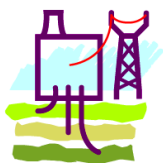
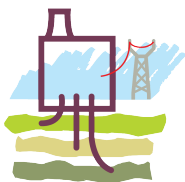


**TECHNOLOGY PLATFORM FOR ZERO EMISSION FOSSIL FUEL POWER  
PLANTS**

**DRAFT MINUTES OF THE 12<sup>TH</sup> MEETING OF THE ADVISORY  
COUNCIL**

**MADRID, 5<sup>TH</sup> SEPTEMBER 2007**





## Z E P Zero Emission Fossil Fuel Power Plants

### AC PRESENT:

Olivier Appert	IFP
Pietro Barbucci	ENEL
Niels-Peter Christensen	GEUS
Luc De Marliave	TOTAL
Jozef Dubinski	Central Mining Institute
John Michael Farley	Mitsui Babcock energy
Bernhard Fischer	E.ON. Energie A.G.
Paal Frisvold	Bellona, replaces Frederic Hauge
Dirk Goldschmidt	Siemens, replaces Mr. Suess
David Gye	Morgan Stanley
Kurt Häge	Vattenfall Europe AG
Johannes Heithoff	RWE, replaces Johannes Lambertz
Gardiner Hill	BP plc.
Alphons Kather	Hamburg University of Technology
Harry Lampenius	Foster Wheeler Power Group Europe, EPPSA
John Ludden	BGS
Jennifer Morgan	E3G
Hakon Mosbech	Vattenfall Nordic
Philippe Queille	Air Liquide, replaces François Jackow
Santiago Sabugal Garcia	ENDESA
Graeme Sweeney	Shell
Antonio Valero Capilla	Fundación CIRCE

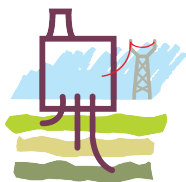
### AC APOLOGIES:

Stephan Singer	WWF
Roberto Garosi	ANSALDO ENERGIA S.p.A.
François Jackow	Air Liquide replaced by Mr. Queille
Michael Süß	Siemens A.G. replaced by Dirk Goldschmidt
Frederic Hauge	The Bellona Foundation replaced by Paal Frisvold
Charles Soothill	ALSTOM Power replaced by Nick Otter
Johannes Lambertz	RWE replaced by Johannes Heithoff
Arve Thorvik	STATOIL
Philippe Lacour-Gayet	Schlumberger

### OBSERVERS:

Eloy Alvarez	Union Fenosa
Marcello Capra	Italian Ministry of Economic development
Patrick Clerens	EPPSA
Davide Damiani	REZIA ENERGIE ITALIA
Dainis Dravnieks	Government group, Latvia
Andreas Ehinger	Government group, France
Andreas Eriksen	Government group, Norway
Helmut Geipel	Government group, Germany
François Giger	EDF
Philippe Geiger	Government group, France
Panagiotis Hatzinikolaou	Government group, Greece
Hubert Höwener	Government group, Germany
Franz Klemm	Government group, Austria
Martti Korkiakoski	Government group, Finland
Vassilios Kougonas	EC DG RTD





## Z E P Zero Emission Fossil Fuel Power Plants

Nicolaos Koukouzas	Government group, Greece
Udo Kremer	EUTurbines
Beate Kristiansen	The Bellona Foundation
Wilhelm Kuckshinrichs	Government group, Germany
Anne Guerin-Moens	ALSTOM Power
Jordi Martinez Jubitero	Endesa
Carsten Mathiesen	Government group, Denmark
Brian Morris	Government group, UK
Nick Otter	ALSTOM Power
Philippe Paelinck	ALSTOM Power
João Parente	Government group, Portugal
Jana Pascaly	Government group, Germany
Pyka	Government group, Poland
Maria Ramadori	Government group, Austria
Trygve Riis	Government group, Norway
Fabrice Rognon	Government group, Switzerland
Renata Rycerz	Government group
Peter Sage	Government group, UK
Thomas Schneider	EC DG TREN
Harry Schreurs	Government group, Netherlands
Gunta Slihta	Government group, Latvia
Hermione st. Leger	Shell
Gijs Vriesman	Shell
Matthew Webb	DEFRA
Fotini Ziogou	Government Group, Greece

