Environmental Audit Committee inquiry on Carbon Capture & Storage

Comment from the National Oceanography Centre, Southampton. 2nd June 2008

Summary

I. Observations of the marine environment confirm that efforts should be in place to reduce anthropogenic greenhouse gas emissions as quickly as possible.

II. Ocean acidification poses as great, if not greater risk to natural ecosystems as changing temperatures and sea level rise.

III. Technology exists to remove carbon dioxide from the exhaust flow of hydrocarbon-fuelled power stations.

IV. Hydrocarbon-fuelled power stations are very large emitters of carbon dioxide.

V. If the UK wants to make significant cuts to CO2 output quickly, carbon capture and storage presents an engineering solution able to quickly deliver reductions.

VI. New-build hydrocarbon, particularly coal, - fuelled power stations should include CCS from day one as an integral part of the design. Older stations could have the technology retrofitted.

VII. The technology is not especially risky and industry already has experience of how to do this.

VIII. Suitable geological formations exist within UK territory for long term carbon storage.

1.0 The National Oceanography Centre, Southampton, welcomes the opportunity to respond to this enquiry. Jointly owned by the Natural Environment Research Council and the University of Southampton, we are the UK's leading centre for observations of the deep ocean environment, see www.noc.soton.ac.uk

2.0 Our oceanographic research and observations lead our scientists to endorse the view that anthropogenic carbon emissions pose a potent threat to the stability of our climate and to the biochemical balance of the oceans.

2.1 There are real risks of the existence of climate 'tipping points', beyond which effects could be rapid and irreversible in the short to medium term.

2.2 The relatively recent discovery that ocean pH is being affected by anthropogenic carbon has shown that even if CO_2 had no climate impact, it is still necessary to lower our emissions if we are to avoid causing damage to the ocean ecosystem, in particular to coral reefs and to organisms that have shells made of calcium carbonate.

2.3 We accept that there are varying estimates of what the ‘safe’ level of atmospheric CO_2 equivalent are. In view of these uncertainties, and the very great impacts posed by rapid climate change in particular, it is prudent to instigate carbon capture and storage techniques to help remove carbon dioxide from the atmosphere.

3.0 It is difficult to engineer carbon capture systems for small, mobile systems such as aircraft and road vehicles but much easier for fixed land structures that burn hydrocarbons such as power stations, and to other large emitters of CO_2 such as cement production plants.

3.1 The Norwegian pilot CO_2 injection scheme at the Sleipner platform in the North Sea points the way ahead to long term carbon capture and storage (CCS) in a stable geological structure.

4.0 If the UK as a nation intends applying measures to reduce CO_2 emissions, coal fuelled electricity generation should only be permitted if carbon capture and storage techniques are applied.

4.1 It is reasonable to say that CCS could be retrofitted to older installations, and new stations should not be built without it.

4.2 The risks to the environment of failing to reduce CO_2 output are potentially so serious that to commission new coal-powered plant without CCS could be seen as negligent, and could give the impression to the world that the UK is not treating climate change seriously.

5.0 The UK has geological formations that have retained vast quantities of oil and natural gas for millions of years.

5.1 These formations are now depleted, and it is reasonable to hold that these same formations can absorb similar volumes of carbon dioxide and retain the substance for a long enough period that even with leakage, the rate at which the carbon re-enters the atmosphere is vastly less than the rate at which it is currently being generated.

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