



# ieaghg

## Greenhouse News

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### Climate Action: Member States submit project proposals for renewable energy and clean technologies

A total of 78 proposals for large-scale demonstration projects involving innovative renewable energy and carbon capture and storage (CCS) technologies have passed the Member State stage of the NER 300 programme and have been submitted to the European Investment Bank (EIB) under the EU's "NER 300" programme, the world's largest demonstration programme for such technologies. The deadline for submissions was 9<sup>th</sup> May 2011.

According to an initial screening of the project proposals by the EIB, applications for 13 CCS projects and 65 projects involving innovative renewable energy technologies have been submitted.

A breakdown of the project proposals submitted by category is shown in the Annex.

#### Background:NER300 Demonstration Programme

The NER 300 programme aims to fund at least eight CCS and at least 34 innovative renewable energy demonstration projects. The programme

is so named because it will be funded from the sale of 300 million emission allowances held in the New Entrants Reserve (NER) of the EU Emissions Trading System (ETS). At the current carbon price, these allowances are worth €4-5 billion, but as project sponsors must also bring funding it is expected to leverage around the same amount in addition from private or other sources.

A first call for proposals was launched in November 2010. Project sponsors had to submit their funding applications to their respective Member State authorities by 9<sup>th</sup> February 2011. Member States then had until 9<sup>th</sup> May to check the eligibility of the projects submitted and to submit the projects they wished to support to the European Investment Bank (EIB). The EIB has started financial and technical due diligence assessments, and aims to finalise the appraisal of proposed projects by 9<sup>th</sup> February 2012.

#### Next steps

Based on recommendations from the EIB, the Commission will consult the EU Climate Change Committee, in which all Member States are represented, check that Member States still support the projects they recommended, and prepare and issue award decisions.

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# Bioenergy, Land Use Change and Climate Change Mitigation

This report was prepared by Associate Professor Göran Berndes, of Chalmers University of Technology, Sweden; with input from contributing authors Dr Neil Bird, Joanneum Research, Austria and Professor Annette Cowie, The National Centre for Rural Greenhouse Gas Research, Australia.

It was co-financed by IEA Bioenergy and the Swedish Energy Agency. The report addresses a much debated issue – bioenergy and associated land use change, and how the climate change mitigation from use of bioenergy can be influenced by greenhouse gas emissions arising from land use change. The purpose of the report was to produce an unbiased, authoritative statement on this topic aimed especially at policy advisors and policy makers.

The publication can be downloaded at [www.ieabioenergy.com/LibItem.aspx?id=6770](http://www.ieabioenergy.com/LibItem.aspx?id=6770) ●

## The 6<sup>th</sup> CO<sub>2</sub> GeoNet Open Forum, by Ludmilla Basava-Reddi, IEAGHG

2011 edition focused on CO<sub>2</sub> storage developments Europe-wide

CO<sub>2</sub>GeoNet, Europe's Network of Excellence on the geological storage of CO<sub>2</sub> held their 6<sup>th</sup> Open Forum on San Servolo Island, Venice on 9<sup>th</sup> - 11<sup>th</sup> May 2011, with the 11<sup>th</sup> May dedicated to the 1<sup>st</sup> CGS Europe knowledge sharing workshop. The CO<sub>2</sub>GeoNet Association comprises 13 research institutes over 7 EU countries, while CGS Europe is a new coordination action that brings together CO<sub>2</sub>GeoNet and 21 other research institutes, thus covering 28 European countries, in order to develop a pan-European scientific body of expertise on CO<sub>2</sub> geological storage.



Ameena Camps (far right) sat on the Discussion Panel at the Open Forum

The objective of the open forum is to allow the CO<sub>2</sub>GeoNet members and stakeholders to interact with each other and share learnings from CO<sub>2</sub> storage activities. Of particular relevance to this year's open forum is the recent EU legal framework and the transposition of the CCS directive by member states into their legal framework. The deadline for completion of this is June and will be necessary if members stated wish to take part in the NER 300 funding scheme for CCS demonstration projects.