### ETP-ZEP SECRETARIAT

Alexandre Rojey	IFP
Heinz Bergmann	RWE Power AG
Robert van der Lande	Triarii
Anna Newnham	Alstom
Marten Slagter	PricewaterhouseCoopers
Hans Modder	Triarii
Mirjam Stegmann	STATOIL

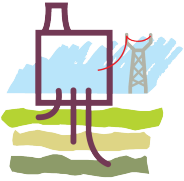
## 1. Opening

### 1.1. Introduction

The Chairman opened the meeting and welcomed everyone. As almost three months have passed since the last AC meeting on 12th June 2007 in Potsdam, the chairman gave a short summary of the developments since then:

- On 21st June, Arve Thorvik and Kurt Häge participated at the ETP-leaders meeting in Brussels;
- On 22 June, the Chairman attended a round table meeting with Commissioners Potocnik (RTD) and Piebalgs (TREN), together with chairs of other energy-related ETPs
- Early July, EC DG TREN assigned PwC Italy to carry out an ex-ante evaluation and impact assessment of possible measures for achieving the up to 12 large scale demonstrations in commercial power generation;
- Climate Change Capital (CCC) recently published its findings of an analysis of the funding options for CCS demonstration plants;





The Chairman provided an overview of the forthcoming events (see presentation). Most important events:

- The second ETP ZEP General Assembly (3<sup>rd</sup> October, Paris), main objective is endorsement of the Flagship Programme.
- The upcoming EC communications (i.e. the legal framework for CCS).

### **1.0. Adoption of Agenda**

The proposed agenda, distributed prior to the AC meeting, was accepted without changes.

#### **1.1. Approval of minutes from last meeting**

As there were no comments or additions to the minutes of AC#11 meeting in Potsdam (12<sup>th</sup> June), the minutes of the last AC-meeting were approved.

#### **1.2. Welcome new AC-members, Government Group**

The Chairman specially welcomed the proposed new AC members:

- Jennifer Morgan, already active in the Taskforce D&I
- David Gye, already participated in giving guidance to the CCC study
- Prof. Alfons Kather

The membership of these members was put up for vote. All candidates were unanimously accepted as new AC-members.

Also, the members of the Government Group (GG) were welcomed by the Chairman. The dialogue between the GG and the AC will become of increasing importance, as the Members States will be responsible for the implementation of CCS.

## **2. Joint session with Government Group**

### **2.1. Introduction**

On behalf of the AC, Gardiner Hill gave a presentation elaborating on the current situation and emphasised the importance of Member State involvement.

In addition, Brian Morris gave a presentation on behalf of the GG. Main message was that 'the Flagship Programme is not a prescriptive mechanism' for Member States' CCS initiatives.

In conclusion, Robert van der Lande presented an overview of the initiatives and state of deployment of CCS among the Member States (Country Profiles).

### **2.0. Welcome address by Mr. Nieto and Mr. Miranda/ Mr. Boges Galvez**

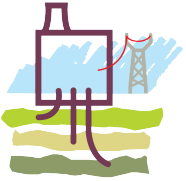
The CEO of Endesa Mr. Miranda gave a short introduction about Endesa and elaborated on the strategy and Endesa's main objectives for the future:

- Balanced mix of energy technologies
- Full commitment for ZEP Flagship Programme
- Endesa would like to have 1 demo project (oxy-fuel, 500MW, coal gasification)

In addition, the Spanish Industry Ministry's Secretary General of Energy Mr. Nieto outlined the Spanish energy vision and policy. He expects a regulatory- as well as a technological revolution in the energy market. The Spanish Energy policy is quite similar to the EC's energy policy:

- Security of supply
- Competitiveness
- Sustainability





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Mr. Nieto stressed the increasing share of China and India in global CO<sub>2</sub> emissions in the future. Clean energy supply especially is therefore important, and CCS seems to be the technology to deploy.

