

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](#)

