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1 Ethanol Blending (Source: The Hindu)

Ethanol Blending involves mixing of ethanol with petrol to create a cleaner, more sustainable fuel. Initially, the target was 5% blending, which has now been increased to 20% blending.

- The present target is E100 (pure ethanol) E100 needs flex-fuel vehicles that can run on varying ethanol blends.

Benefits

- Reduces the hydrocarbon emissions, making the atmosphere cleaner (GHG emissions in case of use of sugarcane and maize-based ethanol are less by 65% and 50%, respectively, than those of petrol)
- Saves precious foreign exchange by reducing the demand for imports.
- Ensures an alternate source of income for farmers.

Challenge

- It can lead to a food security crisis due to food crop diversion and water usage for sugarcane cultivation.



Ethanol Blended Petrol (EBP) Programme

- Aimed at mixing ethanol with standard motor petrol. Operating under the ambit of the National Biofuel Policy (NBP) 2018, the program is driven by the Ministry of Petroleum and Natural Gas.
- Its primary goals are to reduce India's heavy reliance on imported crude oil, cut greenhouse gas emissions, and boost farmers' incomes by creating a lucrative alternate market for agricultural produce.

Generation of Ethanol

- **1st Generation Ethanol:** It is made from food crops such as cereals (rice, wheat, barley, corn, and sorghum), sugarcane, sugar beet, etc.
- **2nd Generation Ethanol:** It is made from ligno-cellulosic or woody biomass, or agricultural residues/waste such as wheat straw, corn stover, wood, etc.
- **3rd Generation Ethanol:** It includes those derived from aquatic biomass such as algae.
- **4th Generation Ethanol:** It is derived from engineered plants and microorganisms.

2 Biofuel (Source: The Hindu)

BIOFUELS

CLEAN ENERGY FROM NATURE

Biofuels are renewable fuels produced from biomass—organic materials from plants, animals or microorganisms. They can be used as alternatives or supplements to fossil fuels for heat, power and transport.

KEY BENEFITS

RENEWABLE Made from naturally replenishing biomass sources.	LOWER EMISSIONS Can reduce greenhouse gas emissions compared to fossil fuels.	ENERGY SECURITY Diversifies energy sources and reduces dependence on imported oil.	SUPPORTS ECONOMY Creates rural jobs and supports agricultural and industrial sectors.	WASTE UTILIZATION Transforms organic waste and residues into useful energy.

TYPES OF BIOFUELS & THEIR FEEDSTOCKS

<div style="text-align: center;"></div> <p>BIOETHANOL Alcohol-based fuel, mainly used in gasoline blends.</p> <p style="text-align: center;">FEEDSTOCKS</p> <div style="display: flex; justify-content: space-around;"> </div> <p style="text-align: center;">Common Uses: Gasoline blends (E10, E20, E85), cooking fuel</p>	<div style="text-align: center;"></div> <p>BIODIESEL Liquid fuel for diesel engines.</p> <p style="text-align: center;">FEEDSTOCKS</p> <div style="display: flex; justify-content: space-around;"> </div> <p style="text-align: center;">Common Uses: Diesel blends (B5, B20, B100)</p>	<div style="text-align: center;"></div> <p>BIOGAS Gaseous fuel produced from the breakdown of organic matter.</p> <p style="text-align: center;">FEEDSTOCKS</p> <div style="display: flex; justify-content: space-around;"> </div> <p style="text-align: center;">Common Uses: Electricity generation, heating, vehicle fuel (upgraded biogas)</p>
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HOW BIOFUELS ARE PRODUCED

- 1. FEEDSTOCK COLLECTION**
Biomass is grown, harvested or collected.
- 2. PRETREATMENT**
The biomass is cleaned, chopped and prepared.
- 3. CONVERSION**
Through processes like fermentation, transesterification or anaerobic digestion.
- 4. REFINING**
The fuel is purified and meets quality standards.
- 5. DISTRIBUTION & USE**
Biofuels are distributed and used in various applications.

