

4.7 The Committee calls on the Commission to establish a compliance regime, under which Member States would, for instance, be fined for exceeding the set emission levels.

4.8 Also, in terms of the equitable geographical distribution of projects, Article 4(1)(c) is not specific enough as to the application of measures on the purchasing of credits.

4.9 To implement this decision, the Commission should provide the Member States with pointers for action, instruments and other measures. A good first step could be to issue a guide containing examples of successes already achieved in the EU.

4.10 To achieve the objective of this decision, the Committee recommends that Member States make use of the Structural and

Cohesion Funds for projects that do not produce, or that even reduce greenhouse gas emissions.

4.11 For ETS installations, provision has been made for the auction of emission allowances during the next allocation round from 2013 to 2020. This will secure the funds needed to reduce greenhouse gas emissions from non-EU-ETS sectors. Part of the funds obtained in this way should be directed towards economic sectors that are making an effort to reduce greenhouse gas emissions. The other part should be channelled into a solidarity fund for developing countries, and allocated to climate change adaptation projects in those countries.

Brussels, 9 July 2008.

The President
of the European Economic and Social Committee
Dimitris DIMITRIADIS

Opinion of the European Economic and Social Committee on the ‘Proposal for a Directive of the European Parliament and of the Council on the geological storage of carbon dioxide and amending Council Directives 85/337/EEC, 96/61/EC, Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and Regulation (EC) No 1013/2006’

COM(2008) 18 final — 2008/0015 (COD)

(2009/C 27/17)

On 8 February 2008 the Council of the European Union decided to consult the European Economic and Social Committee, under Article 175 of the Treaty establishing the European Community, on the

Proposal for a Directive of the European Parliament and of the Council on the geological storage of carbon dioxide and amending Council Directives 85/337/EEC, 96/61/EC, Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and Regulation (EC) No 1013/2006.

The Section for Agriculture, Rural Development and the Environment, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 4 June 2008. The rapporteur was Mr Wolf.

At its 446th plenary session, held on 9 and 10 July 2008 (meeting of 9 July), the European Economic and Social Committee adopted the following opinion by 138 votes to one with four abstentions.

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1. Summary and conclusions

1.1 Capture and long-term storage (CCS) of carbon dioxide (CO₂) released by the use (combustion) of fossil fuels would

substantially help to combat climate change. This technology should therefore be developed more rapidly and used as soon as possible.

1.2 The Committee welcomes the Commission's proposed directive as a prerequisite for the development and use of CCS, and broadly endorses its content.

1.3 The directive addresses the most important aspects and sets out provisions to deal with them. In particular, human and environmental safety issues and the associated responsibilities are covered, thus helping to secure public acceptance of the directive and addressing safety concerns on the part of ordinary citizens.

1.4 The development of the overall CCS value-added chain, involving the capture, transport and storage of CO₂, is in an early — and, in some cases, still exploratory — stage. The provisions of the directive need to take this into account, and some fine-tuning is still needed in certain areas.

1.5 To enable rapid implementation of initial projects, some sections of the directive should be amended to make them more manageable by both the relevant national authorities and potential investors; this would also ensure planning certainty and provide incentives for action. This applies for instance to liability issues and the nature and extent of financial security payments.

2. Introduction

2.1 Following the Council decisions of March 2007 on climate change and threats to the security of energy supplies, the Commission proposed a package of measures in the form of separate documents in order to meet the objectives set by the Council decisions. These measures focus on energy efficiency, promoting renewable energy sources and developing and using the relevant innovative technologies. The Committee has drawn up specific opinions on each measure ⁽¹⁾.

2.2 One area of key importance in this context is the development of methods to sustainably reduce greenhouse gas emissions arising from the use of fossil fuels, which is the subject discussed in this opinion, with particular reference to the Commission's proposal for a directive on the geological storage of carbon dioxide (CO₂).

2.3 This opinion ties in with a Committee opinion ⁽²⁾ on the same technology discussing the Commission's communication on *Supporting Early Demonstration of Sustainable Power Generation from Fossil Fuels*.

