

GREEN ENERGY MINERAL: KEY FACTS

# Silver

<b>US CRITICAL MINERAL?</b> <b>NO</b>	
<b>MAIN USES IN GREEN ENERGY TECHNOLOGY</b>	<b>KEY DEVELOPMENT ISSUES IN MINING</b>
 Solar	 Environment  Governance  Land tenure  Leveraging minerals for economic growth (local/national)

## DEMAND PROJECTIONS

Silver’s high conductivity is harnessed in photovoltaic cells in the form of a paste that collects the electrons generated when sunlight hits the panel. Like gold, silver is used as a store of value, as an investment, as jewelry and in a variety of electronic and industrial applications. Silver’s importance for renewables—and specifically photovoltaic cells—will lead to a 15,000 tons demand per year by 2050, which represents a 56% increase over 2018 global production levels (Hund et al., 2020).

## PRODUCTION/RESERVES



Source: OECD

**Mexico** is largest producer of silver with 5,600 tons in 2020 (22% of global production), followed by **Peru** (3,400 tons) and **China** (3,200 tons). The largest known reserves are in Peru, followed by Australia and Poland. Although silver is the principal product at several mines, most silver is obtained as a byproduct from lead-zinc mines, copper mines, and gold mines, in descending order. Silver prices were stable from 2016-2020 at around \$17 per troy ounce but moved dramatically from below \$12 in March 2020 to historic highs approaching \$30 in August 2020 and February 2021 driven by investors and speculation around industrial demand.

## MINING IN USAID-PRESENCE COUNTRIES

Silver is produced in many USAID-presence countries, mainly as a byproduct of other mining. The top two producers **Mexico** and **Peru** are USAID-presence countries. Other important producers by volume are **Chile** (limited presence) and **Bolivia** (limited presence). Smaller producers include: **Armenia, Azerbaijan, Brazil, Burkina Faso, Colombia, DRC, Côte d’Ivoire, Dominican Republic, Ecuador, Ethiopia, Ghana, Honduras, India, Indonesia, Kazakhstan, Kyrgyz Republic, Laos, Mali, Mongolia, Morocco, Namibia, Nicaragua, North Macedonia, Panama, Papua New Guinea, Philippines, Senegal, South Africa, Tajikistan, Tanzania, and Uzbekistan.**

## MAJOR INDUSTRIAL COMPANIES

**Fresnillo** is the world's largest producer with gold and silver mines in Mexico. **KGHM Polska Miedz** is the second largest producer based in Poland. **Glencore** (Switzerland-based, with copper and lead/zinc) is third, followed by **Newmont** (the world's largest gold miner, US-listed) and **CODELCO**, the main producer of Chile's copper (Basov, 2021).

## ARTISANAL AND SMALL-SCALE MINING (ASM)

Some artisanal gold miners in **Chile** are reported to recover silver as a byproduct (Castro & Sánchez, 2003; Espinoza et al., 2020). In theory silver could be recovered by the millions of artisanal gold miners worldwide but this is not standard practice.

## ISSUES IN USAID-PRESENCE COUNTRIES

Most academic literature on silver mining in Latin America tends to look at it from a historical rather than contemporary perspective. However, given that silver is generally a byproduct, the governance, environmental and land tenure issues in copper, lead-zinc, and gold mines that produce silver are relevant by extension.

## MINE DEVELOPMENT AND SUPPLY CHAIN DYNAMICS

Because most silver is a byproduct of other mining, supply dynamics are linked to trends in the gold, copper, lead, and zinc markets. Supply from these other sources can push prices down to a point where silver-only mining becomes unprofitable. Silver prices, on the other hand, are dependent on a few factors. Because roughly half of silver is used by investors, prices can be subject to speculation but also represent a form of insurance during market turmoil, just like gold. The other half is driven by industry trends in jewelry, electronics, and manufacturing, including the solar photovoltaic panel industry.

## ORGANIZATIONS AND INDUSTRY GROUPS

The **Silver Institute** is the main industry group consisting of miners, refiners, and traders (The Silver Institute, n.d.).