Geosequestration in a Nutshell

A guide for journalists prepared by the AusSMC

This is part of the *Science in a Nutshell* series produced by the AusSMC. This document provides a simple explanation of the technology and of some of the terms associated with it.

If you would like to know more about geosequestration please contact the AusSMC by email (info@aussmc.org) or call us on 08 8207 7415.

Geosequestration is…

The process of capturing and storing carbon dioxide from major industrial and energy-related sources (such as power stations) underground. Another term for geosequestration is Carbon Capture and Storage (CCS). In a typical geosequestration process, carbon dioxide (CO_2) is captured at an industrial facility, compressed and transported by pipeline to a suitable storage location. There, it is injected into a deep geological formation beneath the Earth's surface where it is intended that the CO_2 will be stored in isolation from the atmosphere for a very long time.

Safety issues

Some people are concerned that CO_2 stored underground could become unstable or that it could leak out slowly or rapidly following earth movements. This could result in the asphyxiation of people and animals. However, there are many places in the earth's crust where oil, gas and CO_2 have been safely stored for millions of years and geosequestration aims to emulate these natural traps.

Experts say it is extremely unlikely that CO_2 will leak to the surface from a geosequestration site because the storage location is deep and is overlain by impermeable geological formations that act as a seal. Storage sites will also be monitored to check the location and behavior of the CO_2.

Geosequestration in Australia

Australian research group, the Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC), plans to conduct the first Australian CO_2 geosequestration storage project in western Victoria in late 2006 or early 2007. The aim is to demonstrate the effectiveness of CO_2 storage underground.

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The problem with CO_2

CO_2 is produced when fossil fuels such as coal, oil or gas are burned. Most scientists say CO_2 is the biggest contributor to the greenhouse gas effect because it traps heat from the Sun in the Earth's atmosphere. This leads to climate change. Other gases, such as methane, nitrous oxide, chlorofluorocarbons (CFCs), hexafluorocarbons (HFC) and sulphur hexafluoride also add to the problem.

Reducing greenhouse gas emissions in Australia

In Australia coal is reliable, plentiful and relatively cheap and its supporters argue that we are likely to remain dependent on it for our energy needs for the foreseeable future. In 2006 the Federal Government committed to decreasing Australia's CO_2 emissions though a strategy of promoting innovation and the development of 'clean' technologies. It nominated Carbon Capture and Storage (CCS) as one of a number of technology options needed to reduce greenhouse gas emissions.

The Intergovernmental Panel on Climate Change (IPCC) estimated that a power plant with a CCS system could reduce CO_2 emissions by 80-90% compared to a plant without CCS. However, CCS is an expensive and unproven technology. If it works, the IPCC estimates that it will add 25 to 50% to the cost of coal-fired electricity.

Sources:

Intergovernmental Panel on Climate Change (IPCC) Special report on Carbon Capture and Storage. www.ipcc.ch/activity/ccsspm.pdf

Cooperative Research Centre for Greenhouse Gas Technologies
www.co2crc.com.au/understandccs.html

ABC Science Online www.abc.net.au/science/features/gasgrave/

More information:

Australian Government's Energy White Paper
www.pmc.gov.au/publications/energy_future/index.htm

Australian Greenhouse Office, Department of the Environment and Heritage
www.greenhouse.gov.au

Saddler, H, Riedy, C & Passey, R 2004, Geosequestration: What is it and how much can it contribute to a sustainable energy policy for Australia? Discussion Paper Number 72, The Australia Institute, Canberra, September 2004.

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