

**Sandbag Consultation Response to  
Next steps in CCS: Policy Scoping Document.  
Developing an approach for the next phase of  
Carbon Capture & Storage projects in the UK.<sup>1</sup>**

The UK government is currently consulting on next steps for Carbon Capture & Storage in the UK. Though a regulatory framework has begun to mature, progress on commercial-level CCS has been disappointing, with the UK yet to break ground on a single project. As North America learns lessons from operating commercial-scale CCS on coal power, and China's multiple projects plan for commercial CCS by 2020, the UK is in a race not to be left behind technologically in what could be a crucial weapon against carbon emissions, and simultaneously an export technology.

With the price of carbon remaining low in Europe, as the Emissions Trading Scheme flounders, and with a frozen and unreliable UK Carbon Floor Price, other policies are needed to stimulate CCS.

Sandbag believes that CCS has been particularly neglected in the areas of industrial emissions, and that the already existing CCU companies in the UK are being unhelpfully ignored. We are pleased that the government's policy scoping document recognises the fleet of different technologies that capturing carbon entails, and suggest that regulation must catch up with this stance.

Many in industry and the power sector have a strategic interest in CCS, but require a mixture of incentives and regulation to enable the UK to make the next step toward launching commercial CCS in Europe.

### About Sandbag

Sandbag is a UK-based not-for-profit thinktank conducting research and campaigning for environmentally effective climate policies.

Our research focus includes reform of the EU Emissions Trading Scheme, the EU 2020 and 2030 climate & energy packages, and the persistence of old coal in Europe. The International Centre for Climate Governance ranks us in the top twenty global climate thinktanks.

For more information visit our website at [www.sandbag.org.uk](http://www.sandbag.org.uk) or email us at [info@sandbag.org.uk](mailto:info@sandbag.org.uk)

<sup>1</sup> *Next steps in CCS: Policy Scoping Document. Developing an approach for the next phase of Carbon Capture & Storage projects in the UK*  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/341995/Final\\_Version\\_Policy\\_Scoping\\_Document\\_PSD.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341995/Final_Version_Policy_Scoping_Document_PSD.pdf)

## Key recommendations

- CCS could be important for power if it can compete with other low carbon options, but it also offers a way to decarbonise stubbornly high-emitting industrial sectors (e.g. cement, steel). UK CCS policy must have a new focus on capturing industrial emissions.
- EU Emissions Trading Scheme reform is essential in order to give a stable future carbon price that will allow emitters to make economic decisions on researching, installing and operating CCS. This entails a robust, early Market Stability Reserve, and cancellation of the surplus.<sup>2</sup>
- Separate CCS support policies are needed for the power and industrial sectors, additional to an improved carbon price.
  - To incentivise CCS for power, additional supporting mechanisms must be provided (e.g. CFDs, a decarbonisation obligation, EPS, greater NER300 access).<sup>3</sup>
  - To incentivise CCS for industrials, a new funding mechanism is needed that does not load costs on to sectors exposed to carbon leakage. One possibility is a carbon sequestration obligation funded by fossil fuel extractors. Addressing the flaws in the European Commission's blunt carbon leakage policy is also important here.<sup>4</sup>
- There should be a renewed EU focus on R&D funding, a step that the original CCS Directive failed to adequately incentivise.
- Investigation is needed of the wider scope of CCS&U, particularly including mineralisation and productive uses for stored carbon e.g. aggregates.

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<sup>2</sup> *Slaying The Dragon: Sandbag's Annual report on the state of the Emissions Trading Scheme* (October 2014) [www.sandbag.org.uk](http://www.sandbag.org.uk)

<sup>3</sup> See Sandbag's briefing: *A 2030 Decarbonisation Target* (March 2014) [http://www.sandbag.org.uk/site\\_media/uploads/A\\_2030\\_decarbonisation\\_target\\_in\\_Europe\\_in\\_the\\_context\\_of\\_low\\_carbon\\_prices\\_1.pdf](http://www.sandbag.org.uk/site_media/uploads/A_2030_decarbonisation_target_in_Europe_in_the_context_of_low_carbon_prices_1.pdf)

<sup>4</sup> See Sandbag's *Emergency Briefing objecting to the 2015-2019 carbon leakage list* (October 2014) [http://www.sandbag.org.uk/site\\_media/pdfs/reports/Emergency\\_MEP\\_briefing\\_on\\_the\\_2015\\_to\\_2019\\_Carbon\\_Leakage\\_List.pdf](http://www.sandbag.org.uk/site_media/pdfs/reports/Emergency_MEP_briefing_on_the_2015_to_2019_Carbon_Leakage_List.pdf)

## Financial Incentives and Electricity Market Reform

- *Q1. To what extent would developers be prepared to invest in Front End Engineering Design (FEED) costs ahead of allocation of a Contract for Difference (CfD), and if they are not able to do so what measures could be adopted so that the developers have sufficient certainty of their costs and a Strike Price to form the basis of an investment decision?*

No comment.

