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Group

ANALYSIS REPORT ON ELECTRIC MOBILITY

01 Introduction

Transport is the lifeline of civilization and now it became a basic requirement of life where frequent commutation is important for decent livelihoods. But it also brings the challenges of delays on route, pollution, etc. To keep the momentum going, switching on electric mobility is required in the contemporary world. As this provides convenient, congestion-free and clean commuting options for the growing population of developing countries like India with the continuous growth of the economy and protection of its environment.

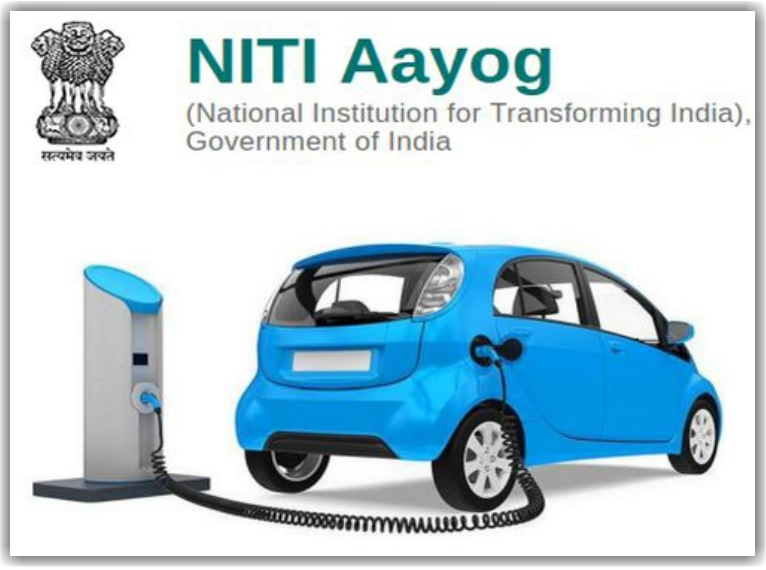
Electric Mobility can lead the future of mankind and is important to set the momentum of the Indian economy in the right direction with an affordable, accessible and safe commuting option for urban and rural India. Concerning its climate change-related commitments, India is trying to adopt electric mobility solutions as a key driver of its growth engine as fast as possible.

For this, the Government of India has also set up the National Mission on Transformative Mobility and Battery Storage under Niti Aayog. It has the responsibility to develop a roadmap for the manufacturing of integrated batteries and cells across India by 2024 and help in boosting the large-scale, cost-competitive indigenous production of electric vehicles (EV) to facilitate the electric mobility value chain as well as export demand sustainably.

The target for phased-wise adoption of EVs on Indian roads is set to be 30% of the total requirement by 2030. This will significantly help to reduce the emission intensity by 33%-35% from 2005 levels by 2030 in terms of GHG emissions per unit GDP. It will also help to counter the surging oil import burden and adverse air pollution levels.

The Indian EV market is expected to touch the mark of US$ 2billion by 2023. With the reduction in battery cost and increasing charging infrastructure, the Indian automobile market is in favor of adopting electric vehicles at the mass level and is ready to reap its benefits for one and all including the Governments, EV manufacturers, energy companies, charging infrastructure operators, service providers, technology providers, aggregators, consumers, etc.

