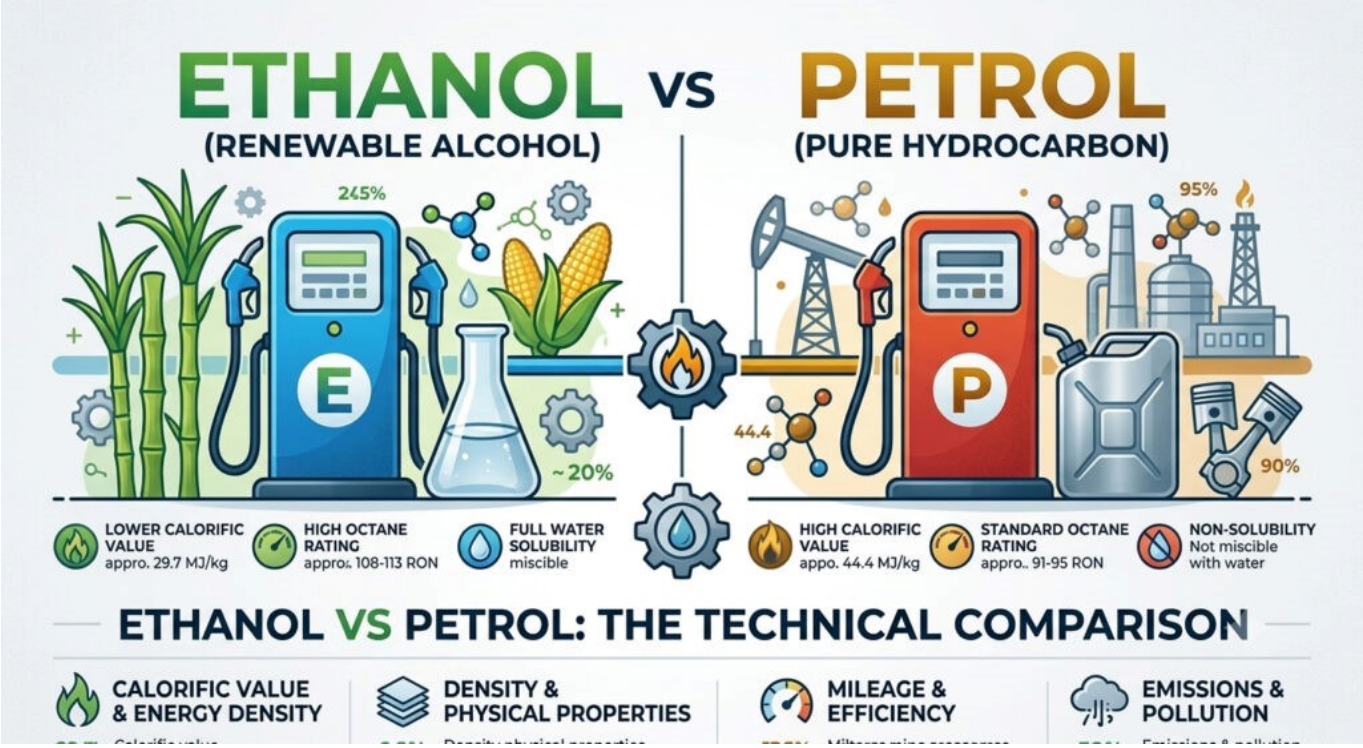
E20 – Balancing Energy Security and Consumer Interests

Mains: *GS III – Energy security*

Why in news?

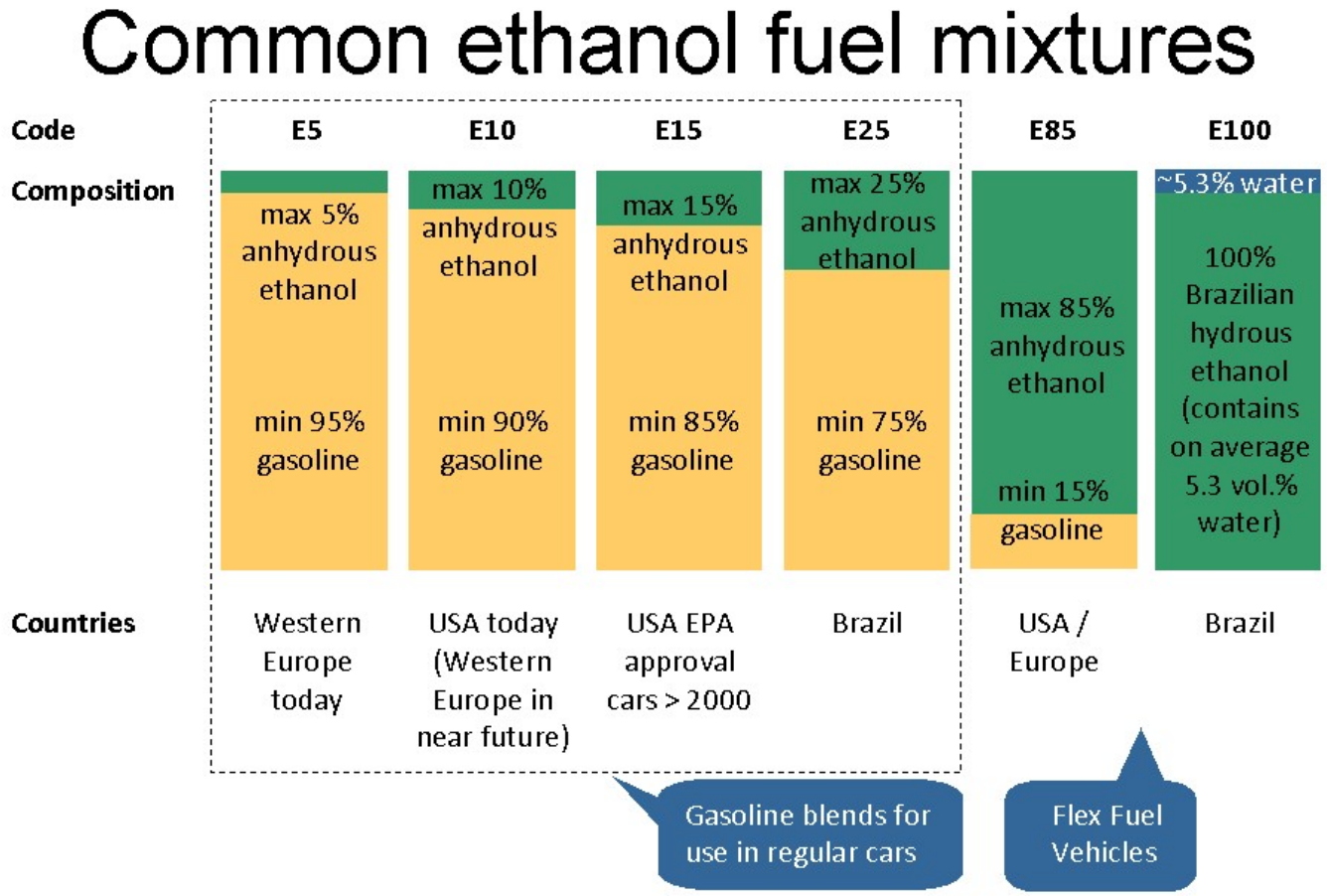
E20 is a promising alternative to fossil fuels in the long-term, but requires behavioural changes among consumers.



