

# WHAT IS CCS?

## CARBON CAPTURE AND STORAGE

Carbon capture and storage (CCS), also referred to as carbon dioxide capture and sequestration, is an integrated suite of technologies that can prevent large quantities of the greenhouse gas carbon dioxide (CO<sub>2</sub>) from being released into the atmosphere.

As the name implies, CO<sub>2</sub> is captured – typically from large industrial processes – before it is emitted into the atmosphere.

Captured CO<sub>2</sub> is then transported to a carefully selected and secure storage site, where it is injected deep into a rock formation for permanent storage.

Because CCS can achieve significant emission reductions, it is considered a key option within the portfolio of approaches required to reduce emissions.

There are three major stages involved in this technology:

**Capture** – the separation of CO<sub>2</sub> from other gases produced at large industrial process facilities such as coal and natural gas power plants, steel mills and cement plants.

**Transport** – once separated, the CO<sub>2</sub> is compressed and transported, usually via pipelines, to a suitable site for geological storage.

**Storage** – CO<sub>2</sub> is injected into deep underground rock formations, often at depths of one kilometre or more.

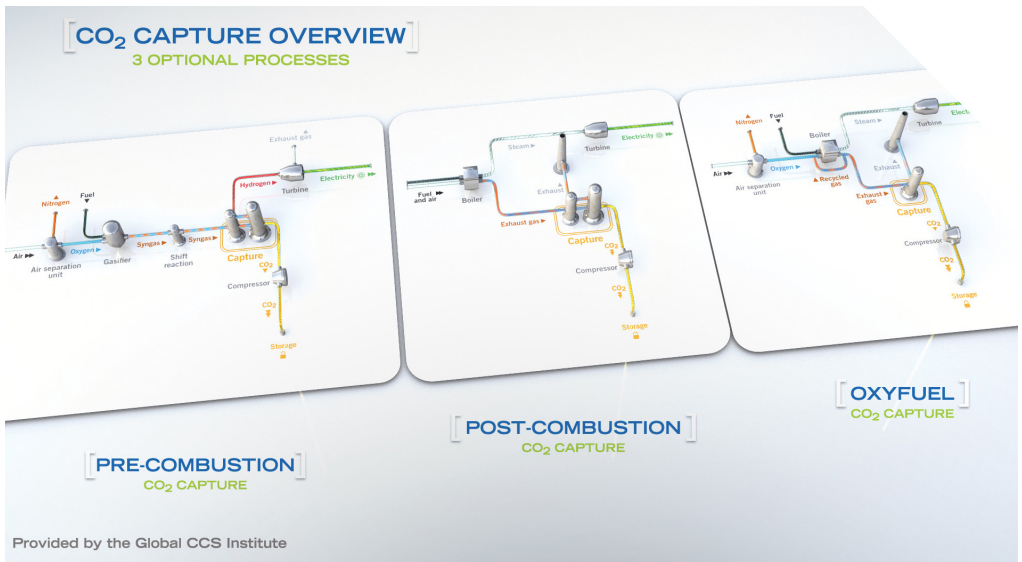
The amount of CO<sub>2</sub> in the atmosphere is increasing and the temperature of the Earth is rising. To avoid dangerous climate change, the global average temperature rise must be capped at 2°C relative to pre-industrial times. To achieve this, we need a very significant scale of CO<sub>2</sub> mitigation.

CCS is expected to contribute around 13% of total energy-related CO<sub>2</sub> emissions reductions by 2050, compared to a ‘do nothing’ approach (2015, IEA, Energy Technology Perspectives).

Demand for fossil fuels is likely to remain strong, especially in developing countries, where a significant percentage of the population currently has no access to electricity.

CCS is a viable option – in some cases, it is the only viable option – for significantly reducing emissions from such large-scale emission sources.





# CAPTURING CO<sub>2</sub>

Capturing carbon dioxide (CO<sub>2</sub>) is the first step in carbon dioxide capture and storage (CCS), a suite of technologies that prevents large quantities of CO<sub>2</sub> from being released into the atmosphere by capturing them and allowing them to be permanently stored in underground geological formations.

Carbon capture can be applied to large-scale emissions processes, including coal and gas-fired power generation, natural gas processing and fertiliser production, as well as the manufacture of industrial materials such as cement, iron and steel and pulp and paper.

The application of carbon capture technologies to these processes can play a major role in reducing the world's greenhouse gas emissions. Carbon separation/capture technologies have been operational at large-scale in the natural gas and fertiliser industries for decades and have recently become operational in the power sector.