3. Commission proposal

3.1 On the basis of (i) the fact that the growing demand for sources of energy at international level is likely to be met predominantly by the use of fossil fuels and (ii) the objective of achieving a global reduction of CO₂ emissions of 50 % by 2050 and a reduction of between 60 and 80 % in the industrialised states, the Commission considers that it is essential to exploit all possibilities of bringing down the level of emissions. With this aim in view, carbon dioxide capture and storage (CCS) ⁽³⁾ is of major importance.

3.2 The European Council of March 2007 called for the development of the necessary technical, economic and regula-

tory framework to bring environmentally safe CCS to deployment; the proposal under review represents one means by which this objective is to be achieved. The proposal relates, above all, to the establishment of the regulatory framework on the basis of Article 175(1) of the EC Treaty. It also provides for simplification of legislation and simplification of administrative procedures for public authorities, be they EU or national.

3.3 Existing provisions, such as those set out in Directives 96/61/EC, 85/337/EEC, 2004/35/EC and 2003/87/EC, are taken into account or where necessary amended in the proposal.

3.4 Actual contents of the Commission proposal:

3.4.1 Chapter 1 covers the subject matter, purpose and scope of the proposal. Definitions of terms are also set out.

3.4.2 Chapter 2 covers site selection and exploration permits. The Member States are to determine the areas to be made available for storage and the rules governing the allocation of exploration permits.

3.4.3 Chapter 3 covers storage permits, conditions for awarding them and the relevant powers of the European Commission. An important element is the environmental impact assessment, which includes impact assessments and public consultations.

3.4.4 Chapter 4 covers operation, closure and post-closure obligations, including CO₂ acceptance criteria, monitoring and reporting obligations, inspections, measures in case of irregularities and/or leakage, closure and post-closure obligations and provision of financial security.

3.4.5 Chapter 5 addresses the issues of access to transport and storage networks.

3.4.6 Chapter 6 covers general provisions relating to the competent authority, cross-frontier cooperation, penalties, reporting to the European Commission, amendments and the relevant comitology procedures.

3.4.7 Chapter 7 sets out the required amendments to other legislation, including the necessary adaptations to water and waste legislation. Additional conditions in respect of the authorisation of new power stations are also set out.

3.4.8 Annex I specifies detailed criteria for the requirements on site characterisation and risk assessment. Annex II sets out detailed criteria for the requirements on monitoring. The European Commission may amend the Annexes, in which case the European Parliament also has a say.

⁽¹⁾ CESE 1201/2008, CESE 1202/2008, CESE 1203/2008 of 9.7.2008, not yet published in the OJ.

⁽²⁾ COM(2008) 13 final.

⁽³⁾ CCS: Carbon (i.e. carbon dioxide) Capture and Storage. TEN/340 — CESE 562/2008 recommends using the abbreviation CCTS (Carbon Capture, Transport and Storage) instead. This opinion sticks to CCS.

4. General comments

4.1 The EESC has drawn attention on a number of occasions ⁽⁴⁾ to the fact that affordable energy is the life blood of modern social market economies and a prerequisite for the provision of all basic services. The need to step up the development of new technologies is of particular importance in this regard ⁽⁵⁾.

4.2 The Committee welcomes the Commission's proposed directive on this subject as an important prerequisite for developing and using CCS as a technology to achieve this objective, and broadly endorses its contents.

4.3 In this connection, the EESC has drawn attention ⁽⁶⁾ to the fact that the fossil fuels coal, petroleum and natural gas are currently the mainstay ⁽⁷⁾ of both European and global energy supply and will perhaps retain their importance over the next few decades.

4.4 This is not at variance with the declared goal of bringing about a dramatic increase in the share of renewables, since, even bearing in mind the EU's target of achieving an at least 20 % share of renewable energies in overall EU energy consumption by 2020 ⁽⁸⁾, there will, for many decades to come, continue to be a considerable need for energy produced from other sources in order to cover the remaining 80 % — by 2050 still approximately 50 % — of energy consumption.

4.5 In the case of renewables, up until now it has only been possible to use hydropower and biomass ⁽⁹⁾ to generate electricity at the level dictated by demand, whereas wind and solar energy are characterised by a limited, weather-dependent availability. Nevertheless, considerable efforts should be put into continued development and use of such energy sources, while working out adequate and economical storage options. However, this subject is dealt with in separate Committee opinions.