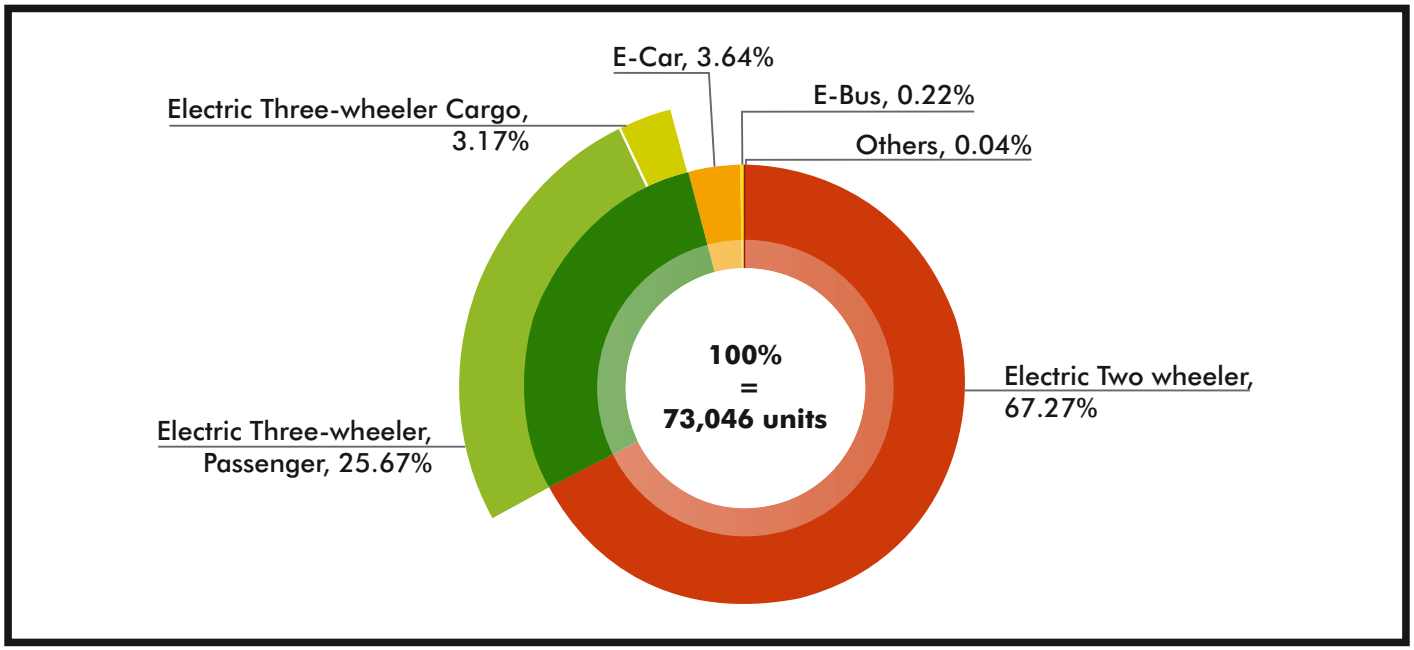
A rapid transition from Internal Combustion Engines to electric mobility is important for the conducive growth of the Indian economy as well as to fulfil India's shared responsibility towards climate change. The growth of the EV industry is mostly dependent on this scenario and supporting regulation, innovation, promotion, and incentivization as per the industry scenario and consumer demand is paving the way for its faster adoption by consumers.



02 Current Scenario and Drivers of Rising Demand

The Indian EV market is expected to be around more than US$ 7 billion by 2025. It has the potential to develop around US$ 206 billion worth of opportunities in the segment by 2030 where the major investment will be required in developing the EV charging infrastructure besides the manufacturing. India being the 6th largest vehicle manufacturer in the world has enormous potential to unfold which can be catered to only through a systematic roadmap in case of EV rollout on Indian roads. The current scenario of EV sales in India is as under:

Sales of Electric Vehicle (Category-wise) in India in April 2022



Sources: https://e-vehicleinfo.com/ev-sales-data-april-2022/

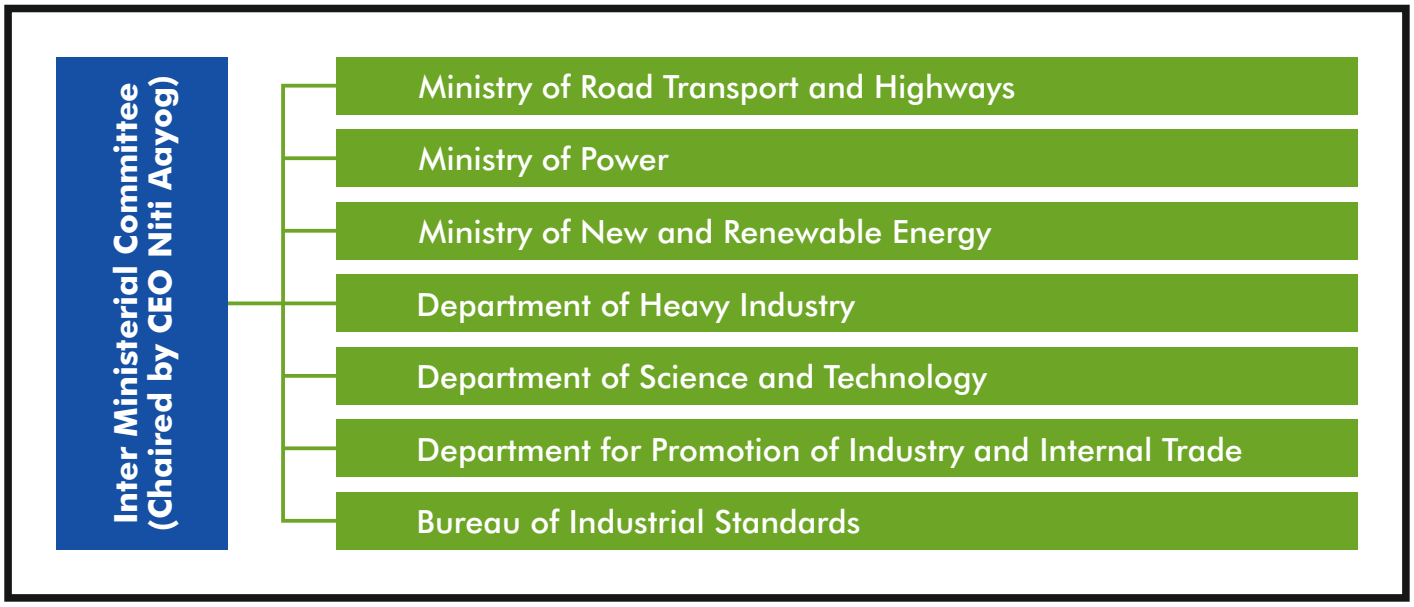
Through government policy support, the rapid decrease in battery costs, and increasing charging infrastructure (an increase of 285% y-o-y in 2022) with the support of Public Sector Units (PSUs) such as BHEL, the adoption of EVs in India became favorable in the last few years. The direct financial benefits to consumers in terms of subsidies and non-financial benefits such as road access, registration privileges, etc have also shaped the scenario in its favor.

