

# COMMISSION NON-PAPER

## **Modalities for co-financing of CCS and innovative renewables demonstration projects under Article 10a paragraph 8 of Directive 2003/87/EC (Emissions Trading Directive) ("NER 300")**

### **Key elements of draft Commission Decision**

#### **1. Purpose**

The purpose of the Decision is to lay down modalities for the co-financing of up to 12 commercial demonstration projects that aim at the environmentally safe capture and geological storage of carbon dioxide (CO<sub>2</sub>) as well as demonstration projects of innovative renewable energy technologies pursuant to Article 10a paragraph 8 of Directive 2003/87/EC.

#### **2. Definitions**

The Decision will contain definitions of all relevant terms, including "environmentally safe capture and geological storage of CO<sub>2</sub>", "renewable energy", "innovative renewable energy technologies" and "relevant costs".

*For 'relevant costs' the proposed approach is to ensure maximum consistency with the State aid provisions by defining relevant costs as the eligible costs, to be assessed by the Commission in light of the definition of eligible costs applied in the applicable Community State Aid Guidelines. These would be either the Community Guidelines on State Aid for Environmental Protection, or the Community Framework for State Aid for Research and Development and Innovation, depending on the nature of the individual project.*

#### **3. Principles**

The following co-financing principles will be established, mainly based on requirements laid down in Article 10a paragraph 8 and Recital 20 ETD:

- 300 million allowances are available in the new entrants reserve for the co-financing of CCS and RES demonstration projects which provide for the development, in geographically balanced locations, of a wide range of technologies that are not yet commercially viable;
- The allowances will be awarded for projects in the territories of the Member States, their exclusive economic zones and their continental shelves;
- No project shall be co-financed with more than 45 million allowances;
- Co-financing under the NER 300 can be combined with other Community funding, including under the Structural and Cohesion Funds and the European Energy

Programme for Recovery EEPR). The combined funding under the EEPR and under the NER 300 shall amount to no more than 50% of the relevant costs;

- Funding shall be limited to the extent necessary to ensure the implementation and operation of the project, and taking into account potential negative effects on competition.

#### **4. Responsibilities**

The following division of responsibilities is proposed:

- The Commission (COM) will carry out the project selection, issue award decisions to the operators of the projects and determine the number of allowances to be auctioned<sup>1</sup> to the benefit of the Member State administering the project;
- MS shall disburse the revenues to the selected projects and ensure project implementation.

#### **5. Selection procedure**

The proposed approach is as follows:

- The allowances will be awarded through two calls for proposals. The first covering 240 million allowances shall be awarded by 31 December 2011, the second covering 60 million allowances and any unused part of the first call for proposals shall be awarded by 31 December 2014. The calls will be published in the Official Journal of the European Union;
- As part of their proposals, projects have to stipulate in cash the required contribution from the 300 million allowances as well as the amount of funding received under the EEPR;
- COM will draw up from the proposals received a shortlist of projects on the basis of an assessment of eligibility and selection criteria (see below 7. and 8.);
- COM may ask the operators of the shortlisted projects to submit Front End Engineering Design (FEED) studies to determine the feasibility of a project and develop project cost estimates; detailed requirements will be specified in the calls for proposals;
- COM will assess the shortlisted projects by awarding points on the basis of the award criteria (see below 9.). RES projects will be ranked on value for money within the categories specified, determined by taking the ratio between the points awarded, and the request for NER funding (but also including any EERP funding in the total funding request). The aim will be to fund at least one project in each category, but we are still

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<sup>1</sup> In accordance with the Regulation to be adopted pursuant to Article 10(4) of the revised ETS Directive. This Regulation is to contain all the required rules with regard the auctioning of allowances from the NER pursuant to Article 10a(8) of the Directive.

reflecting as to whether successful demonstration in certain categories may require more than one project, and will adjust as necessary.

