Transport of CO_2

Carrying CO_2 from a power plant to a storage site can be done in several ways. The most convenient and cost effective in the long run is via pipelines, just like Natural Gas. Other possibilities include ship, train or truck transportation for those sites that cannot be connected to a pipeline network.

Storage of CO_2

This consists of injecting the gas deep underground through a well into specific, gas-tight, geological layer such as deep saline aquifers.

Saline aquifers act like a sponge, which holds water by trapping it within its pores. CO_2 can in the same way be locked indefinitely within the Earth's abundant aquifer layers. Many gases are naturally trapped under the surface of Earth: Natural Gas and CO_2 being familiar examples. Storing the CO_2 underground in properly chosen storage sites is a safe solution.

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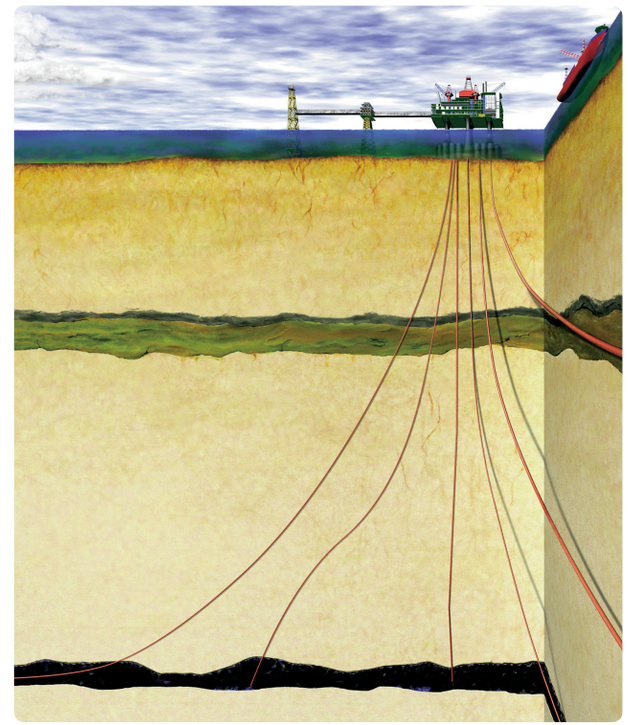
Developing the Future

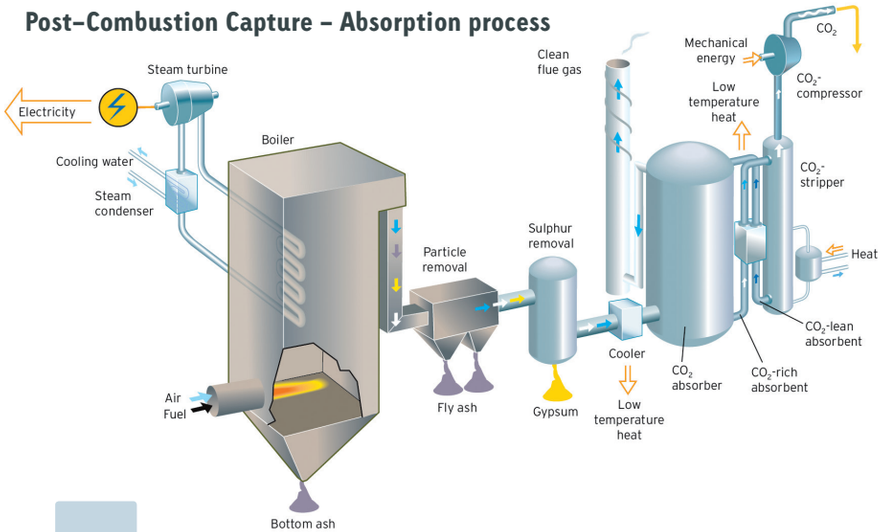
Carbon Capture and Storage – How?

Leaflet 2 of 2

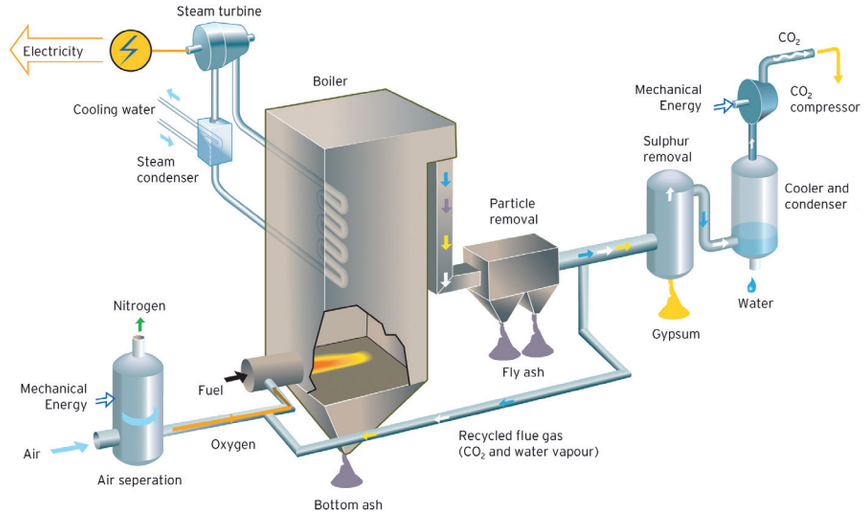


European Power Plant Suppliers Association

Post-Combustion Capture – Absorption process



Oxyfuel (O_2/CO_2 recycle) combustion capture



ccs Technologies

EPPSA's members support large-scale research, development and implementation of carbon dioxide (CO_2) capture technologies.

Post-Combustion Capture

Post-Combustion capture involves capturing the CO_2 after it was generated in the boiler. The addition of a device to capture the CO_2 produced by a power plant (as shown above) requires no substantial modification to the power station and ensures that almost no greenhouse gases are emitted from the running plant. This process can be applied to all fuels and is very suited to retrofit existing plants with CCS Technology.

Oxyfuel Capture

This process uses an Air Separator Unit that separates air into Oxygen (~21% of the air) and Nitrogen (~78% of the air). The fuel is burnt in the boiler in the oxygen, which is diluted with some CO_2 recycled from the flue gas in order to control the flame velocity. The resulting concentrated CO_2 stream, which does not contain Nitrogen or Nitrogen compounds, is then cooled, compressed and piped to the storage site.

Oxyfuel capture has the advantage of reducing the gas volume which has to be treated, thus reducing the capture costs.

Other technologies

In an Integrated Gasification Combined Cycle plant, before entering the combustion process, the fuel (e.g. Natural Gas, Biomass, Oil or Coal) is gasified (if not a gas) and then divided into its chemical components – Hydrogen, which emits only pure water (H_2O) after its combustion; and carbon dioxide, which is separated, compressed and piped away to be stored underground. This technology is fuel flexible.

Other processes include Carbonate capture and Chemical looping.