

Implementation of  
**New Entrant  
Reserve Funding**

Zep recommendations



# ***Implementation of New Entrant Reserve Funding: ZEP Recommendations***

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# **1. Summary Conclusions**

This paper presents the input of ZEP<sup>1</sup> to the European Commission during the comitology process that will determine the allocation of the New Entrant Reserve and the implementation of the demonstration projects whose funding it is intended to support.

## **1.1 Timing and Process**

- a. Timing for the CCS Programme is critically important; the bulk of the CCS portfolio should be funded in time credibly to target completion by 2015; a definitive outer time limit for CCS project completion targets should be established, and a clear timetable should be set for RES projects.
- b. A two-stage process for the selection of projects to be funded from the NER Pool should be implemented, with some flexibility, to ensure that this timing is met.
- c. Stage 1 allocation should start with a call for prequalification submissions within 2009, leading to selection of a short-list of potential candidates for award, intended to make up the bulk (perhaps 70%) of at least the CCS portfolio.
- d. Consideration should be given to the possible selection of a small group of well-prepared projects that can be implemented very quickly ahead of the Stage 1; but the price of such acceleration would be some loss of competition and transparency.
- e. Those Stage 1 candidates that pass through a competitive preliminary negotiation should be mandated to undertake front-end engineering design (“FEED”) studies, either on the basis of a definitive pre-FEED selection or of a limited further competition post-FEED.
- f. It is likely that some public funding for FEED for unselected projects would be needed, though Project Developers would in principle be expected to share this cost.
- g. Final funding bids and negotiations (in which Member States would participate) should result in final investment decision (“FID”) for Stage 1 projects in the first half of 2012, the majority of these projects being completed by 2015.
- h. A Stage 2 competition should be initiated in a similar manner in 2011, provided that there is both the (by then more certain) NER Pool capacity and the need; these projects could constitute perhaps 30% of the total portfolios, but would not be likely to achieve completion by 2015.
- i. Process design, solicitation, selection, negotiation and award will be complex and will place a heavy burden on Commission staff; we recommend the early engagement of qualified advisers to assist in the process.

## **1.2 Maximising NER Value**

- a. The current low value of Allowances is a concern for the value of the NER Pool; while there is some optimism that later in Phase 3 Allowance values will rise, that is not reflected in the forward market today, and may still not be reflected by 2011.
- b. Any underwriting of a future Allowance price at a higher value than forward market prices will represent a value contribution by the underwriter.
- c. Certainty as to the value of the entire NER Pool, together with accompanying contributions from other parties, is likely to be needed by the end of 2012 to allow the whole CCS Programme to be implemented in an acceptable timeframe.

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<sup>1</sup> Please see Section 2 below for definitions and abbreviations.

- d. Member States, and conceivably others such as Project Developers and the EIB, may be stimulated by competition to make an effective value contribution to projects by underwriting future Allowance values at above market rates over the medium to long term.
- e. Underwriting by Member States should be encouraged; we urge that the auction rules currently under development be formulated in a manner that permits the necessary freedom of action by Member States to do this.
- f. Those NER Allowances that are not to be allocated in kind to Member States on behalf of projects will need to be auctioned in 2011 and 2012; Project Developers and Member States may be asked to bear some short-term price risk on Allowances, particularly leading up to FID on Stage 2 projects.
- g. The proposed procedure facilitates underwriting contributions while allowing certainty of value to those not prepared to contribute in this way; it would include provisions to ensure that project performance risk remains substantially with Project Developers.

### **1.3 CCS and Eligible Renewables**

- a. The NER Pool should not be split ex-ante between CCS and RES; nor should the Commission rely on some kind of project by project competition for allocating funds.
- b. The CCS Programme is mandated and crafted with a clear scope and objectives to demonstrate certain essential technologies at a particular stage in their development life cycle; a similar targeted programme should be prepared urgently for RES.
- c. The RES target and Programme should be prepared on a basis that looks at essential demonstration needs not currently funded; preparation should not be allowed to hold up allocation of the NER.
- d. With two portfolios that have parallel demonstration aims it will be possible to select projects for inclusion in each on the basis of their potential contribution to the objective.
- e. There will be competition among projects for inclusion within each portfolio, on the basis among other matters of cost; but direct competition between a CCS and a RES project would not be meaningful.
- f. We recommend that threshold criteria be developed for RES projects as they have been for CCS, as far as possible on a common basis.

### **1.4 Member States – Funding and Relationship**

- a. Member State funding will be vital to the success of the CCS and RES Programmes; the NER Pool is not large enough to fill the need for public sector support and Member States will need to be invited to play a major role.
- b. Member States should be encouraged to contribute in the form of cash or by other means such as underwriting the future value of Allowances.
- c. In assessing project funding bids, Member State contributions should be considered as separate from those of the EEPR and the NER; minimising these two together should be the basis for any financial competition among contending projects.
- d. The primary formal relationship in the competition, negotiation and allocation of NER funding should be between Commission and Project Developer, but in reality the importance of Member State funding means that negotiations will be triangular among the three parties.
- e. To ensure a geographical spread across the EU the Commission should formulate explicit funding limits or allocations, for example to Member States with lower per capita GDP's.

### **1.5 Project Funding**

- a. Project Developers should be invited to offer project proposals that bid for a quantum of NER funding to supplement funds to be provided by themselves, EEPR and Member States.
- b. In practice, Member State contributions may well not be known at the time that initial project offers are made; negotiations are likely to be needed to bring the parties to a definitive final proposal.
- c. Project Developers will be required to take the risk of delivering an operating project, and to fund the base cost of the plant; they will be expected through competition also to recognise the expected long-term value of the CCS element of their projects.
- d. EEPR funding will be welcome where it is received by a project selected for NER funding, but for the purpose of price competition it should be considered bundled with NER funding.
- e. Projects should receive NER funding at FID, rather than waiting until performance has been proven in a completed project; this “advance payment” will increase the value of the NER Pool available for allocation, but the Commission must be fully protected by a legally binding and credit-supported clawback provision in the event that operating performance is not met.
- f. Operating performance should be measured and rewarded over a period of five to ten years against an appropriate performance metric (e.g. clean MWh, tonnes of CO<sub>2</sub> stored or avoided) which will vary by category and technology of project.

### **1.6 Project Selection**

- a. The task of managing the competition is to compile projects that meet threshold criteria into portfolios that as whole meet the requirements for each of CCS and RES of timing, geography and technology.
- b. We propose a set of threshold criteria for CCS projects, governing demonstration size, development status and other matters; these may form a basis for common criteria for all projects.
- c. There should be enough alternative proposals among eligible projects to stimulate price competition; the objective will be to compile the portfolios that provide the best overall value for money.
- d. There will be extensive information requirements to help to obviate the risk of “gaming” by project promoters; analysis of these will impose a heavy load on those tasked with selecting projects for support.
- e. Proposals within a given category will therefore compete on the lowest funding cost (NER plus EEPR) for a role in the portfolio, and in some cases head to head with other proposals that can provide similar demonstration value; projects that are too expensive may be excluded for lack of funds even where they could make a significant contribution to the Programme.
- f. Negotiation can be expected among the Commission, Project Developers and their Member State supporters to reconfigure project proposals or provide improved offers so as to produce the most cost-effective possible Programmes.

## **2. Background**

In March 2007 the European Spring Council gave its support to an EU programme of up to twelve demonstration projects for carbon capture and storage (“CCS”) (the “CCS Programme”)<sup>2</sup>, to be implemented by 2015 at an estimated cost to the public purse of €6 to €10 billion. The CCS Programme was conceived and designed on the basis of recommendations by ZEP<sup>3</sup> in 2007; in November 2008 ZEP presented its further recommendations<sup>4</sup> to the European Commission on the broad guidelines for implementing the CCS Programme.

In December 2008 the European Parliament and the Council adopted the review of the Emissions Trading Directive<sup>5</sup> (the “Directive”), which among its other provisions envisages the award of 300 million EU emission Allowances (“Allowances”) from the New Entrant Reserve (“NER” and “NER Pool”) to CCS and certain classes of renewable energy (“RES”) projects.

A comitology process among the European Parliament, the Commission and Member States is now in train under the direction of DGE<sub>Env</sub> to develop a Draft Regulation on the administration of the NER. DGTrEn has an interest in this process as an observer, given that is the sponsor of the CCS Programme.

