

Legal Uncertainties of Carbon Capture and Storage in the EU: The Netherlands as an Example

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The new EU Directive for the geological storage of CO₂ aims at providing a legal framework for the development of CCS. However, the Directive does not remove all legal barriers and uncertainties. Capture, transport and storage of CO₂ are covered by a large number of international, European and national regulations, resulting in various legal unknowns. These obstacles and uncertainties need to be removed in order to provide companies with a proper incentive to invest in CCS.

I. Introduction

Internationally, the need to reduce greenhouse gas emissions is widely recognised and quantified emission limitations are specified in the Kyoto Protocol.¹ In the battle against climate change, various instruments are available to reduce greenhouse gas emissions. A relatively new instrument is Carbon Capture and Storage (CCS). CCS refers to the capture of CO₂ produced by various industrial processes and to the transportation of this CO₂ to subsoil storage reservoirs where it will remain permanently sequestered. CCS differs from traditional climate change instruments in the sense that it does not prevent the production of CO₂, but rather prevents the emission of CO₂ into the air and thus helps to prevent climate change.² The European Union (EU) has accepted CCS as one of the possible techniques to reduce greenhouse gas emissions in its climate strategy. The need to apply CCS is directly connected to a policy aiming at substantial emission reductions: at least a 20% reduction by 2020 (compared to 1990).³ The European legislator realises that the use of fossil fuels will remain inevitable in the near future, but recognises the need to prevent higher CO₂ emissions.⁴ As a short-term solution and in order to generate knowledge and insight into the technique and consequences of CCS, the EU Commission has introduced measures to stimulate the construction and operation of 12 demonstration projects of sustainable power generation in the EU by 2015.⁵ Council Directive 2009/

31/EC on the geological storage of carbon dioxide was adopted on 23 April 2009 (CCS Directive).⁶ In parallel with the EU, individual Member States have also been developing national CCS policies. The Netherlands, for instance, has stated that it aims to establish the most sustainable energy sector in Europe in the next 10-15 years.⁷

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1 Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 10 December 1997, in force 16 February 2005, 37 *International Legal Materials* (1998), 22.

2 Intergovernmental Panel on Climate Change (IPCC), *Carbon Dioxide Capture and Storage* (Cambridge: Cambridge University Press, 2005).

3 The EU Council agreed to these targets at a Council Meeting on 8 and 9 March 2007, Presidency Conclusions of 2 May 2007, 7224/1/07 REV 1.

4 COM(2007) 1 final. As part of its Energy Package of 10 January 2007, the Commission adopted a Communication on Sustainable Power Generation from Fossil Fuels: Aiming for Near-zero Emissions from Coal after 2020, COM(2006) 843 final.

5 See the website of the European Commission, available on the Internet at: <ec.europa.eu/environment/climate/ccs/index_en.htm> (last accessed 15 August 2010). Some 16-18 CCS projects are currently being developed in the EU.

6 Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

7 Government Policy Statement by the Dutch government presented on 1 March 2007, available on the Internet at <http://www.rijksoverheid.nl/regering/regeringsverklaring> (last accessed on October 4th 2010).

The Groningen Centre for Energy Law (GCEL) has taken upon itself to explore the legal framework that is needed to implement CCS, hereby taking the Netherlands as a case study. In a recently published book, researchers at the GCEL examined the most important legal issues related to the development of CCS in the Netherlands.⁸ The analysis includes legal (international and national) and economic issues that may have an influence on the development of CCS projects. Although there are numerous legal issues that require thorough research, this article takes a broader perspective, presenting the potential legal barriers and uncertainties that our research revealed.⁹

We will start by examining the possible legal barriers for CCS in Section 2. In Section 3, we address the uncertainties that may arise from the implementation of the CCS Directive. In Section 4 we address the question of how these uncertainties affect the development of CCS and how CCS can be promoted. Conclusions are drawn in Section 5.

II. Possible Legal Barriers for the Development of CCS

The objective of the CCS Directive is to establish a legal framework for the environmentally safe storage of CO₂. The greenhouse gas CO₂ can constitute of waste, a base material or even a commodity. The use and emission of this greenhouse gas is regulated in several directives, so the legal framework necessary for CCS is broader than just the CCS Directive. Issues such as the capture, transport, and emission of CO₂, liability for, and requirements of erecting installations are overseen by already existing Directives. A number of existing Directives is amended in order to remove any barriers resulting

from those Directives. Examples are the Directives on environmental impact assessment and environmental liability, and the Directive on integrated pollution prevention and control (IPPC), all of which were amended to include CCS. Directive 2009/31/EC provides a legal framework for the geological storage of CO₂.¹⁰ The emphasis is on storage of CO₂, for which no suitable instrument is yet available. In addition, it facilitates the use by third parties of the storage facility and the pipelines connected to it.

