

An Assessment of Carbon Capture and Storage under EC Competition Law

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1. Introduction

Carbon capture and storage (CCS) refers to the technique whereby carbon dioxide emissions are captured and stored rather than emitted into the atmosphere. CCS is likely to be an attractive carbon dioxide abatement technique power plants, and notably coal fired power plants. The fact that CCS is relevant to the energy production sector, in connection with the close technical connection with the gas market, leads to a number of competition concerns. These are only increased when the importance of coal as part of the EU's strategy for ensuring security of supply is taken into account.¹ CCS may thus have a number of effects on the competitive situation in the EU and on global scale. Some of these effects may also result in the applicability of the competition provisions of the EC Treaty.² This paper aims to investigate these effects and propose solutions to some of the problems that will be identified.

The current framework for CCS is set by the Kyoto Protocol and the implementation thereof in the EU.³ CCS is one of the instruments by which companies may attain their Kyoto obligations, as carbon dioxide that is captured counts towards the emission reduction targets for that company. In the EU large industrial installations face carbon dioxide emissions reductions targets as part of the implementation of the Emissions trading Directive.⁴ This Directive envisages the allocation of allowances to those installations. The total amount of available allowances is consequently reduced in order to reduce total emissions. At the end of every year the companies have to surrender allowances corresponding to their emissions over that period. Excess allowances may be sold to companies that have emitted more than they were allowed.

Moreover, the Commission has just tabled a proposal for a directive on the geological storage of carbon dioxide.⁵ This proposal aims to integrate CCS in the relevant environmental legislation as well as providing a general framework for the authorisation, operation and post-closure obligations of CCS installations. Interestingly for the purpose of this paper, the proposal also contains provisions on access to carbon dioxide transport and storage facilities that appear to have been strongly influenced by competition-considerations.⁶

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¹ Cf. Commission Communication on Sustainable power generation from fossil fuels: aiming for near-zero emissions from coal after 2020, COM (2006) 843, at p. 4.

² On this relation between the competitive situation and restrictions and distortions of competition that fall under competition law see H.H.B. Vedder, *Competition Law and Environmental Protection in Europe: Towards Sustainability?*, Groningen: Europa Law Publishing 2003, p. 61 *et seq.*

³ See further: J.H. Jans and H.H.B. Vedder, *European Environmental Law*, Groningen: Europa Law Publishing 2008, p. 384 *et seq.* For an analysis of the legal framework for CCS see: H. de Coninck, J. Anderson, P. Curnow *et al.* 'Acceptability of CO₂ capture and storage, ECN report of May 2006 available on: <http://www.ecn.nl/docs/library/report/2006/c06026.pdf>.

⁴ Directive 2003/87, OJ 2003 L 275/32.

⁵ Proposal dated 23 January 2008. This is a working document only available on: http://ec.europa.eu/environment/climat/ccs/pdf/com_2008_18.pdf. Hereafter referred to as the proposed CCS Directive.

⁶ Chapter 5 of the proposal. See more extensively section 3.5 below.

CCS is unprofitable at the moment in that the costs of capturing and storing a given amount of carbon dioxide are higher than the costs of emitting it and simply buying extra emissions allowances.⁷ However, with increased scarcity of allowances as a result of a reduction in the total amount of allowances allocated the price of allowances is expected to increase. This is a relevant factor for the competitive assessment of CCS. It is furthermore to be expected that fossil fuels that burn relatively clean (*i.e.* produce relatively little carbon dioxide when combusted; natural gas) will become more expensive in view of their increased scarcity relative to dirtier fuels (such as coal).⁸ CCS opens up the possibility of using relatively dirty and cheap fuels, such as coal, and still meet emissions reductions targets. This opening up of the market for primary energy sources is also partly influenced by security of supply considerations.⁹ As a result CCS has effects on the competitive situation of large industrial installations.¹⁰ This may be relevant as far as an assessment of the competitive situation under EC merger law is concerned.¹¹

The current unprofitability of CCS may trigger government subsidisation of research into CCS or the construction of CCS facilities. Such subsidisation may very well constitute state aid within the meaning of Article 87 EC.

CCS facilities, and notably the storage of captured carbon, require a specific geological situation in that the subsoil must allow for the safe storage of carbon dioxide.¹² Moreover, the costs of storage should be as low as possible, because, for example, existing infrastructure can be used. One way of reducing costs is by using infrastructure that is also available for gas storage, as this takes place on an industry scale already. If such storage facilities cannot be used simultaneously for both carbon dioxide and natural gas storage, the result may be competition between demand for natural gas and carbon dioxide storage. Given the likely dependence on existing infrastructures for storage, CCS may thus not be equally available to installations across the EC. Although this is in itself not directly a problem that falls within the remit of EC competition law, it may reduce the chances of political compromise on an EU wide CCS regime.¹³

If the possibilities for carbon dioxide storage are scarce and the costs of CCS in their relation to the price of emissions allowances make CCS a viable option for meeting emissions reductions targets a further competitive effect may occur. As cost reductions can be achieved through the use of existing facilities for the production of natural gas and because such facilities may be owned or operated by private companies, the storage facility may be an essential facility under EC competition law. Moreover, as the transport and storage of

⁷ The Institut Francais de Petrole (IFP) estimates the costs as at least € 50 / tonne of avoided emissions IFP, *La séquestration de CO₂*, p. 4, available on: [http://www.ifp.fr/IFP/fr/IFP00PPU.nsf/VFOLD/A7E0730F1035C50C80256E220065FD57/\\$FILE/IFP-AlexandreRojey-LaSequestrationDeCO2.pdf](http://www.ifp.fr/IFP/fr/IFP00PPU.nsf/VFOLD/A7E0730F1035C50C80256E220065FD57/$FILE/IFP-AlexandreRojey-LaSequestrationDeCO2.pdf). The current price for a allowance corresponding to one tonne of carbon dioxide is between € 20 and 25.

⁸ See point 40 of the Impact Assessment of the Proposed CCS Directive, Working Document adopted on 23 January 2008. Available from: http://ec.europa.eu/environment/climat/ccs/pdf/ccs_ia_jan2008.pdf

⁹ See point 33 of the Impact Assessment of the Proposed CCS Directive, Working Document adopted on 23 January 2008. Available from: http://ec.europa.eu/environment/climat/ccs/pdf/ccs_ia_jan2008.pdf

¹⁰ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005.

¹¹ Regulation 139/2004, OJ 2004 L 24/1.

¹² See point 265 of the Impact Assessment of the Proposed CCS Directive, Working Document adopted on 23 January 2008. Available from: http://ec.europa.eu/environment/climat/ccs/pdf/ccs_ia_jan2008.pdf

¹³ In the proposal for a CCS Directive, this is acknowledged, see recital 15 of the preamble and point 15 of the Impact Assessment of the Proposed CCS Directive.

captured carbon dioxide is essentially a process whereby a production residue is treated,¹⁴ CCS facilities and activities may stand in a vertical or diagonal relation to the primary market on which an undertaking is active (e.g. power generation). In competition law terminology this is also referred to as the neighbouring market.¹⁵ Such vertical integration may lead to competition problems in the form of foreclosure, even in situations that do not involve the market power required for a finding of an essential facility.