4.6 It therefore follows that to ensure base load supply — as a supplement to and/or replacement ⁽¹⁰⁾ for nuclear energy — a large number of power stations running on fossil fuel will remain a necessity. In addition, if we are to have adequate — positive or negative — reserve capacity available, more power stations will be needed whose output can be adjusted sufficiently quickly to compensate for fluctuating levels of energy generated by wind power.

⁽⁴⁾ e.g. OJ C 162, 25.6.2008, p. 72.

⁽⁵⁾ See CESE 1199/2008 of 9.7.2008, not yet published in the OJ.

⁽⁶⁾ See, for example, CESE 643/2005 and, more recently, CESE 1246/2007. Not yet published in the OJ.

⁽⁷⁾ Initially, the use of CCS is mainly envisaged for electricity production from fossil fuels. In the EU, about 30 % of electrical energy currently comes from nuclear power, with practically no emissions of carbon dioxide.

⁽⁸⁾ See the Presidency conclusions of the March 2007 European Council.

⁽⁹⁾ Biomass only has a positive impact on overall CO₂ emissions if the energy input for production, transport and processing does not exceed the energy yield. Article 24(a) of the ETS Directive provides for the option of appropriate support for biomass power plants equipped with CCS facilities.

⁽¹⁰⁾ In Member States which have decided not to produce nuclear energy.

4.7 With regard to providing peak capacity and reserve capacity, gas-fired and pump-fed hydroelectric power stations are the main options. However, there is limited scope for the development of pump-fed hydroelectric plants, as the specific geographical features which they require have to a large extent already been used.

4.8 For base load and intermediate load supply, coal-fired power stations are mainly used, in addition to nuclear power stations. In Member States which decide not to produce nuclear energy themselves, the use of coal for electricity generation becomes of even greater importance for these types of electricity supply.

4.9 There is therefore a need to reduce CO₂ emissions to the lowest possible level, including when coal-fired power stations are used. With this aim in view, two lines of development — characterised by varying degrees of technical maturity and a variety of impacts — are being pursued: on the one hand, power stations are being developed with even greater efficiency; and, on the other hand, power stations are being developed which have recourse to CCS ⁽¹¹⁾. In the case of the latter, whilst by far the greater part of the CO₂ emitted no longer goes into the atmosphere, the process inevitably involves a noticeable loss of efficiency, in order to cover the additional energy requirements brought about by CCS. There is also a need for continued development of technologies to capture CO₂ from manufacturing processes.

4.10 The development of CCS, involving the capture, transport and storage of CO₂, remains at an early — and, in some cases, still at an exploratory — stage. While it is true that measures to increase the efficiency of conventional power station technology are, by contrast, gradually making progress, they are already approaching the limits of what is physically feasible. Bearing in mind the urgent need to replace power-station capacity over the next few decades, the EESC recommends that a pragmatic approach be adopted under which both technologies are developed side by side. Whilst the development of a higher level of efficiency may be largely market-driven, CCS technologies — for both power stations and infrastructure — require additional support at the demonstration and marketing stages.

4.11 CCS technology is being pursued along various development paths: (a) integrated power station technology involving the capture of CO₂, where, in the coal gasification process, carbon is captured before the combustion process, or, in the oxyfuel process, CO₂ is enriched by the process before capture; and (b) post-combustion technology, which involves washing out CO₂ from the flue gas after combustion (CO₂ washing). Once it has undergone suitable development, method (b) would be suitable for deployment in highly efficient new power stations provided that they are designed accordingly ('capture ready'). A common feature of these development paths is the fact the CO₂ so captured has to be brought from the power station to a suitable storage site.

⁽¹¹⁾ See also CESE 1246/2007. Not yet published in the OJ.

4.12 CO₂ can only be stored in suitable, safe geological formations. Existing research suggests that deep saline aquifers and depleted oil and gas deposits would be the best options, whereas abandoned coal mines are probably less suitable. It is vital to have largely intact rock sealing in the CO₂ so as to prevent leakages, with as few surface outlets as possible.