One of the presumptions of the Directive is that potential investors and Member States will be sufficiently motivated to participate in the capture, transport and storage of CO₂ as a result of the explicit emission reduction targets (both individually and as EU Member States under the Kyoto Protocol) and the price of CO₂ emission allowances in particular. The CCS Directive provides a solid legal basis for companies interested in capturing, transporting and/or storing CO₂ as well as for governments that need to regulate this process. The question is whether or not this basic motivation and new legal framework is enough to enable large scale deployment of CCS. This section explores a number of possible legal barriers for the development of CCS. These barriers may arise from the character and ambition of the Directive itself, from the interaction of the Directive with primary EU law and policy, and from its relation to international law and international agreements.

1. Character and Ambition of the Directive

Measures to be adopted by the Community should comply with the principles of subsidiarity and proportionality.¹¹ As a consequence, the Directive does not go beyond what is necessary to achieve the objective of setting a legal framework for the storage of CO₂. The implication is that Member States still have ample opportunity to go beyond the measures taken by the Community. The Directive is thus based on the principle of minimum harmonisation (Article 193 Consolidated version of the treaty on the European Union).¹² Legal uncertainties will be inevitable due to differences in the national implementation of the CCS Directive. Where one Member State stimulates CCS, the other may even prohibit the storage of CO₂ in its subsoil, or the subsoil

8 Martha M. Roggenkamp and Edwin Woerdman (eds.), *Legal Design of Carbon Capture and Storage: Developments in the Netherlands from and International and EU Perspective* (Antwerpen: Intersentia, 2009).

9 This contribution is based upon the last chapter of Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8.

10 Scott Brockett, "The EU Enabling Legal Framework for CCS", 1 *Energy Procedia* (2009), 4433, at 4441. International Energy Agency (IEA), *Legal Aspects of Storing CO₂: Update and Recommendations* (Paris: IEA, 2007).

11 These principles are set out in Article 5 of the Treaty on the European Union.

12 Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union.

might simply not be suitable. Member States are not obliged to allow CCS, and when they do, they are free to decide on the amount of regulation. Differences in regulation by the Member States may make transboundary transport and storage more complicated, which may in turn increase the cost of CCS for investors. Uncertainties and complications resulting from minimum harmonisation are a first possible barrier to the effectiveness of the Directive.

2. Interaction with Primary EU Law and Policy

Although the CCS Directive provides a legal framework for CCS, the activities of investors and operators are also regulated by primary EU law. The Community competition rules, which safeguard the competitiveness of European markets, constitute one of the areas covered directly by primary EU law, and ultimately also affect potential investors in CCS. The same goes for policies with regard to the use of the subsoil.

We will first address the relation between CCS and competition law. Since CCS is a relatively new technique, suitable locations are not widely available, and because the costs are high compared to other emission reduction alternatives, companies will seek means to reduce the costs of CCS. One of these means is the use of existing facilities, technology and know-how in the production of gas and oil. Operators that have already explored a gas field are more likely to apply for permits under the CCS Directive. Furthermore, there is an existing market in the transport and use of the production residues from combustion processes or other chemical processes. It is thus highly likely that vertical or diagonal integration will occur. An example is the possible situation where the operator of a power plant is vertically integrated with a CO₂ storage facility, has a storage permit and restricts access to its CCS facility for other power generators. This creation of market power may result in competition law problems.¹³ The question is whether or not the requirement for third party access in the CCS Directive can effectively prevent this from happening. This may become another barrier to the effectiveness of the CCS Directive.

