

CO₂ Capture Technology

DIRECT AIR CAPTURE

Capturing CO₂ Today for a Healthier, Brighter Tomorrow

CLEAN AIR
CLIMATE ACTION
SUSTAINABLE
FUTURE

MERITS OF THE TECHNOLOGY

- High affinity toward ultra-dilute CO₂ in ambient air (~400 ppm)
- Specialized adsorbents with strong CO₂ binding at low partial pressure
- Stable performance under fluctuating outdoor temperature and humidity
- Captures CO₂ from indoor, semi-indoor and outdoor conditions
- Environmentally friendly, scalable and energy-efficient

FROM AIR TO A CLEANER TOMORROW

Cleaner Air Carbon Neutrality Healthier Planet

Smart Air

POINT SOURCE CO₂ CAPTURE

CAPTURING TODAY FOR A NET ZERO TOMORROW

TURNING EMISSIONS INTO OPPORTUNITIES

High CO₂ Selectivity Faster Adsorption Kinetics Excellent Multi-cycle Stability Wide Operating Window Energy Efficient (Low ΔT)

TYPICAL FLUE GAS COMPOSITION

Temperature	: 60–75 °C
Total pressure	: 1 bar
CO ₂	: 10–20%
N ₂	: 75–80%
O ₂	: 4–6%
SO _x /NO _x	: 100–150 ppm
H ₂ O	: 10–12%

Indian emits 41% of CO₂ from electricity generation

TECHNOLOGY OVERVIEW

Flue Gas (from industry) → Treated Gas (with reduced CO₂)

High performance adsorbent

Captured CO₂ (for utilization / storage)

KEY ADVANTAGES

- High CO₂ selectivity in the presence of flue gas impurities
- Faster adsorption kinetics
- Excellent multi-cycle stability with minimal performance loss
- Flexible operating window across wide temperature and humidity ranges
- Low ΔT between adsorption and desorption cycles, ensuring energy-efficient operation

SCALABLE
RELIABLE
SUSTAINABLE

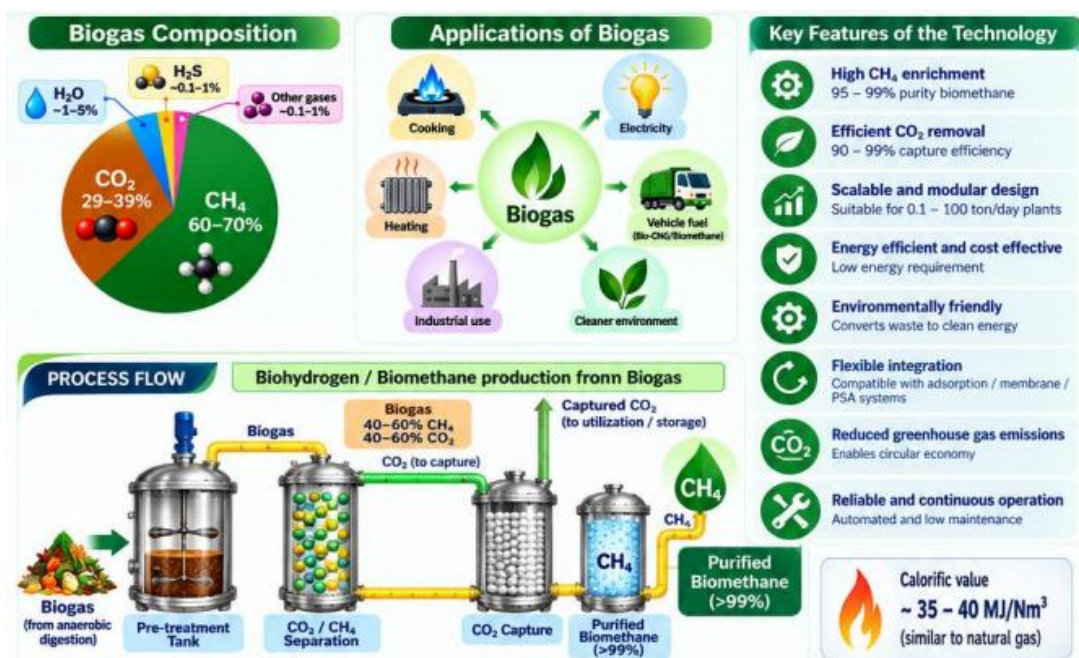
CSIR-CECRI CO₂ CAPTURE SYSTEM

COMMON CHALLENGES

- High Temperature
- Ambient Pressure
- Selective Removal of CO₂
- High Energy Demand

Biogas Enrichment

(Upgrading Biogas to High Value Bio Methane)



Biohydrogen Purification

(From Biomass to Clean Hydrogen - Removing CO₂ for a Greener Tomorrow)