Yet another competitive effect may arise from the use of captured carbon dioxide for enhanced recovery of oil or gas.¹⁶ In addition, CCS may also allow for methane (natural gas) to be recovered from unminable coal beds.¹⁷ Existing infrastructures will thus become extra profitable because more fossil fuels can be obtained and CCS facilities may be offered to third companies.¹⁸ This could be relevant when the competitive situation is assessed under EC merger law. In many jurisdictions, the facility operator is granted an exclusive right to the exploitation of a well or pit for the duration of the exploitation. Extending the life span of an oil, gas or coal field by means of carbon dioxide injection may thus have a multiplier effect on the markets for both the production of gas or oil and CCS. These effects may also be relevant from a competition law perspective as they could enhance the foreclosure effect whilst at the same time increasing the market power on the primary market.

However, before such competitive effects can be investigated the question whether enhanced recovery actually constitutes CCS needs to be addressed. This question follows from the fact that in enhanced recovery schemes the carbon dioxide will be 'produced' along with the oil and gas. As a result it is said that such schemes do not qualify as CCS. The Proposed CCS Directive, however, does appear to allow for the use of CCS in enhanced recovery schemes. The bottom line in this proposal is that CCS should lead to 'permanent containment of carbon dioxide' (Article 1(2)). As long as the carbon dioxide that is pumped up with the gas or oil is consequently stripped and (re)injected in the storage facility under appropriate containment conditions, the use of carbon dioxide in enhanced recovery schemes should qualify as CCS.¹⁹

As there is to this date no competition law practice concerning CCS, we will look at Commission decisions involving the market for gas storage. This is believed to be a valid comparison as the market for gas storage stands in a similar vertical and/or diagonal relation to the primary markets concerned in these Commission decisions.

2. State aid on the financing of CCS development and infrastructure

¹⁴ This paper does not address the question whether captured carbon dioxide constitutes a waste within the meaning of Directive 2006/12. See in more detail D. Pocklington, 'The Significance of the Proposed Changes to the Waste Framework Directive' [2006] EELR 75-87. See further IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 145, on the classification of captured carbon dioxide as a product.

¹⁵ See e.g. Case C-311/84, *Télémarketing*, [1985] ECR 3261.

¹⁶ See: E. Tzimas, A. Georgakaki, C. Garcia Cortes and S.D. Peteves, Enhanced Oil Recovery using Carbon Dioxide in the European Energy System, DG JRC December 2005 at p. 99 *et seq.*, available on: http://ie.jrc.cec.eu.int/publications/scientific_publications/2005/EUR21895EN.pdf

¹⁷ Also referred to as enhanced coal bed methane recovery, see J.C. Pashin, R.H. Groshong and R.E. Carroll, Enhanced Coalbed Methane Recovery Through Sequestration of Carbon Dioxide: Potential for a Market-Based Environmental Solution in the Black Warrior Basin of Alabama, report available on: http://www.netl.doe.gov/publications/proceedings/01/carbon_seq/3a2.pdf.

¹⁸ Cf. J.C. Pashin, R.H. Groshong and R.E. Carroll, *ibid*, at p. 11.

¹⁹ See on this topic: C. Philibert, J. Ellis and J. Podkanski, Carbon Capture and Storage in the CDM, OECD paper COM/ENV/EPOC/IEA/SLT(2007)1, at p. 14, available on: http://www.iea.org/textbase/papers/2007/CCS_in_CDM.pdf.

Article 87(1) EC prohibits any aid granted by or through member states to undertakings insofar as this aid distorts competition and has an effect on trade between member states. The second and third paragraph of Article 87 contain exemption clauses. The application of these, however, requires notification of the aid in advance to the European Commission.

Article 87(1) EC has been given a wide interpretation. As a result all forms of public funds²⁰ fall under this heading when they are distributed by the member state or entities that are under member state control.²¹ The Court considers a distortion of competition inherent in the fact that one undertaking is subsidised whereas others are not²² and the requirement of an effect on trade between member states is equally easily satisfied.²³ Finally, the state aid must contain an advantage for a specific undertaking or a special group of undertakings. As far as the concept of an undertaking is concerned, this is given a wide interpretation. Only entities engaged in the performance of essential state prerogatives²⁴ and those involved in solidarity-based activities²⁵ are excluded from the scope. All entities active in the market for the exploration and production of oil, gas and electricity are undertakings, and thus subject to the competition provisions.²⁶ In *Altmark Trans* an exception to the scope of Article 87(1) was created for government subsidies that only entail a compensation of the costs arising from the fulfilment of a service of general economic interest. Finally, only aid not exceeding more than € 200.000 over a three-year period will fall under the *De minimis* regulation and not be subject to the notification requirement.

Any form of government subsidy for CCS development or infrastructure to these entities will thus constitute state aid within the meaning of Article 87(1). CCS projects will probably require investment aid, to cover some of the extra costs arising from the investment in CCS facilities, as well as operating aid. The latter category of aid has a particular potential for a distortion of competition as it involves a subsidisation of the every day operating costs of a CCS facility. This is probably necessary as CCS in power generation plants may result in the production costs of electricity increasing with 20% to 85%.²⁷ CCS equipped power plants are thus currently unprofitable, although this may change when the costs of carbon dioxide emissions increase.

Such funding will have to be notified to the European Commission for an exemption on the basis of Article 87(2) or (3), unless it can be brought under the heading of one of the group exemption regulations. At this moment none of the block exemptions applies.²⁸ The compatibility of such aids with the common market will thus have to be determined by the Commission on the basis of Article 87(3) EC following a notification. The Commission has

²⁰ See on the necessity of public funds to be involved: Case C-379/98, *PreussenElektra*, [2001] ECR I-2099.

²¹ Case C-482/99, *Stardust Marine*, [2002] ECR I-4397.

²² Joined cases 296 and 318/82, *Leeuwarder Papierfabriek*, [1985] ECR 809 and Case 730/79, *Philip Morris*, [1980] ECR 2671.

²³ Case C-409/00, *Plan Renove*, [2003] ECR I-1487.

²⁴ Case C-343/95, *Diego Calì*, [1997] ECR I-1547, Case C-364/92, *SAT Fluggesellschaft*, [1994] ECR I-43 and Case T-155/04, *SELEX Sistemi*, n.y.o.r.

²⁵ Such as certain forms of social insurance, see Joined Cases C-159/91 and C-160/91, *Poucet and Pistre*, [1993] ECR I-637, Case C-244/94, *FFSA*, [1995] ECR I-4013, Case C-67/96, *Albany*, [1999] ECR I-751 and Joined cases C-264/01, C-306/01, C-354/01 and C-355/01, *AOK*, [2004] ECR I-2493.

²⁶ As is also evidenced by the fact that mergers in that field are subject to the Merger Regulation.

²⁷ The actual cost increase depends on the capture process used and the power plant, see IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 168.

