



GLOBAL
CCS
INSTITUTE

GLOBAL CCS INSTITUTE SUBMISSION TO:

THE EUROPEAN COMMISSION'S
CONSULTATION ON REVISION OF
THE EU EMISSIONS TRADING
SYSTEM (EU ETS) DIRECTIVE

MARCH 2015

Disclaimer

The Global CCS Institute has tried to make information in this submission as accurate as possible. However, it does not guarantee that the information is totally reliable, accurate or complete. Therefore, the information in this submission should not be relied upon solely when making investment or commercial decisions.

The Global CCS Institute has no responsibility for the persistence or accuracy of URLs to any external or third-party internet websites referred to in this product and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

To the maximum extent permitted, the Global CCS Institute, its employees and advisers accept no liability (including for negligence) for any use or reliance on the information in this submission, including any commercial or investment decisions made on the basis of information provided in this submission.

© Global Carbon Capture and Storage Institute Ltd 2015

Unless stated otherwise, copyright to this submission is owned by the Global Carbon Capture and Storage Institute Ltd (Global CCS Institute) or used under license. Apart from any fair dealings for the purpose of study, research, reporting, criticism or review as permitted under the Copyright Act 1968 (Cth), no part may be reproduced by any process without the written permission of the Global CCS Institute.

The comments contained in this paper are the Institute's views, and do not necessarily represent the collective views of its membership on any related matter.

Submission authors

Andrew Purvis, General Manager – Europe Middle East and Africa
Silvia Vaghi, Principal Manager – Policy and Regulatory, Europe Middle East and Africa

Enquiries

Please address enquiries to the authors at:
Global CCS Institute
Europe, the Middle East and Africa
Level 21, Bastion Tower, 5 Place du Champs de Mars
B-1050, Brussels, Belgium
emeaoffice@globalccsinstitute.com

EXECUTIVE SUMMARY

This submission by the Global Carbon Capture and Storage Institute (the Institute) is in response to the European Commission's (EC) request for stakeholders to participate in the public consultation¹ on the revision of the EU Emissions Trading System (EU ETS) Directive (established by Directive 2003/87/EC).

The Institute's main observations are contained in two sections: the innovation fund (section 2 of the questionnaire) relating to the legislative framework post 2020; and the general evaluation of the EU ETS (section 6 of the questionnaire) as enabling policy for carbon capture and storage (CCS).

The Institute's main observations are as follows:

- **CCS must be part of the innovation fund**

Additional financial support measures in the period 2021-2030 are needed to enable transition to an actual portfolio of projects and to provide a basis for expansion elsewhere in Europe. The innovation fund is an essential incentivising factor for the private sector to invest in CCS technology, specifically in the current context of low carbon prices.

- **The programme design needs to be flexible**

This would allow innovative technologies developed in the upcoming five years to be considered by the innovation fund, increasing outreach to a wider portfolio of projects. Those projects are vital in driving large scale CCS deployment post 2020.

- **Industrial CCS and clusters must not be overlooked**

The lack of large-scale CCS projects in high-emitting industrial applications is of concern since CCS is the only technology that can help achieve deep reductions in CO₂ emissions in these industries in the longer term. Urgent attention must be given to the implementation of policies that incentivise the development and subsequent widespread deployment of CCS in high-emitting industrial applications.

- **Seven years is too long to wait to support CCS**

There is currently a significant risk that CCS projects in Europe face a gap of around seven years between funding programmes, as the innovation fund is not expected to start the monetisation of allowances until 2022 at the earliest. Innovative ideas are needed on how to boost immediate financial support to enable current projects to progress faster through the development pipeline and enter construction.

¹ https://ec.europa.eu/eusurvey/runner/ETS_revision

INTRODUCTION

The Institute considers CCS to be an integral part of a low-carbon future and champions CCS as a vital, safe and clean technology. CCS is one of a suite of technologies required to reduce greenhouse gas (GHG) emissions from power generation and industrial sources.

The mission of the Institute is to accelerate the development, demonstration and deployment of CCS globally through our knowledge sharing activities, fact-based influential advice and advocacy, and work to create favourable conditions to implement CCS.

