

Solar Surge Puts Pressure on Silver Supply (But look for the silver lining)

By Kristin Ziv and Morgan Bazilian

As the global demand for solar panels soars, so does the demand for silver – a key component in the manufacturing of photovoltaic (PV) panels.

Solar installations are breaking records worldwide in both volume and low price, [according to BloombergNEF](#). Installations were up 64% from 2022 to 2023, to 413 gigawatts. Leading the charge is China, which added 240 gigawatts in 2023 alone.

Last year photovoltaics consumed 142 million ounces of silver, or 13.8% of total silver usage worldwide, up from nearly 5% in 2014, according to the [Silver Institute](#). The durability and high electrical conductivity of silver make it attractive for many industrial uses, particularly electronics. But in the past 10 years the solar industry's share of global silver has almost tripled.

Not only are solar installations multiplying, but silver use per solar panel is growing, too, by a factor of more than two. More silver content makes solar cells more efficient. Bloomberg [estimates](#) that by 2030, solar panels will consume about 20% of total silver demand given trend projections.

Despite rising demand from solar, the supply of silver has not risen in recent years. Primary silver mines produce only about 28% of the metal, according to a [2023 report](#). The other 72% of silver production comes as a byproduct of lead, zinc, copper and gold projects. New silver mines are not coming online even though geopolitical disruptions, including the Covid-19 pandemic and the Russia-Ukraine war, have strained the supply chain.

Even with the heightened demand for silver, the price today – around \$22/oz, USD -- is where it was 10 years ago, having traded in a narrow range over that period, [between \\$13.70 and \\$29.42](#). Many variables may affect the price, including, among other factors, interest rates, inflation rates, supply forecasts, geopolitical events, and costs of production.

Technological innovations may, in the long-term, take some pressure off the silver demand.

Supply projections are all based on current PV technology. But what if the technology changes over the next several years? One such technology, based on a mineral called perovskite, could eventually eliminate the need for silver in solar panels. [Perovskite solar cell](#) technology, discovered in Japan about

10 years ago, is advancing rapidly. Still, it is unlikely we will see the PV market dramatically switching over from silicon any time soon.

Other advances are also underway.

Senior scientist Kai Zhu with the National Research Energy Laboratory, and his colleague, Tao Xu, a chemistry professor at Northern Illinois University, have [discovered](#) a cheaper and more readily available material. A nickel-doped graphite layer combined with a bismuth-indium alloy layer can be painted onto the perovskite device at mild temperatures and at atmospheric pressure. The new materials may replace silver (or gold) in future solar cells.

Technology substitution could help dampen the stress on the global silver supply. It seems, though, that for the near and medium term, silver will remain a crucial component of PVs, and its use, pricing, recycling, and other approaches will need to be employed.

Silver demand from solar energy will need to be more carefully integrated into markets, mine and processing investment, and solar pricing.

ABOUT THE AUTHORS

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