²⁸ These are Regulation 1998/2006 (De minimis), OJ 2006 L 379/5, Regulation 2204/2002 (Employment), OJ 2002 L 337/3, Regulation 70/2001 (SMEs), OJ 2001 L 10/33, Regulation No 68/2001 (Training aid), OJ 2001 L 10/20 and Regulation 1628/2006 (Regional aid), OJ 2006 L 302/29.

issued guidelines on its application of Article 87(3) to state aid for environmental protection²⁹ and state aid for research and development and innovation.³⁰ Such guidelines have the effect of binding the Commission in that they create legitimate expectations that can be enforced before a Community Court.³¹ Before the compatibility of CCS aid with these guidelines is examined, the Regulation on state aid in the coal sector will be scrutinised.³² Finally, the compatibility of such aids with the new Draft General Block Exemption Regulation is reviewed.

2.1 State aid for CCS and the Coal Sector Regulation

The Coal Sector Regulation is the result of the expiry of the ECSC Treaty, and thus the end of the special regime for the coal sector. It is also clearly influenced by an increased awareness of the security of supply considerations that characterise the energy sector in the EU.³³ The Coal Sector Regulation allows for investment aid and operating aid within a strict framework. For example, investment is allowed for maintaining access to coal reserves (Article 5(1)). It is uncertain whether this can be interpreted to include CCS for enhanced coal bed methane recovery, as this does not entail access to coal reserves but another primary energy source. Nevertheless, the Regulation, when viewed in the context of the objective of energy security, would appear to allow for the state subsidisation of CCS for this purpose. This interpretation will, however, lead to problems with the third condition imposed on such aid. According to Article 5(2)(c) such aid may not exceed 30% of the total costs of the relevant investment project which will enable a production unit to become competitive in relation to the prices for coal of a similar quality from third countries. Allowing for CCS for enhanced coal bed methane recovery will require the competitive assessment to be changed to include methane of similar quality from third countries. Article 5(3) allows for operating aid necessary for accessing coal reserves under similarly strict conditions. One important hurdle to overcome relates to the deadline for the notification. According to Article 9(6) of the Coal Sector Regulation, plans for accessing coal reserves must be notified before 31 October 2002. More recent plans thus fall outside the scope of the current Regulation.

2.2 State aid for CCS and the Environmental Aid Guidelines

The current Environmental Aid Guidelines date from 2001 and were intended to expire on 31 December 2007.³⁴ The new Environmental Aid Guidelines have been presented in draft form, but they are still subject to internal review by the Commission.

The 2001 Guidelines are based on Article 87(3)(c) and distinguish between investment aid and operating aid. Interestingly, the 2001 Environmental Aid Guidelines envisage aid for energy saving, waste management, environmental investments, but not for climate change. In Section F, the Commission explicitly states that member state measures to comply with the Kyoto Protocol could constitute state aid but that it is too early to lay down conditions for the authorisation of such aid. The 2001 Environmental Aid Guidelines also allow for authorisation on the basis of Article 87(3)(b). This is, however, subject to strict conditions.³⁵ For one, the aid must promote the execution of an important project of common European interest. Such a project must be an environmental priority and will often have beneficial cross-border effects. Such aid must be necessary for the project to proceed, and the project

²⁹ OJ 2001 C 37/3 hereafter referred to as the 2001 Environmental Aid Guidelines, the validity of these guidelines has been extended to 30 April 2008 at the latest.

³⁰ OJ 2006 C 323/1.

³¹ Case C-409/00, *Plan Renove*, [2003] ECR I-1487.

³² Regulation 1407/2002, OJ 2002 L 205/1, hereafter: Coal Sector Regulation.

³³ Cf. recitals 3 – 6 of the preamble to the Coal Sector Regulation.

³⁴ The validity of these Guidelines has been extended until the entry into force of the new guidelines, at the latest on 30 April 2008, OJ 2008 C 316/58.

³⁵ These conditions follow partly from the *Glaverbel* case, Joined Cases 62/87 and 72/87, *Glaverbel*, [1988] ECR 1573, see H.H.B. Vedder, *Competition Law and Environmental Protection in Europe: Towards Sustainability?*, Groningen: Europa Law Publishing 2003, p. 299.

must be specific, well defined and qualitatively important and must make an exemplary and clearly identifiable contribution to the common European interest. This ground for an exemption allows for state aid at higher rates than the limits laid down for aid authorised pursuant to Article 87(3)(c).

The preliminary version of the 2008 Environmental Aid Guidelines is quite explicit as regards aid to combat climate change.³⁶ However, concerning CCS, the 2008 Guidelines conclude, in similar vein as the Draft Guidelines,³⁷ that there is at this moment insufficient experience to lay down guidelines for the authorisation of such aid.³⁸ The 2008 Guidelines then continue with the Commission's intention to assess such projects favourably. The Commission will thus allow support for the construction of industrial-scale demonstration plants up to 2015, provided that such plants are environmentally safe. The basis for this would be Article 87(3)(c) EC. The Commission also considers such aid exemptible as necessary for an important project of common European interest under the conditions set out in Article 87(3)(b). In the latter case the following criteria in paragraph 147 of the 2008 Guidelines are applicable:³⁹

- (a) The aid proposal concerns a project which is specific and clearly defined in respect of the terms of its implementation including its participants, its objectives and effects and the means to achieve both. The Commission may also consider a group of projects as together constituting a project.
- (b) The project must be in the common European interest: the project must contribute in a concrete, exemplary and identifiable manner to the Community interest in the field of environmental protection, such as by being of great importance for the environmental strategy of the European Union. The advantage achieved by the objective of the project must not be limited to the Member State or the Member States implementing it, but must extend to the Community as a whole. The project must present a substantive contribution to the Community objectives. The fact that the project is carried out by undertakings in different Member States is not sufficient.
- (c) The aid is necessary and presents an incentive for the execution of the project, which must involve a high level of risk.
- (d) The project is of great importance with regard to its volume: it must be substantial in size and produce substantial environmental effects.

The Commission requires the common European interest to be demonstrated in practical terms. Furthermore, the Commission will consider notified projects more favourably if they include a significant own contribution of the beneficiary to the project. It will equally consider more favourably notified projects involving undertakings from a significant number of Member States.⁴⁰ The consultation that followed the Draft Guidelines revealed that many parties consider that the Guidelines should contain more specific rules on the authorisation of state aid for CCS.⁴¹ One step could be the express recognition of CCS as a project of common

³⁶ Community Guidelines on State Aid for Environmental Protection, working document adopted on 23 January 2008, to be found on: http://ec.europa.eu/comm/competition/state_aid/reform/reform.cfm#environment. Hereafter referred to as 2008 Environmental Aid Guidelines.

³⁷ Staff paper, preliminary draft for public consultation dated 10 May 2007 (first version), Version to Member States for the 2nd Multilateral on 5 November 2007 (second version), both available on http://ec.europa.eu/comm/competition/state_aid/reform/reform.cfm#environment.

³⁸ 2008 Environmental Aid Guidelines, para. 69.

³⁹ These criteria also follow by and large from the Glaverbel case, Joined Cases 62/87 and 72/87, *Glaverbel*, [1988] ECR 1573.

⁴⁰ Draft Environmental Aid Guidelines, paras. 148, 149.