Total Number of Electric Vehicles on Indian Roads (As of 3rd August 2022)

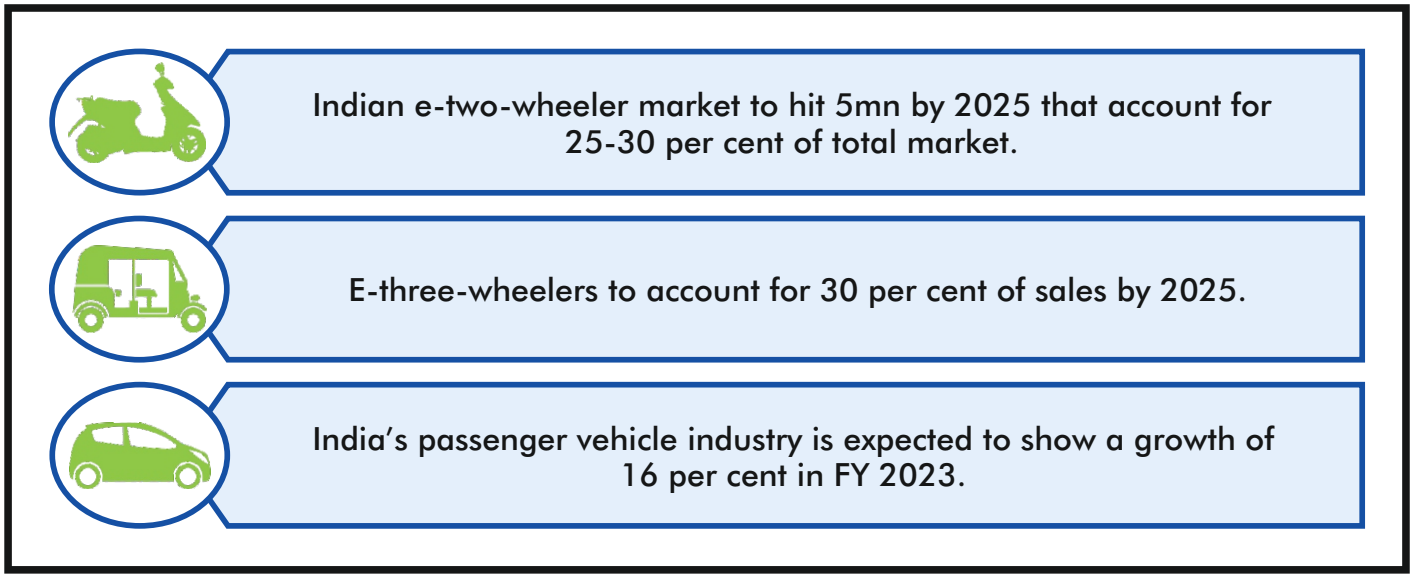
Sl. No.	Vehicle Category	No. of electric vehicle
1.	Two Wheeler	5,44,643
2.	Three Wheeler	7,93,370
3.	Four Wheeler and above	54,252
Grand Total		13,92,265

Source: https://pib.gov.in/PressReleseDetailm.aspx?PRID=1848751#

The National Mission on Transformative Mobility and Battery Storage under NITI Aayog in coordination with the following ministries and apex bodies is developing strategies for the effective roll-out of electric mobility along with developing a smooth EV value chain including manufacturing, related components, batteries, etc.



