ELECTRIC VEHICLES IN INDIA

WHAT ARE ELECTRIC VEHICLES?

- An electric vehicle, uses one or more electric motors or traction motors for propulsion.
- It may be powered through self-contained battery, solar panels or an electric generator to convert fuel to electricity.

CURRENT STATUS OF EVs IN INDIA

- In India, there's a mixed performance by the auto sector when it comes to electric mobility.
- While electric two-wheelers and three-wheelers have found a fair level of traction, other vehicle segments are far behind.
- Indian EV market saw a 20 percent growth in 2019-20 with 97 percent of total volume being two-wheelers.
- Just 3,400 electric cars were sold during the last business year, compared to 1.7 million conventional passenger cars. Globally, the sales of electric cars have been rising at a fast pace from just over 2000 units being sold in 2008 to over 10 lakh in 2017. More than half of the sales were in China.
- Indian market share of electric cars is a meagre 0.06 per cent
- According to the Society of Manufacturers of Electric Vehicles (SMEV), Uttar Pradesh topped the list of the states with highest EV sales.

GOVERNMENT INITIATIVES

- Government has set a target of electric vehicles making up 30 % of new sales of cars and two-wheelers by 2030 from less than 1% today.
- FAME India Phase II has been launched with emphasis on electrification of public transportation.
- In 2015, the Faster Adoption and Manufacturing of Electric vehicles (FAME) scheme was launched to fast-track the goals of NEMMP.
- National Electric Mobility Mission Plan 2020 (NEMMP) was conceived in 2013 with an objective to achieve sales of 60-70 lakh units of total EVs by 2020.
- Karnataka, Kerala, Telangana, Maharashtra and Andhra Pradesh, Uttar Pradesh, Uttarakhand, have drafted EV policies to complement the national policy and address state-specific needs.
- National Mission on Transformative Mobility and Battery Storage was launched to promote clean, connected, shared, sustainable and holistic mobility initiatives.
- Phased Manufacturing Programme to support setting up of a few large-scale, export-competitive integrated batteries and cell-manufacturing Giga plants in India.

IMPACT OF EVs

- **Economic Growth**
  - Shifting modes of mobility could launch new business opportunities. There are several studies that suggest overall positive impact on GDP on introduction of EVs in fuel importing service dominated economies.
- **Employment**
  - European Climate Foundation has estimated that through reducing oil demand by more efficient electric cars, employment will increase by 5,00,000 to 8,50,000 by 2030.
  - As far as the automotive sector is concerned, a large part of the supply chain will get transformed in the power train segment.
  - Another report estimates that about 2 million additional jobs will be created by EVs by 2050.
- **Environment and Health**
  - ICEs are one of the main sources of air pollution globally. They negatively affect both human health and ecology. Emissions from ICE powered motor vehicles are responsible for about two-thirds of air pollution in urban areas.
  - The current ban on older fuel cars in some Indian cities already shows a positive influence on air quality, and this can only further improve with the large scale introduction of EVs.
  - According to NITI Aayog (2019), if India reaches an EV sales penetration of 30 per cent for private cars, 70 per cent for commercial cars, 40 per cent for buses, and 80 per cent for 2 and 3 wheelers by 2030, a saving of 846 million tons of net CO_2 emissions and oil savings of 474 MTOE can be achieved.
- **Last Mile Connectivity and Rural Transport**
  - Freight movement in the rural areas, and for transport connecting farms to cities, are primarily handled by smaller transport vehicles.
  - These vehicles are eminently suited for replacement by EVs.
  - Sustainable mobility would require that small freight vehicles are enabled by aggregators to be made available on request, just as Uber or Ola cabs for city commuters. This would cut farm to market costs for the farmers, and also result in better fleet utilisation.
- **Reducing oil imports**
  - India has over 170 million two-wheelers. India may save ₹1.2 lakh crores worth of imported oil if two-wheelers are shifted to EV technology. (Source: NITI Aayog Report on EVs in India)
- **Innovation**
  - It will encourage cutting edge technology in India through adoption, adaptation, and research and development.
- **Urbanization**
  - India is home to 14 out of 20 most polluted cities in the world. EVs will help in tackling this problem by reducing local concentrations of pollutants in cities.

CHALLENGES FOR EV IN INDIA

- **Policy Instability**
  - EV production is capital intensive sector requiring long term planning to break even and profit realization, uncertainty in government policies related to EV production discourages investment in the industry.
- **Technological**
  - India is technologically deficient in the production of electronics that form the backbone of EV industry, such as batteries, semiconductors, controllers, etc.
- **Lack of associated infrastructural support**
  - The lack of clarity over AC versus DC charging stations, grid stability and range anxiety (fear that battery will soon run out of power) are other factors that hinder the growth of EV industry
- **Lack of availability of materials for domestic production**
  - Battery is single most important component of EVs. India is dependent on countries like Japan and China for the import of lithium-ion batteries.
- **Lack of skilled workers**
  - EVs have higher servicing costs and higher levels of skills is needed for servicing. India lacks dedicated training courses for such skill development.

WAY FORWARD

- **Economic**
  - The NITI Aayog has recommended bringing financing of electric vehicles under priority sector lending.
  - India needs a new approach to import duty while keeping "Make in India" as a goal.
  - Streamlining of the goods and services tax (GST) and import duties for battery, cell and components.
- **Policy**
  - The general strategy should address two key variables affecting the costs of EVs: battery costs and any fiscal policies that either increase the costs of an ICE vehicle or decrease the costs of an EV.
- **R&D**
  - India should develop strong R&D capacity leading to commercialization in EV subsystems.
  - There is a need for better industry-academia collaboration.
  - Development of appropriate battery technologies that can function efficiently in the high temperature conditions in India need to be given utmost importance.
- **Industry**
  - India would need a new power-electronics industry which can help develop and produce high-efficiency sub-systems for EV industries. A special thrust is needed to promote such industries.
- **Infrastructure**
  - Adequate charging stations should be made available throughout the road networks.
  - Universal charging standards for the country as a whole to enable increased investment in creation of such infrastructure.
  - The limiting factor of batteries on driving range may be addressed by developing an ecosystem of fast-charging or swapping of batteries.
- **Public Transport**
  - India's per capita car ownership is just 20 vehicles per 1000 people. In USA, it's 900 per 1,000. In Europe, it's 800 per 1,000. And therefore, when we move from 20 to 900 or 800, there's an opportunity to leapfrog ahead of the legacy model.
  - This low per capita car ownership provides us an opportunity to leapfrog, and our emphasis must be on shared, connected and electric transportation. There is a need to push for public transportation to become the preferred mode of travel.

CONCLUSION

- India has a lot to gain by converting its Internal Combustion Engine (ICE) vehicles to EVs at the earliest. There is a considerable possibility that we can become leaders in small and public electric vehicles. This would however require innovations, a policy regime that encourages access to latest technologies and a concerted effort by the Indian industry to achieve global competition through acquiring the necessary scale and using cutting edge technology.