

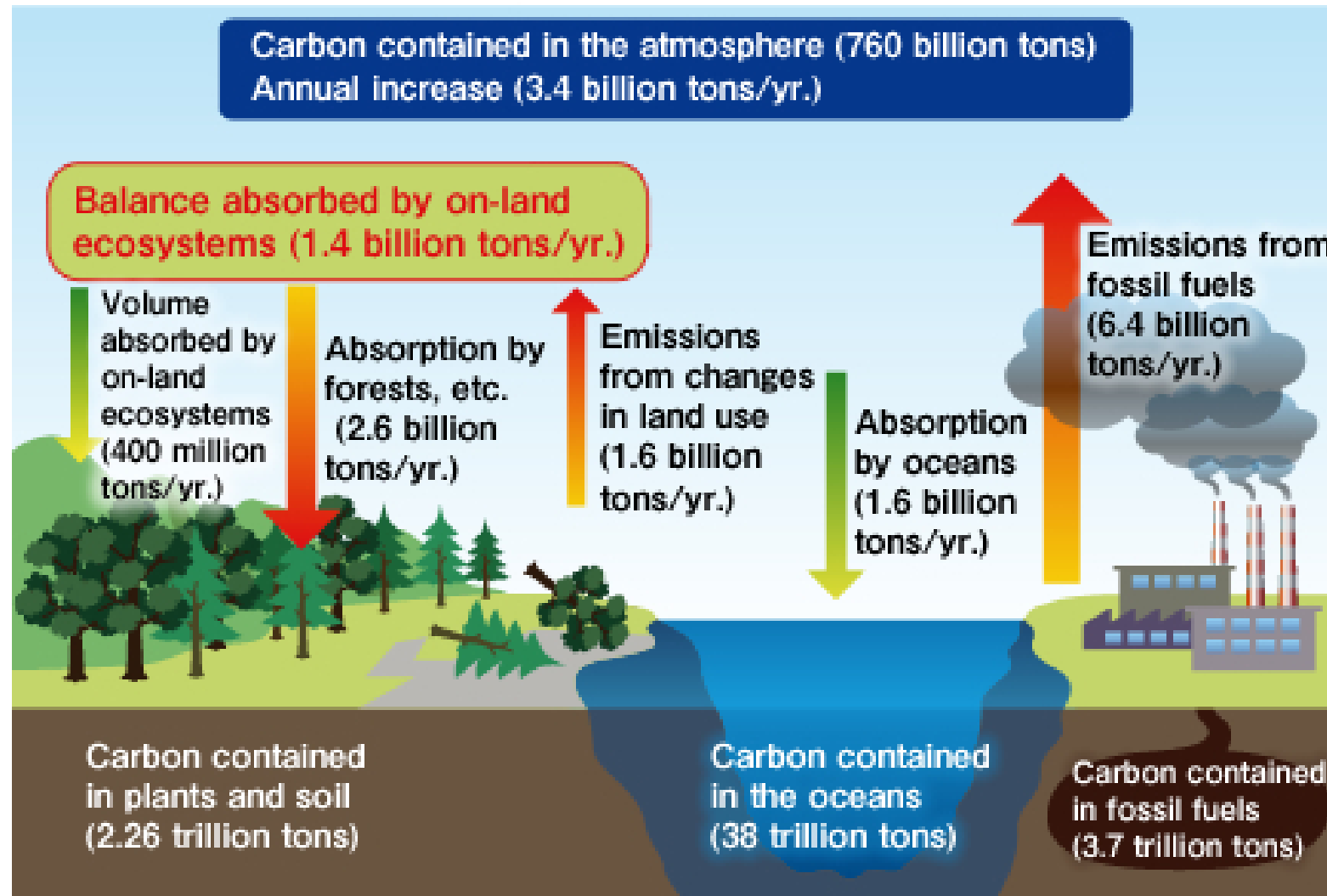
Power Generation and Utility Fuels Group

