

Silver News

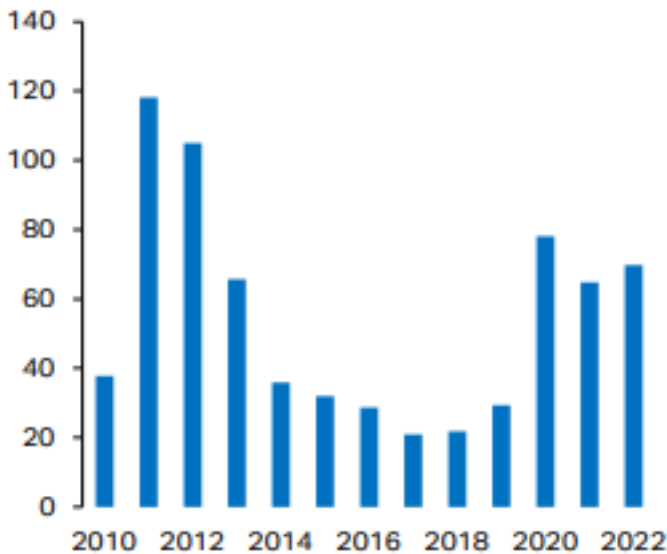
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Indian Investors Offered More Silver Product Choices

Growth Expected Despite Entrenched Interest in Physical Holding

Silver Futures Contracts

No of Contracts (in Mn.)



Note: * as on 3rd January 2023

After a slump in the late 2010's, the Indian silver futures market is once again on the rise.

With the introduction of new investment products, Indian investors now have greater opportunities for silver investing beyond holding physical silver, which has traditionally been their favored way for investing in the white metal, according to a recently-published Silver Institute Market Trend Report, "Trends in Indian Investment Demand." With the introduction of new options, including silver exchange-traded products (ETPs) and digital silver, Indian investors have opportunities to invest in liquid investments without the need to worry about storage of the physical silver.

As the world's sixth-largest economy and foremost silver fabricator, India also plays an essential role in silver and gold investment demand, historically recognized in that market as savings and investment assets, a reflection of the low penetration of banking and other financial products. Today, with new investment products available to Indian investors, India's role in silver investment has the potential to grow.

Since 2010, India's physical silver investment (bars and coins) has accounted for one-third of overall Indian silver demand. During this time, Indian retail investors bought around 730 million ounces (Moz) of silver, representing 90 percent of 2022's global silver mine production. However, the report notes that since 2014, some notable policy and regulatory changes in India have structurally altered investment in precious metals, potentially limiting physical investment. These changes have included the government's push to provide banking services to the entire population and the crackdown on tax evasion and cash transactions. These changes, however, have served to spur new options for investing in silver.

In India today investors can currently choose amongst seven ETPs and five silver ETP Fund-of-Funds (FoFs

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invest in ETPs). “As of end 2022, silver ETP holdings in India stood at an estimated 8 million ounces, a good start given the fact that these products were only released in late 2021,” the report noted.

Another new area of investment in India is ‘digital silver,’ which allows investors to buy silver for a low price point, depending on the platform. The silver is then stored in insured vaults by the seller on behalf of the customer, who can either sell it back on the same platform or take physical delivery in the form of coins or bullion (after paying delivery and minting charges). Digital silver represents another new chapter of silver investment in India, and already nine companies offer these products.

Still another new potential arena for silver investment is futures at the India International Bullion Exchange (IIBX), which launched in August 2022. The report stated: “The IIBX allows Indian jewelers and bullion dealers to import gold directly from foreign suppliers through the exchange by trading Bullion Depository Receipts (BDRs). While the exchange only permits gold imports and trading of gold through spot contracts, officials expect the importation and trading of silver to eventually be allowed.”

Although these new silver investments are expected to increase with growing awareness by investors, Indians still favor holding the physical product in the form of bars, coins and jewelry. According to Silver Institute data, since 2010, India’s physical silver investment (bars and coins) has accounted for one-third of overall Indian silver demand. During this time, Indian retail investors bought around 730 million ounces of silver. Last year saw Indian physical investment jump to 79.4 million ounces, the highest total since 2015. This represents a record high for Indian silver imports, which surged last year to 304 million ounces, easily surpassing the 2015 record of 260 million ounces.

The report was commissioned by the Silver Institute and authored by [Metals Focus](#), a leading precious metals consultancy based in London, England, with offices in key markets, including India. A Silver Institute press release summarizing the report can be found [here](#), and the full report is available for free [here](#).