Government across the globe are promoting EVs to counter the climate scenario and in the last decade, the growing environmental concerns backed by technological innovation and R&D in the field have increased the interest of original equipment manufacturers, policymakers as well customers towards the EV and set the momentum of future growth in favor of EV adoption in India:



Source: https://www.investindia.gov.in/team-india-blogs/electric-vehicle-ev-sector-india-boost-both-economy-and-environment

Air pollution in India is a burgeoning concern as out of the 10 most polluted cities of the world, 6 Indian cities bagged the position including the Indian capital city Delhi. Thus, to limit fossil fuel consumption for a green and clean environment and to reduce the burden on India's foreign

reserve because of costly crude oil imports, it is important to switch to EVs fast. The following features of electric mobility increase the attractiveness of its adoption among stakeholders including consumers are as under:

1. To emit less pollution
2. Promotion of Renewable Energy
3. Significant Reduction in Fossil Fuel Imports
4. Reduce Global Warming Level
5. For the Conservation of Non-renewable Natural Resources of the Country

The EV transition in the Indian automotive industry has the potential to add higher value if the indigenized battery and power components are planned to be manufactured locally. This will also create new jobs in the industry to support economic growth. To fulfill its global commitment towards climate change as well as to achieve a zero-emission nation tag, the Indian government has strengthened its policy framework from production to purchase with the schemes like Faster Adoption and Manufacturing of Electric Vehicles (FAME), Production Linked Incentive (PLI) that are producing the desired effect.

To change the scenario on roads, the government has also formulated a scrap page policy that is going to incentivize EV production in India and set the path to achieving the projected targets. The roll-out of EV promotion policy at the state level is multiplying the government's efforts and helping the industry to revive after the deadly Covid-19 pandemic through cooperative federalism.

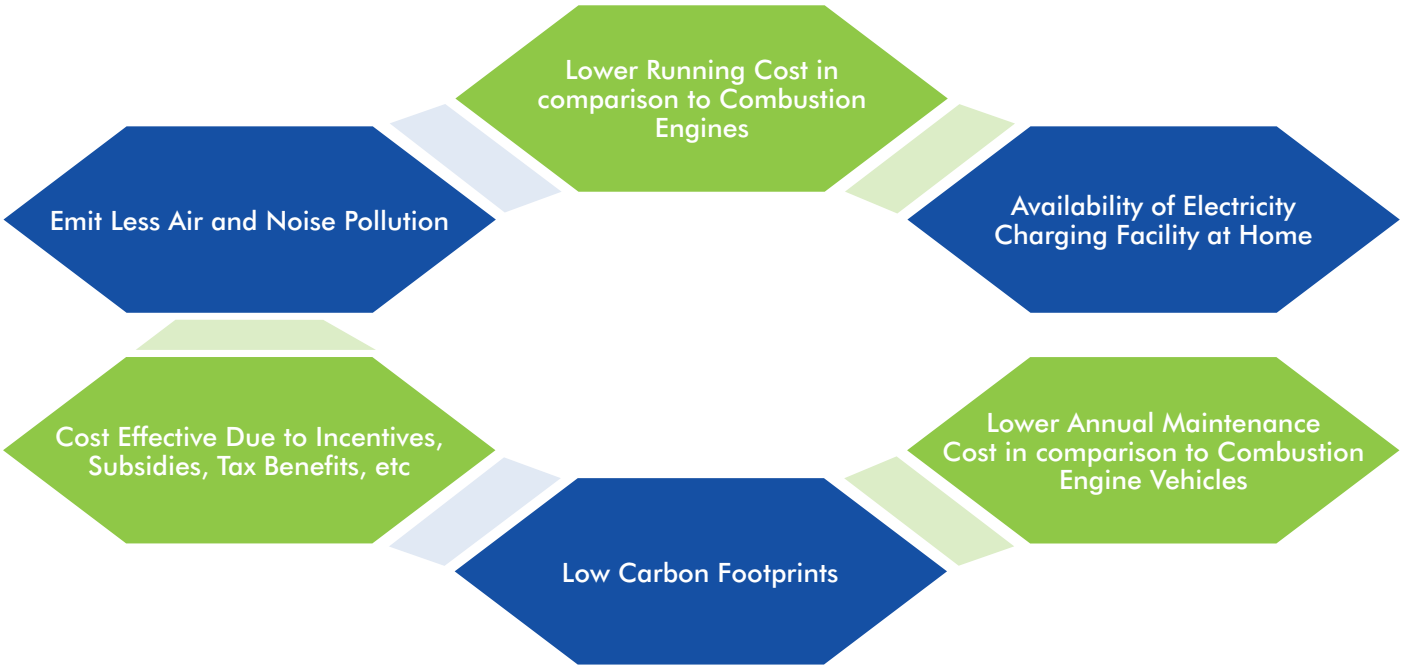
Besides this, the running and maintenance costs of EVs also play an important role in their early adoption as the income level in India varies significantly. The overall strategy that works here to change the scenario is to provide a safe, clean and green mobility option to Indian consumers that can reduce ecological damage and boost public health through improvement in air quality to stimulate market demand in the coming years.