⁴¹ E.g. the reaction of BusinessEurope, the Netherlands and, notably, Norway. Reactions can be found on: http://ec.europa.eu/comm/competition/state_aid/reform/comments_environmental_protection_2/index.html

European interest.⁴² In that case only the economic assessment of the necessity and intensity of the state aid would have to take place. In order to determine this, the Commission suggests a three-stage balancing test in the 2008 Environmental Aid Guidelines.⁴³ Firstly, there must be well-defined objective of common interest, such as environmental protection. Secondly, the aid must be well-designed so as to address the market failure that stands in the way of the objective of common interest. This second step involved three intermediate steps that basically concern the necessity of the state aid. The third step is a proportionality test whereby the distortions of competition and trade should be limited. When this balancing test is applied to state aid for CCS, the first requirement is met, as CCS is a carbon abatement technology that will result in a higher degree of environmental protection.⁴⁴ The second step should not prove to be insurmountable either as there are market failures (notably externalities) that prevent the creation of a market for CCS. In this regard it should be pointed out that the use of CCS in an enhanced oil or gas recovery scheme or for enhanced coal bed methane recovery will result in lower costs as oil and gas prices increase. This reduces the market failure. A market failure may be similarly less likely if the costs of other carbon abatement methods increase relative to the costs of CCS. The outcome of the application of the third requirement will be impossible to predict in the absence of more guidance. Such proportionality tests involve significant discretion. Whatever may be of the application of such a test to state aid for CCS, the uncertainty inherent in this test is hardly conducive to the investment climate that is needed for the large scale and long-term investments involved in CCS.

A further point of critique concerning the Draft Environmental Aid Guidelines concerns the relation of the abovementioned statements on CCS and the possibility of state aid for investments improving on Community standards or increasing the level of environmental protection in the absence of Community standards.⁴⁵ Possibly as a result of comments on the first Draft Guidelines by the Netherlands,⁴⁶ this section no longer contains an express reference to investment aid for investment leading to at least 50% reductions in CO₂ emissions in power generation.⁴⁷ In its reaction the Netherlands wondered what technique, other than CCS, could lead to such reductions. Indeed, the second draft no longer refers to investments for CO₂ emissions reduction, but the fact remains that the general rules on investment aid in the absence of Community standards or improving on Community standard still can be applied to CCS. The reason for this is that there are no Community standards for carbon dioxide emissions. Even if the cap on the allocated allowances could be considered as a Community standard, the use of CCS would lead to emissions reductions that improve on Community standards.⁴⁸ These general rules on investments would allow for an aid

⁴² Given the Commission's current stance, as evidenced in its Communication on Sustainable power generation from fossil fuels: aiming for near-zero emissions from coal after 2020, COM (2006) 843 final, where CCS is very much at the centre of the Commission's approach to sustainable power generation, this should not be problematic.

⁴³ Draft Environmental Aid Guidelines, section 1.3.

⁴⁴ This does depend on the type of CCS involved. For example, deep sea storage of carbon dioxide may have negative effects on the marine environment. For an overview see: IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 277 *et seq.*

⁴⁵ Section 3.1.1, paras. 73 - 84.

⁴⁶ Reactie van de Nederlandse autoriteiten op het consultatiedocument van de Europese Commissie met betrekking tot: Communautaire Kaderregeling inzake Staatssteun ten behoeve van het Milieu, p. 11. Available on

http://ec.europa.eu/comm/competition/state_aid/reform/comments_environmental_protection/35385.pdf

⁴⁷ See paragraph 64 of the First Draft Environmental Aid Guidelines.

⁴⁸ Moreover, if the Commission proposal for An amendment of Directive 2003/87 is followed, allowances will not be allocated in the first place, Cf. COM (2008) 16.

intensity up to 80%.⁴⁹ The specific rules for so-called eco-innovations or eco-innovation assets confirm that the applicability of this section to CCS cannot be *a priori* ruled out. Eco-innovation is defined as all forms of innovation activities resulting in or aimed at significantly improving environmental protection.⁵⁰ The innovation itself must be significant in that minor improvements or changes or the implementation of practices that already in use in other undertakings are not considered innovation. Given the current state of CCS technology,⁵¹ its application in large scale power plants will certainly qualify as eco-innovation. Again, possible income arising from the use of CCS in enhanced oil or gas recovery or in enhanced coal bed methane recovery will have to be taken into account when determining the eligible costs.⁵²

2.3 State aid for CCS and the R & D & I Aid Guidelines

The above paragraph already alluded to the innovative character of the application of CCS on an industrial scale, notably in energy generation. The innovative character of CCS makes it interesting to also investigate the compatibility of state aid for CCS with the Guidelines on state aid for research and development and innovation.⁵³ In 2005, for example, the Gassnova-project was approved by the EFTA Surveillance Authority on the basis of the R & D Guidelines.⁵⁴ From the outset, however, it should be noticed that the primary objective of most CCS projects will related to environmental protection, rather than innovation. The R & D & I Aid Guidelines employ the same three stage balancing test that was already seen in the Draft Environmental Aid Guidelines.⁵⁵ Here the well-defined objective will have to be related to innovation. The R & D & I Guidelines contain no specific reference to CCS.

As far as the innovative character of industrial scale CCS is concerned, the various stages of CCS have to be distinguished, as well as the various sectors in which CCS could take place. Concerning the capture stage, there is widespread experience with the capture of carbon dioxide on an industry scale in the production of ammonia and natural gas processing.⁵⁶ Concerning power plants, however, there are no industry scale applications and CCS would thus certainly be innovative in that sector.⁵⁷

The transport of captured carbon dioxide is anything but innovative, as there is considerable experience concerning the technical as well as economic aspects of this.⁵⁸

The innovative character of the storage of captured carbon dioxide again depends on the sector in which it is employed as well as the exact storage process involved.⁵⁹ The use of

⁴⁹ For small enterprises, large enterprises only qualify for an intensity up to 60%, see table in para. 79 of the 2008 Environmental Aid Guidelines.

⁵⁰ 2008 Environmental Aid Guidelines, para. 60, under (d).

⁵¹ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 107

⁵² 2008 Environmental Aid Guidelines, para. 82.

⁵³ OJ 2006 C 323/1, hereafter referred to R & D & I Aid Guidelines.

⁵⁴ Decision of 30 November 2005 in caseno. 57702, available from: <http://www.eftasurv.int/fieldsOfWork/fieldStateAid/stateAidRegistry/>.

⁵⁵ Section 1.3.1 of the R & D & I Aid Guidelines.

