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Published in Mint
September 03, 2025

India's rare earth magnet crisis: The road ahead for domestic EV companies

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Read on: https://www.livemint.com/auto-news/indias-rare-earth-magnet-crisis-the-road-ahead-for-domestic-ev-companies-11756895257589.html

Article Content:

Experts weigh in on the measures the government and India's EV Inc must take to insulate themselves from any future export restrictions on rare earth magnets and develop an independent supply chain.

China's recent decision to lift the curbs on rare earth magnets, minerals and fertilisers (among other things) has offered respite to India's rapidly growing electric vehicle (EV) sector. With the nearly three-month bottleneck delaying production for manufacturers, even temporarily halting it for brands like Bajaj Auto, the recent thawing of Indo-China diplomatic relations has many heaving a sigh of relief. However, the curb has also exposed major gaps in India's EV supply-chain ecosystem, which continues to remain highly dependent on China for critical and rare earth minerals.

According to a report published by Primus Partners, the projected demand for rare earth magnets for passenger vehicles is expected to be around 712 tonnes by 2030. For three-wheelers, the forecast is for 903.2 tonnes. The same report projects a conservative estimate of 2,640 tonnes of REMs for passenger vehicles by 2047. Each EV demands at least 2kg worth of rare earth magnets to successfully execute a variety of functions, although REMs are a crucial requirement for common ICE vehicle components as well, including power steering, electronically folding rear view mirrors etc.

For India to cater to such growing demand, a multi-pronged solution needs to be looked at closely. Solutions which involve the strategic stockpiling of critical minerals, developing a skilled workforce and creating multiple alliances with countries other than China that have established refining capacity.

India lacks the refining capacity

At present, India lacks the refining capacity, R&D and large-scale manufacturing to qualify as an emerging rare earth mineral economy. During his Independence Day speech, Prime Minister Narendra Modi announced that over 1,200 sites are being prospected for critical minerals.

According to Ather Energy Co-Founder Swapnil Jain, Ather continues to source rare earth magnets from China, although it managed to circumvent the rare earth magnets bottleneck through a "dual-sourcing"

strategy. “We also try to keep a decent amount of stock in anticipation of these challenges. Everything comes from China though, there’s no running away from that” Jain confirms.

The ease of restrictions once again has brands rushing to China, which continues to be able to provide rare earth magnets at a highly competitive price. This, in turn, does not incentivise the local manufacturing of rare earth magnets. When asked about a tentative timeline in which a market leader like Ather Energy could potentially consider sourcing REMs locally, “I think five years would be the right timeline,” he says, although he remains sceptical. “We haven’t developed multiple technologies. From extraction of the minerals, converting them into magnets, refining etc. But with focused effort, five to seven years would be the right time to build a completely indigenous supply chain,” he adds.

Ather has been the first local EV maker to make a decided shift to light rare earths. “We use very little heavy earth magnet content in our e-scooters,” says Jain. At present, however, there appear to be no other alternatives. “Permanent magnets are something which we have explored in the past.” When asked about the use of ferrite magnets, as has been suggested by some experts, Jain maintains that the trade-offs in performance far outweigh any potential benefits. “Ferrite magnets make it more expensive, less efficient and more bulky. It makes your motor bulge acid and it simply does not provide enough flux.”

Dual-sourcing is the way to go for OEMs

For a market as price-sensitive as the EV segment, there appears to be no choice but to source it from whichever supplier is providing it the fastest and the cheapest. According to Vikram Handa, MD of Epsilon Advanced Materials, dual-sourcing is the smart way to go for OEMs, as long as the other source is a local one. “I always tell customers, if you’re getting it from China and you’re getting it cheap, please buy it because the whole industry is under such pricing pressure. But someday this will not be cheap; in fact, someday it might just stop,” he says ominously. “Buy at least 20% locally. But I think you need to have two work streams in parallel. For instance, a lot of this technology is available in Japan. It’s not very cost-competitive, but it’s available commercialised. Attract those companies to build in India, get into long-term agreements over there,” says Handa, adding that it’s important for India to upskill its manpower.

“The government, instead of giving a ₹5,000 crore PLI, should allocate ₹1,000 crore for research and commercialisation of technologies for rare earth processing. In 10 years, that will lead to a much bigger impact in the country. We need to work on those streams,” he observed.

Scheme to subsidise rare earth magnets awaits Cabinet nod

As reported by Mint, a ₹1,345 crore scheme to subsidise rare earth magnets has been proposed, pending Union Cabinet approval. According to Union Minister for Heavy Industries HD Kumaraswamy, the incentives will be extended to two select manufacturers. Some experts, however, also point out recycling as a key cornerstone for building a robust, localised REM supply chain, along with subsidies, of course.

According to Nitin Gupta, Co-Founder & CEO of Attero Recycling, widely recognised as India’s largest li-ion battery recycling company, “It’s a three-pronged approach — focus a lot more on recycling, build-up capacity to become the global recycling hub of the world while in parallel continuing to develop mining activities so that in the long-term, we are not only independent, but supplying to the world.”