# Time to Usher in the EV Revolution

(The editorial is based on the article “Time to usher in the EV revolution” which appeared in Business Line for 28th February 2019. In this article, we will discuss the need for Electric Vehicles - EVs, in India.)

**The air quality in Indian cities is deteriorating at an alarming rate.** Today, 14 out of the 20 most polluted cities of the world are in India. Left unchecked, we are staring not only at severe health costs but also at losing our highly skilled workforce to migration abroad.

## Trend in India

- **India’s love for diesel powertrains peaked in 2012-13.** That was a time when diesel cars accounted for 47 % of all passenger vehicles sold in the country. This craze was driven more by cheaper diesel prices (it was lower than petrol by as much as ₹25 per liter) than for any other reasons.
- That changed when government de-controlled diesel prices in October 2014. As the price differential between diesel and petrol narrowed, the equation changed. **Today, only 23% of the cars sold have diesel powertrains.**
- But the Indian government’s decision to leapfrog from BS-IV to BS-VI emission norms directly will impact diesel engines the hardest and will **force India to promote electrification and hybridization more seriously. It will also be forced to re-imagine public transportation and movement of goods by road.**

## Need

- **Climatic change:** The prospect of rapid global temperature increase has created the need for a reduction in the use of fossil fuels and the associated emissions. India has committed to cutting its GHG emissions intensity by 33% to 35% percent below 2005 levels by 2030.
- **Advances in renewable energy:** Over the last decade, advances in wind and solar electricity generation technologies have drastically reduced their cost and introduced the possibility of clean, low-carbon and inexpensive grids. India proposes to add 175 GW of renewable energy capacity by 2020 and to achieve 40 percent of its electricity generation from non-fossil sources by the same year.
- **Rapid urbanization:** Economic development, especially in emerging economies, is creating a wave of urbanization as rural populations move to cities in search of employment. While urbanization is an important component of the process of economic development, it also stresses upon the energy and transport infrastructure leading to congestion and pollution. According to a recent study by WHO, India is home to 14 out of 20 most polluted cities in the world. EVs can improve that scenario by reducing local concentrations of pollutants in cities.
- **Data capture and analysis:** With the rise of GPS enabled smartphones and the associated universe of mobility applications, mobility has undergone a digital revolution. That digital revolution has created the possibility of greater utilization of existing transportation assets and infrastructure. For EVs, which rely on lower variable costs to offset relatively high fixed costs, (for eg. cost of charging is less than the cost of the battery which is a one-time investment) this enhanced utilization is a critical element of achieving total costs of ownership compared to internal

combustion vehicles.

- **Battery chemistry:** Advances in battery technology have led to higher energy densities, faster charging and reduced battery degradation from charging. Combined with the development of motors with higher rating and reliability, these improvements in battery chemistry have reduced costs and improved the performance and efficiency of electric vehicles.
- **Energy security:** The petrol, diesel, and CNG needed to fuel an internal combustion engine (ICE) based mobility system requires an extensive costly supply chain that is prone to disruption from the weather, geopolitical events and other factors. India needs to import oil to cover over 80 percent of its transport fuel. That ratio is set to grow as a rapidly urbanizing population demands greater intra-city and inter-city mobility.

## Concerns

- However, despite generous tax subsidies, and other forms of support, adoption is not occurring at the pace and scale needed to have a meaningful impact on oil imports and urban air quality. Also, subsidies have proven unsustainable even for the wealthy countries (e.g. Norway).
- Availability of infrastructure across the country also remains a major challenge.

## Way Forward

- **100% EV pilots:** We need to select a few major cities and select major state and national highway corridors to serve as pilots that demonstrate both the technical feasibility and economic viability of 100% electrification of city buses and commercial taxi fleets and a reasonable share of inter-city buses and trucks. The cost of these pilots can be reduced by aggregating demand from all across the country and centrally procuring and allocating the vehicles and infrastructure equipment at scale using public auctions.
- Building **of infrastructure**: Having identified the locations for pilots, the next step is to fund the building of the fast-charging infrastructure. In fact, at this stage, it is prudent to somewhat over-build this infrastructure to ensure reliability and ease of access at the expense of being under-utilized given the high stakes of this venture. It is also essential to ensure that this infrastructure benefits from the revolution in renewable electricity markets.
- **Subsidy targeting:** To reduce the total burden on public finances, the subsidy regime needs to be reformed to ensure that the vast majority of the vehicle subsidies are directed to high-mileage vehicles with a substantial portion allocated to city bus fleets given the environmental imperative and their potential to revive public transportation. At the same time, there is merit to continuing some support to adoption by private households in both the two-and-four-wheeler markets.
- **Industry buy-in:** In order to ensure that the public investments in infrastructure and subsidies are put to their full and best use, we should require that both public transportation agencies and private operators of commercial vehicles (taxis, buses and trucks) commit to mandatory targets for electrification of a certain share of their total annual kilometres travelled or serviced to be derived from Battery Electric Vehicles.
- **Make in India:** The above efforts must be complemented with supporting policies to ensure that in the long run we do not end up swapping oil imports and fuel insecurity for battery imports. This could be achieved by using a combination of carefully designed mandates and targeted subsidies that balance strategic objectives and flexibility for private industry.

Put simply, we suffer a petroleum addiction problem, one that will be hard to shake off. But we have never had a better chance to forge a sustainable future, one that is not captive to a scarce, toxic, and inequitable natural resource whose future is under our feet and not over our heads.

FAME India I

FAME India II

Challenges to Electric Vehicle Adoption in India

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