Greenpeace submission to HM Treasury consultation on barriers to deployment of Carbon Capture and Storage (CCS)

Introduction and Overview

Greenpeace does not object in principle to CCS but questions its overall role in energy policy in tackling climate change. It is no silver bullet and it will be some decades before it is ready for wide deployment, for both technological and economic reasons. Nor does it treat the energy system as a whole; CCS continues the division between large electricity generating stations and local heating needs (space and water heating). Thus it perpetuates a system that has low overall efficiency of fossil fuel use at a time when fuel scarcity and security are seen as significant and growing issues.

For reasons of efficiency, fuel security, long-term liability, compliance monitoring and 'carbon lock-in' we believe that UK would be better off pursuing a path of renewable energy and energy efficiency support rather than shifting fiscal regimes and subsidies in favour of CCS.

We do object to CCS where the political and policy context is such that it entails:

- continued or increasing finance to the fossil fuel sector at the expense of renewable energy and energy efficiency.
- the stagnation of renewable energy, energy efficiency and energy conservation improvements, and decentralization of the energy system[1]
- the promotion of this possible future technology as the only major solution to climate change

Points we believe need to be made have been grouped below in the section as outlined in the consultation.

Potential carbon reductions

CCS is a much lower carbon form of power generation than fossil fuel stations without CCS. However supply-side fuel efficiency will be relatively low even assuming advances in technology. It is extremely unlikely that large CCS power stations will utilise the 'waste' heat produced in fuel combustion, even though the current UK power system wastes as much heat as is needed to supply all the space and water heating in UK buildings. Consequently the continuation of the centralised system of power generation (albeit with a few fossil stations fitted with CCS) could well represent a barrier to better all-round energy-system and fuel efficiency, and hence to better carbon reductions. System-wide thinking about energy will be necessary to reduce CO_2 emissions by 60-80% by 2050. The electricity system is responsible for approximately 38% (2003 figures) of UK CO_2 emissions and 32% of UK greenhouse gas emissions. Even a zero-emission

[1] Greenpeace, 2005. Decentralising Power: An energy revolution for 21st century. Greenpeace, London.

electricity system will not deliver the long-term emissions reductions necessary, emphasising the importance of looking at heat as part of the overall energy system.

Regulation, Liability and public acceptance

- A full regulatory system including ecological, geological, and compliance monitoring will need to be established before CCS can credibly have public confidence. This will necessitate costs from public purse.
- CCS will also have to be subsidised by public purse in taking on long-term liabilities for CO2.
- Although liability may be formally allocated, in practice remediation options for some problems such as leakage may be virtually non-existent
- The storage/dumping of CO2 in sub-seabed geological formations should not be used as a way of opening up more generalised routes to ocean disposal of wastes.
- The UK has a number of features which makes CCS relatively straightforward here – well-characterised geological formations, relatively nearby fossil-fuel power stations, active market in carbon trading to provide potential income stream from CCS, well developed engineering, geological and technical skill base. These are not necessarily available in many countries around the world, and so the international applicability of CCS is at best unproven and at worst virtually non-existent.
- Perhaps more importantly UK has a general corporate culture of regulatory compliance. Again this is not necessarily the case in many countries – important where it will ALWAYS be cheaper to emit CO2 than to capture and store.
- Leakage from geological formations not only poses the risk of environmental damage, it may also jeopardize future stabilization targets when CCS is used excessively or if CO2 is stored in unsuitable storage sites. Studies indicate that for stabilization at 450ppm leakage rates must be less than 0.01% per year to be acceptable for all IPCC emissions scenarios (SRES)[2]. Leak rates of greater that 1% per year will be unacceptable in terms of costs to future generations.

Costs

Power plants fitted with carbon capture and storage technology will need up to 30% more energy input to produce the same amount of electricity, and with generation costs of (typically) 40% or more greater than plant without CCS. This will increase the vulnerability of the UK power system to price shocks from fluctuations in the international fossil fuel prices.

Economic Incentives

[2] Hepple R.P., Benson S.M. (2003): Implications of surface seepage on the effectiveness of geologic storage of carbon dioxide as a climate change mitigation option. Greenhouse gas control technologies, Proceedings of 6th International Conference, Vol.1 p.267.

IPCC Special Report on Carbon Capture and Storage[3] indicates that only under a robust climate regime with high (greater than US$25/tonne) carbon prices could the technology possibly compete with other low carbon generation sources; and these models were run using fossil fuel prices from around 2000, since which time coal prices have doubled, and oil and gas have tripled, making the competitive situation even more difficult. To make commercial (as distinct from demonstration) CCS projects 'bankable' in terms of being financially worthwhile there clearly needs to be an income stream generated from application of the technology. This would necessitate a high and reasonably certain carbon price. With the necessity of a high carbon price to make CCS viable, we submit that it is a bad use of taxpayers' money to incentivise technology without a commitment at the heart of Government to bring about such a high carbon price through tight cap on emissions. We believe that, for CCS, the best incentive is though a high carbon price in the EU Emissions Trading Scheme.

If fossil fuel companies or utilities wish to bring forward proposals to deal with one of their biggest public policy issues (climate change emissions) that is a matter for them. We do not believe it is appropriate for this – currently highly profitable – sector to be further incentivised by contributions from the public purse. Indeed, as described above, the public purse will inevitably have to contribute through the monitoring, inspection, regulatory regime development and long-term liability for captured CO_2. No-one would expect HM Treasury to provide direct financial incentives for banks, insurance companies, food manufacturers or large retailers in response to rising expectations of meeting public policy requirements (e.g. healthy food in response to rising obesity levels) or ethical behaviour. We see no reason for oil or mining companies, or power utilities, to be treated differently.

We believe that the global situation requires that UK puts its public resources and incentives into the promotion of renewable energy generation; especially marine renewables where the UK has clear advantages – good resources, skills base, and engineering infrastructure. The UK energy system needs to proceed in an integrated manner to capture heat and power from fossil-fuels used – meaning a decentralisation of our energy system.

[3] IPCC SRCCS, SPM (download from: http://arch.rivm.nl/env/int/ipcc/pages_media/ccs-report.html); Chapter 5 – Underground geological Storage