

UK Carbon Capture and Storage (CCS) Commercial Scale Demonstration Programme

Delivering Projects 2-4
(Further Information)

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Section 1. Introduction

- 1.1. The UK Government's Department of Energy and Climate Change (DECC) has the responsibility for energy policy and climate change mitigation policy. These two challenging areas are inextricably linked and decisions in one field cannot be made without considering the impacts on the other.
- 1.2. The Office of Carbon Capture and Storage (OCCS) is the part of DECC responsible for facilitating the delivery of Carbon Capture and Storage (CCS) as a key carbon abatement technology in the UK. This includes CCS for power generation and major industrial point sources. It is also tasked with helping to promote the rapid deployment of CCS globally. The actions needed for CCS to be successful will be undertaken using a coordinated approach through the OCCS.
- 1.3. The OCCS will set the strategic path for the use of CCS, facilitate the delivery of the demonstration programme, create the policy and support arrangements to stimulate private sector investment, and work with stakeholders to remove barriers to investment in, and development of, CCS in the UK and globally. It will also look to maximise the domestic and global opportunities for UK businesses and the UK economy that will arise from what will be a significant new global market.
- 1.4. In particular, OCCS is:
 - Facilitating the development of CCS technology, including the UK Demonstration Programme, innovation, and funding;
 - Working with stakeholders to ensure the wider framework for delivering CCS in the UK exists, including the regulatory environment and the necessary skills and capacity;
 - Raising levels of understanding about CCS within governments, industry and the public;
 - Coordinating strategy and policy on CCS, including the wider potential for application to gas generation and industrial processes; and
 - Leading on the development of a Roadmap, to guide future actions on CCS.
- 1.5. If you have any queries about this document please contact the Office of Carbon Capture and Storage:

occs@decc.gsi.gov.uk

Office of Carbon Capture and Storage
Department of Energy and Climate Change
3 Whitehall Place
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Section 2. Background and Overview of CCS

- 2.1. Fossil-fuel power stations play a vital role in providing the UK with reliable, affordable and secure electricity supplies – they can be operated flexibly in response to variations in demand from consumers and supply from other generators, which will become an increasingly important requirement as the amount of variable wind generation grows. Carbon Capture and Storage (CCS) is the only current means by which we can retain the benefits of fossil fuels in terms of significant resource availability, flexibility, affordability and diversity, whilst meeting our legally binding target to reduce carbon emissions by 80% from 1990 levels by 2050.
- 2.2. According to Committee on Climate Change (CCC) analysis, meeting the 80% target means effectively decarbonising electricity generation in the 2030s. CCS is expected to make a critical contribution in meeting these targets. DECC's 2050 Pathways¹ "balanced scenario" envisages 40GW of CCS by 2050. This would require roll-out of CCS at a rate of around 1.5GW per year from 2025 – roughly the equivalent of a medium size power station every year. To deliver this level of capacity by 2040 would require roll-out of 40GW of CCS at a rate of 3GW per year, a challenging rate of deployment similar to the peak rate at which gas fired power stations were delivered in the 1990s. Assuming construction time of 5 years, the first investment decisions would need to be taken around 2020, which means the technology needs to have been sufficiently demonstrated by then.
- 2.3. CCS technologies enable the carbon dioxide from fossil fuel power stations and other large point sources (e.g. iron smelting, cement manufacture, oil refineries) to be captured, transported and stored safely in underground geological formations. Whilst the different elements of the CCS chain have been demonstrated around the world and the full chain has been demonstrated on a small-scale (approximately 10-15MWe), the Global CCS Institute's Interim Report on the Status of Projects² (2010) confirms that the full chain has not been demonstrated at commercial-scale in association with a power station (i.e. capturing the carbon dioxide from around 300MW power generation).
- 2.4. The importance and urgency for demonstrating CCS is why the Government committed, in the Coalition Programme, to continuing public sector investment in 4 CCS projects.
- 2.5. A demonstration programme of 4 commercial-scale projects will allow the UK to gain understanding of different capture technologies and to build experience in the transport and injection of CO₂. The storage sites will also act as test cases for licensing and, later, for monitoring and verification, while also exploring the potential of North Sea (and possibly Irish Sea) storage for future projects.

¹ <http://www.decc.gov.uk/publications/Default.aspx?term=pathways&tags=&urn=&fromDate=&toDate=&alpha=>

² <http://new.globalccsinstitute.com/resources/publications/status-ccs-projects-interim-report-2010>

- 2.6. In 2007, when the process to select the first demonstration project was launched, the policy drivers for the project were focused on demonstrating the technology that had the most global relevance – which led to the conclusion that the first demonstration project should be on a coal-fired power station. The global and domestic context has, however, significantly changed since 2007.
- 2.7. Although coal was the original focus of the demonstration programme, the CCC's 2nd progress report recommended that CCS should also be demonstrated on gas. This rationale is based on the UK having a large gas power station capacity (greater than 30GW) expected to be on the system by 2020. The CCC also consider that developments in gas supply mean that gas may be more secure and lower cost than previously expected. In light of the CCC advice and underpinning evidence (including from our recent Market Sounding exercise) and the changing shape of the energy markets, we will allow CCS projects on gas-fired power stations to come forward under the process to select a further 3 CCS demonstration projects ("Projects 2-4").
- 2.8. In the Spending Review, the Government announced up to £1b to support the capital costs of the first demonstration project (the largest confirmed funding commitment to a single project in the world) and also took the decision to re-assess the means of supporting the additional 3 projects that will make up the UK CCS Demonstration Programme to ensure that funding is provided in the most efficient and cost effective way. Decisions on the means of supporting these projects, i.e. whether through general public expenditure or a specific levy, will be taken following completion of work on the carbon floor price. The process to select participants for Projects 2-4 under the Programme will therefore be launched following Budget 2011.