Another complexity is how the CCS Directive regulates the use of subsoil in relation to existing policies on the use of subsoil. There is already expe-

rience with underground storage of gas, and (EU) regulation on the storage and use of gas storage facilities is already in place. The new policy on the storage of CCS diverges from these rules. There is no doubt about the need to organise third party access to existing gas and CO₂ storage facilities, but a permit system under EU law for creating storage facilities only applies to the latter. This may not constitute a legal uncertainty *per se*, but at least it entails an inconsistency. It may become a problem when, for specific locations, there is competition between the establishment of storage of either gas or CO₂. A broader view on the need to regulate underground storage sites would therefore be preferable. This could have been integrated in a review of the Hydrocarbons Licensing Directive, which has neither been reviewed nor amended since it entered into force in 1994.¹⁴

3. Relation to International Law

When discussing geological storage of CO₂, we need to distinguish between storage on land and storage at sea. Onshore, all states may issue and maintain any rules they seem fit to regulate subsoil storage of CO₂, as long as they take into account applicable provisions of international law. Offshore, the situation is different since coastal states have limited jurisdiction. Under the UN Convention on the Law of the Sea (UNCLOS), coastal states may establish an exclusive economic zone¹⁵ where they then have sovereign rights to explore and exploit natural resources, to produce wind energy, and to carry out other economic activities. In order to carry out these activities, coastal states may construct installations. The question is whether or not a coastal state has the exclusive right to regulate the offshore storage of CO₂. Although Recital 12 states that “[at] the international level, legal barriers to the geological storage of CO₂ in geological formations

13 Hans Vedder, “EC Competition Law and the Organisation of CCS”, in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 140, at 146.

14 Martha M. Roggenkamp, “Regulating Underground Storage of CO₂”, in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 205, at 227.

15 Whereas coastal states automatically have a continental shelf, they need to establish an exclusive economic zone, see Art. 56 of the United Nations Convention on the Law of the Sea (UNCLOS), Montego Bay, 10 December 1982, 21 *International Legal Materials* (1982), 1261.

under the seabed have been removed", this assessment may be doubted given that carbon storage probably neither qualifies as exploration and production of natural resources nor as an economic activity. The Directive does not address the question of whether coastal states have the exclusive right to regulate a storage activity and accordingly make use of the subsoil and erect any installations necessary for this activity. However, UNCLOS does not address CCS, but apparently operates on the assumption that states do have the right to regulate offshore storage.

Two international agreements are specifically relevant: the 1996 London Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter,¹⁶ and the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR).¹⁷ Although in 2007, both the London Protocol and OSPAR were amended to cover CCS, the London Protocol still contains a possible barrier for the development of CCS.¹⁸ Article 6 of the London Protocol provides that Contracting Parties shall not allow the export of wastes or other matter to other countries for dumping or incineration at sea. This would mean that any form of transboundary transportation to offshore locations would be prohibited. Since many of the possible storage sites are actually located at sea, transboundary transportation will be

necessary. Recently, an amendment to Article 6 was adopted.¹⁹ If adopted and ratified, the amendment removes this particular barrier for transboundary offshore CCS. The obstacle will only be removed when the 2007 and 2009 amendments have entered into force, however. Since only 37 states are party to the London Protocol and the OSPAR amendments of 2007 have not yet entered into force, it might take some time before these barriers to offshore CCS are effectively removed.²⁰

Another relevant international agreement in relation to CCS is the Kyoto Protocol. Under the Kyoto Protocol, public or private parties are allowed to carry out greenhouse gas mitigation projects abroad, which can be registered as Clean Development Mechanism (CDM) or Joint Implementation (JI) project activities. This entitles them to obtain emission credits, which can be used to meet their own emission reduction targets.

Carrying out such projects abroad in return for emission credits can be an attractive option if such projects are cheaper than reducing emissions at home. For CCS to be included in the project mechanisms of the Kyoto Protocol, participants must demonstrate that the investment will result in fewer emissions than would have been the case without the investment. The emission reductions generated via CCS in a CDM or JI project thus must be additional to what would have occurred without the project. To assess this, an emission baseline has to be constructed and approved, which raises specific problems for CCS. For instance, capturing CO₂ requires additional energy; how should this "energy penalty" be included in the project baseline? And, more specifically, should the emissions related to the consumption of additional fuels obtained with enhanced oil or gas recovery be treated as leakage emissions?²¹ These rules and regulations have yet to be constructed.

4. Interim Summary

Although the new legal framework for CCS provides opportunities for CCS projects, the existing legal framework provides for some complexities and uncertainties for Member States, investors and operators. Investors in a new technology such as CCS will not only require stable legal framework for their investments, which in turn creates an economic incentive; next to some legal barriers in

16 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London, in force 30 August 1975, 11 *International Legal Materials* (1972), 1294.