- For CCS, the proposed approach is to identify, from the range of projects submitted, which groups of projects will fulfil the CCS portfolio criteria (see below Annex II), and to rank these candidate portfolios on the basis of value for money, on analogy with the above approach for individual projects. (This approach is designed to ensure that as well as a range of capture technologies, the competition also delivers a range of fuel types and storage technologies). The projects selected will be those in the highest-ranked CCS portfolio.
- Adjustments will be made where total request for funds from the NER is higher/lower than the available funds in the call for proposals.
  - If it is higher, the aim will be to reduce the costs of both the CCS and renewables parts of the demonstration programme in the same proportion, until they fit the available finance. This will be done by negotiation with individual projects to reduce requests for funding, and if needed, by deletion of the projects in each group representing least value for money.
  - If the request for funds is lower, more projects can be funded from each category until the funding ceiling is reached. Again, the principle is that the extra funding is distributed proportionately between CCS and renewables, but departures from this can be justified by lack of suitable candidate projects.
- In the second call for proposals, COM will consider the specific technology and geographical location of the proposed projects to adjust any technical and/ or geographical underrepresentation;
- COM will issue award decisions to the selected projects (see below 10.) and inform the projects that have not been selected.

## **6. Basic technology requirements**

All technologies covered by the Decision have to meet the following requirements:

- They are innovative in relation to the state of the art in the key sub-streams for each technology;
- They are not yet commercially available, but sufficiently mature to be ready for demonstration at pre-commercial scale;
- They involve substantial economic risks, and (while technological risks are inevitable) have a good chance of successful demonstration;
- The proposed scale of demonstration is such that no significant additional problems are to be expected from further scaling up;
- They have a high replicability potential, and therefore significant prospects for cost-effective CO<sub>2</sub> reduction both in Europe and globally.

## **7. Eligibility criteria**

The following eligibility criteria are proposed and will be further specified in the call for proposals:

- The project falls into one of the categories listed in an Annex as specified pursuant to the basic technology requirements (see above 6., below Annex I);
- The project meets the project requirements listed in an Annex (see below Annex I).

Proposals may be submitted:

- with the agreement of all MS directly concerned by the project in question, by one or several public or private undertakings or bodies acting jointly;
- with the agreement of all MS directly concerned by the project in question, by a joint undertaking;

Proposals submitted by natural persons shall not be eligible.

## **8. Selection criteria**

The following selection criteria are proposed and will be further specified in the calls for proposals:

- the soundness and technical adequacy of the approach;
- the soundness of the financial package for the entire project for the full investment phase and for the first ten years of operation, including the financial standing of the operator;

## **9. Award criteria**

The following award criteria are proposed and will be further specified in the calls for proposals:

- maturity of the project, in particular in light of achieving operationality within the shortest possible delays before the relevant deadline for operation (31 December 2015 for the first call for proposals and 31 December 2017 for the second call for proposals);
- degree of innovation of the technologies used, including potential replicability;
- commitment by the operator to knowledge sharing beyond the minimum requirements laid down in an Annex (see below Annex III);

- finalisation of the financial package, comprising commitment decisions covering costs for the entire project for the full investment phase and for the first ten years of operation;
- for CCS projects, the degree to which the proposal addresses components not listed in the relevant Annex (see below Annex I) that are relevant for an optimal demonstration portfolio (e.g. ship transport, cross border pipeline transport, co-firing biomass, fluidised bed).

## **10. Award decisions**

COM will issue award decisions to the selected projects. The award decisions will specify:

- the project selected and the relevant cash value award (denominated in euro);
- the corresponding amount of allowances (see below 11.);
- project milestones over the first ten years of operation as appropriate, and the conditionality of funding on achievement of the milestones (see below 12.);
- requirements for knowledge sharing and the conditionality of funding on implementation of these requirements (see below 12. and 13.);
- requirements on disbursement of the revenues and recovery of funds (see below 11. and 12.);
- requirements for project implementation and reporting (see below 14.).

COM will also inform the applicant projects which have not been selected as well as the relevant MS.