Solar Cells May Use Most of the World’s Silver Reserves by 2050 according to Australian Study

Silver is used in solar cells to conduct the electric charge out of the cell and into the system, and demand is soaring for solar energy products in the global quest for a green energy transition. Even though very small amounts of silver are used in solar cells, at the rate that the solar industry is growing, solar manufacturers would require over 20% of the current annual silver supply by 2027 and approximately to 85–98% of the current global silver reserves by 2050, according to a study from Australia.

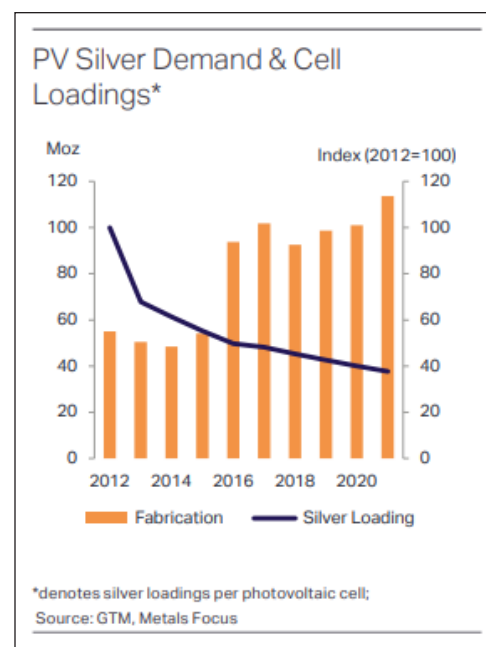
The trend line growth is not surprising, but the growth projected by the study’s authors is dramatic. The Silver Institute’s *World Silver Survey 2022* reported that silver offtake for photovoltaics reached a record 113.7 million ounces in 2021, compared to only 50.5 million ounces in 2013, with 2022 estimates of 127 million ounces.

Silver wires are used to conduct electricity from cells, and each one requires only a few milligrams but this adds up, according to the research from the [University of New South Wales](#). The researchers also noted that new and more efficient ‘N-type’ technologies need even more silver than current ‘PERC’ cells that make up more than 80 percent of the current market.

The study, “[The silver learning curve for photovoltaics and projected silver demand for net-zero emissions by 2050](#),” recently published in *Progress in Photovoltaics*, stated that even if the solar industry were to institute ways to use less silver, “The results show that the current rate of reduction in silver consumption is not sufficient to avoid increasing silver demand from the PV industry and that the transition to high-efficiency technologies including TOPCon (a more advanced N-type silicon cell technology, first scaled in 2019) and SHJ (Silicon heterojunction solar cells, which are very efficient) could greatly increase silver demand, posing price and supply risks.” These assumptions presume a worldwide solar generation of 1 terawatt before the end of 2022 and 15 to 60 terawatts by 2050.

Indeed, even recycling used silver from solar cells may not make a difference in future supplies. The report noted: “Over the longer term, the recycling of older solar modules could provide a significant source of silver. However, further investment and research is needed here, and it may still be several decades before the volume of PV waste processed each year is enough for more than a marginal contribution of new silver.”

Although engineers are considering replacing silver wires with those made of copper or copper-aluminum alloys, “there are still processing and reliability challenges to be solved before mass production,” the report concluded.



Even though newer solar cells use less silver, the cumulative amount consumed is increasing.

New Study Confirms Current Levels of Silver in European Freshwater Bodies Pose No Health Concerns

European governments frequently examine substances, including silver, of potential concern to human or environmental health. A recent study by [ARCHE Consulting](#) and the [European Precious Metal Federation \(EPMF\)](#), both based in Belgium, has analyzed data similar to that used by the European Commission to assess safe levels of substances in freshwater environments, in addition to specific country data, which showed that current levels of silver do not pose a risk to these environments.

The study, published in [Environmental Toxicology and Chemistry and Integrated Environmental Assessment and Management](#), comes in response to a European Commission proposal to amend the European Union water legislation to include silver as a priority substance even though it has an extremely low Environmental Quality Standard (EQS) of 10 nanograms per liter, France Capon, Secretary General at EPMF, told *Silver News*. The study, however, showed that existing data and additional monitoring data from France, Germany, Norway, Poland, and the Netherlands, suggested there is no European-wide risk of silver in freshwater environments. Therefore, the report authors noted, silver should not be added as a 'priority substance' to the European Union's Water Framework Directive 2000/60/EC list of substances posing a significant risk to or by way of the aquatic environment.

