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# Critical mineral recycling: Govt plans PLI scheme to boost circular economy

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Written by [Aggam Walia](#)

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The need to incentivise the growth of critical mineral recycling has become all the more urgent after most critical mineral blocks offered by the Mines Ministry failed to pass the technical bids stage, which requires at least three eligible bidders.

The Ministry of Mines is in the initial stages of designing a Production Linked Incentive (PLI) scheme to boost the recycling of critical minerals in India, The Indian Express has learnt. This move aims to foster a circular economy and bolster domestic supply chains, following a lacklustre response to recent auctions of critical mineral blocks.

The proposed PLI scheme aligns with policy recommendations from NITI Aayog, the government's apex think tank, and complements the Battery Waste Management Rules (BWMR), 2022, which mandate phased recycling of used electric vehicle (EV) lithium-ion batteries from 2026 onwards.

In an office memorandum dated May 1, 2024, the Mines Ministry circulated a concept note on a PLI scheme envisaged for the recycling of critical minerals, people familiar with the developments said. The note was shared with key government stakeholders, including the Department of Science & Technology, the

Ministry of New and Renewable Energy (MNRE), and the Ministry of Heavy Industries (MHI), for comments and feedback. The ministry is yet to hear back from MNRE and MHI.

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The PLI scheme, while yet to be finalised, will target e-waste recycling— often referred to as “urban mining”— to recover critical minerals such as lithium, copper, cobalt, graphite, chromium, and silicon. These minerals are crucial for clean energy technologies like solar PV modules, wind turbines, energy storage systems, and EVs, as well as consumer electronics. Feedback from MNRE and MHI is vital, given MNRE’s role in solar and wind energy policies and MHI’s involvement in the development of the EV ecosystem.

Similar to other PLI schemes, the one under consideration by the Mines Ministry will incentivise production of recycled critical minerals for secondary use and promote investment in advanced recycling technologies and infrastructure, industry sources said. The quantum of incentive is likely to vary based on the type and value of minerals recycled.



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Some recyclers argue the scheme should benefit only those extracting high-purity critical minerals suitable for reuse as primary inputs. Others advocate for a wider scope that includes the production of black mass, which is shredded and processed e-waste rich in minerals including lithium, manganese, cobalt, and nickel, since most Indian recyclers currently lack capacities to extract battery-grade minerals from black mass.

India's e-waste generation is poised to surge, driven by rapid growth in solar and wind energy infrastructure and EV adoption. Industry estimates project solar PV module waste to jump from 100 kilotonnes (kt) in FY23 to 340 kt by 2030. Additionally, 500 kt of EV batteries are expected to reach recycling units in the coming years. Research indicates that recycling critical minerals can significantly reduce the need for virgin ores and new mines.

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In a report released in July, 2023, NITI Aayog also pushed for a PLI scheme for critical mineral recycling. "Apart from non-fiscal incentives from states, a production linked incentive can also be introduced by the Government of India in line with the ACC PLI scheme given to cell manufacturers. This will not only help the domestic recyclers but also serve the cell manufacturers selected under the ACC PLI scheme," the report, co-authored with the Green Growth Equity Fund, said.

The think tank also recommended the consideration of key parameters for developing such an incentive, including the cell chemistry or minerals and metals being recovered, recovery efficiency of recycled minerals and metals, and benchmarks for domestic utilisation of recovered minerals and metals.

The need to incentivise the growth of critical mineral recycling has become all the more urgent after most critical mineral blocks offered by the Mines Ministry failed to pass the technical bids stage, which requires at least three eligible bidders. This indicates a lack of investor interest in domestic mining of critical minerals.

The new incentives will also build on the Battery Waste Management Rules (BWMR) notified in 2022 by the Central Pollution Control Board. These rules mandate that producers of batteries containing lithium, nickel, cobalt, and lead ensure environmentally sound management of waste batteries through Extended Producer Responsibility (EPR) compliance. EPR compliance, based on the polluter pays

principle, holds producers accountable for managing the waste generated by their products. Producers can meet compliance by trading credits with recyclers.

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