Front End Engineering Design (FEED) studies may be necessary in order to get a good grip on the costs of projects, but a requirement to do a FEED prior to application could be a significant disincentive to projects. COM envisaged using the NER to reimburse a proportion of the costs of FEEDs for unsuccessful projects, but this is not possible as it would entail awarding allowances in cases of non-avoidance of CO<sub>2</sub>. However, the disincentive issue remains. COM is interested in MSs views on a specification that those MS whose projects were shortlisted, but not selected, shall reimburse a proportion of the costs of FEED studies (say 50%).

## **11. Award and transfer of allowances, auctioning**

The background to this issue is explained in more detail in Annex IV. The proposed approach is Option 3 of that Annex:

- On the basis of the award decisions, COM will determine the number of allowances corresponding to the cash value of the awards to be auctioned for the benefit of those MSs hosting the selected projects. The corresponding amounts of allowances are

calculated by dividing the relevant cash value award by the average allowance price for the [x] months preceding the date of award [to be specified] .

- The corresponding amount of allowances would be gradually auctioned in line with requirements to be specified in the forthcoming Auctioning Regulation until the relevant cash value award has been realised.
- Any remaining allowances, once the cash value of the awards for the first projects has been reached, will be used for the second set of projects.

## **12. Conditionality of funding and disbursement of revenues**

- Project funding shall be conditional on achievement of project milestones for each of the first ten years of operation, based on the proposed operational performance, and on implementation of the knowledge sharing requirements, both specified in the award decision.
- Auctioning revenue shall be paid into accounts set up by the MS for this purpose, and shall be disbursed to projects annually on the basis of the verified achievement of the project milestones and implementation of the knowledge sharing requirements set out in the award decisions.
- Where there is sufficient guarantee that funds could be recovered if necessary, it could be advantageous to disburse auctioning revenues to the projects as they are realised. However, this option can only be taken if adequate provisions can be made to ensure claw-back in case of non-achievement of the project milestones or non-implementation of the knowledge sharing requirements as set out in the award decisions. The Commission is considering whether specific provisions in this regard are needed.

[Member States are invited to comment on the need for a potential up-front disbursement, including whether the financial sector can be relied upon to provide up-front finance.]

## **13. Knowledge-sharing**

- As a minimum, all project operators, and also consortium members, suppliers and subcontractors who stand to receive substantial benefit regarding the development of their product or service from the public finance provided, must share the information specified in an Annex (see below Annex III) with other project operators, public authorities, NGOs and the public, and research institutes.
- Further knowledge sharing requirements will be stipulated in the award decisions on the basis of the proposals received.

#### **14. Project implementation and reporting**

Member States shall be responsible for ensuring project implementation in line with the award decisions, including for verifying achievement of the technical milestones within deadlines specified in the award decisions, until the deadline for verifying achievement of the last technical milestone has been reached. During this period, they shall provide reports to the Commission by 31 December each year.

## ANNEX I

### Eligibility criteria

#### A. Project categories

##### **I. CCS demonstration projects (with capacity thresholds):**

- power generation: pre-combustion 250 MW
- power generation: post-combustion 250 MW
- power generation: oxyfuel 250 MW
- industrial applications;
  - Refineries: 500kt/y avoided CO<sub>2</sub> at 85% capture
  - Cement (application to cement kiln): 500kt/y avoided CO<sub>2</sub> at 85% capture
  - Iron and steel and aluminium production (application to integrated mill): 500kt/y avoided CO<sub>2</sub>, in principle at 85% capture. Lower capture rates may be acceptable if justified in detail.

##### **II. RES demonstration projects (with size thresholds):**

- Bioenergy:
  - Lignocellulose to synfuels via gasification: 150 kt/y
  - Lignocellulose to Synthetic Natural Gas via gasification: 200 kt/y
  - Pyrolysis based bioenergy carriers (lignocellulose to solid, liquid and/or slurry): 150 kt/y
  - Lignocellulose to ethanol and higher alcohols: 200 kt/y
  - Hydrocarbons from lignocellulose carbohydrates: 30 MW
  - Bio-energy carriers from CO<sub>2</sub> & sunlight through micro-organism based production (algae, bacteria ...) and upgrading to transportation biofuels and bio-products: 150 kt/y
- Concentrated solar power
  - Parabolic trough or Fresnel system using molten salts as heat transfer fluid
    - integrated in a regular Parabolic or Fresnel plant: 5MW
    - free-standing demonstration plant: 30MW