03 Benefits and Challenges to Roll out Electric Mobility in India

The transport sector is a major contributor(around 23% globally) in GHG emissions as it is carrying life and livelihood along with it every second. The continuous emission of black smoke from lakhs of vehicles on Indian roads causes major environmental and health hazards everyday and increases the burden on India's healthcare.

The EV in this scenario provides a safe and clean solution for urban mobility and projects India as a world leader in e-mobility by 2030. As per the government estimate, India is expected to receive investments worth more than US$ 8 billion from domestic and foreign investors in the automobile sector. It is primarily going to strengthen the EV value chain and provide robust charging infrastructure across the country.

It is going to bring new opportunities for battery and EV component manufacturing in India by balancing the oil import spending towards R&D in allied areas. It will create new jobs and bring new business opportunities to India by 2030.Thus, the adoption of EVs in India has the following benefits that will not only ease life but can also impact the economic well-being of individuals as well as the country as a whole:



The eco-friendly electric vehicles are also receiving a positive response from the government as well as customers for mass transit, individual commutation and commercial purposes but still the road ahead is long. The EV adoption in India faces several challenges in its roll-out, some of which are as under:

- Inadequate Public Charging Infrastructure
- Dependency on Battery and EV Components Import
- High Cost
- Range and Performance Anxiety Among Customers
- Variying Electricity Supply across the Country
- Lack of High Performance electric Vehicle Options
- Lack of Maintenance and Repair Services

To address these challenges and encourage the use of electric vehicles by individuals, awareness, and education related to their potential benefits are required. The launch of EVs is disrupting the Indian automobile sector and thus needs strong hand holding by the policymakers to make the transition smooth and save the interest of local manufacturers as well as customers.

In this regard, the Government of India through the launch of the e-Amrit portal made a step in the right direction to educate the Indian masses on all the information related to electric mobility. It works as a centralized data repository for electric vehicles and helps to bust the myths concerning its adoption and rollout. It is supporting the government's effort to make people more aware of the clean mobility option for India's rising commutation needs and green environment.

04 Economic and Environmental Impact

The future of transport is Electric Vehicles. It brings multiple benefits and creates new opportunities for the stakeholders. The automobile industry is seeing a downturn due to the high carbon emissions level of fossil fuels and the rising climate concerns after the pandemic. The EVs bring hope for the manufacturers as well as a consumer with efficient yet clean mobility solutions. The respiratory ailments and potential health hazards for human life due to the black poison emitting from combustion vehicles are posing a serious threat to urban mobility for which EVs are the only effective solution present in the market.

Indian transport sector uses around 1/3rd of the total crude oil consumption of the country and thus creates higher economic and environmental impact to contribute to crude oil import and carbon emissions. The significant replacement of combustion vehicles with smart EVs will bring down this oil import significantly and help in balancing India's trade deficit at the global level. In India, 80% of the crude oil consumption of the transport sector has been consumed on Road Transport alone which directly impacts human lives by generating major air and noise pollution.

In EVs, there are fewer moving parts in comparison to combustion vehicles and thus this keeps their maintenance and repair costs at a low level. The high-efficiency performance and lower fuel cost make it more attractive for buyers when packaged with a stimulus scheme such as FAME. The income tax deduction claim upto Rs 1,50,000 under section 80EEB also increases its appeal among new consumers besides being economical and convenient.

