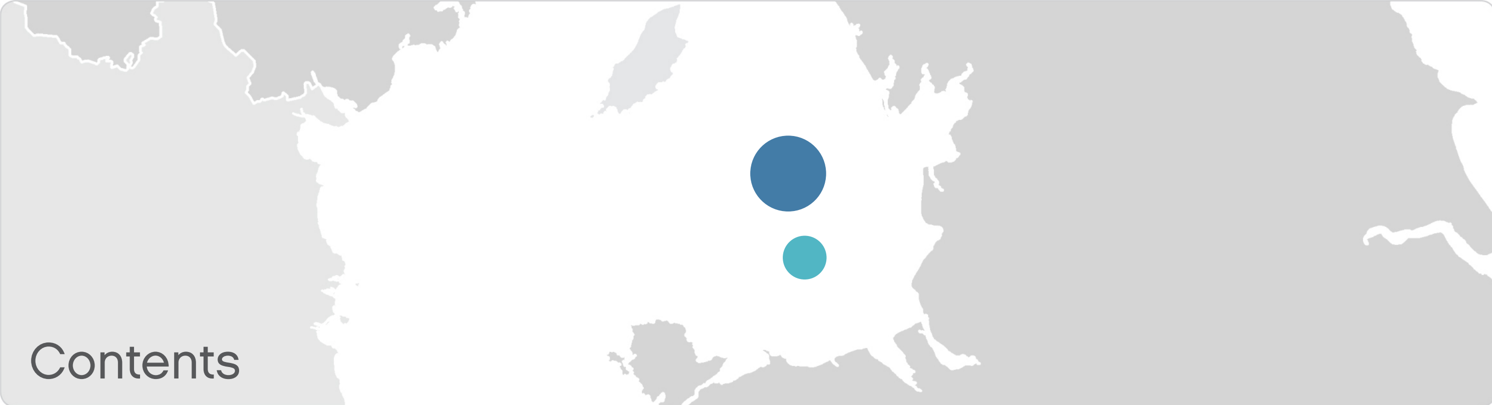
   

The East Irish Sea CCS Cluster
A Conceptual Design

Hydrocarbon Resources Ltd
Peel Energy Ltd

February 2011

eunomia
research & consulting



Contents

Technical Report

This Summary Report is accompanied by a more detailed Technical Report and associated Technical Appendices which can be viewed at **www.eunomia.co.uk**

Contact

Eunomia Research & Consulting Ltd
37 Queen Square
Bristol
BS1 4QS

0117 9172250

www.eunomia.co.uk

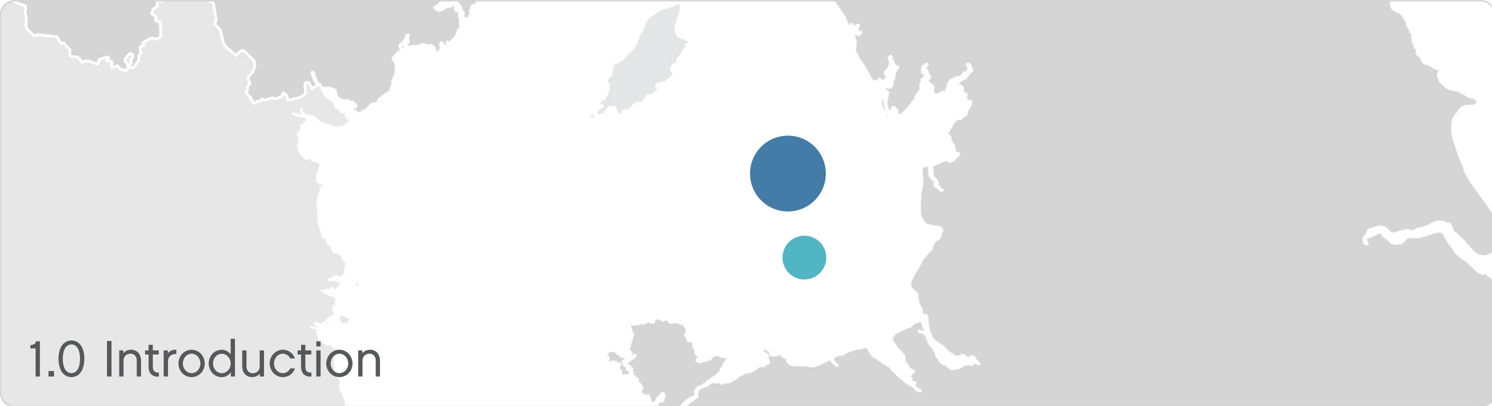
Authors

Mike Brown
Adam Baddeley
Andrew Coulthurst
Sam Taylor

Sponsors

Hydrocarbon Resources Ltd

PEEL ENERGY



1.0 Introduction

It is now widely accepted that climate change driven by human activities is a very real threat. The principal cause of this threat is from greenhouse gas (GHG) emissions, of which carbon dioxide (CO_2) is the largest contributor. Whilst renewable energy sources will undoubtedly continue to be an increasing feature of the energy mix in the UK and beyond, the intermittent nature and practical limitations of renewable energies such as wind, wave and solar mean that 'base-load' and flexible power generation will remain essential to any modern economy for the foreseeable future. Both the age of the existing UK fleet of power stations and European Union (EU) environmental regulations are such that significant new such capacity is needed.[1] Whilst the UK Coalition Government has indicated an intention that nuclear energy should continue to have a role to play, in the interests of energy security (through diversity of supply) it has also stated its belief that fossil fuels, including coal, will need to continue to play a vital role in energy generation for decades to come.[2] All of the individual technologies within the CCS chain have been proven at commercial scale. The challenge to the EU, to national Governments and the private sector is to now develop, integrate and prove the full technology chain at commercial scale. It should be acknowledged that CCS will not provide a long-term solution (beyond 50 years) in delivering low carbon energy due to the finite nature of fossil fuels. It is expected, however, that CCS will have a major role to play in aiding the transition to a decarbonised economy, which is not heavily reliant upon the combustion of fossil fuels.

Further to the climate change benefits of investment in CCS, there is a clear economic case for Government investment. The UK has a long established engineering and project management skills base in both fossil-fuel power generation and offshore hydrocarbon exploration and production, both of which will be integral to the technical delivery of CCS. The UK also has the supporting financial and legal expertise to deliver the complex business models and contractual agreements necessary for project delivery.

