



SCCS

Scottish Carbon
Capture & Storage

SCCS Recommendations and Conference 2013 Report

Unlocking North Sea CO₂ Storage for Europe: Practical actions for the next five years

Executive Summary

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CARBON dioxide emissions are the major cause of climate change: that is unequivocal. To limit the effects, we must reduce the amount of fossil carbon combusted and emitted as CO₂. Carbon capture and storage (CCS) is the only technology that directly reduces emissions at source, and enables countries to manage carbon budgets for both power plants and process industries. The next five years will be crucial in putting CCS back into position as an enabler of Europe's transition to a low-carbon economy. Practical actions must be combined with durable policy drivers to rebuild confidence and attract investment. This will be essential for large-scale emissions reductions from both industry and power generation to 2030 and 2050 as Europe seeks to manage climate risk, retain jobs and improve its low-carbon competitiveness.

The North Sea is the largest CO₂ storage resource in Europe, and offers the ideal location for immediate efforts. By using low-cost available CO₂ from industrial sources, Europe can accelerate the development of enabling infrastructures for CO₂ transport and storage. The following six recommendations set out steps that can be taken now to help unlock North Sea CO₂ storage for Europe.

POLICY CONTEXT

Recommendation 1: A strategic vision for CCS in 2030

› *Position CCS for deployment sufficient for EU industrial emissions and power generation*

CCS needs to be explicitly addressed in the European Union's 2030 framework for climate and energy policy, stating the scale of CCS deployment intended and, consequentially, the timescales for investments in the enabling infrastructures needed for CO₂ storage and transportation. The 2030 framework should place CCS equally alongside actions to support renewable power generation and energy efficiency as part of Europe's future low-carbon energy system, and in line with the emissions reductions required across the whole economy by 2050.

Recommendation 2: Policies and incentives that drive investment

› *Incentivise CCS through "carrots" and "sticks" applied to fossil fuel producers*

A renewed sense of direction for CCS requires the means to make it happen: CCS cannot be solely supported by the weak investment signal from the EU's Emissions Trading System (ETS). Targeted policy and financial incentives will engage industry and provide an enduring, credible and bankable business case for investment. Incentives must engage the oil and gas sector as the key delivery agents for CO₂ storage at commercial scale. A CCS certificate system could do this by requiring storage of increasing volumes of CO₂ over the coming decades. Combined with tax incentives, it could promote the rapid use of depleting oil and gas fields for CO₂ storage and develop large saline aquifer stores.

Recommendation 3: Sourcing low-cost CO₂

› *Accelerate CCS by sourcing high-purity CO₂ captured from industry*

The deployment of North Sea CO₂ storage depends on the timely investigation and proving of geological formations suitable for the task. Pre-commercial test injections of CO₂ are needed to achieve this. Industrial sources of high-purity CO₂ are available now at low cost and present an opportunity to carry out this practical and essential work. These efforts would result in the cost-effective establishment of storage assets, the de-risking of longer term, commercial-scale CCS operations, and better engagement with industrial sectors that will depend on CCS to reduce CO₂ emissions.

Recommendation 5: Establishing CO₂ storage for Europe

› *Validate North Sea storage capacity through six early projects*

The North Sea is Europe's primary CO₂ storage asset. It has immense storage potential and can secure public permission to operate. For the next five years, its surrounding nations must focus on delivering six pre-commercial operational CO₂ storage sites to validate a variety of CO₂ storage options and prove the availability of at least 1 to 2 gigatonnes of bankable storage capacity. This will satisfy storage needs for initial projects up to 2030. By 2025, Europe will need to validate 15 times this amount to create confidence for large-scale commercial investments in CCS, which will store CO₂ through to 2050 and beyond.

Recommendation 4: The transport link in the chain

› *Advance CCS by developing CO₂ infrastructure as Projects of Common Interest*

The EU's Connecting Europe Facility positively includes CO₂ infrastructure as a specific area of interest, but it lags far behind consideration of electricity and gas infrastructure investments. The European Commission should issue a specific call for CO₂ transport projects during 2014, including the development of CO₂ transport infrastructure hubs and the shipping of CO₂ from industrial sources as a means of supporting the characterisation of North Sea storage sites. These can be funded as collaborative Projects of Common Interest.