- *Q2. How best should the industry-led CCS Commercial Development Group work to support project developers in engaging with finance markets?*

No comment.

- *Q3. To what extent should Government reflect long-term risks of full chain CCS projects in the design of a CCS CfD? In particular, we will want to explore the extent to which similar risks also arise in other sectors and the changes that may be needed in CfD design to put CCS on an equivalent basis to other low carbon technologies.*

No comment.

## Financing CCS projects

- *Q4. Are the existing products offered by the Green Investment Bank (GIB), Infrastructure UK (IUK) and the European Investment Bank (EIB) sufficient to support CCS projects in raising necessary finance from non-public sources? If not, please explain why, with supporting evidence, and what kind of additional financing or products would be needed?*

No. To a greater or lesser extent currently existing support assumes a higher ETS carbon price than has been realised or will be realised in the near- to mid-term. Without a boost to the carbon price, or alternatives, the necessary finance will not be mobilised. Funding for capital expenditure will only be forthcoming if the running costs of the plant fitted with CCS do not price it out of the market. In power this is addressed in the UK through CfDs though it is unclear what level of budget will be made available for CCS projects under the Levy Control Framework.

For CCS in industry the UK government must look to alternative support possibilities. Options include certificate-based carbon sequestration incentives/obligations potentially applied on the fossil fuel extractive industry; feed-in-tariffs or CfDs sourced from public funds (similar to the RHI). There may be further possibilities for the government to offer preferential arrangements including loan guarantees or tax incentives.

The ability for the GIB to disburse low-cost finance or grants for CCS FEED should also be investigated.

Existing UK projects such as Don Valley Power Project, though launched with EIB funding, are not sustainable without a CfD. The level of CfDs available under the LCF, in turn, is likely to be unsustainable without the boost from a higher carbon price.

## Transport and Storage Infrastructure

- *Q5. To what extent is it a priority from an industry perspective for regulation to cover technical aspects of shared CCS infrastructure, such as operating parameters including pipeline pressures for wider networks, or specifications for the CO<sub>2</sub> to be transported?*

A key step for the expansion of CCS involves agreements on universal CCS regulation. Experience from elsewhere can inform the standards required, and costs will be significantly reduced in future if standards can be agreed before the initial group of CCS plants enter construction.

Continuing to encourage other governments to ratify the London Protocol Article 6 amendment is plainly helpful.

- *Q6. What further steps may be necessary to stimulate private investment in infrastructure deployment?*

The transportation element of CCS may be considered best delivered as part of the regulated asset base of a company enjoying a natural monopoly. For example, National Grid could be tasked with investing and operating elements of the infrastructure necessary to transport and store CO<sub>2</sub>. Investors are comfortable with this model.

- *Q7. What are your views on the current arrangements for permitting the operation of storage sites? Are these proving to be a barrier to investment, and if so how might these barriers be overcome?*

The EU storage site regulations provide a barrier to investment in the same way as any environmental protection or liability for environmental damage, but still remains entirely necessary. The alternative, that of the state shouldering the burden of risk, has been proven to a) encourage investment in the short term; and b) in the long term introduce a crippling level of costs for cleanup to be borne by the government (e.g. 20<sup>th</sup> Century mining and nuclear industries).

- *Q8. Are there elements of the way the CCS Directive has been implemented in the UK that ought to be revisited? What should the UK be asking for during the Directive review process?*

The most critical issue a revised CCS Directive needs to address is the need for a broad based incentive for deployment of CCS in both power and industry. Such incentives need to cover both capital and O&M costs.

## Part and Full Chain projects

- *Q9. The Government does not consider it currently has a role, beyond existing third party regulations, in establishing the terms and conditions of any agreements between part-chain projects and full-chain / CO<sub>2</sub> infrastructure providers. What steps do you think industry should take to further develop the commercial models for any such agreements?*

The development of CCS infrastructure is similar to the process of developing transmission networks for electricity, where multiple users benefit from the development of a common asset that has to be sized and scaled according to projected need. Given the dependence of projects on subsidies, which are in the control of Government, it will be difficult for industry to develop a commercial model without Government's close involvement. A model based on a price regulated asset base may be necessary to ensure fair pricing in the absence of competition and in order for a business plan to be drawn up with the oversight of a regulator and the Government.

## Enhanced Oil Recovery (EOR)

- *Q10. On issues of incentives for CO<sub>2</sub>-EOR, respondents are encouraged to input to the HM Treasury call for evidence on the Review of the Oil and Gas Fiscal Regime, which closes on 3 October 2014.*

Not applicable.

- *Q11. How should industry collaborate to best match the needs of CO<sub>2</sub> supply and demand for any future CO<sub>2</sub>-EOR industry and how should this be managed?*

If EOR is to be part of a project this should be taken into account during the process of negotiating and agreeing a Contract for Difference to ensure that bill payers are receiving value for money and not inadvertently subsidising a revenue generating activity.

