

**Opinion of the European Economic and Social Committee on the ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Supporting Early Demonstration of Sustainable Power Generation from Fossil Fuels’**

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On 23 January 2008, the European Commission decided to consult the European Economic and Social Committee, under Article 262 of the Treaty establishing the European Community, on the

*Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Supporting Early Demonstration of Sustainable Power Generation from Fossil Fuels.*

The Section for Transport, Energy, Infrastructure and the Information Society, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 16 July 2008. The rapporteur was Mr Simons.

At its 447th plenary session, held on 17 and 18 September 2008 (meeting of 17 September), the European Economic and Social Committee adopted the following opinion by 143 votes to three, with five abstentions.

## 1. Conclusions

1.1 The EESC endorses the mechanisms in the proposal for promoting the demonstration of CCS (Carbon Capture and Storage) in power stations, as set out in the Commission's Communication, however the lack of financing capacity and clearly established financing options for the medium (2010-2020) and long term (2020 and beyond) is a concern.

1.2 Care should be taken to ensure that the lack of financing capacity by the Commission can be partly compensated by revenue generated via the European Emission Trading Scheme (EU-ETS) e.g. through the auctioning of emission allowances by the power generating sector after 2013. It is important to note that so far, no specific financial scheme — including necessary security — has been suggested at EU level.

1.3 It is important that financial conditions are clear and well-established by the end of 2009 at the latest. Only this will ensure a financial basis for launching the preparation of large-scale CCS demonstration sites to be operational in 2015.

1.4 Revenue generated by the EU-ETS should be collected at national level as part of the implementation of the revised EU-ETS directive from 2013 on.

1.5 The Commission's idea to have 20 % of the total revenue from national EU-ETS auctions dedicated to measures to support reductions in CO<sub>2</sub> emissions is completely inadequate and a missed financing opportunity. Member States should be strongly urged to revolutionise their position on EU-ETS revenue, and dedicate all EU-ETS revenue to low-carbon and carbon-neutral technologies with a specific envelope for CCS. In this way the billions of euros that the Commission currently

lacks but are needed to support the early demonstration of large-scale CCS may become available.

1.6 The Commission should draw up a plan defining the organisation and role of the European Industrial Initiative, ensuring that it complements but does not overlap with other initiatives such as the projects supported by the Seventh Framework Programme, the European Technology Platform for Zero-Emission Fossil Fuel Power Plants and the European Flagship programme.

1.7 The EESC agrees with the need for joint European CO<sub>2</sub> transport and storage infrastructure. A European-wide transport system is required to connect Member States that may not be able to create national storage facilities themselves.

1.8 Because of the importance of transport as an essential element in creating large-scale CCS infrastructure, the acronym CCTS (Carbon Capture Transport and Storage, i.e. including transport) could be adopted.

## 2. Background <sup>(1)</sup>

2.1 The development of the overall CCS value-added chain, involving the capture, transport and storage of CO<sub>2</sub>, remains at an early — and, in some cases, still at an exploratory — stage. Measures to increase the degree of efficiency of conventional power station technology, on the other hand, are gradually making progress. Bearing in mind the urgent and high level of need to replace power-station capacity in Europe over the next few decades, the EESC therefore urges that a pragmatic approach be adopted under which both technologies are developed and employed side by side. Whilst the development of a higher level

<sup>(1)</sup> See the Opinion CESE 1203/2008 on the Proposal for a Directive 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)).

of efficiency may be largely market-driven, CCS technologies — in respect of both power stations and infrastructure — require additional support at the demonstration and marketing stages.

2.2 CCS technology is being pursued along two development paths: (a) integrated power station technology involving the capture of CO<sub>2</sub> before the combustion process and (b) post-combustion technology, which involves washing out CO<sub>2</sub> from the flue gas after combustion (CO<sub>2</sub> washing). Once it has undergone suitable development, method (b) would be suitable for deployment in highly efficient new power stations which are now in the process of construction, on condition that certain power stations are designed accordingly ('capture ready'). A common feature of both these development paths is the fact the CO<sub>2</sub> so captured has to be brought from the power station to a suitable storage site.

2.3 The issue of the safe, long-term storage of CO<sub>2</sub> is a matter of decisive importance in respect of the social and political acceptance of this process. This aspect is, in the final analysis, the major environmental question confronting this technology as such <sup>(2)</sup>.

2.4 At a meeting in Aomori, Japan, 9 June 2008, the Group of Eight industrial powers (G8) has agreed to launch 20 large carbon capture storage (CCS) demonstration projects by 2010, with the view to support the technology development and cost reduction for broad deployment of CCS from 2020 on.

2.5 The G8 meeting was attended by representatives from Britain, Canada, Italy, Japan, France, Germany, Russia, the United States, China, India and South Korea.

