



CARBON CAPTURE AND STORAGE: TRANSPORTING CO₂

WHAT IS CARBON STORAGE?

Carbon storage – also known as geosequestration – is one component of carbon capture and storage and involves safely storing captured, liquefied, and transported carbon dioxide (CO₂) deep underground. Carbon storage offers the greatest potential for permanent removal of CO₂.

HOW CAN CO₂ BE TRANSPORTED FOR STORAGE?

CO₂ is very stable and non-toxic. It is used in beer, soft drinks and many food products and is transported regularly across Australia.

Once carbon has been captured there are four methods of transporting it to storage locations: pipelines, rail, ship and truck, with the best method or methods depending on where the CO₂ is captured, its intended storage location and the amount of CO₂ to be transported.

Pipeline transport is generally preferred for very large volumes of CO₂ over large distances for long periods of time to justify the initial cost of the pipeline infrastructure. Rail, ship and truck are preferred for smaller volumes, especially if multiple delivery points or shorter timeframes are involved.

HOW IS CO₂ TRANSPORTED USING PIPELINES?

Once captured CO₂ is compressed from a gas to liquid-like state known as a 'supercritical fluid', it can safely be pumped over great distances through pipelines similar to water.

The first offshore CO₂ pipeline began operating in 2007 in Snøhvit, a natural gas field in Norway, which transports 700,000 tonnes of CO₂ per year 160 km to the North Sea. More than 6,000 km of pipeline has been laid in the United States of America to transport CO₂.

In Victoria, the CO₂CRC Otway project has installed 2.25 kilometres of pipeline to carry CO₂ to a depleted gas reservoir, where more than 65,000 tonnes of CO₂ have been stored.

FAST FACTS

- ⊕ CO₂ is very stable and non-toxic.
- ⊕ CO₂ can be transported via pipelines, rail, ship and truck.
- ⊕ Thousands of kilometres of pipeline have been installed across the world including in Australia to carry CO₂.



HOW IS CO₂ TRANSPORTED USING TRUCKS?

The transportation of gases such as CO₂ by truck to enable its use in beer, soft drinks and many food products is widespread around the world and in Australia. Liquefied CO₂ can be carried in tanks on specially adapted trucks.

HOW IS CO₂ TRANSPORTED USING SHIPS?

The transportation of CO₂ by ship is common in Europe, with four pressurised CO₂ carriers transporting CO₂ for use in food products. The liquefied CO₂ is carried in specially adapted tanks in the same way as trucks and trains.

HOW IS CO₂ TRANSPORTED USING RAIL?

Railroad transport of CO₂ in specially adapted tanks is a viable option if the existing rail infrastructure links the capture plant with the storage destination. It is a better option than trucks if there are large amounts of CO₂ being transported.

HOW IS CO₂ TRANSPORTED IN AUSTRALIA?

In Australia, CO₂ is most commonly transported by truck with small volumes delivered to multiple industrial users. The Callide Oxyfuel Project, supported by the COAL21 industry fund, transported a small volume of CO₂ by truck from Queensland to Victoria for test purposes at the CO2CRC Otway site.

Other COAL21 projects plan to use trucking for small volume, short duration demonstration stages. However, when CCS is deployed commercially in the longer term pipeline transport will be the preferred option.

FIND OUT MORE

The Global CCS Institute
globalinstitute.com

CO2CRC
co2crc.com.au