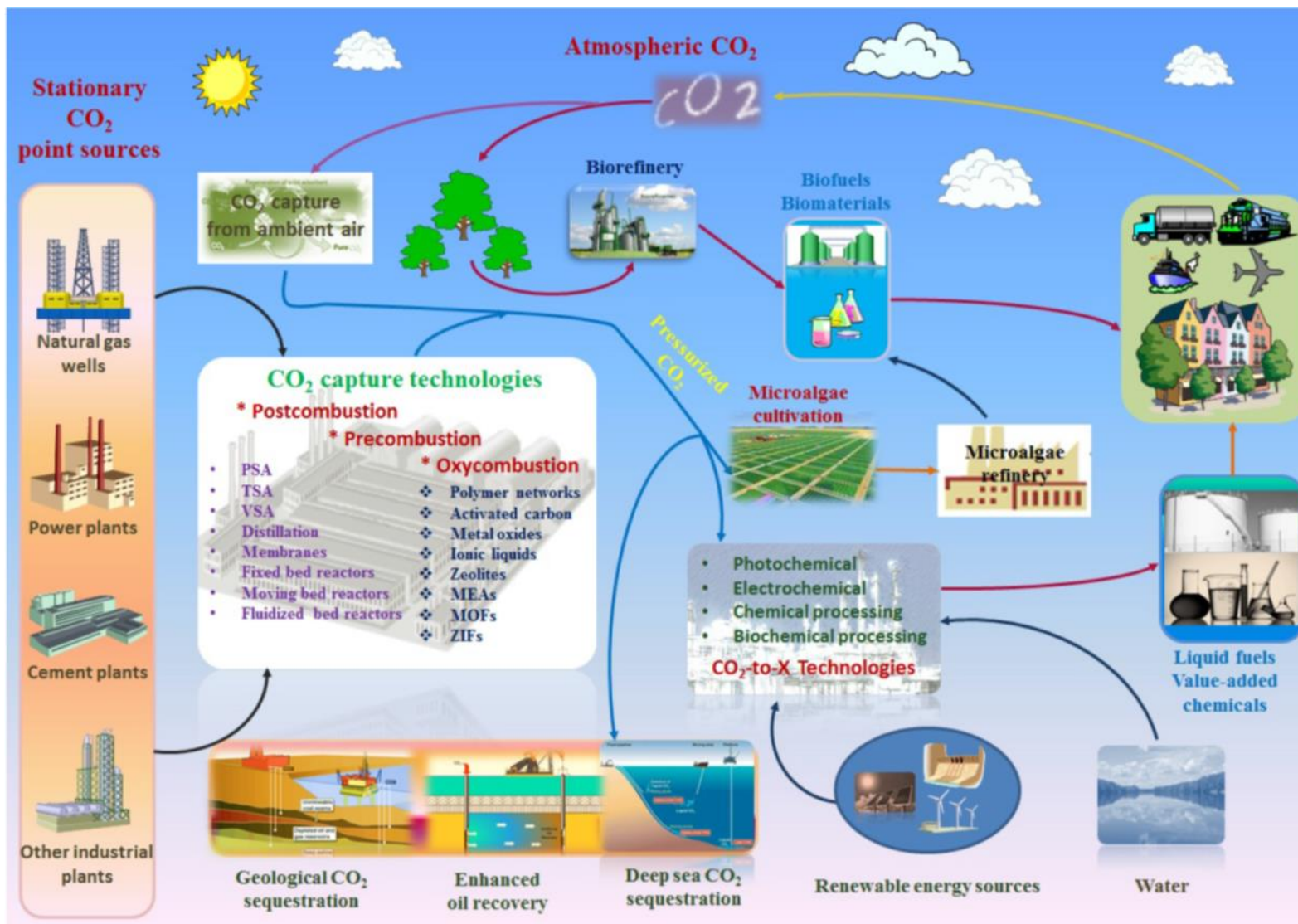
Dr. Reynolds Frimpong

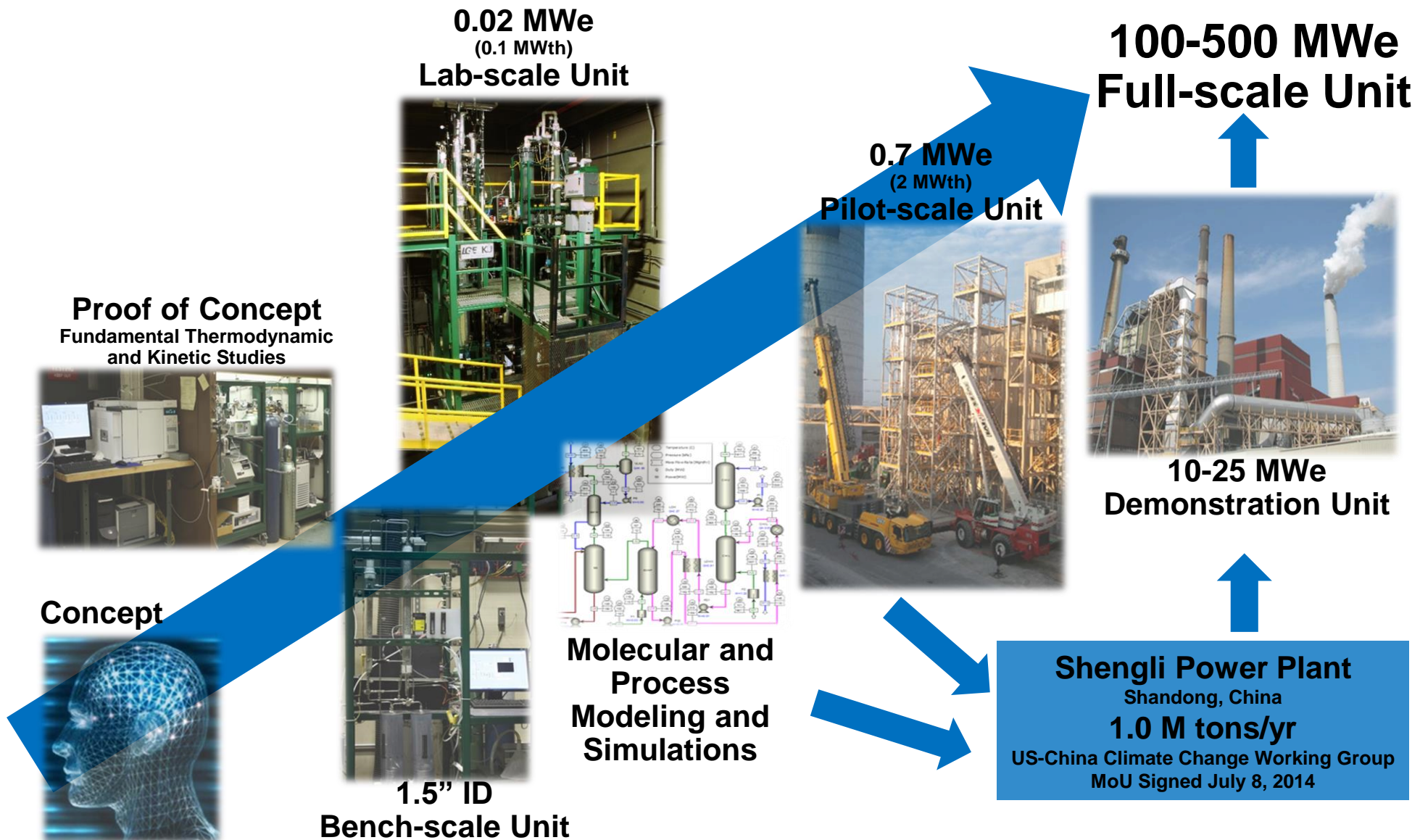
Andy Placido

Director: Kunlei Liu

The Earth's carbon cycle

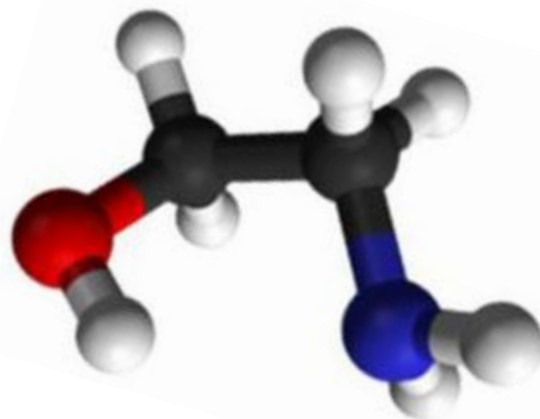






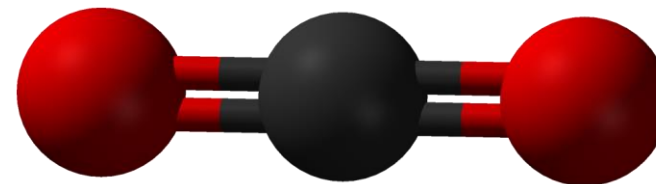
How do we Remove the CO₂?

