



CARBON DIOXIDE CAPTURE AND STORAGE

Carbon dioxide capture and storage (CCS) is a technology option aimed at reducing greenhouse gas emissions from burning fossil fuels during industrial and energy-related processes. CCS involves the capture, transport and long-term storage of carbon dioxide (CO₂), usually in geological reservoirs deep underground, that could otherwise be released to the atmosphere.

CCS, along with other actions such as improving energy efficiency, switching to less carbon intensive fuels and making better use of renewable energy resources, will help Australia, and the world, reduce emissions of greenhouse gases.

The Intergovernmental Panel on Climate Change Special Report on Carbon Dioxide Capture and Storage

The Intergovernmental Panel on Climate Change (IPCC) collates scientific advice on climate change. Australia accepts the conclusions of the IPCC as the most authoritative climate change science available. In September 2005 the IPCC released a Special Report on Carbon Dioxide Capture and Storage, summarising the current status of these technologies. The report was written by over 100 international scientists from more than 30 countries, and was reviewed by many experts and governments. The Australian Government was involved in the review process.

The report covers the sources of CO₂, the technical specifics of capturing, transporting and storing CO₂ in geological formations, the ocean, in minerals, or using the CO₂ in industrial processes. The report also assesses the costs and potential of CCS, environmental impacts, risks and safety, implications for greenhouse gas inventories and accounting, public perception and legal issues.

The report provides a reference for the status of CCS technologies. The results highlighted in the report describe possible policy options, and will have long-term relevance for government policy development.

The IPCC Special Report can be downloaded at: www.ipcc.ch

Key Findings from the IPCC Special Report on Carbon Dioxide Capture and Storage

IPCC analysis indicates that CCS is an important option available to reduce the impacts of climate change.

Technical Findings

- ▶ Geological storage (geosequestration) remains the priority application compared to other CO₂ storage options.
- ▶ Health, safety and environment risks for geological storage are low, and the level of risk will decline over time.
- ▶ For geological storage, 99% of the CO₂ is very likely to be retained over 100 years, and 99% of the CO₂ is likely to be retained over 1,000 years.
- ▶ Capture technologies involve the highest costs associated with CCS.
- ▶ Over the next decade, the cost of capture could be reduced by 20–30%.
- ▶ Before large scale application of geological storage can occur, further research is required into site selection criteria, potential risks, and monitoring and verification.

Policy Findings

- ▶ There is a need to increase public awareness of CCS technologies and their potential role in mitigating climate change.
- ▶ There is a need for the development of suitable regulatory frameworks before large-scale application of geosequestration can occur.

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Australia's Role in Developing Carbon Dioxide Capture and Storage Technologies

The Australian Government recognises that climate change is a serious challenge that requires an effective global and national response.

The best scientific advice tells us that the earth's climate is changing due in large part to human activity. The concentration of greenhouse gases such as carbon dioxide in our atmosphere is increasing through burning fossil fuels (coal, oil and natural gas), agriculture and land clearing, and is contributing to global climate change.

Further information on climate change science can be found in the booklet published by the Australian Greenhouse Office, Department of the Environment and Heritage, *Climate Change Science: Questions Answered* (www.greenhouse.gov.au/science/qa).

The Australian Government is leading the way in research and development of new technologies such as carbon dioxide capture and storage (CCS), through:

- ▶ researching capture and geological storage technologies through the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Geoscience Australia;
- ▶ funding Cooperative Research Centres that focus on capture and geological storage technologies such as the Cooperative Research Centre for Greenhouse Gas Technologies (www.co2crc.com.au) and the Cooperative Research Centre for Coal in Sustainable Development (www.ccsd.biz);
- ▶ working with industry and state governments to develop appropriate regulatory frameworks and monitoring and verification standards;
- ▶ providing funding opportunities for low emissions technologies through the \$500 million *Low Emissions Technology Demonstration Fund* and over \$500 million through a range of renewable energy programmes;
- ▶ supporting international efforts on CCS through the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change, which are tasked to advance global understanding on the nature and impacts of climate change and to seek mitigating action; and
- ▶ participating in international fora that examine low emissions technologies such as the Asia-Pacific Partnership on Clean Development and Climate and the Carbon Sequestration Leadership Forum.

Further information about the IPCC Special Report and Australia's role in developing CCS can be found at: www.greenhouse.gov.au/ccs

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