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**HSE's response to BERR's Consultation Document
"Towards Carbon Capture and Storage"**

A Paper by Rosemary Whitbread

Cleared by Giles Denham on 26 August 2008

Issue

1. On 30 June the Department of Business, Enterprise and Regulatory Reform (BERR) published a consultation document – "Towards Carbon Capture and Storage (CCS)" – which sets out the Government's view on CCS as a 'high potential' carbon abatement technology. A number of issues raised in the document have health and safety implications - to which HSE should respond.

Timing

2. For clearance on 3 September to enable an approved paper to go to the HSE Board meeting on 25 September.

Recommendation

3. The SMT is invited to consider and agree the attached draft paper and formal response to BERR's consultation.

Background

4. See attached draft paper.

Health and Safety Executive Board		HSE/08/53	
Meeting Date	25 September 2008	FoI Status	Fully Open
Type of Paper	Below the line	Exemptions	None
HSE's response to BERR's Consultation Document "Towards Carbon Capture and Storage"			

Purpose of the paper

1. On 30 June the Department of Business, Enterprise and Regulatory Reform (BERR) published a consultation document – "[Towards Carbon Capture and Storage \(CCS\)](#)" – which sets out the Government's view on CCS as a 'high potential' carbon abatement technology. This paper seeks Board agreement to HSE's proposed response on the issues which have implications for health and safety.

Background

2. The UK Government is keen to promote CCS and is committed both to the successful demonstration of the technology and to developing the necessary economic and regulatory framework which together will drive its widespread deployment.
3. Work is progressing on the regulatory and policy framework within which CCS should operate at both a national level (through the Energy Bill¹) and at EU level (through the European Commission's proposal for a Directive on the geological storage of carbon dioxide (CO₂)).
4. Within HSE, work is ongoing to determine a view based on risk assessment of whether and how major hazard legislation could be applied to the CCS process.²
5. The consultation seeks views on:
 - a. proposals in the draft Directive (Article 32) that the carbon capture readiness (CCR) of any new power plant must have been addressed by developers in the design process and be taken into account by regulatory authorities when deciding whether or not to consent to such a new plant;
 - b. a basic framework for licensing storage of CO₂ offshore, including dealing with liabilities;
 - c. other aspects of the Directive not covered above, in particular the regulation of CO₂ storage onshore.
6. As a member of the project steering group, HSE contributes to the UK negotiating strategy for the EU Directive. The Chair, on behalf of the Board, has previously been invited to give an early steer on the position HSE should adopt in relation to CCR.³ This paper addresses the wider aspects of the consultation document.

Argument

7. HSE's CCS working group has prepared a detailed response to the consultation, limiting its comments to those questions which have an impact on health and safety (Annex 1). The key themes are:

¹ The Board were updated on the non nuclear aspects of the Energy Bill and the impact on HSE's business in Misc. Paper 08/09.

² Current evidence indicates that the processes involved in CCS have major accident hazard potential. This is largely due to the scale of the projects and the pressures of CO₂ involved. However, the hazard classification of CO₂ is such that it does not specifically attract the duties normally required for major hazard control.

³ Board Paper HSE/08/52 cleared by the Chair on behalf of the Board.

