

Planning for electric mobility

In October 2017, the Lancet Commission on Pollution and Health, published by the peer-reviewed [Lancet medical journals](#), attributed to air pollution an estimated 6.5 million premature deaths globally, with 1.1 million being from India. Dreadful as these figures were, they were not surprising, considering that back in 2014, the World Health Organisation's urban air quality database had found four Indian cities to be among the world's 10 most polluted. The database also placed 10 Indian cities in the 20 worst list.

There are multiple reasons for India's deteriorating air quality. In urban India, emissions from motor vehicles are among the prime reasons. Acknowledging the challenge of rising vehicular pollution in Indian cities, Piyush Goyal, then Union Minister for Power, said that from 2030, India would completely shift to using electric vehicles (EVs). The push for electric mobility was backed by the government think-tank, NITI Aayog, which has estimated that the nation can save up to 4 lakh crore by rapidly adopting EVs.

While transitioning from an internal combustion engine (ICE)-based regime to an EV-based one is expected to be a painful process, the long-term benefits could outweigh the hardships significantly in the wake of India's ambitious renewable energy plans.

Today, as the NITI Aayog lays stress on the need for a robust action plan to move towards [electric mobility by 2030](#), India needs to address five fundamental issues immediately.

The first is about who will take the lead. EVs, unlike ICE vehicles, involve several actors at the national, State and city levels, respectively. In the first, it needs multiple ministries such as Road Transport and Highways, Housing and Urban Affairs, Heavy Industries, Power, New and Renewable Energy, External Affairs as well as national institutes such as NITI Aayog. Also, since the initial EV revolution would predominantly be an urban one, State and city-level players need to be involved so as to address several technical and infrastructural needs. Coordination between all three is crucial in driving the EV agenda.

Getting charged up

The second is figuring out the best mode forward. China has focussed on the use of electric buses as a catalyst for EV penetration. It is the largest electric bus manufacturer in the world, with most in use in the country. In 2016 alone, about 80,000 electric buses were added to China's roads. The Netherlands, on the other hand, has captured the EV market using a simple yet well-crafted strategy of creating charging infrastructure and encouraging investment in charging technology by providing incentives to EV buyers. Today, it has the densest charging infrastructure in the world and is a major exporter of this technology.

These two case studies show that sustained growth is possible only due to positive economic impacts of EVs. India is today the largest manufacturer and exporter of two-wheelers and auto-rickshaws. Could these vehicles pave the way for an EV revolution?

The third is the battery conundrum. The assumption that anyone who controls the battery will control electric mobility rings true in the current scenario. India does not produce lithium-ion (Li-ion) batteries currently, and companies making battery packs are dependent almost exclusively on imports from China. This is a cost-saving strategy as setting up a cell manufacturing unit in India would be expensive. Accelerating EV use in India should be linked to the "Make in India" goal and domestic battery production. Investment is required for research and development in battery-making and exploring alternative technologies.

The fourth is about charging infrastructure. EV charging is more than just using electricity. It involves exchange of information requiring a communication protocol. There is no unique or single-charging technology for EVs. The three major EV users, China, Japan and the European Union, have their own charging technologies which are often conflicting and not interchangeable.

The absence of a standard global infrastructure is a major deterrent for EV penetration in India, as creating infrastructure can be cost-intensive. For this, the government needs to select or develop appropriate charging technology that avoids multiplicity and reduces the cost of infrastructure, while making it convenient and safe for users.

The final point is about jobs and the economic impact. India is the world's fourth largest fifth auto market, where over 25 million motor vehicles are produced. The sector is estimated to provide direct and indirect employment to about three crore people and accounts for 7.1% of the nation's GDP. The industry is estimated to grow to \$300 billion in annual revenue by 2026, creating 65 million additional jobs, and contributing over 12% to the GDP.

A thorough qualitative and quantitative estimation of the new jobs the EV sector will create would go a long way in negating apprehensions and securing the pathway for EV technology and use.

EVs have the potential to disrupt the mobility ecosystem, and, if implemented well, could have a positive impact on the economy as well as the urban environment. India, however, needs a road map, with timelines, processes, well-researched impact studies, bold initiatives and robust investments in technological research to turn its EV dream into reality.

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