At the same time the European Energy Programme for Recovery (“EEPR”) has been mandated in terms that allocate over €1 billion to certain preselected CCS demonstration projects, to be committed by December 2010. Where such a project is selected on its merits for funding from the NER Pool, it is proposed that the amount of Pool funding will be discounted by the amount of the EEPR contribution. The assumed terms of reference of the EEPR, pending adoption by the Council, are given in a European Parliament Resolution dated 6 May 2009.<sup>6</sup>

This paper represents ZEP’s contribution, at the Commission’s invitation, in support of the comitology process. The members of ZEP are very grateful for the efforts of all the individuals who have worked so hard to achieve such a level of public sector financial support for the CCS Programme. They look forward to working together with the Commission, the Parliament and Member States to bring the CCS Programme to full success.

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<sup>2</sup> Presidency Conclusions, Brussels European Council 8/9 March 2007, (Council of the European Union 7224/1/07). CCS policy in Annex I, Section V, p.22.

<sup>3</sup> European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP). Initiated by the European Commission, ZEP is a broad coalition of stakeholders united in their support for CCS. Members include European utilities, petroleum companies, equipment suppliers, national geological surveys, academic institutions and environmental NGOs.

<sup>4</sup> EU Demonstration Programme for CO<sub>2</sub> Capture and Storage (CCS) – ZEP’s Proposal, November 2008 (“ZEP November 2008 Submission”). To download any ZEP publications, please access [www.zero-emissionplatform.eu/website/library](http://www.zero-emissionplatform.eu/website/library)

<sup>5</sup> European Parliament legislative resolution of 17 December 2008 on the proposal for a directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community (COM(2008)0016 – C6-0043/2008 – 2008/0013(COD))

<sup>6</sup> European Parliament Resolution of 6 May 2009 on the proposal for a Regulation on the EEPR

## **3. Timing and Process**

### **3.1 Timing Constraints**

The timing and process for allocating the NER Pool will be driven by the need to achieve the objectives of the CCS and RES programmes at best value for public money. However, the structure and sequence of award will have to be determined in light not only of the Parliament's and the Commission's processes, but also of industry's project development sequence and activities.

The long-standing objective of the CCS Programme has been to have a portfolio of demonstration projects operating by the end of 2015. While projects that start operating after this date can help to achieve the objective of demonstrating commercial viability by 2020, their value will diminish as their target start dates become later. The process should therefore target a 2015 start-up for the bulk of projects, but accept that some valuable projects may deserve funding even if they cannot meet the date. However, we think projects whose target start of operation is more than about two years beyond 2015 are unlikely to justify support.

The process of award, as we discuss below, requires that funds be allocated on a provisional basis four to five years before target start-up, with definitive allocation about a year later when full commitment is made at Project Sanction, or Final Investment Decision ("FID"). Thus the full value of the NER Pool needs to be known towards the end of 2012 and definitively allocated in 2013.

We have considered carefully the suggestion that delay in funding awards, and hence of projects, would be justified by the probability that the market value of the NER Pool will rise over time. However, we do not think the balance of project utility against possible higher NER Pool value justifies delaying provisional allocation of funds to projects later than about 2012.

We do not know what the timing objectives would be for RES projects. If they can be allowed a more generous timetable it may be possible to delay award to some RES projects until after the CCS portfolio has been fully funded.

### **3.2 Project Development Phases**

The phases by which a project is developed are an important determinant of the timing and process for allocation of NER funds. They are shown in Figure 1.

- a. The **Preliminary Development** phase is proceeding for many candidate projects now. It can be very long and the longer it is, generally, the more expensive. Project Developers<sup>7</sup> will expect to bear the costs of Preliminary Development at their own risk for any project they promote.

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<sup>7</sup> We use "Project Developer" to mean the industry entity or consortium (which may include financial participants) that promotes, plans, develops, funds, builds and operates a project in either the CCS or RES portfolios. In the case of CCS, the Project Developer takes responsibility for the delivery of the entire project, including the base plant, capture, transportation and storage.

- b. **Final Development** is a much better defined, if more expensive, process culminating in FID, when all the financial commitments needed to complete the project (including Project Developer and NER funding) are definitively undertaken. A major activity in the Final Development phase is a front-end engineering design study (“FEED”). While its definition and scope varies considerably, embarking on FEED is usually a threshold decision, undertaken when there is high confidence that the project can proceed.

Because the definitions of the transition into Final Development vary among developers, it is hard to state how long a “typical” Final Development takes; but when it has been decided upon, timing is usually more certain than for Preliminary Development. However, given the complexity of the CCS chain and the need for all parts of it to be ready before FID can be declared, CCS may introduce special Final Development challenges.

Developers are generally ready to carry Final Development costs, principally those of FEED, at their own risk, provided that the project has secured in principle its full construction funding, to be finally committed at FID. But where projects are still in competition for selection, sponsors are reluctant to accept the very high costs of Final Development at their sole risk. We discuss at Section 3.3 below the options for handling FEED in a competitive situation.

**Figure 1 – Generic Project Development Stages**

	<b>Preliminary development</b>	<b>Final development</b>	<b>Construction and commissioning</b>	<b>Learning</b>
<b>Activities</b>	Project concept and economics; permitting and location studies; form sponsor and supplier groups; outline financing plan and sourcing	Complete FEED, tender packages, final permits, site acquisition, definitive financing	Detailed design, construction, and commissioning	Improvement of the initial project
<b>Milestone</b>	Project development agreement and decision to fund and start FEED	FID – commitment of all parties and award of all contracts	Technically complete and delivery of test performance obligations	Continuing project improvement
<b>Cost</b>	€ single figure millions	€ several tens of millions	€ hundreds of millions	Costs covered by revenues
<b>Time</b>	18-24 months +	9-18 months	36-48 months	Ongoing



- c. The **Construction and Commissioning Period** may vary a great deal from project to project. Project completion is a critical date, as it triggers the beginning of the period when proof of performance, starting with completion tests, allows public sector funding to become unconditional. In the nature of projects with a demonstration element it will be difficult to ensure that the completion deadline is met, but we would expect that (a) at the time of FID a credible timeline should show how the target would be met and (b) there will be strong financial incentives for timely completion. (It may well be that the desire to begin earning a return on the very high capital investment that Project Developers will have made will be enough incentive on its own).
- d. The **Learning Period** recognises that, particularly for these first-of-a-kind projects, there are likely to be continuous plant enhancements as operational experience is gained. This is likely to be relatively intense in the early years of operation, but also to continue at some level throughout the life of the plant. It is expected that investment in these enhancements will be self-funding through improved performance; the scheme by which public funding becomes unconditional should be designed to encourage such improvements.

### 1.3 FEED

The FEED study is the major element of the Final Development process of a project. While its scope will vary from industry to industry, its objective is to demonstrate technical feasibility and reduce the cost risk from something in the region of +/-30% to +/-10%. For CCS the FEED will have to include the entire carbon capture, transportation and storage chain, and will be an expensive exercise that may take a year or more.

The risk of undertaking an offering and award process for projects before FEED has been completed is that the cost estimates will be so unreliable that the award may become invalid as the FEED develops, or that financial offers by Project Developers are very expensive so as to lay off the unknown cost risk.

On the other hand, waiting until FEED has been completed requires perhaps a year's delay before project awards can be made, and a large expenditure on work that may be abortive. While Project Developers have been ready to undertake FEEDs in a competitive environment, it is unusual, and it is significant that none of the three current formal CCS Demonstration competitions worldwide<sup>8</sup> have demanded this of competitors. In all these cases FEED costs for all projects, selected or not, are met as a public sector cost either because winners are selected pre-FEED (US, Alberta), or via the public funding of multiple FEEDs for prequalified projects (UK) .

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<sup>8</sup> UK, Alberta, US Clean Coal. Further data on these competitions, to which we have referred in developing our recommendations, are available from the following sources:

- **Alberta:** Department of Energy [Carbon Capture and Storage Program, Full Project Proposals Information Package](#), December 2008
- **US:** [Financial Assistance Funding Opportunity Announcement, Clean Coal Power Initiative Round 3. Funding Opportunity Number: DE-PS26-08NT43181](#). August 11<sup>th</sup> 2008, with subsequent amendments.
- **UK:** The European Commission approves UK aid for the front-end engineering and feasibility studies for two post-combustion CCS demonstration projects under EC Treaty state aid rules. <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/555&format=HTML&aged=0&language=EN&guiLanguage=en>

We recommend that except for those candidate projects that have already committed to FEED studies, project selection and development proceed via a cooperative partnership between the Project Developers and the public sector funder, jointly working to ensure the delivery of the CCS projects. An important element in the funding organisations' selection decision is their confidence in the commitment and competence of the Project Developers to follow through and deliver the project.

The process we propose below (Section 3.5) suggests that only a limited number of projects is taken forward to the FEED study stage so as to control costs (and industry resources for this work, which may be stretched). But it is likely that some projects that fail in the end to be selected will have undertaken FEEDs, and there may have to be some level of cost sharing from NER funds for some of these. However, we believe that Project Developers should in principle bear at least some of the cost.

