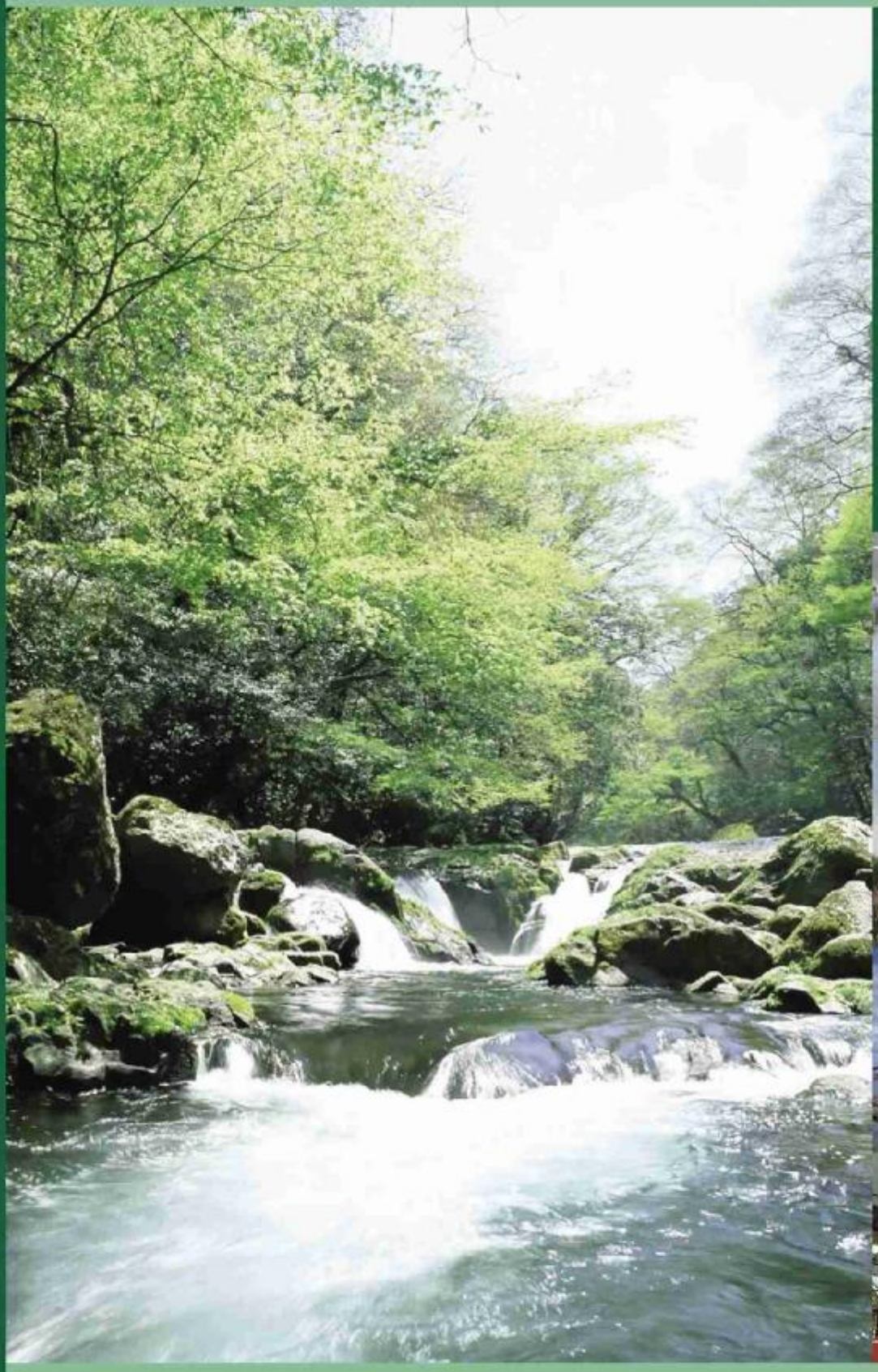
Workshop on Carbon Abatement Technologies
Implementing the Strategy