Key Features of the UK CCS Demonstration Programme

- 2.9. This document sets out the framework under which Projects 2-4 of the Programme (hereafter referred to as "the Programme") will be delivered. Projects will support the demonstration of commercial-scale CCS on 3 electricity generation stations that are connected to the GB grid and / or dedicated to serving a facility(s) e.g. industrial facilities.
- 2.10. These demonstration projects will:
- Utilise any combination of fuel and capture types i.e. coal or gas using pre-combustion, post-combustion or oxyfuel capture;
 - Be scaled to around 300-400MWe (net);
 - Have the prospect of operating for at least a 10 – 15 year demonstration period and preferably longer; and
 - Be carried out on new build, refurbished or on existing generation plant.
- 2.11. The DECC funding contribution to projects will include a level of commercial return necessary to attract private sector investment. Any funding awarded to projects under the Programme will be contingent on securing state aid approval from the European Commission.

2.12. It is expected that funding support from DECC will be provided on a 'revenue' type basis e.g. payment per tonne of CO₂ abated or per kWh of electricity supplied (see Section 5 for more details), and for up to 15 years from the date of commissioning of the project, or up to an agreed maximum. In addition, and depending on the final basis for payment, projects will be expected to receive the market value of electricity generated and any other forms of revenue or benefits that accrue to the project.

Purpose of this document

2.13. In November 2007³ the UK Government launched a procurement under which industry were able to apply for financial support to bring forward the first fully integrated commercial-scale CCS demonstration project in the UK. That process is now at an advanced stage with contract signature expected in 2011. DECC is now developing the process for bringing forward a further 3 commercial-scale CCS demonstration projects.

2.14. This document sets out information and guidance on our Programme for bringing forward these projects. The primary purpose of the document is to assist those wishing to participate in the Programme, by providing, amongst other things' an early indication of the likely requirements projects will need to meet, and the process for their selection. It provides an opportunity, ahead of the Programme's launch, for applicants to consider whether they might meet the eligibility criteria for projects and to begin to build partnerships or collaborations to deliver projects.

2.15. Specifically, this document provides an overview of the;

- Background, aim and objectives of the Programme;
- Requirements for individual CCS projects ;
- Selection process for individual CCS projects;
- Financial support mechanism for CCS projects;
- Regulatory and policy issues that have relevance to projects; and
- Application process

2.16. It also details how we will seek to co-ordinate the Programme and the European Commission's New Entrant Reserve 300 Scheme.

2.17. Whilst we have endeavoured to provide information contained within this document as clearly and accurately as possible, there may be areas on which potential applicants will wish to seek further clarity. This opportunity will be provided to potential applicants prior to the launch of the Programme expected in Spring 2011. Further information on the Programme will be published on the OCCS section of the DECC website⁴ .

³ http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/demo_prog/demo_prog.aspx

⁴ http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/ccs.aspx

2.18. **Potential applicants should note that while the intention of this guidance is to provide early sight of our proposed approach for bringing forward the 3 further CCS demonstration projects, it may not fully reflect the final detailed design of the Programme.**

European Commission’s New Entrant Reserve 300 Scheme

2.19. The New Entrant Reserve 300 Scheme (NER) is a European Union led funding programme to support CCS and innovative renewables projects. The NER makes funding available for commercial-scale CCS projects, with the funds generated through the sale of 300 million EU Emissions Trading Scheme (EU ETS) allowances from the New Entrant Reserve of Phase 3 of the EU ETS. The European Commission estimates that the sale of these allowances will raise between €4.5bn and €9bn, dependent on the carbon price.

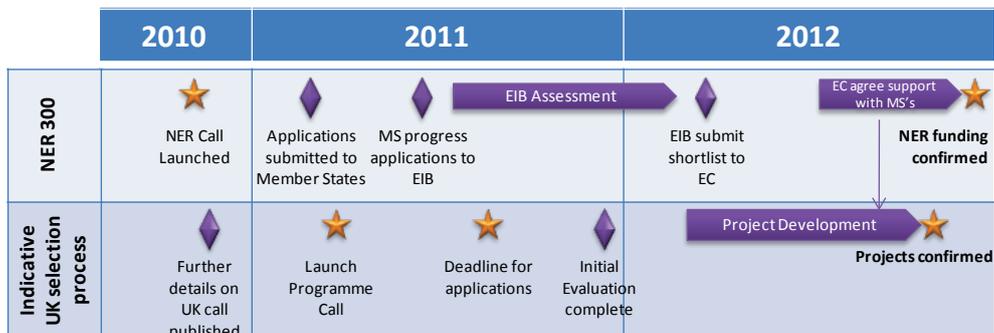
2.20. The Commission intends to publish two calls for proposals. The first of those calls was launched on 9th November and will be funded from the sale of 200 million allowances, which could provide between €3-6bn of funding.

