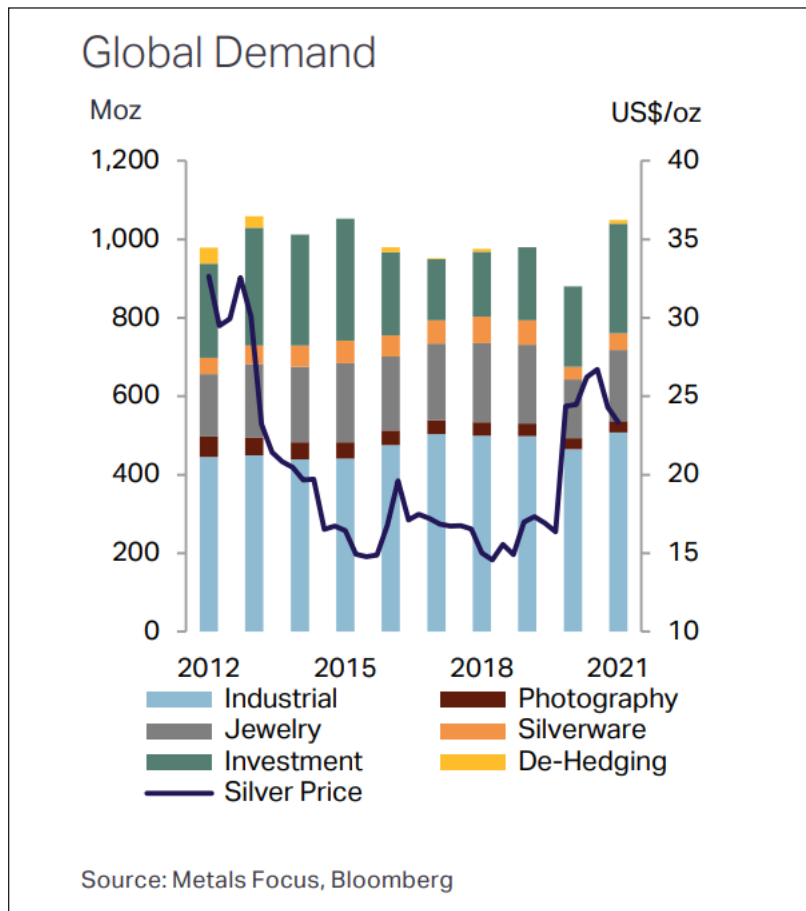


# Silver News

- Global Silver Demand Surged 19 Percent in 2021
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## Global Silver Demand Surged 19 Percent in 2021

### All Key Demand Sectors Grew Together for First Time in Nearly 25 Years



Worldwide silver demand reached its highest level since 2015, led by industrial use.

Total global silver demand in 2021 reached its highest level since 2015, surging 19 percent to 1.05 billion ounces (Boz). Driving this significant rise in demand were increases in every key demand category, the first time since 1997 that all key sectors rose together. Fueling the demand surge was industrial applications, rising 9 percent to 508.2 million ounces (Moz) despite logistical challenges relating to COVID-19. Much of this increase resulted from the resumption of industrial operations and the reopening of businesses as economies began to recover from the pandemic. Aiding this demand was strong consumer electronics sales from people continuing to work at home, 5G infrastructure investment, inventory build along the supply pipeline, and rising silver consumption in the green economy, mainly for photovoltaics, according to the *World Silver Survey 2022*, released by the [Silver Institute](#). The *Survey* was researched and produced for the Silver Institute by [Metals Focus](#), the London-based, independent precious metals consultancy.

Silver continued to make inroads in its contribution to green initiatives as use in photovoltaics increased 13 percent to 113.7 Moz. Similarly, electronic and electrical demand overall rose by 9 percent to 330 Moz. Brazing and alloys accounted for 47.7 Moz, representing a 6 percent gain over 2020.

Silver jewelry fabrication rose by 21 percent in 2021 to 181.4 Moz with India leading the way with a 45 percent jump to 58.7 Moz. Thailand posted 24.8 Moz, followed by Italy at 20.4 Moz and the United States with 13.2 Moz.

Silver investors continued to push demand for the white metal higher with sales of silver coins and bars jumping by 36 percent to 278.7 Moz, the highest level since 2015, as retail investors in North America and Europe were motivated by safe-haven and inflationary concerns, and

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took advantage of periodic silver price dips to purchase the physical metal. Silver-backed exchange-traded products (ETPs) reached a record 1.13 Boz, a 65 Moz rise.

On the supply side, silver production grew by 5.3 percent in 2021, reaching 822.6 Moz, the most significant annual growth in mining since 2013. Mexico was the number one silver producer in 2021, followed by China, Peru, Australia, and Poland.

