
# Manual of European Environmental Policy

The following pages are a section from the Manual of European Environmental Policy written by the Institute for European Environmental Policy.

The Manual was published by Earthscan/Routledge from 2010 to 2012. It was designed as an on on-line interactive reference work and annual printed versions were also produced.

This section is the text of the Manual as published in 2012. It is therefore important to note the following:

- The contents have not been updated since 2012 and no guarantee is given of the accuracy of the contents given potential subsequent developments.
- The sections include links to external websites (e.g. to legal texts). These links continue to work as long as those links are not broken by those websites.
- The sections also include the original links that enabled interactivity within the published on-line version of the Manual. These links no longer work.



The Manual should be cited as follows:

Farmer, A.M. (2012) (Editor). Manual of European Environmental Policy. 1043pp. Routledge, London.

# Use of carbon capture and storage

| **Formal reference** | |
|---|---|
| 2009/31/EC (OJ L140 5.6.2009) | Directive on the geological storage of carbon dioxide and amending Council Directives 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 |
| Proposed – COM(2008)18 | |
| **Legal base** | Article 192 TFEU (originally Article 175(1) TEC) |
| **Binding dates** | |
| Entry into force | 25 June 2009 |
| Date of transposition | 25 June 2011 |

## Purpose of the Directive

The Directive establishes a legal framework for the environmentally safe geological storage of carbon dioxide ($CO_2$) to contribute to the fight against climate change (commonly known as carbon capture and storage (CCS)). The purpose of geological storage of $CO_2$ is permanent containment of $CO_2$ in such a way as to prevent and, where this is not possible, eliminate as far as possible negative effects and any risk to the environment and human health.

The Directive prohibits storage of $CO_2$ in the water column. The Directive does not apply to geological storage of $CO_2$ undertaken for research, development or testing of new products and processes with a total intended storage below 100 kilo tonnes. Furthermore, the storage of $CO_2$ in a storage site with a storage complex extending beyond the frontiers of the EU is not permitted.

## Summary of the Directive

The Directive ensures that $CO_2$ capture is regulated under the Integrated Pollution Prevention and Control Directive 2008/1/EC and that both $CO_2$ capture and pipeline transport are regulated under the Environmental Impact Assessment Directive 85/337/EEC. The bulk of the Directive, therefore, concerns the Regulation of $CO_2$ storage and the removal of barriers in existing legislation to $CO_2$ storage.

The Directive sets out a regulatory regime for the permitting of exploration and storage, and establishes criteria for the selection of storage sites. The requirements on site selection are designed to ensure that only sites with a minimal risk of leakage are chosen.

Member States retain the right to determine the areas from which storage sites may be selected. This includes the right of Member States not to allow for any storage in parts or in the whole of their territory. The suitability of a geological formation for use as a storage site shall be determined through a characterization and assessment of the potential storage complex and surrounding area using criteria specified in Annex I of the Directive.

Where Member States determine that exploration is required to generate the information necessary for selection of storage sites, they shall ensure that no such exploration takes place without an exploration permit. This may include monitoring of injection tests. Such permits shall be open 'to all entities possessing the necessary capacities and that the permits are granted or refused on the basis of objective, published and non-discriminatory criteria'.

The Directive also requires that Member States shall ensure that no storage site is operated without a storage permit, that there shall be only one operator for each storage site, and that no conflicting uses are permitted on the site. Priority for the granting of a storage permit for a particular site shall be given to the holder of the exploration permit for that site, provided that the exploration of that site is completed, that any condition set in the exploration permit has been complied with, and that the application for a storage permit is made during the period of validity of the exploration permit. Member States shall ensure that no conflicting uses of the site are allowed during the permit procedure. The Directive sets out detailed provisions for what should be included in the application for a permit and what should be contained in a permit (administrative information, details of $CO_2$ storage and injection and monitoring). Member States shall make the permit applications available to the Commission within one month after receipt as well as other related material that shall be taken into account by the competent authority when deciding the storage permit. They shall also inform the Commission of all draft storage permits and any other material taken into consideration for the adoption of the draft decision. Within four months after receipt of the draft storage permit, the Commission may issue a non-binding opinion on it. The Directive also establishes obligations with regard to the review of permits.