Parabolic trough or Fresnel system based on direct steam generation:  
30MW

Tower system using superheated steam cycle: 50 MW

Tower system using pressurised air up to 1000°C and solar-gas hybrid  
turbine: 30 MW

- Photovoltaics

Large-scale concentrator photovoltaics demonstration power plants: 20  
MW

Large scale tandem/triple junction Si-thin-film demonstration power  
plants: 40 MW

Large scale copper indium gallium (di)selenide demonstration power  
plants: 40 MW

- Geothermal

Enhanced geothermal systems in tensional stress fields: 5 MWe

Enhanced geothermal systems in compressional stress fields: 5 MWe

Enhanced geothermal systems in areas with deep compact sedimentary  
rocks: 5 MWe

Enhanced geothermal systems in deep limestone: 5MWe

- Wind

Off-shore wind systems (8 MW turbines): 40 MW

Off-shore wind systems (10 MW turbines): 40 MW

Off-shore wind systems (20 MW turbines): 40 MW

Floating Off-shore wind systems: 40 MW

On-shore wind turbines for forested terrains: 25 MW

On-shore wind turbines for cold climates: 25 MW

- Ocean

Ocean energy – Oscillating Water Columns (OWC) – coastal based: 2 -  
5 MW

Tidal energy – underwater wind turbines type: 5 - 20 MW

OWC – off-shore floating devices: 5 - 10 MW

[Under consideration: inclusion of the project part of 'Distributed renewables virtual  
power plants' (compatibility with the legal text being verified).]

## **B. Project requirements**

### **I. Common requirements:**

- The capacity thresholds laid out in Part A. have to be met;
- Project operationality by 31 December 2015 for the first tranche and by 31 December 2017 for the second tranche has to be demonstrated as realistic;
- The project operator has to make a binding commitment to knowledge sharing pursuant to the requirements laid out in the Decision;
- All relevant national permits for the project have to be in place and line with relevant requirements under EC legislation or the relevant permit procedures under way;

### **II. CCS demonstration projects:**

- Each project has to implement the full chain (capture, transport, storage);
- The capture rate has to be at least 85%.

## **ANNEX II**

### **Portfolios of projects listed in Part A. I. of Annex I**

For projects referred to in Part A. I. of Annex I, the Commission will assemble portfolios of projects, which should meet the following criteria:

1. Each portfolio should cover each of the technology categories listed in Part A. I. of Annex I, with at least two projects implementing capture on each technology.
2. Of the projects referred to under 1.:
  - at least one should use coal as defined in the Council Regulation (EC) No 1407/2002 of 23 July 2002 on State aid to the coal industry<sup>2</sup>, and at least one, lower quality coal;
  - at least one should use offshore storage; at least one, onshore storage; at least one, storage in a depleted gas reservoir; and at least one, storage in a saline aquifer.

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<sup>2</sup> OJ L 205, 2.8.2002, p. 1.

## ANNEX III

### **Information to be shared**

#### **A. Technical set-up and performance at the level of technology block [definition to be further specified]**

- reliability
- CO<sub>2</sub> captured
- performance at different levels, including differences between expected and real performance
- increase in fuel demand; electricity, heat and cooling demand
- key inputs and outputs and design
- questions for future R&D

#### **B. Cost level**

- capital and operating costs
- totals and costs per unit performance (ton CO<sub>2</sub> abated, clean MWh produced)

#### **C. Project management**

- legislation/ permitting
- stakeholder management, including interaction with Governments
- planning
- project organisation

#### **D. Environmental impact**

- effectiveness: reduction of CO<sub>2</sub> emissions per unit electricity
- other environmental impacts at undisturbed operation

#### **E. Health and safety**

- incidents and near misses occurred (disturbed operation)
- monitoring and resolution systems to track safety
- health issues in undisturbed operation

## ANNEX IV

### **Options for allocation of allowances**

Some background may be useful for understanding the proposal outlined in Section 11 above.