- a. HSE's role in consenting new power plants as 'carbon capture ready' including the land use planning implications;
 - b. the application of offshore health and safety legislation to CCS installations where the licence is not granted under the Petroleum Act;
 - c. HSE's role in licensing offshore CCS installations;
 - d. potential barriers to the permanent storage of CO₂ onshore.
8. Carbon Capture Readiness
 The most advanced forms of CO₂ capture technology are amine scrubbing (post capture) and oxy-fuel. Both amines and oxygen are defined as dangerous substances under the Seveso II Directive, with qualifying quantities of 50 and 200 tonnes respectively. Therefore, depending on the scale of the process and regardless of any future changes to the classification of CO₂, it is foreseeable that the capture facilities at combustion plants will be defined as establishments to be regulated under the Seveso II Directive (COMAH).
9. HSE has proposed that Article 32 of the CCS Directive should be amended to reflect the land use planning requirements of the Seveso II Directive when consenting a new power plant as 'carbon capture ready'. The need for this amendment is based on existing hazardous substance classifications rather than the ongoing review of the major accident hazard potential of CO₂. This review may result in dense phase CO₂ being classified as a hazardous substance with future implications for regulation by HSE of installations that process or store qualifying quantities. However, as things currently stand, this proposal does not add to regulatory burdens, but rather makes things clearer to industry by drawing attention to an existing requirement.
10. When implementing CCR in the UK, we will need to consider further the assessment of safety issues associated with CO₂ transport arrangements, as these are not regulated at a European level. Work is under way to determine whether dense phase CO₂ should be classified as a dangerous fluid under the Pipeline Safety Regulations (PSR). Such an amendment would introduce a requirement for developers to notify HSE of CO₂ pipelines prior to construction and would establish land use planning restrictions around the proposed routes. The response makes it clear that developers can minimise the impact of any future changes in safety legislation by ensuring they have a robust understanding of the potential hazards, and design their transport solutions to minimise any impact on public safety.
11. The consultation document (paragraph 3.67) highlights that HSE will '*have a key role to play in advising on the safety aspects of CCR studies*'. In line with the current policy on charging⁴ the proposed response states the need for HSE to recover the cost of this work.
12. Licensing arrangements for offshore CCS Installations
 The Energy Bill provides for the licensing of offshore CCS installations and the consultation document gives a more detailed overview of the leasing and licensing arrangements. HSE does not anticipate any problems with the framework as described. However, as licences will not be issued under the Petroleum Act, and currently much offshore health and safety legislation is tied to installations licensed under this Act, key offshore health and safety regulations

⁴ To recover the costs of work of a permissioning nature where there is economic advantage to those required to pay.

will not apply.⁵ The draft response notes that HSE is actively addressing this challenge with BERR, and reviewing what amendments to health and safety regulations may be required.

13. Licensing Authority for offshore CCS installations

As noted in the consultation document, the specialist knowledge necessary to regulate offshore CCS installations is currently spread throughout government and its agencies. Until final arrangements are put in place, BERR's Secretary of State will act lead in licensing the offshore storage of CO₂ except in Scottish territorial waters where the Scottish Ministers will be responsible. The draft response notes that HSE would not seek to take the lead in licensing decisions but would want to explore the best arrangements for contributing its expertise to the decision making process. The draft response points up the distinction between the licensing function and the regulation of licensed activities, in which HSE would expect a lead role.

14. Onshore CCS Storage

The consultation seeks views on barriers to onshore storage of CO₂. The controversy caused by recent proposals for underground onshore storage of natural gas highlights the importance of an appropriate safety regulatory regime to underpin public acceptance of such projects. Until we have a better understanding of the health and safety risks associated with the injection and permanent storage of CO₂ the response suggests that HSE would support the Government's assessment that offshore storage should be the priority in the first instance.

Financial/Resource Implications for HSE

15. The resource implications of HSE's proposed amendment to Article 32 (paragraph 9) are not significant, as the amendment is based on existing hazardous substance classifications. It would result in an additional six to eight hazardous substance consent applications over a ten year period at a cost of £12K per application. If the negotiating position is not adopted, qualifying power plants would still require hazardous substance consent, but the applications would be submitted at a later stage.⁶
16. Developing and following through amendments to PSR to define CO₂ as a dangerous fluid and to introduce land use planning controls around CO₂ pipelines (paragraph 10) would require considerable expenditure, as we do not currently have the necessary assessment methodologies or models for dense phase CO₂. It is likely to cost £300K to develop assessment methodologies and a further £200K to develop the model. Further operational resource would be required to assess pipeline notifications but in the absence of any data on the likely number of new pipelines and the complexity of the assessment required it is not possible to quantify this. Under existing arrangements these costs could not be recovered.
17. As the potential uptake of CCS has yet to be determined, we cannot assess the likely number of offshore license applications. BERR have not quantified the associated costs and benefits in the impact assessments for the Energy Bill or

⁵ Petroleum Act Licences are granted by BERR for the *exploration and exploitation* of oil and gas reserves. They do not cover storage or decommissioning. Several key HSE offshore regulations apply only to installations that are licensed under section 3 of the Petroleum Act. These include; Offshore Installations (Safety Case) Regulations 2005 (SCR); Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER); and Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995 (MAR).

⁶ Further details are available in Board Paper HSE/08/52

the consultation document. HSE would not commit to any statutory function relating to license applications without securing an appropriate cost recovery option, and the draft response makes this point.

Action

18. To agree that the Chair should send a formal response to the BERR consultation, based on the draft at Annex 1. The deadline for responses is 22 September but BERR officials have agreed an extension for HSE to allow the Board to consider its response.