The Directive sets out acceptance criteria for the $CO_2$ to be injected. It must 'consist overwhelmingly of carbon dioxide', so that 'no waste or other matter may be added for the purpose of disposing of that waste or other matter', although it may contain incidental substances or substances added to assist in monitoring and verifying $CO_2$ migration. Such substances must not adversely affect infrastructure, be a risk to the environment or health or breach EU legislative obligations. The Commission may adopt guidelines regarding these criteria. The Directive amends the Water Framework Directive 2000/60/EC, including injection of carbon dioxide as an exemption from the general prohibition on direct discharges to groundwater.

The competent authority in Member States must ensure that inspections are carried out to verify that the provisions of the Directive are observed. Routine inspections must be carried out at least once a year, involving examination of the injection and monitoring facilities and the full range of environmental effects from the storage complex. In addition, non-routine inspections must be carried out if any leakage has been notified, if the operator's annual report to the competent authority shows that the installation is not compliant with the Directive, and if there is any other cause for concern.

A monitoring plan must be set up to verify that the injected $CO_2$ is behaving as expected. For any leaked $CO_2$, corrective measures must be taken and Emissions Trading Allowances under the EU Emission Trading Scheme (EU ETS) must be surrendered, to compensate for the fact that the stored emissions were credited under the ETS as not emitted when they left the source. Finally, the requirements of the Environmental Liability Directive 2004/35/EC on repairing local damage to the environment will apply in the case of leakage.

The Directive sets out detailed obligations for site closure, after which the operator remains responsible for monitoring, etc. However, the Directive also provides for sites to be transferred to Member State control in the long term. Under the Directive a storage site shall be transferred to the state when (1) all available evidence indicates that the $CO_2$ will be completely contained for the indefinite future, (2) a minimum period before transfer to be determined by the competent authority has elapsed, (3) a financial contribution for the post-transfer period covering at least the costs for monitoring for 30 years has been made and (4) the site has been sealed and the injection facilities have been removed. A Commission review is foreseen regarding this key decision, to be taken by Member States.

The Directive also requires, subject to specified conditions, that potential users are able to obtain access to transport networks and to storage sites for the purposes of geological storage of $CO_2$.

General provisions of the Directive address the competent authority, cross-border cooperation, penalties, reporting and the relevant comitology procedures. Annex I specifies detailed criteria for the requirements on site characterization and risk assessment. Annex II specifies detailed criteria for monitoring requirements. The legal basis for the implementation of the necessary monitoring requirements are established as a result of an amendment to Decision 2007/589/EC; the Decision comprising the Monitoring and Reporting Guidelines for the EU-ETS as a whole (Decision 2010/345/EU). A questionnaire to be used for the first report on the implementation of the Directive was adopted on 11 February 2011 (Decision 2011/92/EU).

The EU ETS will provide the main incentive for CCS deployment. $CO_2$ captured and safely stored according to the EU legal framework will be considered as not emitted under the ETS. In Phase II of the ETS (2008–2012) CCS installations can be opted in. For Phase III (2013 onwards), under the amended Emissions Trading Directive 2009/29/EC, capture, transport and storage installations will be explicitly included in the ETS. Furthermore, up to 300 million allowances in the new entrants reserve under the EU ETS will be made available to stimulate the construction and operation of up to 12 commercial demonstration projects to capture and store $CO_2$, and for innovative renewable energy demonstration technologies in the EU. On 3 November 2010 the Commission adopted a Decision laying down criteria and measures for the financing of commercial demonstration projects (Decision 2010/670/EU).

Member States have to transpose the Directive into national legislation within two years after its publication and transmit the relevant provisions to the Commission.