Updates from planned European large scale demonstration projects were given, including full chain CCS demonstrations in Italy, the UK, the Netherlands, Poland and Romania as well as learnings from small scale projects and field experiments. A session on scientific developments, included some results from the RISCS project, which is a 3 year project coming to the end of its first year. The aim of this project is to look at the effects of CO<sub>2</sub> leakage in marine and terrestrial environments by studying natural analogues and experimentation.

There was a panel discussion at the end of the second day on sharing views on CO<sub>2</sub> storage development in Europe; much of the discussion emphasised the importance of demos, public communication and involving stakeholders as early as possible.

The third day was a knowledge sharing workshop on legal and regulatory issues for the implementation of the EU directive on the geological storage of CO<sub>2</sub>. Status, progress



and difficulties in the CCS directive transposition in all CGS Europe partners' countries were summarised and a few case studies were presented. The forum ended with a discussion on the most problematic scientific issues raised during the transposition process.

The forum was attended by 125 participants from 28 countries, including Japan and USA.

Programme and presentations available at: [www.co2geonet.eu](http://www.co2geonet.eu) and [www.cgseurope.net](http://www.cgseurope.net) ●

*San Servolo Island; Venue for the Open Forum*



## New IEA Study on Cost and Performance of CO<sub>2</sub> Capture from Power Generation, by Matthias Finkenrath, IEA, Paris

Energy scenarios developed by the International Energy Agency (IEA) suggest that CCS from power plants might contribute by 2050 to around 10% of the energy-related CO<sub>2</sub> emission reduction required to stabilise global warming. Since CO<sub>2</sub> capture from power generation is an emerging technology that has not been demonstrated on a commercial scale, related cost and performance information is based on feasibility studies and pilot projects and is still uncertain. A recent IEA paper analyses techno-economic data for CO<sub>2</sub> capture from power generation, including CO<sub>2</sub> conditioning and compression, in order to support energy scenario modelling and policy making.

The IEA study compares data for about 50 CO<sub>2</sub> capture installations at power plants that were published over the last five years in major engineering studies. Capital cost and levelised cost of electricity are re-evaluated and updated to 2010 cost levels to allow for a consistent comparison. Calibrated capital costs are reported as overnight costs, a common metric for comparison which assumes a power plant could be constructed in a single day. The analysis covers only costs related to the capture and compression, but not the transportation and storage of CO<sub>2</sub>. The underlying cost data are estimates for generic, early commercial plants based on feasibility studies, which have an accuracy of on average 30 percent. The data do not reflect project-specific cost

or cost for first large-scale demonstration plants, which are likely higher.

High-level results of the IEA report are summarised in Table 1. The IEA study concludes that for coal-fired power generation, no single CO<sub>2</sub> capture technology outperforms available alternative capture processes in terms of cost and performance. Average net efficiency penalties for post- and oxy-combustion capture are 10 percentage points relative to a pulverised coal plant without capture, and 8 percentage points for pre-combustion capture compared to an integrated gasification combined cycle. Overnight costs of power plants with CO<sub>2</sub> capture in OECD regions are about USD 3 800 per kW across capture routes, which is 74% higher than costs for a pulverized coal reference power plant without capture. Cost figures vary substantially depending on the type of power plant type and fuel used, but the relative increase in overnight costs compared to the reference plant without CO<sub>2</sub> capture is a comparably stable metric across studies. It is thus recommended for estimating cost if limited data are available. Projected levelised cost of electricity is on average USD 105 per MWh. Average costs of CO<sub>2</sub> avoided are USD 55 per tonne of CO<sub>2</sub> if a pulverised coal power plant without CO<sub>2</sub> capture is used as a reference.



For natural gas-fired power generation, post-combustion CO<sub>2</sub> capture is most often analysed and appears the most attractive near-term option. Average cost and performance projections include net efficiency penalties of 8 percentage points for post-combustion CO<sub>2</sub> capture from natural gas combined cycles. Overnight costs are USD 1 700 per kW including CO<sub>2</sub> capture, or 82% higher than the reference plant without capture. Levelised cost of electricity is USD 102 per MWh and costs of CO<sub>2</sub> avoided are USD 80 per tonne of CO<sub>2</sub> if a natural gas combined cycle is used as a reference.

Cost estimates stated above are average figures for OECD regions. Cost data for installations in China indicate significantly