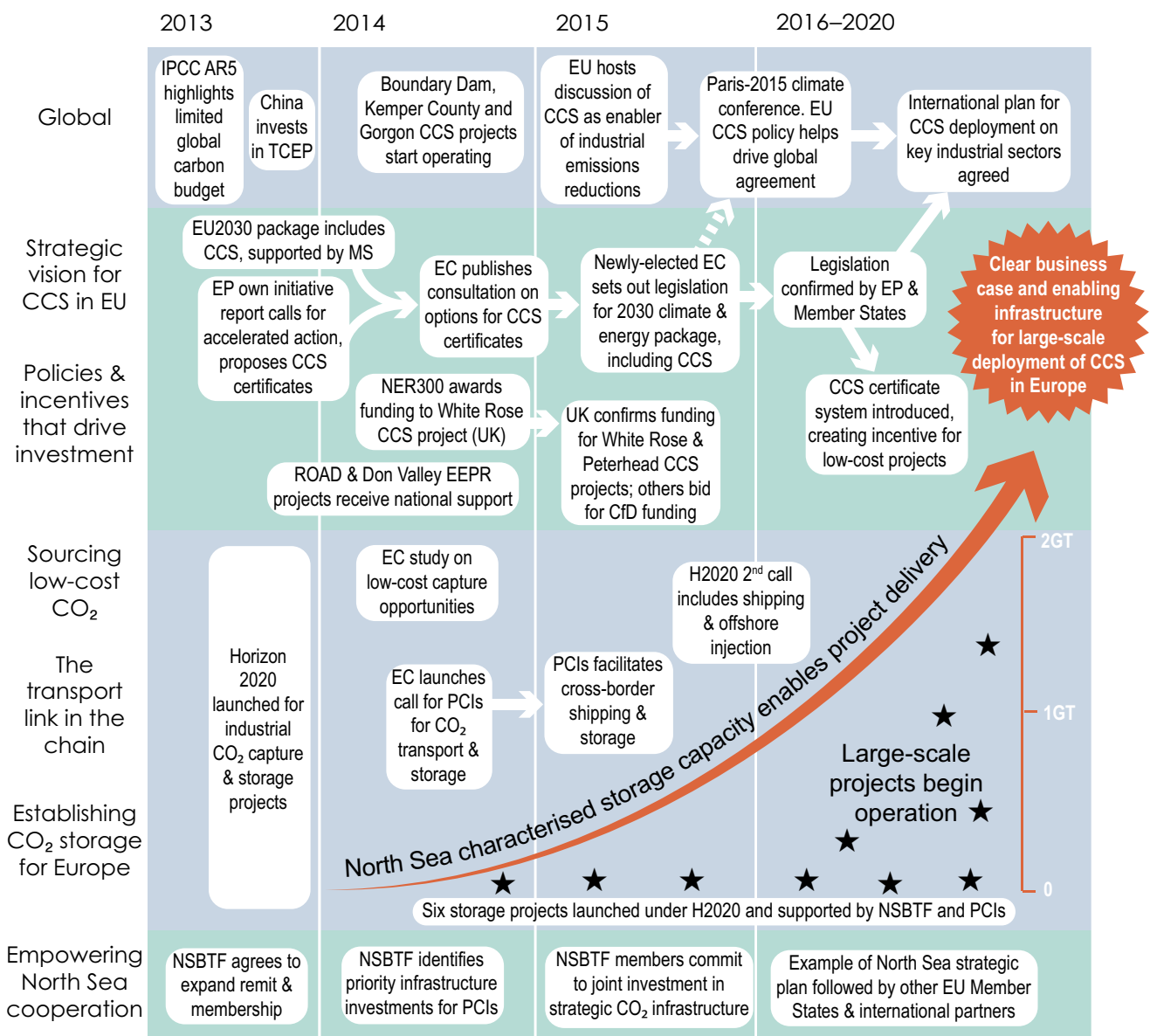
Recommendation 6: Empowering North Sea cooperation