2.21. Proposers for UK located CCS demonstration projects that meet the NER eligibility criteria may apply for funds under the scheme, as well as for funding delivered through the Programme described in this document.

2.22. DECC has recently published guidance on the NER⁵ and has sought, wherever, reasonably possible, to harmonise the NER and the proposed approach to the UK Programme. Figure 1 shows the indicative timelines for the award of support under the NER and UK Programmes.

Indicative Timetable

2.23. Figure 1: Indicative timelines for the EU NER and UK Programme.



⁵ http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/ccs.aspx

Next Steps

- 2.24. Building on the OCCS's recent Market Sounding exercise⁶ carried out over the summer we now wish to continue the dialogue we have established with prospective applicants to the Programme.
- 2.25. Starting in early 2011 the OCCS will be holding a number of '*Programme Surgeries*' that will enable prospective applicants to discuss the proposed approach that is set out in this document in more detail and to seek clarity on any of its more detailed aspects. However, we will not be able to enter into a dialogue or provide feedback about specific projects as part of this process.
- 2.26. We hope that publishing this pre-launch document will provide potential applicants with a useful lead-in to the Programme, and so help to deliver an accelerated programme, minimising the overall timeline to project start dates.

⁶ http://www.decc.gov.uk/en/content/cms/consultations/mktsound_ccs/mktsound_ccs.aspx

Section 3. Framework for the UK CCS Demonstration Programme

Background

- 3.1. The UK's first commercial-scale CCS demonstration project is being delivered through an ongoing procurement, launched in 2007. The aim is for that project to be constructed by 2014/15. Up to £1 billion was awarded in the October 2010 Spending Review for the capital costs of this first demonstration project.
- 3.2. Over the summer the OCCS conducted a market sounding exercise to engage with key industry stakeholders to gauge their interest in participating in further CCS projects. We also explored views on options for their delivery. A summary of the responses received can be found on the DECC website⁷. These discussions helped to inform our approach towards the design of the key aspects of the Programme.

Principal Drivers for the UK CCS Demonstration Programme

- 3.3. There are a number of key policy drivers that underpin the Programme. These are:
 - Meeting the UK's carbon abatement commitments;
 - Enhancing diversity and security in UK electricity supply; and
 - International leadership on climate change.
- 3.4. In addition to the energy and environmental benefits that will be realised from the accelerated development and early deployment of CCS the Programme will help to stimulate the establishment and development of a UK CCS supply chain providing green business opportunities and job creation, as well as safeguarding existing jobs by helping to retain carbon intensive industries in the UK.
- 3.5. Analysis of these drivers has led to an overarching objective for the 3 further projects under the Programme, principally; *'To prove the CCS technologies most relevant to UK deployment both technically and economically so that they are ready for commercial deployment by 2020'*.
- 3.6. Our vision for this Programme is to maximise the prospects for achieving the overarching objective, by providing the UK with experience of a range of alternative CCS technologies and approaches. It will therefore be important for selected projects supported under the Programme to have a high probability of success, to be affordable and to represent value

⁷ http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/ccs.aspx.

for money. The principal rewards to project developers should be the benefits of owning and operating a CCS plant in a sector that will need to decarbonise in the 2030's. We also expect it will provide enhanced credibility of CCS technologies, and as a result increase the value in the businesses developing the technologies. The Programme should therefore encourage private-sector investment in projects whilst ensuring that any financial returns from the operation of projects under the Programme fairly reflect the risks involved as well as the value of the credibility, experience, business-value, know-how and intellectual property generated.

- 3.7. The learning and transfer of knowledge that are expected to flow from the Programme should help stimulate the widespread deployment of CCS by providing information on the costs and performance of CCS technologies at commercial-scale. Our proposed approach to Knowledge Transfer is set out under Section 6.

Eligibility for the Programme

Eligibility of Projects

- 3.8. Consistent with the approach described in earlier sections of this Document we currently envisage that a number of project eligibility criteria will be set to aid applicants prepare their proposals, ensure compliance with the objectives and assist with the selection of projects. These are likely to include the following;
- Projects will include the full chain of CCS technologies i.e. fully integrated carbon capture, transport and geological storage.
 - The power plant and capture facility must be located in Great Britain and the storage site located offshore, likely to be required within the UK territorial sea and gas importation and storage zone (GISZ).
 - Projects must be connected to the GB grid and / or dedicated to serving a facility(s) e.g. industrial facilities.
 - The CO₂ capture method must be based on post-combustion, pre-combustion or oxyfuel methods.
 - Projects must be fuelled predominantly by coal or gas.
 - Projects must be of a commercial-scale, where power thresholds are expressed as net electrical output after installation of CCS. This is expected to be around 300MWe – 400 MWe (net) depending on capture technology and fuel.
 - Projects should be fully operational by no later than 2018, although earlier operation would be desirable.
 - Projects will be expected to abate quantities of CO₂ consistent with levels expected of the plant operating under usual commercial conditions. We currently anticipate these levels would be around 1-1.5Mt CO₂ annually for projects on coal-fired power stations and around 0.5-0.75Mt of CO₂ annually for projects on gas fired power stations.
 - Projects must be designed so as to be capable of delivering flexible and baseload operation.
 - Projects may be carried out on new build, refurbished or on existing power generation plant.