#### **1.4 Staging the Process**

We expect that auctioning of Phase 3 Allowances will start at some time in 2011. The Directive makes it clear that<sup>9</sup> it should start no later, and the completion date of the comitology process makes it impracticable for it to start any earlier.

The 2015 operational target for CCS projects implies a development process in which a reliable, if nonbinding, indication of the NER Pool contribution is needed at the start of negotiation with Project Developers, which will have to be in 2010. During 2011 a firm understanding of available value will be needed as provisional awards are made to projects. (Only at FID will value be definitively committed, in the form of cash or Allowances<sup>10</sup>). A 2015 completion target therefore implies a need for a presumption of NER Pool value very soon, before auctions are possible.

This timing mismatch argues for a staged process, in which commitments to some projects – the majority – are made early on the basis of an estimate of NER Pool value, while the remainder are awarded only when the value is certain. Arguments for staging are:

- a. It will allow maturing development stage projects to be offered, selected and mandated in good time to allow them to achieve the 2015 deadline; projects that are on a slower track will have a second chance to compete for delivery on a slightly delayed timetable.
- b. Staging can largely de-link the project selection process from the timing of Phase 3 Allowance auctions, allowing more flexibility for both activities.
- c. Designing portfolios for CCS and RES on the basis of the projects offered is going to be a very difficult task (see Section 8 below). A staged process will allow the design to be staged too, so that later allocations can focus specifically on the gaps left in the portfolios after early awards.
- d. A staged process may allow funds that had been committed to any early projects that fail in development to be released and recycled; this could prevent a loss of valuable NER value from the process.

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<sup>9</sup> (*Preamble Item 20*) states that auctioning of Allowances for 2013 should “start by 2011 at the latest and be based on clear and objective principles defined well in advance” and (*Article 9*) that “the Commission shall, by 30 June 2010, publish the absolute Community-wide quantity of allowances for 2013”

<sup>10</sup> “Definitive commitment” is not a strictly accurate term since all commitments of funding will be subject to clawback if and to the extent that projects underperform after completion.

- e. Intense work will be required from the Commission's team to negotiate detailed terms for the funding of each project; there are practical advantages in spreading this over time.

We have had much debate about how flexible the staging process can be. Should there be a rigid timetable for competitive submissions, preliminary awards and final commitments; or should there be flexibility within the competition to allow projects to receive approval and funding as they become ready? The argument arises from the tension between transparent competition and building an optimal portfolio on the one hand, and speed of implementation on the other. Competition and portfolio building favour rigidity; only by receiving simultaneous offers prepared on a consistent basis can the Commission properly compare one with another and build a CCS Portfolio of optimum demonstration value. The need for speed argues for encouraging projects to get ahead and hence for more flexible timing.

We have in particular considered the merit of giving accelerated awards to any "early projects" that are already in mature development, so that they can get a head-start in the implementation of the CCS Programme.

However, we understand that the Commission is likely to prefer a transparent and fully competitive process, even if it means that relatively mature development projects are not brought forward as early as they might be. Provided that the 2015 target date can be substantially met, we accept that policy direction. Provisional funding awards should be made in clear tranches so that simultaneous project offers can be properly compared. This is the stage when the competitive outcome is largely determined; by the time of definitive awards at FID, the competition is effectively over and timing can be more flexible to suit the particular requirements of each project.

There will also have to be room for flexibility as the process develops. It will not be possible to assemble optimal portfolios of projects without negotiation between the Commission, Project Developers and Member States, and it may be necessary to modify the initial set of competition rules and procedures in response to this process.

### **1.5 Proposed Two-stage Solicitation**

Figure 2 at the end of this Section shows a proposed tentative timetable. The processes we suggest are as follows:

- a. **Prepare a Stage 1 prequalification invitation.** Start as soon as possible. As the comitology process comes to a conclusion a comprehensive document describing the procedures for the allocation of the NER should be prepared, including both threshold criteria and portfolio objectives in each of CCS and RES categories. This document needs to be clear and comprehensive, as it will set the standard for the process that is to follow. It may be appropriate, for example through a press release, to alert the industry to the forthcoming process as soon as it is decided upon.
- b. **Candidate projects prepare.** Start as soon as possible. Project Developers are in many cases already in preliminary development. When they know the schedule for solicitation they should be able to prepare themselves for that event, for example by joining the Project Network, which will enhance their submissions and may in due course become a requirement.

- c. Solicit prequalification proposals.** By the end of 2009. Proposals for both CCS and, we assume, RES projects should be sought, on a basis that meets threshold criteria and shows how projects could participate in a demonstration portfolio. Projects may still be in preliminary development, but they need to be realistic and to have some level of Member State support in principle. Some projects may be well-developed.
- d. Form prequalified list:** Second quarter 2010. Several dozen proposals may be received for each of CCS and RES. We expect that they will be quite varied. Projects would be prequalified on the basis of meeting threshold qualifications and their state of readiness. Rejected project proposals might be invited to resubmit in Stage 2 when they were more mature.
- e. Select Stage 1 candidates:** Third quarter 2010. From among the prequalified candidates the Commission would select those projects that could participate in the Stage 1 award round that is likely to make up the bulk of the CCS and possibly RES portfolios. Most project proposals can be expected not yet to be in Final Development. That would imply a need for FEED studies, completion of permitting and regulatory approvals and negotiation with host Member States over facilitation, support and funding. From prequalified projects, a group would be chosen for negotiation and development over the forthcoming 12 to 18 months, targeting FID in 2012. This negotiation, while it needs to be cooperative vis-à-vis the Commission, also needs to feel competitive pressure to ensure that Project Developers are offering best value.

The selected group would include projects chosen for their ability to make up between them as much as possible of the portfolios that would meet the aims of, respectively, the CCS and the RES Programmes. The aim would be to choose a group that was large enough, and appropriately configured, to meet those aims in several different ways. For example, in the case of CCS, it might be judged that a total of up to ten projects were required, of which the majority should be in Stage 1; in that case perhaps 12 to 15 candidate projects might be selected to take forward into negotiation for those places. In this way competitive pressure could be maintained.

- f. Form the Stage 1 portfolio:** The procedure could be:

  - candidate projects negotiate to confirm their preferred status on grounds of sound preliminary planning and cost estimates and solidity of Project Developer's and Member State's in-principle support; this process may take three months or more and experience suggests some candidates may drop out;
  - it may be that this preliminary negotiation effectively constitutes a competition that yields high confidence in a group of projects all of which qualify for the Stage 1 round. In that case the Commission could announce winners prior to the completion of FEED, thereby minimising "wasted" public money on FEED studies for projects that are not implemented;
  - however if a pre-FEED award is not considered prudent, candidates remaining in the selected group should commit to a FEED study and other aspects of Final Development; risk of a failed FEED and an abandoned development at this stage lies with Project Developers;

- post-FEED, definitive technical and financial proposals would be put forward to the Commission and selected competitively (see Section 8 below);
- from the example figures quoted above, the majority of candidate projects could be successful; the costs of complete and well-run FEED studies carried out for rejected proposals, may, depending on circumstances, be shared by the Commission (especially if the knowledge gained and shared in the FEED stage is deemed to be of value to the programme);
- the number of projects that turns out to be affordable in this Stage 1 is still unknown, given that neither project costs nor the size of the NER Pool are known; part of the Commission's process would be to decide on the number of projects that was affordable and how close it could be to the target figure;
- given the pre-negotiation during the Final Development process, it could be expected that final documentation and definitive award could follow quite quickly, perhaps in less than six months.

This procedure should result in a more or less simultaneous award decision in respect of a portfolio of CCS projects in 2011, targeting a date as early as possible in that year. Definitive funding allocations would occur at FID some months later, perhaps for some projects in 2011, though we assume FID during 2012 for the bulk of the projects in the CCS Programme. There could high confidence in most such projects setting a credible 2015 target, while others might follow shortly afterwards. It is likely that by the time the Stage 1 project portfolio was fully formed, the NER Pool could be fully valued by reference to market activity.

- g. Stage 2:** The need and scope for the Stage 2 solicitation and award process would become clearer as the Stage 1 process, and early auctions, take place. It would become clear what funds were likely to be available and where there were gaps to be filled in the CCS and RES Programmes.

We would expect that the Stage 2 solicitation would be initiated at some point in 2011, giving the chance to later-developing projects to make offers on a more focused basis and against clearer funding limits. The process for this could be decided at the time in light of the potential offers expected, informed (and accelerated?) by the experience gained in the Stage 1 process. Timing would be determined by the operational deadline – we have suggested the end of 2017 – beyond which projects would be considered no longer able meaningfully to contribute to the Programmes. In other respects we would expect the selection process to be similar to that of Stage 1.

