

High-grade lithium discovered in Nigeria

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In news– Recently, high-grade lithium was discovered in Nigeria.

Key updates-

- The discovery does not equate to a commercial find. In fact, it should be taken only as a **first step in the long journey to be established as a commercially viable deposit** that can be mined and extracted.
- **In Nigeria, lithium minerals (spodumene and lepidolite) are known to be associated with cassiterite, columbite-tantalite (coltan) and others in the extensive belt of rare metal-bearing rock types called pegmatite.**
- The Geological Agency described the **lithium as high grade because what's been found has between 1-13 per cent oxide content.** Normally exploration begins at levels as low as 0.4 percent.

Lithium and its importance-

- **Grade (in percent) is a measure of concentration of the lithium in the minerals** and or rocks that contain it.
- **Therefore, the higher the grade the more the economic viability.**
- **Lithium is a metallic mineral** in very high demand by manufacturing industries.
- **In nature it tends to concentrate sufficiently in the two minerals, spodumene and lepidolite.**
- Otherwise it will occur dispersed in minerals but not sufficient enough to be of economic consideration.
- They are usually found in specialised rocks called rare metal-bearing pegmatites and greisens.
- **Earlier the bulk of demand for lithium was split between ceramics and glasses (35 per cent) and greases,**

metallurgical powders, polymers, and other industrial uses (over 35 per cent). Less than 30 per cent was for batteries.

- **But by 2030, batteries are expected to account for 95 percent of demand.**
- **Lithium-ion batteries are generally more expensive but have better performance** and are becoming the preferred technology. **The different types are:**
 - **Lithium-cobalt oxide battery**– It is used in **consumer electronics** and is finding application in electric vehicles. It is relatively cheap.
 - **Lithium-nickel-manganese-cobalt** is a newer, higher performing range of battery chemistry. It is mainly developed for the electronic vehicle market but is finding a wider use because of its increasing cost effectiveness.
 - **Lithium iron phosphate**, the safest technology with relatively high performance but relatively expensive. **It is very popular in China** but is likely to become overtaken by Lithium-nickel-manganese-cobalt over the longer term; and
 - **Lithium-nickel-cobalt-aluminium oxide** was developed to reduce cobalt consumption and is known as a solid performer and of reasonable cost.
- **Lithium-ion batteries are used in mobile phones, computers, electronics, energy storage systems and electric vehicles.**
- Lithium and most lithium minerals are mined along with other high-value metallic minerals such as tin, niobium-tantalum (columbite-tantalite) and uranium (in pyrochlore).
- **Greenbushes mine in Western Australia is the largest hard-rock lithium mine in the world.** Tantalum is also

mined there.

- **Due to the growing interest in clean energy, the demand for lithium has skyrocketed as most countries** draw plans to phase out fossil fuel vehicles and switch to zero-emission electric vehicles.
- Lithium production globally grew from 28,100 metric tonnes in 2010 to 86,000 in 2019.
- **Three countries, Australia (40,000 tonnes), Chile (20,600 tonnes) and China (14,000 tonnes) mine about 86 per cent of the world's lithium.**
- Others are Argentina, Brazil, Zimbabwe, USA and Portugal.
- **The largest importers of lithium are South Korea, China, Japan, US and Belgium.**
- **Lithium price was average of \$2,000 per metric tonne in 2002 rising to \$18,000 in 2018.**
- The lithium supply chain involves converting lithium minerals to lithium concentrates and lithium hydroxides.

Lithium reserves in India-

- India **currently imports lithium** and the majority is routed through China.
- The Geological Survey of India also works on the **probable location of reserves in 6 states of Arunachal Pradesh, Andhra Pradesh, Chhattisgarh, Jharkhand, Rajasthan, and in the Union Territory of Jammu and Kashmir** and the Department of Atomic energy conducted surveys in Karnataka and Rajasthan.
- In 2021, the Department of Atomic Energy discovered the **country's first lithium reserve of 1600 tonnes in Mandya, Karnataka.**
- It has an estimated lithium reserves of 14,100 tonnes.
- In the 2022-23 Union Budget, the Finance minister announced a separate battery swapping policy alongside the government's Faster Adoption of Hybrid and Electric

Vehicles (FAME) scheme.