Eligibility of Applicants

- 3.9. The Programme will be open to businesses or consortia of businesses.
- 3.10. DECC recognises the challenges in developing and undertaking a project of this nature. Applicants will need to demonstrate their ability, willingness and intention to commence implementation of their projects immediately and provide evidence that they have sufficient technical, financial and commercial resources and ability to carry out the project. In order to do this applicants may elect to form consortia. DECC envisages that this may result in one of the following structures:
- A single organisation
 - A consortium of organisations acting together through a special purpose vehicle, joint venture or otherwise.
- 3.11. Consortia proposing to operate through a collaborative agreement should have an agreement in place at the time they submit their application and may be required to provide a copy of the signed legal agreement with their application. They must, as part of the application, nominate a lead partner to whom any funding provided under the Programme would be paid on their behalf.
- 3.12. Consortia proposing to operate through a joint venture should have the joint venture vehicle in place at the time they submit their application and may be required to provide a copy of the relevant legal agreement(s) with their application.

General requirements

- 3.13. As well as meeting the indicative project and applicant eligibility criteria, projects are likely to have to demonstrate that:
- They have plans to be fully compliant with all relevant regulatory requirements, secure all necessary permissions and consents and meet health and safety requirements and industry standards;
 - They have a viable plan for delivering the project; including a credible technical approach for its implementation and operation that meets the requirements and delivers the objectives of the Programme; and
 - They will meet in full an agreed set of conditions for monitoring, data collection and information and knowledge transfer. Further detail of our intended approach for the sharing of information generated by projects is set out under Section 6.

Information Requirements

Monitoring and Reporting

- 3.14. Projects will be required to agree a comprehensive monitoring, data collection, verification, evaluation and reporting regime. There are a number of purposes for these requirements.
- 3.15. The first is in respect of financial support payments that will be payable to projects subject to the delivery of agreed outputs i.e. CO₂ abated or electricity supplied. Accurate quantification of CO₂ stored and abated by the project will also be necessary to meet regulatory requirements for the capture, transport and storage of CO₂. Given the continuous monitoring of CO₂ emissions will be important for demonstration purposes we expect that monitoring requirements will be over and above those normally required by a power station.
- 3.16. In addition, the collection, verification, analysis, evaluation and reporting of information and data on key aspects of each stage of a project i.e. design through to construction, commissioning and ongoing operation will be required in order to deliver agreed knowledge transfer outputs.

Financing Approach

- 3.17. DECC is not intending to specify to applicants the type of financing approach that they should use for a project. DECC expects that this flexibility will enable applicants to select the best overall financing approach for their project, using whatever sources and funding types they consider most appropriate.
- 3.18. Applicants will be expected to demonstrate that the overall financing approach is transparent, financially robust and deliverable.

Section 4. Selection Process for CCS Projects

Background

- 4.1. DECC expects that there will be a significant level of interest in the opportunities offered under the Programme. We will apply a fair and transparent process for selecting projects to be supported under the Programme. Our current intention is that the selection process will consist of two broad stages – a first stage to identify those projects that best meet the eligibility criteria, and a second stage to evaluate detailed proposals and costs. Detailed information about the selection process will be set out as part of the Programme launch, expected in Spring 2011.

Options for Selection Process

- 4.2. As part of the Market Sounding exercise conducted by OCCS over the summer, we presented and discussed with stakeholders two broad approaches for the selection of projects.

Option 1

Under Stage 1 of this option, projects would be assessed against eligibility criteria, with any number of projects then invited to progress to Stage 2. The second stage would consist of a process designed to gain a more detailed understanding of each of the projects, partly through a Front End Engineering Design study (FEED), to be funded by the applicant. Selection of the three preferred projects would be after completion of Stage 2 of the process.

Value for money would be achieved through competition between proposals. Projects selected at the end of Stage 2 would move to contract signature.

Option 2

Under Stage 1 of this option, as for Option 1, projects would be assessed against a number of criteria, but with no more than three projects then invited to progress to Stage 2. Those projects would then provide more detailed proposals (equivalent to FEED), particularly on costs. Subject to DECC's assessment of affordability and value for money, those projects would move to contract signature.

The majority of those that responded to our Market Sounding favoured this option as they felt it offered the advantages of :

- Closer co-operation and co-ordination between the applicant and DECC through greater openness and communication;
- Speedier advancement of projects and shorter overall timescale to financial close and eventual delivery; and
- Greater opportunity for DECC and applicants to work collaboratively to optimise the design of the FEED and project.

- 4.3. We aim to take this feedback into account, along with the experience and lessons learnt from the process that has been applied for the first CCS demonstration project, when finalising the selection process for the Programme. We therefore intend to explore further how we might develop a selection process which offers the above benefits whilst meeting our requirements for value for money.