Paper clearance

19. This paper was produced by Rosemary Whitbread and was cleared by the Senior Management Team on 3 September.

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Annex 1
Towards Carbon Capture and Storage
HSE's response to BERR's consultation questions

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**HSE RESPONSE TO THE DEPARTMENT FOR BUSINESS, ENTERPRISE
AND REGULATORY REFORM (BERR) CONSULTATION DOCUMENT
“TOWARDS CARBON CAPTURE AND STORAGE”**

The Health and Safety Executive (HSE) welcomes the opportunity to comment on the Government's view on CCS as a 'high potential' carbon abatement technology, and in particular those areas that have implications for health and safety.

HSE will have a key role in ensuring that all aspects of CCS address the health and safety risks involved and provide appropriate protection for workers and the public. In this respect, four themes are of interest to us:

- our role in consenting new power plants as 'carbon capture ready', including the land use planning implications
- the application of offshore health and safety legislation to CCS installations (where the licence is not granted under the Petroleum Consolidation Act)
- our role in licensing offshore CCS installations, and
- potential barriers to the permanent storage of CO₂ onshore.

Our views on these matters are detailed in the attached response to your consultation questions.

I would also ask you to note that HSE's policy is to recover the costs of work associated with permissioning regimes, where there is economic advantage to those required to pay. We would therefore seek to recover the costs of our role in assessing whether a plant is carbon capture ready, and from our involvement in any new licensing or similar system.

Towards Carbon Capture and Storage HSE's response to BERR's consultation questions

Fossil Fuels: electricity generation and climate change

Q1: We would welcome your views on what more the Government might do to promote the development and deployment of CCS technologies in the UK, EU and globally.

Public acceptance of CCS is a key success criterion. As noted in the IPPC special report on Carbon Dioxide Capture and Storage '*public concerns about CO2 transportation may form a significant barrier to large-scale use of CCS*'. The Government should continue to support and promote research which will allow for a shared understanding of the hazards/risks and an appropriate safety regulatory regime to underpin public confidence in CCS technologies.

Article 32 of the draft CCS Directive⁷. Carbon Capture Ready

Q2: Do you agree that developers should have suitable space on site or adjacent to it to accommodate future carbon capture and processing plant?

HSE welcomes this requirement. Suitable and sufficient space is essential for the safe retro fitting of carbon capture and processing plant. Insufficient space could lead to a high level of congestion on site. This could lead to safety problems during installation; would make maintenance more difficult and would make explosion hazards worse (e.g. in the event of a catastrophic leakage of fuel).

Q3: What do you see as the appropriate space requirements to accommodate different types of capture technologies and why? How might these vary in relation to different sizes of plant?

The Health and Safety Laboratory is currently doing work for the International Energy Agency on hazards in CCS. During this work industry representatives have discussed space requirements ranging between 40% and 100% of the area covered by the main power station buildings. If space requirements are to be defined in terms of area per GW then further research may be required to clarify these requirements.

An alternative approach would be to require developers to complete a high level design and layout study to demonstrate they have adequate space available. A good layout may be able to minimise the space requirement.

In some cases it may not be necessary to have all the space available adjacent to the power plant. For oxycombustion, there may be safety advantages in having the oxygen production units separate and to pipe the oxygen to the power station so as to mitigate the potential hazard of coal/fuel dust ingress into the oxygen plant.

⁷ Full text of Article 32 available at Appendix 1

Q4: *Should developers be required to assess the feasibility of retrofitting carbon capture technology to their combustion plant?*

Yes

Q5: *Do you know of any other evidence that provides a more appropriate benchmark (in respect of post capture amine technology or oxy-fuel) than the IEA document as to what issues need to be considered for the power station design.*

No

Q6: *Do you know of other documents for other capture technologies that we should be considering as reference documents?*

No

Q7: *Should a developer have to identify a potential storage area or areas when it develops new combustion plant? If so, do you think that identifying a potential area by reference to the DTI study is appropriate or can you identify other studies on storage sites that might be relevant?*

The proposed approach seems reasonable. There should be the opportunity to use future relevant studies which supersede the DTI document.

Q8: *Is a feasibility study for each application the appropriate means of addressing the transport component of CCR?*

HSE would welcome this requirement. A feasibility study would be important to demonstrate that safety concerns could be addressed and that the best option for transport (where risks are controlled to as low as reasonably practicable) had been chosen.