2.6 To support the G8's CCS commitment, the United States Department of Energy (DOE) pledged to provide funding for the addition of CCS technology to multiple commercial-scale Integrated Gasification Combined Cycle (IGCC), or other advanced clean-coal technology power plants, under its FutureGen programme. The U.S. is also funding seven regional carbon sequestration partnerships to demonstrate the effectiveness of large-scale, long-term terrestrial storage of carbon dioxide.

2.7 The G8's CCS announcement is in line with the International Energy Agency's (IEA) recommendation to use CCS technology as part of a package solution to halve greenhouse gas emissions by 2050.

### 3. Gist of the Commission's Communication

3.1 Technologies for the capture and storage of CO<sub>2</sub> (CCS) represent a crucial element in a portfolio of existing and

emerging technologies with the potential to bring the cuts of CO<sub>2</sub> emissions needed for meeting targets beyond 2020 <sup>(3)</sup>.

3.2 Wide-scale application of CCS in power plants can be commercially feasible in 10-15 years, enabling CCS by 2020, or soon after, to stand on its own feet in an Emission Trading Scheme (ETS)-driven system as a crucial instrument for the elimination of CO<sub>2</sub> emissions from fossil fuels in power generation.

3.3 This will not happen without an immediate start to the necessary preparatory steps; early demonstration is particularly needed for CCS technologies, already globally developed and used in other applications, to be adequately adapted for large-scale application in power generation.

3.4 The European Council gave its endorsement in March 2007, and reiterated it in March 2008, to the Commission's intention to stimulate the construction and operation by 2015 of up to 12 demonstration plants of sustainable fossil fuel technologies in commercial power generation.

3.5 Complementing the Commission proposal for a Directive on Geological Storage of CO<sub>2</sub> creating the legal framework for CCS in the EU, the present Communication takes the work on CCS forward, aiming to create a structure to coordinate and effectively support large-scale CCS demonstrations and the conditions for bold industrial investments in a series of plants.

3.6 It is imperative that European efforts on CCS demonstration within an integrated policy framework, including focused R&D efforts and public awareness and acceptance measures, start as soon as possible. According to the European Commission, a delay of 7 years in demonstration leading to a similar delay in global introduction of CCS could mean over 90 Gt of avoidable CO<sub>2</sub> emissions being released by 2050 worldwide <sup>(4)</sup>, equivalent to over 20 years of current overall EU emissions of CO<sub>2</sub>.

3.7 Clear and decisive commitments from European industry backed by Commission incentives and guarantees are essential if contributions are to be paid from public funds. In particular, those Member States intending to rely on coal in their future energy mix should implement support measures for early demonstration of CCS.

<sup>(2)</sup> See the Opinion CESE 1203/2008 on the geological storage of carbon dioxide.

<sup>(3)</sup> While improvements in combustion efficiencies will be indispensable, they alone will not deliver the necessary reduction of CO<sub>2</sub> emissions.

<sup>(4)</sup> IAES.

3.8 Two main types of obstacle are mentioned:

- Legislative and safety obstacles: these issues can be overcome on time and without substantial extra cost. Once a regulatory framework ensures risk mitigation, legal barriers can be addressed.
- Economic obstacles: CCS cost is estimated to be around 35 EUR/ton CO<sub>2</sub> in 2020 and it is felt that they could easily be covered by the value of emission allowances.

The Commission's document suggests that there is an opportunity to take leadership in international regulation.

3.9 The proposed European Industrial Initiative should bring together the efforts of first movers in a network of demonstration projects. This should assist in exchanging experience and information, increase public awareness and provide input for policies enabling a complete CCS value chain. In addition, the proposed European Industrial Initiative is also expected to assist in attracting national and international funds.

3.10 The Commission states that it can only provide a minimum of support and therefore focuses on catalysing financing by first movers themselves and public funding from national governments and international NGOs.

3.11 Three actions are defined:

- Mobilising first movers in industry by means of the Flagship Programme and providing real commercial benefit.
- Willingness of the Commission to allow on a case-by-case basis the use of state aid and other preferential measures by Member States.
- Mobilising financing at EU level: a specific initiative by the Commission together with the EIB to develop financing/risk sharing instruments.

In addition it is pointed out that the longer industry takes to start embracing CCS, the more policy-makers will be obliged to look at compulsory measures.

3.12 The need for a joint European CO<sub>2</sub> transport and storage infrastructure is addressed. A revision of the TEN-E guidelines including CCS is envisaged.

#### 4. Context of the European Commission's referral

4.1 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 <sup>(5)</sup>.

4.2 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.