4.13 When a storage site is selected by experts in compliance with the proposed rules set out in the directive, it must be established that the risks associated with storage are minimal. In the case of suitable storage formations, sudden escape of large quantities of CO₂ is practically impossible ⁽¹²⁾. It should also be established that induced seismic shocks do not pose a threat, with the maximum storage pressure chosen so as not to destroy the rock layers used for storing and sealing ⁽¹³⁾, as these must be preserved in order to ensure storage.

4.14 The issue of the safe, long-term storage of CO₂ is a matter of decisive importance for the social and political acceptance of this process.

4.15 The Committee therefore feels it is very important for the public to be fully informed by the Commission, and — in particular — the Member States and potential operators, of all aspects of this new technology, and for them to be involved through transparent dialogue in the associated decision-making processes. Appropriate procedures should be developed to this end.

4.16 The Committee would like to advocate a further preventive measure at the end of this section. This relates to the possibility of CO₂ being needed in the more distant future, either in unforeseeable applications as a basic chemical substance, or as a variable within 'natural' long-term climate cycles ⁽¹⁴⁾. As an additional preventive measure to ensure sustainability, the EESC therefore recommends that, whilst the storage of CO₂ should indeed be carried out, consideration should however be given to the possibility of at least partial re-emission under the closure plans, or that documentation on potential re-emission options be required from particular storage complexes. Of course, the priority must be to ensure that storage sites are as safe as possible and leak-proof.

⁽¹²⁾ Only if this happened would there be any danger for people living in the immediate vicinity, as CO₂, unlike CO, is not toxic, and is not life-threatening until it reaches a concentration of over 8 % (at present, the average concentration of CO₂ in the air is around 380 ppm (ppm: parts per million)).

⁽¹³⁾ In contrast to the use of geothermal energy.

⁽¹⁴⁾ Ice-core samples, obtained from drilling, provide evidence relating to global climate development over the last 600 000 years. This evidence shows that in the past there has been a succession of warm periods and ice ages, alternating at regular intervals of typically 100 000 years, with a sawtooth variation of temperature over time, together with correlated changes in CO₂ levels in the atmosphere. Given that there has, at the moment, been a prolonged warm period, with temperatures at the top end of the sawtooth cycle, and that the end of the last warm period was over 100 000 years ago, a gradual drop in global temperatures and CO₂ levels is again likely in the foreseeable future, unless current greenhouse gas emissions due to human activity have precisely the opposite effect.

4.17 In general, the EESC welcomes the European Commission's proposed directive and sets out its views on a number of individual points in the proposal in the following section.

5. Specific comments

5.1 The proposal contains the fundamental provisions which are necessary to provide operators of CCS installations with the requisite legal framework, though in a small number of cases they go beyond what is necessary to achieve this objective.

5.2 Some points in the proposal are, however, in need of clarification in order to make it possible to implement the provisions and to ensure legal certainty.

5.3 Under the Commission's proposal, CO₂ captured and stored is to be credited as 'not emitted' under the Emissions Trading Scheme (ETS); consequently, no CO₂ allowances have to be surrendered in this case (see recital 23 which refers to Directive 2003/87/EC). As a result there is a useful market-based incentive to invest in CCS installations, albeit an as yet inadequate incentive in the case of the demonstration stage.

5.3.1 The EESC therefore welcomes the proposed inclusion of these measures in the ETS; a market-based approach is clearly preferable to compulsory CCS, particularly as, given the current stage of development of CCS technology, such an obligation to carry out CCS would be clearly premature.

5.3.2 It is, however, the right course of action to oblige new power stations to make available suitable space for the equipment necessary to capture and compress CO₂ (Article 32, amendment of Article 9a in Directive 2001/80/EC). These measures, which systematically give rise to increased costs, should, however, always be backed up by corresponding market economy incentives ⁽¹⁵⁾ (in the form of, for example, the allocation of CO₂ allowances on favourable terms or using part of the proceeds of the options held under the ETS for promoting CCS).

5.4 In order to prevent unnecessary restrictions being placed upon storage, the ban stipulated in Article 2(3) of the Commission's proposal should apply not to 'storage of CO₂ in geological formations' but rather to 'storage site'. This amendment is being proposed since 'geological formations', as defined in Article 3(4) can easily extend beyond the area defined in Article 2(1), whereas the likelihood of a corresponding extension of a 'storage site' is clearly less great. A clause could be included to provide for additional storage options through reliable contractual agreements with non-EU states.