As the name suggests, Carbon Capture and Storage (CCS) is a three stage process which involves:

1.Capture

Capturing CO_2 emissions from the combustion of fossil fuels – for initial CCS projects this is likely to be from large-scale emitters such as power stations or large industrial plants[3]

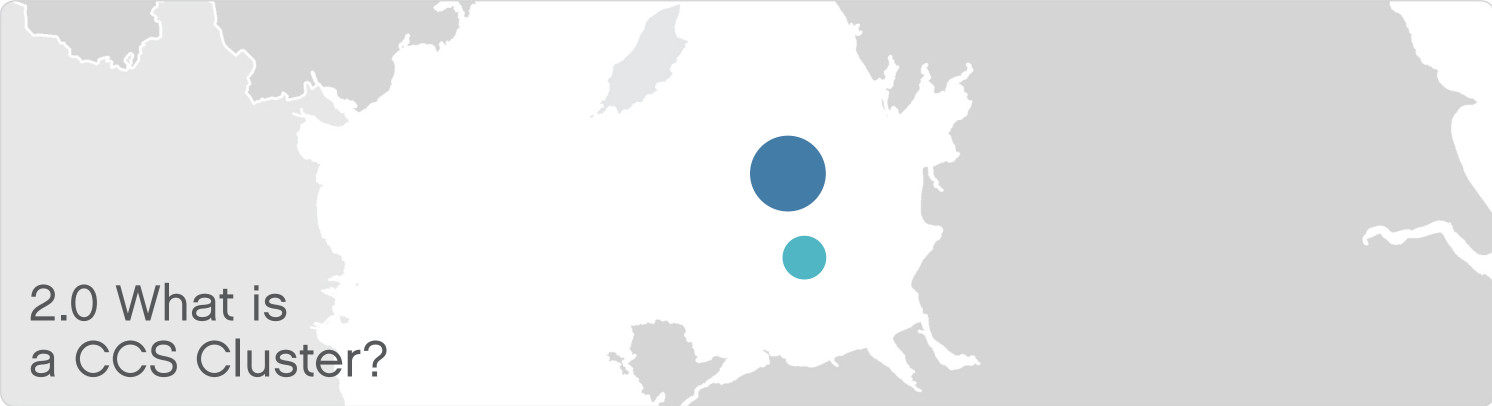
2.Transport

Transporting the CO_2 by pipeline (or ship) for offshore storage[4]

3.Storage

Storing the CO_2 securely, usually in depleted oil and gas fields, which have previously held hydrocarbons for millions of years[5]

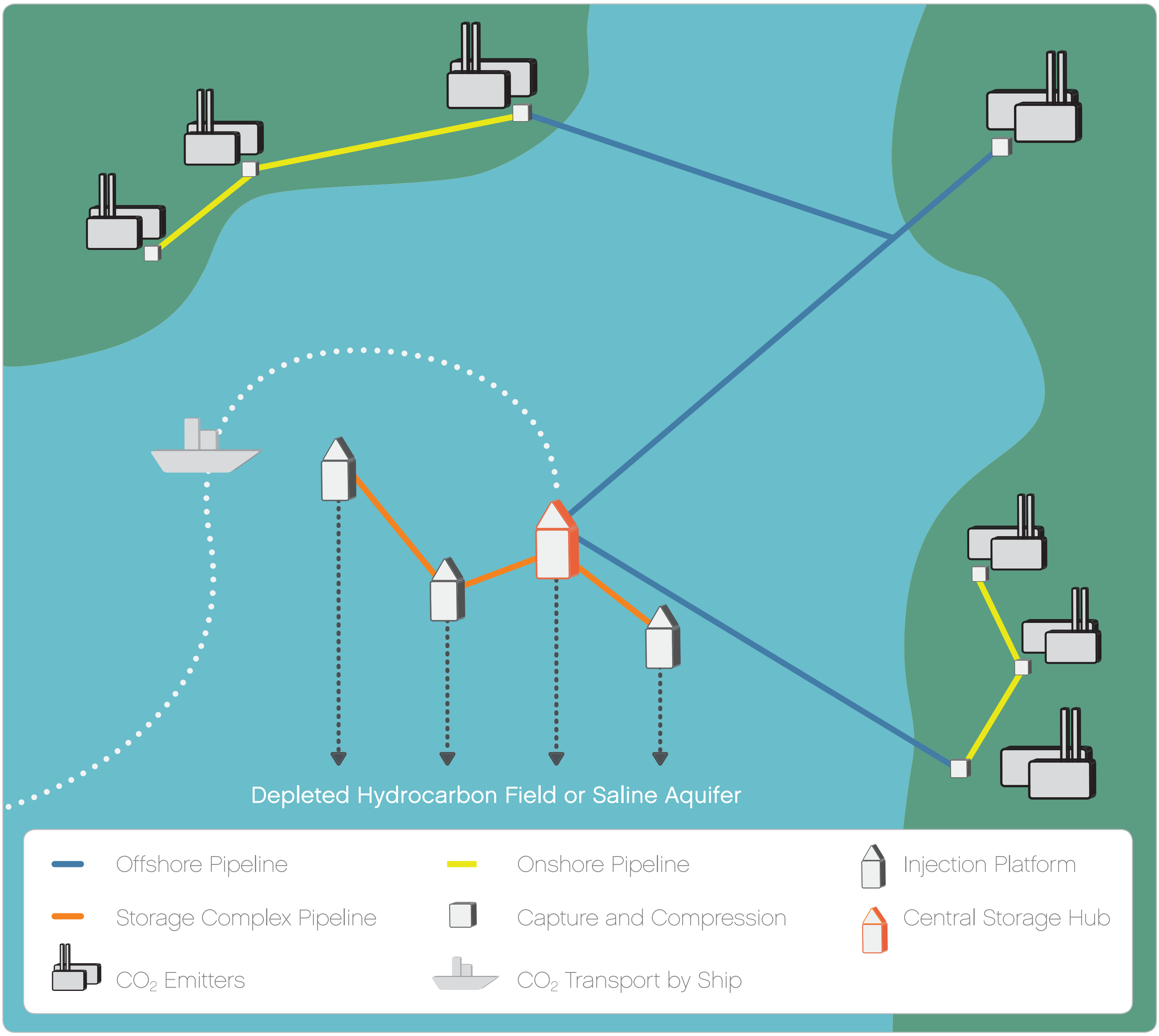
1 Namely the EU Large Combustion Plant Directive (LCPD), the key elements of which have been incorporated into the EU Industrial Emissions Directive (IED)
2 DECC (2010) Annual Energy Statement: DECC Departmental Memorandum, July 2010
3 For example, the power station in North Dakota operated by the North Dakota Gasification
4 For example, storage of CO_2 at Sleipner in the Norwegian sector of the North Sea. See http://www.statoil.com/enTechnologyInnovation/ProtectingTheEnvironment/CarboncaptureAndStorage/Pages/CarbonDioxideInjectionSleipnerVest.aspx
5 For example, the CO_2 pipelines operated by Kinder Morgan across the US, See http://www.kindermorgan.com/business/co2/ Company.



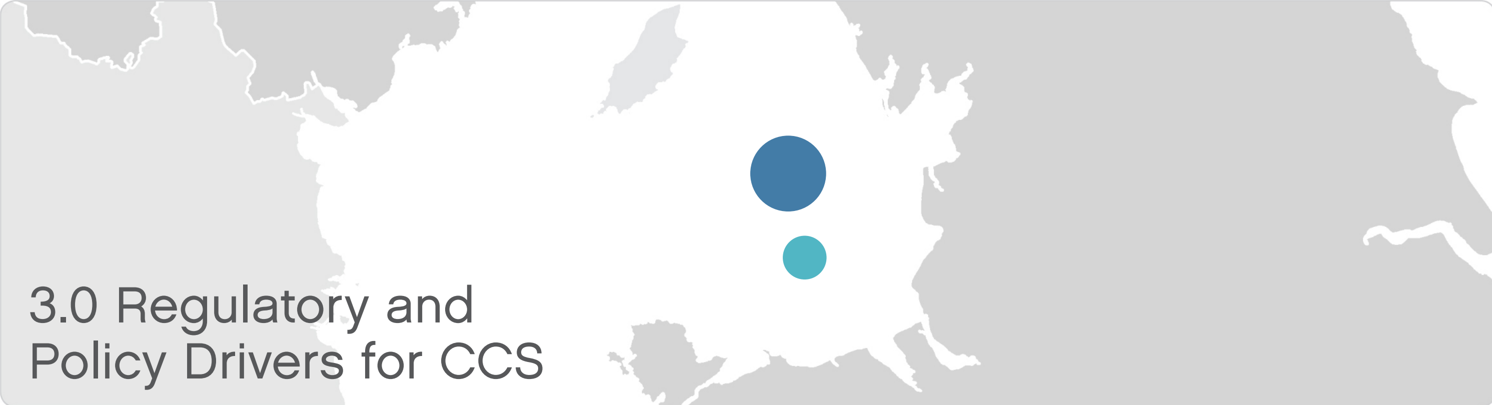
2.0 What is a CCS Cluster?