4.3 This opinion ties in with a Committee opinion <sup>(6)</sup> on the same technology discussing the Commission's Proposal for a Directive on the geological storage of carbon dioxide.

#### 5. General comments

5.1 In its Communication, the Commission repeatedly makes the point that if its plans are to succeed, it is crucial to demonstrate at an early stage that (a) the European Emission Trading Scheme (EU-ETS) will play a key role and (b) there is scope for 'real commercial benefits'. Obviously, the EU-ETS promises to generate real commercial benefit for first movers. However, it will come too late if the Commission fails to provide a clear and final basic set of rules for the post-2012 EU-ETS scheme before the end of 2009.

By the end of 2009, industry will need to have a solid basis for taking investment decisions in order to start the engineering and construction phase in time for the first CCS sites to become operational in 2015. This aspect has not been sufficiently stressed, especially in view of the current lack of clarity surrounding the EU-ETS and vague demands from the Commission on industry and national governments that keep the financing issue in the air.

5.2 The EU-ETS does indeed constitute an important carbon market, which may prove to be very effective, but this will only be the case if the scheme is strongly geared towards establishing of a price for emission allowances which more than covers the extra costs incurred by carbon mitigation measures. If the Commission fails to set out clear provisions in respect of the rules and scope for auctioning and appropriate recovery of such collected revenues and if it fails to play a supervisory role, potential investors will be inclined to adopt a 'wait and see' position because of too large uncertainties.

<sup>(5)</sup> NAT/399, NAT/400, NAT/401 and TEN/334, TEN/338, TEN/341.

<sup>(6)</sup> See the Opinion CESE 1203/2008 on the Proposal for a Directive on the geological storage of carbon dioxide and amending Council Directives 85/337/EC, 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).

5.3 A joint European CO<sub>2</sub> transport and storage infrastructure is indeed something which would clearly facilitate large-scale implementation of CCS throughout Europe. Some Member States may not be able to create national storage facilities themselves <sup>(7)</sup>. Where possible, use should be made of existing infrastructure that has fallen into disuse or new facilities integrated with other infrastructure. Because of the importance of transport, the EESC would even suggest adopting the acronym CCTS (Carbon Capture Transport and Storage) explicitly including transport, even though the acronym CCS is already internationally known and acknowledged.

5.4 The Commission imposes a considerable burden upon national authorities in respect of CCS financing as there is no scope for a significant contribution from the Commission's current budget. Bearing in mind that the subject at hand is an important issue to the EU and in view of the need for EU-level supervision to ensure the success of the demonstration projects, the Commission should take a much larger share in financing CCS projects than it now envisages, backed up, where necessary, by Member State contributions provided by the Member States <sup>(8)</sup>.

5.4.1 The auctioning of emission rights under the EU-ETS has provided an opportunity to tackle the issue of insufficient Commission financing. At present only 20 % is dedicated to supporting low-carbon and carbon-neutral technologies. Member States should be strongly urged to revolutionise their position on EU-ETS revenue, and dedicate all EU-ETS revenue to low-carbon and carbon-neutral technologies with a specific envelope for CCS <sup>(9)</sup>. In this way the billions of euros that the Commission currently lacks but are needed to support the early demonstration of large-scale CCS, may become available.

5.4.2 Moreover, as the Committee already has suggested, the budget for energy within the Seventh Framework programme (FP7) could be significantly increased by 15 % resulting in an increase of 2 % to 3 % of GDP invested in R&D. In this way a real contribution to promoting CCS demonstration could be made via FP7.

5.4.3 There are a number of other measures supported under the Seventh Framework Programme which can also contribute to the preparation of large-scale demonstration projects. The various measures should be clearly linked with the proposed mechanisms for promoting demonstration.

<sup>(7)</sup> See The Primes study mentioned in footnote 2 with relevant maps attached.

<sup>(8)</sup> There are nevertheless other suggestions how to overcome the financing deadlock — see the EurActive.com article of Wednesday 27 February 2008 'Financing woes plague EU Climate technologies'.

<sup>(9)</sup> In the European Parliament proposals are being discussed to dedicate between 60 and 500 million EUR revenues from the ETS to large-scale commercial demonstration projects (amending the draft directive that amends directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community COM(2008) 16 final).

5.5 No mention is made of how the *European Industrial Initiative* ties in with the range of other measures and initiatives in which the Commission is involved <sup>(10)</sup>. To ensure an integrated approach, it is essential to indicate which measures are to be taken.

5.6 It is anticipated that the development and implementation of CCS technologies will have a substantial positive impact on employment in Europe. Some major CCS equipment and transport infrastructure providers are based in Europe. They develop and would also sell and install e.g. equipment and pipelines when CCS is implemented worldwide. Europe has a strong worldwide position on CCS that would be strengthened further if the EU succeeded in early large-scale demonstration of CCS technology within Europe <sup>(11)</sup>.