Given the regional and global activities undertaken by the Institute across the full spectrum of CCS and our experience with the European CCS Demonstration Project Network, the Institute is well positioned to offer informed views on the revision of the EU Emissions Trading System (EU ETS) Directive.

The Institute acknowledges that a specific objective of the consultation is to gather stakeholders' views on the 2030 package² which will influence the design of the EU ETS for the period post-2020. Other aspects of the EU ETS reform were consulted on previously³.

This document addresses questions on the innovation fund (section 2 of the questionnaire) and the general evaluation of the EU ETS (section 6 of the questionnaire). The other sections of the consultation related to carbon leakage, the modernisation fund, small and medium enterprises (SMEs) and free allocation are not included in the present submission.

This submission is structured into three sections:

- observations on the NER300;
- observations on Industrial CCS; and
- observations on the EU ETS.

The Institute has also submitted these observations through the online questionnaire⁴.

² http://ec.europa.eu/clima/policies/lowcarbon/ner300/docs/c_2015_466_en.pdf

³ http://ec.europa.eu/clima/consultations/articles/0023_en.htm

⁴ http://ec.europa.eu/clima/consultations/articles/0024_en.htm

THE NER300 EXPERIENCE

The European Council has concluded that 400 million allowances in the period 2021 to 2030 should be used to fund demonstration projects of innovative renewable energy technologies, carbon capture and storage (CCS) and low carbon innovation in industrial sectors. To make this fund operational, a legal basis has to be created in the EU ETS Directive while further implementation modalities can be set out in secondary legislation. The work can build on the experience with the existing NER300 programme which made available 300 million allowances for CCS and innovative renewable energy technologies⁵.

Government funding bodies and project proponents both have a range of experiences with the New Entrance Reserve (NER) funding programme. This section builds upon lessons learnt by the Institute over the past five years. It suggests potential improvements to the modalities governing the fund, based on information gathered by the Institute through our dealings with project proponents, participation and facilitation of knowledge sharing events, presentations, and surveys conducted on an annual basis with projects developers in Europe and beyond.

The Institutes' main observations address five main areas:

1. Adopt a forward looking approach

CCS is an important part of a least cost greenhouse gas mitigation portfolio⁶. The application of CCS solutions offers increasingly cost-effective and deep mitigation outcomes for the power sector, and also high-emitting industrial sectors such as iron and steel, cement and chemicals; which, without CCS, have few (if any) options to significantly abate their greenhouse gas emissions.

Funds raised through the sale of 300 million carbon allowances in first and second calls of the NER programme have been awarded to one CCS demonstration project, the UK White Rose Oxy combustion project⁷.

The Institute welcomes this award decision and strongly supports existing EC measures and programmes, particularly the NER, as the main source of funding for CCS activities in Europe. However, these funds are insufficient to adequately drive CCS as commercially attractive investments.

In the European Union, more specifically in the UK and the Netherlands, there are four large scale CCS projects in advanced planning (ROAD, Peterhead, White Rose and Don Valley) and planned to commence operations in 2017-2020. Outside the EU, Norway has two operational large scale CCS projects⁸.

The Institute has recently observed an increasing vulnerability of the NER's demonstration funding to sharply lower carbon prices and that many of the legacy funding programmes for CCS are either lapsing or cancelled.

The Institute recommends that the EC further consider CCS in its mix of projects both within its prevailing investment portfolio and in future policy measures in order to ensure deep decarbonisation, energy security and energy affordability outcomes. The EC could increase its own propensity to support pre-commercial demonstration projects that meet a broader range of objectives including mitigation, energy security, sustainable development and medium/long term competitiveness.

⁵ http://ec.europa.eu/clima/policies/lowcarbon/ner300/index_en.htm

⁶ The IPCC's 5th Technical Assessment Report states that without CCS, total mitigation costs to meet a 450ppm target over the period 2015 to 2100 increase by some 138%.

⁷ July 2014, <http://www.globalccsinstitute.com/project/white-rose-ccs-project-formerly-uk-oxy-ccs-demonstration>

⁸ Annex I - Large Scale projects in Europe, March 2015

To enable transition to an actual portfolio of projects and to provide a basis for expansion elsewhere in Europe, additional financial support measures in the period 2021-2030 are critically needed. Therefore, the innovation fund is an essential incentivising factor for the private sector to invest in CCS technology, specifically in the current context of low carbon prices.