Q9: *Should this transport assessment address the three issues set out in paragraph 3.25?*

Yes. In addition to these issues the assessment should also address whether the best option/concept has been chosen, balancing factors such inherent safety with economics.

The consultation document highlights possible future changes in the Pipeline Safety Regulations which would require operators to notify HSE prior to the construction and operation of CO₂ pipelines. Such changes to legislation would also introduce land use planning controls around approved pipelines. In practice, developers can minimise the impact of any future changes in safety legislation by ensuring they have a robust understanding of the hazard potential of their proposed transport solution and design it accordingly to minimise the impact on public safety. HSE has published Interim Guidance on conveying CO₂ in pipelines in

connection with Carbon Capture, Storage on its web site (<http://www.hse.gov.uk/pipelines/co2conveying.htm>).

Q10: *Are there any other factor(s) you believe should be included in Article 32? If so, why?*

Where the proposed capture technology requires the introduction of qualifying quantities of dangerous substances as defined by the Seveso II Directive, Member State should give due regard to Article 12 of this Directive⁸ when assessing the suitability of the space on the installation site.

The addition of this factor will not add to regulatory burdens, but will make things clearer to industry by drawing attention to an existing requirement.

Article 12 of the Seveso II Directive requires Member States to ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in their land use policies and/or other relevant policies. They shall pursue those objectives through controls on the siting of new establishments.

At present, Carbon Dioxide is not classified as a dangerous substance under the Seveso II Directive. However, as cited in paragraph 3.7 of the consultation document, the most advanced forms of capture technology are amine scrubbing (post capture) and oxy-fuel. Amines (if the amine chosen is toxic) and oxygen are both defined as dangerous substance with qualifying quantities of 50 and 200 tonnes respectively. Depending on the scale of the process it is possible that carbon dioxide capture facilities will be defined as establishments under the Seveso II Directive. Due consideration should be given to the siting of new capture plants to minimise the consequences of a major accident.

Where combustion plants have been licensed as 'carbon capture ready' there will be an ongoing need to ensure that the competent authorities and planning authorities responsible for implementing the land use planning requirements of the Seveso II Directive take account of the need, in the long term, to maintain appropriate distances between the proposed capture plant and residential areas etc.

This approach will have the added benefits of;

- a) providing a land use planning 'buffer' around potential capture installations reducing the impact of any future reclassification of CO₂. (Ongoing research into the major accident hazard potential of dense phase CO₂ may result in capture installation being subject to the Seveso II Directive by virtue of the quantity of CO₂ on site.)
- b) encouraging the development and uptake of alternative capture technologies that are inherently safe and do not attract the duties of the Seveso II Directive.

⁸ Full text of Article 12 (Seveso II Directive) available at Appendix 2

- c) providing a better overall justification for putting CCR requirements in legislation by drawing attention to the existing land use planning issues as outlined above along with other necessary considerations at the design stage.

Q11: Should the UK support a 300MWe threshold or should we be arguing for a higher or lower threshold? Why?

It is possible that any threshold would be revised in the future as the hazard potential of dense phase CO₂ is better understood.

Q12: Should the coverage of CCR extend to all fossil fuel power plants with a capacity of 300MWe or more?

N/A

Q13: What impact might a CCR requirement have on the likelihood of new build, whether for 300MWe or move standalone CHP⁹ or Good Quality CHP plants attached to coal and gas generating stations?

N/A

Q14: Should the Government explore with the Commission and other Member States the possible disincentive effect on proposed 'Good Quality' CHP plants which might otherwise be caught by a CCR requirement? If not, why not?

N/A

Q15: What might the impact of the potential costs of CCR for 100% biomass power plants and so the implications for their future build? Should the Government explore excluding 100% Biomass schemes from the proposed Article 32?

N/A

Q16: In EU negotiations do you agree that the UK Government should support the proposals in Article 32 relating to carbon capture ready?

HSE's formal position is to support Article 32 provided Member States pay due regard to Article 12 of the Seveso II Directive. This will ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in their land use policies and/or other relevant policies.

Q17: If, following the negotiations, the adopted EU Directive does not contain Article 32, should UK Government take steps domestically to introduce

⁹ CHP = combined heat and power

requirements equivalent to Article 32 in England and Wales? Why do you think this would be justified?

N/A

Q18: Do you envisage any difficulties with using the consent regime under section 36 Electricity Act 1989 to implement Article 32?

