



# Environmental Concerns Regarding Ethanol Blended Petrol

**For Prelims:** [Ethanol Blended Petrol \(EBP\) programme](#), [Net Zero 2070](#), [Krishna](#), 3G Ethanol Production, [Pradhan Mantri JI-VAN Yojana](#)

**For Mains:** Environmental Impact of Biofuels, Sustainable Development & Ethanol Production

[Source: TH](#)

## Why in News?

The [Ethanol Blended Petrol \(EBP\) programme](#) is facing strong opposition in Andhra Pradesh (AP).

- Environmentalists and farmers are raising concerns over **environmental pollution** and excessive **water consumption** by ethanol factories.

## What is Ethanol Blended Petrol Programme?

- **About:** The **EBP Programme** began with **pilot projects in 2001**. It was launched by the **Ministry of Petroleum and Natural Gas in 2003**, with **5% Ethanol (C<sub>2</sub>H<sub>5</sub>OH) blending** and extended nationwide (except Andaman & Nicobar, Lakshadweep) by **2019**, allowing **up to 10% blending**.
  - The EBP Programme now **targets 20% ethanol blending** in petrol by **2025-26** (advanced from 2030 under the [National Policy on Biofuels-2018 \(amended in 2022\)](#)). As of 2024, the blend percentage stood at **15%**.
- **Objective:** EBP aims to reduce **carbon emissions**, **fuel imports**, and **increase farmer income**.
  - Support **India's energy diversification**, enhancing resilience to global oil supply disruptions.
  - Help **India achieve its [Net Zero 2070 commitment](#)** under the Paris Agreement.
  - EBP Programme follows the "**Waste to Wealth**" approach, supporting [Swachh Bharat Mission \(SBM\)](#) and [Make in India](#).
- **Key Milestones:** Ethanol production capacity reached around **1,600 crore litres** as of September, 2024.
  - By cutting crude oil imports, the EBP Programme **saved Rs. 1,06,072 crore in foreign exchange**.
    - EBP has reduced **CO<sub>2</sub> emissions by 544 lakh metric tons** and substituted **181 lakh metric tons of crude oil**.
  - The programme had a significant **economic impact**, with Oil Marketing Companies disbursing Rs. 1,45,930 crore to distillers and Rs. 87,558 crore to farmers.

**Note:** Ethanol is a biofuel primarily produced from "**first generation**" (**1G**) sources like sugarcane molasses, juice, wheat, and rice, while "**second generation**" (**2G**) sources include agricultural residues like rice straw, wheat straw, bagasse, and corn stover.

# ETHANOL AS A FUEL

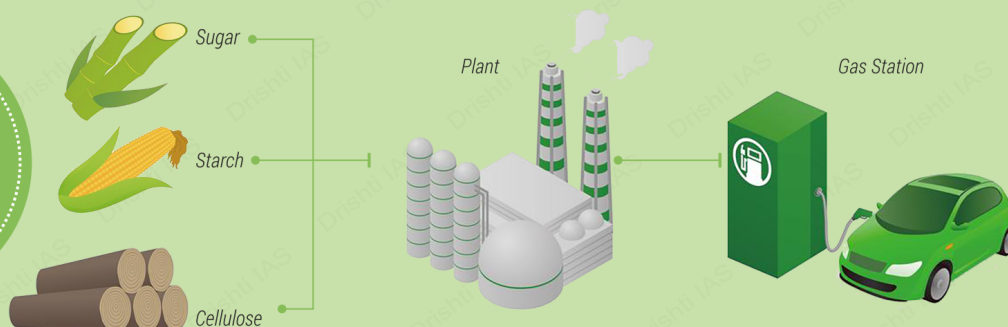
## About Ethanol

- One of the principal biofuels
- Also called ethyl alcohol ( $C_2H_5OH$ )

## Produced

- Naturally by fermentation of sugar (or corn, rice etc)
- By petrochemical processes (ethylene hydration)

World Biofuel Day is celebrated on 10 August to raise awareness about the importance of non-fossil fuels.



## Ethanol Blending

Blending ethanol with petrol to burn less fossil fuel while running vehicles.

### Blending Target

- 20% ethanol blending in petrol (E20) by 2025

Currently, ethanol makes up 10% of the petrol used in vehicles.

### Significance

- Reduce oil imports
- Equivalent efficiency at a lower cost than petrol
- Burns completely and cleaner than petrol
- Ethanol produced from farm residue to boost farmers' income

### Challenges in Success

- High land requirement for sugarcane (+ consequent food prices issue)
- High water requirement of biofuel crops

### Related Initiatives

- Roadmap for Ethanol Blending in India (Report by NITI Aayog) (2021)
- E100 Pilot Project (Network for production and distribution of ethanol) (2021)
- Pradhan Mantri JI-VAN Yojana (to boost 2G ethanol projects) (2019)
- The National Policy on Biofuels (2018)

## What are the Environmental Concerns Regarding EBP?

- Pollution vs. Emission Reduction:** Achieving 20% ethanol blending target by 2025 requires around **1,000 crore litres** of ethanol, with planned production expansion to **1,700 crore litres**. Increased production may lead to **greater emissions** affecting **air, water, and soil quality**.
- Water Scarcity:** Ethanol production is highly **water-intensive**, with grain-based factories requiring **8-12 litres of water per litre of ethanol**. Sugarcane and molasses-based production contribute to high water consumption, deforestation, and industrial waste.
  - Distilleries generate **vinasse, a pollutant-rich wastewater** that can contaminate water bodies and deplete oxygen if untreated.
  - Factories near rivers like the **Krishna** are diverting water meant for agriculture and drinking. Farmers fear depletion of **water resources**, affecting **crop production**.
- Industrial Pollution:** Ethanol distilleries fall under the "red category" of industries

(Pollution Index core 60 and above ) due to their high pollution potential.

- Hazardous chemicals such as **acetaldehyde, formaldehyde, and acrolein** are emitted, increasing risks of respiratory diseases and cancer.
- In AP, many ethanol factories received environmental clearances without public hearings or proper emission assessments, often located near human settlements.

## Way Forward

- **Promoting 3G Ethanol:** Scaling up **3G ethanol production** (produced by algae from wastewater, sewage or seawater) under the [Pradhan Mantri JI-VAN Yojana](#) can reduce environmental impact by using microalgae instead of food crops, offering a sustainable **alternative to 1G and 2G methods** without straining food or freshwater resources.
- **Environmental Regulations:** Enforce **Mandatory pollution control measures** (such as **effluent treatment plants**) and reinstate public hearings for environmental clearances to address community concerns.
  - Ethanol factories should be required to use **recycled or treated wastewater** instead of groundwater.
- **Incentivizing Green Technologies:** Provide **subsidies for pollution control equipment** like [Wind Augmentation and Air Purifying Unit \(WAYU\)](#) making it more affordable for ethanol manufacturers.
  - **Research and development (R&D) in low-emission ethanol production** can help minimize environmental damage.

### **Drishti Mains Question:**

Ethanol production is seen as an eco-friendly alternative to fossil fuels. Critically examine the environmental challenges associated with ethanol production in India.

## 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)**

PDF Reference URL: <https://www.drishtiias.com/printpdf/environmental-concerns-regarding-ethanol-blended-petrol>

