,600	25,300	193,000	136,000
Colombia	--	--	365	261	1,290	925	1,650	1,190
Costa Rica	--	--	22	9	37	14	59	23
France	--	--	2,000	1,200	--	--	2,000	1,200
Germany	--	--	501,000	301,000	10,200	5,990	512,000	307,000
Hong Kong	--	--	10,000	8,900	--	--	10,000	8,900
India	--	--	16,800	10,300	--	--	16,800	10,300
Italy	--	--	12,000	6,800	2,960	1,880	15,000	8,680
Kazakhstan	--	--	195,000	124,000	--	--	195,000	124,000
Korea, Republic of	--	--	487,000	338,000	--	--	487,000	338,000
Mexico	1,210	356	1,830,000	1,200,000	632,000	713,000	2,460,000	1,910,000
Nicaragua	--	--	--	--	32,600	21,800	32,600	21,800
Panama	--	--	834	719	116	76	950	795
Peru	--	--	9,920	4,890	7,910	4,410	17,800	9,300
Poland	--	--	330,000	224,000	--	--	330,000	224,000
Russia	--	--	110,000	88,400	--	--	110,000	88,400
South Africa	--	--	11,800	7,260	--	--	11,800	7,260
Switzerland	--	--	198,000	134,000	1,540	1,300	200,000	136,000
United Kingdom	--	--	613,000	430,000	418	287	614,000	430,000
Uzbekistan	--	--	49,800	43,700	--	--	49,800	43,700
Other	(2)	171	5,760	3,950	5,160	3,100	10,900	7,220
Total	8,930	3,510	5,830,000	3,860,000	904,000	884,000	6,740,000	4,750,000

-- Zero.

<sup>1</sup>Table includes data available through July 21, 2021. Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 7  
U.S. IMPORTS FOR CONSUMPTION OF SILVER, BY COUNTRY OR LOCALITY<sup>1</sup>

Year and country or locality	Other unwrought silver		Metal powder		Silver nitrate		Semimanufactured forms <sup>2</sup>		Waste and scrap	
	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)	Gross weight (kilograms)	Value (thousands)
2019	458,000	\$181,000 <sup>r</sup>	303,000	\$29,000	2,640	\$534	291,000 <sup>r</sup>	\$147,000	9,540,000 <sup>r</sup>	\$1,070,000
2020:										
Argentina	--	--	--	--	--	--	--	--	--	45,400
Belgium	--	--	--	--	540	22	--	--	328,000	6,890
Bolivia	--	--	--	--	--	--	10,100	5,830	14,000	21
Brazil	--	--	--	--	--	--	--	--	184,000	4,710
Canada	102,000	35,800	13,200	685	253	94	18,900	13,900	2,310,000	171,000
Chile	--	--	--	--	--	--	32,100	22,100	64,700	182
China	--	--	1,390	187	--	--	--	--	215,000	8,270
Colombia	--	--	--	--	--	--	--	--	65,100	13,200
Costa Rica	--	--	294	59	--	--	--	--	29,500	3,350
Czechia	13	12	--	--	--	--	424	241	126	2
Dominican Republic	--	--	--	--	--	--	--	--	41,100	4,620
France	--	--	48,700	2,740	--	--	15	10	4,030	28
Germany	103	77	11,000	7,350	626	47	130,000	93,500	1,010,000	491,000
Honduras	--	--	--	--	--	--	--	--	24,500	1,320
Hungary	24,800	698	25,900	1,480	--	--	--	--	3,610	86
Italy	338	137	--	--	--	--	142	233	2,070	885
Japan	20	20	85,300	6,550	--	--	32	47	13,000	430
Korea, Republic of	581	26	20	27	88	42	164,000	99,600	859	2,420
Mexico	279,000	183,000	--	--	--	--	363	61	507,000	42,300
Nigeria	--	--	--	--	--	--	--	--	23,300	133
Peru	84,200	54,200	--	--	--	--	--	--	--	5
Poland	--	--	--	--	--	--	214,000	139,000	9,770	7,120
Singapore	--	--	3,510	2,790	--	--	--	--	7,680	464
Switzerland	31	22	156	91	2	6	57,700	29,800	3	90
Taiwan	--	--	3,690	220	--	--	38,700	33,900	25,900	2,580
Thailand	--	--	195	136	--	--	7	25	140,000	25,800
Trinidad and Tobago	--	--	--	--	--	--	--	--	25,000	2,360
United Arab Emirates	--	--	--	--	--	--	18,300	10,400	83,700	1,950
United Kingdom	70	61	491	326	523	59	494,000	317,000	3,080,000	643,000
Vietnam	71	26	--	--	--	--	--	--	70,100	364
Other	185	71	584	301	28	9	91,300	60,500	200,000	29,300
Total	491,000	275,000	194,000	22,900	2,060	278	1,270,000	826,000	8,530,000	1,460,000