What is ethanol blending?

- **Ethanol blending** – It is the practice of mixing ethyl alcohol (a renewable plant-based biofuel) with standard petrol to create a cleaner-burning vehicle fuel
- **Source** – Ethanol is made by *fermenting sugars and starches from crops* like sugarcane, corn, maize, or surplus food grains.
- **Naming** – Blends are *named by their ethanol percentage*, such as
  - E10 (10% ethanol, 90% petrol)
  - E20 (20% ethanol, 80% petrol)
  - E85 (80% to 85% ethanol and 15% to 20% petrol) strictly meant for compatible flex-fuel vehicles (FFVs).
- **Key benefits –**

- Ethanol contains oxygen molecules that help fuel burn more completely, *reducing harmful carbon monoxide and hydrocarbon exhaust*.
- **Energy Security** – Mixing plant-based fuel with petrol reduces the amount of crude oil a country must import.
- It *gives farmers an extra market* to sell surplus crops and agricultural waste



What are the possible challenges associated with ethanol blending?

- **Food vs Fuel** – Diversion of food grains and sugarcane for ethanol may affect food availability and prices.
- **Water stress** – Sugarcane-based ethanol can increase groundwater pressure due to high water requirements.
- **Regional imbalance** – Ethanol production is concentrated in a few states, creating logistical and supply-chain challenges.
- **Environmental concerns** – Cultivation, processing and transport may involve significant water use and emissions.
- **Farmer dependence** – Excessive focus on sugarcane may encourage monocropping and distort cropping patterns.
- **Federal coordination** – Effective implementation requires coordination among the Centre, states, farmers, OMCs and automobile manufacturers.
- **Feedstock sustainability** – Overdependence on a few feedstock's can make ethanol supply vulnerable to crop failures.
- **Transition challenge** – Ethanol alone cannot decarbonise transport; it must complement EVs, public transport, green hydrogen and energy efficiency.

Why is Ethanol blending important for India?

- **Energy security** – Reduces dependence on imported crude oil.
- **Foreign exchange savings** – Lower crude oil imports reduce the import bill.
- **Lower fossil-fuel consumption** – Ethanol partially substitutes petrol.
- **Climate benefits** – Can reduce lifecycle greenhouse-gas emissions compared with pure fossil petrol.
- **Price stability** – Greater domestic fuel sources can reduce vulnerability to international crude-oil price shocks.
- **Agricultural linkages** – Creates an additional market for sugarcane and other feedstocks used for ethanol production.
- **Strategic autonomy** – Reduces India's exposure to geopolitical disruptions in major oil-producing regions.

Why are consumers dissatisfied?

- **Lower fuel efficiency** – E20 can result in lower fuel efficiency in some vehicles compared with lower ethanol blends.
- **High cost** – Consumers are not seeing a direct price benefit at petrol pumps.
- **Limited fuel choices** – The transition has largely been supply-driven, leaving consumers with limited fuel choices.
- **Lack of awareness** – Government benefits such as foreign-exchange savings and greater energy security are indirect and difficult for consumers to perceive.

What measures can be taken?

- **Differential pricing** – Price ethanol-blended fuel lower than conventional petrol to compensate for lower mileage.
- **Consumer choice** – Where technically and logistically feasible, allow different fuel blends to coexist during the transition.
- **Vehicle compatibility** – Ensure automobiles are designed and certified for higher ethanol blends.
- **Transparent communication** – Publish data on fuel savings, import substitution and environmental benefits.
- **Gradual transition** – Align blending targets with vehicle compatibility and availability of ethanol.
- **Feedstock diversification** – Reduce excessive dependence on sugarcane and promote sustainable feedstocks such as agricultural residues.
- **Lifecycle assessment** – Evaluate ethanol policy on water use, land use, food security and emissions along with energy-security gains.

What lies ahead?

- India's ethanol policy reflects the larger challenge of green transition in a developing economy.
- Public policy need to ensure that the costs of transition are not disproportionately borne by consumers.
- A successful E20 transition therefore requires a combination of energy security,

environmental sustainability, consumer choice, technological adaptation and fair pricing.

Reference

The Indian Express| Urban Flooding and Heatwaves in Indian Cities