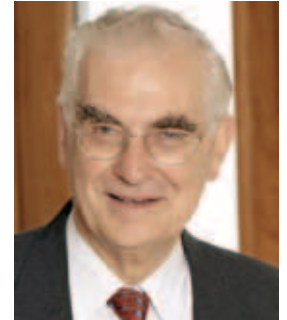




Working Party Report on the arrangements needed to develop the Infrastructure for Carbon Capture and Storage in the UK

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Introduction

It is likely that coal and gas will continue to be burned both in Europe and rest of the World for a number of decades. This makes it highly desirable to do everything possible to abate the associated greenhouse gas emissions. The diverse technologies needed to do this are loosely grouped together under the name 'carbon capture and storage' (CCS). It is probable that those who are first to optimise CCS, reduce its costs, and build up the relevant know-how will have significant commercial opportunities open to them.

This paper was the result of a request by the Energy Group of the Conservative Party to Lord Oxburgh to assemble a small expert group on a non-political and non-confidential basis to report on what steps might be necessary to implement the infrastructure for carbon capture and storage in the UK.

The Nature of CCS

The different elements of CCS present different challenges in their implementation. The Group was asked to advise on measures that could be taken to facilitate the latter parts of the process namely transport and storage – transport of the gas captured at point sources (e.g. power stations, refineries, cement works etc.) to places where it may be stored indefinitely.

The point sources of CO₂ on land in the UK are dispersed and will need to be linked to marine storage locations by pipelines. On shore the existing natural gas pipeline network is owned and operated by a regulated monopoly (National Grid). Parts of this system may be available to transport CO₂. Off-shore pipelines have been owned and operated by hydrocarbon companies and are connected to the shore at coastal hubs. There is some scope, perhaps limited, for reuse of existing pipelines both on shore and at sea. New build will, however, be required as well.

In considering this problem the Group also bore in mind:

- The urgency of tackling climate change and meeting emissions reduction targets
- The long lead times historically taken to achieve planning consents and way-leaves for pipelines on land, and the time needed to then implement them
- The very high capital cost of such projects and the need to keep costs faced by final consumers as low as possible, particularly in light of current economic difficulties

The Group concluded that there is simply not time to wait and see whether current market forces alone, with the EU carbon price as the sole incentive, will deliver CCS at the scale and pace required. The uncertainties concerning the carbon market, the lack of knowledge of potential CO₂ reservoir structures, and the limited operational experience with large scale CO₂ separation equipment, all suggest that the conditions necessary for competitive markets to work in time will not be present. This implies that some level of intervention in the market is needed.

A Proposal for a National Carbon Storage Authority

The Group accordingly proposes establishing a regulated monopoly, the National Carbon Storage Authority (NCSA). The Authority's prime function would be to facilitate the movement of CO₂ from point sources to storage sites and to make such arrangements as are necessary to ensure the availability of those sites.

Onshore, the objective is to develop a network of pipelines to take CO₂ from dispersed point sources to coastal hubs. The hubs play a central role in matching capture volumes from multiple sources with transport and storage to multiple sites. The authority would need to contract with the owners of existing pipelines and facilitate their incorporation as appropriate into larger systems. It would also have to commission some new pipeline construction.

This would enable economies of scale and infrastructure sizing to meet future need that could not be achieved as effectively by any other means. There are also likely to be planning consent difficulties for new pipelines on land and a single authority with a coherent plan would be best placed to manage these.

Initially the role of the Authority would be to ensure that participants in the 'demonstration phase' of CCS in the UK could be confident of disposing of their CO₂ emissions. Subsequently this role would be extended and cater for the later 'deployment stage', when CCS has matured technically and commercially.

The Authority's duties will include:

- offering fair access to all installations wishing to dispose of CO₂, though there will be operational conditions applied; such as quality of CO₂, capacity utilisation and pumping rates;
- offering long term contracts to emitters to dispose of their CO₂; the form of contract will encourage an emitter to send CO₂ to storage, rather than simply emit CO₂ and purchase the requisite EU allowances; various payment arrangements are possible between the Authority and the emitters and the arrangements may be different during the 'demonstration phase' from those employed later;
- arranging tenders for companies/consortia to bid for the monopoly rights to operate CCS hubs and to transport onwards and store the CO₂ that arrives there from emitting installations;
- organising competitive tenders for the provision of pipeline capacity, storage and monitoring services;
- commissioning research, and, if applicable, survey work on the suitability of long term storage sites including saline aquifers.

The Authority's costs could be recovered in various ways. A levy on all power customers or an addition to network charges on an annual basis would both be possible. Alternatively Government might choose to meet the costs from the proceeds of an auction of emission allowances. It is this income security that will allow the Authority to offer secure long term CO₂ transport and storage contracts which, in turn, will allow plant operators to raise low-cost capital to cover the additional costs of installing the capture and local transmission equipment. In this way the cost faced by customers may be kept as low as possible.

The possibility that a capability could be established within Government to meet these challenges was considered. It was, however, concluded that given the strongly technical/commercial nature of the infrastructural arrangements that would be required, implementation would be better carried out by a non-governmental body with extensive commercial experience.

Given the requirement to enter into contracts with the private sector, the Group concluded that the NCSA should be established as a non-Governmental body, along the lines of the Nuclear Decommissioning Authority. Alternatively, in principle it could be a government owned not-for-profit company. Many details remain to be clarified but it is clear that there would initially have to be a degree of flexibility over the remit of the Authority.

Additionally, although the Authority would have responsibilities only for execution, there are areas in which general policy and mode of implementation are closely related. As in the case of executive government agencies this would need to be carefully managed. It should be emphasised, however, that not only would the Authority need to have on its staff and management board members with energy business and project oversight experience, but would also almost certainly require the secondment of some of those currently working on these problems within DECC.

Conclusion

What is offered above is a broad outline. If it is accepted in principle, a great deal of detailed work would be needed before it could be implemented. The group is, however, confident that none of these problems is insuperable. This report is solely concerned with transport and storage; arrangements to support capture would not be the responsibility of the NCSA. At a higher level, CCS policy has clear implications for energy mix and government energy policy as a whole

It is observed that proposals along these lines broadly extend rather than conflict with present governmental policies. If implemented relatively rapidly they should lead to a timely and cost-effective development of CCS infrastructure in the UK and would send a clear message to industry that could only increase investor confidence in government intentions. Nor would the message be lost on other countries.

* This paper was originally written as a contribution to the UK Conservative Energy Group. All authors participated in their personal capacities and not as representatives of their companies and organisations.