<sup>r</sup>Revised. -- Zero.<sup>1</sup>Table includes data available through July 21, 2021. Data are rounded to no more than three significant digits; may not add to totals shown.<sup>2</sup>Contains 99.5% or more silver by weight.

Source: U.S. Census Bureau.

TABLE 8  
SILVER: WORLD MINE PRODUCTION, BY COUNTRY OR LOCALITY<sup>1</sup>

(Kilograms)

Country or locality <sup>2</sup>	2016	2017	2018	2019	2020
Algeria	20	25 <sup>r</sup>	26 <sup>r</sup>	20 <sup>r,c</sup>	12
Argentina	1,055,700 <sup>r</sup>	997,961 <sup>r</sup>	1,023,768 <sup>r</sup>	1,070,000 <sup>r</sup>	768,000
Armenia <sup>c</sup>	16,000	15,500	19,500 <sup>r</sup>	22,800 <sup>r</sup>	22,300
Australia	1,418,000	1,120,000	1,254,000	1,325,000 <sup>r</sup>	1,343,000
Azerbaijan	320	3,429	3,229	3,820 <sup>r</sup>	4,310
Bolivia	1,353,202	1,196,416	1,191,024	1,153,000 <sup>r</sup>	930,000
Brazil	77,000	86,000	71,000	66,000 <sup>r</sup>	68,000
Bulgaria	52,526	53,053	41,315	35,145 <sup>r</sup>	32,760
Burkina Faso <sup>c</sup>	22,000	6,000	1,000	1,000	1,000
Canada <sup>3</sup>	385,000	368,000	392,000	349,710 <sup>r</sup>	295,051
Chile	1,501,436	1,318,582	1,370,237	1,309,321 <sup>r</sup>	1,575,794
China	3,754,000	3,601,000	3,422,000	3,443,000	3,378,000
Colombia	11,866 <sup>r</sup>	12,076 <sup>r</sup>	16,684 <sup>r</sup>	12,706 <sup>r</sup>	19,022
Congo (Kinshasa)	835	--	--	--	--
Côte d'Ivoire	594	485	137	--	--
Cyprus	--	96	180	97 <sup>r</sup>	486
Dominican Republic	121,749	151,757	166,500	108,700 <sup>r</sup>	87,990
Ecuador	934	68 <sup>r</sup>	192 <sup>r</sup>	2,892 <sup>r</sup>	1,792
Eritrea	13,200	49,921	31,000	44,836	65,284
Ethiopia <sup>c</sup>	1,000	1,000	1,000	1,000	1,000
Fiji <sup>4</sup>	354	350	413	692 <sup>r</sup>	518
Finland	16,348	13,654	12,849	40,461	54,833
Georgia	3,500 <sup>r,c</sup>	3,000 <sup>r,c</sup>	3,000 <sup>r,c</sup>	4,052 <sup>r</sup>	5,467
Ghana <sup>c</sup>	2,300	1,800	1,800	1,800	1,800
Greece	29,409	23,967	25,237	28,161	30,209
Guatemala	793,083	336,943	--	--	--
Honduras	19,275	21,785	31,182	43,579	18,088
India	445,367	526,604	648,600	633,176 <sup>r</sup>	705,795
Indonesia	185,234	329,000	309,000	487,000 <sup>r</sup>	335,200
Iran <sup>c</sup>	50,000 <sup>r</sup>	50,000 <sup>r</sup>	50,000 <sup>r</sup>	50,000 <sup>r</sup>	50,000
Ireland	1,080	1,340	1,160	1,578	918
Japan	5,076	3,408	3,596	3,492	1,757
Kazakhstan <sup>c</sup>	587,000 <sup>r</sup>	461,000 <sup>r</sup>	369,000 <sup>r</sup>	422,000 <sup>r</sup>	435,000
Korea, North <sup>c</sup>	30,000	20,000	20,000	20,000	20,000
Korea, Republic of	6,579	8,788	7,090	5,245 <sup>r</sup>	5,739
Kyrgyzstan	18,410	17,097	16,000	14,000 <sup>r</sup>	11,700
Laos	50,904	42,841	37,465	34,443 <sup>r</sup>	30,100 <sup>c</sup>
Malaysia	1,075	1,404	1,542 <sup>r</sup>	686 <sup>r</sup>	423
Mexico	5,408,521	6,108,722	6,049,000	5,840,000 <sup>r</sup>	5,541,000
Mongolia <sup>c</sup>	69,000	62,000	60,000	57,000	57,000
Morocco	295,000	306,000	230,000	251,000	260,000
Namibia <sup>c,5</sup>	8,770 <sup>6</sup>	7,010	4,670	6,220	6,980
New Zealand	7,960	8,022	6,332	4,060 <sup>r</sup>	4,050
Nicaragua	21,382	15,149	11,263	17,362	20,186
Niger <sup>c</sup>	120	120	120	120	120
Oman	3,621	120	--	--	--
Pakistan	3,110	3,000 <sup>c</sup>	3,000 <sup>c</sup>	3,000 <sup>c</sup>	3,000 <sup>c</sup>
Papua New Guinea	90,498	86,700	114,900	147,000	132,000
Peru	4,375,337	4,303,541	4,160,162	3,860,306	2,771,825
Philippines	35,186	31,737	29,782	31,267	24,024
Poland	1,482,000	1,490,000	1,471,400	1,249,000 <sup>r</sup>	1,218,000
Portugal	38,630	40,185	90,820	95,271	96,000 <sup>c</sup>
Russia	2,261,000	1,373,000 <sup>r</sup>	1,400,000 <sup>r</sup>	1,407,000 <sup>r</sup>	1,380,000
Slovakia	391 <sup>r</sup>	410 <sup>r</sup>	345 <sup>r</sup>	295 <sup>r</sup>	300 <sup>c</sup>
Solomon Islands	--	--	--	NA	NA
South Africa	55,622	62,536	46,467	55,903	38,154