## **1.6 Flexibility**

The process outlined in Section 3.5 above could be subject to several variants. If it were decided to trade off some competitive pressure in favour of speed of execution, it might be possible to select a few well-qualified and advanced projects for early award, as mooted at Section 3.4 above. This process might also offer the opportunity for the CCS Programme to take advantage of any well-qualified proposals that can benefit from EEPF funding.



complete, but also needs to recognise that external events may in part set the pace. For example, very few projects are advanced with permitting, and it is often this activity that determines timetable. Similarly, it may well be Member State processes for allocating funding and choosing projects that will decide the schedule.

### **1.8 Complexity**

On the basis of our varied experience in processes similar to this one (including Alberta and the UK), we see the allocation of NER funding as exceptionally complex, whichever precise processes are used. The scope, complexity, political sensitivity and compressed timescale of this process are a real organisational challenge.

The Commission may wish to draw on the particular and recent experience in similar competitions in Member States and elsewhere. For example the UK competition may have lessons for this process. The experience of Alberta may also be helpful; we understand that a highly focused team is administering a complex programme there on a rapid timetable and largely keeping to schedule.

These experiences emphasise the importance of building confidence among all participants with a transparent process that is well thought-out and “gets it right first time”. Effort spent in fully designing the process now is not likely to be wasted.

In particular, we suggest that serious consideration be given now, in parallel with the comitology process, to appointing advisers. Advisers should provide the technical skills to compare projects and assemble programmes that work across different generation, carbon capture, transportation and geological technologies. We would also recommend the appointment of advisers with hands-on experience of running complex competitions for public sector funding; good experience is available in organisations that have helped to design and administer competitions for public-private partnership roles across several Member States. Such advisers should of course be independent of any of the potential recipients of NER funding.

## **4. Maximising NER Value**

### **4.1 Operation of the Allowance Market**

There is today no market for Phase 3 Allowances and it is not expected that one will exist in any substantial form until the auction rules are established with some degree of certainty, perhaps in late 2010. For the reasons outlined below, the traded market is not expected to be deep or liquid, especially in its early stages. However, it may be sufficiently reliable to provide a “fair value”<sup>11</sup> market price for the purpose of allocating funds.

The best indicator as to how the Phase 3 market is likely to function is the existing market in Phase 2 Allowances. This market has (as of April 2009) the following characteristics:

- a. Throughout Phase 2 it is expected that a total of about 10.7 billion Allowances will be issued, of which only about 3% are expected to be awarded by auction, by seven Member States. Daily trading volumes averaged 8 million in 2008 and 18 million in the first quarter of 2009.
- b. Auctions are held at the discretion of Member States, for example biannually and more recently monthly by the UK. Other countries (e.g. Germany) sell smaller lots through banks or brokers. Although as of April 2009 only two auctions had been held, prices achieved have closely reflected those traded in the market, as would be expected.
- c. Buyers at auction are primarily utility and industrial companies who need Allowances for their business. Trading is carried out by a variety of industrial companies as well as brokerage houses and the commodities desks of financial institutions.
- d. Allowance prices have been volatile, moving in the range €13 to €18 for December 2009 vintage Allowances. The April volatility index was in the region of 60%.
- e. There is forward market in Allowances out to about 2012, at which point it becomes extremely shallow. Even though Phase 2 Allowances are tradable forward into the Phase 3 period this has hardly happened.
- f. As is normal in a market where commodities are not time-limited, forward prices reflect the current spot price, discounted for the carrying cost of capital and subject to an adjustment for regulatory and credit risk.
- g. Options are occasionally written and traded in small volumes, with a term out to two or three years, but they are illiquid and expensively priced.

### **4.2 Today’s Market Value of Allowances**

Current Allowance market prices at around €14/tonne are widely considered “low” compared with expectations, on the basis of market fundamentals, of much higher prices as Phase 3 develops. In particular, commentators argue that the ratification of a new global climate change agreement for the post-2012 period – likely in 2011 – will lead to a step change in carbon prices. However, there is no evidence of any major party buying and warehousing Allowances against their expected future rise in value; and of course if any material number of market participants were to do this the price would rise to reflect demand.

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<sup>11</sup> In the technical sense of a value agreed transparently between a willing buyer and a willing seller.



The participants in the market to whom we have spoken suggest that today's low price may be explained by several factors:

- medium term capital constraints on long-term buyers and users of Allowances;
- the risks both of the economy and the regulatory structure of Phase 3 ETS;
- a large overhang of Phase 2 units;
- uncertainty about political developments over the next few years;
- the recent decision on the total size of the Phase 3 Allowance issuance (taken before it was known that the world was to suffer a recession that would depress Allowance values).

There is also a view that in addition to long-term macro-economic effects on carbon price, there may be a shortage of Allowances when trading starts in 2011, as power generators need to build a stock of Allowances to allow them to hedge risk. In our view, it would be unwise to rely on this assumption, which is uncertain and may anyway be of marginal effect.

The current low value of the NER Pool is a concern for the CCS Programme, with its very specific funding requirement. Even on optimistic assumptions (majority allocation to CCS over RES, inclusion of several projects benefiting from the EEP, maximum risk-bearing by Project Developers), it will be hard to realise the full vision of the CCS Programme without generous financial support from other sources, most probably including Member States.

### **4.3 Auction vs. Trading**

We may assume that the prices to be received at auctions of Phase 3 Allowances will track those in the traded market. The traded market is more immediately liquid, as trades take place all the time, and should reflect market value consensus. But it does not have the depth that is required to handle the very large bulk trades that will take place through auctions. The monetisation of the NER Allowances will rely, whenever it takes place and whether underwritten or not, on an auction process.

We are unsure of the mechanisms for such an auction – whether the Commission itself can run it, whether there is a role for EU financial institutions or whether it must be run by a Member State working by agreement with the Commission.

The annual volume of auctions in Phase 3 is likely to be well over 1,000 million Allowances per year. We are advised that in this context a series of auctions totalling 300 million tonnes over one or two years, perhaps at monthly intervals, is unlikely to move the market.

### **4.4 Future Value**

The market for Phase 3 Allowances does not yet exist, but we may assume that by 2011 it will do, and that it will function in a similar way to the current Phase 2 market. We do not know now what the spot price of Allowances will then be. But we can reasonably predict how the market will price a forward purchase of Allowances relative to the spot price. Because Allowances will be fungible throughout the whole period of Phase 3 (and

throughout the EU), the spot market value, subject only to the risk-adjusted cost of carry, will reflect the market consensus on the future value of Allowances<sup>12</sup>.

A purely rational economic market participant will not offer a future price for an NER Allowance which is different from today's price discounted for a risk-adjusted carrying cost. If it seeks a long position in Allowances, its cheapest way to achieve one is to buy them in the market at about the same price at which it would be able to sell them.

#### **4.5 Underwriting and Price Guarantees**

It is thus clear that anyone underwriting a future price at a higher level than indicated by the market makes a value contribution to the CCS and RES portfolios. There are some parties that might choose to do this, and to that extent the competitive process needs to encourage the contribution of value in this way. We have considered the possible positions of the European Investment Bank ("EIB"), Project Developers and Member States.

- a. **EIB:** The EIB is a commercial bank, but has a mandate to allocate capital in the furtherance of EU social aims. We do not believe that without a very specific mandate this role is likely to extend to underwriting future Allowance prices at levels materially above market, thus effectively contributing to project funding. Subject to anything the EIB might say, we think it is likely that its role will be limited to facilitating the monetisation process without a major contribution of cash value.
- b. **Project Developers:** Project Developers are neither irrational market participants nor charitable institutions. But they might in principle welcome the opportunity to contribute to projects in the form of underwriting the future price of Allowances; they are already in this process undertaking a variety of project risks, and participation in the Allowance market is for many of them a regular part of their business. This is a risk exposure that they understand and can to some extent manage. There could be advantage, in a competitive process, in allowing them to offer project value in this way.

However, it is very unlikely that Project Developers will take this risk unless they have full discretion as to when to sell their Allowances, which we understand may not be acceptable to the Commission. We also note that it will be a Commission requirement that such an underwriting cannot be seen as offering the opportunity to make windfall profits, so the realisable value will presumably be capped in some way. Given that such a cap is easy to avoid by selling the NER Pool Allowances when received and simultaneously repurchasing uncapped Allowances, this may be another obstacle to Project Developer underwriting.

We have to conclude that if we have understood the Commission's constraints on Project Developers correctly, the possibility of Project Developer underwriting over the long term must be discounted.