17 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), in force 25 March 1998, 32 *International Legal Materials* (1993), 1069.

18 Tom Kerr et al, "Legal and Regulatory Developments Associated with CCS: A Global Update", 1 *Energy Procedia* (2009), 4395, at 4402; Marcel Brus, "Challenging Complexities of CCS in Public International Law", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 19, at 59.

19 Andy Raine, "Transboundary Transportation of CO₂ Associated with CCS Projects", 2 *Carbon & Climate Law Review* (2008), 353, at 365. At the meeting in October 2009, Contracting Parties adopted a Resolution (Resolution LP.3(4)) on the amendment to Article 6 of the London Protocol.

20 Marcel Brus, "Challenging Complexities of CCS in Public International Law", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 19, at 59.

21 Anatole Boute, "Carbon Capture and Storage under the Clean Development Mechanism: An Overview of Regulatory Challenges", 2 *Carbon and Climate Law Review* (2008), 339, at 352. Anatole Boute, "CCS under the Project-Based Kyoto Mechanisms", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 61, at 95. This was an issue in Copenhagen 2009, but no agreement was reached.

international law (especially concerning offshore CCS), companies also face regulatory uncertainties with regard to competition law. Furthermore, the new Directive will result in a certain amount of legal uncertainty as a logical consequence of applying a system of minimum harmonisation. In the following section, we will address some of these uncertainties for Member States and investors in more detail.

III. Uncertainties in the Implementation of the CCS Directive

Member States have a certain degree of discretion in deciding how to implement the CCS Directive. In this section, we will explore some of the questions Member States have to deal with, taking the Netherlands as an example. We will focus on the issues following the order of the CCS chain: capture, transport, storage, third party access (TPA), closure and long-term stewardship. We will address the provisions of the Directive, the regulatory issues for Member States, and the uncertainties that may exist.

1. Capture of CO₂

The CCS Directive provides a legal basis for CCS as an additional mitigation option for emitters under the EU Emissions Trading Scheme (ETS). The EU ETS allocates emission caps to emitters in the form of tradable emission rights. Point emitters (holding an emission permit) can count captured and stored CO₂ as an emission reduction under the EU ETS. Point emitters thus have a financial incentive to invest in CCS. Furthermore, the Directive requires Member States to incorporate the possibilities for CCS in the licensing procedure for new combustion plants (after the entry into force of the Directive). The Directive thus does not provide for mandatory CCS, it just adds CCS to the interests and developments that should be taken into account when deciding on the construction of new combustion plants. The European Parliament proposed mandatory CCS for new installations, but the incorporation of CCS in the EU ETS system versus the requirement of emission limit values based on the IPPC Directive might complicate the feasibility of such an obligation. In the Netherlands, the Min-

ister of Economic Affairs has declared an intention to explore some form of legal obligation to capture and store CO₂.²² The risk in doing so is that companies are no longer able to choose the least-cost option, which is however the essence of the ETS.²³

2. Transport of CO₂

The capture of CO₂ is then followed by transportation. Although transportation of CO₂ is possible by rail, road and sea, the most likely form is transportation by subsoil pipelines. Internationally, transportation other than by pipelines is hardly regulated, and not all jurisdictions have pipeline regulations.²⁴ The CCS Directive requires an environmental impact assessment for the construction of pipelines.²⁵ One question of interest is: which legal framework will be applicable to the construction and exploitation of pipelines? For the larger part, the Member States will regulate the construction of pipelines within the national regulatory framework. Consequently, there is a risk of inconsistency between Member States with regard to the requirements and conditions of a permit or the technical requirements of the pipelines. The absence of one uniform technical norm thus creates legal uncertainty when procuring new CO₂ pipelines and when constructing cross-border pipelines. The Directive does not make a reference to existing EU policy promoting the construction of cross-border networks, i.e. the policy on Trans-European Networks. The latter policy, for example, tries to promote the interconnection and interoperability of national networks as well as the possibility to obtain some financial support from the Community to develop such networks. A barrier in the development of cross-border networks are the dif-

22 The Minister of Economic Affairs made this announcement in a letter to the Parliament, 24 November 2009, available on the Internet at <<http://www.rijksoverheid.nl/onderwerpen/co2-opslag/documenten-en-publicaties/kamerstukken/2009/11/26/algemeen-overleg-19-november-ccs-kamerbrief.html>>.

23 Edwin Woerdman and Oscar Couwenberg, "CCS in the European Emissions Trading Scheme", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, at 115.