⁵⁶ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 107 and p. 111 *et seq.* and p. 170 *et seq.*

⁵⁷ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 113 *et seq.*

⁵⁸ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 181.

carbon dioxide for enhanced oil recovery, for example, is well documented whereas there are still considerable uncertainties regarding its use in enhanced coal bed methane recovery or enhanced gas recovery.⁶⁰

The degree of innovation thus varies with the various stages of the CCS-process and the sector and manner in which it is applied. This varying degree of innovation has important consequences for the aid intensity. The R & D & I Guidelines contain the following three categories of research and development, listed in a decreasing degree of innovation⁶¹

- Fundamental research⁶² – aid intensity up to 100%
- Industrial research⁶³ – aid intensity up to 50%
- Experimental development⁶⁴ – aid intensity up to 25%

The research required for CCS would appear to fall in the category of experimental development.⁶⁵ The Guidelines thus allow for a subsidy to cover 25% of the costs involved. In addition to this maximum, the Guidelines also prescribe that the Commission will assess the competitive effects of the subsidy on the market for R & D as well as on the market for the final product. It does so with the help of an analysis of possible crowding out effects and effects on market power. Concerning the latter, the Commission indicates that it is unlikely to find market power where the market share of the aid recipient(s) is below 25% and the HHI⁶⁶ is less than 2000.⁶⁷ Despite the high HHI threshold,⁶⁸ the 25% market share cap will make it difficult to meet this condition in the energy sector that is characterised as highly concentrated.⁶⁹

2.4 State aid for CCS and the New Draft General Block Exemption Regulation

The final element of the state aid analysis involves the Draft General Block Exemption Regulation. Above, we have already identified a number of such regulations. The Commission intends to replace these and a number of the Guidelines identified above with one general block exemption regulation. At this moment, the second draft has been published for public consultation.⁷⁰ The Draft GBER uses the same three stage balancing test that was

⁵⁹ For an overview see IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 197 *et seq.* for an overview of geological storage.

⁶⁰ IPCC, 2005: IPCC Special Report on Carbon Dioxide Capture and Storage. Prepared by Working Group III of the Intergovernmental Panel on Climate Change [Metz, B., O. Davidson, H. C. de Coninck, M. Loos, and L. A. Meyer (eds.)]. Cambridge University Press, Cambridge 2005, p. 216 – 217.

⁶¹ Section 5.1.2 of the R & D & I Guidelines.

⁶² This term is defined in section 2.2 (e) of the R & D & I Guidelines.

⁶³ This term is defined in section 2.2 (f) of the R & D & I Guidelines.

⁶⁴ This term is defined in section 2.2 (g) of the R & D & I Guidelines.

⁶⁵ Note that this is based on a very global assessment of the technology and innovations involved by the author, who does not have any specific training in this field.

⁶⁶ The HHI is the Herfindahl-Hirschman Index. It is calculated by adding up the squares of the market shares of the firms on a market.

⁶⁷ Section 7.4.2 of the R & D & I Guidelines.

⁶⁸ Both the US DoJ horizontal merger guidelines (available on http://www.usdoj.gov/atr/public/guidelines/horiz_book/15.html) and the EC Commission horizontal merger guidelines, OJ 2004 C 31/5, would characterise a market with such an HHI as highly concentrated.

⁶⁹ See the Commission's Energy Sector Inquiry, SEC (2006) 1742, at p. 37 and p. 130.

⁷⁰ Second draft revised after consultation of the Advisory Committee of 3 & 4 July 2007 available on http://ec.europa.eu/comm/competition/state_aid/reform/reform.html. Hereafter referred to as the Draft GBER.

identified above in the R & D & I Aid Guidelines and the Draft Environmental Aid Guidelines.⁷¹

Within the framework of the Draft GBER section 3 on aid for environmental protection appears to be most relevant. CCS would certainly fall within the scope of that section.⁷² For investments that will lead to environmental protection levels that are more stringent than those laid down in EC legislation, as is the case with reductions in carbon dioxide emissions, a 25% aid intensity is allowed.⁷³ This aid intensity may be increased with a bonus of up to 20% for SMEs.⁷⁴ Given the current definition of an SME and the industry where CCS is most relevant, this bonus is unlikely to be relevant.⁷⁵ For the same reason Article 15 on early adaptation to Community standards will probably not apply. The other categories of aid are similarly irrelevant for CCS. The Draft GBER confirms the picture that already emerged when the (Draft) Environmental Aid Guidelines were examined. The same observation applies to the section on R & D aid in the Draft GBER.⁷⁶

3 Competition law concerns and CCS

The introduction has already made clear that CCS may have a number of effects as far as the competitive situation is concerned. These can be graphically illustrated as follows.

⁷¹ Second Memorandum on the Revised Draft GBER, September 2007, paragraph 4. Available on http://ec.europa.eu/comm/competition/state_aid/reform/reform.html.

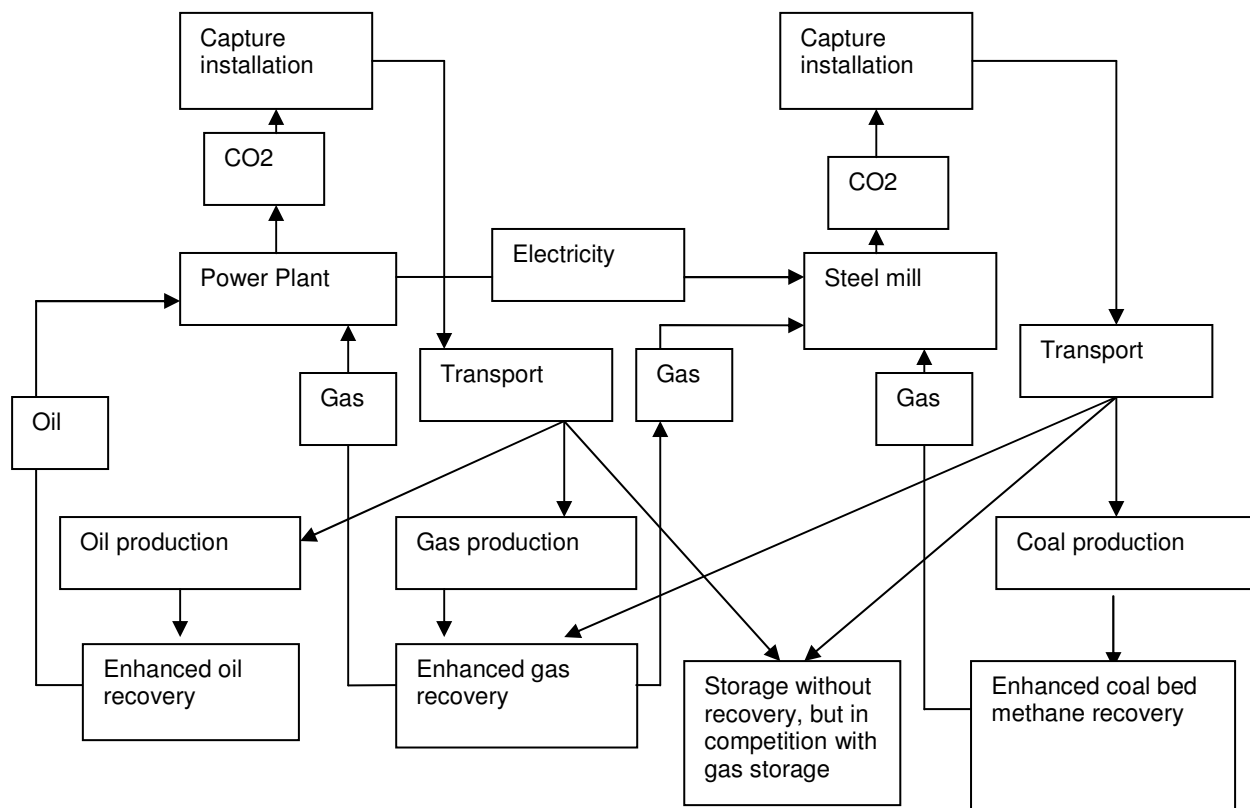
⁷² See Article 13(a) Draft GBER.

