



CLIENTEARTH  
JUSTICE FOR THE PLANET

**Laying the Regulatory Foundations for Carbon Capture and  
Storage in the EU**

A Legal Review of the Draft European Directive on Geological  
Storage of Carbon Dioxide

EXECUTIVE SUMMARY

**October 2008**

## **About ClientEarth**

ClientEarth is a dynamic non-profit law, science and policy organisation based in London and Brussels. The organisation is composed mainly of activist lawyers working at the EU level and in the Member States. We bring together law, science, economics and politics to develop legal strategies which address the big environmental challenges.

Our mission is to bring dedicated legal expertise to the environmental movement across Europe. We operate by monitoring existing laws, developing policy, lobbying for effective legislation and, where necessary, pursuing strategic litigation. We act as legal advisors to non-governmental organisations as well as MPs, MEPs and policy makers in the EU, the UK and other Member States.

ClientEarth works across the environmental agenda, and has programmes on climate and energy, environmental justice and marine protection.

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## **About this report**

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## Executive summary

A comprehensive and effective regulatory framework is one of the key building blocks towards enabling the successful demonstration and deployment of carbon capture and storage (CCS) technology in Europe. The European Commission's (the **Commission**) proposal for a directive on the geological storage of carbon dioxide (CO<sub>2</sub>) (the **Directive**) provides the basis for a standalone regulatory framework for storage activities which would otherwise have been prohibited or difficult under existing law. The Directive reflects recent international moves to amend international laws to facilitate CCS storage and transport.

The draft Directive accordingly aims to provide a comprehensive permitting system for geological storage of CO<sub>2</sub>. The regime is not, however, a complete regulatory framework for CCS technology. It does not require the use of CCS at power stations or industrial installations, and takes a weak enabling approach to incentivising the use of CCS and financing demonstration of the technology. In summary, the draft Directive:

- establishes a legal framework to create a permitting system and to address liability for environmental damage and risks to human health arising from the geological storage of carbon dioxide;
- requires Member States to ensure that certain new combustion plants are constructed "capture ready", that is capable of being retrofitted with carbon capture technology in the future (Article 32); and
- sets out some basic principles to encourage the commercial development of CCS, for example by bringing CCS activities under the EU emissions trading scheme (**EU ETS**), and ensuring fair and open access to carbon dioxide transport networks and storage sites.

**Storage.** The key challenge for the Directive is to establish a CO<sub>2</sub> storage regime that is adequate from an environmental and public policy perspective (safety and environmental integrity). The regime must also provide a clear and certain process for project developers to obtain necessary licences and permits, and a basis for developing, operating and monitoring storage sites with a clear understanding of the scope and extent of their liability for leakage of CO<sub>2</sub>, as well as for local environmental damage.

The draft Directive largely meets this challenge by proposing a **comprehensive permitting regime for CO<sub>2</sub> storage** together with a mechanism that will ultimately allow operators to transfer liability for storage sites to the competent authorities of the relevant Member State after injection of CO<sub>2</sub> has finished and all post-closure obligations have been fulfilled. The draft Directive also removes prohibitions on CCS which exist under current EU legislation, for example excluding CO<sub>2</sub> captured and transported for storage from the definition of waste, although a company would still need to review local waste law if it is operating outside EU.

The basic premise of the permitting regime is that a proposed site should only be selected for geological storage of CO<sub>2</sub> following a **site characterisation and assessment** that shows that there is no significant risk of leakage, and no significant environmental or health impacts are likely to occur. **Exploration permits** will be available so that potential storage sites can be identified, although an exploration permit does not automatically entitle the entity to apply for a storage permit for the area covered by an exploration permit, potentially limiting their commercial appeal.

In addition to demonstrating the suitability of a proposed storage site, operators applying for a storage permit must demonstrate that they have sufficient technical competence and provide full details of a monitoring plan, a corrective measures plan, an environmental impact assessment and a post-closure plan. Such obligations will be met by **financial security** arrangements. Once issued, the competent authority has the power to review, update or withdraw the storage permit under certain conditions, for example, where it is notified of “*significant irregularities or leakages*”, although this provision would benefit from being strengthened to cover earlier instances where the authority becomes aware of such incidents.

Site characterisation criteria and criteria for the monitoring plan and the post-closure monitoring plan are set out in annexes to the Directive, and the Commission can amend the criteria following the comitology procedure. This provides some flexibility for the regime to respond to developments in CCS technology and best practice.

Our legal review identified some areas where amendments could improve the permitting process. A number of these may be addressed in the final stages of consideration of the draft Directive by the European Parliament and the Council of the European Union (the **Council**), or may be dealt with in the implementation stages by Member States. A key omission in the Directive as drafted is a provision for storage permits to be transferred between operators in the event of a change in ownership of an operator or a storage site, which is a standard provision in environmental regimes.

The allocation of **liability**, including liability for leakage and damage, and the transfer of responsibility from commercial operator to a competent authority resulting from long-term CO<sub>2</sub> storage, is one of the most significant legal issues for CCS deployment. The draft Directive aims to strike the right balance in the liability regime between the government and private entities, by holding operators liable for any damage caused during their period of operation until the permit is terminated.

