



## Domestic Exploration of Lithium

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### Why in News

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Recent surveys by the **Atomic Minerals Directorate for Exploration and Research (AMD)** have shown the presence of **lithium resources in Mandya district**, Karnataka.

AMD is the oldest unit of the **Department of Atomic Energy**.

### Key Points

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- **About Lithium:**

- **Properties:**

- It is a chemical element with the symbol **Li**.
    - It is a soft, silvery-white metal.
    - Under standard conditions, it is the **lightest metal** and the **lightest solid element**.
    - It is highly **reactive and flammable, and must be stored in mineral oil**.
    - It is **an alkali metal and a rare metal**.
      - The **alkali metals** consist of the chemical elements **lithium, sodium, potassium, rubidium, caesium, and francium**. Together with hydrogen **they constitute group 1**, which lies in the **s-block** of the periodic table.
      - **Rare Metals** (RM) include Niobium (Nb), Tantalum (Ta), Lithium (Li), Beryllium (Be), Cesium (Cs) etc. and **Rare Earths** (RE) include Lanthanum (La) to Lutetium (Lu) besides Scandium (Sc) and Yttrium (Y).

These **metals are strategic in nature** with wide application in the nuclear and other high tech industries such as electronics, telecommunication, information technology, space, defense etc.

- **Uses:**

- Lithium metal is used to make **useful alloys**.  
For example, with lead to make **'white metal'** bearings for motor engines, with **aluminium to make aircraft parts**, and with **magnesium to make armour plates**.
    - In Thermonuclear reactions.
    - To make **electrochemical cells**. Lithium is an important component in **Electric Vehicles**, Laptops etc.

- **Lithium Resources in Karnataka:**

The survey shows presence of **1,600 tonnes of lithium resources** in the **igneous rocks** of the **Marlagalla-Allapatna** region of **Karnataka's Mandya district**.

- **Benefits of Domestic Exploration:**

- **Reducing Import Bill:**

**India currently imports all its lithium needs**. Over 165 crore lithium batteries are estimated to have been imported into India between 2016-17 and 2019-20, at an estimated import bill of upwards of **USD 3.3 billion**.

- **Reducing Overdependence on China:**

China is a major source of **lithium-ion energy storage products** being imported into the country.

- **Issues Associated with Domestic Exploration:**

- The new find is categorised as “**inferred**”.

The ‘**inferred**’ mineral resource is the part of a resource for which **quantity, grade and mineral content** are estimated only with a **low level of confidence** based on information gathered from locations such as **outcrops, trenches, pits, workings, and drill holes** that may be of limited or uncertain quality, and also of lower reliability.

- The lithium find is **comparatively small**, considering the size of the proven reserves in **Bolivia, Argentina, Australia, and China respectively**.
- India is seen as a **late mover in attempts to enter the lithium value chain**, coming at a time when **Electric Vehicles** are predicted to be a **sector ripe for disruption**.

2021 is likely to be a turning point for battery technology with several **potential improvements to the li-ion technology**, and alternatives to this tried-and-tested formulation in **advanced stages of commercialisation**.

- **Extraction Method:**

Lithium can be extracted in different ways, depending on the type of the deposit .

- **Solar evaporation** of large **brine pools**.
  - A **brine pool** is a volume of brine collected in a seafloor depression.
  - For example: Brines of **Sambhar and Pachpadra** in Rajasthan.
- **Hard-rock extraction of the ore** (a metal-bearing mineral).  
For example: **rock mining at Mandya**.

- **Other Potential Sites:**

- The major **mica belts** in **Rajasthan, Bihar, and Andhra Pradesh**.
- **Pegmatite** (igneous rocks) belts in **Odisha and Chhattisgarh**.
- Brines of **Sambhar and Pachpadra** in Rajasthan, and **Rann of Kachchh** in Gujarat.

- **Other Government Initiative:**

India, through a newly state-owned company **Khanij Bidesh India Ltd**, had **signed an agreement with an Argentinian firm** to jointly prospect lithium in Argentina that has the **third largest reserves of the metal in the world**.

The company has a specific mandate **to acquire strategic mineral assets such as lithium and cobalt abroad**.

**Source:IE**