USES OF BIOFUELS

- TRANSPORTATION**
Powers cars, trucks, buses, ships and aircraft.
- ELECTRICITY GENERATION**
Used in generators and power plants.
- HEATING**
Provides heat for homes, industries and cooking.
- INDUSTRIAL APPLICATIONS**
Used in boilers and as a feedstock in chemical processes.

A SUSTAINABLE FUTURE

Biofuels, when produced sustainably, can play a vital role in building a cleaner, greener and more energy-secure world.

NOTE

Sustainability depends on responsible feedstock production, efficient processes and reduced competition with food and ecosystems.

3 Depreciation and Appreciation of Currency and Impact upon Economy (Source: The Indian Express)

DEPRECIATION & APPRECIATION OF CURRENCY AND THEIR IMPACT ON ECONOMY

Changes in the value of a currency relative to other currencies affect trade, prices, investment, growth and overall economic well-being.

DEPRECIATION OF CURRENCY	APPRECIATION OF CURRENCY
<p>When the value of a currency falls in comparison to other currencies.</p> <p>WHAT IS IT? It means you need more of your currency to buy the same amount of foreign currency.</p> <p>Example: If ₹ was 70 per \$ and becomes 80 per \$, the rupee has depreciated.</p> <p>WHY DOES IT HAPPEN?</p> <ul style="list-style-type: none"> Higher inflation than other countries Large trade deficit Capital outflow / foreign investors pulling out Loose monetary policy / lower interest rates <p>IMMEDIATE EFFECTS</p> <ul style="list-style-type: none"> Imports become more expensive Exports become cheaper & more competitive Increase in inflation Higher cost of foreign debt (external debt) 	<p>When the value of a currency rises in comparison to other currencies.</p> <p>WHAT IS IT? It means you need less of your currency to buy the same amount of foreign currency.</p> <p>Example: If ₹ was 80 per \$ and becomes 70 per \$, the rupee has appreciated.</p> <p>WHY DOES IT HAPPEN?</p> <ul style="list-style-type: none"> Lower inflation than other countries Trade surplus Capital inflow / foreign investors investing more Tight monetary policy / higher interest rates <p>IMMEDIATE EFFECTS</p> <ul style="list-style-type: none"> Imports become cheaper Exports become costlier & less competitive Decrease in inflation Lower cost of foreign debt

IMPACT ON THE ECONOMY (DETAILED)

DEPRECIATION – IMPACT	APPRECIATION – IMPACT
Helps exports (cheaper for foreigners) and hurts imports (costlier).	Hurts exports (costlier for foreigners) and helps imports (cheaper).
Generally increases inflation as import costs rise.	Generally reduces inflation as import costs fall.
May boost growth in export-oriented sectors but can slow growth if inflation becomes high.	May slow growth in export sectors but benefits consumers and industries relying on imports.
May discourage foreign investors due to higher risk and volatility.	Attracts foreign investors due to currency stability and higher returns in real terms.
Boosts jobs in export industries (e.g., textiles, IT services, tourism).	May reduce jobs in export sectors; benefits import-dependent industries.
Increases burden of external debt as repayment in foreign currency becomes costlier.	Reduces burden of external debt as repayment in foreign currency becomes cheaper.
Purchasing power of consumers decreases.	Purchasing power of consumers increases.

FACTORS INFLUENCING CURRENCY MOVEMENTS

- Interest Rates
- Inflation Differential
- Trade Balance
- Capital Flows
- Government Policies
- Global Economic Conditions

KEY TAKEAWAY

Neither depreciation nor appreciation is always good or bad. Both have advantages and disadvantages.

A stable and competitive exchange rate that supports sustainable growth, low inflation and external balance is ideal for a healthy economy.

NOTE: Central banks and governments use tools like interest rate changes, forex reserves, and policy measures to manage currency movements and minimize adverse impacts.