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<sup>12</sup> For those for whom this is counter-intuitive, given the widespread anecdotal belief that future prices will be a multiple of today's, the analogy is with currency markets (fungible across time) rather than with oil markets (value specific to time and place).

There will however be short-term pricing risks to be addressed. For example a project may receive a conditional award of NER support expressed as a fixed number of Allowances. Project Developers may be ready to share the risk of the change in value of those Allowances in the interval of (at least) several months before FID. But we can assume that there will be limits on such sharing, and a price for carrying the risk which may not be fully transparent.

- c. **Member States:** Member States may prefer to make all or a part of their value contribution through underwriting future Allowance price. There are precedents in Member States for such underwritings, for example in the UK an understanding that a contract for difference as a means of support for its own CCS demonstration programme may be acceptable.

Assuming that Member States would not be restricted either as to timing of sales or a value cap (the Allowances after all emanate from the Member States themselves), this could be a very important mechanism for the injection of long-term value into projects. We urge that as the auction rules are developed, they allow maximum possible flexibility to facilitate this possible value contribution from Member States.

As for Project Developers, it may also be that Member States will be ready to share or carry the risk of Allowance values in the interval between conditional award and FID.

#### **4.6 Recommended Process**

The discussion at 4.5 above leads us to conclude that when NER contributions are committed at FID, it will be in the form either of cash awarded directly to projects, or of Allowances awarded to Member States. Cash sums will have been raised from the sale of Allowances under arrangements controlled by the Commission. Allowances allocated to Member States will be monetised under their sole control, and they will make independent arrangements with Project Developers for the timing and amount of project funding – in other words, the term and strike price of their underwriting.

At each award stage of the project selection process, the Commission will need to consider the remaining available value of the NER Pool, always by reference to current market value and how the Pool might shrink or grow as future prices change. In the case of Stage 1 projects, the problem is less serious, since only part of the NER Pool will be allocated to them; such allocation can be planned to be well within an estimate of the of the total NR Pool value.

The process of award could be as follows:

- Bids for NER funding are sought competitively from Project Developers, expressed either in cash value or number of Allowances. To compare such bids among themselves and (e.g.) with EEPR awards, they need to be valued as of the time of provisional award (pending FID) by reference to the current market. If a Project Developer or Member State is ready to bear the risk of changes in Allowance price in the interval from provisional award to FID, some additional value may be assessed in that bid according to an appropriate option pricing formula.

- The Commission auctions Allowances, probably under arrangements to be agreed with Member States, in time for the cash portion of funding awards to be available at FID. For the Stage 1 projects – the bulk of the portfolio (at least in the case of CCS) – there should be enough Allowances available in the NER Pool to meet the total of all provisional awards made, even if there has been a material drop in the market price of Allowances from that assumed for estimating purposes. The question will be how much of the NER Pool will remain for Stage 2 projects.
- The management of Stage 2 will be more difficult. Provisional Awards will have to be made from a Pool consisting of a fixed number of remaining Allowances. To ensure that definitive awards can be made as promised when FID occurs, the whole remaining NER Pool (other than any element that had been bid for by Member States in kind) would need to be monetised by that time, or according to our schedule by the end of 2012.
- It would be possible to delay definitive monetisation by a few months, to the Stage 2 FID date, provided that Project Developers or Member States are prepared to take some risk. They could be required to underwrite Allowance price over that interval, as discussed (though not on an obligatory basis) for Stage 1. Or projects could be ranked, with the risk that low-ranked projects would never reach FID in the event of a funding shortfall.

It is worth noting here again that the “definitive award” of NER support at FID is still effectively conditioned on eventual project performance. For reasons we discuss in Section 7.5 below, we recommend that this conditionality is achieved not through deferred funding but through binding claw-back provisions in the event of non-performance. The scheme we propose is greatly to the public advantage in increasing the value of the NER Pool and can be executed in a manner that brings minimal performance risk back into the public sector.

#### **4.7 Alternative Process**

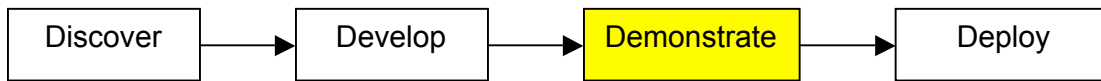
As discussed at 4.5b above, we have assumed that Project Developers will not be willing to underwrite future Allowance prices in the long term, because they will not be allowed the freedom to decide when to sell them. But if this restriction could be lifted, there might be merit in allocating Allowances to Project Developers instead of cash, using some form of trust arrangement to protect the public interest. In that structure we would envisage a role for an independent trustee to control the auction process, and would propose that the EIB be consulted about its interest and ability to undertake the trustee role.

## 5. CCS and Eligible Renewables

The Commission is currently considering how to meet the requirements of the Directive to allocate the NER Pool between the CCS Programme and eligible renewable projects. The option of making an allocation of the NER Pool between the two categories “ex-ante” and running a competition for each is not favoured; it would require an early administrative decision on an essentially political matter. On the other hand, the proposal that all projects should compete among each other “on their merits” cannot work either.

### 5.1 Portfolio Principle

The CCS Programme is designed to support the demonstration of technologies that have reached a specific point in their development cycle:



Every new technology needs to undergo this process<sup>13</sup>. Both Commission and Parliament have recognised this need for CCS over the past two years, which is why they have mandated the CCS Demonstration Programme, and allocated funding for it through the establishment of the NER. They have ensured that the CCS Programme is properly configured and costed, with an internal integrity designed to demonstrate a specific and bounded range of technologies.

The much more open-ended target for eligible renewable technologies is hard to analyse. The Directive<sup>14</sup> gives the objective of this deployment of the NER only as to “accelerate demonstration of the first commercial facilities and demonstration of innovative renewable technologies that are not yet commercially viable.”

What is now needed is a parallel objective for a relevant set of RES technologies, which can be the basis of a similarly structured and bounded demonstration programme. Within the spirit of the Directive, they need to demonstrate innovative technologies already developed and proven at small scale. After they have been successfully demonstrated in this programme, they should be ready to move up into commercial industrial deployment.

### 5.2 A Renewables Portfolio?

It is beyond our expertise or brief to propose a basis for formulating a portfolio of renewable technologies to be demonstrated. But without such portfolio proposal it is impossible to know what kind of funding is necessary or appropriate from the NER Pool.

We recommend that the relevant industry bod(ies) be asked to propose a set of objectives for the RES portion of this funding, together with their proposed structure for a

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<sup>13</sup> Other low-carbon technologies (mature renewables, nuclear) have received tens of billions of Euros of essential public funding over decades for this same purpose. CCS has received no material public support for its development programme.

<sup>14</sup> Directive, Preamble Clause 20

portfolio; we understand that some work is currently being done along these lines. Outline estimates of costs should be provided as they have been for the CCS Programme. Such estimates should show which part of the cost is specific to the demonstration role of projects and not met by any other kind of public contribution. The rules for allocation of funds among RES projects could then be applied in a manner analogous to those for CCS, though the work to get to this point will have to be done in time not to delay the overall process.

Work needs to reach maturity very soon, so that candidate projects can be solicited within a clear structure at the end of this year. If an assessment process such as the one we propose in Section 3.5 above is to be used, the allocation of funds among projects in the two portfolios can then be made in ways that most nearly meet the needs of each Programme.

Within each portfolio, projects need to compete among themselves for inclusion. The rules of that competition need to be parallel as between the two portfolios, sponsors being required to carry risk and the concept of an “economic gap” (see Section 7.1 below) being applied to each.

What would not work would be some notion that all projects compete with each other on their merits (e.g. incremental cost per tonne of carbon emission saved), since that would deny both for CCS and RES the demonstration purpose of each of the Programmes. Each Programme must be designed to demonstrate not just the “low-hanging fruit”, but also the more difficult and risky technologies that may have more long-term potential.

### **5.3 Threshold Criteria**

We recommend that a set of ground-rules be articulated, to apply to all projects that receive funding from the NER Pool. Such rules are already proposed for CCS projects, as outlined at Section 8.1. It would be useful if a common set of criteria could be developed that could apply to both CCS and RES, as this would make it easier to allocate funds between projects in the two Programmes. The CCS criteria proposed may provide a basis for common thresholds with RES.

However, we understand that the nature of innovative RES projects is likely to be very different from CCS projects, which will make the development of common criteria and parallel programmes difficult. It has been pointed out that RES projects are more likely to be at an earlier pilot stage, to be smaller and to benefit more from risk underwriting than direct subsidy. Whatever criteria are chosen for RES projects, we do consider that candidates should not be at the early research stage, and should have demonstrated the ability to produce low-carbon energy at some appropriate scale before being considered for NER funding.

