



Flex Fuel Vehicles

For Prelims: Flex Fuel Vehicles (FFV) , Flex Fuel Strong Hybrid Electric Vehicles (FFV-SHEV), BS-6 Norms, Production Linked Incentive (PLI) scheme.

For Mains: Flex Fuel Vehicles: Significance and its usage, Green model of development.

Why in News

Recently, the Government has advised the **Automobile Manufacturers in India**, to start manufacturing **Flex Fuel Vehicles (FFV) and Flex Fuel Strong Hybrid Electric Vehicles (FFV-SHEV)** complying with **BS-6 Norms** in a time bound manner.

Key Points

- **About FFV and FFV-SHEV:**
 - **Flex-fuel vehicles (FFV):** They have engines that can run on flexible fuel — a combination of petrol and ethanol, which can include up to **100% ethanol**.
 - **Flex Fuel Strong Hybrid Electric Vehicles (FFV-SHEV):** When FFV is integrated along with strong **hybrid electric technology**, it is referred as FFV-SHEVs.
 - **Strong hybrid** is another term for full hybrid vehicles, which have the capability to run solely on **either electric or petrol modes**.
 - In contrast, **mild hybrids** cannot run purely on one of these modes and use the secondary mode merely as a supplement to the main mode of propulsion.
 - In order to accelerate the introduction of FFVs, the **Production Linked Incentive (PLI) scheme** has included automobile and auto components of flex fuel engines.
- **Significance of the Move:**
 - **Easing Pressure on Import Bill:** The policy is expected to **reduce the demand for petroleum products**.
 - India presently **imports more than 80%** of its petroleum requirement, and this also represents one of the biggest outflows of money from the country.
 - **Benefiting Farmers:** The wide uptake of ethanol or methanol as a fuel is intended to create an **additional revenue stream for farmers**.
 - This will provide direct benefits to farmers and help in doubling the farmer's income.
 - **Boost to Atma Nirbhar Bharat:** It is in line with Prime Minister's vision of **Atma Nirbhar Bharat** and government's policy on promoting ethanol as a transport fuel.
 - **Reducing Greenhouse Gas & Tackling Climate Change:** This move will drastically reduce greenhouse gas emissions from vehicles on a well-to-wheel basis.
 - Thereby, helping India to comply with its commitment made at **Conference of parties (COP26)** to reduce the total projected carbon emissions by one billion tonnes by 2030.
- **Related Government Initiatives:**
 - **National Policy on Biofuels-2018**
 - **E100 Project.**

- [Pradhan Mantri JI-VAN Yojana, 2019](#)
- [GOBAR \(Galvanising Organic Bio-Agro Resources\) DHAN Scheme, 2018](#)
- [Repurpose Used Cooking Oil \(RUCO\)](#)

6 THINGS TO KNOW ABOUT ETHANOL AND FLEX FUEL

- 1 Flex fuel vehicles can run on both **petrol and ethanol**
- 2 India is aiming to achieve **E10 by 2022** and **E20** (which would involve a 20% ethanol blend) **by 2025**
- 3 At present there are **no flex-fuel-powered engines or vehicles** with the exception of a limited-edition TVS Apache RTR motorcycle
- 4 Ethanol is hygroscopic, and has a tendency to absorb moisture making it **difficult to store in pure form**. Its affinity to attract moisture can also lead to impurities settling at the base of the fuel tank and contaminating the engine
- 5 At present **E10 isn't available** across the country, and will be made so by 2022
- 6 According to the government, **all vehicles manufactured since 2008 are E10 compatible** (but not optimised). E100 ethanol will be sold at a lower price from ethanol pumps

BS-VI Fuel Norms:

- The Bharat Stage (BS) are **emission standards instituted by the Government of India** to regulate the output of air pollutants from motor vehicles.
- India **directly shifted from BS-IV to BS-VI norms**. The switch to BS-VI vehicles was to happen in 2022 but looking at the poor air condition, the move was advanced by four years.
- In BS-VI fuel, the volume of [Particulate Matter 2.5](#) ranges from 20 to 40 micrograms per cubic metre whereas in BS-IV fuel it is up to 120 micrograms per cubic metre.
- BS-VI fuel **will bring down sulphur content by 5 times** from the current BS-IV levels. It has 10 ppm of sulphur as against 50 ppm in BS-IV.
 - Sulphur in the fuel contributes to fine particulate matter emissions. High sulphur content in the fuel also leads to corrosion and wear of the automobile engine.
- With BS-VI fuel, for every one kilometre, **a car will emit 80% less particulate matter** and nearly 70% less nitrogen oxide.
- **Air pollutants** in BS-VI fuel are much less as compared to BS-IV fuel.
- BS-VI norms also **seek to reduce the level of certain harmful hydrocarbons** in the emissions that are produced due to incomplete combustion of fuel.

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