⁽¹⁵⁾ See, in this context, the general recommendations set out in point 3.3 of OJ C 162, 25.6.2008, p. 72.

5.5 The definition of the term 'storage site' in Article 3(3) should really refer to that 'part' of a 'specific geological formation used for the geological storage of CO₂'. (A geological formation can extend over millions of km² in terms of surface area; only part of such a geological formation can therefore be designated as a 'storage site'). It is perfectly possible — and indeed probable — that several storage sites will be situated in a given geological formation.

5.6 Under Article 4(1) of the proposal, the Member States reclaim the right to designate suitable storage sites. It should be clearly stipulated in this context that the areas which are in principle suitable for the storage of CO₂ must actually be designated by the Member States, provided that there are no important reasons standing in the way of such designation.

5.7 The EESC welcomes the fact that the proposed provisions call for a maximum level of security. This is essential both to protect human beings, the environment and climate ⁽¹⁶⁾ and also to ensure the integrity of the trade in emission allowances.

5.7.1 This goal must be achieved by making use of appropriate, state-of-the-art monitoring systems. This requirement needs to be taken into account when permits are being issued by the Member States ⁽¹⁷⁾.

5.7.2 Monitoring systems require and must also ensure that processes in the actual storage site can be understood and modelled as accurately as possible (measurements taken at or near surface level do not provide sufficient information on this). For this reason, the models which are used should if possible be tested or certified using two independent simulation/modelling systems.

5.7.3 The term 'leakage' should be defined as follows: 'Any release of CO₂ from the storage complex which can be verified using state-of-the-art monitoring systems'. It is not possible to provide absolute (i.e. 100 %) leak-tightness, nor could such tightness be proved because of the natural release of CO₂ from the ground. Nor is such leak-tightness essential on grounds of safety or climate protection ⁽¹⁸⁾. This definition, based on state-of-the-art technology available at a given time, would ensure increasingly precise monitoring systems, which would also benefit from development of CCS, thus making a dynamically developing contribution to further improvements in safety.

⁽¹⁶⁾ Often also an HSE (Health, Security, Environment) requirement.

⁽¹⁷⁾ See also Article 13(2) and Annex II of the proposed directive.

⁽¹⁸⁾ If this were not the case, emissions certificates would be needed (emission trading scheme).

5.7.4 Should there be any plan during subsequent day-to-day operation to set maximum permitted leakage levels, the level chosen could be one at which there is no threat to safety or climate, and therefore one which is of no relevance to emissions certificates, for example leakage of 0.1 %/100a.

5.8 The duration of exploration permits, as proposed by the Commission in Article 5(3), is too short. Experience shows that a period of at least four years is necessary, even under optimal circumstances, in order to implement the exploration work programme. We must, on no account, be faced with a situation in which exploration work has to be halted solely because the prescribed duration, including the extension period, has expired, even in cases where very little data have still to be obtained. Provision should therefore be made for flexible rules, taking account of the local conditions whilst, at the same time requiring operators to proceed apace with the exploration programme, in order to prevent potential storage sites from being blocked because of delays in exploration.

5.9 Whilst the exploration of a potential storage site requires know-how, skilled staff, time and money, success is by no means guaranteed. A decisive incentive to carry out exploration would therefore be lost if this commitment on the part of enterprises were not to be backed up by a prior claim to the use of storage sites. The provisions proposed by the Commission in Article 5(4) should therefore be backed up by the granting of first right of access to storage, for instance by including the following sentence (already under discussion): 'After this time, the CO₂ storage exploration permit shall either be converted into a CO₂ storage permit or else be relinquished for the total area covered'.

5.10 The Commission rightly proposes that a corrective measures plan be drawn up. This plan (see Article 9(6) and Article 16(1)) should, however, only be applied in line with the requisite changes to the definition of the term 'leakage' (Article 3(5)).

5.11 Articles 6 to 9 of the proposal set out provisions governing applications for storage permits, the conditions for granting such permits and the contents of these permits. It is clear from these provisions that several operators may be working in one geological formation.