## **6. Member States – Funding and Relationship**

### **6.1 Role of Member States**

Given a fixed amount of funding available from the NER, and a competitively established limit to the contribution that Project Developers will make, the role of Member States in filling any remaining gap from nationally controlled public funds is likely to be vital.

The Directive requires that the allocation of the NER is administered through Member States. It also encourages (but does not require) co-funding by Member States, not least by specifically referencing<sup>15</sup> the support of CCS demonstrations as a potential use for the 50% of auction revenues that are to be allocated to clean energy uses.

Member States are therefore likely to be involved at every stage of the process. It will be in the interests of the CCS and RES Programmes to solicit maximum input from Member States, in the form of financial contributions as well as political and regulatory support. Competition among projects for inclusion in the programmes will not only take place among Project Developers making the best technical, timing and cost offers they can, but also among Member States for the projects that they choose to support.

### **6.2 Forms of Member State Financial Support**

Member States may choose to support the projects they host with cash or with other forms of contribution such as the underwriting of Allowance values (see Section 4.5 above). Some less transparent forms of support may be applied through tax provisions and regional grants, and indeed existing legislation already grants a variety of benefits to potentially eligible projects in different jurisdictions.

Whatever the form of support, Member States may wish to make support conditional on performance, or they may choose to make it in the form of a simple grant to projects, thus increasing the value of the support by sharing risks with Project Developers. We do not recommend trying to regulate or conform Member State contributions to a common norm; it would be too complicated and inject a political element that will make allocation of the NER more complicated and slower.

### **6.3 Treatment of Member State Support**

We have been asked to comment on whether the competition among projects for inclusion should be on the basis of minimising the total public sector funding offered (i.e. from Member States<sup>16</sup>, EEPR and NER considered together), or of minimising only the sum of EEPR and NER funding. We understand that it has been accepted that EEPR and NER funds should always be considered together as a funding bloc for the purpose of assessment; and we are working on the assumption that no State Aid issues arise from either approach, the necessary exemptions having been granted.

The argument for using the sum of EEPR and NER funding alone as the basis of assessment is simple – it encourages Member States to make the maximum contribution

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<sup>15</sup> Directive, Article 10a (3).

<sup>16</sup> This may include Structural and Cohesion Funds

into programmes that are struggling to find funds to get to completion. Unsurprisingly, we support this argument.

We believe the argument against is founded in fairness; why should a rich Member State be able to improve the chances of its own companies receiving EU funds? That is a political question which we are not well qualified to answer, but overall rules on geographical distribution such as we suggest at Section 6.5 below may help. Also, as was pointed out in the January 2008 communication on financing CCS, Member States have great freedom to spend structural/cohesion funds on CCS if they so desire; and of course, the availability of such funds is inversely proportional to Member States' wealth.

A supplementary issue that argues for considering Commission funding alone is that we think Member States should be encouraged to support their sponsored companies in other ways beyond simple funding, as discussed at Section 6.2 above. Many of these forms would be very difficult to value and an attempt to do so might lead to further complexity in the assessment process.

#### **6.4 Commission/Member State Relationship**

The Parliament, the Commission and Member States are currently working together to develop the rules and procedures for the allocation of the NER Pool. Once the rules are established, there will be a framework within which the relationship will be defined.

The Commission will hold an open competition directly among Project Developers bidding for inclusion in NER funding. Submissions to the Commission (or a body set up for the purpose) would be endorsed by Member States, certainly with regulatory and policy support, and possibly also with funding, which may at that stage be only indicative. Member States may wish to establish their own internal processes – formal or informal – to select projects for support. However, we would strongly urge that Project Developers are not required to submit to two separate tender processes, either simultaneously or, even worse, sequentially; apart from the discouraging effect on Project Developers, it would take too long.

The strength of Member State support will be a major factor in project selection. Indeed, in many cases it will determine the outcome of the competition for NER funding. We have therefore considered the alternative competitive process in which NER funding is allocated to Member States representing their sponsored projects. This would recognise the reality that funding from Member States will greatly influence the shape of the Programmes, and give full weight to their importance in a negotiation that is likely to become triangular, with Commission, Member State and Project Developer at the three corners.

This alternative might relieve some administrative pressure on the Commission, but is also likely to be slower. We still recommend that the process remains driven by Project Developers pitching their proposals to the Commission, so that private sector impetus helps to drive the process, and the Commission retains the coordinating function essential to building workable portfolios of projects.



## **6.5 Geographical Spread**

The CCS Programme must show a geographical spread throughout Member States. This requirement is partly driven by the obvious need to test different technologies in different operating, climatic and regulatory environments. But it also includes an important political element, to ensure a fair distribution of benefit among Member States.

We recommend that in the context of the political debate on the allocation of resources between old and new Member States some specific rules or guidelines are developed. Without such a background it will be difficult for competing projects to know where they stand. Two ways that this might be approached are:

- in addition to the existing mandate of the Directive that no more than 15% of the NER may be allocated to any single project,<sup>17</sup> some restriction could be placed on the proportion of NER funds that are allocated to projects in any one Member State;
- there could be a special allocation of a proportion of the NER Pool to Member States with lower per capita GDP's: relative per capita GDP should also be factored in to expectations of co-funding from Member States.

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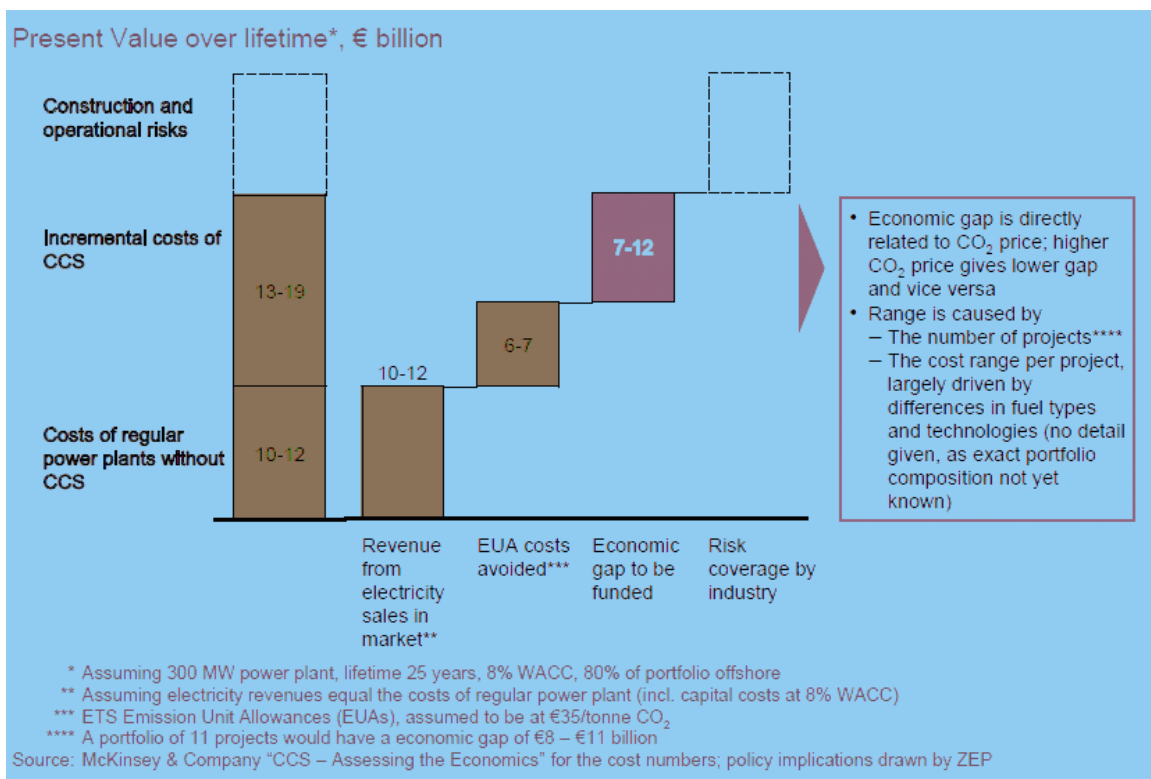
<sup>17</sup> Directive, Article 10a (8)

## 7. Project Funding

### 7.1 Project Costs

We are unable to comment on the cost structure of putative RES projects, but those of the CCS Programme have been quite extensively studied. We show as Figure 3 Exhibit 7 of the ZEP November 2008 Submission, which lays out how Programme costs fall into four buckets, of which the portion to be covered by public sector (EEPR, NER and Member States), the “economic gap”, is shown in purple.

