



# CCS Technology Innovation Needs Assessment ‘Refresh’

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Technology Innovation Needs Assessments (TINAs) aim to **prioritise** innovation needs across 12 different areas for the Low Carbon Innovation Co-ordination Group (LCICG)



The TINAs use a consistent methodology to provide analysis on innovations that:

Have the greatest potential to reduce costs

Benefit the UK economy

Require public support to overcome market barriers

The TINAs focus specifically on '**learning by R&D**', i.e. outcomes achieved through R&D and innovation

## The original CCS TINA was completed in 2012

It concluded that successful innovation in CCS could save the UK energy system **£10-45bn to 2050**, with the help of investment amounting to hundreds of millions of GBP over the next 5-10 years

This would amount to 40% cost reduction for capture plants; c. 50% cost reduction for transport; c. >50% cost reduction for storage

Whilst supporting up to **£3-16bn** in direct GVA impact for the UK economy

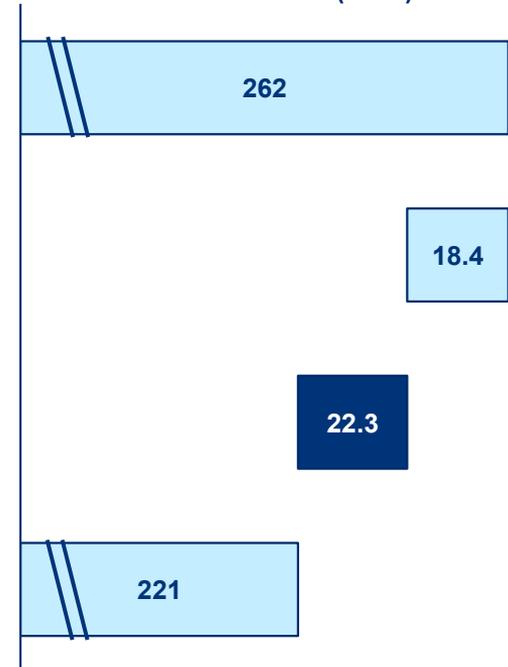
Deployment costs based on 2010 levelised costs\*

'Learning by doing' improvements (2010-2050)

'Learning by R&D' [and breakthrough] improvements (2010-2050)

Deployment costs based on achieving expected 2050 levelised costs

Resource cost savings based on medium deployment/high innovation scenario (£bn)



\*Cumulative levelised cost of capacity installed between 2010 and 2050 discounted to 2010 using the social discount rate

Some of the innovation areas identified which would have the biggest benefit for the UK were:

The importance of a **source-to-sink demonstration** as a critical innovation need to unlock understanding of potential improvements and future deployment



Assure the security of long-term **deep sub-sea storage** – with a particular emphasis on ‘lynch pin’ technologies that address the need for characterisation, simulation and risk assessment; measuring, monitoring and verification; and mitigation and remediation

**Advanced capture** development to drive down costs in the long-term – especially for natural gas and biomass related technologies in the UK

The purpose of the CCS TINA Refresh is to provide an up-to-date analysis for the LCICG

Taking account of **developments in policy, deployment and innovations** since the previous TINA e.g. incentive schemes, recent international progress etc

Build **more detail** on top of the previous TINA:

- Exploring the role that CCS can fulfil in the future low carbon energy system
- Considering options for CO<sub>2</sub> utilisation
- Including analysis on the potential for job creation and splitting GVA across domestic value and exports
- Conducting sensitivity analysis

It is not a complete re-do of the previous TINA, but a **refresh**

## TINA Refresh timeline



- March 2015 – evaluation of the previous TINA and establishing the scope of the Refresh
- April 2015 – literature review of recent developments
- May – August 2015 – engagement with industry and academia through a questionnaire and in-depth interviews
- September 2015 – cost modelling and testing out initial findings with industry and academia through a workshop
- October 2015 – final report by the end of the month

Some of the insights we have received so far from our engagement with experts are:

CCS does not require innovation to prove its technical feasibility and potential large-scale deployment

Innovation in CCS will be part of a strongly reciprocal process between what is actually built and what is worked on in research communities

Some potentially significant innovation opportunities for the UK are related to:

- Natural gas post-combustion capture power plant construction, integration and management
- Understanding and developing reliable and effective flexible power generation as part of the future low carbon energy system
- Advanced sub-sea storage pressure management, water extraction and monitoring

Thank you very much for your time

Please contact Joshua Brunert if you would like to discuss the  
CCS TINA or other related issues further:

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