

**UK ADVANCED POWER GENERATION TECHNOLOGY
FORUM**

**WORKSHOP ON CARBON ABATEMENT
TECHNOLOGIES
- MAJOR INITIATIVES AND RD&D PRIORITIES**

REPORT ON PANEL SESSION

Radisson SAS Portman Hotel, London, 30 January 2007

INTRODUCTION

Following the 2006 UK Energy Review, the Treasury and the DTI together with industry have begun looking towards commercial deployment of carbon capture and storage (CCS) in the UK. This has resulted in several UK initiatives that have just begun or are about to do so. These include the implementation of the UK CAT Strategy by the DTI, the governmental CCS Regulatory Task Force and the HMT Consultation on Fiscal Incentives for CCS. In the research and technology field, there are the recently announced Energy Technologies Institute, the Energy Research Partnership and EPSRC's Energy R&D actions. Also there are a number of proposals for large scale CCS projects with electricity generation that have been announced.

Parallel developments are occurring elsewhere in the world especially in the EU with the creation of a Technology Platform for Zero Emission Fossil Fuel Power Plants whose vision is for fossil fuel power plants with zero CO₂ emissions to be deployable commercially by 2020. This has provided a significant input to the EC FP7 Energy Programme to be launched in 2007.

The UK Advanced Power Generation Technology Forum (APGTF) provides the focus for the Power Generation sector in the UK on the research and development activities on fossil fuel, including biomass and waste, and associated technologies including CO₂ capture and storage. The APGTF members are contributing to the development of the strategies in the UK and EU as well as to other international programmes.

The APGTF organised this workshop:

- To provide an update on the fossil energy CAT/CCS strategy in the UK and the EU
- To identify the key UK initiatives for advanced fossil fuelled plant with carbon capture
- To discuss the RD and D needs for the UK for the short, medium and longer terms
- To identify the immediate priorities to ensure success with CAT/CCS for the UK

The Workshop consisted of invited presentations covering the UK and EU strategies and initiatives with other relevant international activities. This was followed by a session in which all delegates were invited to participate; it was led by a panel of members of the APGTF. It discussed the implementation of the strategies and identified the immediate priorities within the UK.

This document is a report of the panel session and the accompanying discussion session; it will be fed into the Government and other national and international funding agencies to help ensure success with CAT/CCS for the UK.

THE PANEL SESSION

The panel was chaired by Nick Otter of ALSTOM, who is the chairman of APGTF and it consisted of four APGTF members representing different parts of the supply-chain:

Fuel suppliers – Tony Espie, BP
Equipment suppliers – Mike Farley, Doosan Babcock
Utilities – Nina Skorupska, RWE npower
Academia – John Oakey, Cranfield University

together with Nick Riley of British Geological Survey representing the storage sector.

The chairman posed three questions which were first directed to the panel for answers. The delegates were then invited to provide answers or comments as appropriate.

Question 1: How can we make the UK actions sufficiently ambitious and urgent to meet UK and EU targets?

The UK has no clear targets for CCS but the EU does have. Current funding bodies are not well coordinated with not enough money.

We need a long term 10 year framework for RDD&D with CATs being the highest priority for EPSRC, ETI and ETF. This should drive towards all new/retrofit plants being capture ready by 2010 and CCS by 2020.

10-12 full scale CCS demonstrations are needed by 2015 covering coal/gas/new/retrofit/storage options. The RDAs could be involved in brokering regional projects.

The UK is well-blessed for CCS and plants could be built today. Technology is not a limiting factor. Policy framework is the real issue and this includes: legal and regulatory; costs and commercial issues.

The recent good work on legal/regulatory needs to continue to national regulatory framework. Australia could provide valuable lessons.

There has been little progress on commercial issues. Incentives will determine the take-up rate for CCS.

A roadmap is needed for a zero emission fossil fuel economy going out beyond 2020.

The 2050 targets for CO₂ levels in the atmosphere are not tight enough. The role of the scientist is to engage, inform and to spell out the urgency.

The Government has picked a 'winning sector' in renewables but CCS, which is more critical, is not 'on its radar'.

Air travel is a growing contributor and this needs to be tackled as well.

The Treasury has not delivered and there is a UK policy vacuum. The EU needs to take the lead on policy and get sign on from its members.

A large part of the plant portfolio is closing in 2010-2020. Investment decisions are being made now that could have a long term impact.

Security of supply – the market only gives guidance for 3-4 years; current signals favour gas over coal. This issue of timescales must be addressed now.

CO₂ Guidelines - need much longer timeframe, for example in the EU ETS. The markets need to give a clear steer.

The technology is available but not demonstrated. The first of a kind is the most expensive, therefore incentives are needed.

At the moment the industry is waiting; clear market and fiscal signals are needed in order to move forward.

The universities are now picking up roles that were traditionally carried out by the nationalised labs but without support for this.

CATs are marking time; more support is needed for research and more encouragement should be given to the universities.

The public do not understand CCS or what is needed. Greater emphasis needs to be given to getting the message across and the universities have a key role here.

There is going to be a skills shortage and enough people are still not being trained. Many of those students being trained are from overseas and return home after training.

Have probably already missed 550ppm and resulting climate and sea level changes are already locked-in.

The Stern report states that 1% of GDP needs to be spent now. The Government has not responded.

The Danes put a premium on power prices for windpower and are now world leaders. Similar action should be taken in the UK for CCS.

The number of new project proposals together with those that are needed in the near term may be too many for the construction/engineering industry to build. There is a likely bottleneck on the availability of resources eg people, steel.

Question 2: How should the different activities be integrated and co-ordinated to achieve critical mass needed?

There is a huge fragmentation of effort over small groups, which is not being harnessed.

Regulatory – good progress being made, needs to be kept up.

Technology – can build CCS today; must learn by doing but it needs money.

Implementation – EU believes it leads. However, AP6 is becoming key and UK and EU need to engage with these.

The effort and resources are fragmented because the funding is fragmented.

Need to focus on what is simple and quick to achieve.

Focus on delivering CCS as quickly as possible and for the quickest implementation, storage must be offshore.

There are disconnects in the strategy and what is needed eg looking at infrastructure without considering security of supply.

Existing sites must be looked at to see what needs to be done.

Planning is a nightmare even for a CCGT. What chance for CCS?

The public must be informed.

There is not sufficient funding for the provision of the science base and for training engineers – this needs sorting out now.

Universities need greater continuity with a longer timeline to deliver people. Investment is needed now.

The ERP still needs to continue working on restoring the fragmented landscape.

Industry cannot plan for future manufacturing when there is so much uncertainty.

The APGTF needs materials-type groups for other technologies. These groups could define agendas and roadmaps which could then be fed into the EPSRC, ETI and ETF.

So far the Treasury has not been convinced over CCS. Convincing the Treasury is essential; in order to get more money into the sector.

Question 3: How can the UK take practical advantage of international activities?

The Government should encourage international collaboration on the safety and integrity of storage. An international database of different storage geologies is needed.

We must take advantage of different incentive schemes in other countries, particularly through multinational companies eg IGCC being done by RWE in Germany.

Liaising with other international organisations, such as through the IEA, is essential.

There is a concern that the UK uses international collaboration as an excuse for not doing enough. Where possible, the UK should lead.

The UK has a portfolio of projects, which could beneficially be turned into international projects with the UK leading.

CHAIRMAN'S CLOSING REMARKS

The Chairman thanked the speakers, panellists and delegates for making it a successful workshop. He hoped that there would be significant progress on the main issues raised for CCS to report at next year's workshop.