⁷³ Article 14 Draft GBER.

⁷⁴ Article 14(3) Draft GBER.

⁷⁵ In order to qualify as an SME, the undertaking may not have more than 250 employees and an annual turnover not exceeding € 40 million or an annual balance sheet not exceeding € 27 million, see Annex I to Regulation 70/2001, OJ 2001 L 10/33.

⁷⁶ Section 6 of the Draft GBER.



This scheme shows the vertical relations between the carbon dioxide producer, the capture installation, transport and storage (CCS), as well as the vertical relation that may exist concerning the product of CCS in enhanced recovery situations.⁷⁷ The elements in this vertical relation may be operated by separate and independent legal entities. However, it is likely that some form of vertical integration in the form of ownership or long-term contracts will exist. Current practice in the energy sector, is that large investments are generally accompanied by long-term contracts and vertically integrated companies.⁷⁸ Such long-term contracts could be mutually beneficial, as they would guarantee the carbon capturer (e.g. electricity generators) certainty that captured carbon will be stored at predictable prices whereas the storage facility operator will have a predictable flow of carbon dioxide that can be used in enhanced recovery. For the storage facility operator, there would thus be an extra advantage because he will not only be able to offer carbon storage services and thus enter the market for carbon storage, but he will also profit on the market for the production of gas and oil.⁷⁹ The relation between carbon capturers and storage facility operators may, however, contain an element of inequality. This follows from the fact that CCS may well be the only viable option to meet the reduction targets for carbon dioxide emissions from power plants in order to comply with the Kyoto Protocol obligations. As a result, carbon capturers may well be captive customers on the carbon storage market. Particularly for coal-fired power plants,

⁷⁷ Admittedly, such situations are not very likely, particularly for natural gas recovery, in view of the costs of removing carbon dioxide from the natural gas that is thus produced. However, with increasing gas prices and taking into account security of supply-reasons, such enhanced recovery schemes may become more attractive.

⁷⁸ Commission Energy Sector Inquiry, SEC (2006) 1742, at p. 47 and p. 151.

⁷⁹ These advantages must be taken into account when determining the necessity and proportionality of state aids in this regard, see section 2.2 *supra*.

CCS appears the only option that will allow them to operate in keeping with carbon dioxide reductions targets. As carbon prices increase, this effect will only become more realistic.

Apart from these vertical relations, horizontal relations (e.g. between two suppliers of carbon storage services) or diagonal relations (e.g. between an enhanced oil recovery scheme fed with carbon dioxide captured from a gas-fired plant) may also exist.

In general the primary competition concerns arising from these relations are as follows. Vertical relations or integration may result in foreclosure. This refers to a situation where, for example, the operator of a power plant that is vertically integrated with a CCS facility restricts access to its CCS facility for other power generators. In horizontal relations the primary concern relates to the creation of market power. This may result in competition law problems even in situations where the market power involving facilities is not such so as to make that facility an essential facility. Large market shares possibly in combination with a high degree of market concentration may result in market power. Diagonal relations may result in a plethora of competition concerns that are however, controversial.⁸⁰

3.1 The market for gas storage as a useful parallel

As was noted in the introduction, there are at this moment no competition law decisions involving CCS issues. A competition law assessment should nevertheless be possible if a parallel is drawn with competition law decisions involving the market for gas storage. To this end we will first have to establish whether the competition law experiences with the market for gas storage can be extrapolated to the market for CCS. This requires an assessment of the market for gas storage in its relation with the primary markets concerned.

The market for gas storage is comparable to that for carbon storage as regards the technical interwovenness of storage with the production of gas. Gas storage is to a large extent dependent on non-productive gas fields to provide the actual storage. In this regard, the Commission regularly distinguishes between cavern storage and aquifer or pore storage, with the former better suited for rapid charging and discharging than the latter.⁸¹ The Commission further appears to equate cavern storage with storage in depleted gas fields.⁸² However, it must be recognised that gas storage can also take place in salt caverns.⁸³ A further reason why the market for carbon storage is comparable to that for gas storage follows from the fact that gas storage is a so-called flexibility tool, i.e. an instrument to cope with daily or seasonal changes in energy demand. Given that such changes exist and energy production does not really lend itself for flexible production, access to flexibility tools is a prerequisite for entities active on the energy production market.

The market for gas storage has been the subject of various commission merger decisions.⁸⁴ Of these, *DONG / Elsam / Energi E2* (hereafter referred to as *DONG*) is the most interesting for the purpose of this paper. This involved a merger of DONG, the Danish incumbent active in the market for the exploration, production, transport and sale of gas and oil, and Elsam

⁸⁰ These include portfolio effects, decision 98/602, *Guinness/Grand Metropolitan*, OJ 1998 L 288/24 and decision 2004/134, *HE/Honeywell*, OJ 2004 L 48/1, see on this decision Case T-210/01. For an overview of recent caselaw see: A. Morfey, N. Dodoo and F. Dethmers, 'Conglomerate Mergers under EC Merger Control; An Overview', *ECJ Vol 1* (2005).

⁸¹ E.g. M.1383, *Exxon / Mobil*, para. 262.

⁸² M.3410, *Total / GDF*, para. 18.

⁸³ M.4180, *Gaz de France / Suez*, para. 328.

⁸⁴ These are M.493, *Tractebel / Distrigaz II*, para. 29 ; M.1383, *Exxon / Mobil*, paras. 50, 69 and 261 *et seq.*; M. 3294, *ExxonMobil / BEB*, para. 11; M.3080, *ECS / Intercommunale*, paras. 13, 15, 42-43 ; M.3086, *GDF / Preussag*, paras. 14-16 ; M.3318, *ECS / Sibelga*, para. 14 ; M.3410, *Total / GDF*, paras. 13, 17-19, 27-30, 55-61, M.3868, *DONG / Elsam / Energi E2*, paras. 38-42 and 294-378 and M.4180, *Gaz de France / Suez*, paras. 40-42 and 576-596. These cases can be found on: <http://ec.europa.eu/comm/competition/mergers/cases/>.

and Energi E2, two Danish electricity generation incumbents, active in the production and trading of electricity.⁸⁵ The merger thus has a clear vertical integration aspect (supplier of primary energy source and generation of electricity). The Commission assesses the storage facilities operated by DONG as a flexibility tool and consequently determines the substitutability of gas storage and other flexibility tools.⁸⁶ An important aspect in the Commission's reasoning is that the involvement of Elsam and E2 in the merger means that their demand flexibility also disappears and thus affects the market for flexibility tools.⁸⁷ The Commission then characterises the market for gas storage as one adjacent to other gas markets.⁸⁸ The competition problems that lead to the divestiture of the larger of the two gas storage facilities operated by DONG follow from the vertical integration in connection with the fact that the acquisition of the foremost suppliers of demand flexibility will increase DONG's market power on the market for gas storage or flexibility.⁸⁹ Concerning the vertical aspects the Commission notices that without the divestiture competitors of DONG's trade branch would have to be customers of DONG's storage branch.⁹⁰ DONG's market power on the storage/flexibility market could be used against competitors by for example raising the price of flexibility.