24 Global CCS Institute, *Strategic Analysis of the Global Status of Carbon Capture and Storage. Report 3: Policies and Legislation Framing Carbon Capture and Storage Globally* (Canberra: Global CCS Institute, 2009), at 39.

25 Art. 31 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

ferences in the legal framework on either side of the border (such as spatial planning law).

In the Netherlands, spatial planning law and environmental law are applicable when constructing onshore pipelines.²⁶ Pipelines are to be constructed under a zoning plan, which falls under the responsibility of municipalities, which may or may not require a construction permit for a pipeline.²⁷ A pipeline will typically cross multiple municipalities and zones that require several other zone-specific permits. The construction requires the cooperation of the land owner, and a rather complicated and non-transparent regime applies if the landowner does not cooperate. New regulation is proposed, which will impose a duty of care on the operators of pipelines, regulate the zoning of pipelines in municipal zoning plans, regulate external safety, require emergency plans, and set requirements for the appointment of operators.²⁸ The large amount of required permits (with their various conditions and their respective competent authorities) in constructing a single pipeline creates legal uncertainty and additional costs for the investor. When a pipeline is qualified as an upstream pipeline (mining installation), the Mining Act applies, which does not provide for a permitting regime, but does consider protection of the environment and safety in the construction and exploration of the pipeline (both onshore and offshore).

3. Storage of CO₂

Storage of CO₂ takes place in underground geological formations. The CCS Directive states that the selection of storage sites falls within the competence of the Member State. Also, the decision to allow or not to allow storage for parts or the whole of the territory is a decision of the Member States. The suitability of a site is determined through characterization of the area pursuant to the criteria of Annex 1 to the Directive.²⁹ The exploration of a possible site is a task of the Member State, which allows companies to explore a site based on an exploration permit.

Once the decision is made to allow a CCS activity, specific locations need to be selected. Locations such as aquifers, depleted coal mines, and depleted oil and gas fields are likely to be chosen. The storage capacity in the Netherlands is high, compared to the amount of CO₂ that it produces.³⁰ These locations are mostly in use as gas or oil reservoirs and might be available for CCS in the future. Detailed information on the subsoil is already available, and a system of exploration permits might be redundant.³¹ A factor that may complicate the use of these locations is the way in which the fields/locations are abandoned. If not sealed properly, a location may not be suitable for CCS later on. Furthermore, an operator that has terminated activities in a depleted field may remove all installations.³² However, it is in the interest of the Member States that these locations remain intact, that the installations be available and that the location thus be suitable for CCS in a later stage. For economic reasons, an operator cannot be expected to take on responsibility for the maintenance of the installations on an abandoned location. Offshore, the situation is even stricter. There is an explicit provision in UNCLOS that all installations used for exploring and exploiting natural resources need to be removed after they have been abandoned.³³ Keeping abandoned installations in place for CCS is a clear violation of this principle as it would hinder other use of the high seas. Can a Member State decide not to remove an installation, both onshore and offshore? And who is responsible for management, maintenance and safety during the period in which the previous activities have ended and there is no licensee for CCS yet? Ensuring that future fields are suitable and available for CCS might prove to be a quite complicated task for Member States, facing both legal and financial issues.³⁴

26 The Act on the Management of Water Utilities applies offshore and contains a permitting regime.

27 Provincial and national authorities may provide general rules for the assessment of the application for a Construction permit, see Dick A. Lubach, "Pipelines Transporting CO₂ from a Public and Private Law Perspective", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 185, at 203.

28 Staatscourant 2009, nr. 12819, 28 August 2009, Governmental Decree on Pipelines.

29 Arts. 4, 5 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

30 Hans Spiegeler, "Making Large Scale CCS Work in the Netherlands", Presentation held at an EC Workshop, 8 May 2007.

31 EBN/Gasunie, *CO₂ transport en opslagstrategie (CO₂ transport and storage strategy)*, april 2010. See also C. Cronenberg et al., *Potential for CO₂ storage in depleted gas fields at the Dutch Continental Shelf, phase 2: Costs of transport and storage*, 2009, Netherlands Oil and gas Exploration and Production Association (NOGEPa).

32 Martha M. Roggenkamp, "Regulating Underground Storage of CO₂", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 9, 205, at 227.