#### ***Issue***

The issue is that allocation of awards to the first set of projects must be made by 2011, which raises the question whether the valuation of the allowances at that date may be substantially lower than the projected average price over a subsequent period of Phase III.

It has been argued that in theory this should not happen, because EUAs are fungible assets, and so the EUA price at any time should reflect also market expectations of future prices. (The spot price for fungible assets such as currencies reflect expectations on future prices subject only to risk-adjusted cost of carry.) However, the risk is that the market's assumptions could be conservative.<sup>3</sup>

#### ***Options:***

1. Auction allowances in 2011.

*Assessment: the value of the pot is fixed, but determined by carbon market at the time of auction. If the market is working efficiently, there is no problem. If market assumptions are conservative, there is a significant probability that the pot is being undervalued.*

*In any case, any decision on auctioning in 2011 will be made solely on the basis of the sound operation of the auctioning programme.*

2. Award allowances in trust for projects. The intention is that this would encourage MSs or projects prepared to put a higher value on the allowances. [Note that no discretion will be possible on the auctioning calendar, which will be fully determined by the Auctioning Regulation.] Examples:
  - a. Two projects with a funding gap of €300m. One project values the allowances at the then market value (say €15); but the other values them at twice the market value, anticipating future gains (€30). The first will bid for 20m allowances, the second for 10m allowances. The second project's higher expectations of future value give it a competitive advantage in the selection process.
  - b. A project with total eligible project costs of €1bn and an operator contribution of €300m. The notional funding gap is €700m, of which at most €500m can come from the NER. The MS agrees to guarantee to the project a carbon price of €30 (twice the market value of €15). The operator then bids for 23.3m

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<sup>3</sup> Some preliminary work has indicated that the current market price could be at the low end of the probability distribution for the average EUA price for Phase III.

allowances, which at market value constitute financing of €350m allowances and so within the allowable range. The effective MS contribution would have to be determined by a stochastic option pricing formula and could be several hundred million euros; its actual contribution can range from negative (i.e. a profit) if the allowance value is higher than the guarantee; to €700m.

*Assessment: regarding (a), it is unlikely that any project sponsor will in practice value allowances at significantly above the market price, especially given that the realisable price would need to be capped, and there would be no discretion on when to auction allowances. Regarding (b), the question is whether the MS is likely to provide a higher effective contribution on this basis than on straightforward cash terms (i.e. whether the state would be more willing guarantee a carbon price of €30 than to provide a cash contribution of equivalent value). This will depend inter alia on the state's assessment of the probability distribution of future prices.*

3. Assign support to projects in cash terms, award allowances sufficient to cover the cash value of support at the current market price. Provide in the Auctioning Regulation for gradual auctioning of allowances until the cash value of the award is reached. Any unused allowances are then used for future projects. [Assuming that the market price will be a conservative reflection of future prices (for the sake of the example below, that the market price is the P10 price: the price for which the probability that the average carbon price for the period in question will fall below that value is 10%).] Example:

- a. A project has a funding gap of €300m and is granted support to this level from the NER. The market (P10) carbon price is €15 and so 20m allowances are auctioned gradually over a specified period.
  - i. If the average carbon price over the period of auction is equal to the market price, then the cash value of the award will be met.
  - ii. If the average carbon price is higher than the market price, then there will be surplus allowances once the cash value of the award is met which would be returned to the NER and used to fund additional projects
  - iii. If the average carbon price is lower than the market price, there will be a shortfall in funding which has to be borne. There are three options:
    1. The sponsor bears the risk
    2. The Member State bears the risk
    3. A third entity, commercial or otherwise, bears the risk
    4. A risk-sharing combination of two or more of the above.

*Assessment: The intended advantages over the previous options are: that the (we believe small) risk of a downside is laid off clearly; and the (large) chance of an upside is managed so as to maximise the number of projects that can be funded in the second tranche. The intended value of the scheme depends on auctioning taking place over a reasonable length of time after award of allowances in 2011, and so Tranche 2 is scheduled for award in 2014 for a 2017 completion, i.e. an auctioning period of 4 years.*