See footnotes at end of table.

TABLE 8—Continued  
SILVER: WORLD MINE PRODUCTION, BY COUNTRY OR LOCALITY<sup>1</sup>

(Kilograms)

Country or locality <sup>2</sup>	2016	2017	2018	2019	2020
Spain	74,740 <sup>r</sup>	82,694 <sup>r</sup>	88,514 <sup>r</sup>	77,501 <sup>r</sup>	75,000 <sup>e</sup>
Sweden	515,039	488,135	471,325	423,777	421,025
Tajikistan	3,000	4,300	6,300 <sup>e</sup>	10,800 <sup>r</sup>	3,300
Tanzania	17,984	10,911	12,262 <sup>r</sup>	12,607 <sup>r</sup>	13,187
Thailand	35,954	--	--	--	--
Turkey	376,640	151,490	197,320	242,000 <sup>r</sup>	98,000
United Kingdom	14	--	--	130	130 <sup>e</sup>
United States	1,150,000	1,030,000	934,000	981,000	1,030,000
Uzbekistan	220,000 <sup>r, e</sup>	220,000 <sup>r</sup>	224,000 <sup>r</sup>	219,200 <sup>r</sup>	237,600
Zimbabwe	1,463	1,480	1,542	1,493 <sup>r</sup>	1,500 <sup>e</sup>
Total	28,600,000 <sup>r</sup>	26,700,000 <sup>r</sup>	26,200,000 <sup>r</sup>	25,700,000 <sup>r</sup>	23,700,000

<sup>a</sup>Estimated. <sup>r</sup>Revised. <sup>NA</sup> Not available. <sup>--</sup> Zero.

<sup>1</sup>Table includes data available through November 30, 2021. All data are reported unless otherwise noted; totals may include estimated data. Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the countries and (or) localities listed, silver may have been produced in other countries and (or) localities, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>Metal content of concentrate produced.

<sup>4</sup>Mine output, silver content.

<sup>5</sup>Metal content of concentrates, estimated.

<sup>e</sup>From zinc concentrates.