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China's Helium Export Ban and the Geopolitics of a Critical Gas

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WHY IN NEWS

Around , China imposed a **temporary and immediate ban on helium exports**, *citing supply stress after disrupted shipping through the* **Strait of Hormuz** (https://ujiyari.com/terms/strait-of-hormuz/) *during the West Asia conflict and the closure of a* **Qatar** *helium facility. Because China itself imports the bulk of its helium and re-exports part of it to Europe, the move sent a shock through a supply chain in which India is an almost fully import-dependent buyer.*

WHY HELIUM MATTERS MORE THAN ITS PARTY-BALLOON IMAGE

Helium is popularly associated with floating balloons, but its industrial value lies in properties no other element shares. It has the **lowest boiling point of any element**, about **minus 269 degrees Celsius**, which makes it the only practical coolant for the deep-cryogenic (https://ujiyari.com/vocab/cryogenic/) systems on which advanced technology runs. It is chemically **inert**, so it can flow through sensitive processes without reacting. These two traits place helium at the heart of three strategic industries.

Semiconductors

Modern chip fabrication depends on helium at several stages. It cools the plasma and optics in **extreme ultraviolet (EUV) lithography**, provides **wafer cooling** during high-heat steps, and serves as a carrier and purge gas in **chemical vapour deposition** (https://ujiyari.com/terms/chemical-vapour-deposition/) **(CVD)** and **etching**. A helium squeeze therefore lands directly on the most contested technology of the decade.

Healthcare

The **superconducting** (https://ujiyari.com/vocab/superconducting/) **magnets** inside **MRI machines** must be kept near absolute zero, and liquid helium is the coolant that keeps them superconducting. A sustained shortage threatens diagnostic imaging capacity in hospitals.

Space

Helium is used to **purge and pressurise rocket fuel tanks**, displacing volatile propellant vapours safely because it will not ignite. Every major launch programme, including India's, consumes it.

WHY CHINA SITS AT THE CENTRE

China is not a large producer of helium. It **imports more than 85 per cent** of its requirement, over half of that from **Qatar**, and it also **re-exports Russian helium onward to Europe**. This makes China an **intermediary node** rather than a source: a chokepoint (https://ujiyari.com/vocab/chokepoint/) through which volumes flow. When such a node halts exports, the disruption ripples outward even to countries that do not buy directly from it, because the redistribution role it plays disappears.

The trigger this time was geography. The **Strait of Hormuz** connects the **Persian Gulf** and the **Gulf of Oman** and is the maritime artery for Gulf energy and gas exports. Conflict-related disruption there, combined with a Qatar facility closure, tightened global supply, and China responded by conserving its own stocks.

WHERE INDIA STANDS

PARAMETER	INDIA'S POSITION
Domestic commercial production	None
Import dependence	Almost total
Main suppliers	United States and Qatar
Domestic exploration prospect	Discussed for the **Rajmahal basin**
End-user sectors exposed	Semiconductors, healthcare (MRI), space, welding, fibre optics

India has **negligible domestic helium** and imports **almost all** of what it uses, chiefly from the **United States** and **Qatar**. A ban by an intermediary such as China does not cut India's direct pipeline, but it tightens the entire global market and pushes prices up for every importer. For a country building out the **India Semiconductor Mission**, an unreliable helium supply is a strategic, not merely commercial, vulnerability (https://ujiyari.com/vocab/vulnerability/).

THE DEEPER LESSON: A NON-RENEWABLE, ESCAPING RESOURCE

Helium is extracted mainly as a byproduct of **natural gas fields**, where it accumulates over geological time from radioactive decay. What makes it uniquely unforgiving is that once released into the atmosphere, being the **second lightest element** after hydrogen, it rises and **escapes into space**. Unlike most minerals, it cannot be recovered from the environment and recycled at scale. In that sense helium is **effectively non-renewable**, and wastage is permanent loss.

This reframes the episode. It is not only about one country's export decision; it is about a finite, irreplaceable material concentrated in a handful of geographies and routed through a handful of chokepoints.

WAY FORWARD

- **Strategic reserves (https://ujiyari.com/terms/strategic-reserves/).** A national helium buffer stock would cushion short, politically driven supply shocks, on the model of strategic petroleum reserves.
- **Supplier diversification.** Deepening long-term contracts with the United States, Qatar and emerging producers such as those in East Africa reduces single-point exposure.
- **Domestic exploration.** Assessing helium potential in Indian natural-gas basins, including the **Rajmahal basin**, could seed a domestic base.
- **Recovery and recycling.** Mandating helium capture and reuse in MRI and industrial installations conserves a resource that cannot be replaced.
- **Critical-materials strategy.** Folding helium into India's broader critical-minerals and materials framework, alongside the India Semiconductor Mission, treats it as the strategic input it is.

UPSC RELEVANCE

GS Paper 3: Science and technology developments, indigenisation (https://ujiyari.com/vocab/indigenisation/) of technology, strategic-resource supply chains, mobilisation of resources, and the security dimension of critical inputs.

Prelims pointers:

- Helium is the **second lightest element** and an **inert noble gas** with the **lowest boiling point** of any element (about **minus 269 degrees Celsius**).
- It is extracted mainly from **natural gas fields**; once released it **escapes into space** and is effectively **non-renewable**.
- **Qatar and the United States** are the top global helium suppliers.
- **China imports more than 85 per cent** of its helium and **re-exports Russian helium to Europe**, acting as an intermediary node.

- The **Strait of Hormuz** connects the **Persian Gulf** and the **Gulf of Oman**.
- India has **no commercial helium production**; exploration has been discussed in the **Rajmahal basin**.
- Uses: EUV lithography (https://ujiyari.com/terms/euv-lithography/) and wafer cooling in chips, superconducting magnets in **MRI**, purging **rocket fuel tanks**.

Mains question: "Helium is a finite, non-renewable gas concentrated in a few geographies and critical to semiconductors, healthcare and space. In light of China's 2026 export ban, examine India's supply-chain vulnerability and suggest a strategy to secure this input." (15 marks, 250 words)

FACTS CORNER

📌 FACTS CORNER, KNOWLEDGEPEDIA

Event (around 10 July 2026): China imposed a temporary, immediate ban on helium exports.

Trigger: Disrupted Strait of Hormuz shipping during the West Asia conflict and a Qatar facility closure.

China's role: Imports over 85 per cent of its helium (over half from Qatar); re-exports Russian helium to Europe; an intermediary node, not a producer.

Helium basics: Second lightest element; inert noble gas; lowest boiling point (about minus 269 degrees Celsius); extracted from natural gas; escapes to space once released, effectively non-renewable.

Top suppliers: Qatar and the United States.

India: No commercial production; imports almost all helium (US and Qatar); exploration discussed for the Rajmahal basin.

Critical uses: Chip lithography and wafer cooling, MRI superconducting magnets, rocket-tank purging.

Sources: Ministry of Mines (https://mines.gov.in/), South China Morning Post (https://www.scmp.com/), TrendForce (https://www.trendforce.com/)

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