The Institute recommends the innovation fund be designed with a forward looking approach to low carbon technologies. This approach should lead to an innovation driven transition that is critical to reaching the climate objectives in a cost effective way, in line with the recent communication on a framework strategy for resilient energy union with a forward looking climate change policy⁹.

2. Extend timeline of entry into operation

Many projects which were awarded NER300 funds are currently delayed. As with many large scale renewable energy technologies (concentrated solar power and storage, offshore wind), CCS project proponents faces long project development times. It can take up to 10 years to plan, construct and operate large scale mitigation technologies.

Recipients under the first round were required to enter into operation no later than four years from the date of the award decision. This requirement created a disincentive for projects to apply for funding under the second round. To address this, European government officials recently approved a proposal by Member States to delay the timeline for the entry into operation by two years¹⁰. To avoid unnecessary constraints in the future, ***the Institute believes that the design the innovation fund should consider a longer period than four years between the date of award decision and the date of entry into operation.***

3. Simplify the application process

The Institute has observed that major barriers to participation in the award process were linked to over-formalised procedures; a lack of clarity in the Q&A part of the process; and a focus on technical parameters. The amount of documentation required to lodge an application under the scheme was large and has increased over time with the competition process being more onerous. In general, the NER300 processes tended to make bid preparation very costly and time consuming.

The nature of CCS projects will usually differ from a technical perspective. Therefore, it was seen as less useful to focus on the technical parameters of the project because a lot of this information only gets “flushed out” when the project moves into detailed design. There are strong arguments to suggest that it may be more important to focus on commercial aspects of the project, its deliverability and risk profile.

The Institute recommends the innovation fund be designed with stronger commercial and deliverability criteria and less emphasis on technical parameters. This would allow innovative technologies developed in the upcoming five years to be considered for funding by the innovation fund, increasing outreach to a wider portfolio of projects. Those projects are critical in driving large scale CCS deployment post 2020.

4. Assess viability of the award ranking criterion

The least Cost per Unit of Performance (CPUP) is used in the NER300 as the ranking criterion to award projects. CPUP is related to the amount of CO₂ stored in case of CCS projects. Industrial CCS

⁹ http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf

¹⁰ Implemented by EC decision, 5 February 2015

http://ec.europa.eu/clima/policies/lowcarbon/ner300/docs/c_2015_466_en.pdf

and CCS projects in the gas fired power generation are disadvantaged compared to other sectors, due to the lesser volumes of CO₂ captured. Such criteria could therefore be a limitation for certain types of CCS projects. A focus on CO₂ incremental abatement for instance could be considered, as based on a technology neutral framework.

5. Consider multi- funding and innovative financial instruments

The NER300 caps EU funding per project to 50% of the eligible costs and it limits the maximum funding per project to 15% of the total funding available under the programme. Considering that carbon prices have decreased significantly since the programme was launched, proponents faced a funding gap that materially affected the commercial viability of their projects.

To bridge this gap, the Institute supports the option of considering complementary sources of funding to improve the financial viability of CCS projects¹¹. The use of innovative investment vehicles encouraged by the European Investment Bank (EIB) could further leverage existing funding resources and de-risk investment by the private sector. The Institute has submitted its views on climate finance solutions to support deployment of CCS into the EIB's public consultation process on climate action¹².

INDUSTRIAL CCS

The European Council concluded¹³ the scope of the innovation fund be extended to support low-carbon innovation in industrial sectors. ***The Institute believes that tailored modalities for the industrial sector are not desirable. Laying down specific selection criteria or pre-defined amounts for industrial sectors would disqualify specific application of a wider range of innovative technologies.***

As stated in the previous section, the Institute recommends that modalities for applying to the innovation fund should be focused on a forward looking approach. Such modalities should be flexible enough to enable a wider project portfolio of innovative technologies. This would lead to an innovation driven transition that is critical to reaching the climate objectives in a cost effective way.

