Electrified Flex Fuel Vehicle

For Prelims: Electrified Flex fuel vehicle, **Bharat Stage-6(BS 6) Stage-II**, Bharat Stage Emission Standards, **Ethanol Blending**

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

Source: PIB

Why in News?

Recently, the Prototype of **the world's 1st** Bharat Stage-6 (BS6) **Stage-II, Electrified Flex fuel vehicle**, developed by Toyota Kirloskar Motor was unveiled.

- This vehicle is capable of **running on up to 85% ethanol blended petrol** and features an **electric powertrain.**
- The Ministry of Petroleum & Natural Gas has also highlighted flex-fuel vehicles' potential to substitute petrol with higher ethanol blends **beyond 20%.**

Note:

- **Flex-fuel vehicles (FFV):** They have engines that can run on flexible fuel - **a combination of Petrol/Diesel/Electric and ethanol, which can include up to 100% ethanol.**

What are the Electrified Flex Fuel Vehicles?

- **About:**
  - Electrified Flex Fuel Vehicle integrates both a **Flex Fuel engine** and an **electric powertrain**, offering the dual benefit of **higher ethanol use and improved fuel efficiency.**
  - 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.
- **Significance:**
  - The integration of an electric powertrain **reduces reliance on conventional fuels**, contributing towards **sustainable transportation** and India's **'Aatmnirbhar Bharat' initiative** as production of **ethanol** increases.
  - Similar to **SHEVs**, this vehicle can achieve significantly **higher fuel efficiency, optimizing the use of ethanol and electricity.**

- By promoting the use of FFVs, India can capitalize on its abundant **ethanol potential, reducing petrol consumption.**
- The vehicle represents a significant stride towards **decarbonization and greener mobility, aligning with global efforts to combat climate change.**

What are BS6 (Stage II) Norms?

- **BS6 Norms:** The Bharat Stage (BS) norms are emission standards instituted by the Government of India to regulate the output of air pollutants from motor vehicles.
  - The BS regulations are **based on the European emission standards** and the **Central Pollution Control Board** implements these standards.
  - Presently, every newly sold and registered vehicle in India is required to adhere to the **BS-VI version of emission regulations.**
- **BS6 Stage II:** BS6(Stage II) has even **stricter emission limits compared to the initial** BS6 norms.
  - BS6 (Stage II) incorporates **Real Driving Emissions (RDE)** and **Corporate Average Fuel Economy (CAFE 2)** and On-Board Diagnostics.
  - The new RDE test figures will provide a more realistic estimation of the amount of emissions likely to be produced by vehicles in real traffic conditions with frequent changes in speed, acceleration, and deceleration.
  - Onboard diagnostic (OBD) systems monitor and report the status and performance of various vehicle subsystems and sensors.

Ethanol Blending:

- **About:**
  - **Ethanol,** a key **biofuel** produced through fermentation of sugars by yeasts or petrochemical methods.
  - The **Ethanol Blending Programme (EBP)** in India aims to decrease oil imports, curb emissions, achieve energy self-sufficiency, and **doubling farmers' income**, transitioning them to **'urjadata' while remaining 'annadata'**, and contributing to environmental improvement.
  - The Government of India has advanced the **target for 20% ethanol blending in petrol (also called** E20**) to 2025 from 2030.**
    - India has been increasing its ethanol blending in petrol from 1.53% in 2013-14 to **11.8% in August, 2023.**
- **Other Initiatives to Promote Ethanol Blending in India:**
  - **National Policy on Biofuels 2018**
  - **E100 Pilot project**
  - **Pradhan Mantri JI-VAN Yojana 2019**
  - **Repurpose Used Cooking Oil (RUCO)**

UPSC Civil Services Examination, Previous Year Questions (PYQ)

Q. According to India's National Policy on Biofuels, which of the following can be used as raw materials for the production of biofuels? (2020)

1. Cassava
2. Damaged wheat grains
3. Groundnut seeds
4. Horse gram
5. Rotten potatoes
6. Sugar beet

Select the correct answer using the code given below:

(a) 1, 2, 5 and 6 only
(b) 1, 3, 4 and 6 only
(c) 2, 3, 4 and 5 only
(d) 1, 2, 3, 4, 5 and 6

Ans: (a)