Application Evaluation

- 4.4. Our intention is that applications will be assessed against a number of criteria. These will reflect the objectives of the Programme and can be grouped into three key areas:
- Key technical objectives relating to the scope and scale of the project;
 - Deliverability – reflecting whether the proposal is mature from a technical, financial, commercial and management perspective; and
 - Knowledge Transfer– relating to dissemination of data and learning from the project.
- 4.5. In addition the applicant's eligibility is likely to be assessed against:

- Understanding of, and experience in the design, construction, commissioning and operation of commercial-scale electricity generation stations and CO₂ capture, transport and storage;
- Project Management and Delivery;
- Governance across a complex supply chain;
- Financial robustness;
- Ability to secure private sector investment; and
- Affordability and value for money.

- 4.6. Potential applicants to the NER should note that while we are seeking to harmonise our design and delivery of the Programme with the NER, at this relatively early stage it is not possible to provide assurances that decisions on UK Government funding will be possible within indicative decisions points in the NER timeline. Proposals to the NER will be assessed using a separate process to the UK Programme.
- 4.7. The devolved administrations will be consulted in respect of any applications coming forward from their areas.

Section 5. Financial Support Mechanism for CCS Projects 2-4

5.1. This section provides an overview of the options for providing financial support and the approach to risk allocation for CCS Projects 2-4. The financial support mechanism and risk allocation will be designed to support projects, incentivise their efficient and effective delivery and operation and meet DECC's requirements.

Background

5.2. There is general consensus that the next step towards commercialisation of CCS is commercial scale demonstration. Although there is considerable confidence that CCS can be deployed effectively at commercial-scale, there is, as yet, no practical experience of operating such a facility. In summary, the steps that we believe are needed to take CCS towards commercialisation are:

- Initial demonstration of the technology at commercial scale, to prove technically the full integrated CCS chain and get a better understanding of both capital and operating costs. This is where activity currently lies including the first UK demonstration project and demonstrations elsewhere.
- Transition to commercial viability, where there is some experience with the technology from a first wave of large scale projects, but where further demonstration is needed to prove CCS, driving down technical and investment costs and risks as well as testing the commercial relations between the different parts of the CCS chain. This is where we see the contribution of the Programme.
- Full commercial deployment, where technical and economic viability is proven and investors can choose CCS as one of a suite of low carbon options. Ultimately, our goal is that the market framework will eventually incentivise such choices, but this will only happen once the technology has been sufficiently demonstrated.

Level of support

5.3. It is recognised that the development and operation of a project will involve costs which are not directly recoverable from the sale of electricity in the market. The financial support mechanism will therefore need to meet the additional capital, operating and maintenance costs of a project.

5.4. DECC will contribute direct funding to a project which includes an amount reflecting the level of commercial return necessary to attract private sector investment.

Options for Financial Support Mechanism

- 5.5. Since the inception of Projects 2-4 our expectation has been that projects will be supported through payments linked to outputs (i.e. electricity supplied or CO₂ abated).
- 5.6. The CO₂ abated payment would likely involve a 'contract for difference' with the EU Emissions Trading Scheme (EU ETS) carbon price for abatement delivered. The CCS projects would receive a fixed 'strike price' per tonne of CO₂ abated, measured relative to an agreed counterfactual based on the emissions from an unabated fossil generation plant. This strike price would be paid minus the price for European Union Allowances (EUA's) under the EU ETS.
- 5.7. The electricity supplied payment approach, would involve CCS projects being paid a fixed amount, per unit of electricity supplied, in addition to the revenue gained from selling their electricity in the wholesale market.
- 5.8. Both these approaches have pros and cons, including their fit with any future mechanism for supporting the deployment of low carbon technologies, for example the options set out in the recently published consultation on Electricity Market Reform⁸ (EMR).

Electricity Market Reform

- 5.9. The Government is consulting on a package of options for reforming the electricity market. The proposals are designed to strike a balance between the best possible deal for consumers and giving existing players and new entrants in the energy sector the certainty they need to raise investment. Specifically, they are designed to ensure that low-carbon technologies become a more attractive choice for investors, and adequately reward back-up capacity to ensure the lights stay on. The proposals set out in the recently published EMR consultation document include measures for an Emissions Performance Standard, Feed-in-Tariffs and Capacity Payments. A separate consultation document on a Carbon Price Support mechanism has also been published.
- 5.10. These proposals have the potential to impact on the design of any financial support mechanism for CCS projects. We therefore intend to keep the details of the financial support mechanism under review and will provide further information as our approach to delivering the Programme is finalised.

Additional Funding from other sources

- 5.11. Projects in the Programme could potentially be supported by a combination of funding sources; public expenditure (national or regional sources), EU funding and private funding. The receipt by a project of public funding from other sources, for example through

⁸ <http://www.decc.gov.uk/en/content/cms/consultations/emr/emr.aspx>

the EU NER300 scheme or regional funding body, will be taken into account in the payment mechanism and will give rise to an equivalent reduction in the level of support provided by DECC to a project.

Risk Allocation

- 5.12. Consistent with the general preference for a market-led solution, DECC considers that the generality of risks and uncertainties inherent to the construction and operation of a major plant, transport systems and offshore facilities should be mitigated, managed, borne and funded by the project developer and its supply chain.
- 5.13. Any proposals by projects to share other specific risks with DECC should be made on an “exception” basis and will only be considered where a project can demonstrate value for money to DECC from any such arrangement.
- 5.14. The project contract will set out the final risk allocation between the parties.