5.7 The EESC proposes using the word 'clean' instead of 'sustainable' fossil fuels. Sustainable is more appropriate for e.g. solar and bio energy and less appropriate for CCS technologies that bridge the gap, using fossil fuels in a clean way, until we have succeeded in a full transition towards a sustainable energy supply.

5.8 With regard to the feasibility of safe storage of CO<sub>2</sub>, there is already considerable experience in this field, as indicated briefly below:

- i) Gas fields: proven containment for natural gas; potential for enhanced gas production (EGR) to be proven;
- ii) Oil fields: proven containment for oil; enhancing oil production (EOR) routine in South West USA since mid 1970s;
- iii) Aquifers: large potential with large uncertainty; site-specific appraisal needed, good experience for many years with Sleipner field Utsira saline aquifer;
- iv) Coal seams: interesting niche for enhancing coal bed methane production with CO<sub>2</sub> injection. This, however, is still in the research phase.
- v) An important aspect to large-scale demonstration will be to show and to provide proof to the public that storing CO<sub>2</sub> in amongst others gas fields is just as safe as producing oil and gas from the same types of fields. The EESC asks the commission to take appropriate measures for informing the public.

<sup>(10)</sup> Reference may be made, in this context, to, for example, the European Flagship Programme or the Zero Emission Power Platform.

<sup>(11)</sup> See IEA report.

## 6. Specific comments

6.1 The EESC is able to endorse the mechanisms in the proposal for promoting the demonstration of CCS in power stations, as set out in the Commission's Communication, but wishes to make a number of observations:

6.1.1 The Commission should have a strategy ensuring that the European Industrial Initiative does not overlap with the European Flagship Programme and the European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP). These activities should be properly coordinated and mutually reinforcing.

6.1.2 In its Communication, the Commission speaks of 'extending the scope of the European Industrial Initiative beyond a project network'. The aim of this statement is not clear. It is also pointed out that the requisite financing still has to be found. What added value is provided by such extension and how does it tie in with the abovementioned measures in the field of CCS?

6.2 The EESC does not endorse the proposal for catalysing the finance for CCS demonstrations because it does not go far enough.

6.2.1 The proposal advocates a 'case-by-case' approach under which the Commission would be presented with national initiatives and would assess which forms of state aid and other national measures would be permitted. If the implementation of the European flagship demonstration projects is to succeed, the Commission should play a central co-ordination and supervisory role. This would mean that the Commission would take responsibility for general financing. In addition to the commission's contribution financing could then be topped up by earmarked contributions from the Member States concerned which would then have such funding recognised as authorised state aid. At the same time the industry would have to commit itself in respect of financing and implementation.

6.2.2 If the Commission were to guarantee, subject to certain conditions, EU co-financing proportional to an earmarked national contribution, this could provide a stimulus to national authorities. Pre-determined co-financing could remove some of

the uncertainty surrounding the financing of projects and could speed up their development.

6.2.3 Catalysing financing for demonstration projects through new financial facilities is, in itself, an attractive idea. In the final analysis, however, such blueprints will only prove effective if the risk is acceptable and if it is clear how the additional long-term costs can be recovered in each case.

6.3 The EESC can readily endorse the view that the inclusion of CCS in the EU-ETS provides an important stimulus to the development and implementation of large-scale demonstration projects in a European context. In its Communication, the Commission also points out that first movers must be able to see a 'real commercial benefit'.

6.4 It is, however, stated that the EU-ETS should be able to compensate for — or even more than compensate for — the additional costs incurred in each case. As things stand at present, though, this scenario cannot be guaranteed for the following reasons:

- the situation as regards a post-2012 EU-ETS remains unclear;
- assuming that CCS is incorporated in the EU-ETS, there is ongoing uncertainty with regard to the pricing of emission allowances. The major issues at stake in this context are, for example: the character, scope and timing of auctioning at the Member State level within the EU wide cap or the influence of the Clean Development Mechanism (CDM);
- the actual costs involved in CCS after 2012 (early demonstration) and after 2020 (commercial implementation) will depend to a considerable extent on progress made with R&D and economic developments (e.g. fuel prices and design and construction costs).

6.5 The Emissions Trading Scheme (EU-ETS) provides important scope for enabling first movers to derive real commercial benefit vis-à-vis other parties. Further elaboration is however required with a view to making the EU-ETS into a reliable and long-lasting market which gives first movers a competitive advantage over subsequent market entrants. Furthermore, efforts should be made to bring about stronger and possibly different market drivers.

Brussels, 17 September 2008.

The President  
of the European Economic and Social Committee  
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