- *Q12. How should the industry collaborate to take forward any additional transportation infrastructure requirements of any future CO<sub>2</sub>-EOR industry?*

No comment.

## Industrial CCS

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- *Q13. What changes to the CfD design would developers need in order to bring forward projects involving industrial emitters installing CCS on their onsite power generation? Respondents should note that the Government intends to publish further guidance on Private Network Generation in early Autumn 2014.*

No comment.

- *Q14. Which of the barriers to industrial CCS are the most important and how should they be overcome?*

Cost is the most significant barrier. Certain industrial sectors face international competition and it is difficult to load additional costs without compensation. This makes the raising of revenues to spend on decarbonisation in this sector challenging. Options include phasing in of regulations to encourage investment in CCS coupled with incentives such as feed-in tariffs, CfDs or certificate based obligations. These could be funded through ETS auction revenues, public finance (as is currently the case for the RHI) or a new levy on the fossil fuel extractive industry.

Technological awareness is often slow to develop, but commercial products are increasingly becoming available which offer industry a route to decarbonisation. Where many industrial sectors currently dismiss further emissions cuts as an impossibility, it is vital that new technologies are researched and demonstrated.

- *Q15. What is the best next step for each sector? For example, should first generation technologies be brought forward in all sectors, or would it be better to consider bespoke actions per sector?*

Taking a sectoral approach may have some advantages, for example, cement and aggregate production has the potential to be radically transformed using carbon dioxide as a feedstock for exothermic reaction with mineral aggregate. The steel sector has the potential to combine the coking process and blast furnace into one integrated plant with a single capture ready flue gas. However, in developing industrial CCS a geographic rather than sectoral approach may be the best way forward, utilising infrastructure that is funded through CfDs in the power sector.

- *Q16. How should any Government activity best support R&D and innovation for ICCS?*

A clear pot of funding should be made available for R&D in industrial CCS and CCSU.

## Bio-CCS / BECCS

- *Q17. We would welcome views as to what issues the UK Government may want to urge the European Commission to consider regarding BECCS before they propose the detailed architecture of EU climate and energy policy for the period post-2020, including revisions to the EU ETS Directive for phase IV of the EU ETS (2021-2030)*

In order for Bio-CCS/BECCS to develop a clear approach to the quantification and certification of the emission reduction will need to be developed. Companies removing emissions from the atmosphere will need to be able to demonstrate their emissions reductions are real and permanent. Once this is demonstrable certification should be made fungible with the ETS in order to stimulate demand and reward investment.

## CCU

- *Q18. The Government and its R&D partners will continue to monitor the progress of CCU technologies, as part of its wider efforts on CCS. Do you wish to offer any evidence of such progress?*

Carbon8<sup>5</sup> already offers a commercially viable accelerated carbonation for the treatment of industrial waste and contaminated soils. Their technique has the possibility to be scaled up to an industrial level, however, they are currently purchasing food grade CO<sub>2</sub>, typically at a price of £100/tonne. Cambridge Carbon Capture and Storage have developed a mineralisation process that uses serpentine rock to capture CO<sub>2</sub> in an exothermic reaction that creates an aggregate. Lafarge Cement have explored mineralisation as an alternative to traditional cement production, but this work has been put on hold with the consistently low carbon price on the EU Emissions Trading Scheme. These later two endeavours are not yet out of the lab but the work of Carbon8 demonstrates that these processes can be commercialised given the right incentive structures.

Other potential CCU options include the use of CO<sub>2</sub> to develop liquid fuels, displacing traditional fossil fuels and therefore potentially delivering a relative saving. However, such uses do not deliver permanent storage of the CO<sub>2</sub> and, increasingly, over time would be displacing other non-CO<sub>2</sub> emitting alternatives such as electrification or advanced biofuels.

## Supply Chain

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<sup>5</sup> Carbon8 website <http://www.c8s.co.uk/>

- *Q19. Is any further action needed to support supply chain companies wishing to supply good and services to CCS projects in the UK, or abroad?*

No comment.

- *Q20. Do you agree that currently there does not appear to be significant supply chain barriers to the commercial deployment of CCS up to 2030? If your answer is no, please set out why, with supporting evidence.*

No comment.

### **Knowledge Transfer (KT)**

- *Q21. Should similar arrangements as those under the Commercialisation Programme, be made for the provision of KT from any future CCS projects? If so, what kind of aspects of KT does industry find most useful?*

No comment.

- *Q22. How can KT from projects under the Commercialisation Programme and any future projects be most usefully disseminated, e.g. via report, workshops, seminars etc.?*

No comment.

### **Research, Development and Innovation**

- *Q23. For any future funding calls, should R&D funding be targeted at specific aspects of the CCS chain, or level of technology maturity?*

As mentioned elsewhere, we believe R&D on industrial CCS should be the government's principle funding focus.

**ENDS**