# Development of the Directive

On 10 January 2007, the Commission adopted a package of measures in the area of energy and climate change, inviting the Council and the European Parliament to approve:

- An EU commitment to reduce greenhouse gas emissions by at least 20 per cent by 2020 compared to 1990 levels, as well as the aim for a 30 per cent reduction by 2020, subject to the conclusion of an international agreement on climate change.
- A binding target for the EU of a 20 per cent share of renewable energy sources in energy consumption by 2020, and a 10 per cent target for biofuel use in transport.

This strategy was approved by the European Parliament and EU leaders during the March 2007 European Council. The European Council invited the Commission to present concrete proposals, particularly on the provisions for sharing the effort between Member States to achieve this objective. As a response to this invitation, a proposed set of key legislative measures was published in January 2008:

- A proposal for a Directive amending Directive 2003/87/EC, to improve and extend the European Union Greenhouse Gas Emission Trading Scheme.
- A proposal for a Decision on how to share the effort to be made between Member States to respect the Community's commitments to reduce these emissions by 2020.
- A proposal for a Directive aiming to promote renewable energy.

Included among the proposals that made up this set of measures were: a proposal for a regulatory framework on carbon dioxide capture and storage; a communication on the demonstration of carbon dioxide capture and storage; and a new Community framework on State aid in the area of the environment. This legal framework was designed to ensure that $CO_2$ capture and storage is an available mitigation option, and that it is done safely and responsibly.

On 17 December 2008 the European Parliament formally adopted the Commission's legislative proposal on $CO_2$ capture and storage during a first reading vote in Plenary, following months of intense negotiations between the French Council Presidency, the Commission and the Parliament. The agreed texts were adopted by the Council on the 6 April 2009 and published in the Official Journal on the 5 June 2009.

# Implementation of the Directive

Information on the measures taken by the Member States to transpose Directive 2009/31/EC can be found in their national execution measures. However, the deadline for transposition is not until 25 June 2011.

The European Commission has produced guidance documents to assist competent authorities and stakeholders in implementation of the Directive. These are:

- Guidance Document 1: $CO_2$ Storage Life Cycle Risk Management Framework (2011). This document discusses how risk management principles can be applied in order to implement CCS projects under the Directive.
- Guidance Document 2: Characterisation of the Storage Complex, $CO_2$ Stream Composition, Monitoring and Corrective Measures (2011). This provides an overview of the technical issues to consider in selecting storage sites; as part of $CO_2$ injection; and as part of monitoring exercises.
- Guidance Document 3: Criteria for Transfer of Responsibility to the Competent Authority (2011). Under the Directive a storage site shall be transferred to State control when (1) all available evidence indicates that the $CO_2$ will be completely contained for the indefinite future, (2) a minimum period before transfer to be determined by the competent authority has elapsed, (3) a financial contribution for the post-transfer period covering at least the costs for monitoring for 30 years has been made and (4) the site has been sealed and the injection facilities have been removed. A Commission review is foreseen regarding this key decision, to be taken by Member

States. The guidance document reiterates key technical detail in relation to this aspect of project development.

- Guidance Document 4: Article 19 Financial Security and Article 20 Financial Mechanism (2011). The guidelines on financial security indicate how operators can price risks once they submit applications for a storage permit. They help ensure that operators can comply with their storage obligations longer term, given the risk of leaks and other unforeseen hazards.

# Enforcement and court cases

No cases have been concluded by the European Court of Justice concerning Directive 2009/31/EC.

# Related legislation

There are a number of other EU Directives that have a strong interaction with the CCS Directive:

- Directive 2008/1/EC, concerning integrated pollution prevention and control for certain industrial activities.
- The Industrial Emissions Directive 2010/75/EUThe Environmental Liability Directive 2004/35/EC.
- Directive 2003/87/EC establishing the EU Emission Trading Scheme.
- Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community.
- The Water Framework Directive 2000/60EC.