The outlook for silver demand in 2022 is positive, according to Metals Focus, which forecasts a 5 percent rise in global silver demand mainly due to increased industrial fabrication. On the supply side, a 3 percent increase in global supply is expected in 2022 due to project ramp-ups and gains in established mines' output.

The 32nd edition of the Silver Institute's annual report on the global silver market was made possible by generous sponsorships from 23 companies and organizations from North and South America, Europe and Asia. A free PDF of the *World Silver Survey 2022* can be downloaded from the Institute's website at [www.silverinstitute.org](http://www.silverinstitute.org).

## Vizla Silver Corp. and Silvercorp Join the Silver Institute

The Silver Institute welcomes two new members:



With a team of experienced natural resource professionals, [Vizsla Silver Corp.](http://www.vizsla.com) (TSX-V: VZLA, NYSE: VZLA) is focused on advancing its flagship, 100%-owned Panuco silver-gold project in Sinaloa, Mexico, according to company officials. To date, Vizsla has completed over 140,000 meters of drilling at Panuco leading to the discovery of several high-grade veins and the announcement of its maiden resource estimate on March 1, 2022, which included an indicated mineral resource of 61.1 Moz silver equivalent (AgEq) and inferred mineral resource of 45.6 Moz AgEq. This initial resource establishes Panuco as a high-quality silver and gold district with a combination of size, grade and width, with room for growth, said officials.



[Silvercorp](http://www.silvercorp.com) is a Canadian mining company producing silver, gold, lead, and zinc with a history of profitability and growth potential, according to Silvercorp officials. Its strategy, officials say, is to create shareholder value by 1) focusing on generating free cashflow from long-life mines; 2) organic growth through extensive drilling for discovery; 3) equity investments in potential world-class opportunities; 4) ongoing merger and acquisition efforts to unlock value; and 5) making a long-term commitment to responsible mining and ESG.

## New Photovoltaic Cell from Silver and Bismuth Shows Promise

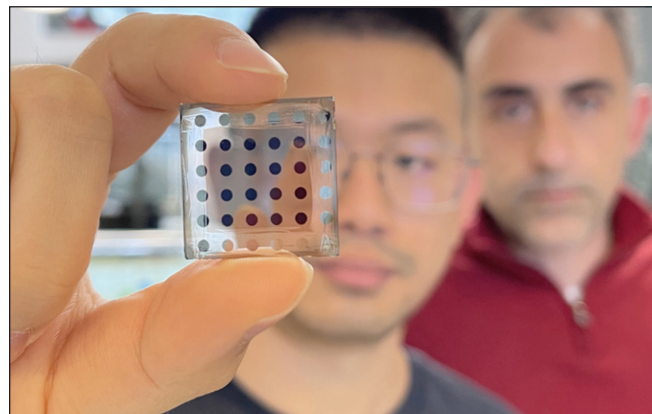
Silicon is the largest component in most solar cells, but this may change based on work conducted by European researchers who have made photovoltaic cells with only two components: silver and bismuth.

Not only are the new silver/bismuth cells less bulky and less expensive to produce than silicon-based cells, but both are environmentally friendly. In addition, bismuth is naturally abundant.

One prototype photovoltaic (PV) cell was built with silver/bismuth nanocrystals deposited onto a layer of glass and indium tin oxide. Others were deposited on flexible materials allowing the cell to be paper thin and applicable to making stickers that could adhere to windows, clothing or almost anywhere else without adding appreciable weight.

Researchers at the [Institute of Photonic Sciences](http://www.instituteforphotonics.com) in Castelldefels, Spain, produced a cell that was 10,000th of a millimeter thick with a power conversion of 9 percent, meaning that 9 percent of solar energy was converted to electricity. While this may not seem like a lot, it is substantial when considering that the maximum conversion rate of traditional silicon solar cells is only 30 percent.

Another section of the team working at [University College](http://www.ucl.ac.uk) in London, England, used computer modeling to show that spreading a 50/50 composition of silver and bismuth atoms on a traditional PV cell increased sun-to-electricity conversion. "These particular solar cells have made huge leaps in efficiency in less than a decade, from 1-2% to 9%," said PhD researcher Seán Kavanagh. "This gives us confidence that further improvements are possible, and the goal is to further improve efficiency so it is comparable with silicon-based solar cells. The results show how our research, looking at the underlying chemistry and physics of materials, can help in the design of high-performance, low-cost devices and support a green economy."



This solar cell was built with silver bismuth nanocrystals that were deposited layer-by-layer onto a sheet made of glass and indium tin oxide.

# Silver Antimicrobial Coatings Enter the Mainstream

## Large Companies' Use Will Spur Silver Demand

By Trevor Keel, PhD., Technical Director to The Silver Institute

Interest in silver antimicrobial coatings is rising rapidly as healthcare specialists and others seek more efficient and effective ways to tackle the spread of disease, especially in the face of growing resistance brought on by overuse of antibiotic drugs.