Industrial CCS must not be overlooked

Annual CO₂ emissions from the iron and steel, cement, chemicals and refining industries presently total approximately seven gigatonnes, or around 20% of total CO₂ emitted globally each year. Under a 'business as usual' scenario, CO₂ emissions from these sectors could grow by over 50% by 2050¹⁴. Reducing emissions from these industries is just as important as reductions in the electricity sector, and for many industrial processes deep emission reductions can only occur through abatement options such as CCS.

Many of the large-scale CCS projects currently in operation or under construction worldwide are in the industrial sector, mainly natural gas processing and fertiliser production, where the CO₂ is already separated as part of production and it is relatively inexpensive to capture compared to heavy industrial processes.

¹¹ For instance, the Juncker Investment Plan for Europe, European Energy Programme for Recovery (EEPR), Structural Funds and Cohesion Funds

¹² <http://www.eib.org/about/partners/cso/consultations/item/public-consultation-on-eib-approach-to-supporting-climate-action.htm>

¹³ http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/ec/145397.pdf

¹⁴ Global Status of CCS, 2014

However, these industries are relatively low emitters of CO₂ compared to the iron and steel, cement and chemicals sectors where, with current knowledge, the addition of CO₂ capture technologies would incur significant incremental costs. Significant decarbonisation in these industries is important to help meet global CO₂ emissions reduction goals; however, there is a paucity of large-scale CCS projects in these industries in either operation, construction or the advanced stages of development planning.

The lack of large-scale CCS projects in high-emitting industrial applications is of concern since CCS is the only technology that can help achieve deep reductions in CO₂ emissions in these industries in the longer term. The Institute believes that urgent attention must be given to the implementation of policies that incentivise the development and subsequent widespread deployment of CCS in high-emitting industrial applications.

The potential development of CO₂ hubs in highly industrialised areas in Europe is therefore a welcome development.

There are a number of initiatives and projects that have been and are currently being undertaken to examine the feasibility of the development of industrial hubs and clusters. These include National Grid's proposed Yorkshire and Humber Carbon Capture, Transportation and Storage (CCS) Cross-County Pipeline project¹⁵, the Tees Valley Industrial CCS study (Teesside Collective¹⁶) and work previously undertaken by the Rotterdam Climate Initiative (RCI¹⁷), the Port of Antwerp, and the Scottish Centre for CCS¹⁸. Initiatives of this type are vital to decarbonising industrial processes and products, and the EC should look favourably on supporting similar initiatives across Europe.

EU ETS AS CCS ENABLING POLICY

This section provides the Institute's high level observations on the reform of the EU ETS that can act as a stimulus in the deployment of CCS technologies in Europe.

EU ETS is vital for long term deployment of CCS

The Institute continuously tracks progress of large scale CCS projects. Surveys of project proponents strongly highlight that there is insufficient policy certainty to support a business case for large-scale CCS projects. CCS projects have large capital costs and long development times. Investors require long-term predictability if they are to invest in CCS.

Strong and clear emission reduction policies that have a technology neutral framework and encourage CCS and other low-carbon technologies are urgently needed and necessary for longer-term deployment.

The Institute believes that structural reform of the EU ETS after the 2020 period is vital to restore long term confidence in the business case of CCS and achieve emission reduction targets.

The EC conclusions on the 2030 package restates that "a well-functioning, reformed Emissions Trading System (ETS) with an instrument to stabilise the market will be the main European instrument to achieve the emission reduction targets".

Therefore, the Institute emphasises the urgency of action to reform the EU ETS to drive a well-functioning and appropriately carbon priced ETS.

¹⁵ <http://www.globalccsinstitute.com/insights/authors/stephenbrown/2011/06/02/large-scale-co2-transport-network-yorkshire-and-humb>

¹⁶ <http://www.teessidecollective.co.uk/>

¹⁷ <http://www.rotterdamclimateinitiative.nl/documents/Documenten/2012rcicasestudyfinalreport-opt.pdf>

¹⁸ <http://www.sccc.org.uk/expertise/reports/central-north-sea-co2-storage-hub>

Urgent need for a near term financial support for CCS

The fluctuation of the carbon price within the EU ETS market over the past six years has posed difficulties to projects in making reasonable and bankable estimations of future revenues. The fall of the carbon price has significantly reduced investments in emission reduction projects.

