The Problem with Battery Electric Vehicles

Why in news?

Battery Electric Vehicles (EVs) are seen as push for net zero but there are some challenges with respect to Indian scenario.

What is Battery Electric Vehicles?

- An EV is a vehicle that uses one or more electric motors for propulsion.
- They are either partially or fully powered on electric power.
- While some EVs used lead acid or nickel metal hydride batteries, the standard for modern battery electric vehicles is now considered to be lithium ion batteries.

Types of EVs

- Battery electric vehicles (BEVs)
- Plug-in hybrid electric vehicles (PHEVs)
- Hybrid electric vehicles (HEVs)
- Fuel cell electric vehicles (FCEVs)

What is the significance of EVs?

- **Lower running costs-** The running cost of an electric vehicle is much lower than an equivalent petrol or diesel vehicle.
- **Eco-Friendly-** Neither gas nor fossil is used to power the engine.
- Hence, it will help India achieve net zero by 2070.
- Noise pollution is comparatively less than conventional vehicles.
- **Low maintenance cost-** They have very low maintenance costs as they don’t have as many moving parts as an internal combustion vehicle.
- The servicing requirements for electric vehicles are also lesser.
- **Zero Tailpipe Emissions-** Driving an electric vehicle can help you reduce your carbon footprint because there will be zero tailpipe emissions.
- **Tax and financial benefits-** Government offers many incentives for purchase of EVs like free toll roads, free parking lots etc.,

What are the steps taken by the government to promote EV?

- **National Electric Mobility Mission Plan (NEMMP) 2020-** It aims to achieve national fuel security by promoting hybrid and electric vehicles in the country.
- There is an ambitious target to achieve 6-7 million sales of hybrid and electric vehicles year on year from 2020 onwards.

- **GST-** Goods and Services Tax on the electric vehicles and the chargers/ charging stations has been reduced from 12% to 5% and from 18% to 5%, respectively.
- **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme-** Launched in 2015, it aims to promote electric mobility through financial incentives for enhancing electric transportation infrastructure.
- **FAME 2 –** It is launched in 2019 with an outlay of 10,000 crores to incentivize demand for Electric Vehicles (EVs) by providing upfront subsidies and creating EV charging infrastructure.

What are the issues regarding EVs?

- **High Subsidy-** The tax breaks for cars, results in tax burden for middle or upper middle classes, who are typically the buyers of battery electric four-wheelers.
- **Infrastructure Deficit-** In India, the number of EVs had crossed 1 million by mid-2022, but only about 2,000 public charging stations are currently operational across the country.
- **Non-Renewable Electricity Source-** In India, the power source for grid is largely fed by coal-fired thermal plants resulting in GHG emissions.
- **Increased dependency of import-** Since India requires 50,000 tonnes of lithium to manufacture EV batteries alone, it would ultimately depend on imports.

  More than 90% of the global Li production is concentrated in Chile, Argentina, Bolivia, Australia and China. Lithium Triangle Countries - Argentina, Bolivia, Chile

- **EV Firing Incidents-** EV fires is caused due to thermal runaway that results in short circuit by malfunctioning of batteries.

What other technologies are available?

- **Hybrid technology-** It has improved fuel efficiency and does not require the charging infrastructure base.
- **Flex Fuel-** A flex fuel or flexible fuel vehicle has an internal combustion engine which can run on more than one type of fuel, or even a mixture of fuels such as petrol and ethanol.
- **FCEVs & Hydrogen ice -** Hydrogen fuel cell electric vehicles (FCEVs) are practically zero emission.
- In this, Hydrogen is pressurised and stored in a cryogenic tank, from there it is fed to a lower-pressure cell and put through an electro-chemical reaction to generate electricity.
- **Hydrogen Internal combustion Engine (ICE)**- It is similar to conventional internal combustion engine vehicles.
- The fuel delivery system and spark plugs are modified to enable compatibility with hydrogen.
- **Synthetic Fuel-** This idea is to make it usable in all petrol-engine cars, which results in CO_2-neutral.

What lies ahead?

- **Improve Public charging infrastructure-** The successive faster adoption of EVs in Norway and China is due to sustained efforts of increasing public charging infrastructure.
- **Increase investment-** Reduce the overt subsidies given to purchase of EVs instead invest in R&D to improve the efficiency and efficacy of EVs.
- There is a need to customise it to the needs of Indian environment to reduce firing incidents of EVs.
- **Enhance value chain**- Reduce dependency of raw materials, look for other viable options.

References

1. Indian Express| EVs issues in Indian Context
2. IBEF| steps to promote EVs
3. PIB| FAME II scheme