CO₂ Capture Chemistry

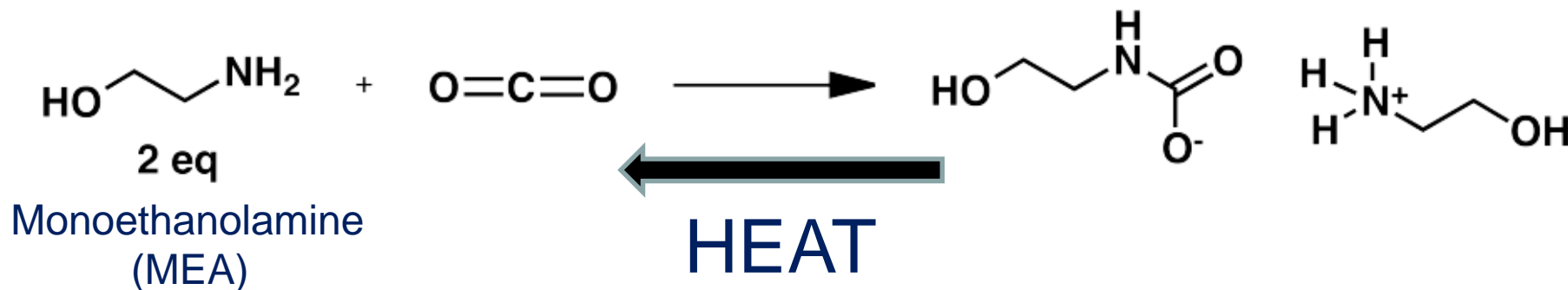


Amine
(MEA)