In its simplest form a CCS technology chain will involve a point-to-point solution, i.e. a CO_2 emitter linked, via transport, to a storage site. By linking a number of emitters in relative proximity via onshore pipelines a 'cluster' offers benefits through the potential to share the significant costs associated with the capture, compression, offshore transport and storage of CO_2, and hence the potential delivery of more affordable solutions to emitters. A summary schematic of how a CCS cluster might function is provided in Figure 1. This includes the possibility of several clusters sharing the same storage asset(s).

Figure 1: Summary Schematic of a Potential CCS Cluster



eunomia



3.0 Regulatory and Policy Drivers for CCS

The UK Government is currently progressing with a programme of four commercial scale CCS demonstration projects. The commitment to funding these projects was announced by the previous administration and is now backed by the current Coalition Government within their Programme for Government.[6] This support will be aided by funding from the European Commission (EC), which has committed to providing funding, via the 'New Entrant Reserve' (NER) element of the Emissions Trading Scheme (ETS), for up to eight new CCS projects across Member States, which may include up to three in both of the UK and Ireland.

Regulatory requirements have now been aligned such that any new coal-fired power station in England, Wales and Scotland must install a minimum of 300MWe (net) equivalent CCS capacity.[7]

This position underlines Government's stance that no new unabated (in terms of CO_2) coal-fired power stations will be built in the UK. Furthermore, all new fossil-fuel plant (with a peak output capacity of 300MWe or more), including gas-fired power stations, must be designed to be 'carbon capture ready' (CCR). Along with a series of design aspects, being CCR means that consideration must be given in the consenting process to the space and routing requirements to facilitate future retro-fit of CCS infrastructure.[8] Finally, Government has committed to commencing analysis of the economic viability of CCS in 2018, which will potentially result in all new coal plant (with a peak output capacity of 300MWe or more) being required to retrofit to full capacity by 2025.[9]

Figure 2: Dynamically Positioned Pipe-lay Vessel

Note: Image provided courtesy of Allseas

6 HM Government (2010) The Coalition: Our Programme for Government, May 2010
7 DECC (2009) Draft Supplementary Guidance for Section 36 Applications: New Coal Power Stations, November 2009: Scottish Government (2010) Thermal Power Stations in Scotland: Guidance and Information on Section 36 of the Electricity Act 1989 under which Scottish Ministers determine consents relating to thermal power stations, March 2010
8 DECC (2009) Carbon Capture Readiness: A guidance note for Section 36 Electricity Act 1989 consent applications, November 2009
9 On the advice of the UK Committee on Climate Change, the Government is also currently considering whether this should apply to any new Combined Cycle Gas Turbine (CCGT) Power Station

4.0 Potential CO_2 Storage Capacity in the EIS

The availability of CO_2 storage capacity is a prerequisite for CCS, and suitable resources are limited not only by geology, but also by public acceptance and regulatory constraints, with regard to onshore storage.[10] In this context, unless the East Irish Sea (EIS) CO_2 storage capacity is enabled, current Government policy will be such that any thermal power station emitter located geographically west of the Pennines will potentially not be permitted to operate beyond 2030. As a result, in the national (and international) energy interest, every effort should be made in order to ensure transition of the hydrocarbon fields located in the EIS from oil and gas extraction to CO_2 storage.

The potential CO_2 storage capacities of both hydrocarbon fields and saline aquifers in the EIS have been assessed at a high-level by the British Geological Society (BGS).[11] More detailed research has also been undertaken on behalf of Ayrshire Power Ltd (APL).[12] The key difficulty with saline aquifers is that they are usually not well characterised, as in contrast to hydrocarbon fields, there has usually been little historic investigation and analysis of the related geology. At this stage, therefore, judging the suitability of any particular saline aquifer is highly speculative and the related CO_2 storage capacities are unknown. Unless significant funds were to be devoted to test drilling, injection of CO_2 and subsequent monitoring of CO_2 in an aquifer, therefore, such potential storage sites are considered very unlikely to be bankable. The best potential storage sites identified in both BGS and APL studies (judged according to containment, capacity and injectivity criteria) were the Liverpool Bay and Morecambe Bay natural gas fields. Table 1 shows that these two groups of fields hold a total estimated potential CO_2 storage capacity of 1,148Mt, whilst Figure 4 shows their geographic location.

The South Morecambe field represents the most valuable asset for the long-term storage of CO_2 in the EIS, and due to its massive scale, is identified by DECC as the UK's second largest natural gas field which might be 'realistically' converted into a CO_2 storage site.[13] The proximity of the two groups of fields will also provide efficiencies in terms of the relatively small distances required to connect pipelines between CO_2 storage sites as part of any future 'hub' solution.

Some of the hydrocarbon fields within the EIS are now at what might be described as a 'mature' extraction phase. The Liverpool Bay Fields could become available for transfer into use for CO_2 storage as early as 2014, with the Morecambe Bay Fields available from 2020.

Table 1: Summary of EIS CO_2 Storage Resource

Gas Field	Likely year of Depletion	Storage Capacity ($MtCO_2$) (Based on APL Study)
Hamilton	2014-2017	13
Hamilton North	2014-2017	38
Liverpool Bay Sub-total		151
South Morecambe	2023-2030	820
North Morecambe	2020-2023	177
Morecambe Bay Sub-total		997
TOTAL		1,148

10 Current legislation in the UK provides for offshore storage only
11 DTI (2006) Industrial carbon dioxide emissions and carbon dioxide storage potential in the UK, October 2006
12 Studies were undertaken by Senergy on behalf of APL, but are considered commercially confidential
13 DECC (2009) Carbon Capture Readiness: A guidance note for Section 36 Electricity Act 1989 consent applications, November 2009

5.0 EIS CCS Cluster Concept Design

The EIS Cluster, set out conceptually in this report, differs from other emerging UK CCS clusters, for example those proposed in Yorkshire and Humber or Eastern Scotland, in that it is not formed around a sole pre-defined onshore region, rather it is an offshore 'storage resource' driven cluster which will potentially accept CO_2 from a range of onshore areas across the UK and Ireland.