The European Union Parliament plans to discuss the proposal in May 2023, but any timeline for implementation, if it happens, is unclear, Capon said. She added: "The EPMF and ARCHE Consulting's findings on all identified European freshwater silver monitoring data is most timely. We conclude that there is currently no reliable monitoring data indicating a European-wide risk for silver in the aquatic environment. In absence of any risk indication, silver should not be selected as a priority substance under the [Water Framework Directive](#). These key findings have been shared with the relevant authorities."

The report added: "Selecting priority substances for which risk has not been demonstrated means that Member States will waste valuable time and resources on their routine measurement while bringing no benefit to the aquatic environment."

The authors noted that because of silver's chemical properties it is not unusual to find very low levels of free silver ions in water, because it strongly binds with organic and non-organic molecules and precipitates out of the water.

Silver's New Role in Photography Spurred by E-Commerce

E-commerce sales are expected to reach US\$6.9 trillion by 2024, and US\$8.2 trillion by 2026, according to market and consumer data provider [Statista](#), and this growing trend of on-line shopping requires one crucial component: a clear, accurate image of the item for sale.

Although digital photography has largely taken over the mantle from silver-based photography, silver is still playing an important role in on-line commerce as a cure for 'vignetting,' a darkening of photo image corners when compared to the middle of the item. While vignetting is sometimes used to enhance an artistic message by emphasizing one part of the photo over another, in the case of product photos of smaller sales items, it can be distracting and even misleading to a potential buyer.

In order to ensure that an item is accurately portrayed, professional and even amateur photographers buy or build 'light boxes' or 'light tents,' which are small containers – often constructed from cardboard, fabric or even paper – that enclose an item so it can be photographed in a well-lit and controlled environment. And, to make certain that the item does not suffer from vignetting, the inside walls of the best performing boxes are coated on the inside with silver particles that diffuse light evenly.

"Photographing static objects and products is surprisingly difficult. They're just sitting there, but getting the lighting just right can be a real challenge," writes Stan Horaczek, senior gear editor of [Popular Photography](#) magazine. "Creating even lighting on a product is tricky without a light box. By surrounding the product with diffusion material [silver particles] or light, these devices drastically reduce the chances of hot spots and odd shadows that might obscure part of the product."



Silver particles on the walls of light boxes diffuse the light evenly, making sure the item is not only portrayed accurately but is also pleasing to the eye.

3D-Printed Polymer with Silver Flakes Could Mean Mass-Produced, Less-Costly Wearables

Hydrogels are polymers that retain a lot of liquids, and this property makes them ideal for biomedical applications like contact lenses, wound dressings, and artificial skin. Moreover, hydrogels keep their overall shape but are extremely flexible – and don't dissolve in water.

These properties make hydrogel ideal for wearables but they don't conduct electricity. To help fix this shortcoming, a team of Chinese researchers have figured out how to 3D print hydrogels using stretchable silver-hydrogel ink – permeated with silver flakes – on a hydrogel structure. This method not only offers a wearable that is water and sweat-proof, but makes use of silver's excellent electrical conductivity. In addition, mass producing hydrogel products is costly so producing them with 3D printers can make them less expensive in large quantities.

Yue Hui, a member of the research team at [Westlake University](#) in Hangzhou quoted in 3dprint.com said: "As we demonstrate in our [paper](#), our method can be used to make various hydrogel electronic devices with different functionalities.

Particularly, we can directly print exposed electrodes that can communicate with the outside world, and we can incorporate components such as LEDs and chips into the circuitry via printing.

Our findings imply that with delicate design we can really make functional hydrogel electronic devices."



This all-hydrogel electrode containing silver flakes, used for electrocardiography (ECG), was 3D printed.

HUI, ET AL.

Silver-Coated Test Strips Help Doctors Confirm Heart Attacks

If a patient enters the hospital with heart attack symptoms, it may not be a myocardial infarction at all but something else, so doctors must run tests on the patient to confirm or rule it out. The main test is for troponin, a protein that only enters the bloodstream if the heart muscle has been damaged. Currently, a test for this protein requires sophisticated equipment and operators trained to read the outcomes.

However, a simple dip strip (similar to litmus paper test strips) covered by gold nanoparticles and enhanced by silver nanoparticles may make this measurement easier to read and with faster results. Although a special gold testing strip can be accurate, by adding silver nanoparticles the strip's red color turns an easier to read dark brown as the silver ions precipitate and enlarge the gold nanoparticles, allowing the result to be seen with the naked eye. In fact, the researchers at the [Department of Clinical Chemistry](#), Faculty of Medical Technology, Mahidol University, Nakhon Pathom, Thailand, noted in their [journal article](#) that the silver enhancement gave the strip a 50-fold increase in visual detection. Additionally, a smartphone camera and app can be used to actually measure the change in color, offering a qualitative measure of the amount of troponin and thus the amount of heart damage.