State Aids

- 5.15. The quantum and approach for the provision of financial support to projects under the Programme will be subject to the securing of State Aids approval from the European Commission.

Section 6. Relevant Policy Issues

Background

- 6.1. There are a number of key policy issues that are likely to affect prospective applicants' approaches to their CCS projects. This section sets out our current thinking on a number of these key areas.

Knowledge Sharing

- 6.2. Projects will need to meet information and knowledge sharing requirements in order to facilitate further commercial-scale CCS projects. The meeting of these key requirements (which are likely to go beyond the requirements applied for the purposes of the NER is likely to form part of the payment mechanism.
- 6.3. At this stage, our expectations are that data will be collected, quality assured, made accessible and disseminated (including providing access to experts) on the key aspects of each stage of a project, including:
- Designs and changes to the designs through the phases of the project;
 - Complying with consenting and regulatory processes;
 - Commercial mechanisms used, approach to risks and risk sharing;
 - Costs;
 - Operational performance;
 - Storage and containment monitoring;
 - Project governance and management; and
 - Learning through the phases of the project, including insights that inform key decisions and risk management plans.
- 6.4. Further details of our intended approach will be set out prior to the formal launch of the application process for the Programme.

Shared Infrastructure

- 6.5. There is potential for projects to share infrastructure e.g. transport pipelines and / or storage facilities. Such sharing of common infrastructure may be economically advantageous, by reducing the overall combined cost of the sharing projects as well as providing greater opportunities for learning; for example, to test the compatibility between different capture technologies when using common infrastructure, or the robustness of the infrastructure network (i.e. the interdependence between multiple emission sources).

- 6.6. While it is clear that there are potential merits in the sharing of infrastructure it is also clear that there are potential costs and benefits that companies are best placed to assess. For example, if co-location requires capture projects to be located further away from their storage sites this will add costs by requiring longer and so more expensive pipelines to transport their CO₂. In contrast some sites may entail lower fuel delivery costs or lower transmission charges, and present more straightforward licensing requirements for either the capture plant or the pipeline.
- 6.7. For these reasons we propose to leave the selection of the location for demonstration projects open to applicants who are best placed to assess costs against benefits.
- 6.8. The Programme will not therefore require sharing of infrastructure, but will encourage applicants to come forward with innovative solutions, that reduce costs or enhance delivery. Any such sharing will not be taken into account in the assessment of projects under the UK Programme when weighing overall delivery of non-monetary objectives against price and value for money.

Shared Infrastructure - Treatment of Costs

- 6.9. Where a project shares infrastructure with another project, it is likely to need to provide within the application both:
- the apportioned costs of the shared infrastructure relating to the project; and
 - the total costs of providing such infrastructure as is necessary to deliver the project independently as well as evidence that those costs can be met.
- 6.10. For the purposes of the selection process, projects that include shared infrastructure, will be considered as distinct projects during their assessment.
- 6.11. We expect that any approach adopted by applicants in this respect will be strongly influenced by a number of factors including the geographical locations of the CO₂ point sources sharing the infrastructure, planning (routes), storage locations and options in the short and medium-longer term.

Oversizing of Infrastructure

- 6.12. Applicants may propose projects that involve oversized CCS infrastructure capable of capturing, transporting or storing CO₂ exceeding the capacities required for the demonstration project. However, the cost of oversizing must be supported entirely by the applicant or other private sector investors without reimbursement by DECC and should not increase the overall risk to the public sector funds invested in the project.
- 6.13. Where applicants wish to include the oversizing of elements of the CCS chain in their project they will be required to articulate an acceptable and transparent basis for

allocating costs, revenues, assets and liabilities between the distinct project infrastructure and the oversized element of the infrastructure.

Reuse of Oil and Gas Infrastructure

- 6.14. Projects may include within their projects the use of existing oil and gas infrastructure. Any regulatory implications of such re-use, including UK taxation laws that apply to the change of use of existing oil and gas infrastructure in the North Sea will need to be identified by applicants, together with any implications, financial or otherwise, that may impact on the deliverability of a project.

Pipes vs Shipping

- 6.15. The transport of CO₂ captured by projects to the designated permanent storage site may be provided by pipeline or another approved means of transport including shipping. Pipelines can be either newly constructed or modified existing pipelines. In either case projects will be required to ensure that their approach for transporting CO₂ meets all relevant regulatory requirements, including those pertaining to health and safety. In the case of re-used pipelines projects will need to show that the remaining lifetime of those assets is sufficient to meet the Programme requirements i.e. can achieve the minimum period for demonstration of the CCS chain.

Enhanced Oil Recovery

- 6.16. It is recognised that “Enhanced Oil Recovery” (EOR) linked to CCS projects, could make the economics of the project more attractive and reduce the amount of financial support needed for projects. Projects that include EOR will be eligible to participate in the Programme as long as they meet the overall eligibility criteria.