The *DONG* case shows how vertical integration within one undertaking or as a result of a concentration may actually have the effect of increasing market power. As was noted above, the producers of carbon dioxide stand in a similar relation to carbon storage facility operators. Instead of access to and possible market power on the market for gas storage, future competition law decisions could have to deal with access to and market power on the market for carbon storage.

3.2 Vertical Integration in the Energy Sector and CCS

One of the concerns following from the Commission's energy sector inquiry and other competition authorities' forays into the energy sector⁹¹ is the degree of vertical integration and foreclosure. It is expected that CCS will lead to vertical integration in the energy sector. Investments for carbon capture, transport and storage are considerable and parties will thus want mutual insurances that the installations will be used at optimal capacity. Given that the entities most likely to be interested in CCS (electricity generators and the chemical industry) do not possess geological storage capacity; such vertical integration will probably involve entities currently active in the production of gas and oil.⁹² In those circumstances the companies that supply electricity generators with fuel will also be able to offer the operators of power plants the possibility of carbon dioxide storage. This could result in foreclosure on the market for the supply of fuel as well as on the market for carbon dioxide storage. This is particularly likely to happen in enhanced recovery situations, where both parties require a large degree of certainty as to the continuity of the carbon dioxide flow. In non-enhanced recovery situations the relation between the natural gas supplier and carbon capturing gas fired power plant will also become more complex because the gas producer with an abandoned (empty) gas field will have the choice between marketing the field as a flexibility instrument (natural gas storage) and using it for carbon dioxide storage. A gas producer thus

⁸⁵ M.3868, *DONG*, paras. 3 and 4. There are other parties involved and other activities as well, but these are not interesting for the purpose of this paper and have thus been omitted.

⁸⁶ M.3868, *DONG*, paras. 55 – 70.

⁸⁷ M.3868, *DONG*, para. 69.

⁸⁸ M.3868, *DONG*, para. 295.

⁸⁹ M.3868, *DONG*, para. 297.

⁹⁰ M.3868, *DONG*, paras. 296 and 730.

⁹¹ See, for example, the decisions of the German Federal Cartel Office (*Bundeskartellamt*) concerning long-term contracts for gas distribution, B8-113/03-3 – B8-113/03-8, B8-113/03-10, B8-113/03-11 and B8-113/03-15, all available on: <http://www.bundeskartellamt.de/wDeutsch/archiv/EntschKartArchiv/EntschKartell.php>.

⁹² This is also evidenced by the fact that the biggest carbon dioxide storage projects in Europe are operated by gas and oil producing companies, see MEMO/08/36, point 4.

has the strategic choice between functioning in an upstream and/or downstream relation to the energy producer. In view of the probable vertical integration between carbon dioxide producers and carbon storage facility operators, this bundling of upstream and downstream activities may lead to competition concerns. Carbon storage facility operators may be tempted to grant access to natural gas storage as a flexibility instrument on more favourable terms to the vertically integrated partner. This can be overcome when adequate third party access to both natural gas storage and carbon storage is ascertained. Given that new gas storage infrastructure may be exempted from the third party access obligations arising from Directive 2003/55,⁹³ third party access to such facilities cannot be guaranteed. The net result of CCS will probably be an even higher degree of vertical integration on the energy market.

It must, however, be pointed out that CCS does not necessarily have to lead to more vertical integration. From the introduction it became clear that CCS must also be seen in the light of enhancing security of supply because it will enable the construction of coal-fired power plants with a reduced carbon dioxide footprint that will thus be profitable under the emissions trading scheme. In this scenario the operator of the coal-fired plant will be the buyer of carbon storage. Taking into account that gas- and oil producing companies will probably be the most important parties offering carbon storage, there is no simultaneous up- and downstream relation between them.

Notwithstanding the effect of opening up the market for primary energy sources, the fact remains that CCS will result in stronger ties between buyers of fossil fuels that are at the same time carbon capturers and suppliers of carbon storage, that are very likely to be suppliers of fossil fuels. Such strong ties may foreclose the market for carbon storage. Short of completely foreclosing it, vertically integrated carbon capturers and storage operators may also choose to charge higher tariffs or otherwise less favourable terms to newcomers wanting to use a carbon storage facility. In both cases the market for carbon storage is used to deter entry on the market where carbon is produced (e.g. electricity generation). The Commission's reasoning in *DONG* shows that such competition concerns are all but illusory.

3.3 Carbon Capturers as Captive Customers

Yet another effect on the competitive situation could occur if the market for carbon storage is characterised by market power. This could happen if there are only limited suppliers of carbon storage and there is large demand for such storage. Whether or not such a situation will materialise depends on the attractiveness of carbon capture as an emissions reduction mechanism. This in turn depends on the price of carbon dioxide, the price of CCS and the costs of the current carbon dioxide emitting installation. In the absence of subsidisation or other incentives CCS will only be economically attractive when the price of carbon dioxide (i.e. the price of allowances, CERs or ERUs) increases.

In view of the plans of the European Union, it is very likely that the price of carbon dioxide will go up. A 20% reduction of greenhouse gas emissions by 2020 will inevitably lead to scarcity on the market for allowances.⁹⁴ As a result CCS will become more attractive and may even become the economically most attractive carbon dioxide abatement option. Depending on the market for carbon storage, operators of storage facilities may well find themselves in the comfortable position of market power. The CCS proposal contains stringent standards to be met by carbon storage facilities and in the short term they are most likely to be economically achievable by operators using depleted gas and oil fields.⁹⁵ This results in a limited number

⁹³ OJ 2003 L 176/57, notably Article 22.

⁹⁴ See Commission Communication 2020 by 2020, Europe's Climate Change Opportunity, COM (2008) 30 final.

⁹⁵ Storage in aquifers can probably only take after extensive geological research of the characteristics of such aquifers. This research has already been done on gas and oil fields, cf. C. Gough *et al.* An

of potential players on the market for carbon storage. Depending on the exact legal regime applicable to depleted gas and oil fields,⁹⁶ barriers to entry for non-gas and oil producing companies, may be considerable as they will first have to obtain access to such depleted fields.

However, a certain category of carbon dioxide producers will encounter market power at lower carbon prices. This refers to the operators of coal fired installations with a carbon capturing installation. For those operators the costs of not using a non-amortised capturing facility must be included in the price of carbon dioxide. Depending on the technical integration of the capturing facility or permit conditions, it may even be impossible or inefficient to operate the plant without the capturing installation.⁹⁷ Moreover, the costs of having a dedicated pipeline for carbon dioxide transport must also be taken into account. The result could be that the costs of not using the complete installation including the transportation facility must be added to the costs of CCS. In those circumstances a carbon capturer may become a captive customer. Carbon capturers are well-advised to take this into account.