HSE does not envisage any difficulties in using the consent regime under section 36 Electricity Act provided appropriate mechanisms are but in place to ensure safety issues are given due consideration as part of the decision making process.

Q19: Is the EA the appropriate agency to advise the consenting body on whether the proposed plant could be built CCR? If not, who might be better placed to do so?

N/A

Q20: Are there any of the proposed factors another body might be better placed to advise on and why?

As indicated in the paragraph 3.67 of the consultation document HSE should have a role to play in assessing safety issues associated with determining whether a plant is carbon capture ready. HSE would seek to recover the cost of this work from the operator in line with the current policy on charging (which is to recover the costs of work of a permissioning nature where there is economic advantage to those required to pay).

Q21: Should a plant only be consented if the studies and assessments carried out demonstrate that it could be capable of being build CCR?

N/A

Q22: Do you agree that the CCR factors might have the consequences described in paragraphs 3.71-2¹⁰? Would such consequences cause concern and if so why?

HSE would agree that safety considerations for CO₂ capture and transport, particularly those associated with land use planning controls, may give rise to circumstances where it would not be appropriate for a plant to be built CCR.

'Planning Circular 04/00: Planning controls for hazardous substances' provides the following guidance on balancing potential conflicts between safety and the socio-economic benefits of proposed developments.

¹⁰ Full text of paragraphs 3.71-3.72 available at Appendix 3

'HSE has the expertise to assess the risks arising from the presence of a hazardous substance to persons in the vicinity and advise upon the likely risks arising to the environment. However, the decision as to whether the risks associated with the presence of hazardous substances, either to persons or to the environment, are tolerable in the context of existing and potential uses of neighbouring land is one which should be made by an elected authority (paragraph 41).'

Q23: Do you agree that in certain circumstances Government should be permitted to consent to power stations that do not meet all the four factors that underpin the CCR criterion? If yes, what might such circumstances be?

N/A

The Safe Storage of Carbon Dioxide

Q24: We would welcome views on our proposals for dealing with CO₂ storage projects involving EOR.

EOR is a regulated activity under the Petroleum Act whereas carbon storage *per se*, is currently not subject to health and safety regulation. HSE is actively considering what amendments to its secondary legislation will be required to address this issue.

Q25: We would welcome your views on this model licensing and lease structure. Can you see any problems with our conceptual model? If so, how might we address such problems?

HSE does not anticipate any problems with the framework as described. However, as licenses will not be issued under the Petroleum Act, key offshore health and safety legislation will not apply. HSE is actively considering what amendments to its secondary legislation will be required to address this issue.

Q26: We would welcome views on how the perimeter of a store should be described in the case of a CO₂ store in an unconfined space such as an aquifer.

HSE agree the CO₂ store should be defined by its impermeable (geological) boundaries rather than artificial spatial boundaries (as are used in petroleum license areas). This would provide more reliable controls against loss of containment hazards.

Q27: Is it important to retain the possibility of using the sub-surface space for multiple purposes so long as these do not conflict?

The principle of multiple use of a reservoir for CO₂ containment and temporary hydrocarbon storage will create specific hazards the control measures for which have yet to be developed. See also our response to Q.25.

Q28: Are the suggested arrangements for dealing with potential interference between CO2 storage and petroleum production adequate? If not, what would you suggest?

In addition to the proposed licensing arrangements, adequate safety and environmental protection measures would need to be applied.

Q29: If the Directive remains focussed on environmental projects, should the UK implementation arrangements be wide enough to also control economic considerations?

Yes, along with safety considerations.

Q30: We would welcome views on the criteria that should apply to the termination of a licence and our preferred approach also set out in Article 18(1) of the proposed Directive.

N/A

Q31: We would welcome views on the proposed financial security arrangements we should introduce.

N/A

Q32: Of the two types of arrangements we have identified, what do you see as the advantages and disadvantages of each approach for CO2 storage? Are there any other arrangements that you believe may be more effective?

N/A

Q33: To what extent should the financial guarantee arrangements include a provision for contingent liabilities? How should we estimate an appropriate level of financial provisioning for these liabilities?

N/A

Q34: Should any provisions for contingent liabilities pass to government on termination of a license to compensate for the residual risk that will transfer?

N/A

Q35: We would welcome views on the measures covered by Annex 2, particularly if you think that anything is missing or unnecessary.