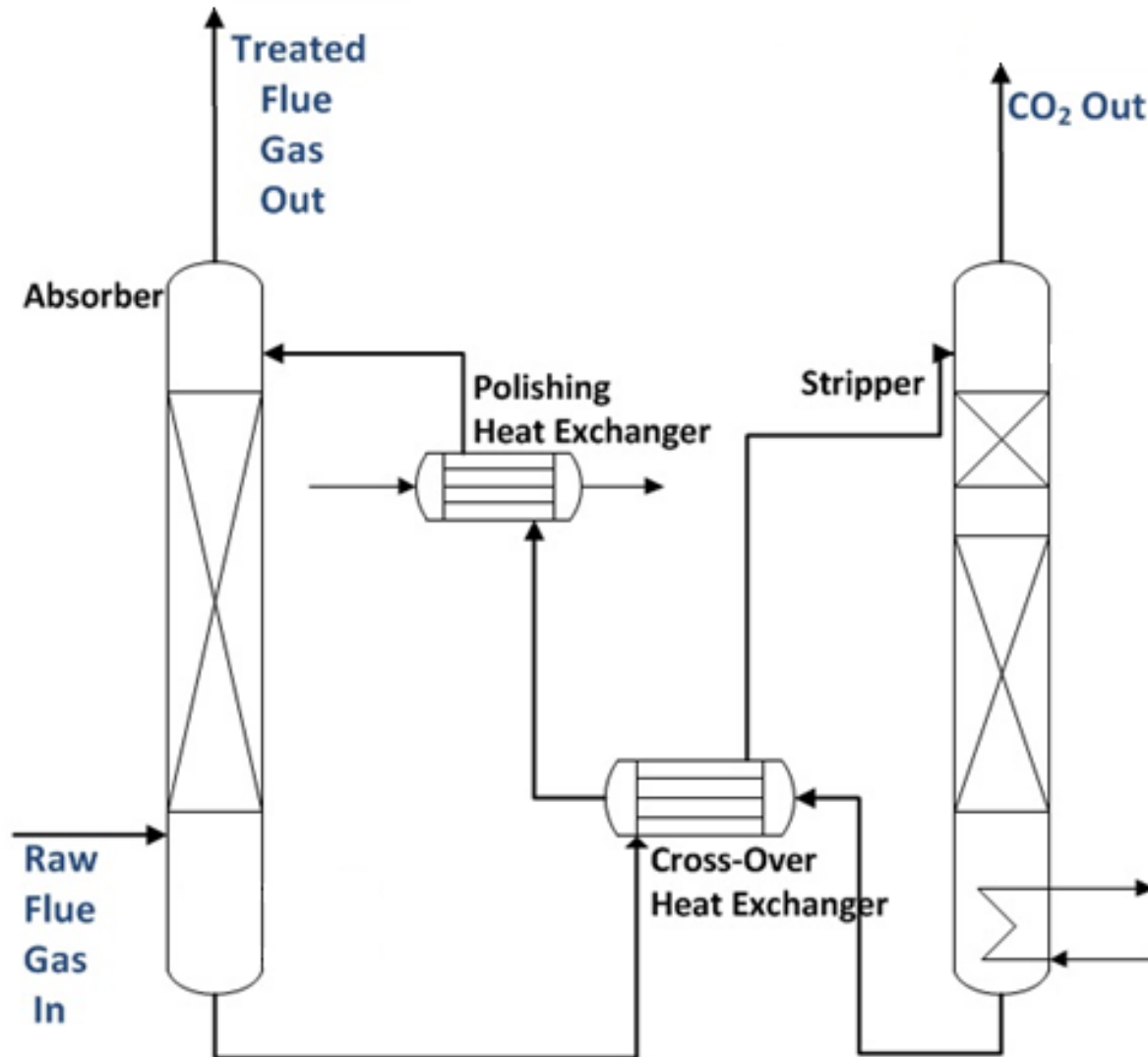
+



Carbon
Dioxide



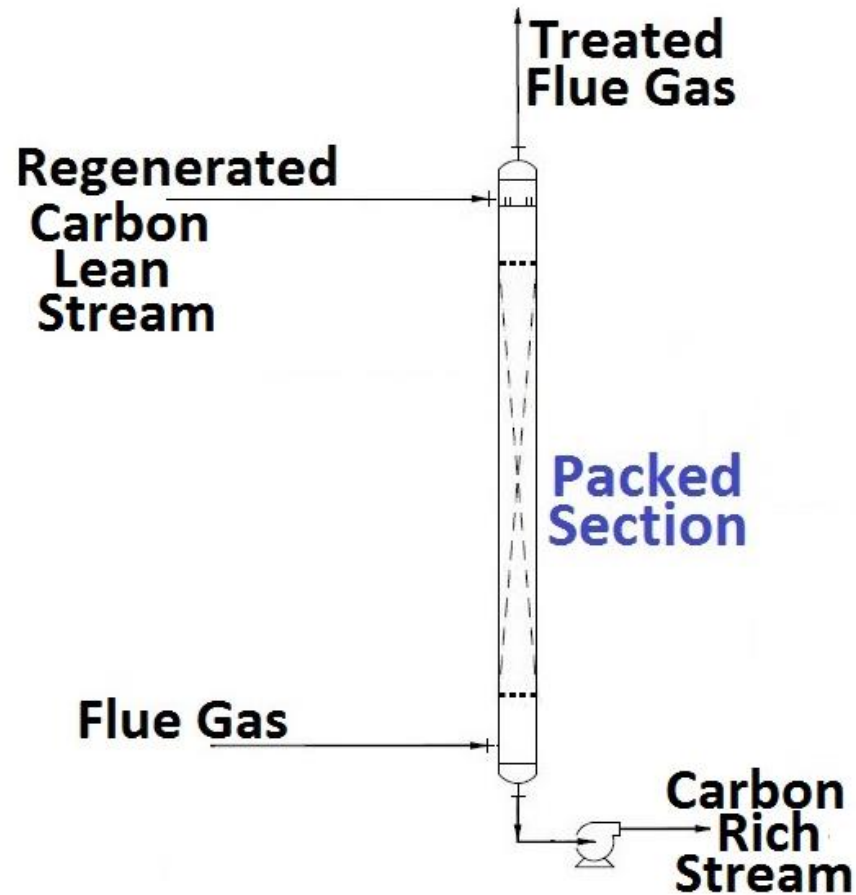
A Typical CO₂ Capture Process Flow Diagram



Key Equipment:

- 1) Absorber
- 2) Stripper
- 3) Heat Exchangers

What Happens in an Absorber?