Decommissioning

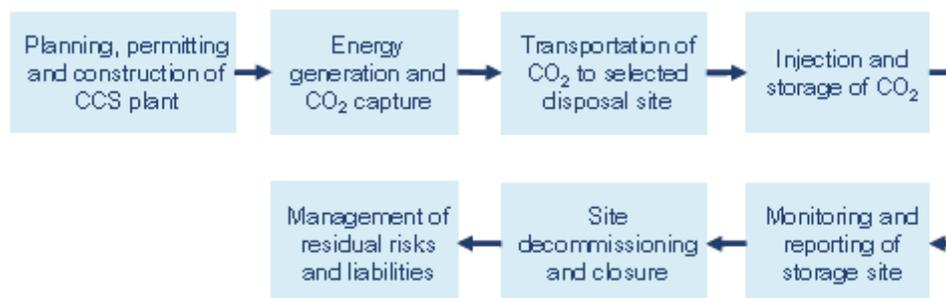
- 6.17. Projects will need to demonstrate that they have plans for making adequate provision for the complete and safe decommissioning of all facilities that fall within the scope of the supported project and in accordance with all relevant regulatory requirements.

Section 7. Regulatory Issues Relevant to Projects

Background

- 7.1. CCS projects are complex industrial developments and will be subject to a number of consenting, regulatory and policy requirements. Those requirements may vary, both in substance and application, in different parts of Great Britain. It will be for those proposing projects to satisfy themselves that these various requirements can be met, and to assess the likelihood of achieving the necessary consents and permissions within the timescale of their proposal.
- 7.2. Over the lifetime of a CCS project, the areas of regulation could be considered sequentially, as illustrated in figure 2.
- 7.3. This section sets out some of the key areas that project proposers may need to consider to satisfy themselves on this point, within the jurisdictions in which their projects are located.

Figure 2: Areas of regulation



Health and Safety

- 8.4 The Health and Safety at Work etc Act 1974 and relevant statutory provisions made under the Act will apply across the length of the CCS process chain from power generation to CO₂ injection. HSE will keep under the review the need to introduce or extending any existing regimes (e.g. Pipeline Safety Regulations) as the science and evidence base develops.

Planning, Permitting and Construction of Power Stations and Capture Facilities

- 7.4. In England and Wales deemed planning permission for a power station over 50MW is issued through a development consent under the terms of the Planning Act 2008. There is a draft National Policy Statement (NPS) governing the issue of development consents on fossil fuel generating infrastructure⁹. The main requirements in the draft NPS are that all combustion power stations should be constructed carbon capture ready and new coal-fired generating stations must be constructed with a full CCS chain fitted on at least 300 MW net of their proposed generating capacity. Further guidance of carbon capture readiness¹⁰ is also available. Depending on the nature of the development a Hazardous Substance Consent under the Planning (Hazardous Substances) Act 1990 and Planning (Control of Major Accident Hazards) Regulations 1999 may also be required.
- 7.5. In Scotland Scottish Ministers determine consents relating to thermal power stations over 50MW under s36 of the Electricity Act 1989. Guidance in Scotland is set out in 'Guidance on Thermal power stations in Scotland published in March 2010'¹¹ (this guidance is broadly aligned with the basic principles applied in England and Wales, although Scottish legislative provision, planning and consenting procedures are different).
- 7.6. Capture facilities located within the power station boundary also come within these consenting arrangements.
- 7.7. Environmental consents in relation to water abstraction and wastewater, solid wastes, local airborne emissions and site-specific Environmental, Health and Safety (EHS) requirements would need to be sought in the normal way under the procedures contained in England under the Environmental Permitting Regulations, the Water Resources Act 1991 and the Water Industry Act 1991. In Scotland consents would be sought under the Pollution Prevention and Control (Scotland) Regulations 2000 and under the Water Environment (Controlled Activities) (Scotland) Regulations 2005 for water abstraction.
- 7.8. Since the plant will have a thermal capacity exceeding 20MW, it will also be bound by the requirements under the Greenhouse Gas Emissions Trading Regulations 2005 which transposes the EU Directive establishing the EU Emissions Trading Scheme (EU-ETS).
- 7.9. Compulsory Purchase Orders and wayleaves may also be needed, depending on the nature of the Project.

⁹ <https://www.energynpsconsultation.decc.gov.uk/energy/fossil> (ISBN: 9780108509353)

¹⁰ http://www.decc.gov.uk/en/content/cms/consultations/ccr_consultati/ccr_consultati.aspx (URN 09D/810)

¹¹ <http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Thermal-Guidance>

Energy generation and CO₂ capture

- 7.10. Once the plant is operational, the Project will be required to adhere to various permit and licensing conditions pertaining to the generation aspects and provide monitoring and other reportable data on environmental and other parameters to the enforcing agencies (HSE, Environment Agency, Scottish Environment Protection Agency, etc) in the normal manner.
- 7.11. CO₂ permanently stored under the terms of the CCS Directive (below) counts as not-emitted under Phase III of the ETS Directive. Until then they can be opted in to Phase II. A project that comes within the ETS Directive requirements will be required to follow prescribed monitoring and reporting guidelines and surrender EU allowances to cover verified emissions on an annual basis.

