Bitumen – The Black Gold

Prelims: *Current events of national and international importance | Economy*

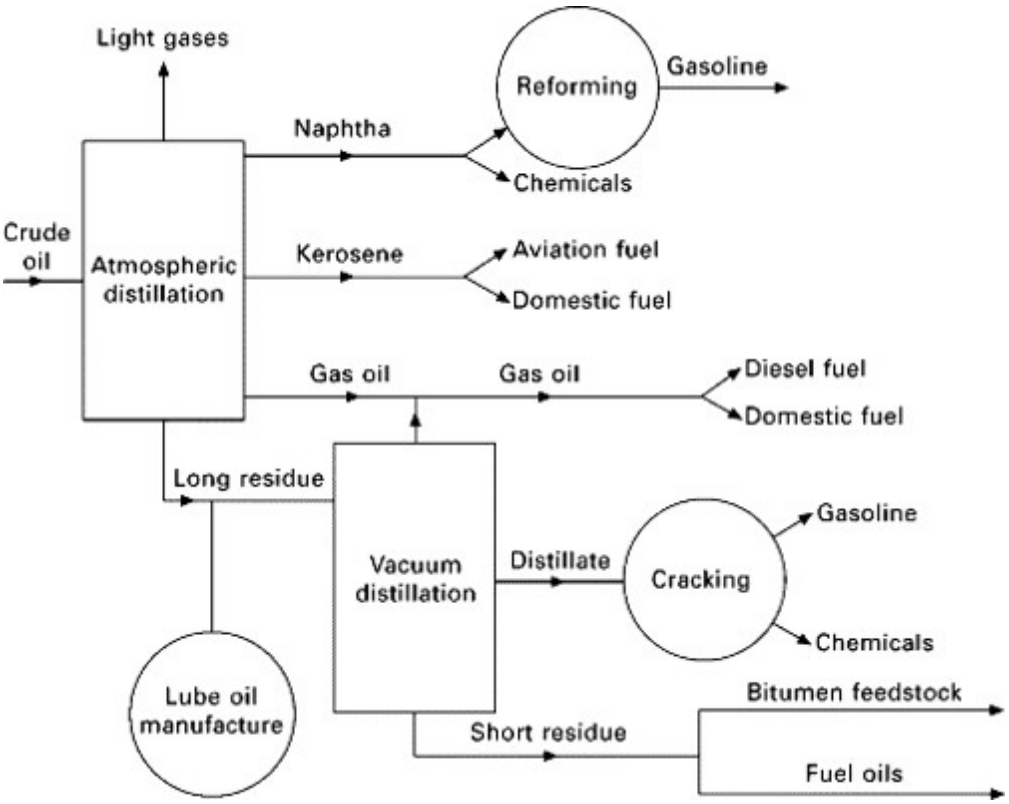
Why in News?

Recently, the ongoing West Asia conflict has disrupted India's bitumen imports, bitumen prices have doubled, threatening the government's target of building 10,000 km of highways in FY 2026-27.

- **Bitumen –** A ***highly viscous, black, sticky mixture of hydrocarbons***, soluble in carbon disulfide, composed mainly of polycyclic aromatic hydrocarbons.
- It is also known as ***Black Gold*** in the pavement industry.
- **Derived from –** Crude oil, Oil Sands and Natural Asphalt Lakes.
- **Uses –** Binder in road construction (to form asphalt), waterproofing and it helps roads withstand traffic load and various weather conditions.

Production Process

- **Crude Oil Heating –** Crude oil (mix of hydrocarbons) is heated to about **350–400°C** in a refinery.
- Lighter products like LPG, petrol, kerosene, diesel, and jet fuel are separated.
- **Residue Formation –** Heavy leftover material, called *atmospheric residue*, collects at the bottom of the distillation column.
- **Vacuum Distillation –** This residue is sent to a vacuum distillation unit and lower pressure allows heavy hydrocarbons (vacuum gas oils) to vaporise at lower temperatures.
- **Bitumen Extraction –** Under controlled heating (380–425°C), vacuum gas oils are removed the *remains is vacuum residue, known as bitumen.*
- **Blending –** Bitumen is blended to meet road-paving grades (VG-10, VG-30, VG-40).
- **Yield –** From 1 tonne of crude oil, about 3–8% (30–80 kg) becomes bitumen and thus heavy crude gives more yield than the ligther ones.
- **Storage –** Bitumen is stored at 150–170°C to keep it liquid and pumpable.



India's Import Dependence

- **Road Construction in India – 85%** of paved roads are flexible type, dependent on bitumen.
- **Annual Requirement –** 90 lakh tonnes but domestic production (Indian Oil, BPCL refineries) is 54 lakh tonnes only.
- **Imports –** 30–40% shortfall met by West Asia and *99% imports from Iraq, UAE, Iran, Oman, Bahrain.*
- **Trend –** Imports are more than doubled, due to mega projects like Bharatmala, PMGSY, but domestic bitumen production has not kept its pace.
- **Government Response –** Ministry of Road Transport and Highways has granted relief measures of force majeure and price adjustment to highway contractors.
    - **Force Majeure clause –** 2–4 months relaxation for war-linked delays without penalty.
    - **Price Adjustment –** Compensation for cost escalation in fuel, materials, logistics.
    - **Limitation –** Cannot claim both force majeure and price adjustment simultaneously.

References

1. Indian Express | Bitumen

2. Indian Express | Bitumen