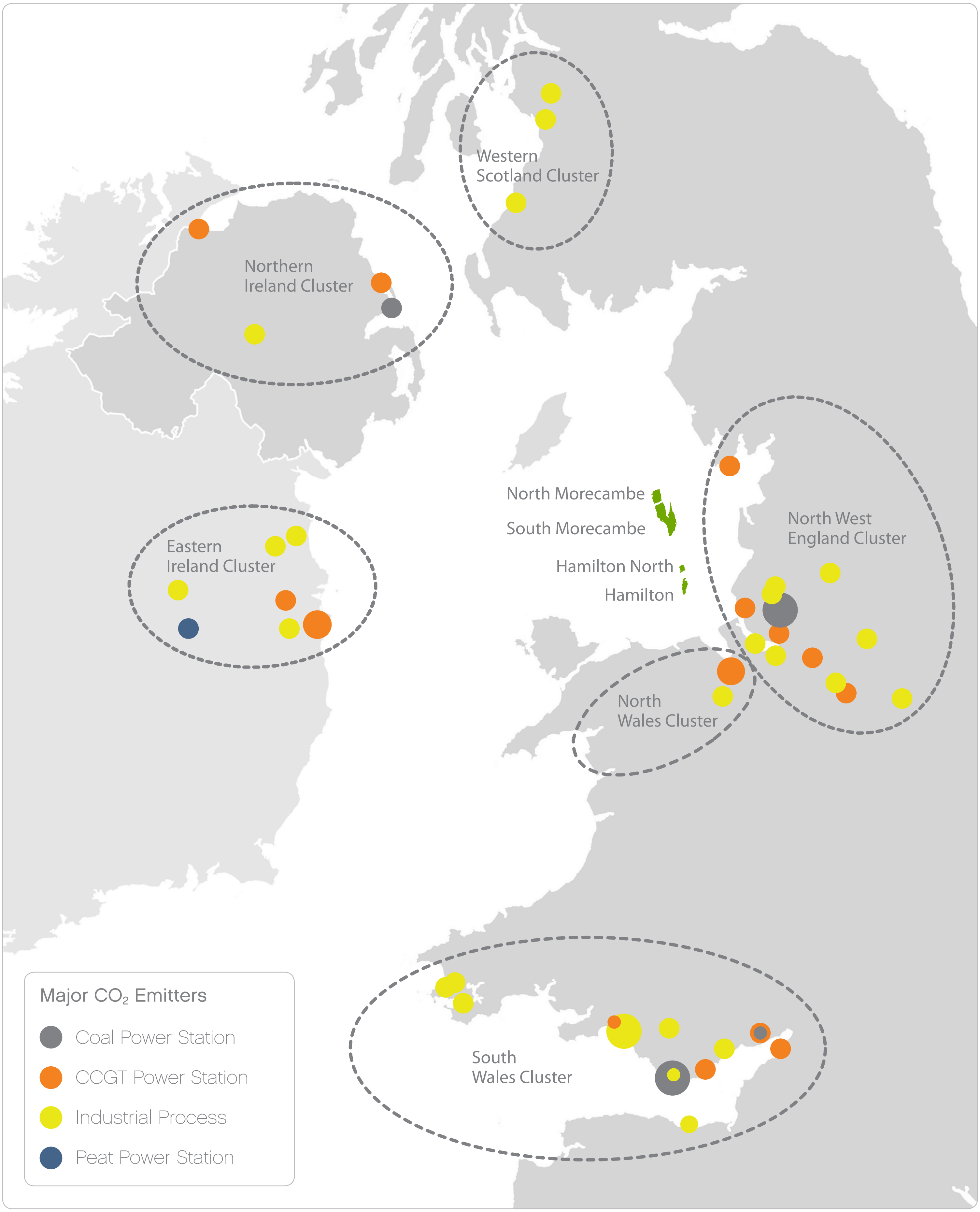
The EIS is surrounded by a range of large-scale CO_2 emitters in North West England, Northern Ireland and on the east coast of Ireland. All such 'mini-clusters' could feasibly be linked to the CO_2 storage sites in the EIS by either pipeline or ship. Furthermore, two further mini-clusters located on the west coast of Scotland and on the south coast of Wales have no alternative than to rely upon the EIS for CO_2 storage, should CCS retrofit be required.

Figure 4 demonstrates the relative abundance of existing major CO_2 emitters (over 50,000tCO_2pa) within the six mini-clusters and their proximity to the Liverpool Bay and Morecambe Bay natural gas fields.

Figure 3: Flue-gas Treatment Infrastructure at CO_2 Capture Plant

Note: Image provided courtesy of Doosan Power Systems

Figure 4: Existing CO_2 Emitters Potentially Seeking Storage in the EIS



6.0 Current Levels of CO_2 Emissions

Figure 5: Modern Coal-fired Power Station in Esbjerg, Denmark

Note: Image provided courtesy of Dong Energy

To determine current CO_2 emissions across the six mini-clusters, verified data for 2009 has been obtained from the Community Independent Transaction Log for the EU ETS.[14] Using this data the total CO_2 emissions for each potential cluster (for facilities over 50,000tCO_2 pa) are presented in Table 2. This shows that across all six clusters 47 million tonnes (Mt) of CO_2 were emitted in 2009.

Table 2: Total CO_2 Emissions by Mini-cluster Group (based on 2009)

Mini-cluster	Total CO_2 Emissions (Mt)
Eastern Ireland	6.2
North Wales	5.1
North West England	12.6
Northern Ireland	3.9
South Wales	18.9
Western Scotland	0.3
TOTAL	47.0

14 See: http://ec.europa.eu/environment/ets/

7.0 Technical Opportunities and Constraints

Compared to other substances that are routinely transported by pipeline, the issues associated with CO_2 are particularly complex. Even small changes in pressure and temperature may lead to rapid and substantial changes in the CO_2 physical properties – notably phase and density. Whilst this can be managed to make transportation as efficient as possible, it also presents technical challenges as it will often be undesirable to have multi-phase flows through a single system.

7.1 Sharing of CO_2 Capture Facilities

Shared capture plant would require flue gases, which for coal-fired power stations contain approximately 10-15% CO_2, to be transported between emitters. This would potentially require pipeline diameters in excess of 10 metres, the cost of which, not to mention the visual impact, is likely to be prohibitive.

Furthermore, flue gas composition and temperature vary significantly across facility type and as such any combining of gases would need to be carefully considered on a case-by-case basis.

These constraints mean the sharing of CO_2 capture facilities is likely to be limited to examples whereby:

- There are immediately adjacent or co-located facilities; and
- Flue gas streams are of similar composition and temperature.

There are currently no relevant examples within any of the proposed mini-clusters which meet both of the above criteria.

7.2 Onshore CO_2 Handling and Pipeline Networks

Following capture, CO_2 requires dehydration and (varying levels of) compression, prior to injection into pipelines. Whilst the former is likely to take place at the emission site, there is merit in exploring the possibilities for sharing of the latter infrastructure to reduce the costs of compression across a network of emitters. Shared compressor stations might be strategically located at various points across the network, with additional ‘booster’ stations potentially near an onshore-offshore boundary, with the objective being to optimise the trade-off between energy demand and the cost of steel. Transportation of CO_2 in gaseous phase also offers benefits in terms of perceived health and safety constraints relative to dense (or liquid) phase transportation.

Figure 6: Onshore Pipeline Construction

Note: Image provided courtesy of Allseas

7.0 Technical Opportunities and Constraints

7.3 Trunk Pipeline and Compression Design

It is likely that the proposed EIS CO_2 pipeline network would include a series of 'trunk' pipelines running from each mini-cluster to the storage sites (see Figure 9 on Page 14). The first of these could come from the proposed power station at Hunterston in Scotland, which represents the potential 'catalyst' project for the wider EIS cluster. All new pipelines would be subject to routing constraints, including existing cables, pipelines, offshore wind development, unexploded ordinance, aggregate lease areas and licensed hydrocarbon blocks All new pipelines would be subject to routing constraints, including existing cables, pipelines, offshore wind development, unexploded ordinance, aggregate lease areas and licensed hydrocarbon blocks.