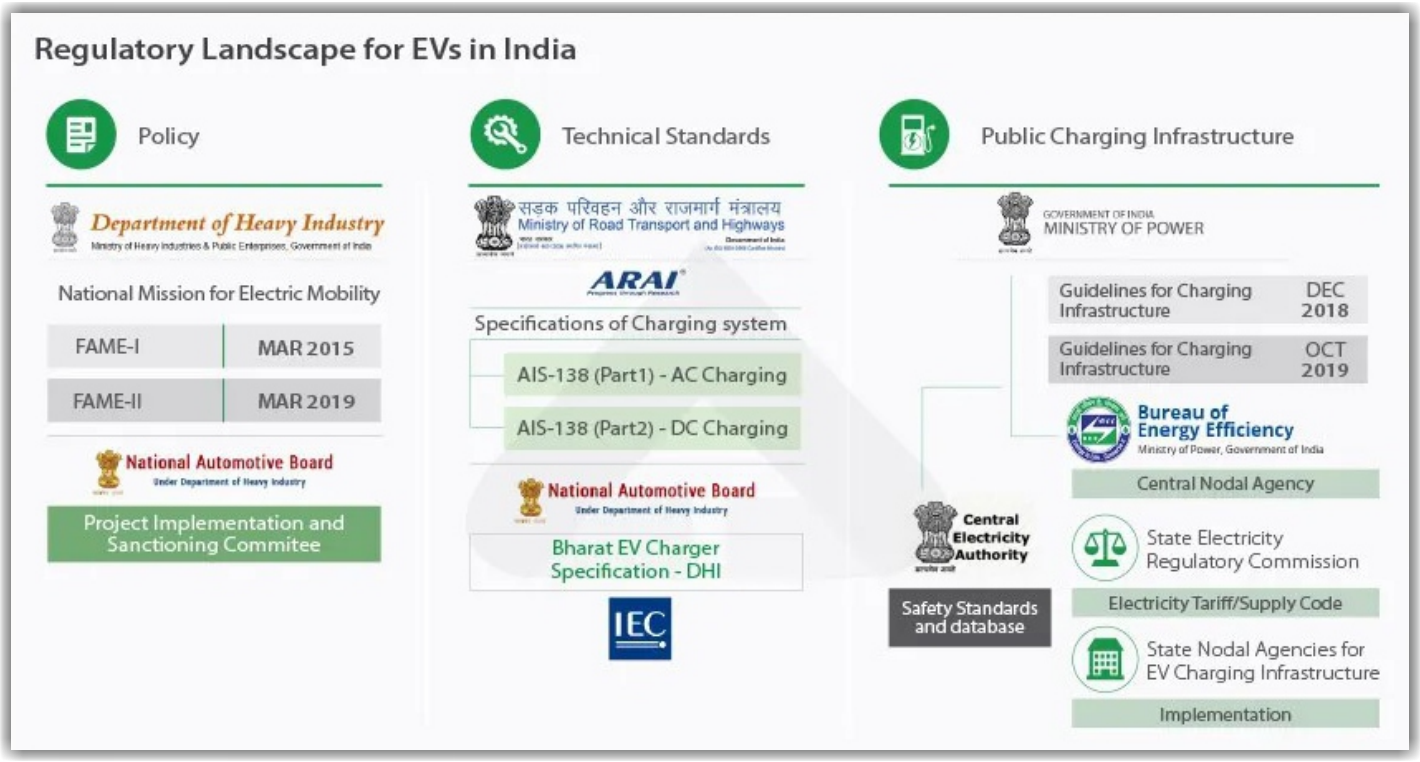
But still, India needs to follow a roadmap to completely switch to battery-powered electric mobility. Here, the low carbon emission from EV sis capable of significantly impacting the health of polluted air in and around Indian cities in the future and helping individuals to take breathe a little in the fresh air.

The EV revolution provides energy-efficient mobility solutions to commuters in comparison to combustion engines. As in the case of combustion engines, only 17-21% energy of the fuel can be stored in the wheels in comparison to 60% in the case of EVs. Thus, it can address the wastage of energy effectively. To make it more eco-friendly, the government has achieved 40% of the total electric power installed capacity in India through renewable energy resources such as solar, wind, etc, and made the way for a green India.

05 Government's Initiative to Promote and Incentivize Electric Mobility Solutions

Currently, the Indian government is keen to take the fundamental decision to transform the automobile and transport industry with electric mobility solutions. Their commitments are reflected in letter and spirit. Thus, the stakeholders are also embracing the technological advancements in the area that will be powered by 5G services across the country in the coming years.

The broad policy framework including the regulation related to technical standards for electric vehicles in India is governed through the following Ministries, departments and apex bodies. These central, as well as state governments, are working to sensitize the public towards the technical, operational and performance details of EVs and encourage sales through incentives and subsidies.



Source: https://www.india-briefing.com/news/policies-to-facilitate-indias-transition-to-electric-mobility-26100.html/

To make a transformational shift in the industry, the government has adopted a multi-disciplinary approach that works on cooperation and consultation among various stakeholders such as the government, manufacturers, etc. The mobility landscape in India has been derived through a

focused approach to EV manufacturing, technical standards and specifications, regulatory frameworks, overall demand creation, and target projections, including research and development for time-bound results.

The reduction in EV prices through subsidies and incentives has made the scenario more favorable for buyers and thus brought new energy to the EV production and manufacturing of related components. Some of the major policy frameworks that provide impetus to India's Electric mobility are as under:

National Electric Mobility Mission Plan (NEMMP), 2020

The national mission has been launched by the Department of Heavy Industry (DHI) as a nodal department for the Indian Automotive Sector with the vision of preparing a comprehensive roadmap for the faster adoption of the full range of EVs and hybrid vehicles by facilitating their manufacturing in the country itself.

Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) India Scheme

Under the Ministry of Heavy Industries, the scheme has been notified in 2015 with the vision to promote the manufacturing of electric vehicles in India with a focus on overall demand creation, technology adaption, pilot projects and development of charging infrastructure with a price reduction for buyers. To date, two phases of the FAME scheme have been rolled out and are providing upfront incentives for the purchase of EVs including electrification support to the public and shared transportation through subsidy support.

Production Linked Incentive (PLI) Scheme for the Automobile and Auto Component Industry

The Indian government has launched a Production Linked Scheme for Automobile and Auto component industry with a budgetary allocation of US$ 3.50 billion. This will enhance the capabilities of India's clean energy sector and increase its trade competitiveness at the global level. The scheme has been launched to attract investments to develop the domestic EV industry and project India as an export hub in the global supply chain of automobiles and their related components.

Besides these policy frameworks, the “National Mission on Transformative Mobility and Battery Storage” under Niti Aayog has developed with a focused approach to research & development in battery-related technology to counter the battery import from china. This will also increase the cost competitiveness of Indian EVs in the domestic as well as global markets.

The “Make in India” program along with the “Atmanirbhar Bharat” initiative is providing new energy to EV manufacturing in the country. The scenario is also providing numerous opportunities for global giants like Teslato attract Indian customers and boost local employment.

06 Future Roadmap

The EV industry has dependent on various other sectors like steel, thermoplastics, etc for manufacturing and value supply chain. The future of mobility is electric but bringing it to the masses in a developing country like India has a rocky road. To promote its use and raise awareness about its efficiency and performance among the masses the transition of the public transport system by the central and state government has enormous potential.

The recent launch of India's first double-decker electric bus on Mumbai roads is one of the examples where the government can integrate the higher passenger load with less carbon footprint of Evs and redefine India's overcrowded urban transport system. As the number of commuters is increasing with each passing day, R&D in the field of electric and hybrid mobility including the indigenisation of the overall supply chain is required.

A roadmap to provide more support and incentives to Original Equipment Manufacturers (OEMs) will also be needed to bring down the cost further and add value propositions supported through demand-supply measures to increase penetration. The manufacturers must also be encouraged to meet the eligibility criteria set under EV manufacturing to provide the benefit of subsidies and incentives to customers and increase sales.

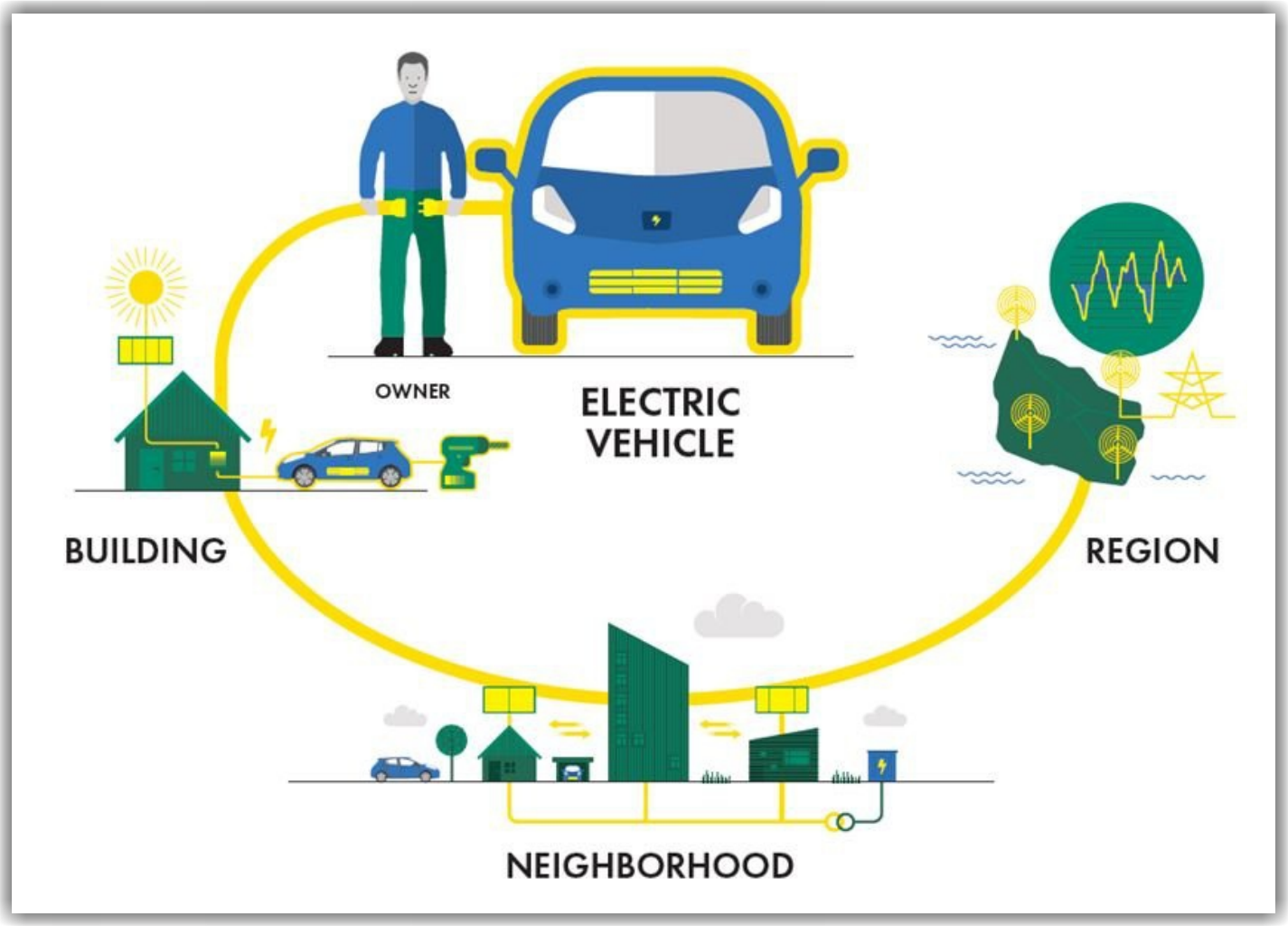
As per the CRISIL report, 95% of e-scooter in India are ineligible for the incentives provided under the FAME II scheme. The scenario weakens the response against effective policy formulation. Thus, the mass awareness campaign and promotion policies to educate the customers about the benefits to switch to EVs will pave the way for its rapid adoption and help in meeting the targets by 2030.

