WORLD COAL INSTITUTE

CLIMATE POLICY PAPER 5

5 Investing in CCS

Successfully addressing climate change requires the deployment of low-carbon technologies at a scale and rate not previously witnessed. Carbon Capture and Geological Storage (CCS) will make an essential contribution to global emissions reduction efforts; attempting to address climate change without CCS is estimated to increase costs by over 70% – an additional annual cost of US$1.28 trillion by 2050[1]. The World Coal Institute (WCI) believes that the new international climate change agreement must play a central role in increasing worldwide investment in CCS and should:

KEY POINTS

- Enhance the deployment of the full portfolio of low-carbon technologies including: energy efficiency; renewables; CCS; nuclear; and biomass technologies
- Promote and catalyse greater international investment in CCS to reflect the importance of this technology to international efforts to lower GHG emissions
- Provide CCS support mechanisms equivalent to those used to support other low-carbon technologies, enabling CCS projects to be developed now
- Contribute to the cost reductions in CCS technologies which will enable medium-term climate goals to be reached cost effectively
- Facilitate and enable the dissemination of this clean energy technology to countries which consider CCS to meet their national sustainable development criteria

[1] IEA "Energy Technology Perspectives" (2008)

WORLD COAL INSTITUTE

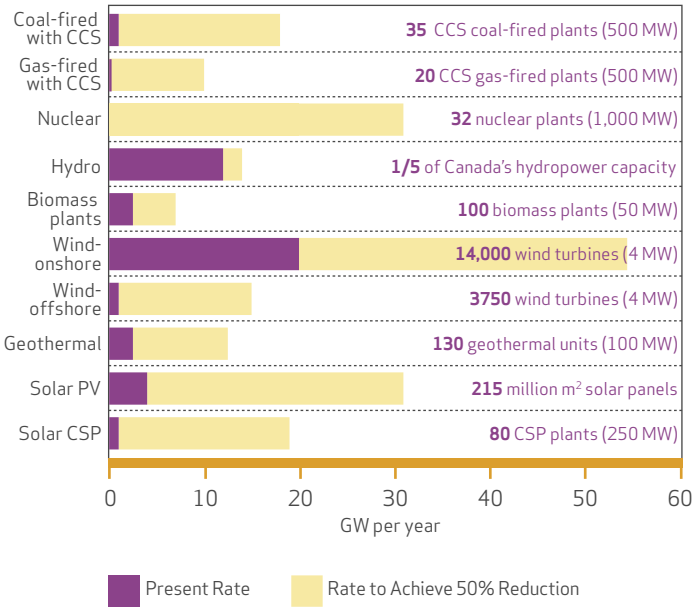
CLIMATE POLICY PAPER 5

Investing in CCS

The new international climate change agreement must enhance the deployment of the full portfolio of low-carbon technologies; including, energy efficiency, renewables, CCS, nuclear and biomass technologies

The exclusion of any technology family from the new international agreement will limit countries options to respond to climate change and hinder the international mitigation effort. Decisions on which technologies are deployed at the national level must remain with the host country which is best placed to ensure that technology choices are nationally appropriate and meet national sustainable development criteria.

Figure 1. Average Annual Power Plant Investment Needed Between 2010 - 2050 to Reduce Emissions by 50% from Current Levels



Source: IEA "Energy Technology Perspectives" (2008)

Current deployment rates for all low-carbon technologies are inadequate and investments must be increased substantially (Figure 1). Increased investment in technology deployment will generate emissions reductions and significant co-benefits that include improvements to the environmental and economic performance of technologies. These improvements will enable future emissions reductions to be reached at lower cost. Concerns that investing in CCS is diverting investment from other technologies such as renewables and energy efficiency are misplaced; all low-carbon technologies are required and greater investment is needed for all.

CCS is an environmentally effective, cost efficient technology with great potential to contribute to the global GHG reduction effort. The new agreement must promote and catalyse greater investment in this promising technology

Recognition that fossil fuels with CCS deliver the same climate benefit as other low-carbon technologies, coupled with the ability for CCS to deliver GHG reductions at the scale required, necessitates the removal of barriers that limit the deployment of CCS. Under the new agreement CCS must be incorporated under all mechanisms, incentives and programmes that pertain to GHG mitigation technology and finance. The new agreement should seek to incorporate and encourage:

- The generation of financial mechanisms to enable the development of CCS projects in developing countries;
- The recognition of developed country actions to further improve CCS technologies and facilitate their global diffusion and deployment; and
- The establishment of cooperative research and development efforts to further global capacity to deploy CCS.

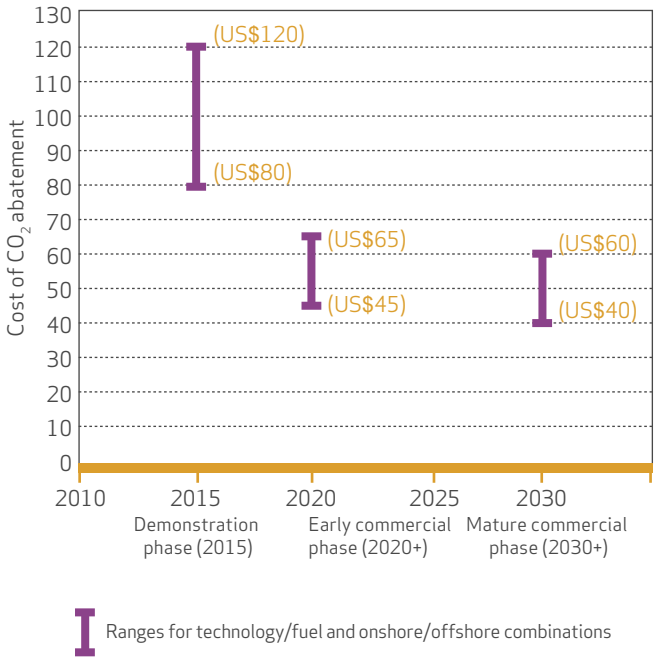
The central role of CCS to the global GHG reduction effort is not currently matched with a commensurate level of investment in the technology

