

## The great lithium push

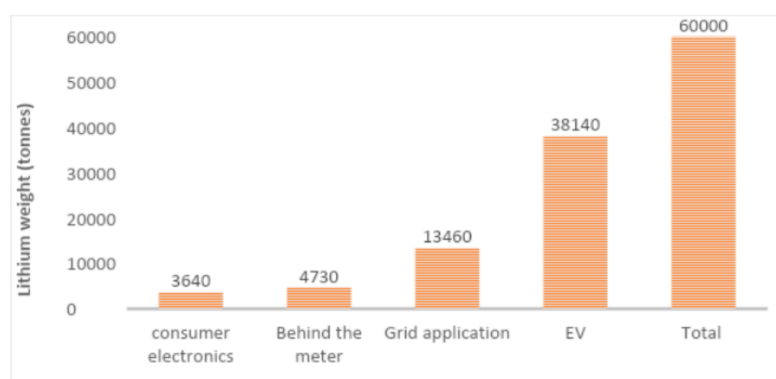
-By Anjali Singh

**Synopsis: India is now the eighth-largest lithium reserve country thanks to discovery in Jammu & Kashmir. This find has the potential to alter the speed of India's decarbonisation. It puts India in much stronger position in the global critical materials trade, makes it attractive for investments in key forward-looking sectors.**

On February 9, the Geological Survey of [India](#) announced the discovery of 5.9 million tonnes of inferred lithium resources in the Reasi district of Jammu and Kashmir. It is an inferred resource because its quantity and quality has been estimated using geological evidence, making the estimates unverified in terms of geological and grade continuity. Nonetheless, this makes India the eighth-largest lithium reserve country in the world after Bolivia (21 million tonnes), Argentina (20 million tonnes), Chile (11 million tonnes), Iran (8.5 million tonnes), Australia (7.9 million tonnes), and China (6.8 million tonnes). The discovery is crucial, especially because lithium is expected to be the new crude in a world striving for greener transportation.

Nations across the world are developing strategies to achieve net zero by adopting energy-efficient pathways and reducing fossil-fuel dependency, and energy storage will play a crucial role in it.

Batteries form a significant part of energy storage systems. A [NITI Aayog](#) report says that the demand for battery storage in India will be 600 GWh by 2030. After [Sony](#) and Akashi Kasei released the first commercial lithium-ion battery (LIB) in 1991, the economic importance and demand of lithium—the lightest metal of Group 1 in the periodic table—boomed. The global demand for LIBs is expected to increase exponentially because of their wide usage in electric vehicles, stationary applications, and consumer electronics. The sector-wise lithium demand (in tonnes) by 2030 is shown in the figure below.



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Now, the question is how much lithium is required to fulfil the total demand for battery storage in India? The reported reserve is approximately 100 times our projected demand for 2030 and can, therefore, facilitate a smoother clean energy transition.

Lithium Nickel Manganese Cobalt Oxide (NMC) and [Lithium Iron Phosphate](#) (LFP) are the key battery technologies adopted by major sectors. In NMC batteries, apart from lithium, nickel and cobalt are used as critical raw materials (CRMs), whereas [LFP](#) has only one [CRM](#), lithium. Irrespective of chemistries, the quantity of lithium used in LFP and NMC batteries is the same.

In 2021, China supplied approximately 80% of all LIBs in the global market. Owing to the small supply base, the price of lithium has been highly volatile in the global market, with a thirteen-fold increase in price seen from 2000 to 2022 (from USD 6,000 to 78,032 per tonne). In the past two decades, China has ramped up battery manufacturing by setting up factories and investing heavily in Chile's lithium mines.

For India, lithium resource discoveries will not only accelerate the government's push towards making the country a battery manufacturing hub but will also attract foreign direct investment (FDI), which has been lacking due to the over-dependency on CRM imports (for battery manufacturing). As per the [Ministry of Commerce and Industry](#), between April and December 2022, India spent INR 163 billion on the import of lithium. With increased FDI, schemes like the [Production Linked Incentive](#) scheme will yield favourable results for the battery manufacturing industry. Also, the sound application of circular economy in lithium mining can create more job opportunities and attract domestic as well as foreign fund flows in this sector.

Thus, the latest lithium resource discovery gives India an upper hand in this industry. Although lithium mining is a time-consuming process, India's dominance in this area is likely to become visible to the world in the coming years. The Indian government can now explore opportunities for engagements with countries that have reserves of CRMs (such as nickel and cobalt) through strategic investments in their mines.

From being one of the biggest lithium importers to becoming self-reliant, India is now on the path to becoming a leading lithium exporter.

Challenges in lithium extraction, however, cannot be ruled out. But these challenges can be dealt with by applying the latest technology—direct lithium extraction—in mining. Such measures will also minimise the adverse effects of lithium mining on the environment.

With the armoury of lithium reserves by its side, India will be in a better position to negotiate with leading exporting countries for other CRM imports. Better trade agreements with USA, UK, Australia, and Europe can be expected in the coming years, which will benefit several other sectors, besides the energy sector. While the impact of the lithium reserve discovery will be visible only after some time, it is sure to give the Indian economy a boost.

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