Future of Ethanol Blending in India

This editorial is based on **"Understanding ethanol blending"** which was published in The Hindu on 16/08/2022. It talks about the future of ethanol blending in India and related challenges.

For Prelims: Ethanol Blending, Biofuels, National Policy on Biofuels 2018, Industries Pradhan Mantri JI-VAN Yojana 2019, India Maize Summit

For Mains: Significance of Ethanol Blending for India, Food Security, Recent Government Initiatives to Promote Ethanol Blending in India

The **energy demand in our country is rising due to an expanding economy**, growing population, increasing **urbanisation,** evolving lifestyles and rising spending power. About **98% of the fuel requirement** in the road transportation sector is currently met by **fossil fuels** and the **remaining 2% by** biofuels.

The **National Policy on Biofuels 2018,** provides an indicative target of **20%** ethanol blending under the Ethanol Blended Petrol (EBP) Programme by **2025.**

Achieving **energy security** and the transitioning to a thriving low carbon economy is critical for a growing nation like India. Blending locally produced ethanol with petrol will help India strengthen its energy security, **enable local enterprises and farmers to participate in the energy economy** and reduce vehicular emissions.

While ethanol blending **can** reduce CO_2 emissions, **inefficient land and water use** for ethanol extraction as well as **food security** concerns still remain.

What do We Understand by Ethanol Blending?

- Ethanol is an **agricultural by-product** which is mainly obtained from the **processing of sugar from sugarcane,** but also from other sources such as rice husk or **maize.**
    - **Blending ethanol with petrol to burn less fossil fuel** while running vehicles is called **Ethanol Blending.**
- Currently, **Ethanol makes up 10% of the petrol** we use in our vehicles.
    - The **original target for India was to raise this ratio to 20% by 2030**, but that deadline was pushed back to 2025 when the **NITI Aayog** released its **ethanol roadmap in 2021.**

What is the Significance of Ethanol Blending for India?

- **India has adopted ethanol blending in petrol** in order to **reduce vehicle exhaust emissions.**

    - India’s net import of petroleum was 185 million tons in 2020-21. Most of the petroleum is used by vehicles and therefore a **successful 20% ethanol blending programme can save the country 4 billion dollars per annum.**
- The renewable ethanol content is **expected to result in a net reduction in the emission of carbon dioxide, carbon monoxide (CO) and hydrocarbons (HC).**
    - **Ethanol itself burns cleaner** and burns more completely than petrol it is blended into.
- Ethanol blending will help **bring down our share of** oil imports on which India spends a considerable amount of precious **foreign exchange.**
    - It is estimated that a **5% blending** (105 crore litres) **can result in replacement of around 1.8 million barrels of crude oil.**
- More ethanol produced from farm residue will **boost farmers' income** and **minimise** air pollution by reducing the amount of **stubble burned.**

What are the Challenges Associated with Ethanol Blending?

- **Shift Towards Sugarcane Production:** In order to achieve a 20% blend rate, almost **one-tenth of the existing net sown area will have to be diverted for sugarcane production.**
    - Any such land requirement is likely to put a **stress on other crops** and has the **potential to increase food prices.**
    - There are already **indications that more sugarcane is being grown** and that the Government of India **encouraged more corn production** at the **India Maize Summit** in May 2022.
- **Storage Constraint: Annual capacity** of required bio-refineries is stipulated to be 300-400 million litres, which is still **not enough to meet the 5% petrol-ethanol blending requirement.**
    - Storage is going to be the main concern, for if **E10** supply has to continue in tandem with **E20** supply, **storage would have to be separate** which then raises costs.
        - **E10 fuel** is **90 % petrol** mixed with **10% ethanol.**
        - **E20 fuel** is **80 % petrol** mixed with **20 % ethanol.**
- **Food Insecurity:** Sugar and cane production that end up in the petrol tank cannot also appear on the dinner plate, in animal fodder, be stored in warehouses, or be exported.
    - India may not find it easy to simultaneously **strengthen domestic food supply systems, maintain an export market for grains,** and **divert grain to ethanol** at the expected rate in coming years, and this is an issue that **warrants continued monitoring,**
- **Instability of Ethanol Movement Between States:** There are restrictions on inter-state movement of ethanol due to **non-implementation of the amended provisions of** Industries (Development & Regulation) Act, 1951 by all the States.
    - **Ethanol blending has not been taken up in North-East states** due to non-availability of feedstock or industries.
    - In order to develop Ethanol Blended fuels and vehicles on a pan-Indian scale, this concern must be addressed.
- **No Reduction in Emission of Nitrous Oxide:** Because ethanol burns more completely than petrol, it avoids emissions such as **carbon monoxide.** However, **there is no reduction in** nitrous oxides, one of the major environmental pollutants.

What are the Recent Government 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)**

What Should be the Way Forward?

- **Ensuring Uniform Availability of Ethanol Blends:** To enable a pan-Indian roll-out, ethanol would need to be **supplied from surplus to deficit states** as per requirements so as to ensure uniform availability of ethanol blends in the country.
- **Promoting Advanced Biofuels:** Technology for production of ethanol from non-food feedstock, called **"Advanced Biofuels"** Including **second generation (2G)** should be promoted so as to tap this abundantly available resource **without causing any trade off with the food production system.**
    - Ethanol produced from **rice straw, wheat straw, corn cobs** and other such materials falls under the category of **second generation (2G) ethanol.**
- **Supply Enrichment**: Schemes for ethanol production from different feedstocks and encouragement to **augment bio-refineries** and **their capacities.**
    - For better implementation, it is necessary to **optimise engines for higher ethanol blends** and ensure durability test mechanisms.
- **Single Window for Clearances:** A system for single window clearances should be formulated to accord **speedy clearances for new and expansion projects** for ethanol production.
- **Setting a Floor Price for Ethanol:** In order to bring predictability and to encourage investment by entrepreneurs in **expansion/new ethanol capacities**, the government may devise a floor price of ethanol for a few years with an escalation clause for purchase by **oil marketing companies.**
    - Special efforts are needed to attract investors to the **North East India.**
- **Balance between Food Security and Ethanol Blending:** India's biofuel policy stipulates that fuel requirements must not compete with food requirements and that **only surplus food crops should be used for fuel production.**
    - **Producing ethanol from crop residue** will then be a good alternative.

Drishti Mains Question

Explain the role of Ethanol Blending in achieving energy security in India and discuss major challenges in its implementation.

UPSC Civil Services Examination, Previous Year Questions (PYQ)

Q. Given below are the names of four energy crops. Which one of them can be cultivated for ethanol? (2010)

(a) Jatropha
(b) Maize
(c) Pongamia
(d) Sunflower

Ans: (b)

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)

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