5.11.1 In principle, the EESC welcomes the idea that access should be free of discrimination. Difficult questions relating to delimitation, however, arise with regard to the responsibility for leakages and the transfer of responsibility to the State.

5.11.2 For this reason, there should be a rule that only one operator can be granted a permit for each storage complex, thus ensuring that responsibilities are clearly identified. Article 20 would also ensure that access to storage sites is free of discrimination.

5.12 Under the Commission's proposal a national authority has to notify the Commission before finally awarding permits (Article 10 and Article 18) and then await the Commission's opinion for a period of up to six months. The Commission's opinion has then to be taken into consideration when granting the permit or, where appropriate, the authority has to state the reasons if it deviates from the Commission's opinion.

5.12.1 The proposed provisions would bring about delays and lead to heightened bureaucracy. Furthermore, they are out of step with the subsidiarity principle.

5.12.2 The Committee therefore recommends amending these provisions of the regulation in such a way as to ensure sufficient uniformity in national procedures while avoiding preventable delays and ensuring sufficient compliance with the subsidiarity principle. To this end, one possible approach would be to limit the licensing process to an obligation on the part of national authorities to notify the Commission. If infringements take place, the Commission could have recourse to the tried-and-trusted instrument of an infringement procedure under Article 226 of the EC Treaty. The text of Article 10 could therefore read: 'The competent national authority shall notify the Commission of its decision on storage permits, for the purpose of verification'.

5.13 The EESC believes that the national authorities require effective instruments and also need to carry out regular checks in order to ensure the safety of storage sites at all times. The EESC does, however, doubt whether this goal is furthered by the Commission's proposal for an additional review of storage permits every five years. This provision would not further enhance safety but would give rise to additional bureaucracy affecting all stakeholders.

5.14 Article 18 of the proposed Directive sets out stringent demands in respect of the transfer of responsibility for storage sites to the respective Member State. The EESC welcomes these provisions which are the right course of action.

5.14.1 Article 18(1) of the proposal calls, however, for all available evidence to indicate that the stored CO₂ will be 'completely' contained for the indefinite future. Absolute leak-tightness cannot, however, be assured, and should not therefore be made a requirement. In this context, the EESC would, therefore, refer to its comments in points 5.7.3 and 5.7.4.

5.14.2 To avoid creating insurmountable obstacles to the transfer of responsibility, the passage in question should read: '... all available evidence indicates that leakages are not to be expected for the indefinite future ⁽¹⁹⁾'. (This is in line with the definition referred to in point 5.7.3 above).

5.15 Under the Commission's proposal, it is essential for the undertaking to lodge a financial security when developing storage sites and starting storage operations (Article 19). The EESC endorses this provision and welcomes the fact that responsibility for determining the form of this financial security is to be in the hands of the Member States.

5.15.1 In the EESC's view, it is not, however, appropriate for the security in question to be provided, in full, prior to the submission of the application for a storage permit. Rather, the financial security payment should in principle be geared to the security required at that particular stage of the project. Failing this, the financial incentive for companies to invest in this new technology, which has in any case been insufficient up to now, will be even lower.

5.15.2 In the event of leakages which could impact on climate change, additional emissions certificates will have to be purchased subsequently. In view of the extensive investigations preceding awards of storage permits, it is unlikely that such leakages will occur. Proof of sufficient assets which are accessible even in the event of storage operators becoming insolvent should therefore suffice as financial security. Given the remote probability of such an eventuality, requiring more than this would place a disproportionate burden on companies' investment capacity.

5.16 Some of the procedures required in Annex I for characterisation and assessment of storage sites are still at the R&D stage. To ensure the manageability of such procedures in practice, documentation requirements should refer to 'state-of-the-art' technology.

5.17 In Annex I and in the risk assessment of potential storage sites, the concept of biospheres should be clarified. Biospheres in which no negative impact is permitted should include not only biospheres on the earth's surface but also biospheres down to the level of drinking water aquifers.

5.18 Details should also be given of membership and working methods of the expert group responsible for ongoing revision of the Annex.

Brussels, 9 July 2008.

The President
of the European Economic and Social Committee
Dimitris DIMITRIADIS

⁽¹⁹⁾ Translator's note: footnote does not apply to the English-language version.