A Spanish coal platform has been set up that is responsible for national CCS activities:

- 5 working groups (storage-, regulatory issues etc.)
- First CCS pilot projects by 2015
- Commercial CCS power plants by 2020

In response to the speeches the following questions were posed:

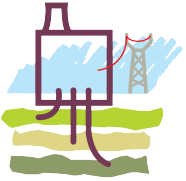
- Will Spain support EU ETS? According to Mr. Nieto Spain supports EU ETS and will see what happens after 2012. Although Mr. Nieto has his doubts about the efficiency of EU ETS. His current expectation is that Spain will support EU ETS also in the post Kyoto period.
- Will the Spanish Government support a public acceptance campaign for CCS? Mr. Miranda considers it very clever of ETP ZEP to propose such a campaign. However, it is a risk to confront renewables with current / conventional energy technologies. A good balance between technologies (including CCS) is therefore needed, keeping in mind the energy security of supply.
- Why did Endesa choose oxyfuel technology for its CCS demo plant? In reply Mr. Miranda stated that oxy-fuel technology is considered the less risky technology.

### 2.1. Discussion and decisions on way forward

The Chairman asked the GG and AC members to share their views in order to answer the key question: 'What actions are needed to get Member States sufficiently involved?'

- Paal Frisvold expressed his concerns about the divided views of the GG on CCS.
- The Chairman asked Brian Morris what could be done to get all Member States involved. In reply Brian Morris stated that it will be difficult to involve all MS as most currently missing MS do not recognise CCS as an important technology. Mr. Barbucci emphasized the need for EU policy in the field of CCS, as this will be the only way to get CCS accepted by all MS.
- Jennifer Morgan called it 'alarming' to go in a mode that the MS should take care of the financing (and thus decide) regarding the Flagship Programme.
  - o ETP ZEP can provide the vision and concrete suggestions to the MS governments, in order to mobilise this process.
  - o ETP ZEP should consider which MS we should have on board from a strategic point of view (e.g. EU Presidency etc.)
  - o We should keep in mind the international dimension of the Flagship Programme to:
    - Engage with China, India and the US to drive down costs.
    - Share knowledge and experiences.
- Graeme Sweeney argued that the value lies in a large number of MS participating in the Flagship Programme. In addition, the following key issues are crucial and agreement on these is needed in this AC meeting:
  - o State aid may take far more time than expected. There are other measures (e.g. market based mechanisms to cover the risk) that MS could use for CCS projects.
  - o The Flagship Programme should be the reference for technology choices of flagship projects.
- Thomas Schneider compared the CCS-overview of the country profiles with the information available from Mr. Piebalgs. He suggests to verify the information of the country profiles.
- Mr. Fisher stressed the importance of a concrete discussion and conclusion on the funding issue:
  - o Is EU funding available for CCS demo projects?
  - o Secondly, determine the path forward (selection, allocation of demo projects).
- Olivier Appert expressed his worries about the mismatch between the policy and actual EU support for CCS, as no CO<sub>2</sub> storage projects are approved under the current FP7 call.
- Nick Otter stressed the importance for a pragmatic approach to be able to move forward:





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- If certain MS go forward with their own CCS programmes, they will determine and probably limit the technological choices for CCS.
- We therefore need a broad approach, that is provided by the Flagship Programme
- Identify early demo projects of member states should be put in the Flagship framework, and used as examples for further deployment.

Chairman Häge asked the Government Group if the MS will (financially) support the Flagship Programme if the EU will not provide funding. In response, Helmut Geipel indicated that the political intention is there. Action and actual funding are however a different matter. Industry can play a key role to bring this question to the MS Governments.

According to Tryve Riis it is a challenge for MS to select demo projects. Thought should be given on how the Flagship Programme can support this selection of demo projects. Involvement of ETP ZEP together with MS is of crucial importance to reach an optimal outcome for CCS deployment across Europe.

Mike Farley expressed his concerns about the Flagship Programme with respect to:

- The limitation of the programme to 10-12 CCS demo projects, more may be needed.
- The selection process (as also mentioned in the CCSA letter).