Thursday
15 December
2005

Church House
Westminster

UK ADVANCED POWER GENERATION TECHNOLOGY FORUM

WORKSHOP ON CARBON ABATEMENT TECHNOLOGIES - IMPLEMENTING THE STRATEGY

REPORT ON PANEL SESSION

Church House, Westminster, 15 December 2005

INTRODUCTION

The UK Government's report "A strategy for developing carbon abatement technologies (CAT) for fossil fuel use" presents the rationale and objectives for a UK CAT strategy together with a plan for delivering it. The strategy identifies a number of activities which include R&D and demonstration projects and it stresses the importance of international collaboration. Modelling work in the UK and elsewhere shows that CAT technologies need to be implemented as soon as possible with the commencement of deployment of carbon capture and storage (CCS) being between 2010 and 2020. Now that a UK strategy is in place, it needs to be implemented and this should include linking with other national and international CAT programmes as appropriate.

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 CO_2 capture and storage. The APGTF members have contributed to the development of the strategy and are involved in developing and implementing a similar approach in Europe; also members are co-operating with the US through the UK agreement with the US Department of Energy.

The APGTF organised this workshop:

- To present the UK strategy for RD&D for CAT with fossil fuels
- To identify appropriate national and international activities and how they can support the strategy
- To discuss the strategy implementation covering both short, medium and longer terms
- To identify the immediate priorities for the UK's programme

The Workshop consisted of invited presentations covering the UK strategy and other national and international activities together with presentations from industry and academia on current projects and proposals for the future. This was followed by a session in which all delegates were invited to participate; it was led by members of the APGTF. It discussed the implementation of the strategy and identified the immediate priorities for the UK's programme.

This document is a report of the panel session; it will be fed into the Government and other national and international funding agencies for consideration in the implementation of the CAT strategy.

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 – Nigel Yaxley, UK Coal
- Tony Espie, BP
Equipment suppliers – Mike Farley, Mitsui Babcock
Utilities – Allan Jones, Eon UK

together with Nick Riley of British Geological Survey representing the storage sector and Jon Gibbins of Imperial College representing academia.

Each panel member was given 2-3 minutes at the start of the session to make points which they thought were a priority. The session was then opened up for comments and questions from the delegates.

Comments of Panel Members

The chairman introduced the session by pointing out that it was important for the UK to position itself in areas of high importance where it has a strong capability.

NICK RILEY – BRITISH GEOLOGIACAL SURVEY

For storage, integrity is the key issue for R&D.

Other related issues are:

- public acceptance
- development of regulations and environmental best practice
- health and safety, particularly for onshore storage
- acceptance within trading /payback schemes
- strategy for licencing and regulation of sites, which includes:
  - guidelines for site characterisation and acceptance,
  - monitoring strategy and performance acceptability.

There is an urgent need to proceed with developments utilising the North Sea infrastructure, before it is decommissioned.

The UK is in a strong position to drive the development of regulation and the North Sea is a huge asset both in terms of storage and the associated know-how.

TONY ESPIE – BP

The focus is now commercialisation; the outstanding obstacles are commercial rather than technical.

Related issues are:

- cost recovery/cost reduction/commercial model, with costs currently exceeding value
- acceptance of storage
- projects need to be material in scale but it is not clear how to kick-start these
- a legal and regulatory framework is needed, which includes:
  - a national licencing framework for onshore and offshore storage,
  - resolution or extension of the London Convention and Ospar treaties,
  - plans for long term stewardship (which could be for >1000years)

A portfolio of demonstration projects is needed covering a variety of geologies and technologies but these must be chosen to be relevant to our conditions. International collaboration is essential and this must involve developing countries, particularly China. However, it is not clear how this would be financed.

For storage in the North Sea, not including EOR, the southern sector fields look the most attractive. They are close to the shore, there is an existing infrastructure and the fields are now becoming available for storage. It is important to get going now, with appropriate incentives.

