

# FTP Strategy for Biofuels

### Why in News?

Recently, Feedstock-Technology-Product (FTP) has been stressed for the biofuel sector.

### What are the technologies of biofuel production?

- The F-T-P (Feedstock-Technology-Product) It provides a structured framework for embedding biofuels into industries like sugar, paving the way for a green economy.
- **Alcohol-to-Jet (ATJ) Technology** It is a process for the conversion of alcohols to an alternative jet fuel blendstock.

The CSIR-IIP pilot plant in Dehradun produces 30 liters of sustainable air fuel.

- **Bio-Methanation** It converts organic waste into biogas, supporting circular bioeconomy principles.
- Lactic Acid Technologies It is the process of developing bioplastics from PLA (polylactic acid) form using biofuels.

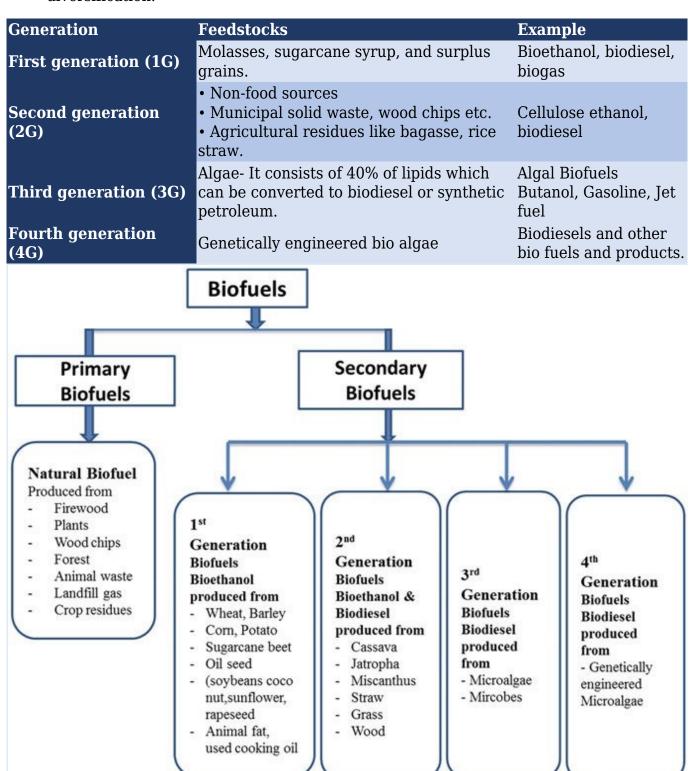
### What are the types of biofuel products produced under FTP?

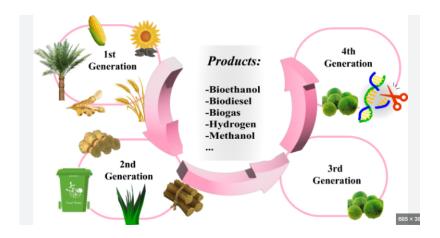
- **Ethanol (1G and 2G)** The Ethanol Blending Programme (EBP) has driven ethanol demand, with India achieving record blending rates.
- Sustainable Aviation Fuel (SAF) It represents a lucrative opportunity as global aviation embraces decarbonization.
- With the aviation sector eyeing biofuels as a compliance mechanism for climate commitments, India must position itself as a key SAF supplier.
- Renewable Chemicals and Materials (RCM) Producing bio-based chemicals and materials can significantly enhance the sugar industry's profitability while reducing reliance on fossil-based inputs.
- **Bioplastics and Bio-Bitumen** The rising demand for sustainable infrastructure materials and eco-friendly packaging aligns perfectly with these product lines.

## What are the benefits of FTP approach?

- **Fosters innovation** Combining feedstock diversity, cutting-edge technologies, and diversified outputs, biorefineries
- **Sustainability** This approach, not only achieves our energy goals but also set a benchmark for sustainable industrial transformation worldwide.
- **Integrated biorefineries** When aligned with India's National Policy on Biofuels 2018, can help transform the sugar industry into an engine of sustainable growth.

- By combining feedstock diversity, cutting-edge technologies, and diversified outputs, biorefineries can:
- **Optimise resource utilization** Biofuels production put resources like agri, bio resources, industrial plants, labour and capital effectively.
- **Rural development** It helps the emergence of sustainable industrial hubs driving rural development.
- **Economic resilience** This method strengthens the economy through energy independence, job creation, waste utilization rural development and market diversification.





### What are the opportunities in biofuel production for India?

• **Agricultural production** - India's agricultural abundance positions it as a natural leader in biofuel production.

Total food grain and horticulture production in 2023-24 period were about 320 million tonnes and 350 million tonnes.

- **Sugarmills** India's sugar mills, with their vast bagasse by-products, are uniquely positioned to drive this forward.
- By integrating bio-methanation with sugar mill operations, waste can be transformed into valuable energy.
- Waste management 68.7 million tonnes of food is wasted annually in Indian homes.



- **Post harvest losses** 22% of the foodgrain output or 10% of the total foodgrain and horticulture production for the 2022-23 period were lost.
- $\bullet$  **Preharvest losses** Crop losses due natural calamities like heavy rainfall, flood and cyclone can be used as feedstock in  $2^{nd}$  generation biofuel production.
- **Plastic management** Developing bioplastics using bioplastics reduces plastic dependency and help in achieving sustainable material production.

#### What lies ahead?

- With global biofuel production projected to rise significantly by 2027 (as per IEA reports), India's multi-feedstock strategy must emphasise regional adaptability and waste valorisation.
- Technology adoption in biofuel production must ensure scalability and cost-efficiency.
- Global reports like GBET 2022 emphasize the need for biomass pretreatment and advanced bioconversion methods, which India must prioritize.
- India must diversify biofuel products to expand beyond ethanol into chemicals, SAF, and renewable materials to harness the opportunities from evolving global biofuel markets.
- With the aviation sector eyeing biofuels as a compliance mechanism for climate commitments, India must position itself as a key SAF supplier.

### Reference

BusinessLine | The F-T-P approach

