Automakers gear up to roll out EVs without rare earth magnets by FY27

SOHINI DAS & SHINE JACOB
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India's automobile majors are preparing for a future less dependent on rare earth magnets (REMs), in an effort to safeguard the country's burgeoning electric vehicle (EV) sector against global supply shocks. According to several industry insiders, nearly all leading passenger and commercial vehicle manufacturers are now working towards launching vehicles powered by REM-free motors by 2026-27 (FY27).

While companies remain tight-lipped about the shift, most acknowledge that the transition is essential to match the pace of the sector's growth. For years now, original equipment manufacturers (OEMs) and component vendors have been developing technologies aimed at bypassing the need for REMs — an effort that picked up pace in the wake of China's Ministry of Commerce imposing export restrictions on several rare earth elements.

The move was widely interpreted as a retaliatory measure following tariffs imposed on Chinese goods by US President Donald Trump. The resulting disruption led to panic across global automotive supply chains. On Wednesday, however, Trump announced the US would get magnets and REMs from China under a new trade deal and that tariffs on Chinese goods would be 55 per cent.

Speaking with *Business Standard*, Jaideep Wadhwa, director, Sterling Tools, revealed that his firm had been collaborating with multiple OEMs over the past four-five years over REM-free motor applications.

Turn to Page 6

Dysprosium, terbium may top India's wish list

Amid reports that at least 10 applicants are in the advanced stages of receiving rare earth licences from China, sources indicate the government is actively pushing for the import of two key materials — dysprosium and terbium, report PUJA DAS & SHINE JACOB

2

China will supply rare earths, says Trump

US President Donald Trump said a trade framework with China has been completed, with Beijing supplying rare earths and magnets "up front" and the US allowing Chinese students into its universities.

8

FROM PAGE 1

Most OEMs have programmes to test REM-free motors in vehicles

The company signed a technology licensing agreement on May 14 with the UK-based Advanced Electric Machines (AEM), after years of discussion.

"Almost all leading OEMs have programmes to test REM-free motors in their vehicles — whether commercial (heavy and light), two-wheelers, EVs, or even ICE (internal combustion engine) vehicles. This is part of everyone's technology road map. We cannot divulge names due to non-disclosure agreements," Wadhwa said. He added that several OEMs had already requested them to develop applications for both existing products and future lineups.

Sterling expects to begin production of these motors for various use cases within a year.

Automakers themselves are not denying this strategic pivot. "All companies will have to look at long-term alternatives for REM. We need to. In some cases, the deadline may be FY27; others can possibly take longer," said Mahesh Babu, CEO of Switch Mobility, the EV arm of commercial vehicle giant Ashok Leyland.

Even the academic sector is playing a role in this technological shift. Numeros Motors, a newage OEM focused on indigenous electric mobility solutions, has entered into a research collaboration with the Indian Institute of Technology (IIT) Bhubaneswar. Together, they are undertaking a two-year initiative to explore and evaluate REM-free motor topologies.

"We believe that rare earth-free motor technologies will play a crucial role in building sustainable, affordable, and truly indigenous EVs," said Shreyas Shibulal, founder & CEO of Numeros Motors. "Scaling these technologies will help reduce import dependency, lower production costs, and contribute meaningfully to a greener, more self-reliant EV ecosystem in India."

Wadhwa echoed the sentiment, noting that the current geopolitical tensions had accelerated timelines. "The current geopolitical crisis, which no one could have predicted, has accelerated this, and now several Indian OEMs want to have REM-free motor-based vehicles by FY27 as their internal targets," he said.

Underlying the urgency is a growing awareness that global demand for REMs may soon exceed supply. Past crises offer a cautionary tale: In 2014, a dispute between China and Japan caused prices of REMs to jump three times. Besides, China has consistently leveraged its dominance over rare earth supplies as a geopolitical tool.

The cost implications are also substantial. REMs account for nearly 30 per cent of the cost of electric motors in larger commercial vehicles, and 15-20 per cent in the case of two-wheelers. While India does possess rare earth reserves, mining and refining the material remains a highly polluting process, according to component manufacturers.

One component manufacturer, Conifer, claims to have developed REM-free motors under 30 horsepower that outperform conventional REM-based motors in terms of power density, efficiency, and cost. "We are making the only rare-earth-free motor for under 30 hp that performs better than REM-based incumbent motors across power density, efficiency, and cost," said Ankit Somani, cofounder of Conifer.

Somani stressed that Conifer's approach differed from others as it eliminated reliance not just on Chinese materials, but also on Chinese manufacturing methods. "Our manufacturing process is designed in-house and sourced locally. So, we truly remove dependence on China," he said, adding that the company's in-wheel powertrain solutions served as drop-in replacements for OEMs currently dependent on hub motors.

Conifer has been working with several Indian OEMs and reports a recent surge in interest. While some clients are currently testing their systems, others are nearing the production phase.

"While our technology scales to four-wheelers, our current focus is small mobility (<30hp), which refers to vehicles smaller than typical four-wheelers. It leads to up to a 30 per cent increase in range and a 10 per cent increase in power density," Somani added.