Liability for damage will occur both in terms of damage to the local environment and damage to the climate. In relation to **local environmental damage**, the Environmental Liability Directive (2004/35/EC) (**ELD**) will apply to CO<sub>2</sub> storage to ensure the prevention and remedy of any such damage by the operator.

Operators will have strict liability for remediating any damage to the local environment caused by leakage of CO<sub>2</sub> or as a result of CCS activities. In addition to liability under the ELD, operators may also have liability (in tort) for negligence under national legal systems, where injury/damage has been caused to a third party. The use of the term “significant environmental or health impacts” in relation to *site*

*selection* is directly related to liability for damage to the environment under the ELD, a relatively new EU directive which is in the process of being implemented by Member States. The term “significant” is a well understood term in this context and is consistent with other risk-based environmental regimes.

The ELD fails to provide a comprehensive framework to cover damage caused by CO<sub>2</sub> leakage or storage activities because it applies only to certain types of damage such as biodiversity and land contamination that creates a significant risk for human health. Actions brought under the ELD or tort may be difficult to establish. The insurance industry has not yet taken a view on liability for leaked CO<sub>2</sub> and it will be important to see how the industry responds.

An alternative approach to deal with this gap is to extend the concept of the **corrective measures plan**, which is required as part of the permitting system. The plan should be extended to specifically require measures to remedy or mitigate any negative impact on the environment or human health. This approach would ensure that any damage to the surrounding environment and human health in the course of storage operations under a permit would be dealt with as a compliance matter directly under the standalone storage permitting system. Such an amendment would provide greater clarity and certainty to operators and regulators, and build public confidence in the permitting system.

**Damage to the climate system** caused by the escape of CO<sub>2</sub> from storage sites will result in a financial liability to surrender EU ETS allowances purchased at market rate. Under the revised EU ETS, CCS activities including capture, transport and storage will be covered. This approach to climate damage raises some interesting challenges because it brings unintended leakages of CO<sub>2</sub> from a geological storage sites within the emissions trading scheme, which deals primarily with emissions from industrial installations. Without default rules for calculating the number of tonnes of CO<sub>2</sub> deemed to have been emitted, it may also be very difficult to quantify the liability with accuracy where data cannot show the precise volume of CO<sub>2</sub> leaked.

Moreover, the requirement to buy credits is not a penalty in itself; it simply puts the operator back into the EU ETS with liability for climate damage limited to the current carbon price. This creates an unusual situation whereby if the carbon price is relatively low compared to the costs of site monitoring and preventing leakages, the penalty may be an inadequate deterrent. The financial security required under the storage permit must also cover liability under the EU ETS. However, the EU ETS is not necessarily a comprehensive solution for imposing liability for climate damage as a result of leakage.

The draft Directive requires Member States to introduce **penalties** for infringements of the national implementing legislation. Although a minimum level is not specified, penalties must be “*effective, proportionate and dissuasive*”. It is unclear whether penalties apply to leakage of CO<sub>2</sub> or only technical breaches of permitting rules. However, a robust system of sentences and fines should be in place to ensure operators incur a penalty in proportion to the nature of the breach and the damage caused. This should sit parallel to liability under the EU ETS, so that a sufficient deterrent against poor management of storage sites is imposed. There is likely to be a high degree of variation in sentences and fines for leakage across the EU, possibly affecting an operator’s decision as to where to locate their storage site.

It would be helpful if the Commission clarified the relationship between the draft Directive on CCS and the recent draft Directive on environmental crime. If there is a link, it could be argued that penalties under the CCS regime should impose criminal sanctions where leakage of CO<sub>2</sub> causes serious damage.

In recognition that operators will be reluctant to develop storage sites if they have indefinite and unlimited liability and legal responsibility in perpetuity, the Directive provides a mechanism for eventual **transfer of responsibility** after closure of a storage site. Operators will remain liable for storage sites until they can satisfy all post-closure requirements at which point the relevant Member State must take over the responsibility for the closed storage site, including all future legal obligations. However, while operators can therefore work on the basis that they will eventually be able to transfer responsibility for the site to a competent government authority, an element of uncertainty remains because operators will have to meet the high test that *“all available evidence indicates that the stored CO<sub>2</sub> will be completely contained for the indefinite future”*. The availability of such evidence will depend upon the adequacy of the initial site characterisation and selection and the management and monitoring of the site during operations. It may be necessary to prescribe best practice standards and criteria that must be met before transfer of responsibility can occur to provide greater certainty to operators.

**Capture.** The capture of CO<sub>2</sub> at its industrial source is not the focus of the Directive. Existing legal regimes are expected to provide the legal basis for dealing with capture, specifically the integrated pollution prevention and control regime for permitting purposes and the EU ETS for incentive purposes. However, the Directive introduces the concept of “carbon capture readiness” and Article 32 of the draft Directive will require Member States to ensure that new combustion plants are constructed such that they are *capable* of being retrofitted with CCS technology.

