

# WHAT IS CCUS?

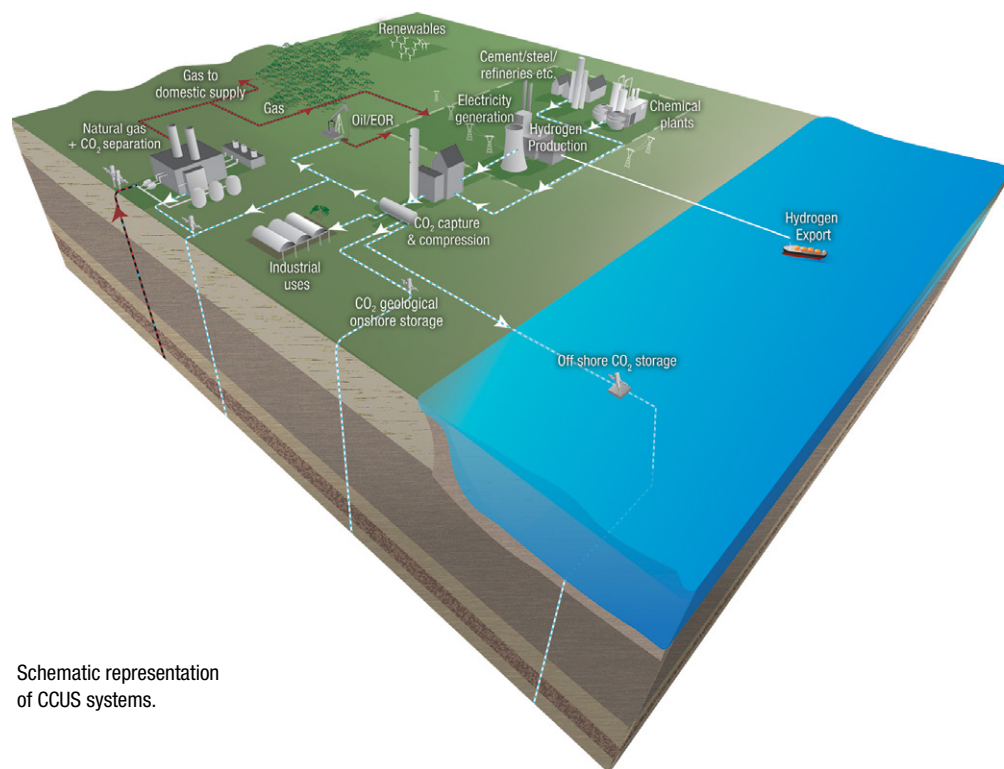
Carbon capture, utilisation and storage (CCUS) is about putting carbon back where it came from – inside the earth.

The burning of fossil fuels – coal, oil and natural gas, releases carbon in the form of carbon dioxide (CO<sub>2</sub>). The CO<sub>2</sub> then becomes part of exhaust gases that go up the smokestacks of power plants and factories, ending up in the atmosphere. These CO<sub>2</sub> emissions contribute to climate change. The purpose of CCUS is to “capture” the CO<sub>2</sub> before it’s released to the atmosphere and permanently store it deep underground.

In order to capture CO<sub>2</sub>, a capture plant is attached to an industrial process, such as a power station or fertiliser plant. The capture plant uses technologies such as solvents or membranes to capture CO<sub>2</sub> before it is cooled and compressed so it becomes liquid-like. The CO<sub>2</sub> is then pumped deep underground into a rock formation at depths greater than 800m where the liquidlike CO<sub>2</sub> fills the pore space in the solidrock, similar to the way water is captured in a sponge. Over time, the carbon dioxide is immobilised deep underground via various trapping mechanisms.

This process means carbon is extracted from the earth in the form of fossil fuels and returned to the earth as CO<sub>2</sub>. The CO<sub>2</sub> is monitored to make sure it remains where expected, providing assurance to regulators and the community.

An alternative to injecting the CO<sub>2</sub> deep underground is to use it in some way, known as utilisation. Some of the commercial uses for CO<sub>2</sub> are in enhanced oil recovery, carbonating beverages, flash freezing of foods, and as an expellant in fire extinguishers.



Schematic representation of CCUS systems.

## Who is CO2CRC?

CO2CRC is Australia’s leading CCUS research organisation. It owns and operates the Otway National Research Facility in south-western Victoria, which is one of the most advanced field scale CCUS research sites globally. Here it is currently undertaking its biggest research project to date. Known as Otway Stage 3, it aims to reduce the cost and environmental footprint of monitoring CO<sub>2</sub> stored underground.

CO2CRC works in close collaboration with internationally respected industry, academic and government partners. More than \$150 million has been invested in CO2CRC’s applied research and development program over the past decade. It has demonstrated the effectiveness of real-world CO<sub>2</sub> capture, injection, storage and monitoring technologies and applies tangible CCUS cost reduction technologies and methodologies to advance the deployment of CCUS projects globally.