Climate Action Network Europe
Position Paper CO_2 Capture and Storage

The Climate Action Network Europe believes that:

- Climate policy cannot wait for any one technology. Renewable energy sources and energy efficiency and conservation are proven, mature and environmentally friendly solutions to tackling the problem of climate change.
- CO_2 Capture and Storage must not divert public investments or political attention away from renewable energy and energy efficiency.
- In Europe, fossil fuel power stations including those labelled as 'clean coal' which emit significant amounts of greenhouse gases should not be built. Fossil fuel-powered station which already emit significant amounts of greenhouse gases need to close down with the next decade or so. Renewable energy technologies, energy efficiency and energy conservation should always be prioritised before building any new fossil power stations.
- CO_2 Capture and Storage may have a role to play in reducing greenhouse gas emissions from new and existing fossil fuel power station, provided that the risk and uncertainties associated with CO_2 Capture and Storage are addressed.

Introduction

The Climate Action Network (CAN) Europe believes that climate action must be driven by the aim of keeping global mean warming well below 2°Celsius compared to pre-industrial levels in order to prevent dangerous anthropogenic interference with the climate system. Recent science has made it clear that long-term atmospheric stabilisation at a level below 400 ppmv carbon dioxide (CO_2) equivalent is needed to stay below 2°Celsius of warming with high probability. The European Union must adopt a binding target to reduce its greenhouse gas emissions by at least 30% by 2020 and 80% by 2050, as part of a global reduction pathway in line with staying below 2° Celsius.

In order to achieve such reductions, profound, long-term structural changes are needed, especially with respect to the use of fossil fuels. Europe must build a sustainable energy system that can power its energy needs without harmful social and environmental impacts. Climate policy cannot wait for any one technology – we need a package of options to reduce the impact of climate change. Each climate mitigation option must fulfil high sustainability criteria. The promotion of renewable energy sources and energy efficiency and demand side management across all sectors is urgently required so as to confront a changing climate, while encouraging a shift to a truly sustainable energy future and taking advantage of the multiple environmental, economic and social benefits that clean energy sources and energy savings have to offer.

CO_2 Capture and Storage (CCS) is being discussed as a possible technology to mitigate climate change. CCS can be used from a variety of applications: post- and pre-combustion technologies. A power plant with CCS may reduce CO_2 pollution by 65-90% compared to a non-CCS plant[1]. Also, CCS requires technological scrubbing of conventional air pollutants and can contribute to clean air and health policy. However, there are a number of risks and uncertainties associated with CCS technology. Therefore, CAN Europe therefore calls for an informed public debate on CCS, focusing on the key issues set out below.

Sustainable Energy policy: A sustainable energy policy should be based on the highest level of energy efficiency and increased use of renewable energy sources. Diversifying the energy supply by maximising the share of renewables must include a just transition from all fossil fuels to clean energy sources. Even if the risks and uncertainties associated with CCS were to be resolved, it can not single-handedly solve the climate crisis. Technology development must be coupled with strong policy frameworks that help reduce CO_2 emission reductions. This means binding limits on

[1] IPCC (2005) IPCC Special Report CO2 Capture and Storage Summary for Policy Makers, p. 10 and Fischedick, M; Esken, A; Schuewer, D; Supersberger, N (2006) Ecological Comparison of Renewable Energy Technologies with Other Options for Climate Protection.

greenhouse gas emissions. Over the medium-term, within this emissions reduction framework, CCS may become more attractive as the scale of the necessary greenhouse gas emission reductions increases, but only as part of a system that supports clean, green technologies and practices. However, in the long run, only renewable energy technologies and energy efficiency can deliver a truly sustainable energy system.

Permanence: Carbon dioxide must be stored safely and permanently in locations that does not allow any leakage for thousands of years. The Intergovernmental Panel on Climate Change's (IPCC) Special Report on Carbon Dioxide Capture and Storage states that "if continuous leakage of CO_2 occurs, it could at least in part, offset the benefits of CCS for mitigating climate change"[2]. Leakage rates need to be near-zero or the benefits to the climate will be negligible. While oil and gas companies have experience with injecting CO_2 underground, there is still a lack of experience to prove long-term storage and safety in a variety of locations. Governments and proponents must ensure independent scientific review and long-term monitoring of storage projects and provide full public disclosure. International standards should be set vigorously with regard to the criteria to prove permanence. In addition, a liability scheme or "insurance" should be developed that could discount the amount of carbon stored over time to address issues of risks and leakage in case this carbon is being traded. Any CCS scheme must be based on a sound regulatory framework that in the case of the EU should be independent of the ETS.

