

## **Response to the Commission's current consultation on the 'Future of carbon capture and storage in Europe' (COM(2013) 180 final)**

The European Academies Science Advisory Council (EASAC) is the body established by the national science academies of European countries to provide scientific advice to EU policy makers. In October 2011 it established a working group to examine the challenges that must be addressed to secure CCS as a viable component of strategies to mitigate climate change, and consequently to consider what contribution CCS may make in Europe up to 2050. The report presenting the findings and recommendations of this EASAC study can be downloaded from <http://www.easac.eu/home/reports-and-statements/detail-view/article/easac-report.html>.

The report considers the three main components of CCS – capture, transport and storage. It also presents an evaluation of alternatives to mainstream CCS technologies and reviews the important overarching issue of public engagement. Drawing these strands together, the report evaluates the prospects for CCS in Europe from now until 2050 and makes recommendations on the policy initiatives that will be necessary to enable CCS to contribute to climate change mitigation in Europe. The financial viability of CCS, storage issues, CCS technology development, CO<sub>2</sub> transport, and public engagement are analysed and discussed.

Drawing on the report and the advice of the working group, EASAC is pleased to respond to the specific questions posed in the Commission's current consultation on the 'Future of carbon capture and storage in Europe' (COM(2013) 180 final) in the following paragraphs.

- 1) Should Member States that currently have a high share of coal and gas in their energy mix as well as in industrial processes, and that have not yet done so, be required to:
  - a. develop a clear roadmap on how to restructure their electricity generation sector towards non-carbon emitting fuels (nuclear or renewables) by 2050,
  - b. develop a national strategy to prepare for the deployment of CCS technology.

*In general, countries should be required to show how they will meet the overall requirements of reducing their emissions by 2050 and if the plan in part relies on CCS, a national strategy for CCS deployment should be required. This should apply to industries such as steel, cement and chemicals production as well as to power generation, and should extend where appropriate to biomass as well as fossil fuels. Simultaneously, at EU level, effective forums and mechanisms should be provided for CCS projects that require collaboration between countries.*

*We express our concern at the rate at which the deployment of this technology is presently advancing, which may jeopardise achievement of the targeted reductions in emissions by 2050.*

2) How should the ETS be re-structured, so that it could also provide meaningful incentives for CCS deployment? Should this be complemented by using instruments based on auctioning revenues, similar to NER300?

*An important issue that will need to be addressed in re-structuring the ETS will be to find a way to avoid the over- or under-availability of allowances when (as is inevitable) unexpected shifts in Europe's economy significantly change the demand for them. The ETS may need to be complemented by specific rules, such as a floor price as proposed by the UK.*

*Our report concludes that ETS allowances on their own will, in many scenarios, generally be insufficient to make it cost effective to install CCS (particularly on gas-fired power stations). An additional source of capital and/or revenue will typically therefore be required. Instruments based on auctioning revenues may be an appropriate source of such funds but would rely on ETS allowance prices being much higher than at present, and would leave the economic viability of CCS plants rather vulnerable to variations in ETS allowance prices.*

3) Should the Commission propose other means of support or consider other policy measures to pave the road towards early deployment, by:

- a. support through auctioning recycling or other funding approaches
- b. an Emission Performance Standard
- c. a CCS certificate system
- d. another type of policy measure

*As for the previous questions, we anticipate that either an additional source of capital/revenue will be required, or that some form of requirement for CCS will be needed. Care must be taken that measures are complementary. A viable playing field needs to be established in relation to other energy technologies.*

4) Should energy utilities henceforth be required to install CCS-ready equipment for all new investments (coal and potentially also gas) in order to facilitate the necessary CCS retrofit?

*Unless there is such a requirement, there is the potential for lock-in to unabated fossil-fired power generation. However, it should be recognised that being 'CCS ready' is not straightforward given the need for the integration of CCS equipment at the source, and the need for CO<sub>2</sub> transport and storage facilities. Uncertainties will arise from the further developments of capture technologies (which may impact on their integration with the source plant) prior to CCS retrofit, and from the development of transport infrastructure and storage facilities subsequent to locating and building the power station.*

5) Should fossil fuel providers contribute to CCS demonstration and deployment through specific measures that ensure additional financing?

*We have concluded that additional financing, above ETS allowances, are likely to be needed, but we do not have a view on whether fossil fuel providers should be required to contribute.*

*However, for some countries, the use of captured CO<sub>2</sub> for enhanced oil and gas recovery may prove to be a significant economic driver for CCS, particularly in the early stages of commercial roll-out. In which case, the revenues received from the oil and gas companies could constitute very helpful additional financing.*

6) What are the main obstacles to ensuring sufficient demonstration of CCS in the EU?

*As is widely recognised, without additional sources of funding given the current ETS allowance prices, the demonstration plants are unlikely to go ahead. To have a sound business case, attention needs to be paid to their operational costs as well as to their capital costs: a minimum price for the electricity from fossil-fired plants is needed (as is already the case for electricity from renewable energy plants in some member states). The approach applied in the UK of 'contracts for difference' may be appropriate in this context. Current rules for funding the demonstration projects may need to be revisited to enable funding packages to be created which will enable commercially viable projects to be established in the current, difficult circumstances.*

*Also, manufacturers and utilities need to be convinced that CCS will play a significant role in the future, and public support needs to be gained through effective engagement processes. In addition to the EU demonstration plants, arrangements should be put in place so that the EU can share information with, and learn from, demonstration plants elsewhere in the world.*

*Current problems of securing sufficient funding for the demonstration projects may, in the short term, appropriately be addressed by focusing the available public funds on a smaller number (3 or 4, not fewer) of demonstration projects rather than to attempt to fund up to 12 projects as originally planned. However, it has previously been concluded by the Zero Emissions Platform that a minimum of 6 to 7 demonstration projects are needed to demonstrate an adequate range of technologies and application options (including to industrial processes), so a second tranche of demonstration projects will need to be planned for and financed.*

7) How can public acceptance for CCS be increased?

*An enhanced emphasis should be placed on public debates about the role of CCS in mitigating climate change at an EU, national and local levels in relation to other options in order to increase awareness and to put decisions to proceed with CCS on a firmer footing. These debates should enable a better understanding to be developed of publics' attitudes to CCS and why they are formed. To inform such debates and more general public considerations of CCS, operation of pilot and demonstration plants should be transparent, ensuring effective channels of communication with interested stakeholders. The safe and reliable operation of these plants should provide reassurance to the public, including on potential environmental impacts of CCS.*

*Consideration should be given to the potential enhancement of public understanding and acceptance of CCS by including CCS applied to biomass-based plants for generating heat and power in the overall mix of technologies comprising the CCS portfolio.*