Given the current forecast for European Union Allowances (EUA) prices, the EU ETS is not expected to solve the imminent challenge to accelerate the momentum of CCS in Europe. ***Consequently, the Institute strongly believes that funding arrangements and policy mechanisms¹⁹ that complement a longer term policy driven by carbon prices are needed to enable current projects to progress faster through the development pipeline and enter construction.***

Considering that all designated NER300 funds have already been awarded with the second call of the programme (July 2014), there is currently significant risk for CCS projects in Europe as they face a gap of around seven years between funding programmes, with the innovation fund not expected to start monetising allowances until 2022 at the earliest. This poses significant challenges to CCS project developers in Europe. Therefore, innovative ideas are needed on how to boost immediate financial support for the implementation of demonstration projects in Europe.

The Institute acknowledges that the recommendation to bridge this gap between programmes as soon as possible was broadly supported by the CCS stakeholders during the review process of the Directive 2009/31/EC on geological storage of carbon dioxide (CCS Directive)²⁰.

The EC could consider reallocating funding returned from the NER300 programme that was awarded to successful applicants that have since decided to not to progress to construction.

The ROAD project in the Netherlands is the most advanced project in development planning in Europe and is ready to adopt a final investment decision if additional funding can be secured.

The Market Stability Reserve

The Institute observed that there was a surplus of around two billion allowances by 2013²¹, which could increase to more than 2.6 billion by 2020 in a Business as Usual (BAU) scenario. Having a large surplus depressed prices and therefore discourages companies from investing in green technology, thereby hampering the scheme's efficiency.

The need to stabilise the market is addressed by the proposed Market Stability Reserve (MSR), through which any surplus of allowances above a pre-determined level would be removed from the market, and reintroduced when the surplus falls. The MSR proposal is currently under discussion at the EU level and the Institute is closely following the exchange of views, specifically related to the start date and the review of the carbon leakage list. Both elements are likely to have an impact on the speed and the incentive for industrial sectors to drive investment towards low carbon technologies.

It is desirable that once the MSR is established, if carefully designed and managed, a proportion of the back loaded and unallocated allowances are moved to the reserve and made available for innovation technologies.

This mechanism, if run efficiently and at the speed required to make unallocated allowances available in the near term, could partly bridge the funding programme envisaged under the current scenario.

¹⁹ The Institute has provided its views on policy mechanisms to underpin the demonstration process in an earlier submission: <http://www.globalccsinstitute.com/publications/european-commission-CCS-consultation-paper-global-CCS-institute-submission>

²⁰ <http://www.ccs-directive-evaluation.eu/>

²¹ http://ec.europa.eu/clima/policies/ets/reform/index_en.htm

Elements of the EU ETS Directive that could enable CCS

The recent report of the CCS Directive assessment²² offers a comprehensive view from stakeholders on elements of the EU ETS that can be reviewed in the period after 2020 to enable CCS in Europe.

To assess how well the EU ETS Directive fits with the CCS Directive, the Institute recommends that the following main elements be considered:

- Shipping of CO₂: under the current modalities of the EU ETS regulation, shipping of CO₂ for the purpose of storage under the scheme is considered an emission and consequently the activity should be covered by the EU ETS. The majority of stakeholders agreed that shipping of CO₂ should be classified as an “installation” and included in the measuring and reporting guidelines of the EU ETS regulation.
- Biomass & CCS: there are several projects demonstrating combined application of biomass in different phase of demonstration, including potentially the White Rose Oxy combustion project in the UK. Stakeholders felt that the “negative emissions” from bio-CCS are not adequately treated under the current EU ETS. This could be of particular significance in the Nordic region, where incentives to undertake bio-CCS could provide an additional opportunity for sharing the costs for common infrastructures and storage of CO₂.
- Reporting and monitoring requirements under the CCS and the EU ETS Directive: under the EU ETS, CO₂ emissions captured, transported and stored are to be considered as not emitted. The operator of the capture installation secures the main financial benefit from not having to surrender allowances in relation to the captured CO₂, which is then transported to a CO₂ storage site in accordance to CCS Directive provisions. In the event of any leakage, the storage site operator would be liable to purchase EU Emission Trading Allowances to offset the CO₂ released. The operator is thus exposed to a potentially huge liability depending on the price of carbon at the time of leakage, which is unknown. This is perceived as an important risk by developers, as the value cannot be accurately estimated in advance. The Institute has recently released a report on long-term liability²³ that addresses this issue specifically.