The Commission has indicated that at this time, Member States should not be required to make the use of CCS mandatory for new power stations or to impose a specific date when CCS must be retrofitted either on existing power stations or on power stations consented as “capture ready”. The definition is controversial because it fails to address the risk of lock-in to high carbon infrastructure in light of large numbers of new coal power plants being planned in Europe, and does not provide certainty as to whether a plant will ever be fitted with CCS. In particular, Article 32 does not require any financial or economic assessment of retrofitting CCS for new combustion plants. The concept of capture readiness as set out in Article 32 does not therefore reflect the multiple factors that will affect the feasibility of deploying CCS in the future and whether deployment will occur in practice.

The alternative approach to carbon capture readiness is to set an emissions performance standard setting the maximum amount of CO<sub>2</sub> that may be emitted from a power station which gives energy companies the option of meeting the standard with suitable power generation including renewable energy, efficient combined cycle gas or combined heat and power, or coal with CCS operating from the outset.

**Transport.** The draft Directive relies on existing legislation for regulating transport of CO<sub>2</sub>. The exception is the provision for ensuring that operators are able to access CO<sub>2</sub> transport networks and storage sites based on the principle of fair and open third party access.

Pipeline infrastructure will be subject to existing national planning systems and property (including compulsory purchase) law. This will include transboundary planning issues where proposed construction of pipelines across national borders within the EU will be subject to the environmental impact assessment (EIA) directive, which sets out procedures for projects with transboundary impacts. This will be a key challenge for planning and developing an integrated European pipeline infrastructure, and the EU should take a lead in a planning and coordination role although it will not have direct jurisdiction in relation to consenting of pipelines. The physical transportation of CO<sub>2</sub> by pipeline will have to comply with applicable national health and safety legislation.

**Demonstration of CCS.** The Commission has indicated support in principle for up to 12 demonstration projects in the EU, but has not proposed how these would be financed. Apart from individual Member State-level funding of CCS demonstration projects, proposals are also on the table for an EU-led demonstration programme based on an EU ETS financing mechanism. An EU-led demonstration programme would allow a coordinated commercial-scale demonstration of the range of CCS technologies, demonstrate an integrated chain of CCS at a commercial level and allow CCS to be tested in a range of geographical locations and installations (power stations, industry). Such a demonstration programme would need careful design to ensure that projects selected for financing deliver the objectives of the programme and that any public funding of projects, including through allocation of allowances under the EU ETS, is granted subject to appropriate conditions to ensure that technology transfer occurs in the future.

**Legislative process and implementation.** The Directive remains in draft at this stage and is in the process of being considered by the European Parliament and the Council under the codecision procedure as part of the climate and energy legislative package. Further revisions may address some of the legal issues identified in this report. The implementation process may also resolve practical issues at Member State level. This will give developers more certainty to embark on such projects.

Once the Directive is published in its final form, Member States will have a period of time to implement (transpose) it into their national regulatory systems. Some Member States such as the UK are at a more advanced stage in establishing a regulatory regime. However, implementation is only effective with strict compliance and enforcement of the legislation by Member States and the Commission. The Commission should also continue to play an important role in ensuring that the regulatory framework facilitates and incentivises CCS as well as ensuring the safety of CCS in environmental and health and safety terms. In addition, the Commission should give further consideration to requiring the deployment of CCS, given the fundamental role CCS has to play in reducing CO<sub>2</sub> emissions at both existing and new installations.

## Key recommendations

ClientEarth makes the following legal and policy recommendations:

- The definition of corrective measures should be extended to specifically include measures to remedy or mitigate any negative impact on the environment or human health. This would ensure that damage is addressed as a compliance matter directly under the standalone storage permitting system, rather than under the Environmental Liability Directive which only applies in narrow circumstances.
- Member States should introduce a robust system of penalties for breach of permit conditions. This should sit parallel to liability under the EU ETS, so that a sufficient deterrent against poor management of storage sites is imposed. Further, the Commission should clarify the relationship between the draft Directive on CCS and the recent draft Directive on environmental crime.
- The provisions related to transfer of responsibility to the competent authority, in particular the statement *“all available evidence indicates that the stored CO<sub>2</sub> will be completely contained for the indefinite future”* should be clarified further. The Directive should provide guidance as to what the criteria for transfer should be.
- The permitting system could be improved with amendments such as the inclusion of a procedure to transfer a storage permit to another operator, an amendment to the Commission’s time period to review a draft storage permit, and requiring appropriate monitoring after a site has been closed and responsibility transferred to a competent authority.
- A financing mechanism is required for demonstration of CCS. A future EU-led demonstration programme must be designed carefully to ensure that projects selected for financing deliver the objectives of the programme and that any public funding of projects, including through allocation of allowances under the EU ETS, is granted subject to appropriate conditions to ensure that technology transfer occurs in the future.
- The EU should provide a strategic role in planning and coordinating the development of a European transport network for CCS, subject to Member States’ own jurisdiction over national property and planning laws.
- Further consideration should be given to the risks of failing to achieve EU emissions targets by allowing fossil fuel power stations to be build “capture ready”, and to the alternative means of managing the risk, such as an emissions performance standard for CO<sub>2</sub> emissions from power stations and setting the date by which deployment of CCS will be required.