Hybrid Vehicle vs Electric Vehicle

Why in news?

The HSBC Global Research report suggests that hybrid vehicles are a practical medium-term solution for India's decarbonisation drive as the country moves toward eventual electrification.

What is the difference between hybrid vehicles and electric vehicles?

Key aspects	Hybrid vehicle	Electric vehicle
Power source	It use a combination of an internal combustion engine (ICE) and an electric motor.	It is powered a solely by electricity from battery.
Energy source	Electricity and fossil fuels like petrol and diesel are used as the source of energy to drive the vehicle.	Electricity stored in batteries is the main source of energy to drive the car.
Fuel efficiency	They are generally more fuel-efficient than traditional gasoline-powered vehicles but not as efficient as EVs	They can be driven for longer distances on single charge.
Emissions	They emit fewer pollutants and greenhouse gases compared to traditional gasoline-powered vehicles but still emit some emissions from ICE.	They produce zero tailpipe emissions and are considered one of the cleanest forms of transportation.
Recharging	They do not need to be recharged as they use gasoline to power the battery. The electric battery in hybrid vehicle can be recharged through regenerative braking and other methods.	They must be plugged in for recharging.
Maintenance	They require regular maintenance, including oil changes and other routine maintenance tasks associated with internal combustion engines	They have fewer moving parts and generally require less maintenance.
Cost	They are generally more affordable than electric vehicles	The cost of electric vehicles is decreasing as technology improves and production increases.

What are the major findings of the report?

- **Less polluting**- The total carbon emission from Well to Wheel from an EV is currently 158 g/km and 133 g/km for hybrid. Hybrid vehicles are 16% less polluting than EVs.

Total emissions include both vehicle emissions- tank to wheel (TTW) and crude

mining/refining emissions and power generation emissions -- well to tank.

- **Emissions-** In the case of EVs, only the power generation emissions have been incorporated and not coal production emissions, which would have skewed the equation further in favour of hybrids.
- By 2030, even if India's share of non-fossil fuel is 40%, hybrids will release 8% fewer emissions than EVs, down from 16% today.
- It may take ***7-10 years*** for EV and hybrid emissions to converge hence India needs to embrace hybrids over the next 5-10 years as a credible and practical roadmap to full electrification.

What are the issues with battery electric vehicles?

- **Upfront subsidy**- India’s subsidies and tax breaks are targeted at the high-end EV segment, which is dominated by affluent buyers who can afford the upfront cost of EVs without much financial support
- **Charging network**- Norway and China have invested heavily in public charging stations, while India lags behind with only 2,000 stations for over 1 million EVs.

World Bank analysis shows that charging infrastructure is more effective than purchase subsidies in boosting EV demand.

- **Unique challenge**- India requires different charging standards and voltages for two, three and four wheelers.
- **Electricity source**- Norway has 99% hydroelectric power but in India, the grid is still fed largely by coal-fired thermal plants.
- **Value chain**- India’s demand for Li-ion batteries is expected to grow rapidly, but the country lacks domestic sources of lithium and other critical metals.

To know about the problems of battery electric vehicles click here

Steps taken to promote EVs
• **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.

References

1. Indian Express- Hybrid vehicles cleaner than EVs
2. Business Standard- Hybrid vehicles are practical solution