Diversion of Resources: CCS must not divert investments or political attention away from renewable energy and energy efficiency which are proven and have many additional environmental and other benefits such as increased security of supply and job creation. CCS is still in the early phase of deployment and there is uncertainty over when and whether the technology will become commercial. As the IPCC Special Report concludes, there will be no single policy option that will provide all the emission reductions needed to achieve stabilisation of greenhouse gas emissions at safe levels[3]. CCS technology must not be prioritised over any mature, proven and environmentally friendly technology, particularly energy efficiency and renewable energy sources.

Public Funding: Industry argues that there must be a level playing field for all greenhouse gas abatement technologies, however this ignores the historical level of funding for fossil fuels, the most significant contributor to global warming. Member states and the EU continue to grant huge tranches of public finance as subsidies and state aid for fossil fuels[4]. Governments must not divert public resources away from clean energy to support CO_2 capture and storage. CAN does not support public funding, including state aid, for improving the efficiency of coal-fired power stations.

Environmental risks: CCS involves a range of environmental risks that are poorly understood with regard to large scale application of capture and as yet unknown risks associated with storage including risks to biodiversity and waterways. The sudden large-scale escape of CO_2 to the atmosphere could have severe consequences for humans, animals and plants[5]. A widespread application of CCS will result in the continued and increased reliance on fossil fuels, with the range of local environmental and social impacts associated with extraction, transportation and burning of fossil fuels. However, there are also high climate and environmental consequences with the release of all greenhouse gases into the atmosphere in the case old and new fossil fuel plants keep on emitting CO_2 without any capture.

No ocean storage: CAN is strongly against ocean storage (also named ocean disposal or dumping) because it will put the oceans and ocean sea beds unnecessarily at risk. The oceans, particularly the seabed, are rich in biological life and any disposal of CO_2 eventually increases the level of acidity (by

[2] Ibid, p.23

[3] Ibid p.2

[4] Froggatt, A and Teske, S (2005) "Invest in a Clean Energy Future! Greenpeace Exposes the EU's Dirty Energy Subsidies", Greenpeace International, The Netherlands.

[5] In central and south-central Italy degassing of non-volcanic CO_2 occurs to the atmosphere. CO_2 is emitted from vents, surface degassing and diffuse emission from CO_2-rich groundwater. At least ten people have been reported to have died from CO_2 releases in the region of Lazio in the last 20 years and CO_2 asphyxiation prompted the death of 30 cows in a heavily populated area near Rome in 1999 (Beaubien et al. 2003, Carbon dioxide and radon gas hazard in the Alban Hills area, Journal of Volcanic and Geothermal Research 123, 1-2 p. 63-80).

lowering the pH level) of oceans to potentially dangerous levels. CO_2 disposed of in this way is likely to get back into the atmosphere in a relative short time. Furthermore, the dumping of fossil fuel-derived CO_2 in the water column, at the seabed or beneath the seabed but connected with the marine environment from vessels or platforms would be contrary to the London Convention (1972) and, in the North East Atlantic region, to the OSPAR Convention (1992). The IPCC report found that "sustained high concentrations of CO_2 would cause mortality of ocean organisms"[6]. We call for an end to continuing efforts to develop pilot projects and plans for eventual implementation of ocean disposal[7].

Energy Penalty: Capturing CO_2 from existing power stations would require the use of large and expensive equipment and will use significant amounts of energy, thereby reducing overall power station efficiency by up to 40%[8]. A large energy penalty requires more tonnes of fossil fuels to be extracted and transported with their associated impacts. It also means that we are transferring our CO2 emissions and their negative impacts onto future generations.

Regulatory Framework: Currently, there is no legal or regulatory framework for CCS technology in the EU. There is an absence of an appropriate liability regime and lack of criteria for monitoring and reporting. Before any commercial projects are developed there must be an adequate regulatory framework which ensures high environmental standards as well as a legally-binding liability system.

Monitoring and Verification: Governments must ensure that third party monitoring and verification of storage facilities is undertaken and also enforce European side standards and regulations that guarantee environmental integrity. Independent high quality standards should be agreed globally to avoid any countries allowing low standard projects. The time-scale for monitoring is site-specific and has to be decided on a case-by-case basis. In this respect, proper and transparent site selection and well-monitored sites must be the priority. Also, in order to reduce leakage and seepage risks, a variety of sites should be considered rather than just one large carbon storage reservoir.

Liability: It has not yet been determined who will be liable to ensure that carbon pollution is safely stored underground for thousands of years. Governments must establish a stringent legal framework for regulating carbon storage projects, ensuring that the proponents assume complete legal liability for the full economic, environmental and social costs of leakage over the lifetime of the storage. The government and proponents of CCS must undertake to develop and implement Emergency Management Plans for site-specific projects. Governments should investigate the use of 'Carbon Storage Funds' or 'Carbon Sequestration Bonds[9]' as insurance, if leakage does occur.