07 Conclusion

Electric mobility is going to stay and is expected to serve for several decades. India is also ready to experience its numerous benefits and shift the choices from traditional transport solutions to be a part of this change. Over time, all the stakeholders are becoming more concerned about environmental degradation and health hazards from conventional fossil fuel use and thus feel the urge to go electric for commutation and mobility requirements.

Being a pioneer, in the global war against climate change, India is ready to reap the dividends of early mover advantage and thus has set ambitious targets of switching to EVs as well as renewable energy sources to fulfill the demand of increasing electricity supply at robust public charging infrastructure.

The policy framework to promote its adoption and counter the battery imports from China is bringing numerous opportunities in the sector and creating lakhs of job opportunities for local skilled and unskilled human resources. The long-term policy roadmap is enabling smart users to dig deep and encourage them to bring green mobility solutions to their homes without a hitch. The trend is going to attract significant growth for the EV market and is expected to add new feathers to India's automobile sector in the coming decade.



08 Resources

1. https://www.niti.gov.in/e-mobility-national-mission-transformative-mobility-and-battery-storage
2. https://pib.gov.in/PressReleseDetailm.aspx?PRID=1848751#
3. https://www.investindia.gov.in/sector/automobile/electric-mobility
4. https://morth.gov.in/incentivisation-electric-vehicles-and-induction-evs-shared-mobility-and-public-transport-operations
5. https://e-amrit.niti.gov.in/benefits-of-electric-vehicles
6. https://www.india.gov.in/spotlight/e-amrit-accelerated-e-mobility-revolution-indias-transportation
7. https://www.bis.gov.in/
8. https://beeindia.gov.in/content/e-mobility
9. https://www.ibef.org/industry/india-automobiles
10. https://vahan.parivahan.gov.in/vahan4dashboard/vahan/view/reportview.xhtml
11. https://e-vehicleinfo.com/electric-vehicles-in-india-arai-standards-and-regulation/
12. https://www.tfe.energy/project/the-case-for-electric-mobility-in-india
13. https://link.springer.com/article/10.1007/s40032-022-00852-6
14. https://openknowledge.worldbank.org/handle/10986/35655
15. https://www.outlookindia.com/business/top-5-reasons-why-electric-vehicles-are-the-future-of-driving-in-2022-news-201722
16. https://www.ceew.in/publications/indias-electric-vehicle-transition-and-impact-on-indian-economy
17. https://inc42.com/resources/paving-the-way-for-emobility-challenges-ahead-of-indias-mass-ev-adoption/
18. https://inc42.com/features/what-are-the-challenges-for-the-ev-market-in-india/
19. https://morth.nic.in/green-initiatives
20. https://heavyindustries.gov.in/writereaddata/Content/NEMMP2020.pdf
21. https://fame2.heavyindustries.gov.in/
22. https://pib.gov.in/PressReleasePage.aspx?PRID=1806077#
23. https://www.investindia.gov.in/team-india-blogs/electric-vehicle-ev-sector-india-boost-both-economy-and-environment

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