Pipeline and compression design for CO_2 storage must initially focus on knowledge of the existing reservoir conditions into which the CO_2 will be injected. Ideally the arrival conditions of CO_2 at the offshore platform will be such that minimal offshore processing (and thus cost) is required to inject it down the wellbore and into the reservoir. Pipeline and compression design must also take into consideration changing reservoir conditions, as storage sites 'pressure-up' in response to ongoing CO_2 injection. Related modelling must therefore be undertaken to determine the likely pressure changes throughout the CO_2 injection lifetime to decommissioning.

One of the key issues with trunk pipeline design is anticipating the extent of additional future flows from other emitters. The level of potential oversizing (and thus possible future revenue streams from other emitters) must be based on a commercial decision by relevant entities, which takes into consideration both regulatory and market drivers for CCS. In this context, operators might consider the inclusion of 'Tee' pieces at relevant junctures in the trunk pipeline to more easily allow other emitters to enter the network in the future.

It should be noted that the marginal cost of increasing pipeline diameters can be relatively low, so if additional future flows are a distinct possibility (as identified in this study) then oversizing and the associated operating regime, should be considered in pipeline design, as is also recommended in a recent DECC consultation.[15]

7.4 Pipeline Reuse

To reduce transport network costs, consideration of reuse of existing oil and gas pipelines should be undertaken, such that these might be reverse engineered to take CO_2 out to the offshore hydrocarbon fields from which the pipelines previously brought hydrocarbons ashore.

The most significant opportunity for such activity in the EIS relates to the Liverpool Bay Development, which includes not only the Hamilton and Hamilton North, but four further oil and gas fields.

Gas produced by Hamilton and Hamilton North is sent via pipeline to the offshore Douglas Complex for part-processing before being piped by subsea pipeline to the Point of Ayr gas terminal for further processing. It is then sent by underground pipeline to the combined cycle gas turbine (CCGT) power station at Connah's Quay in North Wales.

Preliminary technical information relating to these existing gas pipelines indicates that they would be suitable for transport of CO_2 from North Wales.

15 DECC (2010) Developing Carbon Capture and Storage Infrastructure: Consultation on Implementing the Third Party Access Provisions of the CCS Directive and Call for Evidence on Long Term Development of CCS Infrastructure, December 2010

7.0 Technical Opportunities and Constraints

7.5 Offshore Facilities

The Hamilton and Hamilton North satellite platforms became operational in the mid 1990s with a structural design basis of 30 years. Detailed structural surveys of the platforms would be required following the end of production activities to identify any serious structural issues. Should any be identified, any proposed CO_2 storage site operator would need to determine whether to reinforce or replace the existing platform(s).

High-level initial analysis indicates, however, that there are currently no serious structural issues at either platform. Given the considerably greater gas reserves of South Morecambe, unsurprisingly there is a greater network of associated platforms and offshore facilities. Whilst much of the South Morecambe infrastructure will be 35-40 years old by the time of field depletion, it is understood that it was designed and specified according to a principle of longevity.

The assets appear to have been maintained to a high standard throughout their life and have been subject to regular third party inspection and audit. As a result, it is likely that they could support CO_2 storage activities for at least a similar additional timeframe without major structural modifications, albeit any developer would need to undertake their own detailed structural analysis.

Figure 7: Satellite Platform within the Morecambe Bay Complex

Note: Image provided courtesy of Hydrocarbon Resources Ltd

7.0 Technical Opportunities and Constraints

The timing of availability of fields for transfer from hydrocarbon production to CO_2 storage will determine how facilities are developed and integrated to support the proposed EIS cluster development. In light of the above high-level assumptions, whilst Hamilton and Hamilton North might be used to store initial volumes of CO_2, it is more likely that any major processing hub for future cluster volumes would be developed at the South Morecambe Complex.

An important part of the development of CCS infrastructure is the reliable verification of the inventories of CO_2 which are transported through the network from point of capture to injection and storage. This is important not only towards aiding payments across different entities operating the CCS chain, but also towards identifying where in the system potential leakages might have taken place.

7.6 Flow Metering

Due to the emerging nature of CCS, accurate measurement of CO_2 along the CCS chain is not well developed. Whilst flow meters have been used to measure CO_2 streams in enhanced oil recovery projects in the US and within CCS demonstration projects, there has not been wide validation of their performance.

A considerable challenge will be delivering the degree of metering accuracy required to support both commercial structures and ETS reporting.

Under CCS Monitoring and Reporting guidelines developed for the ETS the measurement of CO_2 flow along the chain will need to be accurate to within 2%.[16] Whilst Table 6-3 shows that levels of accuracy for all are within +/-1% under ideal stable, single phase flow conditions, the cumulative errors from a number of metering points along the CCS chain, together with issues relating to sampling and physical property determination, are likely to result in levels of accuracy substantially some way outside the 2% threshold proposed by the EU.

16 http://ec.europa.eu/clima/documentation/lowcarbon/ccs__en.htm

8.0 Deployment of the EIS CCS Cluster

Any projection of the demand for CO_2 storage capacity must be associated with a range of assumptions.[17] Over longer timeframes, uncertainty increases as the number of possible outcomes increases. Accordingly, this study does not aim to project CO_2 emissions from installations further than what is necessary to demonstrate potential significant demand. It is therefore deemed appropriate that emissions are only modelled up to 2050. Within this period, we have then made an assessment of the emissions expected to be released by each installation (emitting over 50,000tCO_2pa) within the study area.

For the purposes of this study, and demonstrating the potential roll-out of an EIS CCS cluster, we have modelled three core Phases as follows:

Phase 1 (2016-25)

As mentioned in Section 7.3, the proposed Hunterston CCS demonstration project in Western Scotland is likely to function as a catalyst for the cluster. If successful in securing planning permission and securing the appropriate levels of funding, this project may be operational by as early as 2016.

Phase 2 (2025-35)

There is an assumption that the policy and regulatory environment is such that both Hunterston and the other new coal power stations within the study area retrofit CCS to their entire output. It is also assumed that CCGT power stations begin to install full scale CCS in a staged manner from 2028 to 2032. As such a further five mini-clusters are initiated.

Phase 3 (2035-50)

Assumes that large-scale industrial emitters retrofit CCS between 2038 and 2042 once technology development and the wider cluster has reduced the associated costs.

Figure 8 illustrates the profile of CO_2 emissions captured over the study period.

Figure 9 shows the spatial distribution (including potential trunk pipeline routes) of the cumulative total captured emissions for study period (2016-50) and the remaining capacity (116 Mt) in the Hamilton and Morecambe Bay fields.

Figure 10 provides a map of the modelled North West England conceptual cluster development. Maps of all potential conceptual clusters are provided in the Appendices to the Technical Report.