Of course the best way to prevent this and the other problems identified above from occurring in the first place is to completely integrate the capturing, transport and storage facility, but this could lead to vertical foreclosure problems identified in the previous paragraph. From a competition perspective, the solution is in ensuring effective third party access, as this will negate any market power

3.4 Access to transport and storage in the proposed CCS Directive

The proposed CCS Directive shows that the competition concerns are considered real. The proposal contains provisions on access to the transport network and storage sites (Article 20). It further contains rules setting the framework for dispute settlement (Article 21). The dispute settlement provisions require a dispute settlement system to be set up by the member states. The proposal declares applicable the dispute settlement mechanism of the member state that has jurisdiction over the infrastructure concerned. In cases involving more than one members state the authorities involved shall consult in order to ensure a consistent application of the directive. By and large these rules follow the standard pattern for third party access to transport and storage facilities, albeit that they are less elaborate than the provisions contained in Directive 2003/55⁹⁸ and Regulation 1775/2005.⁹⁹

What is interesting is that the member states are relatively free to determine the method by which access is to be obtained. The proposal confines itself to stating that the objectives of fair and open access are to be applied (Article 20(2)), taking into account the following five factors:

- (a) the storage capacity which is or can reasonably be made available within the areas determined under Article 4, and the transport capacity which is or can reasonably be made available;
- (b) the proportion of its CO₂ reduction obligations pursuant to international legal instruments and to Community legislation that it intends to meet through CO₂ capture and geological storage,

Integrated Assessment of Carbon Dioxide capture and storage in the UK, available from: <http://www.co2storage.org.uk/Publications/Gough.pdf>.

⁹⁶ In some member states gas and oil producers have been granted the unlimited right to exploit certain fields. It maybe interesting to see whether this exploitation also covers marketing as a carbon storage facility.

⁹⁷ Oxy-Fuel combustion, for example, requires a specially designed boiler to operate efficiently. If standard air is used as a combustion agent, efficiency may be reduced, increasing the operating costs and thus generating costs.

⁹⁸ OJ 2003 L 176/57, notably chapter VI.

⁹⁹ OJ 2005 L 289/1.

- (c) the need to refuse access where there is an incompatibility of technical specifications which cannot be reasonably overcome;
- (d) the need to respect the duly substantiated reasonable needs of the owner or operator of the storage site or of the CO₂ transport network and the interests of all other users of the storage or the network or relevant processing or handling facilities who may be affected; and;
- (e) the need to apply the relevant national laws and administrative procedures, in conformity with Community law, for the grant of authorisation for production or upstream development.

Striking in this is the amount of discretion the member states have in actually laying down the framework for access. This will undoubtedly result in differing levels of access or at least different levels of predictability of the outcome of access requests. The second aspect to be taken into account is particularly interesting as it could effectively foreclose an entire member states carbon storage market. A member state planning to achieve the overwhelming majority of its carbon dioxide reduction obligations by means of CCS could invoke this to claim that all carbon storage capacity is reserved. Such a claim could be contrary to the EC Treaty provisions on the free movement of goods. It is assumed that captured carbon dioxide qualifies as a good and such a measure by a member state would be an obstacle to the free movement of goods.¹⁰⁰ Whether this obstacle could be justified is uncertain given that the Court's reasoning in *Walloon Waste*, where a similar measure was held compatible with EC Law, strongly relies on the principles of proximity and self-sufficiency.¹⁰¹ Similar principles do not apply to greenhouse gas reductions. Indeed, the global use of flexible mechanisms based on trading carbon credits and allowances may well be at odds with a member state wanting to reduce emissions within the own territory. Still, this is what the proposed CCS Directive facilitates.

The third party access regime in the proposed CCS Directive differs from the third party access regime in Directive 2003/55 in one important aspect. Under the latter Directive investments in new transport and storage infrastructure may be exempted from the third party access regime.¹⁰² Taking into account that new CCS infrastructure is probably new infrastructure as well, the absence of a similar exemption clause in the proposed CCS Directive is striking. Perhaps Article 20(2)(d) of the proposed CCS Directive¹⁰³ may have a similar effect, albeit that – again – compared to Directive 2003/55 the conditions for such exemptions are much less clear, if not non-existent.

Finally, one wonders what the practical impact of such a regime will be as far as access to transport is concerned, given that most fixed carbon dioxide transport networks (pipelines) will be purpose-built. This makes the network situation radically different from that in the gas distribution market, where a network of pipelines already existed and competition was consequently introduced. Pipeline routing may affect the practical possibilities for third party access, as may decisions concerning pipeline capacity. An oversize pipeline will not work below a minimum threshold, whereas there are also upper limits to pipeline capacity.¹⁰⁴ The proposed CCS Directive is completely silent on these matters.¹⁰⁵ Moreover, access to

¹⁰⁰ A parallel may be drawn with the *Walloon Waste* case, C-2/90, *Commission v. Belgium*, [1992] ECR I-4413.

¹⁰¹ Case C-2/90, *Commission v. Belgium*, [1992] ECR I-4413, paras. 33-36 and notably para. 35.

¹⁰² Such exemptions may be granted by the member state competent authority pursuant to Article 22 of the Directive.

¹⁰³ Cited *supra*.

¹⁰⁴ Article 20(3) of the proposed CCS Directive acknowledges this when it allows for a restriction of third party access on the basis of lack of capacity.

¹⁰⁵ The proposed CCS Directive contains a general duty for the member states “to take the necessary measures to ensure that potential users are able to obtain access to CO₂ transport networks and to storage sites for the purposes of geological storage of the produced and captured CO₂”, Article 20(1).

transport and storage may have an unwanted effect on transparency on the market for power generation. Take for example the situation where two electricity generation companies want to build coal fired power plants that are capture ready or even equipped with capture installations and one of them is the first mover and also builds a pipeline to the nearest storage facility. The first mover will then have the option of choosing for a pipeline that will just meet it's own requirements, or it could choose to construct a bigger pipe that it will share with the second company. The latter option will not only open up a second market, but it will also allow the first company to gain insight into the carbon dioxide production and thereby electricity production. This increase of market transparency in an already concentrated market is likely to be detrimental to competition.

4 Conclusions

This paper set out to analyse the possible effects of CCS on the competitive situation and the resulting competition law problems. Essentially two phases can be distinguished. In the current (development) phase CCS is not a competing carbon abatement option and thus requires subsidisation. Such subsidisation is subject to the provisions on state aid. This paper has identified a number of possibilities to justify such aid.

In the second (market) phase the costs of CCS will have dropped and the price of carbon will have increased to the extent that CCS can compete without subsidisation. In these circumstances there will be a market for carbon abatement in which CCS is one of the options. This market will probably be characterised by vertical integration and foreclosure. As the decision in *DONG* shows, this may lead to far-going commitments being imposed on the basis of competition law. The proposed CCS Directive addresses these problems by including provisions on access to transport and storage infrastructure. These, however, are laconic and do not provide the guarantees required for effective third party access.

The most striking feature that the above review has brought to the fore is the lack of legal certainty. Particularly in connection with the large and long-term investments that are needed to make CCS work this is all but satisfactory.