

GipNet

What is GipNet?

GipNet is a network of monitoring instruments deployed in Gippsland. It will be used to establish the equipment's suitability to provide environmental monitoring for future carbon capture and storage (CCS) projects.

The research, funded by ANLEC R&D, will determine the best technology mix to monitor changes in the environment for CCS projects, such as CarbonNet. Instruments are being tested to prove they are reliable, durable and accurate in the coastal and Gippsland environment.

Researchers from CSIRO, The University of Melbourne and the University of Wollongong will test instruments that can be used to measure air quality, water quality and marine life health and earthquake activity.

What is CarbonNet?

The CarbonNet Project is investigating the potential for establishing a commercial-scale CCS network in Gippsland. CarbonNet aims to capture carbon dioxide (CO₂) released by industrial processes in the Latrobe Valley, compress and transport it to an injection site offshore, then store it deep under the seabed in suitable secure geological formations – similar to the way oil and gas has been stored underground for millions of years.

The CarbonNet Project offers significant opportunities for new industries in Gippsland and for new jobs and investment, particularly in hydrogen and fertiliser production. At the same time, the project could make a substantial contribution to reducing Victoria's and Australia's CO₂ emissions.

What is carbon capture and storage?

Carbon capture and storage is a proven emissions reduction technology that involves capturing large amounts of CO₂ from industrial sources. This CO₂ would otherwise be released into the atmosphere. It is then transported for safe, long-term storage deep underground.

CCS activities have been in operation globally for more than two decades, safely storing millions of tonnes of CO₂.

The CCS process typically consists of four key steps:

- > The CO₂ is captured and purified.
- > The CO₂ gas is then compressed into a liquid-like form.
- > It is transported through a pipeline to a suitable injection site.
- > The CO₂ is injected deep below the ground (at a depth of 1 to 3 km) into a secure geological formation for permanent storage. Typical storage formations are areas of porous rock (reservoirs) that trap the CO₂ under thick layers of impermeable rock that act as seals, similar to oil and gas fields.



There are three specific research projects using the GipNet monitoring instruments.

The **Seismology Monitoring Network** will provide high accuracy seismology monitoring across the Gippsland Basin, a region with very few existing earthquake monitoring sites. The network will enable the precise location of local earthquakes, allowing a detailed understanding of these background earth movements and other geophysical properties of the region. By using innovative and cost-effective instruments and installation practices, the number of sites installed can be maximised. Earthquake measuring devices (seismometers) will be positioned in quiet locations away from sources of noise such as roads, power lines and heavily populated areas. Sites such as national parks and farm land are ideal locations.

Seismometers sit on hard, rocky ground or within a posthole, with all other equipment housed in a small self-contained box. Using a modem, data is transmitted back to The University of Melbourne, meaning the network can be remotely monitored and any movement of the ground can be detected.

The **Atmospheric Monitoring Network**, being established by The University of Melbourne and the University of Wollongong, is developing a method of detecting emissions to the atmosphere as well as their source.

The method is based on new atmospheric modeling techniques combined with atmospheric monitoring instruments. Researchers are developing a passive light-based system for measuring CO₂ in the atmosphere. The system uses an instrument that points invisible and harmless light at a series of reflectors in the Gippsland Basin. The project leaders are pioneers at developing models and instruments that detect emissions to the atmosphere.

The researchers will test the technology for suitability in the Gippsland environment, and use the findings to determine the future location of instruments and reflectors.

The Marine Monitoring Network is being led by CSIRO Oceans and Atmosphere. Their involvement is required because many of the best sites for storing CO₂ are located below the ocean floor. The team, who have extensive research experience, will study the natural variability of the marine environment. This will enable operators to develop environmental monitoring programs that provide public assurance and address regulatory requirements. As part of their research, CSIRO will be testing floating and submerged monitoring equipment that measures natural changes in seawater CO₂ levels and other environmental properties near-shore.

Where can I get more information?

To find out more about GipNet visit co2crc.com.au/gipnet or call 0467 003 122.

More information about CarbonNet can be found on at earthresources.vic.gov.au/carbonnet