²² <http://www.ccs-directive-evaluation.eu/final-report/>, 25 January 2015

²³ Legal liability and carbon capture and storage: a comparative perspective, Global CCS Institute & UCL Laws, October 2014. Section 8 (pp 34-36)

References

- The Global Status of CCS: 2014
<http://www.globalccsinstitute.com/publications/global-status-ccs-2014>
- The Global CCS Institute's submission to the European Commission's consultative communication on the future of carbon capture and storage in Europe, 2013
<http://www.globalccsinstitute.com/publications/european-commission-CCS-consultation-paper-global-CCS-institute-submission>
- The Global CCS Institute's submission to: the European Commission's evaluation process of the Directive on the Geological Storage of Carbon Dioxide Directive 2009/31/EC, August 2014
<http://www.globalccsinstitute.com/publications/global-ccs-institute-submission-european-commission%E2%80%99s-evaluation-process-directive-geological-storage-carbon-dioxide-directive-200931ec>
- Legal liability and carbon capture and storage: a comparative perspective, Global CCS Institute & UCL Laws, October 2014 <http://www.globalccsinstitute.com/publications/legal-liability-and-carbon-capture-and-storage-comparative-perspective>
- The costs of CCS and other low carbon technologies – Issues Brief 2011
<http://www.globalccsinstitute.com/publications/costs-ccs-and-other-low-carbon-technologies>
- CCS 2014, what lies in the store of CCS?, International Energy Agency, June 2014
- Business models for commercial CO₂ transport and storage – Delivering large scale CCS in Europe by 2030, June 2014, Zero Emissions Platform
- IPCC 5th Technical Assessment Report <http://www.ipcc.ch/report/ar5/wg3/>
- European Council Conclusions, 2030 climate and energy policy framework, 23-24 October 2014
- Final report support to the review of the Directive 2009/31/EC on the geological storage of carbon dioxide (CCS Directive), 25 January 2015
- Energy Union Package, a framework strategy for a resilient energy union with a forward-looking climate change policy, 25 February 2015

Annex I

Large-scale CCS projects in Europe, March 2015

| Name | Country | Project Lifecycle Stage | Capture type | Transport type | Storage type | Industry | Operation Date |
|--|----------------|-------------------------|---|--|------------------------------|------------------------|----------------|
| C.GEN North Killingholme Power Project | United Kingdom | Evaluate | Pre-combustion capture (gasification) | Pipeline (onshore to offshore) | Under evaluation | Power generation | 2019 |
| Caledonia Clean Energy Project (formerly Captain Clean Energy Project) | United Kingdom | Evaluate | Pre-combustion capture (gasification) | Pipeline (onshore to offshore) | Dedicated geological storage | Power generation | 2022 |
| Don Valley Power Project | United Kingdom | Define | Pre-combustion capture (gasification) | Pipeline (onshore to offshore) | Dedicated geological storage | Power generation | 2019 |
| Peterhead CCS Project | United Kingdom | Define | Post-combustion capture | Pipeline (onshore to offshore) | Dedicated geological storage | Power generation | 2019 |
| ROAD | Netherlands | Define | Post-combustion capture | Pipeline (onshore to offshore) | Dedicated geological storage | Power generation | 2017 |
| Sleipner CO ₂ Storage Project | Norway | Operate | Pre-combustion capture (natural gas separation) | No transport required (direct injection) | Dedicated geological storage | Natural gas processing | 1996 |
| Snøhvit CO ₂ Storage Project | Norway | Operate | Pre-combustion capture (natural gas separation) | Pipeline (onshore to offshore) | Dedicated geological storage | Natural gas processing | 2008 |
| White Rose CCS Project | United Kingdom | Define | Oxyfuel combustion capture | Pipeline (onshore to offshore) | Dedicated geological storage | Power generation | 2019-20 |