Public Dialogue: CCS will also face hurdles of public acceptability and will require an informed public debate. Inclusion of NGOs and the public in discussions about climate technologies is absolutely necessary, particularly as these discussions begin to result in both real projects on the ground and real policies affecting their development. This includes not only the siting and operating storage reservoirs, but also the other environmental impacts of fossil fuel extraction and use. It is not reasonable to impose the risks of CCS onto future generations without full public disclosure and participation during the assessment process.

Research: Research is needed to fill the existing knowledge gaps, particularly with regard to storage, and must include assessing the environmental implications of this technology. Governments, however, should prioritise funding in research and legislative support to renewable energy sources and energy efficiency, which will achieve high greenhouse gas abatement and reduce environmental impacts. Research should determine the realistic scale of using this technology within the larger portfolio of carbon abatement options.

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[6] IPCC (2005) IPCC Special Report on Carbon dioxide Capture and Storage: Summary for Policymakers, p.22.
[7] For further information please see CAN Europe's policy paper on Ocean Storage www.climnet.org/CTAP/positions/CAN-E_oceanstorage.pdf
[8] IEA Greenhouse Gas R&D Programme, Putting Carbon back in the Ground IEA, UK and CAN Europe (2004) Climate Technology Sheet 1: Carbon Capture Technologies, Brussels.
[9] Edenhofer, O; Held, H and Bauer, (2005) "A regulatory framework for carbon capturing and sequestration within the Post-Kyoto Process" in Rubin, E. S., Keith, D. W., Gilboy, C. F. (ed.), Proceedings of 7th International Conference on Greenhouse Gas Control Technologies. Volume 1. Cheltenham.

We strongly reject research for ocean storage. We do not support research into improving the efficiency of fossil fired power stations. It is the natural role of the fossil fuel industry to undertake research on carbon capture to examine if their products (e.g. hard coal or coal power plants) can have a future in a carbon-constrained world. We support Government research into the environmental impacts of CCS particularly from storage sites. Governments should also investigate the environmental impacts associated with fossil fuel extraction.

CCS and Biomass: CCS in combination with biomass might offer the only energy option with negative CO_2 emissions. If grown and processed sustainably, biomass is more or less carbon neutral over its lifetime (growth, harvest, burning). If, after burning biomass, the CO_2 released is stored through CCS, this would reduce atmospheric concentrations of CO_2. Such an option might be important if CO_2 emissions have to be reduced more rapidly than currently thought.

Enhanced Oil and Gas Recovery: Injection of CO_2 in fossil fuel reservoirs can take place in order to increase the yield of fossil fuels. Experience with Enhanced Oil Recovery (EOR) and Enhanced Gas Recovery (EGR) is mainly in the United States but increasingly in Europe as well. Currently, studies are underway through pilot projects of EOR and the production of methane from coal layers (Coal Bed Methane or CBM). However, EOR plants can increase greenhouse emissions if the total CO_2 from the extra oil recovered from the reservoir is larger than the CO_2 stored.

Sustainable development: As a capital-intensive technology CCS does not provide as many long term benefits to local communities, compared to a shift from conventional energy sources to more labour-intensive renewable energy. The latter would likely promote more local development by creating employment and economic opportunities. CCS is effectively an end-of-pipe waste management response for CO_2 emissions. Health, safety and environment standards must be implemented and guidelines for CCS technology must be developed. All the unknowns and risks associated with CCS should first be resolved, before it is decided whether it will be used in the developed and developing world. For this reason CAN Europe does not support the inclusion of CCS in the first commitment period of the Clean Development Mechanism.

Technology alone is not the solution. Technology can reduce emissions but it will only be effective as part of a strategy that has measures to reduce emissions including ambitious binding targets. 'Clean fossil fuels' is a misleading term that has been used by the fossil fuel industry to green its public image. Incremental improvements in generation efficiency are a start but are physically incapable of achieving the needed emission reductions, because of the high carbon content of fossil fuels, especially coal. Governments must reject a new generation of investments in energy infrastructure that is accompanied by high carbon emissions.

Conclusions

Which role CCS has to play in the future will require an informed public debate. There are potential benefits but also critical risks, limitations and uncertainties associated with carbon capture and storage. There are also significant uncertainties concerning the risks of re-release of CO_2 from underground storage into the atmosphere. However, there are also the full climate risks of all emissions going into the atmosphere in a case of unabated emissions of new and existing fossil fuel plants. Carbon capture and storage must be integrated into a climate change policy framework and must not be developed at the expense of other environmentally friendly and proven solutions to climate change. There needs to be a regulatory and legal framework for CCS technology which includes independent monitoring and verification and a legally-binding liability system. Carbon capture and storage should never become an excuse to delay action to improve energy efficiency and to develop renewable energy sources.