Figure 3 – CCS Portfolio Value Components



### 7.2 Funding Sources

Project Developers will be putting forward qualifying projects to compete on their merits (technical, financial and geographical) for support from the NER. Their financial proposals will amount to bids for contributions from the NER Pool, in effect to fill the gap in funding left after Project Developers have assembled the strongest funding package they can, bringing together their own resources and those of their supporting Member States. In some cases their proposals will also benefit from a fixed dowry of EEPR funding, pre-allocated according to principles that may be different from those relevant to the NER. The mechanisms for selecting projects are discussed in Section 8 below.

An example may be helpful. The “average” project implied by Figure 3 would have an “economic gap” as implied by the figure of €860 million<sup>18</sup>. If €180 million of EEPR funding were available, around €700 million would need to come from NER and Member States working together. Except on more optimistic assumptions as to the value of the NER, this suggests that the majority of public sector support will need to come from Member States, especially for projects (the majority?) that do not benefit from EEPR support.

The bidding process as proposed may not be ideal. But the reality is that the neat split in demonstration project cost elements shown in Figure 3 is in fact very nebulous. So a bid by Project Developers, who will end up bearing the actual project cost and risk after public funding has been allocated, is probably the only realistic and competitive way to proceed.

The procedure as laid out implies that Member States provide firm offers of support before projects have been selected for inclusion in the Programmes, which will be hard to achieve in practice. The NER Pool is then to use its finite resources to meet the funding gap across several projects as best it can. The result is likely to be a shortfall of NER funds, at which point the Commission will revert to Project Developers to negotiate a better deal; this will turn into a three-way negotiation in which Member States will also play a major part.

However, in our view the alternative of fixing the allocation of NER funding and then inviting Project Developers and Member States to fill the gap is even less satisfactory. That would in effect cede control of the design of the demonstration portfolios to Member State interests, which is unlikely to achieve the objectives of the Programmes.

### **7.3 Project Developers**

The Directive <sup>19</sup> states that projects to be funded should “ have significant co-financing by the operator covering, in principle, more than half of the relevant investment cost”. It is not clear how the Directive intends that this provision should be interpreted; we assume that “relevant investment cost” excludes the base power plant and refers only to the capital cost of the CCS element of each project.

On the basis of these figures it would seem that ZEP’s assumptions are broadly consistent with the requirements of the Directive; there will be “substantial co-financing by the operator of the installation.” It is clear that if Member State contributions are included, well over half the CCS cost will be met by from funds other than the NER.

We should however recognise that Project Developers will approach their potential investments in projects through a rigorous process of return analysis. They will need to demonstrate to their Boards that on reasonable assumptions as to economic variables and project cost and performance, any sponsor investment will make an appropriate minimum long-term return. The investment decision in these projects will be entirely an issue for the Project Developers rather than their bankers. We would not expect banks or capital markets to lend on any basis that directly bears project risk, given the nature of

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<sup>18</sup> Central value of €9.5 billion spread over a central figure of 11 demonstration projects.

<sup>19</sup> (*Preamble, Clause 20*); being in the Preamble, this Clause is presumably non-binding. The binding language of Article 10a (8) states only that NER funding shall be “complementary to substantial co-financing by the operator of the installation”.

the CCS Programme. Any loan funding is likely to be to Project Developers against their corporate credit, or subject to sponsor guarantees, and therefore considered as a corporate investment.

#### **7.4 EEPR Funding**

Especially given the current low price of Allowances and the uncertainty about NER Pool allocation between CCS and RES, use of EEPR funding can contribute to ensuring maximum possible funding for the CCS Programme. However, we are cautious about the risk of allowing EEPR-funded projects to distort the competition among the wider universe of eligible CCS projects. We therefore recommend that the Commission accept any offer from an EEPR-funded project only on its merits; for competitive purposes the funding contribution to any project should be deemed to include both EEPR and NER funding.

Notwithstanding its risks to the competitive process, EEPR funding is likely to allow some candidate projects to commit funds early to Final Development and to facilitate some Stage 1 projects.

#### **7.5 Payment for Performance – On-account Payments**

It is a condition of allocation of the NER that payment is made only for a project that successfully produces clean energy and either removes or avoids carbon dioxide emissions, demonstrating “verified avoidance of CO<sub>2</sub> emissions”<sup>20</sup>.

We have proposed (Section 4.6) a scheme of allocation for the NER Pool by which Project Developers receive at FID either cash payment or an undertaking of future payment from a Member State (derived from the monetisation of Allowances allocated for the benefit of the project). Either way, the payment has to be structured as a payment on account, which can be recovered from the project and its Developers if it is not in due course earned by performance. We propose below a “claw-back” mechanism that should accomplish this.

The justification for making payments on account is one of financial efficiency, which should be very directly reflected in a reduced demand for public funding and thus potential to fund more projects. The efficiency arises through the difference in the notional cost of capital between European governments on the one hand and Project Developer funds placed at project risk on the other. By way of example, the developer might value funds received at FID<sup>21</sup> at about 2.1 times what they would be worth if delivered during operation. Should the Commission choose to compute the time value of delaying its payments (which it might not) at an appropriate cost of capital, it might use a value factor of around 1.4 times. These very rough indicative figures suggest a 57% uplift in the value of the NER contribution to the projects, all of which we would expect would accrue back to the NER Pool through competition.

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<sup>20</sup> Directive, Article 10a (8)

<sup>21</sup> Assume for the sake of example that funding would be earned at a weighted average date of 2020, vs. FID in 2012, and that the project target return was 10% p.a. vs. an EU cost of sovereign funds of 4% p.a. (These return rates are for the purpose of an example only and are not intended to predict, pre-empt or persuade Project Developers as to what the appropriate hurdle rate for a demonstration project should be).

The additional risk that the Commission would bear would be the credit risk of the clawback, plus some additional litigation risk in the event that performance provisions were disputed. It is essential that the obligor for clawback is not only the project company – often a fragile entity – but the Project Developer companies themselves. For Project Developers with weak credit, clawback would be against bank guarantees. Requirements to monitor performance would be unchanged whether the payments were made on account or at the time of performance.

There are precedents for government agencies accepting corporate guarantees in support of future obligations – for example in the very public UK case of Metronet, where sponsor guarantees were successfully called after the bankruptcy of the project entity; other UK PPP projects show similar provisions on a smaller scale. But while the principle behind NER clawbacks is arguably well-established, the scale and term proposed here may be unusual.

We strongly recommend the on-account payment scheme, which will effectively increase the value of the NER Pool at low risk to the Commission. If for legal reasons it cannot be implemented in full, we recommend that at a minimum partial implementation is considered.

#### **7.6 Payment for Performance – Standards**

The performance standards by which a project should be judged will vary from technology to technology and project to project. We recommend that the level of performance required to earn NER funding should be set case by case through the terms of competition. Either thresholds should be set for each category of project, or more likely, each project proposal should lay out performance standards it undertakes to meet to earn the full level of support. Then an innovative technology with a limited performance record (which may be an attractive element of a Programme) can limit its risk by offering a lower threshold standard for full payment. Among less risky projects, the performance standards offered will become a competitive element in the assessment of project proposals.

There has been considerable discussion of whether a project must meet a certain minimum standard of performance, possibly by a certain completion date, as a condition of receiving any funding at all. We are generally not in favour of such additional criteria. It should be possible to design incentive schemes on the basis purely of earning funding credits over a performance period; there should be no need to add the risk of “falling off a cliff” if output or capture ratio demonstrated on completion falls below a specific figure. Such a risk is unlikely to induce better performance by projects and may make Project Developers over-cautious and unambitious.

#### **7.7 Payment for Performance – Measurement**

The scheme for earning performance credits can be the same whether they are to be applied to cash payments or to reductions of a potential clawback liability. The scheme will need to incentivise continued operation of the plants for a period after completion as the marginal operating costs, including efficiency loss, of most CCS facilities are generally high; without a continued payment over time there may not be enough continued incentive to continue to operate the CCS element of the project. The scheme

should also reward improvements in performance that the Project Developer is able to make over the learning period starting immediately post-commissioning.

We recommend that the period for earning performance credits should be no less than five years nor more than ten, depending on a variety of criteria including in particular the configuration of storage. This short period, relative to expected project life, should be enough to prove the performance of the project. However, there is no suggestion that at the end of the earning period it is expected that the project would close down, or that it would continue to run but without CO<sub>2</sub> abatement.

