Indigenous Green Refrigerant Technology

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Why in News?

The CSIR-IICT, Hyderabad, has developed India's first indigenous process technology for manufacturing next-generation green refrigerants.

- The Council of Scientific and Industrial Research-Indian Institute of Chemical Technology (CSIR-IICT) developed the laboratory-scale process platform for ***HFO-1234yf (a hydrofluoroolefin).***
- They made it ready for commercial transfer to the domestic chemical industry.

HFO-1234yf

- It is a newly developed hydrofluoroolefin is regarded globally as the ***most promising green alternative*** to conventional cooling agents. \
- **Zero Ozone Depletion -** It has Zero Ozone Depletion Potential (ODP), meaning it causes absolutely no damage to the Earth's protective ozone layer.
- **Negligible Global Warming Potential -** It features an exceptionally low Global Warming Potential (GWP) compared to conventional gases.
- **Ultra-Short Atmospheric Lifetime -** While conventional Hydrofluorocarbons (HFCs) take 13.8 years to degrade in the atmosphere, HFOs break down in just about ***11 days***, drastically reducing long-term greenhouse accumulation.

Hydrofluorocarbons (HFCs)	Hydrofluoroolefins (HFOs)
• Hydrofluorocarbons (HFCs) were originally introduced to replace ozone-depleting substances, they turned out to be extremely potent greenhouse gases.	• Hydrofluoroolefins (HFOs) are unsaturated HFCs containing double bonds, which make them highly reactive and quick to dissolve in the lower atmosphere without triggering climate warming.

Kigali is an international agreement that targets the phase-down of hydrofluorocarbons (HFCs)and India ratified the Kigali Amendment to the Montreal Protocol in 2021.

Reference

Times of India | Indigenous Green Refrigerant Technology