In conclusion, Gardiner Hill summarised the discussion and formulated the key conclusions and way forward:

- Political commitment for CCS is the foundation we should work from.
- Common objective that binds us together will need a pragmatic and structured approach to enable learning, avoid doubling etc, otherwise we will not realise the ETP ZEP vision.
- Companies are proposing CCS projects and we should recognise this way of happening.
- Norway and UK showed that it is possible to have CCS projects/ to deploy CCS technology.
- Engagement with China, India and US needed.
- Federal approach but also listen to MS.
- MS and companies will propose CCS demo projects. The FP matrix of technologies might end up with some gap areas, where projects have not been proposed. There could be a role for the FP to then develop proposals for how these gaps are closed and experience in these technology areas is achieved ( and funded).
- Reach commitment by the AC about this today.

The Chairman assumed that all AC members accepted the conclusions and approach suggested by Gardiner Hill and closed this agenda point.

## LUNCH

## 3. Discussion progress Taskforces

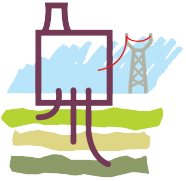
### 5.1. Introduction

Nick Otter summarized the overall outcomes of the CG #16 meeting on 22<sup>nd</sup> August in Frankfurt, and gave an update regarding recent development with respect to the Flagship Programme.

In addition, he stressed the importance of having an (up-to-date) status overview of CCS demo projects. All AC-members were asked to provide an update of their current CCS-projects.

An overview of CCS projects is available separately.





### **3.0. Taskforce Demonstration & Implementation**

On behalf of the Taskforce D&I, Gijs Vriesman provided a detailed presentation about the Flagship Programme especially the outcomes of the Climate Change Capital (CCC) study on the funding options for CCS demonstration plants. Main findings:

- The first tranche of CCS demo plants will not bring the cost down.
- Based on the CCC calculations roughly 10-17 billion funding is needed
- Limited ability to share CO<sub>2</sub> transport and storage infrastructure when demos are spread across Europe.
- Important to have clarity about CCS regulation.

Graeme Sweeny added that it is important to have agreement on two issues during the meeting:

1. Do we believe that there should be EU funding for the Flagship Programme?
2. Have we addressed the technology choices or do we leave this to individual MS?

Olivier Appert asked if the FP will become part of the EC Strategic Energy Technology (SET) plan. He also expressed his concern about the attitude of the EC, as it is very difficult to get into a dialogue with the EC about CCS and the FP.

Niels Peter Christensen shared the notion that we should build an EC co-ordinated Flagship Programme. In response to the Flagship Programme presentation he added the following:

- Ex-post knowledge sharing won't work for CO<sub>2</sub> storage projects.
- CO<sub>2</sub> storage demonstration should not be a matter of a CO<sub>2</sub> M tonnes stored competition, but should lead to technology demonstration of CO<sub>2</sub> storage technology.
- Demonstration of CO<sub>2</sub> storage in EU first, followed by China and India.

David Gye was impressed by the level of detail of the CCC study and the FP. However, he was hesitant to put forward this proposal in so much detail. One should be careful; "one month of work is not enough basis to invest 10-17 billion". We should also avoid to get locked in 4 technology buckets. In addition, he made the following remarks:

- The CCS market is a politically driven market; which makes industry hesitant when investing
- Some form of underpinning mechanism is needed to make the FP fly.
- A payment mechanism could be a grant of EUAs.

Fisher agreed with Mr. Gye that it is difficult for industry to invest in highly uncertain (unproven) technologies and markets. He also remarked:

- Improvement of plant efficiency will not be stimulated by the proposed grant/ funding scheme.
- More study needed in order to make a well-balanced decision.

In response to the feedback and questions of AC members, Gijs Vriesman stated the following:

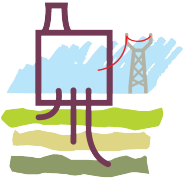
- In order to provide backup for (industry) investment in CCS demos, EIB will investigate the possibility to set up a Carbon Price Stability Fund (timing of the funding is still an open door).
- All CO<sub>2</sub> storage options are included in the Flagship Programme.