An example of a scheme that might apply to a particular project, and there will be variations, could be:

- a. The project sets out at the time of FID its targets for performance over the selected earning period. These will include power output, availability and (for CCS projects) the target quantity of CO<sub>2</sub> that is to be captured and stored.
- b. A metric is chosen for the “carbon dioxide abatement” performance of the particular project:
  - paying directly for carbon dioxide emissions stored from CCS projects has the advantage that no definition of “clean MWh” is needed – some payment could be earned for even partial capture;
  - for RES projects, and possibly for some CCS projects, payment could be in the form of a feed-in payment per MWh of clean power produced or tonne of CO<sub>2</sub> avoided, possibly measured by using the national or EU electricity mix as a benchmark;
  - different schemes would apply to different technologies.
- c. The award of NER funding will be decided through the process of solicitation and funding award (see Section 8.6 below). This sum is then divided by the accumulated target quantity of the chosen metric (CO<sub>2</sub>, MWh, etc.) and the resulting per-unit payment computed:
  - the amount might be a flat nominal sum per unit;
  - more elaborate structures are possible that weight the payments to the early operating years, or make them constant in real terms.

Many refinements to this scheme are possible. For example, the definition of the period over which credits are earned will make a major difference to the Project Developer’s risk. If the earning period is a fixed term of years starting at the scheduled completion date, there is a major risk if start-up is delayed; but if (subject to some limits) the period starts at actual completion, this risk can be reduced to a more acceptable level, which in this case we recommend.

Industry will also expect very clear exemptions from losing benefit if their performance is delayed or reduced by force majeure events. We expect that the definition of force majeure will be hotly debated; some contentious items will concern loss of permits, geology and regulatory change.

## **8. Project Selection**

Section 3.5 above suggests a process and sequence for selecting projects. This Section focuses on the criteria by which projects can find a place in a project portfolio and the basis for choosing one over another.

It is difficult for us to comment on the selection criteria for RES projects until the objectives of this programme have been better defined. But for the CCS Programme, some criteria are clear, and others can be proposed in a form that reflects the intention of the Directive and previous EU resolutions.

### **8.1 Threshold Criteria for CCS Projects**

The following proposed threshold criteria which all CCS project proposals would need to meet are based on those recommended by ZEP in the November 2008 Submission:

- a. Each project must demonstrate its technical, regulatory and financial feasibility with committed total funding and a satisfactory allocation of risk to Project Developers:
  - technology, completion and performance risk should in principle lie with Project Developers, subject to force majeure provisions;
  - committed funding must include material Project Developer funding and may also include that of Member States.
- b. Disbursement should be conditioned on, or at risk of, actual power generation and/or CO<sub>2</sub> capture and storage as agreed contractually at FID:
  - payments to be made per MWh of output or per tonne of CO<sub>2</sub> stored or avoided.
- c. The main elements of the technology involved in the project must have already been demonstrated at pilot scale, demonstrating the capability to produce actual greenhouse gas mitigation.
- d. The technology to be demonstrated must not be working at commercial scale as of January 2009 anywhere in the world<sup>22</sup>.
- e. With the exception of the EEPR, there should be no existing support scheme (funding or regulatory) in the EU that covers the additional demonstration costs for which NER funding is sought:
  - definition of additional cost is clear for CCS, but would need to be established if these criteria were to be applied to RES.
- f. Projects should be of sufficient scale to demonstrate their industrial deployment, but not materially larger:
  - the appropriate minimum size for CCS power projects varies considerably<sup>23</sup> and when industrial projects are included there will be further variation; the size of

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<sup>22</sup> For example, if these criteria were to be applied to RES, tidal barrages would be excluded whereas horizontal or vertical axis turbines could be eligible.

<sup>23</sup> ZEP's work on this can be found in a presentation at [www.zero-emissionplatform.eu/ZEP\\_Technology\\_Matrix.pdf](http://www.zero-emissionplatform.eu/ZEP_Technology_Matrix.pdf), dated 15 October 2008.

- projects should also be no larger than the minimum viable industrial size so as to preserve NER funds;
- as a guideline, a demonstration project of any technology is likely to be between 5 and 20 times the size of the preceding pilot project.
- g. Knowledge-sharing is required as described elsewhere, including for FEED studies publicly funded in whole or part for candidate projects that are not accepted.

Given that these criteria are already well-established for CCS, it is likely that most short-listed CCS projects fulfil them. Commentary on their relevance and application to RES from the renewables industries would be welcome.

## **8.2 Timing**

It has been a long-standing target that CCS demonstration projects should all be required to be implemented by the end of 2015. As is now evident, this is an exceptionally ambitious target. However, with a staged solicitation process it is hoped that there are enough well-prepared projects that the majority of the portfolio can be expected to meet the 2015 deadline. Later projects could be operating by 2016 or 2017, and we would recommend that this degree of delay for part of the portfolio should be accepted.

Timing requirements for RES projects are unclear to us.

## **8.3 Geography**

The Programme must show a geographical spread among Member States. We have suggested at Section 6.5 above how this might be implemented. This factor is likely to be material in the process of project selection.

## **8.4 Technology**

The November 2008 Submission is quite prescriptive about the technologies that should be tested in the CCS Programme. There are no fewer than sixteen technology criteria for the Portfolio, of which the ones that are likely to be the primary filters in selecting projects are:

- Fuels: Hard coal, lignite, gas and co-fired biomass
- Capture Technologies: Precombustion, post-combustion, oxyfuel
- Transport Technologies: Pipeline (including cross-border), ship
- Storage: Onshore, offshore, depleted hydrocarbon, saline aquifers

The November 2008 Submission shows how in an ideal world a programme consisting of only seven “archetypical” projects could be assembled to demonstrate all the technology characteristics listed. It also lists 34 known project proposals that could be candidates for inclusion in the CCS Programme. In reality, ZEP recommends that ten to twelve projects are likely to be required to cover the full spread of technology to be proven, which is the basis for the estimated economic gap of €7 to €12 billion.

Choosing projects that bring together these technology elements in a rational way and selecting among them those most likely to demonstrate the technologies successfully, is



a complex task. When considered in light of the geographical and timing constraints it is still more so. It can only be achieved via a process with some flexibility and negotiation.

It will be an early task for the Commission, on technical advice, to confirm or modify the technical recommendations of ZEP, particularly in light of its emerging view as to available funding. In the first instance further detailed engagement with the technology subgroup of ZEP may well be constructive.

### **8.5 Information Requirements for Project Proposals**

It is normal in competitions for public funding for project proposals to be required to include extensive detail on their projects, the Project Developers and their development plans. In this case, where the project specification is very open, the information requirement may be still more extensive. There will be a need to disclose expected costs and financial performance of the project, as well as the financial inputs to be made by each of the stakeholders – members of the Project Developer consortium, Member States and EU funding sources. There will also need to be some disclosure of relationships among the consortium partners and how risks are shared among them. This high level of information provision will help to prevent “gaming” of the competition. Analysis of such extensively documented proposals will impose a substantial load on the Commission staff and advisers tasked with assessment.

### **8.6 Value**

Projects must be chosen so that each portfolio as a whole, CCS and RES, meets the criteria of timing, geography and technology with the best possible value for public funding. The classic approach to value is to encourage promoters to compete for funds in a well-specified and highly structured process. Where a clear requirement for each project one by one can be specified, that is realistic and practical. But where a whole portfolio must be selected together, and on a tight schedule, another solution must be found.

There is a temptation to rank projects simply on the grounds of their cost per tonne of carbon stored or (in the case of RES projects) avoided. The allure of this approach is that it is simple and transparent, and can be applied equally to CCS and RES projects. But it will not meet the objectives of the CCS Programme, which are designed to prove both risky technologies as well established ones, apparently expensive innovations as well as maturing lower cost techniques. It is likely similarly to fail for a RES portfolio.

However, it is possible to have a value competition on the basis of agreed performance metrics, but only within a portfolio of projects that meets the objectives laid out for it. Where projects compete with each other for a role in the portfolio they should be chosen on the basis gives the lowest total cost to the CCS Programme. And we expect, perhaps pessimistically, that funding constraints may mean that the whole CCS Programme cannot be fulfilled. So competition runs at several levels:

- Where two projects are offered that demonstrate the same or similar technologies, the one demanding the lower funding from NER (and EEPR) is chosen.
- Where there is no such competition a judgement may have to be made that the given technology to be tested has to be sacrificed to shortage of funding.

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- There is the possibility of “shuffling the pack” of eligible projects to capture maximum demonstration benefit per euro, including negotiation in some cases for more sponsor/Member State funding, reconfiguring projects (one unit instead of two?) etc.

Above all, where such large amounts of public funding are to be provided, not just competition but also transparency of process and accountability will be at a premium. This will be challenging in such a complex process, where the portfolio outcome will have to be developed on the basis of well-informed and rigorous criteria, but will ultimately also rely on careful judgement.