NIGEL YAXLEY – on behalf of COALPRO

Coal imports are now running ahead of indigenous coal.

Policy mechanisms are needed to bring forward clean coal. The current market is unlikely to lead to the investment in CATs.

The ETS is too short term and CCS mechanisms being considered risk favouring gas. Mechanisms are needed to encourage coal for the benefit of security of supply and fuel diversity. Schemes based on carbon saved compared to ‘business as usual’ are favoured

Germany has introduced an 18 year scheme to encourage investment in clean coal. The UK needs something similar with this kind of timescale.

ALLAN JONES – EON (UK)

By 2020, 30GW of power plant will need to be replaced or replanted. An urgent issue is whether sufficient plant can be built quickly enough to avoid power shortages in the future.

Uncertainties covering the sustainability of the ETS are impeding the kind of investment needed to ensure sufficient plant is built; the variability of the market place and of fuel prices add to this – more long term certainty is needed.

Studies by EPRI for US conditions have shown that by 2020 CCS with coal becomes competitive with gas plant when gas is $4 – 6, with IGCC being cheaper than pulverised coal for CCS plant. Recently gas prices in the US have been up to $14.

There is a need for a large scale demonstration plant and this is becoming urgent.

MIKE FARLEY – MITSUI BABCOCK

Currently there are many uncertainties regarding the implementation of CATs and CCS: uncertainties over phase 2 of the ETS; uncertainties due to the Government Energy Review and policy; uncertainties over the regulation, acceptability and economics of CCS. However, decisions on new or replacement plant to replace plants that have to close by 2015 have to be made ***before*** all the uncertainties are resolved.

The UK clearly needs an approach that keeps coal in the power plant fuel mix.

Early action is needed on the ETS which does not provide incentives for coal; an approach similar to that introduced in Germany is needed.

The Government is urged to take early action to facilitate a bold but measured risk approach which keeps carbon abated coal in the generation mix and CCS options open.

A focus is needed on demonstrations of CCS for the period 2008-12 in order to ensure that CCS is ready for around 2016. In the UK there should be a focus on CCS for hard coal and incentives for upgrading existing coal plant to be capture-ready. Upgrading opted-out coal plant to capture ready Advanced Supercritical CCS looks particularly attractive.

The demonstration programme should be underpinned by a UK R&D programme, as recommended by the APGTF with funding being put in place ASAP for 2010+.

JON GIBBINS – IMPERIAL COLLEGE

In the area of CCS, there is a need to ‘learn by doing’ and in this, academia needs to be involved with industry.

It is important that academics are involved in international as well as national activities.

Apart from science and technology expertise, universities can also provide independent expertise on licensing and monitoring.

Younger people need to be involved in CCS and the universities provide an ideal way for this to happen. CCS is seen as an attractive subject area for students and support is needed now to get them involved.

In order to progress CCS in the UK, input from all stakeholders will be needed.

Open Discussion

The following points were made either by delegates or by panel members during the open discussion session.

It is seen as important to commit to major projects as soon as possible. The necessary resources, involvement of stakeholders etc would then automatically follow.

The importance of gas separation technology and its development was highlighted. This would contribute to IGCC and oxy-combustion.

CCS is often portrayed as an expensive option for controlling CO_2. It was pointed out that it is cheaper than offshore wind, more reliable and there is a bigger market for the technology.

The reduction of costs for CCS was seen as an important issue for both new and retrofit plant.

Chairman's Summing –up

2005 has been an important year for the UK in this sector and 2006 is likely to be just as important.

All parties involved agree there is an urgent need for a CCS demonstration with the North Sea being the focus for storage.

Incentives will be important for making CCS happen, the current market place will not do it.

The regulatory framework to allow CO_2 storage must be developed and it must be done in an international context.

With the increased focus on CATS and CCS, the skills issue is becoming important with an urgent need to grow new skills and to get younger people involved.

Finally, successful deployment of new technologies into the market place is key and must be a priority.