According to Dirk Goldschmidt the current proposal for a flagship programme looks like a 'CO<sub>2</sub> economy', lacking the power generation aspects. In addition, he stressed the importance of the efficiency aspect in the choice / selection of technology blocks. He also expressed his concern with respect to the proposed process to engage only a few AC members, full AC approval should be needed before the GA.

In response to the concerns expressed by Fisher and Goldschmidt, Paal Frisvold stated that the upcoming EC communications, with a deadline for input half September, are crucial for ETP ZEP to convey a very clear message (the Flagship Programme) to the EC. If we don't decide now we will miss this opportunity, which will cause severe delay to the FP.







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The Chairman questioned if we need EC funding for the FP, as not all AC members stressed the need for EC funding.

The goal of ETP ZEP is speed according to Jennifer Morgan.

- ETP ZEP should put forward the ideas instead of the numbers behind the FP, so that the EC can consider the FP.
- Time is of essence, therefore no time left to demonstrate CCS in Europe first, also internationally.

Mike Farley was pleased with the presentations on behalf of the Government Group and the 'Pragmatic Approach' to the FP as suggested by Gardiner Hill. Farley proposed that the 'pragmatic approach' should be adopted in the preparation of the recommendations on the FP to the GA. He also remarked that a capital grant component and ongoing financial support is needed for CCS deployment.

Philippe Paelinck confirmed that efficiency aspect will be included in technology block approach. Furthermore:

- EU funding is critical for the FP, otherwise there will be no FP.
- To be prepared for full CCS deployment after 2020, at least 10MW power capacity should be installed in the EU and the US and a substantial part of this in China.
- Therefore, agreement on the principles of the FP is needed today.

In conclusion, the Chairman asked the AC-members for approval of the high level proposal for a Flagship Programme as presented by Gijs Vriesman. The following changes to this proposal were agreed on:

- The Efficiency roadmap (700°C/50%/COAL) is to be included as a key technology block sustaining the CCS effort.
- EU funding and project centralisation is prerequisite to a sustainable FP.
- Our contribution to the GA should cover:
  - o presentation of essential principles for selection and funding derived from the CCC study, (a market based approach), the details are to be worked out later;
  - o high level presentation of the technology blocks to be validated.

The proposal was accepted by the AC (19 votes in favour). It was also communicated that by means of a teleconference, the document elaborating on the FP (which will be released at the GA) will be discussed in detail. AC members will be requested to give their feedback to the draft by e-mail, to the Secretariat as input for the teleconference.

### **Decision D12.1: Approval of high level proposal for Flagship Programme**

### **Action A12.1: Provide feedback to the FP document as input for the teleconference on the FP**

#### **3.1. Taskforce Technology**

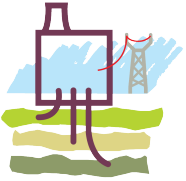
Dirk Goldschmidt outlined the progress of the Taskforce Technology (TTECH). After giving his presentation, he asked for AC approval regarding the following topics:

- Request for EC R&D funding for CCS.
- Approval on the way forward as proposed by the TTECH

The Chairman asked the AC members for their votes, which resulted in full AC approval for both topics.

### **Decision D12.2: Approval of the estimate of required CCS R&D funding**





### **Decision D12.3: Approval of the TTECH proposed way forward**

Olivier Appert stressed the importance of the current CO2 storage proposal (covering different CO2 storage types) for FP7. Appert proposed to mobilise Member State representatives to promote this proposal.

In this respect, Helmut Geipel mentioned that the formulation of the aforementioned CO2 storage proposal was the reason that this proposal was evaluated relatively low. Possible compromise would be to redraft the proposal and submit it again for the next FP7 call in this area. However, this will cause a delay of approximately two years.

In response, Paal Frisvold remarked that the next CO2 storage tender will be in 2008.

The Chairman proposed to request a meeting with Mr. Liberali to discuss the CO2 storage issue in due course.

Nick Otter agreed on this approach and in addition, stressed that FP7 CO2 capture project proposals are under pressure as well, as the EC intends to merge some capture projects. It is therefore crucial to follow a two stage approach by arranging a dialogue with MS representatives as well as the EC (Liberali).

### **3.2. Taskforce Policy & Regulation**

François Giger and Paal Frisvold gave an update of the progress and activities of the Taskforce Policy & Regulation.

