How India can give a Boost to Biofuels

What is the issue?

While electric vehicle or hydrogen fuel cell based transportation may be the mainstream in the long run, biofuel is expected to play an important role in the near future.

What is the status of India's transportation sector?

- India's transportation sector contributes about 10% of total national greenhouse gas (GHG) emissions.
- Out of that, road transportation contributes about 87% of the total emissions.
- Transport Minister Nitin Gadkari has announced that flex-fuel engines will be made mandatory in the coming days.

What are flex fuel vehicles?

- **Flex fuel** vehicles (FFV) are capable of running on 100% petrol or 100% bio-ethanol or a combination of both.
- Flex Fuel Strong Hybrid Electric Vehicles (FFSHEV) essentially houses an electric motor which powers the vehicle alongside the traditional petrol engine.
- The blending varies depending on the availability of biofuel feedstock and price of global crude oil.
- **Dual fuel** vehicle means the engine uses two fuels (gas and diesel) at the same time
- **Bi Fuel** means the engine could run on either fuel separately.
- FFV is capable of running on either petrol or ethanol or a combination of both hence it is a synthesis of Dual fuel vehicle and Bi fuel vehicle.
- The entire automobile sector in Brazil runs on flex-fuel engines.
- **Advantages**
    1. Import substitutes
    2. Cost effective
    3. Indigenous
    4. Pollution-free
    5. Increases engine performance
    6. Excellent lubricity

What are the challenges in pushing towards the idea of flex-fuel auto-engine?

- **Availability of feedstock-** We do not have the feedstock even for 20% blending ratio.
- Currently, the supply is enough to meet about 8.5% blending ratio.
- The government has decided to step up domestic manufacture of biofuels by 10%every year
- It has advanced the target of blending 20% ethanol in petrol to 2025, from 2030 but there is no way that the target can be achieved by 2025.

- **Low quality food grains-** India is using its large inventory of foodgrains of low quality (due to improper storage) to produce biofuel.
- Earlier, these food grains were used for fodder for animals but the tendency is now to use them for producing ethanol.
- This is not a sound idea as these foodgrains were procured at higher prices.

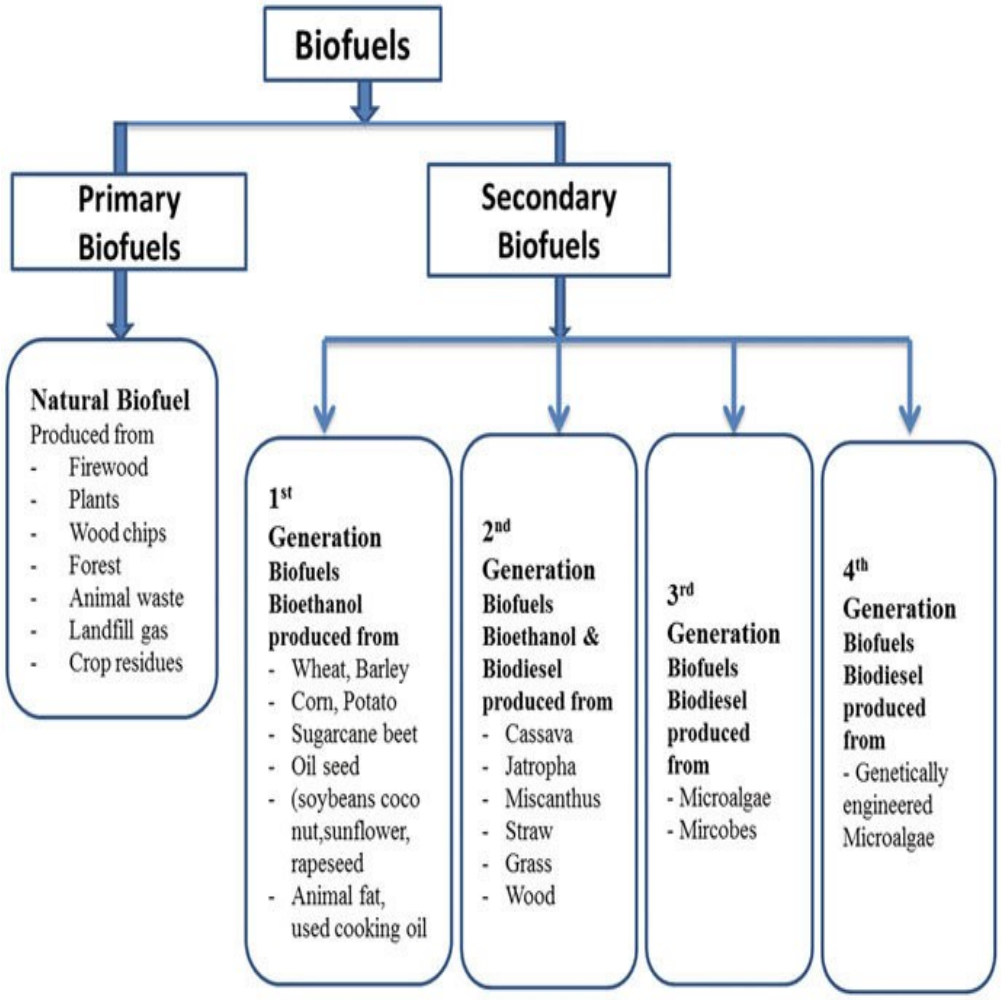
How is Biodiesel produced?