17 See the Technical Report for further details on all modelling assumptions

8.0 Deployment of the EIS CCS Cluster

Figure 8: Timeline of CO_2 Captured within EIS Cluster

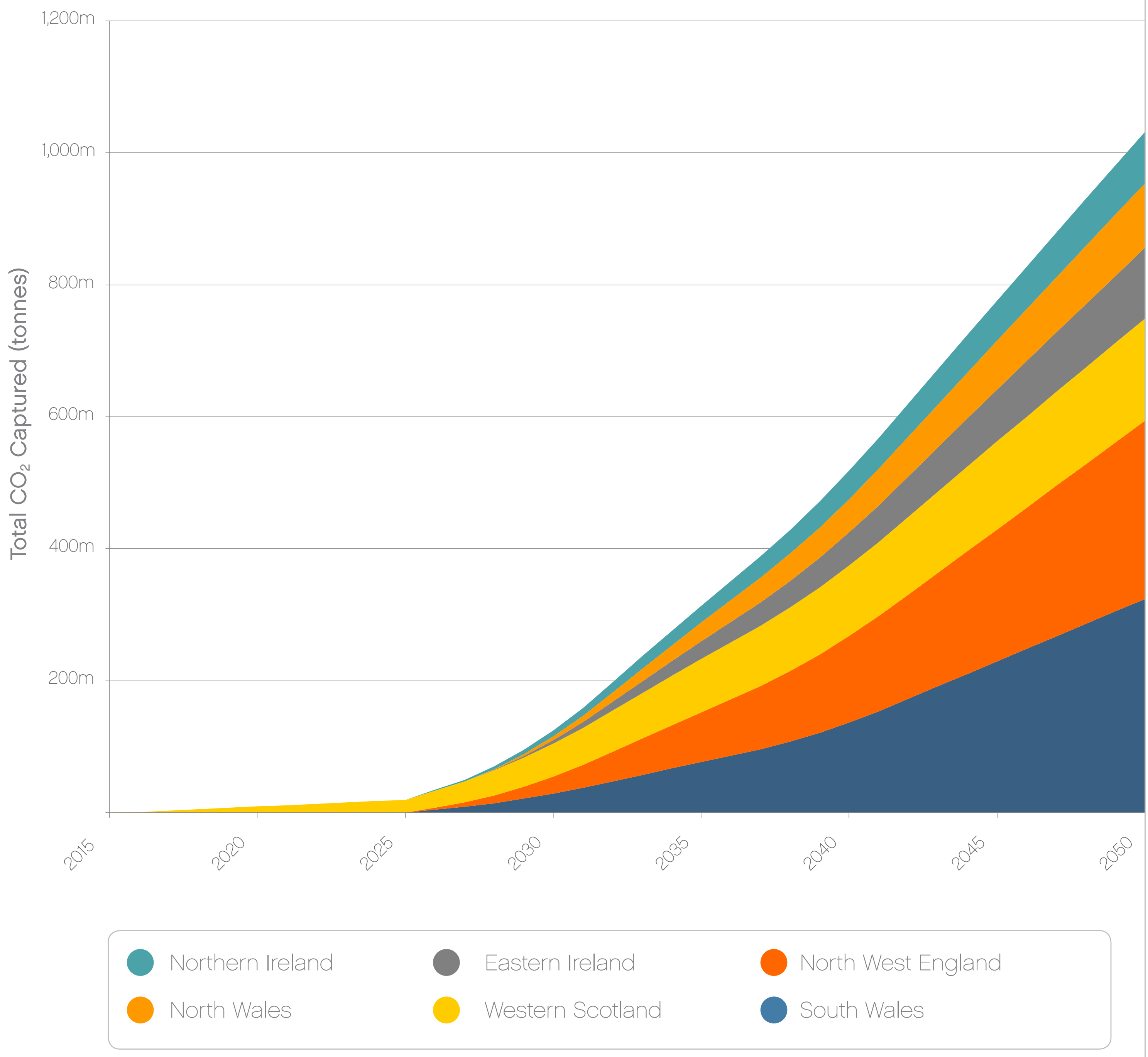
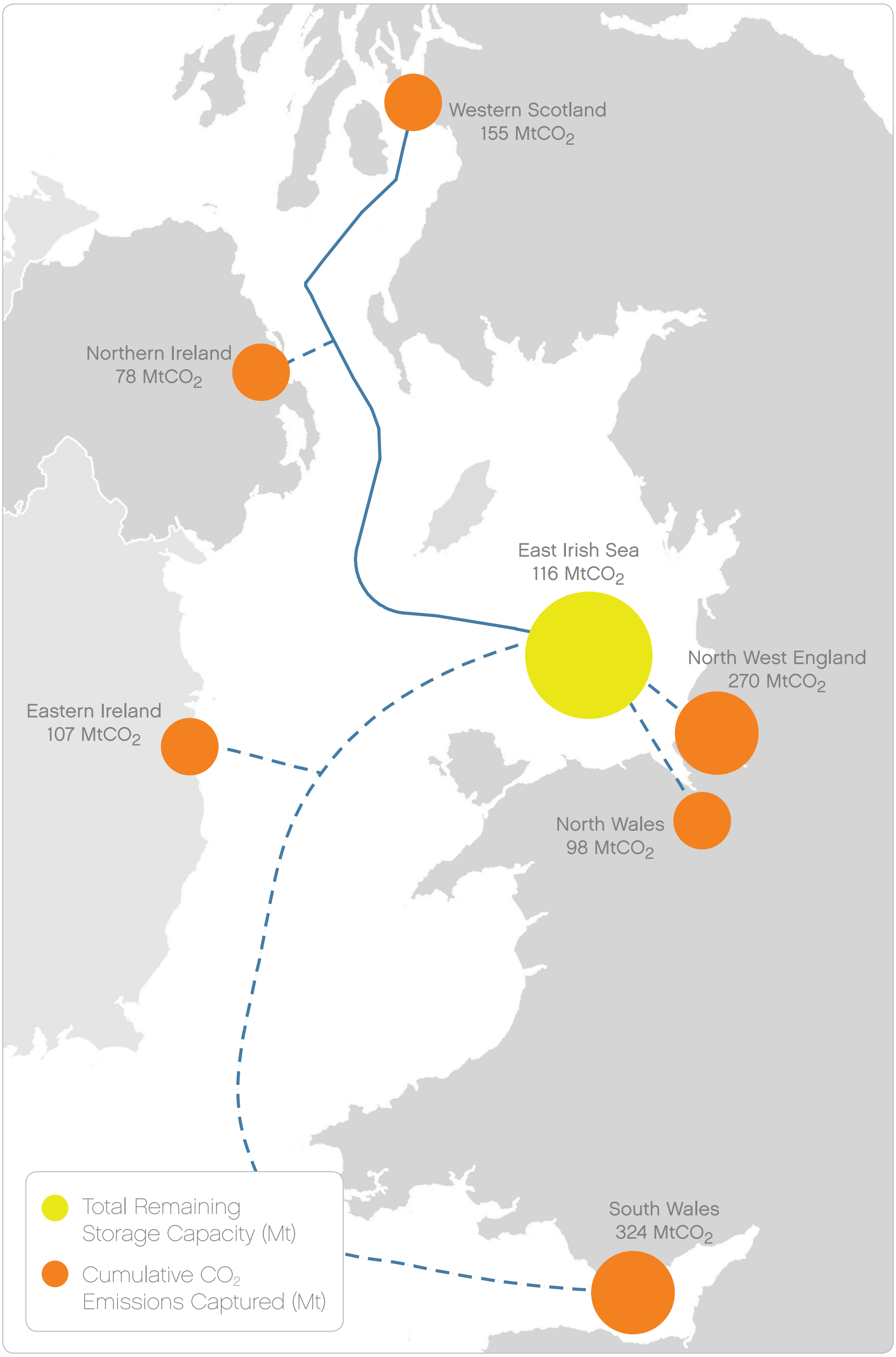
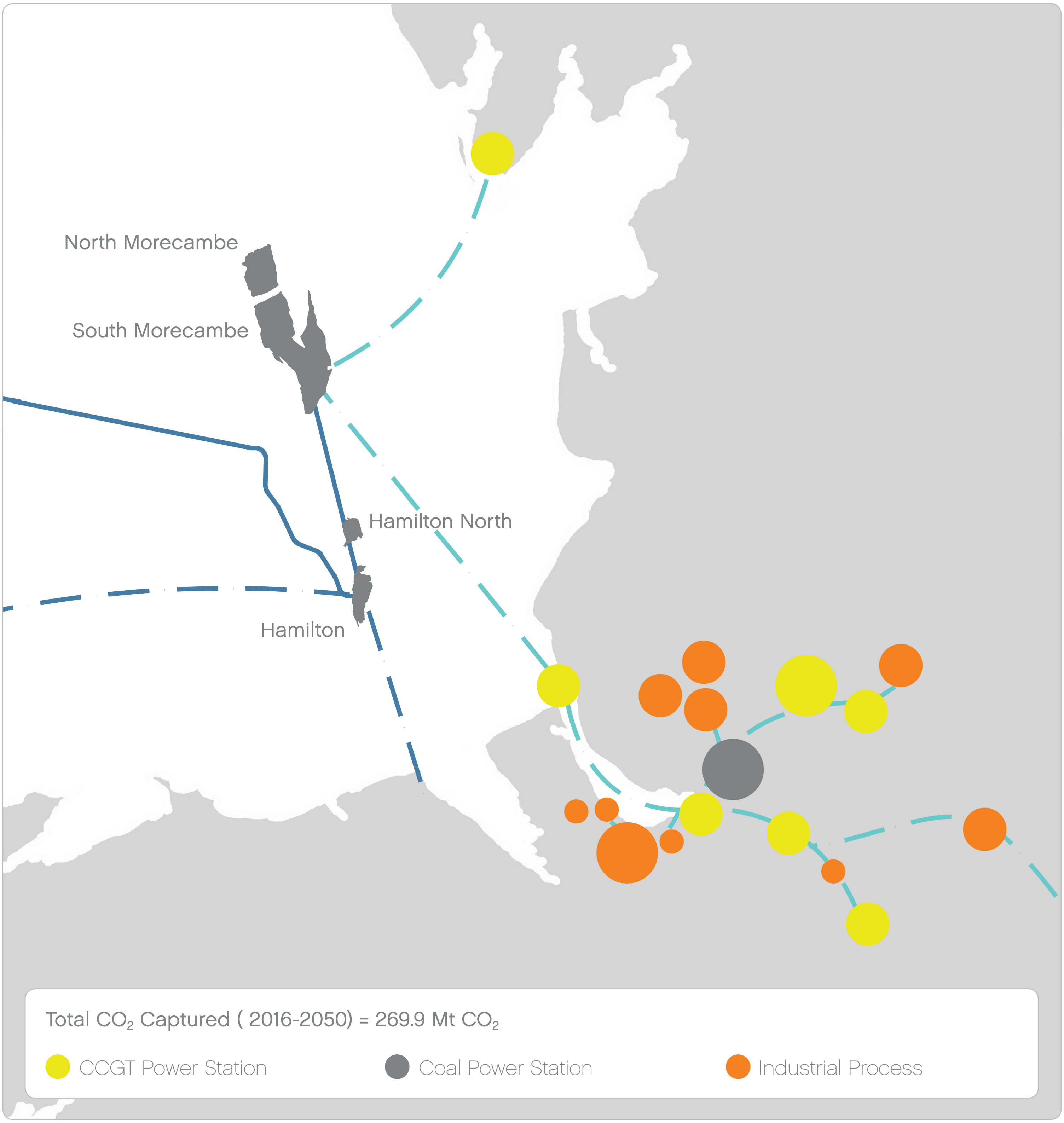