33 Art. 60 para. 3 of UNCLOS, supra, note 15.

34 Senter Novem, *Bestuurlijk Juridische Aspecten van CCS* (The Hague: Senter Novem, 2009).

Once a site is selected, Member States are to ensure that no storage facility is operated without a permit. The Directive describes the conditions for storage permits, the application and content of a permit, and updates to the permit.³⁵ Member States are obliged to appoint a competent authority or authorities to supervise the storage of CO₂. In the Netherlands, the underground storage of substances is regulated in the Mining Act. This act will be adapted and amended to implement the CCS Directive (proposal published in March 2010).³⁶ The Directive sets guidelines for the supervision of the operation of the storage site with regard to monitoring, reporting, inspections, and measures to be taken in case of leakage or irregularities. For the highly technical supervisory task at hand, the State Supervision of Mines will be the competent authority, which seems suitable.³⁷ Its function would be to ensure the safe storage of CO₂.

The main risks in storing CO₂ are the possibility of leakage and soil movement. Not only can this be harmful to human health, it also leads to environmental damage and climate damage. When such damage occurs, liability issues arise.³⁸ The liability regimes for environmental damage and climate damage are quite clear: environmental damage is covered by Directive 2004/35/EC, climate damage is covered by the ETS Directive.³⁹ Damage to health and property is covered by the liability provisions in the Dutch Civil Code. An operator will be liable for blowouts and leakage if the event was caused by defective man-made structures or defective equipment.⁴⁰ A complicating factor in the liability regime is the situation of transboundary storage or leakage. One of the questions that has not yet been answered in the Directive is who will be liable for damage to health and property when point emitters store the captured CO₂ in another Member State.

Another uncertainty arises in situations in which CCS is developed as a CDM or JI project under the Kyoto Protocol. Who must be liable: the seller of the resulting emission credits, the buyer or both? Buyer liability makes CCS economically less attractive and seller liability implies that developing countries without emission targets have to buy other credits on the market in case of leakage. All these existing uncertainties will not benefit the development of CCS projects.

4. Third Party Access

With regard to both pipelines and storage facilities, the Directive requires Member States to ensure that potential users have access to these facilities. The Directive also requires Member States to have a dispute settlement arrangement in place to settle disputes relating to access to transport networks and storage sites.⁴¹ The Directive chose a system of third party access (operator provides access if capacity is available) over a system of common carriage (access at all times).⁴² Third party access (TPA) may vary from negotiated access whereby parties negotiate on the transportation conditions and the tariffs and calculation methods, to regulated access whereby a regulator sets the conditions, tariffs and calculations methods. In general, a competent authority in regulated TPA is involved before the activities occur (*ex ante*), whereas in negotiated TPA a competent authority is only involved when conflicts arise (*ex post*).

For access to storage facilities and transporting networks, a system of negotiated TPA seems suitable, where operators, owners and interested parties may issue a complaint to a competent authority in case of excessive tariffs or abuse of market

35 Arts. 6–16 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

36 Tweede Kamer (Dutch Lower House of Parliament), 2009–2010, 32 343 no. 3.

37 Ko de Ridder and Avelien Haan, “The Role of the Competent Authority in Regulating CCS”, in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 300, at 319.

38 Alexandra B. Klass and Elizabeth J. Wilson, “Carbon Capture and Sequestration: Identifying and Managing Risks”, 3 *Issues in Legal Scholarship* (2009), 1, at 30.

39 Council Directive 2004/35/EC on Environmental Liability with Regard to the Prevention and Remedying of Environmental

Damage, OJ 2004 L143; Council Directive 2009/29/EC amending Directive 2003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, OJ 2009 L140.

40 Mark H. Wissink, “Post-Injection Liability for Onshore CO₂ Storage”, in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 229, at 272.

41 Art. 21 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

42 Jonathan P. Stern, *Third Party Access in European Gas Industries: Regulation-driven or Market Led?* (London: Royal Institute of International Affairs, 1992), 21 et seq.

power.⁴³ A first reason for this is that the provisions in the Directive are based on the essential facilities doctrine and the access regime applying to upstream oil and gas pipelines (negotiated access). One might argue that CO₂ pipelines can be characterised as a reversed upstream grid and should be treated in the same way.⁴⁴ Another reason is that the purpose of the CCS Directive is not to create a competitive market; its aim is the general environmental interest of combating climate change. The need for a strong and proactive competent authority with regulatory powers is not present in the case of CCS. Member States may however decide to apply a stricter regime and provide for regulated access (which the Dutch government did not do in its proposal). Different regimes undermine the level playing field for CCS across the EU. The question is whether or not this variety would be beneficial for the development of CCS. When the TPA is not harmonized, differences and even competition (i.e. cherry picking) between Member States may occur.

