



ETI Evidence to the Public Accounts Committee Session on the NAO Report on CCS

Introduction

1. The Energy Technologies Institute (ETI) is a partnership between energy and engineering companies and the UK Government which is able to draw on the business and engineering expertise of key global players engaged in the UK energy sector (ETI private sector members: BP, Caterpillar, EDF, Rolls-Royce and Shell).
2. The ETI has developed strong credentials in national energy system analysis, informed by the latest industrial and engineering expertise. This enables us to explore the lowest-cost decarbonisation pathways, under a range of assumptions, constraints and uncertainties. Our analysis has been widely cited by academics, government and by the Committee on Climate Change in its advice to government.
3. This submission is based on ETI analysis of projects we have commissioned and also on rigorous whole-system analysis informed by our public and private sector members and our portfolio of technology development and knowledge building projects¹.

Response

4. Over the past 10 years, the ETI's whole energy system analysis has shown the economic prize of deploying CCS in the future energy system is potentially considerable. Achieving UK 2050 carbon targets without deploying any CCS is very likely to result in substantially higher costs (greater than 2% of GDP by 2050 across the energy system). This comes from its potential for use in multiple operations – power generation, capturing industrial emissions, through gasification of various feedstocks providing new low carbon gases and delivering “negative emissions” in combination with bioenergy.
5. Cost effective, impactful and investable CCS requires reliable, large quantities of CO₂ to be captured and stored over many years. In the UK, power generation best meets these requirements so should lead deployment of CCS. There is a need for secure, flexible, low carbon electricity generating capacity from the mid-2020s onwards as existing fossil fuel and nuclear stations reach the end of their lives and carbon budgets tighten. Power with CCS would meet this requirement and would enable other CCS applications to cost-effectively flourish.
6. More recent ETI analysis (both before and since cancellation of the DECC Commercialisation programme) has focussed on the need for and value of power with CCS from the mid 2020s - and how it can be implemented affordably.
7. Hence the ETI welcomes the findings and recommendations of the NAO in its report, which adds to the knowledge generated and lessons learned from the Competition.

¹ Further details can be found in the ETI report 'Options, Choices, Actions: UK scenarios for a low carbon energy system transition', available via the ETI website www.eti.co.uk

8. We would like to briefly expand on some of the key findings from the NAO Report.
9. **The value of the Department's spending on the second competition will depend on how it takes forward CCS.** Clearly the value of the spending depends crucially on whether, when and how the UK implements CCS at scale. The ETI has drawn great value from the key knowledge deliverables (KKDs) in supporting our own projects and analysis work, both in terms of the engineering data released and the learnings for future CCS schemes (to identify how – and equally valuably how not - a development should proceed). The ETI is actively involved in defining the detail of and developing the business case² for what it believes would be an affordable, impactful and investable first commercial gas power with CCS scheme: this draws on information from both sets of KKD's. ETI are developing and testing how an essentially commercial finance based model for a new power with CCS project could be delivered with limited government support. There is a strong and growing body of evidence to suggest that a 1GW+ scale post-combustion gas+CCS plant, close to the Tees or Humber with easy access to the best proven storage sites in the southern North Sea, would offer a best value strike price while also providing infrastructure for an industrial CCS cluster.
10. **The Department designed the competition so it could withdraw from supporting its preferred bidders without incurring cancellation costs.** This was seen as a positive by the NAO report. Based on its engagement with industrial stakeholders, any industrial investor will need to see early and enduring commitment by UK government before investing in a CCS project (conditional on meeting agreed value for money/affordability targets as projects develop). Government funding of early stages of projects is helpful, but not a substitute to such long term (conditional) commitment.
11. **The terms of the competition contributed to one of the shortlisted projects being unlikely to reach the construction phase.** The NAO pointed out the issues faced by the White Rose Project on its management of the chain risks, and put this down to the requirement for a 'full chain project'. The ETI's own analysis and stakeholder engagement has suggested that full chain projects may be viable, provided a single entity takes the whole chain risk and government assumes low probability but potentially high impact storage risks, including contingent risks on the rest of the chain.
12. **The Department expected the unit costs of electricity from the competition projects would be higher than for subsequent CCS projects and other low-carbon technologies.** As set out in the NAO report, expected costs of the two competition projects were in line with the expectation set out in the government's CCS Cost Reduction Task Force. The ETI's own independent analysis suggested that even the second plant in a cluster could be cost effective compared to other low-carbon technologies.³ Subsequent analysis by the ETI has shown by correct selection of technology, scale, location and business model, even a first UK project in a cluster could be cost competitive (particularly if the wider electricity system benefits of on-demand, dispatchable power from a gas with CCS plant are taken into account). Furthermore the likely timing of UK deployment (mid/late 2020s) means that CCS demonstration around the world reduces first of a kind risks and costs, and learnings can be taken on for a UK project design. The ETI is further developing this analysis and expects to report back in mid year.

² Further details can be found at <http://www.eti.co.uk/programmes/carbon-capture-storage/thermal-power-with-ccs>

³ Further details can be found in the Insight at <http://www.eti.co.uk/insights/reducing-the-cost-of-ccs-developments-in-capture-plant-technology>

13. In summary, the ETI maintains its strong belief that CCS can bring long term benefit to the UK and potential investors, and that with the correct design a first commercial gas power with CCS scheme can provide affordable, reliable low carbon power. This needs long term commitments from both public and private sectors – each side needs to take on the risks that it can manage, and early commitment by private sector investors will need similar commitments from the public sector through a genuine partnership approach.

About the ETI

14. The Energy Technologies Institute (ETI) is a partnership between global energy and engineering firms and the UK Government.
15. Our mission is to accelerate the development, demonstration and eventual commercial deployment of a focused portfolio of energy technologies which will increase energy efficiency, reduce greenhouse gas emissions and help achieve energy and climate change goals.
16. We carry out three key activities:
- modelling and strategic analysis of the UK energy system to identify the key challenges and potential solutions to meeting the UK's 2020 and 2050 targets at the lowest cost to the UK
 - investing in major engineering and technology demonstration projects to de-risk and build capability both technology and supply-chain solutions for subsequent commercial investors
 - enabling effective third party commercialisation of project outcomes.
17. The ETI has developed an internationally peer-reviewed national energy system design tool (known as 'ESME' - Energy System Modelling Environment⁴), to underpin our strategic techno-economic analysis of the UK energy system. ESME models choices across power, heat, transport and infrastructure sectors and is informed by evidence drawn from our private sector members, our technical projects and a range of expert advisers. As such it enables the ETI to deliver evidence-based insights on how to deliver affordable, secure and low carbon energy for Britain in the decades ahead, including identifying credible, lowest-cost pathways to secure low-carbon energy in future.

Written evidence submitted by Nigel Richardson, Public Affairs Manager on behalf of the Energy Technologies Institute (ETI) March 2017.

Contact details

Nigel Richardson, Public Affairs Manager
01509 202084

Nigel.richardson@eti.co.uk

www.eti.co.uk

⁴ <http://www.eti.co.uk/project/esme/>