N/A

Q36: We would appreciate views on the appropriate licensing authority for offshore carbon dioxide storage.

HSE would not seek to take the lead as the licensing authority for offshore carbon dioxide storage but would want to explore the best arrangements for contributing its expertise to the decision making process. Again, in line with the charging policy, HSE would seek to recover costs for this work from the operator.

Regulation of operations carried out under the terms of the license is a separate function in which we would expect HSE to take a primary role.

Other Aspects of the Draft Directive

Q37: We would welcome any information about the effect that this proposed permit review might have on potential storage site operators.

N/A

Q38: Although we think the proposed Directive provides sufficient scope for Government intervention in the future should it be necessary, we would welcome any views you have on the way in which the transport and storage network might develop in both the UK and EU.

N/A

Q39: We would welcome information about forthcoming or planned CCS projects that might require transboundary cooperation between competent authorities

N/A

Q40: Assuming EU legislative barrier to onshore storage of CO2 are removed by the Directive, do you agree with the Government's assessment that offshore storage should be the priority in the first instance? Do you envisage any other barriers to onshore storage of carbon dioxide?

The controversy caused by recent proposals for onshore underground storage of natural gas highlights the importance of an appropriate safety regime to underpin public acceptance of such projects. Until we have a better understanding of the health and safety risks associated with the injection and permanent storage of CO2 HSE would support the Government's assessment that offshore storage should be the priority in the first instance.

Appendix 1

Extract from the proposed EU Directive on the geological storage of carbon dioxide

Article 32

Amendment of Directive 2001/80/EC

In Directive 2001/80/EC, the following Article 9a is inserted:

"Article 9a

Member States shall ensure that all combustion plants with a capacity of 300 megawatts or more for which the original construction licence or, in the absence of such a procedure, the original operating licence is granted after the entry into force of Directive XX/XX/EC of the European Parliament and of the Council.(*), have suitable space on the installation site for the equipment necessary to capture and compress CO₂ and that the availability of suitable storage sites and suitable transport facilities, and the technical feasibility of retrofitting for CO₂ capture have been assessed.

Appendix 2

Extract from the Seveso II Directive 96/82/EC (as amended)

Article 12

Land-use planning

1. Member States shall ensure that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in their land use policies and/or other relevant policies. They shall pursue those objectives through controls on :
 - a. the siting of new establishments,
 - b. modifications to existing establishments covered by Article 10,
 - c. new developments such as transport links, locations frequented by the public and residential areas in the vicinity of existing establishments, where the siting or developments are such as to increase the risk or consequences of a major accident.

Member States shall ensure that their land-use and/or other relevant policies and the procedures for implementing those policies take account of the need, in the long term, to maintain appropriate distances between establishments covered by this Directive and residential areas, areas of public use and areas of particular natural sensitivity or interest, and, in the case of existing establishments, of the need for additional technical measures in accordance with Article 5 so as not to increase the risks to people.

2. Member States shall ensure that all competent authorities and planning authorities responsible for decisions in this area set up appropriate consultation procedures to facilitate implementation of the policies established under paragraph 1. The procedures shall be designed to ensure that technical advice on the risks arising from the establishment is available, either on a case-by-case or on a generic basis, when decisions are taken.

Appendix 3

Extract from "Towards Carbon Capture and Storage"

- 3.71 The Government would as a general principle want the assessments to demonstrate that, on the basis of known information, there are no insuperable difficulties to a plant being built CCR. But the Government is also conscious that there may be circumstances in which it might be appropriate to grant consents, even though a new plant could not demonstrate all four factors of CCR. For example, it is possible that, with CCR, the siting of some combustion plants in suburban industrial sites would become more difficult, partly because of the extra space that CCR would require, but also for possible safety reasons when transporting CO₂ off site. It might be a particular

problem for new 300MWe or more plants with CHP plant which need to be relatively close to the users and therefore tend to be in more suburban areas than is the norm for most fossil fuel plants.

- 3.72 There may also be security of supply reasons why plant that did not fulfil CCR might need to be consented. For example, over time the transport factor in any CCR condition could effect the location of new power plants, which may lead to difficulties in managing the electricity system. There is also a risk that plant fitted with CCS will not be able to operate flexibly, which is one of the significant benefits of fossil fuel plant today. There are different views on the extent to which flexibility might be affected, if at all, by various types of capture technologies. We will understand this risk better once our, and other, demonstration projects are operational.