5. Closure/Long-term Stewardship

The purpose of CCS is to store the CO₂ permanently, and storage sites are closed when the conditions of the permit are met, the operator requests so (after authorisation by the competent authority), and (by the competent authority) if the permit is withdrawn.⁴⁵ The Directive requires a post-closure plan that should be approved by the competent authority. After closure of a site, the responsibility for the site will transfer to the competent authority after twenty years, when the competent authority is sure that the stored CO₂ is completely and permanently contained and a financial contribution from

the operator has been made. The competent authority thus decides whether or not the site will be closed and the responsibility is transferred. Any uncertainty about the requirements and guidelines applicable to such a decision may have an adverse effect on the development of CCS. In this respect, the state obviously has a dual position. On the one hand, if it applies strict guidelines, responsibility will not be transferred to the competent authority and the state will then avoid any compensation disputes. On the other hand, such an approach would restrict any interest in CCS in general. Furthermore, when the operator wants to transfer responsibility to the competent authority, an additional financial contribution to the competent authority must be made.⁴⁶ These requirements (closure conditions and financial requirements) are likely to play a role in the assessment of an investor regarding the economic viability of CCS. The Dutch proposal for implementation does not elaborate on the conditions for closure and the financial requirements. The EU Commission has recently issued two draft guidance documents on the transfer of responsibility and the financial security.⁴⁷ Although the documents are still in draft version, there is much debate between representatives of the industry and representative of the Commission and Member States on the division of responsibilities as foreseen in the guidance documents.

A complicated issue is the liability for damages after the site has been closed and the responsibility has been transferred to the competent authority. The transfer only concerns the liability regimes covered by the CCS Directive, Directive 2003/87/EC (ETS) and Directive 2004/35/EC (general environmental liability); it does not cover claims based on national law. In the Netherlands, the liability provisions in national legislation covering damage to health and property are not specifically drafted with a view to the long-term storage of CO₂. For example, Article 6:177 of the Dutch Civil Code (liability for mining activities) states that liability for a blowout lapses five years after the mining work has been abandoned, but there is no such rule for damage as a result of soil movements. Also, the operator remains liable for all damage to persons and property caused by a defective man-made structure even after the site has been abandoned (Article 6:174 (3) of the Dutch Civil Code).⁴⁸ A former operator may be faced with claims for damages which are made many years after the closure or abandonment of the

43 Martha M. Roggenkamp, "The Concept of Third Party Access Applied to CCS", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 273, at 299.

44 Ibid.

45 Art. 17 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

46 Art. 21 of Council Directive 2009/31/EC on the Geological Storage of Carbon Dioxide, OJ 2009 L140/114.

47 Guidance documents 3 and 4 under Directive 2009/31/EC, prepared by EU Commission DG Climate Action and published on June 17th.

48 Mark H. Wissink, "Post-Injection Liability for Onshore CO₂ Storage", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 229, at 272.

site. A situation should be avoided in which investors do not wish to hold a storage permit because of the liability involved and would rather apply for third party access. Similarly, it should be avoided that point emitters would rather make use of storage facilities in other Member States in order to avoid long-term national liability.

IV. Promoting CCS

The CCS Directive has provided a legal framework that makes CCS possible. Although several barriers are still in place, CCS can still become an instrument that can be used to combat climate change. Enabling CCS is a political choice in itself. As we have seen in this contribution, Member States still have to make a wide range of choices in implementing the Directive, which will have consequences for the development of CCS. In the end, companies are the ones who invest in CCS. They desire a stable legal framework, and the carbon price on the ETS market provides the principal incentive to invest in CCS. It is up to the Member States to further develop the framework to make CCS possible, and they have several instruments to do so.

