Flexible Fuel Vehicles

Why in news?

India's first 'flex fuel' car, a Toyota sedan developed under the new pilot initiated as part of a government-led push to carmakers for adopting alternative fuels is likely to be launched.

What is flex fuel vehicle (FFV)?

- Flex fuel, or flexible fuel, is an alternative fuel made of a combination of gasoline and methanol or ethanol.
- Flex fuel / flexible fuel vehicle has an internal combustion engine (ICE) that can run on more than one type of fuel, or even a mixture of fuels.
- The most common versions can run on a blend of petrol and ethanol or methanol, 100% petrol or ethanol.

To know more about flex fuels, click here

How does FFV work?

- Flex fuel vehicles are similar to their conventional petrol-only counterparts, other than an ethanol-compatible fuel system and a different powertrain (ECM) calibration.
- The engine is equipped with a fuel mix sensor and an engine control module (ECM) programming that senses and automatically adjusts for any ratio of designated fuels.
- Modifications are made to the fuel pump and fuel injection system and the ECM is calibrated to accommodate the higher oxygen content of ethanol.

What are the pros and cons of FFVs?

Pros

- The use of ethanol blending reduces harmful pollutants such as carbon monoxide, sulphur, and carbon and nitrogen oxides.
- Also reduces the country's dependence on oil imports for fueling vehicles.

Cons

- The fuel economy is generally lower with increased levels of ethanol.
- Over 90% of ethanol produced in the country came from sugarcane, a water intensive crop.

> *Ethanol, a cleaner and greener fuel, is made from bio-ethanol from rice, corn and sugarcane juice.*

What is the state of FFV technology in India?

- FFVs are commercially deployed in countries like Brazil, Canada and the US.
- The Union Ministry of Road transport and highways issued an advisory to carmakers to introduce Flex fuel vehicles in 2021 to reduce import of fossil fuels.
- National Biofuel Policy 2018 envisaged a target of 20 per cent blending of ethanol in petrol by 2025.

  Currently, around 9.5 per cent ethanol blending with petrol has been achieved in fuel dispensed in pumps in most metros and it is likely that the targeted 10 per cent ethanol blending will be achieved by November 2022.

- Besides ethanol, the Indian government is also focusing on using green hydrogen and other alternative fuels.

What India can learn from Brazil?

- Brazil is the biggest market and a leader in this segment.
- Brazil's vehicle fleet has been equipped to adjust to the fuel mix of varying degrees.
- With this, it has the ability to be flexible on the degree of the mix depending on the crude prices, varying it when energy prices surge like just after the Ukraine war.
- Brazil government provides subsidy to narrow the price gap of higher ethanol blends.
- That is another factor that would have to be considered as India steps up its fuel blending plan.

References

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