

# Policy briefing

## UK policy on carbon capture and storage: Squaring coal use with climate change?

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### Introduction

The controversy over energy giant E.On's plans for a new coal-fired power plant at Kingsnorth in Kent has exposed a tension between the UK government's climate change and energy security agendas. At the centre of this tension are questions about the technical and economic feasibility of carbon capture and storage (CCS). CCS could radically reduce emissions from fossil fuel power stations. It has been argued by some Ministers and companies that building Kingsnorth is vital to replace older power plants that are due to retire. But allowing new coal plants without CCS equipment could do serious damage to UK credibility in international climate debates.

The government recently proposed a resolution to this tension: that new, large fossil-fired power stations such as Kingsnorth should only be granted consent if they could be built 'carbon capture ready'. But does such a resolution work in practice? If not, what alternative policies should be pursued?



### Key messages

1. The government is right to support carbon capture and storage (CCS) technologies. CCS could substantially reduce global emissions. It is a particularly important option for some developing countries (ie China and India) and the USA.
2. The construction of new coal-fired plants without CCS would damage the UK's international leadership on climate change. It would also be inconsistent with its long term emissions reduction targets.
3. Energy security arguments are not sufficient to justify new coal plants without CCS. The security of UK gas supplies is very important, but should be tackled by investing in the UK's gas infrastructure rather than through new coal.
4. Requiring new coal-fired plants to be 'capture ready' is not sufficient. Due to technical and economic uncertainties surrounding CCS, there is no guarantee that CCS would be retrofitted at the sites concerned.
5. Additional policies are required to support CCS deployment. A limit on the carbon emissions from power plants should be implemented by 2020 which would exclude unabated coal, and further funding is needed for CCS demonstrations in the UK and abroad.

## Kingsnorth and Climate Diplomacy

The government's response to E.ON's application to build a new power plant at Kingsnorth – and to other similar plans – is critical. Granting consent before CCS technologies are proven risks strengthening the UK energy system's lock-in to a high carbon pathway. But this is arguably not the most important risk associated with such a strategy. The UK government has consistently promoted itself as a leader in tackling global climate change, with some success. This leadership could have a vital, positive influence in negotiations for a new global climate treaty post-2012.

To maintain this leadership, the UK will need to demonstrate progress towards its ambitious emissions reduction targets. The move to an 80% reduction target for 2050 is welcome, but it is equally important that short term policy decisions are consistent with this goal. Allowing Kingsnorth to go ahead in the absence of adequate guarantees that CCS will be fitted would call this into question. Furthermore, it would make it more difficult for the UK to persuade developing countries such as China to make further commitments to action at an appropriate time in the future.

But would a commitment to 'capture readiness' by developers of new coal-fired (and indeed gas-fired) plants be sufficient to demonstrate that short term policy is in line with long term goals? Most definitions of 'capture ready' emphasise a number of elements. Firstly, they require developers to have space available on site for CCS equipment to be added. In addition, three further elements are usually added: appraisals of the technical feasibility of retrofitting CCS, the likely pipeline route to a CO<sub>2</sub> storage site, and the practicality of the storage site itself could be required. In practice, the government has suggested that only the space

requirement should be a condition of consent for new coal-fired stations being granted.

Whether or not all four elements are made mandatory, there is no guarantee that CCS technology would be retrofitted when available to a 'capture ready' power plant. This is not only due to technical factors, but also because CCS economics are subject to large uncertainties. At present, no company or analyst can accurately predict the costs of CCS because it has not been implemented at scale anywhere in the world.

Over time, CCS technologies, their regulation and their economics are likely to change significantly. So studies carried out to comply with requirements for plants to be capture ready might be out of date by the time a decision to retrofit CCS equipment is made. Furthermore, the costs of adding CCS to a capture ready plant may turn out to be too high when compared to other investments that abate a similar quantity of emissions. Whilst incentives to retrofit CCS equipment are likely to be available – eg from the EU emissions trading scheme – these may be too small for CCS investment to take place.

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Given that the definition of capture ready is so problematic, further action is likely to be required to avoid a proliferation of fossil power plants with no carbon emissions controls. Many organisations have argued that an emissions standard for new power plants would help to avoid this situation. We agree. An emissions standard that places an upper limit of 500g/kWh should be applied to all power plants (existing and new), to be enforced by 2020 at the latest. This would rule out unabated coal plants, but allow developers considerable choice about which generation investments to make – including coal with CCS. Ideally, this limit should be reduced further over time so that gas-fired plants will also be fitted with CCS once the relevant technologies have been demonstrated.

### **New coal and energy security**

The government has argued that such an emissions standard would mean that no new coal-fired capacity gets built, resulting in a new 'dash for gas'. They argue that this would lead to over-dependence on imported

natural gas, with negative implications for energy security. An important subtext of this argument is that this over-dependence would be on Russia. Whilst there are certainly risks associated with importing a lot of gas from Russia, this is neither a serious short- nor medium-term issue. The government's own consultants have projected a diversified mix of imported gas over the next decade or so, with only a small proportion likely to come from Russia. Ironically, the UK's consumption of imported coal from Russia is much more significant, at around a third of total UK consumption in 2007.

Diversifying electricity generation – for example, by maintaining a significant role for coal – can enhance energy security. But this would not remove the risks associated with significant gas use in the UK. At present, changes in the fuels used in power generation cannot protect household gas consumers from the impact of disruptions or price shocks.

Instead of focusing on reducing gas use per se, a more strategic policy would be to strengthen the security of the UK's own gas infrastructure.



Gas security could be significantly strengthened by requiring gas companies to invest in more non-commercial, strategic storage. The current provision of storage is inadequate and this has had a much greater effect on security in the past few years than events outside the UK.

## **Walking the talk: Deploying CCS**

If power companies today have too little confidence in CCS to fit it now, then more needs to be done to reduce the technical and economic risks as soon as possible. To this end, a number of countries are moving ahead with full-scale demonstration plants. The UK's own demonstration of post-combustion carbon capture is a welcome part of this international effort. However, there are significant uncertainties about how many of the plans for demonstrations will become a reality. Implementing a dedicated

funding mechanism for CCS at EU level will be essential to reduce these uncertainties.

Despite this international activity, the UK should support more than one full scale CCS plant. The current policy places all of the UK's CCS eggs in one basket at a time when it is not yet clear which variant will deliver emissions reductions reliably. Supporting several plants that use a variety of technologies and fuels would reduce these risks. It would maximise the chance that CCS technologies will be successfully deployed. This would also help the UK government to maintain its leadership position, and use it to good effect as a global climate deal becomes ever more pressing.

This briefing note is based on SEG's response to the Government's 2008 consultation: 'Towards Carbon Capture and Storage'. The full response is available at [www.sussex.ac.uk/sussexenergygroup/documents/seg\\_spru\\_captureready\\_response.pdf](http://www.sussex.ac.uk/sussexenergygroup/documents/seg_spru_captureready_response.pdf)

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