Figure 9: Phase 3 – Cumulative Emissions and Remaining Storage Capacity



8.0 Deployment of the EIS CCS Cluster

Figure 10: Phase 2-3 (2025-2050) North West England Mini-cluster



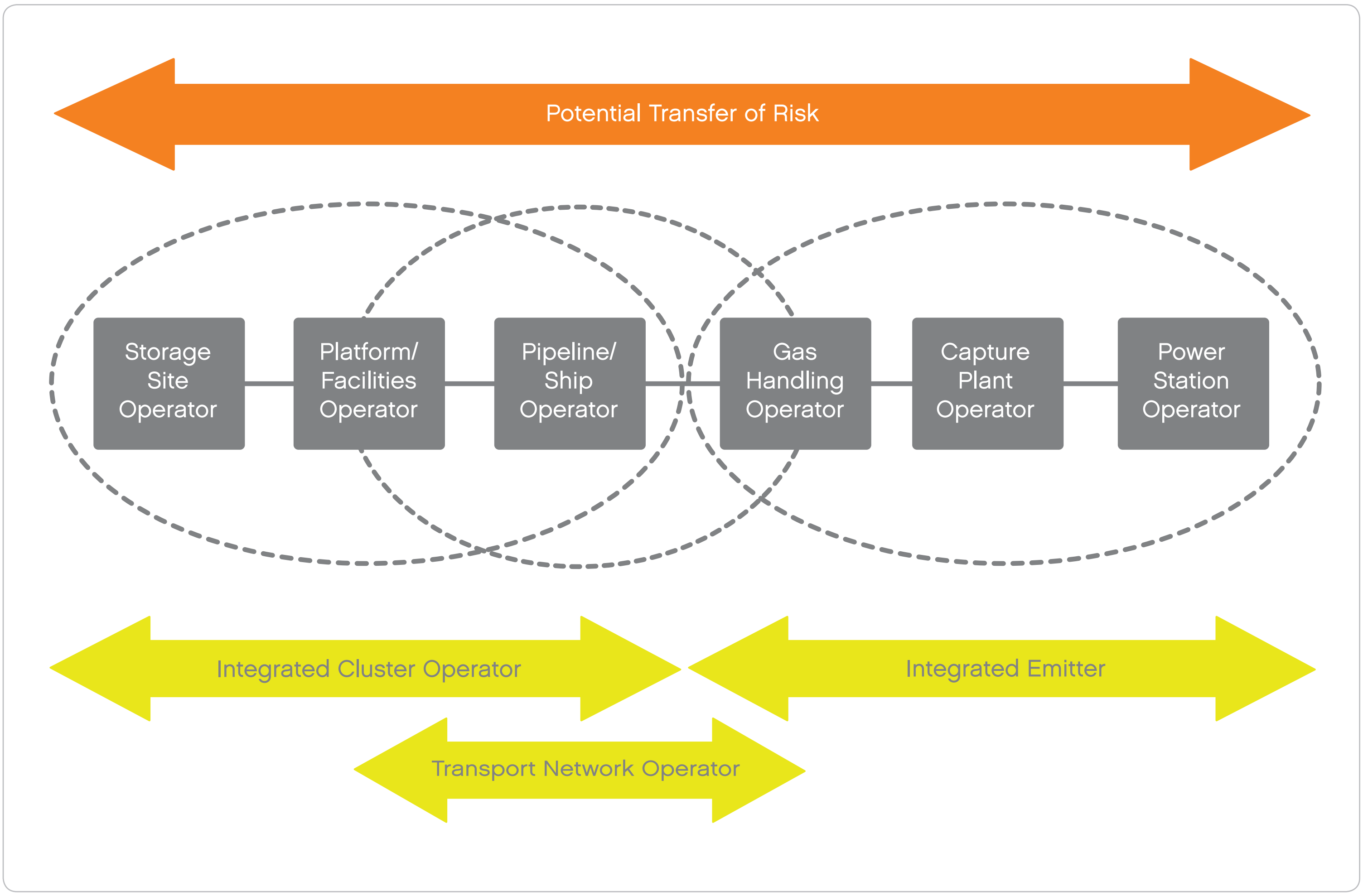
9.0 Potential Commercial Structures

Both DECC and the EC expect that emitters will lead consortia of organisations bidding for funding from the UK Demonstration and NER300 Competitions. This is because demand for CCS infrastructure is currently emitter-driven given that, via electricity (and potentially heat) or product sales, the emitter (power generation or industrial) is the only element of the CCS chain which independently generates revenues which come from outside of the scope of the chain or cluster itself.

As a result, it is likely that a proportion of these external revenues (along with any public funding received) will be cascaded down the chain to capture, transport and storage elements, whether these are owned by the emitter entity, or are distinct Special Purpose Vehicles (SPVs).

Developers of initial CCS infrastructure will undoubtedly need to carry significant business risk along the chain of technologies from capture to storage. This chain might split into the key constituent parts as shown in Figure 11. A level of risk is associated with each, whilst the overall level of risk for the full chain might be considered as greater than the sum of these parts due to additional integration risk. Figure 11 also shows that multiple partnerships might be developed to spread risk across the CCS chain, which might involve a series of SPVs, with several entities holding a share in more than one element of the chain.

Figure 11: Potential Business Models and Transfer of Risk along the CCS Chain



9.0 Potential Commercial Structures

Given the complex nature of the CCS chain it is considered likely that contract arrangements between parties will be based on some kind of tolling agreement. In the case of initial point-to-point projects, both 'take-or-pay' and 'send-or-pay' mechanisms are likely to be most applicable, with later emitters joining the network via more variable unit arrangements.

A key constraint to splitting up the ownership and operation of the CCS chain, as shown in Figure 11, is the ability to cover consequential losses. Should one element of the chain cease to operate for any given reason, depending upon the contractual payment mechanisms in place, it may need to compensate not only all other members of the chain, but also potentially the power station, which under the current regulatory regime would need to cease operation. Investors will therefore find it very difficult to provide debt or equity funding unless:

In summary, the evidence presented in this study suggests that:

- Government is willing to share the technical and consequential risks of CO_2 storage, or
- The proposed emissions performance standard (EPS) for new coal-fired power stations is designed in such a way that these are permitted to operate unabated for certain periods (during the CCS project demonstration phase only) whilst technical problems associated with injection and storage are resolved.

10.0 Recommendations

UK Government should continue not only to support CCS through at least four demonstration projects, but should ensure that those selected are evenly spread across geographies. This will ensure that new CO_2 storage infrastructure is enabled to support future CCS infrastructure in all areas where existing thermal plant are located across the UK;

UK Government should clarify as soon as possible the nature of support to be provided to thermal plant under the proposed feed-in tariff and capacity payments for low carbon energy sources being considered as part of the current Electricity Market Reform (EMR) consultation;

UK Government should take into consideration the issue of management of consequential risks (due to losses from other parts of the CCS chain and potentially the power station, when any element breaks down) when designing the potential emissions performance standard (EPS) being considered as part of the EMR;

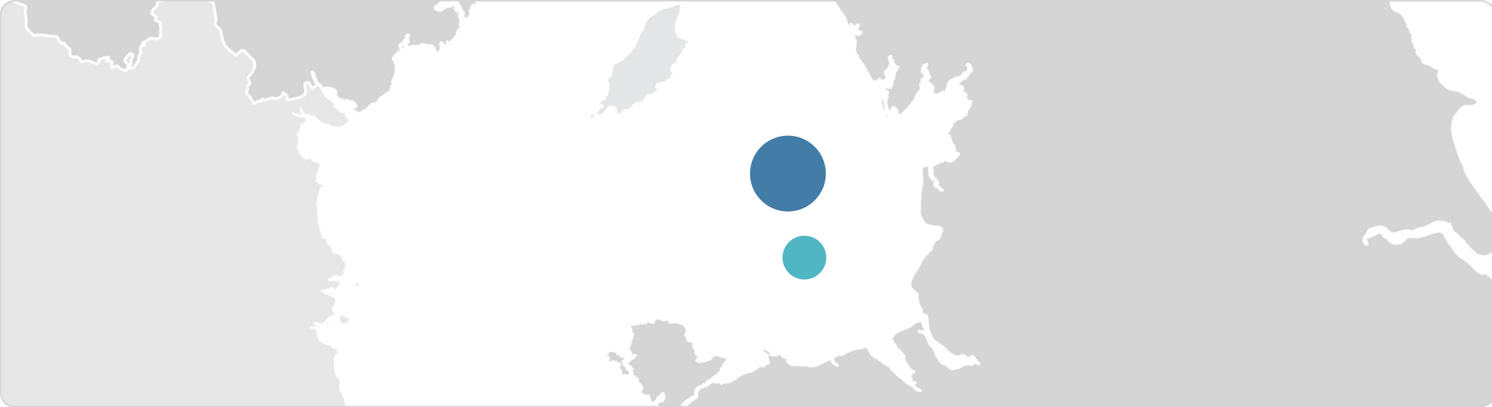
Within the NER300 and DECC 'Demos 2-4' Competitions, weight should be given within scoring processes to each projects potential to act as a 'catalyst' for wider CCS clusters;[18]

The EC should recognise the limitations of current metering technology with regard to EU ETS requirements, such that the related accuracy target becomes achievable by first-mover CCS projects. Without this flexibility, emitters will potentially have to purchase greater amounts of EUAs, which might threaten project viability;

The emerging Mersey and Greater Manchester Local Enterprise Partnerships (which will replace the functions of the North West Development Agency), and Sustainable Energy Authority of Ireland (SEAI) should invest in further exploring the potential economic and environmental benefits of the EIS cluster; and

Relevant public sector entities should consider the development of funding bids to the EC to fund further cross-border working on the EIS CCS cluster between Ireland and the UK.

18 Based on the Call for Proposals issued by the EC for the NER process, it is understood that projects will not formally be scored higher for being linked to clusters



About

Eunomia is an environmental consultancy specialising in energy, climate change, resource efficiency and waste management issues. The emphasis of the company lies in strategy, policy, economics, and appraisal of technologies, from both commercial and environmental perspectives.

Hydrocarbon Resources Ltd is the legal trading entity for Centrica plc in the East Irish Sea. Hydrocarbon Resources Ltd operates two gas fields, South Morecambe and North Morecambe, whose combined reserves are still amongst the largest in the UK in terms of remaining reserves. Centrica is an integrated energy company operating predominantly in the UK and North America.

Peel Energy is at the forefront of delivering low carbon energy for the UK, with a balanced portfolio of more than 3GW in generation or development. This includes wind, tidal power, biomass and multi-fuel power plants with CCS.