Absorber – the equipment that captures CO_2 using a chemical solvent

Carbon Rich Stream – the chemical solvent after it has absorbed the CO_2

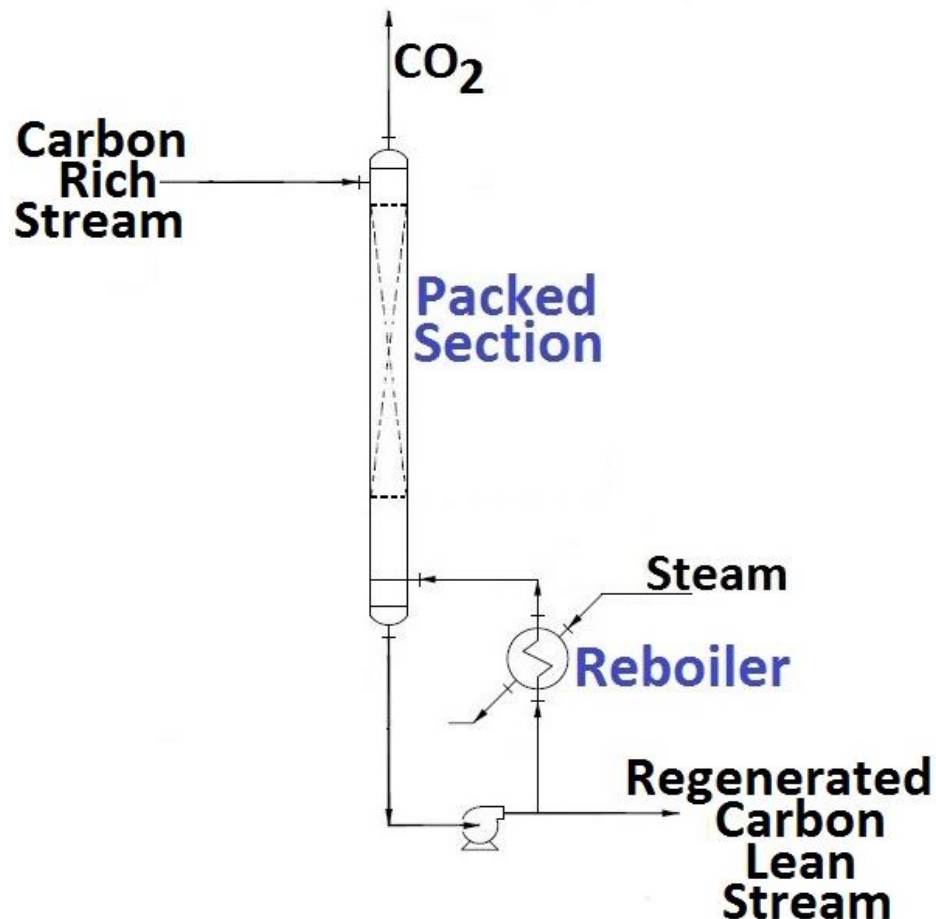
Exothermic chemical absorption

Counter current

Careful liquid and gas distribution

Structured packing

What Happens in a Stripper?



Stripper – the equipment that regenerates the solvent and liberates the captured CO₂

Carbon Lean Stream – the chemical solvent after it has been regenerated and contains very little CO₂

Heat is added with the reboiler

Reverse the exothermic chemical absorption reaction

Structured packing

What is Involved in PGUF?



Process Modeling and Simulation
Chemical Engineering
Chemical Process Development
Mechanical Engineering
Equipment and Structural Design
Analytical Chemistry
Emissions Studies
Solvent Chemical Changes
Materials Science
Metallurgy
Corrosion Studies
Energy Efficiency

Engineering