China To Curb Exports Of Graphite Material

Source: TH

Why in News?

Recently, China, **the world's top graphite producer (around 65%) and exporter,** has decided to curb exports of key battery material.

- The curbs are similar to those in place since 1st August, 2023 for two chip-making metals, **gallium and germanium** which pushed up prices outside of the country.

What is China's Decision To Curb Exports of Graphite And Its Impacts?

- **Significance:**
  - This move is aimed at **protecting China's national security and controlling supplies of** critical minerals in response to challenges over its global manufacturing dominance.
    - Graphite, Cobalt, Nickel etc are important critical minerals as reflected in **Mineral Security Partnership** which India is part of.
  - It also becomes important for major **Electric vehicles (EVs)** manufacturers across the world and also India due to its **National Electric Mobility Mission Plan (NEMMP)** where Graphite is a key component.
- **Restrictions:**
  - China will require as of December 1st that exporters apply for permits to **ship two types of graphite,** including high-purity, high-hardness and high-intensity synthetic graphite material, and natural flake graphite and its products.
  - Meanwhile, it **dropped temporary controls on five less sensitive graphite** items used in basic industries such as steel, metallurgy, and chemicals.
- **Concern for EV Manufacturers:**
  - South Korean firms which heavily rely on China for graphite imports would need to seek alternatives, **such as mines from the United States or Australia.**
  - With rising sales of EVs, automakers are racing to lock in supplies from outside China, but **shortages are looming, which is all set to push the costs manifold.**

What is Graphite?

- **About:**
  - Graphite is a naturally occurring mineral composed of carbon. It is **one of the three crystalline forms of carbon**, with the other two being diamond and amorphous carbon (such as charcoal or carbon black).
- **Structure:**
  - Graphite has a hexagonal crystal structure in which carbon atoms are arranged in layers or sheets. These layers are weakly bonded together, **allowing them to easily slide past each other, giving graphite its lubricating properties.**
- **Properties:**
  - Graphite is a **good conductor of both electricity and heat.** It is used in the production of electrodes for batteries and in the electronics industry.
- **Applications:**

- Graphite is commonly known for its use in pencils. **The "lead" in pencils is actually a mixture of graphite and clay.**
- Other applications include **crucibles, foundry facings, polishes, arc lamps, batteries, brushes for electric motors, and cores of nuclear reactors.**

- **Global Reserves:**
  - China produces two-thirds of the world's graphite, but compared to global reserves, the Asian country is not the only option.
  - According to the United States Geological Survey, **Turkey (27.3%) and Brazil (22.4%) together own half of the world's natural graphite resources. China comes third**, sitting on 16%, followed by Madagascar (7.9%)

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Top producers of rare minerals 2020

Metal	Share of key producers	India's production share
Lithium	Australia (49%), Chile (22%), China (17%), Argentina (8%), Brazil (2%)	-
Graphite	China (65%), Brazil (10%), Madagascar (5%), India (3%), Mozambique (2%)	3%
Cobalt	Congo (68%), Australia (4%), Cuba (4%), Canada (3%), Philippines (3%)	-
Manganese	South Africa (32%), Gabon (16%), China (13%), Australia (10%)	5.32%
Nickel	Indonesia (33%), Philippines (13%), Russia (9%), New Caledonia (8%) Australia (7%)	-

Expected mineral demand of the EV sector
(in thousand tonnes)

	2020	2030	Growth (%)
Graphite	141.03	2,499.25	1,672
Nickel	80.47	1,566.94	1,847
Copper	110.32	1,632.63	1,380
Lithium	19.83	358.39	1,707
Cobalt	21.12	256.64	1,115
Manganese	25.34	246.28	872

EVs need more minerals than a conventional vehicle

	Conventional vehicle	Electric vehicle
Graphite	-	66.3
Nickel	-	39.9
Copper	22.3	53.2
Lithium	-	8.9
Cobalt	-	13.3
Manganese	11.2	24.5

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims:

Q. Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals'. Why? (2012)

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.
3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (c)

Mains:

Q. Despite India being one of the countries of Gondwanaland, its mining industry contributes much less to its Gross Domestic Product (GDP) in percentage. Discuss. **(2021)**