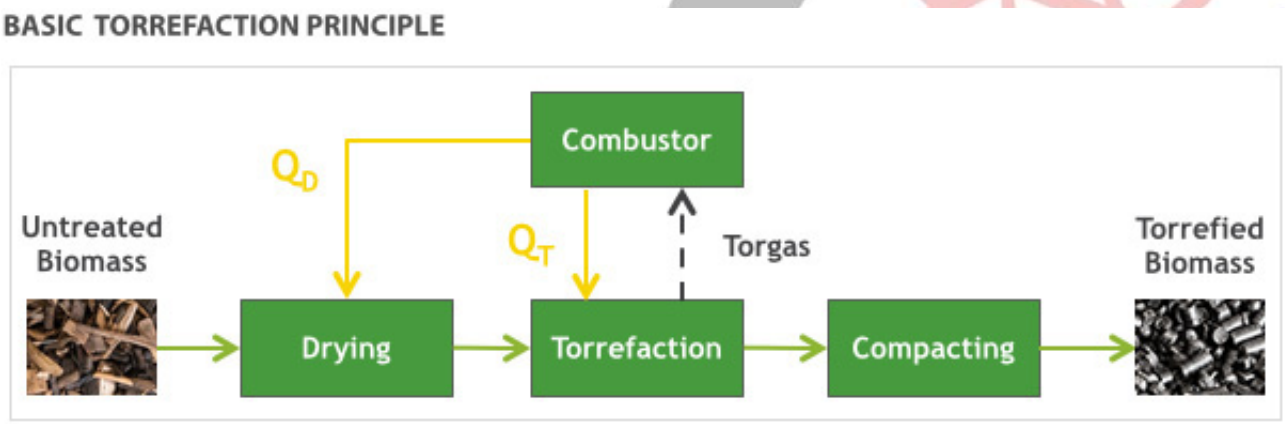
Swedish Technology to Reduce Stubble Burning

Why in News

The pollution from **stubble burning** in winter is a major factor for the sharp **decline in air quality in Delhi**. To overcome this issue, India is testing **Swedish technology — torrefaction** that can convert rice stubble into **'bio-coal'.**

- The government has funded a **pilot project** at the **National Agri-Food Biotechnology Institute in Mohali (Punjab)** with a Swedish company to evaluate the feasibility of the technology.

Torrefaction Technology - Stubble to Bio-coal



- Torrefaction is a **thermal process** to **convert biomass into a coal-like material,** which has better fuel characteristics than the original biomass.
- The process involves **heating up** straw, grass, sawmill residue and wood biomass to **250 degrees celsius - 350 degrees celsius**.
- This changes the elements of the biomass into **'coal-like' pellets.** These pellets can be used for combustion along with coal for industrial applications like steel and cement production.

Advantages

- The project has a capacity of converting **150-200 kilograms of paddy straw to bio-coal every hour** and **reduce CO_2 emissions by 95%.**
- Torrefied biomass is **more brittle,** making grinding easier and **less energy-intensive.**
- Compared to fresh biomass, **storage** of the torrefied material can be substantially simplified since **biological degradation** and water uptake is **minimized.**
- The torrefied pellets are ideal for **coal replacement** because it has **lower shipping and transport costs, lower sulfur and ash content (compared with coal),** etc.

Disadvantages

- The volume of torrefied biomass is **reduced only slightly, ~ 10-20%** lower than the dried

feedstock during the process.
- Despite higher calorific values, **energy density** is **not improved significantly.**
- Torrefaction **does not reduce corrosion** of machinery especially boiler tubes.

Bio-coal

- Bio-coal, also commonly referred to as **synthetic coal,** is created through the torrefaction of biomass.
- The bio-coal has **similar characteristics to traditional fossil-based coal,** and thus viable option **to reduce greenhouse gas emissions.**

Source:TH