Studies on the technologies deployed to stabilise atmospheric concentrations of CO_2 show that CCS is expected to make a major contribution to emissions reductions that will be equal to, or greater than, that provided by renewable energy technologies (see WCI Climate Policy Paper 4). However, current investments in CCS are tiny relative to those being made in renewables. Investment in renewables is estimated at over US$100 billion per annum - excluding subsidies[2]. In comparison, investments in CCS are just a small fraction of this amount, although a number of countries have recently made funding commitments for CCS projects. The G8 has agreed to commit, by 2010, to build 20 CCS plants at a total estimated cost of US$30 – 50 billion[3] over the 35 year lifetime of the projects.

Industry has the experience and technologies to develop CCS projects now; the provision of levels of support equivalent to those currently provided to other low-carbon technologies would enable CCS projects to be developed

The technologies used for CCS are found in existing industrial activities and are commercially available. CCS is the novel integration of these technologies for CO_2 mitigation purposes. A number of low-carbon technologies are reliant on the provision of support mechanisms that enable them to be deployed despite the cost of electricity they generate being higher than that provided by conventional generation technologies. CCS projects could be developed and operated if provided with an equivalent level of support.

Figure 2. CCS Overall Cost Journey



Source: McKinsey & Company "Carbon Capture and Storage: Assessing the Economics" (2008)

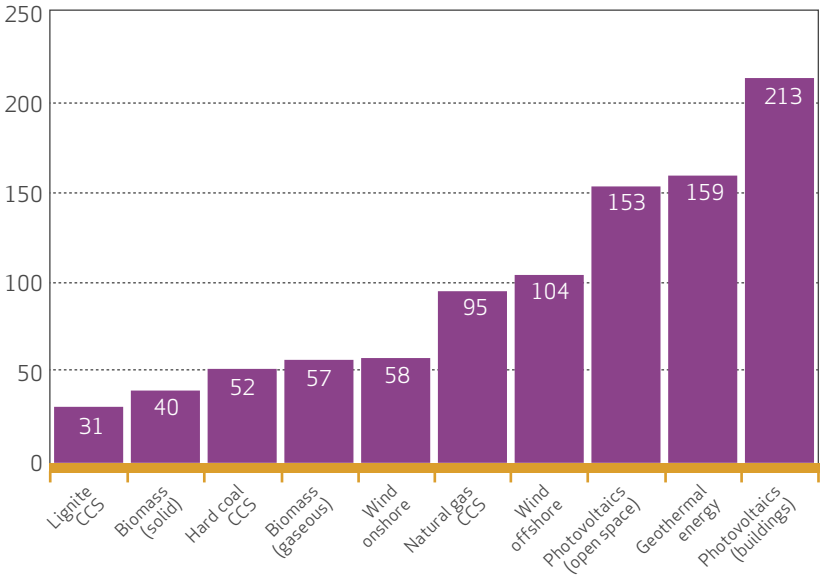
The cost of a CCS project varies significantly depending largely on the CO_2 source and its distance to a suitable storage site

Low-cost CCS projects can be developed where industrial activities that already separate CO_2 as part of the process – thereby avoiding high capture costs – are sited close to good storage sites. These projects can store CO_2 at a cost as low as US$6 tCO_2[4]. Deploying CCS at power plants is more expensive due to the high cost of capturing the CO_2. The first commercial-scale power plants fitted with CCS are likely to cost between US$80 – 120 tCO_2 although these costs are expected to decline to US$40 – 60 tCO_2 (Figure 2)[5].

[2] REN21
[3] IEA "CO_2 Capture and Storage, A Key Carbon Abatement Option" (2008)
[4] http://unfccc.int/files/meetings/sb24/in-session/application/pdf/sbsta_may_20th_in_salah_wright.pdf
[5] McKinsey & Company "Carbon Capture & Storage: Assessing the Economics" (2008)

Investing in CCS

Figure 3. 2020 CO_2 Avoidance Costs for Power Generation Technologies (EUR/t of CO_2)



Source: McKinsey & Company "Costs and Potentials of Greenhouse Gas Abatement in Germany", Energy Sector Perspective, Berlin (2007)

Investing in CCS now will lower the cost of the technology - as installed capacity is increased and operational experience gained - enabling medium-term emission reduction objectives to be reached at lower cost

Although CCS is ready for deployment now, significant opportunities exist to lower costs, particularly for CO_2 capture which is commonly the most expensive component of a project. It is estimated that in the future the costs of deploying CCS in the power sector could be reduced by almost half (Figure 2). Additional cost savings can be generated through economies of scale as larger CCS plants are constructed and opportunities to share CO_2 pipeline networks and geological storage sites become available. Failure to widely deploy CCS will mean that alternative – and frequently more costly – low-carbon technologies will need to be deployed (Figure 3).

CCS is an emerging industrial sector and will provide significant sustainable development opportunities for countries that become leaders in this technology

The huge challenge of reducing GHG emissions and the central role that will be played by CCS means that the technology will become a very significant industrial sector rivalling many of today's largest sectors in size. Countries at the leading edge of international action on CCS will be well placed to take advantage of this clean, sustainable energy technology and benefit from the skilled jobs and advanced technologies that the sector will generate. The new climate agreement must not include barriers to the deployment of CCS that would prohibit countries from using the technology should they wish.