

TECHNOLOGY AREAS

POST-COMBUSTION CAPTURE

PRE-COMBUSTION CAPTURE

KEY TECHNOLOGIES

Solvents

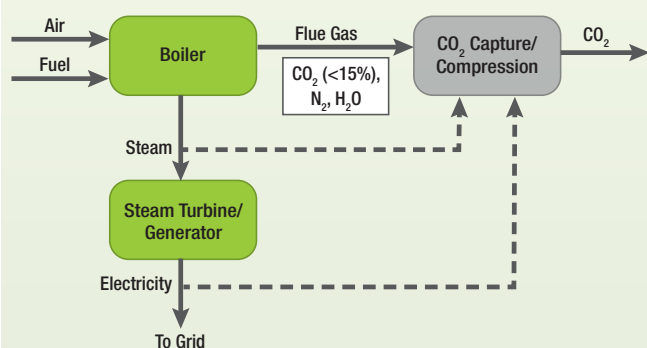
Sorbents

Membranes

Novel Concepts

POST

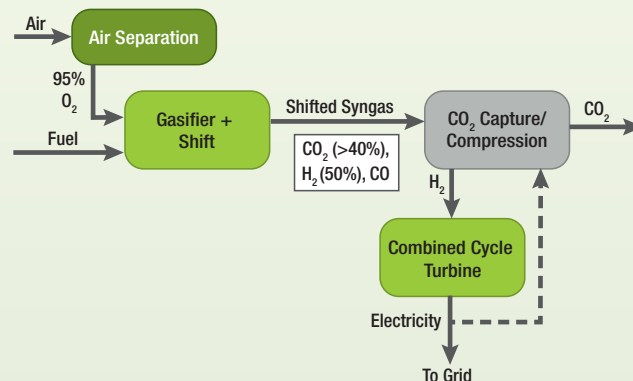
Applicable to vast majority of electricity generation globally



- Fuel combusted in air to generate steam that drives turbines to produce electricity
- Flue gas generated consisting principally of CO₂, N₂, and H₂O
- Capture process separates CO₂ from N₂
- Currently available technology – aqueous amine solvent – demonstrated at large scale
- Solvent regeneration requires steam from power cycle, reducing power output
- Capital costs for capture systems are substantial

PRE

Applicable to gasification-based power generation or fuels/chemicals production



- Fuel gasified with O₂ to produce syngas (mostly H₂ and CO)
- Shift reaction converts CO to CO₂ and produces more H₂
- Capture process separates CO₂ from H₂
- H₂ combusted to produce power in combined cycle unit
- Currently available capture technology – physical solvents – require substantial heating and cooling, reducing efficiency
- Challenging process integration