Transportation of CO₂

- 7.12. It will be for the project proposer to decide on the most appropriate means of transporting the CO₂ from the capture facility to the storage location.
- 7.13. The construction of onshore (longer than 16km) and offshore pipelines are subject to regimes set out in the Pipelines Act 1962 onshore and the Petroleum Act 1998 offshore. They may also be subject to Environmental Impact Assessment.
- 7.14. In England and Wales a pipeline authorisation under the Pipelines Act 1962 is issued in the form of a development consent under the Planning Act 2008. There is no draft National Policy statement that specifically applies to pipelines conveying CO₂, although the overarching Energy NPS¹² contains guidance of a general nature on CCS. The National Policy Statement on Gas Supply Infrastructure and Gas and Oil Pipelines¹³ may also provide useful information for project developers to take into account. In Scotland Construction Authorisations under the Pipelines Act are issued by Scottish Ministers.
- 7.15. CCS transport and Storage Infrastructure will also be subject to third party access requirements of the EU Directive on the Storage of Carbon Dioxide (Directive 2009/31/EC). The Government is currently consulting on how to implement most effectively these arrangements. (Developing Carbon Capture and Storage Infrastructure¹⁴).

Storage of CO₂

- 7.16. The demonstration programme will not support projects that involve onshore storage of CO₂. Storage in the UK offshore area will require compliance with the terms of a storage

¹² <https://www.energynpsconsultation.decc.gov.uk/overarching> (ISBN: 9780108509346)

¹³ <https://www.energynpsconsultation.decc.gov.uk/energy/gas> (ISBN: 9780108509377)

¹⁴ http://www.decc.gov.uk/en/content/cms/consultations/ccs_3rd_party/ccs_3rd_party.aspx (URN 10D/989)

licence issued under the Energy Act 2008. This licence will implement requirements set out in the Storage of Carbon Dioxide (Licensing) Regulations 2010 and the Storage of Carbon Dioxide (Licensing etc) (Scotland) (Regulations) 2010. These also implement relevant requirements of the EU Directive on the Storage of Carbon Dioxide (Directive 2009/31/EC).

- 7.17. A storage site will also be subject to the offshore environmental regime already applying to oil and gas by virtue of the Energy Act 2008 (Consequential Modifications) (Offshore Environmental Protection) Order 2010. In parallel to obtaining a storage licence it will also be necessary to obtain rights to utilise the sub-surface porous space for storage. These rights are vested in The Crown Estate under the terms of the Energy Act 2008.
- 7.18. Transport and storage of CO₂ will also be subject to the EU Emissions Trading Scheme.

International Agreements Impacting on Offshore Storage

- 7.19. Two international agreements currently restrict the scope of offshore storage projects in UK waters – the OSPAR Convention and the London Protocol. Both have been amended to remove the relevant restriction, but in neither case has the amendment been ratified. The precise timing of ratification is uncertain, although the Government is seeking to influence the other parties to do so as soon as possible.
- 7.20. Until the amendment to the OSPAR Convention is ratified the re-use of existing offshore structures for the purpose of CO₂ storage will contravene the Convention. The use of new offshore structures or the direct injection of carbon dioxide without the need for offshore structures are not affected by the Convention.
- 7.21. The London Protocol prohibits the dumping of waste at sea. It was amended in November 2006 to permit permanent storage of CO₂, subject to certain conditions. The London Protocol also prohibits the cross-border transfer of CO₂. Agreement has been reached to remove this restriction, but this has yet to be ratified by sufficient parties for it to come into effect.

Section 8. Process for Applying to the Programme

- 8.1. The nature and level of information that applicants will need to provide as part of the application process will need to be sufficient to enable DECC to carry out a robust and thorough assessment of the applications it receives. At the same time, wherever possible, our aim is to harmonise the Programme with the EU's NER 300 Scheme. This will avoid placing differential or unnecessary demands on applicants.

Applying to the UK Programme

- 8.2. The information requirements for the Programme's initial stages is likely to be very similar to requirements under the NER, although applicants may need to provide some additional information that relates to UK Programme specific requirements; for example on project costs and knowledge transfer. Our current view is that a majority of the NER application forms will be suitable for the initial stage of the Programme selection process. Application forms for the EU NER 300 Scheme can be found on the EC website¹⁵.
- 8.3. Costs incurred in preparing applications at the outset of the Programme's selection process will not be met by DECC.

How to apply

- 8.4. Further details of the application process will be published on the DECC Website at www.decc.gov.uk/occs prior to the formal launch of the application process for the UK Programme expected in Spring 2011.
- 8.5. **Note: The expected Programme application information requirements have been set out in this document to assist potential applicants. However, the process and requirements outlined may be subject to change, and applicants should wait until DECC publishes notice of the date for receipt of applications together with further supporting information before considering the detail of their applications.**

Assessment of Applications

- 8.6. Applications will be assessed against the project and applicant eligibility criteria; the process for selecting projects is discussed in Section 4.

¹⁵ http://ec.europa.eu/clima/funding/ner300/index_en.htm

- 8.7. DECC may be assisted, where appropriate, in the assessment process by independent experts appointed for this purpose. The devolved administrations will be consulted in respect of any applications coming forward from their areas. Final decisions will rest with the Secretary of State.

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