Further testing of the silver-enhanced test strip is planned.

Silver Can Make Poultry Waste Less Dangerous to People, Chickens and the Environment

Poultry farming is one of the world's fastest-growing agribusinesses, representing nearly 40 percent of the world's meat supply, according to the [United Nations](#).

Along with this growth comes ever larger poultry farms, in addition to rural, smaller family farms, producing increasing waste, mainly feathers and manure. These waste products harbor many dangerous bacteria – *E. coli* and *Salmonella*, in particular – that enter water systems as well as getting on the chickens themselves. While chemicals toxic to waste can be effective, they bring their own danger in the form of chemicals that are harmful to humans and animals. More important, some disinfectants are not as effective as farmers, government health agencies and environmentalists would like.

However, experiments using silver as an add-on antibacterial are showing promise because of the metal's ability to kill germs without harming the environment or poultry.

Testing led by the [Department of Hygiene, Zoonoses and Epidemiology, Faculty of Veterinary Medicine, Beni-Suef University, Beni-Suef, Egypt](#) showed that a mixture of calcium hypochlorite and silver nanoparticles had a 100 percent killing rate of the most dangerous microbes in poultry waste. Calcium hypochlorite is commonly used as a disinfectant in poultry farms because it is low cost and easy to apply, however it does not kill 100 percent of the dangerous microbes unless combined with silver nanoparticles, researchers found.

The study in the journal [Scientific Reports](#) concluded: "All pathogenic bacteria isolated from liquid and solid waste from the tested poultry farms were killed (100%) by calcium hypochlorite and silver nanoparticles when used at a concentration of 1.0 milligrams per liter that confirmed the improvement of calcium hypochlorite disinfectant power throughout its loading on nano-silver based particles. Calcium hypochlorite and silver nanoparticles' ability to penetrate microbial cell membranes and subsequently impede growth is thought to be the cause of their bactericidal effects."



BRITANNICA

Chicken farms produce large amounts of waste, but silver is helping to make their toxic effects less dangerous.

Royal Canadian Mint Silver Bullion Coin Honors No. 2 Construction Battalion

The Royal Canadian Mint has honored the No. 2 Construction Battalion – the largest all-black battalion in the country’s history – with a one-ounce, .999 silver coin.

The battalion served in World War I, assisting the Canadian Forestry Corps (CFC) which was tasked with providing wood for crates, planks, structures and anything else needed for the war effort. It was thought that of all British-Empire nations, Canadians had the most experience with lumber and forestry and their expertise was valued. However, it was too costly to ship wood from Canada so the CFC operated in French woodlands and were aided by No 2. Construction Battalion soldiers.

“Despite racial prejudice, the members of No. 2 Construction Battalion persevered in their determination to serve, and a century later, their legacy remains an inspiration,” Mint officials noted in announcing the coin. They added: “This is the first coin to highlight Black military history in Canada and the experiences of Black Canadian soldiers. It’s a timely theme: in July 2022, the Government of Canada issued an apology for the historic racism endured by members of No. 2 Construction Battalion.”

For information about pricing, go to the [Royal Canadian Mint](#).



Silver Institute Upcoming Events

World Silver Survey 2023 Launch

The 2023 edition of *World Silver Survey*, the Silver Institute’s leading publication, will be released on April 19 in New York City and April 21 in Mexico City. The report will cover the key aspects of the 2022 silver market, including silver investment, silver mine supply, silver industrial demand, jewelry and silverware demand, recycling, and silver bullion trade. It will also provide a 2023 market and price outlook. The Institute will issue a press release with the report’s findings and post the 2023 *Survey* to our website on April 19. A library of past *Surveys* can be found here: [World Silver Survey Library](#)



India Silver Conference

The inaugural India Silver Conference will take place in Jaipur India, from April 28-30. Key stakeholders from each of the major industrial demand segments in India, including electric contacts, silver paste and brazing alloys, silverware, and silver jewelry, are scheduled to address conference attendees. For more information, see the conference website at [India Silver Conference](#).

Larry Kahaner
Editor

www.silverinstitute.org
[@SilverInstitute](#) on Twitter

THE
SILVERINSTITUTE

1400 I Street, NW, Suite 550
Washington, DC 20005
T 202.835 0185
F 202.835 0155