Most important are the upcoming EC communications on the following topics:

- Legal Facilitation Framework for CCS.
- Financial incentives and the establishment of a flagship programme.
- Revision of the EU ETS

In addition, the following supplementary measures/ new instruments are considered :

- Feed in tariffs.
- Decarbonised electricity certificates.
- Carbon fund – price guarantee mechanism.

Possibly the EC will ask ETP ZEP to assist the EC with the organisation of a side event on CCS (focus on legal framework) at the Bali COP/MOP meeting.

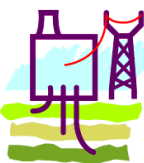
In conclusion, Paal Frisvold informed the AC that a risk management paper was released by his taskforce edited by Claude Monet (Schlumberger / member of TP&R). Moreover, a paper about the CCS legal framework will be released on September 6<sup>th</sup>.

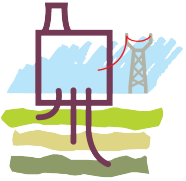
### **3.3. Taskforce Public Acceptance**

An update of the progress and an outline of the public communication strategy of the Taskforce was given by Beate Kristiansen. In addition, an overview of several scenarios for a public communication campaign were elaborated.

In response to the presentation, Jennifer Morgan expressed her support for the proposed communication strategy. Moreover, she stressed the importance for a tailored approach for each MS (sort out which messages will work and which not).

Nick Otter remarked that funding for the public communication campaign is still an issue, however the first thing is to approve the proposed communication strategy, and give the taskforce the mandate to explore the various financing mechanisms.





Mr. Fisher agreed that we need a tailored approach for each MS, and therefore national/ regional funding mechanisms should be considered for funding local communication messages (for instance the AG Klima in Germany).

Helmut Geipel asked for the lessons learned in public communication as this might be a basis for country specific public communication initiatives.

In response, Paal Frisvold underlined the aim of the current proposal for the public communication strategy; 'let the right people say the right things'. Engagement of people locally will of course be part of this strategy as they can address the local CCS issues.

Philippe Queille mentioned the need for a minimum amount of (bridging) funding to enable the taskforce PC to move ahead with their work. He suggested that each company can sponsor the taskforce by donating 15-20k each.

In conclusion, the Chairman proposed to only to decide about the public communication strategy and decide about the funding at a later stage. As there was not a financial proposal given in the presentation of the public communication taskforce, the taskforce can further work on a funding proposal in the meantime.

The public communication strategy was put up for vote and accepted by all AC members.

#### **Decision D12.4: Approval of the proposed public communication strategy**

### **4. General Assembly**

Due to time limitations this agenda point was reduced. Robert van der Lande will distribute the minutes of the GA organising committee meetings and the draft programme of the GA, among AC members.

#### **Action A12.2: Distribute the minutes of the GA organising committee meetings and the draft programme of the GA**

### **5. Presentations industry**

A presentation was provided by Union Fenosa (presentation is provided on the ETP ZEP website).

### **6. Miscellaneous**

#### *AC membership*

Stephan Singer intends to step down as AC member. Sanjeev Kumar from WWF will be proposed as new AC member.

### **7. Close of meeting**

The Chairman thanked Endesa representatives for their hospitality and closed the meeting.

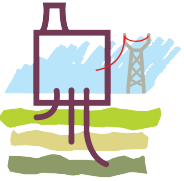
Next AC meeting will take place in Rome from 10.30 – 17.00 hrs. on 16th November 2007. Venue will be announced together with the agenda.

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## **DECISION REGISTER 5<sup>th</sup> September 2007**



### **Decision D12.1: Approval of high level proposal for Flagship Programme**



Decision D12.2: Approval of estimate of CCS R&D funding

Decision D12.3: Approval of the TTECH proposed way forward

Decision D12.4: Approval of the proposed public communication strategy

### **ACTION REGISTER 5<sup>th</sup> September 2007**

Action A12.1: Provide feedback to the FP document as input for the teleconference on the FP

Action A12.2: Distribute the minutes of the GA organising committee meetings and the draft programme of the GA