› *Support CCS efforts by reinvigorating government and industry collaboration*

If Europe is to unlock North Sea CO₂ storage, it will require the proactive engagement of additional governments and a broader set of stakeholders. There is an urgent need to revitalise and empower the North Sea Basin Task Force (NSBTF) as a forum for strategic collaboration and challenge, driven by bottom-up innovation and practical implementation. It must bring together the practical actions identified here to step up the capture, transport and storage of CO₂, and provide the necessary collaborative political drive to secure Projects of Common Interest and a supportive EU policy framework.

A five-year framework

The recommendations presented in this report propose a pathway towards the large-scale deployment of CCS in Europe. Fresh efforts are required over the next five years to make this a reality, with practical actions and policy incentives combining to create a framework for investment. This timeline provides an overview of how these different measures – within the six areas identified in this report – combine to provide both a clear business case and the enabling infrastructures required. Europe’s CCS policy forms part of global efforts to address climate change. We therefore also show how renewed efforts on CCS can form part of a broader international effort.



Key:
 TCEP Texas Clean Energy Project
 EC European Commission
 MS Member States
 EP European Parliament
 CfD Contracts for Difference
 NSBTF North Sea Basin Task Force
 PCI Projects of Common Interest
 EEPER European Economic Programme for Recovery

Why Europe needs a CO₂ storage solution

- “ If the world is to have a reasonable chance of limiting the global average temperature increase to 2°C ... less than one-third of proven reserves of fossil fuels can be consumed prior to 2050, unless CCS technology is widely deployed.”
World Energy Outlook 2012, International Energy Agency (IEA)
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- “ Abundant CO₂ storage capacity, clusters of CO₂ sources, world-class research institutes and commercial stakeholders ... makes the North Sea countries natural leaders for the development and deployment of CCS technology in Europe.”
One North Sea: A study into North Sea cross-border CO₂ transport and storage, Element Energy
-
- “ For all fossil fuels, [CCS] will have to be applied from around 2030 onwards in the power sector in order to reach the decarbonisation targets.”
European Commission Energy Roadmap 2050
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- “ If CCS is removed from the list of emissions reduction options in the electricity sector [worldwide], the capital investment needed to meet the same emissions constraint is increased by 40%.”
Energy Technology Perspectives 2012, IEA
-
- “ Ensuring a European stake in the global CCS industry will also increase employment in green industries – creating and preserving thousands of jobs.”
CCS in EU energy-intensive industries, ZEP, 2013
-
- “ UK gas and coal power stations equipped with carbon capture, transport and storage have clear potential to be cost competitive with other forms of low-carbon power generation.” *UK CCS Cost Reduction Taskforce – Final Report*
-
- “ Successfully deploying [CCS] would be a huge economic prize for the UK in its low carbon transition, cutting the annual cost of meeting our carbon targets by up to 1% of GDP by 2050.”
CCS: Mobilising private sector finance for CCS in the UK, ETI and Ecofin
-
- “ CCS is currently the only large-scale mitigation option available to make deep reductions in the emissions from industrial sectors such as cement, iron and steel, chemicals and refining.”
Tracking Clean Energy Progress 2013, OECD/IEA
-
- “ CCS is vital for meeting the [European] Union's greenhouse gas reduction targets and it offers potential for a low-carbon re-industrialisation of Europe's declining industries.”
European Commission Communication on Future of CCS in Europe, 2013
-
- “ The fact is that any new fossil resources brought to market, conventional or unconventional, risk taking us further away from the trajectory we need to be on, unless there is a firm CCS requirement in place or governments are prepared to risk writing off large amounts of invested capital.”
Angel Gurría, OECD Secretary-General
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SCCS is a research partnership of British Geological Survey, Heriot-Watt University and the University of Edinburgh. Our researchers are engaged in high-level CCS research as well as joint projects with industry, with the aim of supporting the development and eventual commercialisation of CCS in the UK and abroad. www.sccs.org.uk