1. Regulatory Challenges

A first decision for Member States is to allow CCS. Choices of Member States may vary from a prohibition of CCS to making CCS mandatory. Once the decision is made to enable CCS, Member States are to decide where to allow CCS, which is more than assessing the suitability of a geological formation. Guaranteeing the value of future fields may limit the amount of possible locations or might even be impossible due to financial and legal obligations in the current legal framework. Although investors in CCS are likely to bear the costs for constructing transport and site installations, the way in which the Member State chooses to regulate access to these facilities may play a crucial role in the willingness of companies to invest. Furthermore, the requirements for closure and long-term storage may even prove to be a trigger for companies not to invest in CCS. With regard to transboundary transport and storage and the long-term horizon for liability, several uncertainties exist both for Member

States and possible investors. When reviewing this shortlist of choices and uncertainties, two regulatory issues stand out: the choices available to regulate the post-closure phase, and the regulation of third party access to CCS. Both in drafting and supervising these rules, Member States define the position of CCS.

2. Instruments for Developing CCS

Member States have different instruments for the development of CCS.⁴⁹ The matter of incentives and funding is crucial for developing CCS over the long term. So far the EU legislator has considered the ETS the most important instrument to stimulate CCS. Direct subsidies are made available primarily for demonstration projects. The problem, however, is that direct subsidies are at least partly inefficient, since they generate an overuse of CCS and thus imply a welfare loss to society. It is therefore in the public interest to end such subsidies as soon as possible, but it is in the special interest of companies that use CCS to expand those subsidies.⁵⁰ The price for CO₂, which is the main driver for CCS, will not only depend on the emission cap (set by the Member States until 2013, after that by the EU) and market factors, including the supply of and demand for gas and oil, but it will also depend on governments' (in)action regarding minimum and/or maximum allowance prices, CO₂ taxes or subsidies for CCS. Taxes can be quite a financial burden when developing new and innovative projects. Property taxes, for instance, increase the costs of CCS for investors.

Instead of using subsidies for CCS, use could be made of tax incentives. To stimulate R&D in general, tax incentives are usually more effective than subsidies.⁵¹ Private firms remain more autonomous in their decisions and they are less subject to the bureaucracy and uncertainty connected to direct

49 Heleen Groenenberg and Heleen de Coninck, "Effective EU and Member State Policies for Stimulating CCS", 2 *International Journal of Greenhouse Gas Control* (2008), 653, at 664.

50 Edwin Woerdman and Oscar Couwenberg, "CCS in the European Emissions Trading Scheme", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note 8, 97, at 124.

51 Willem Vermeend, Rick van der Ploeg and Jan Willem Timmer, *Taxes and the Economy: A Survey of the Impact of Taxes on Growth, Employment, Investment, Consumption and the Environment* (Cheltenham, UK: Edward Elgar Publishing, 2008), at 235.

subsidies. Moreover, tax credits are more efficient as they do not have the welfare-economic disadvantages of subsidies. Member States could therefore consider opting for a tax write-off to firms that wish to apply CCS. A corporate income tax credit for firms using CCS is such an example, but one could also think of exempting CCS from property or transfer taxes.⁵²

V. Conclusion

The CCS Directive must be transposed into national law by 25 June 2011. This will require some changes in the national regulatory framework. In March 2010 a proposal was published for implementing the CCS Directive into Dutch law. The legislator has chosen to implement the directive in national law without further elaboration on the regulatory challenges as defined in this contribution. Although the Dutch government has chosen to promote CCS and has appointed storage locations both in the West and the North of the country, the uncer-

tainties that still exist are not resolved in national law. Many Member States still have to publish the proposals for the implementation of Directive 2009/31/EC. It is therefore too early to say what the national regimes will look like, and whether and to what extent the legal uncertainties and consequences we have sketched above will remain valid.

The legal framework for CCS leaves many uncertainties for potential investors in CCS, while these companies in fact desire stability and certainty. The examples given above demonstrate that, in the future, some amendments to the CCS Directive are required in order to create more legal certainty and thus reduce transaction costs for companies considering to capture, transport and/or store CO₂. The EU legislator does facilitate such a harmonized approach, since the Commission is required to submit by 31 March 2015 a report on the implementation of the CCS Directive, in the light of the four years of experience with CCS, and taking into account technical progress and scientific developments. It therefore can be expected that the current CCS Directive will be amended and supplemented in the next few years. Whether such a process of learning by doing will provide investors with sufficient certainty now is another matter – and it may even result in a situation where the state will be given a more important role than currently envisaged.

52 Jan N. Bouwman and Irene J.J. Burgers, "Tax Law as a Barrier or a Tool for Promoting CCS", in Roggenkamp and Woerdman (eds.), *Legal Design of Carbon Capture and Storage*, supra, note, 321, at 344.