Biofuels are fuels produced directly or indirectly from organic material, including plant materials and animal waste.

- Biodiesel production involves four distinct stages

1. Cultivation of oilseeds bearing plants from which seeds would be harvested
2. Trading of seeds which involves procurement of seeds from the individual farmers and selling them to the processing factories;
3. Oil extraction from the seeds and transforming the extracted oil to biofuel through the process of trans-esterification
4. Blending this biofuel with the petrol/diesel and its disposal to individual consumers through retail outlet

- India’s biofuel programme is now focussing on adopting second generation biofuel process which uses non food feedstocks such as crop residue.
- Only two bio-refineries with capacity of 5 lakh litres/day of ethanol from spoilt and surplus foodgrain have been constructed by Indian Oil Corporation out of the 12 new bio-refineries to be built across 11 States in the country.



What efforts have been taken in the biofuel sector?

- **Production** - The government has an ambitious plan to triple the production of biofuels in four years.
- Ethanol Blended Petrol (EBP) programme was launched in **2003** to promote the use of alternative and environment friendly fuels and to reduce import dependency for energy requirements.
- **Policy** - The recently-approved National Biofuel Policy 2018 pushes for a new biofuel strategy.
- It is aimed at raising ethanol doping of petrol to **20% by 2025**
- **Refineries** - Biofuel refineries would deploy second-generation technology.
- Government is offering subsidised credit, viability gap funding and relatively higher purchase prices for ethanol produced by these plants.
- The GST has been trimmed from 18% to 5% on ethanol and from 12% to 5% on biodiesel.
- **Sugar industry** - The sugar industry has already been permitted to produce ethanol.
- The mills are incentivised to set up biofuel refineries with liberal government assistance.
- The government has also fixed a higher procurement price (more than the price for that manufactured from the byproducts like molasses)for the ethanol drawn directly from cane juice.

What is the best option?

- **Construction of bio refinery-** To have a long-term solution to stubble burning in northern India, notably Punjab, Haryana and Western UP, the idea is to construct a bio-refinery so that the same can use crop residue to produce ethanol.

- But, no plant has come up so far as it may not be economically viable given the current taxes/incentives schemes.
- **Incentive to farmers**- The farmers have to be given enough incentive to bring the crop residue to the proposed plant after harvest.
- **Yield maximisation**- Most countries have undertaken genetic engineering on the crops so that the yield is maximised.
- In the case of Brazil, most of its ethanol is produced from sugarcane directly for efficient extraction.
- Using used oil and crop residue for biofuel can supplement biofuel production, but can never fulfil the target what India needs if it wants to replicate Brazilian experiment with biofuel.
- **Government support-** Support for feedstock producers as well as the biofuel production value chain for a sustained 3-5 years is needed if the sector has to take off.

References

1. https://www.thehindubusinessline.com/opinion/how-india-can-give-a-boost-to-biofuels/article38207067.ece
2. https://vikaspedia.in/energy/energy-production/bio-energy/biofuels