

# China's curbs on critical metals a hurdle in India's chip road map

## Controls on gallium, germanium exports may impact telecom, EV industries too

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In a move that may have far-reaching consequences, China, one of the world's leading producers of critical minerals, on Monday announced export controls on two technology-critical elements, gallium (Ga) and germanium (Ge), sending shockwaves through the global market.

Though the decision comes as a retaliation against moves of Western countries, it may impact not just India's ambition of becoming a semiconductor hub but also its burgeoning telecommunications and electric vehicle industries.

Gallium and germanium are usually extracted as by-products from refineries of other metals. Gallium is a by-product of processing bauxite and zinc ores and is used in information and communications industries for semiconductors, integrated circuits, and LEDs. It is also used in electronic circuits, specialised thermometers, barometric sensors, solar panels, blu-ray

technology, and pharmaceuticals.

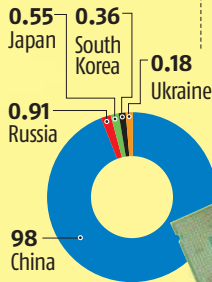
Germanium is formed as a by-product of zinc and sulfide ores. Significant amounts of germanium are contained also in ash and flue dust generated in the combustion of certain coals for power generation. Germanium is used in the value chain of information and communications, clear technology, and advanced manufacturing. It is also used in optical fibres, satellites, solar cells along with cameras, microscope lens, infrared night vision systems, and as polymerisation catalyst.

Though demand for these minerals is limited in the country, it will surge if India becomes a semiconductor hub. The global semiconductor industry is anticipated to grow to \$1 trillion in revenues by 2030, according to Deloitte's 2023 semiconductor industry outlook.

Over six global semiconductor giants have evinced an interest in the ₹76,000 crore "Semicon India Programme" and are likely to invest in the near-future.

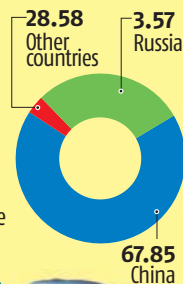
### CHINA HOLDS ALL THE ACES

**GALLIUM OUTPUT**  
World: 550,000 kg  
(Share in production; in %)



### GERMANIUM OUTPUT

World: 140,000 kg  
(Share in production; in %)



Note: Gallium data is for 2022 and germanium is for 2021; Source:USGS

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It is expected that one drone would be able to cover 20 acres of land per day, spraying nano fertilisers, water-soluble fertilisers, and nano DAP.

IFFCO has also procured 2,500 electric three-wheelers (of the loader type) under Category L5 (a three-wheeled motor vehicle with maximum speed exceeding 25 kilometres per hour or motor power exceeding 0.25 kilowatt) to carry the drones to the fields, along with nano fertilisers and associated utilities.

The nano fertilisers are applied on various crops through the foliar application using agricultural sprayers and drones. The drones and sprayers can be used for any kind of spray application.

“We are witnessing a surge in demand for agricultural drones from agrochemical players, including fertiliser and pesticide companies. With substantial benefit to farmers, we are also witnessing a surge in demand from rural entrepreneurs and large-farm holders,” said Deepak Bhardwaj and Anoop Upadhyay, co-founders, IoTechWorld Avigation, one of India’s leading agricultural drone manufacturers, in a statement.

## Metals...

The first among them is the Foxconn-Vedanta project, which will invest \$19.5 billion

in the country. Other chip-making giants like Taiwan’s TSMC, US-based Micron Technology, Applied Materials and Lam Research, and India-based Tata are also in the game.

“India needs to take long-term and short-term measures to navigate such trade wars, which are expected to increase in the future as the battle for technology supremacy among counties intensifies. In the short term, there will be a glitch in supply and price rise but this has given an opportunity to other countries to come together and break China’s monopoly in the long-term,” said Tirthankar Mandal, head, Energy Policy, World Resources Institute, India.

“India has also entered the Mineral Security Partnership. Now all these 12 players can work on advancing technology to mine and produce these products. Efforts should also focus on substituting these minerals by other resources,” Mandal added. According to the United States Geological Survey, in 2022, China accounted for 98 per cent of worldwide 550,000 kg of primary low-purity gallium production. It also contributed 67 per cent to the 140,000 kg germanium produced worldwide in 2021.

Because of China’s dominance in the global supply, both the minerals are on the critical minerals list of all the major economies — Australia,

the US, Canada, the UK, Japan, and South Korea, including India. Germanium is not on the

critical minerals list of the UK.

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Solution tomorrow

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