Safe CO2 storage test aids top research project

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A new method that inexpensively monitors the safe storage of industrial greenhouse gas emissions is to be used by a leading research project.

The test will aid the development of carbon capture and storage (CCS) technology, in which carbon dioxide from power stations and industrial sites is securely held underground.

The technology can help prevent emissions from reaching the atmosphere and contributing to climate change.

Scientists have shown that their test that can determine the source of a CO2 sample by analysing its chemical fingerprint.

Their method will be put to use at a $5 million CCS test site in Alberta operated by Carbon Management Canada.

Identification

Researchers from the University of Edinburgh developed the test by showing that the chemical fingerprint of CO2 captured from power plants remains recognisable after it is injected underground.

This enables stored industrial CO2 to be distinguished from other sources of CO2, such as groundwater or natural emissions from plants and bacteria.

The team verified the method by studying the chemical fingerprint of CO2 from experimental storage sites in Australia and Canada.

They sampled gas before and after its injection into underground storage and found that the fingerprints remained identifiable.

They also found that changes to the fingerprints during storage gave insights into behaviour of the CO2 underground.

Sourcing samples

In the same study, samples from CO2 from industrial sites and power plants around the world revealed how the chemical signature of CO2 varies with the source of the emissions, such as coal, gas or biomass.

Their research, published in the International Journal of Greenhouse Gas Control, was supported by the Engineering and Physical Sciences Research Council.

"The chemical fingerprint of captured CO2 varies depending on the capture technology used. This will be useful for tracking CO2 injected into storage sites and means that in most cases there is no need to add expensive artificial tracers," says Dr Stephanie Flude.

"Our study paves the way for inexpensive monitoring of CO2 underground for safe, secure storage. We look forward to working with Carbon Management Canada in applying our findings at the new Canadian CCS test site, which will demonstrate the exciting methods we have developed," says Dr Stuart Gilfillan.

Provided by University of Edinburgh

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