



*Carbon Capture &
Storage Association*

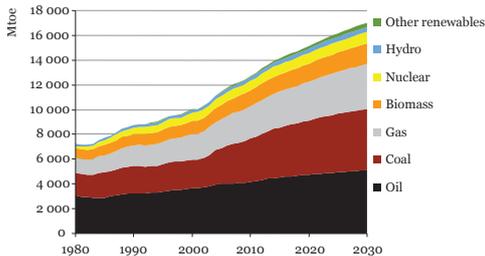


Carbon Capture and Storage

A crucial technology in addressing climate change

Why we need CCS

Carbon Capture and Storage (CCS) is urgently needed as a fundamental part of the fight against climate change.



*World primary energy demand for business-as-usual scenario
Source: IEA, "World Energy Outlook 2008"*

With nearly all developed economies largely relying on fossil fuel power for the foreseeable future and demand from developing countries increasing rapidly, it's clear that we cannot reduce global CO₂ levels without CCS.

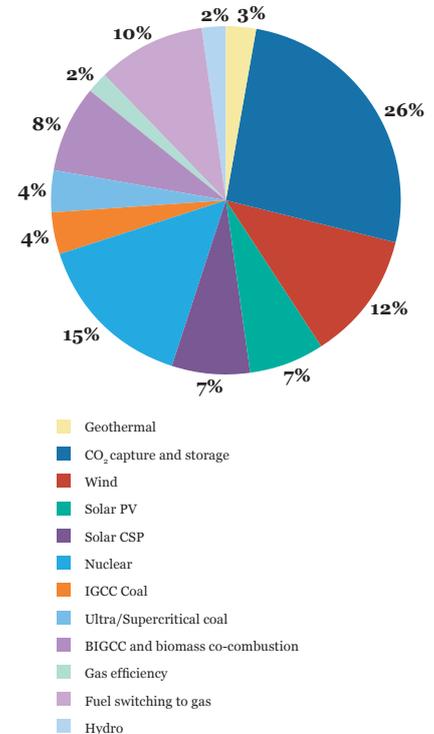
"We are at a critical junction in developing CCS. In order for CCS to realise its potential in the fight against climate change, we need to deploy a large number of CCS plants over the next 20 years." – Lord Oxburgh, President CCSA

Global energy demand as a whole is rising and the International Energy Agency estimates fossil fuels will remain a central part of the way we generate energy.

The question is how we maintain energy security and meet rising demand while minimising the effects of climate change.

CCS will allow us to take the carbon out of electricity supply while ensuring that fossil fuels remain part of a diverse portfolio of generation. In addition, CCS has huge potential for reducing emissions in other sectors, such as cement, steel and chemicals, where there may be few or no other options than CCS for reducing CO₂ emissions.

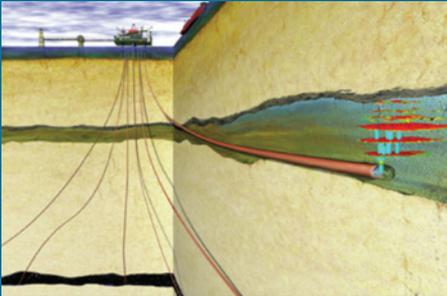
CCS is not the only solution, but it has to be a major part of it. It will only be developed if we take action now.



*Contribution to reduction in CO₂ emissions from the power sector by 2050
Source: IEA Energy Technologies Perspectives 2008*

How CCS works

CO₂ is captured...



CO₂ injection, Source: StatoilHydro

CCS captures approximately 90% of the carbon dioxide (CO₂) produced when fossil fuels are burnt, preventing it from entering the atmosphere. This can be done in three different ways: 'post-combustion', 'pre-combustion' and 'oxyfuel combustion'.

In post-combustion capture, CO₂ is separated from the exhaust gases of a combustion process instead of being released directly into the atmosphere.

In pre-combustion capture, fuel is first converted to a mixture of hydrogen and

CO₂. The CO₂ can then be captured and the hydrogen can be burnt to generate electricity.

In oxyfuel combustion, fuel is burnt in pure oxygen (rather than air) which results in flue gases consisting mainly of CO₂ and H₂O (water). This enables CO₂ to again be captured.

...then transported...

The CO₂ is then transported by pipeline or ship for storage at a suitable site.

CO₂ is already transported for commercial purposes today by road tanker, by ship and by pipeline.

...for secure underground storage

CO₂ can be stored in depleted gas and oil fields, in deep saline aquifer formations, or

injected into declining oil fields to increase the amount of oil recovered – a process known as Enhanced Oil Recovery (EOR). Storage sites are typically several kilometres under the Earth's surface.

CO₂ is injected into microscopic spaces in the porous rock that makes up the storage site and over time it gradually binds chemically to the rock. It is the same process that has kept oil and natural gas secure under the ground for millions of years.

Clearly the ability of storage sites to retain injected CO₂ is essential to the success of any CCS project. Storage sites will therefore be very carefully selected and monitored to ensure the highest confidence in permanent storage.

"CCS generation is an essential technology for reducing global emissions, but needs to be developed rapidly." – Lord Turner, Chair, Climate Change Committee, December 2008

About the CCSA

The Carbon Capture and Storage Association exists to promote the deployment of Carbon Capture and Storage (CCS) technology.

We work to raise awareness, both in the UK and internationally, of the benefits of CCS as an important climate change mitigation technology.

In the UK we have three main objectives:

- To increase understanding amongst policy makers and the general public of the benefits of CCS in reducing CO₂ emissions
- To help implement an appropriate long-term regulatory framework for the development of CCS in the UK, EU and internationally
- To ensure appropriate funding and investment incentives to develop CCS

We are working closely with the UK Government, the EU and international institutions to ensure CCS is developed to help tackle climate change internationally.

Membership

The CCSA brings together a broad range of companies with expertise in CCS. Our membership covers manufacturing & processing, power generation, engineering & contracting, oil, gas & minerals as well as a wide range of support services to the energy sector such as law, banking, consultancy and project management.

For a full list of our members visit http://www.ccsassociation.org.uk/our_members/our_members.html

Further information

For more information on the CCSA, the work we do and how to join visit our website www.ccsassociation.org

Or contact us at

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Carbon Capture &
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