While many companies have investigated incorporating silver as an antimicrobial agent into their products, often these organizations have been small or mid-size businesses. We're now seeing larger companies get in on the act, and their projected large-scale incorporation of silver into products will spur increased use of silver in coatings and infusions.

Indeed, a recent report offered by [Research and Markets](#) forecasts that the global antimicrobial coatings market size is projected to grow from US\$3.9 billion in 2021 to US\$6.4 billion by 2026, at a compound annual growth rate (CAGR) of 10.5%, and silver-based antimicrobial coatings are projected to witness the highest CAGR during this period. Silver has advantages over competing technologies as a consequence of its low toxicity, longevity and compatibility with a broad range of industrial applications.

[Silver's association with healthcare is a long and established one](#) and gives large, reputable companies the confidence in the metal's safety, efficacy and user acceptance. One such company is Heraeus which offers [AGXX](#), a novel silver-based antimicrobial system that has been successfully tested against 130 microorganisms, company officials say, and is designed for use in a wide range of applications, such as face masks, exterior wall paint and air filtration systems.

In the consumer electronics sector, for example, [Acer](#) has worked with Corning to incorporate silver into the high-touch parts of their devices including laptops, monitors and tablets. Similarly, device accessory specialist [Targus](#) has developed a silver antimicrobial technology called *Defenseguard* which neutralizes some bacteria and viruses, and never wears or washes off, company officials say.

Another area of rapid growth in recent years has been the addition of silver into a wide variety of paints and surface coverings. Major producers including [AkzoNobel](#) and [PPG](#) have developed products which offer long-lasting antimicrobial action thanks to the formulation of silver ion technology into their coatings.

Finally, hard surface coatings and materials such as those supplied by [Microban](#) and start-ups like [Inhibit](#) are partnering with large companies and offering promise for the next generation of large scale, solid surface silver-based antimicrobial protection.

The need for novel antimicrobial technologies has been bought into sharp focus by the COVID-19 pandemic, and it is clear that major manufacturers are increasingly turning to silver-based formulations to differentiate their products and increase user confidence in their safety.



Acer utilizes silver ion antimicrobial technology in its laptop computers.

# Silver Part of Three-Metal Catalyst to Reduce Greenhouse Gases

In an effort to mitigate the effects of global climate change, engineers are paying more attention to ways in which they can capture and use carbon dioxide – a byproduct of fossil fuel combustion – which causes greenhouse gases. The goal is to take carbon dioxide from the atmosphere and turn it into feedstock to produce useful industrial chemicals such as carbon monoxide, formic acid, ethylene, ethanol and others.

However, there's a challenge: finding which catalysts produce the most feedstock compared to the amount of electricity used during the production process. The most popular catalysts are silver, gold and copper, but finding the right one to use based on which feedstock you want to produce is complicated.

So, instead of using just one catalyst, or sometimes two in tandem, researchers have found that by tweaking the amount and structure of the three metals together they can select with greater accuracy the feedstock they want to produce. "We thought if two metals were producing good results, then perhaps three metals would be even better," said Zhicheng Zhang, a chemist with [Tianjin University](#), in a prepared statement.

Experiments are focused on growing silver, gold and copper structures in varying ratios and shapes and testing to see how selective the outcomes can be. For example, ethanol production was at maximum level when a specific positioning and ratio of the metals involving one atom each of gold and silver combined with five copper atoms were used. Scientists continue to experiment to find which combination and shape of the three metals produces the desired amount and type of feedstock.

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# Silver Inks Aim for Higher Print Resolution

While nanosilver ink printing can be quite precise, Austin, Texas-based [Electroninks](#) has announced a particle-free, aerosol jet printing product that company officials say offers even finer resolution lines and room-temperature curing without sacrificing silver's high electrical conductivity properties.

In addition, the company says that the aerosol printing heads are compact and can be easily integrated into production lines or placed on robotic arms. Officials added in a prepared statement: "This manufacturing technique is ideal for highly precise semiconductor packaging, aerospace, display, and biomedical applications. The use of the particle-free ink with aerosol jet printing makes it possible for manufacturers to reduce the size, power and weight of devices, making it ideal for interconnects and metallization in mobile and wearable products, foldable displays, biomedical devices and sensors, and conformal 3D parts."

The particle-free silver ink is capable of being printed at less than 15-millionth of a meter resolution while most silver nanoparticles are between 1-thousandth and 100-thousandth of a meter in size.

The aerosol ink has garnered attention especially from the United States intelligence community through a partnership from [In-Q-Tel](#), a group that "invests in cutting-edge technologies to enhance the national security of the United States." Said Victoria Chernow, Technology Architect, In-Q-Tel: "We believe our strategic investment in Electroninks will contribute to our partners' mission."

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Larry Kahaner  
Editor

[www.silverinstitute.org](http://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