



# CCS in the Power Sector 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)



This TINA Refresh looked at the following types of carbon capture plant

Component	Sub-component						
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						

As well as the following aspects of transport and storage

Component	Sub-component						
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

What the TINAs focus on is how much of an impact innovation can make on cost reduction

Component	Sub-component	Value of innovation					
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

In addition they make a conclusion on how much direct economic benefits this industry could provide

Component	Sub-component	Value of innovation	GVA & jobs				
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

## Public support is most necessary where there are exceptional market barriers

Component	Sub-component	Value of innovation	GVA & jobs	Severity of market barriers			
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

Due to limited resources it is important to recognise who are the international leaders in innovation

Component	Sub-component	Value of innovation	GVA & jobs	Severity of market barriers	Opportunity to rely on someone else		
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						



This TINA also considered the connections between power and industrial CCS technologies

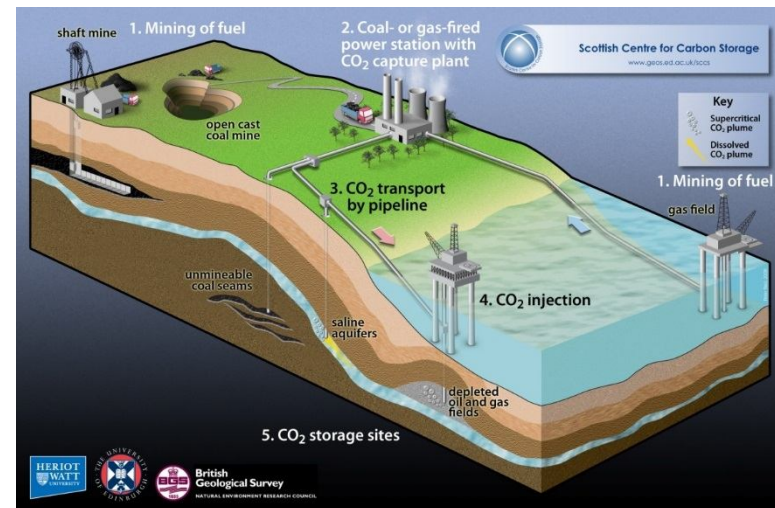
Component	Sub-component	Value of innovation	GVA & jobs	Severity of market barriers	Opportunity to rely on someone else	Overlap with ICCS	
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

This analysis enables us to come a judgement about how beneficial UK public sector support is

Component	Sub-component	Value of innovation	GVA & jobs	Severity of market barriers	Opportunity to rely on someone else	Overlap with ICCS	Benefit of UK public sector support (not considering costs)
<b>Capture</b>	Post-combustion (coal & gas)						
	Pre-combustion (coal)						
	Oxy-combustion (coal & gas)						
<b>Transport</b>	Onshore & offshore pipelines						
<b>Storage</b>	Exploration & appraisal						
	Infrastructure						
	Closure						
	O&M						
	MMV						

The previous TINA was completed in 2012. 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 needs 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:

- Explore the role that CCS can fulfil in the future low carbon energy system
- Further detail on the different components of storage
- Synthesise the power and industrial CCS TINAs
- Consider options for CO<sub>2</sub> utilisation
- Include analysis on the potential for job creation and splitting GVA across domestic value and exports
- Conduct 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

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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