

Viking CCS Pipeline

7.3 Need Case for the Scheme

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Executive Summary

This document provides the Need Case for the development and forms part of the application for a Development Consent Order (DCO) for the Viking CCS Pipeline which is referred to herein as the Proposed Development. The Proposed Development comprises a new 24-inch onshore underground pipeline approximately 55.5km long to transport CO₂ from the Immingham industrial area to the former Theddlethorpe Gas Terminal (TGT) on the Lincolnshire coast and into the existing LOGGS pipeline to Mean Low Water Spring (MLWS) on the Lincolnshire coast.

The associated infrastructure necessary for the pipeline includes a reception area at Immingham to receive CO₂ from facilities in the Immingham industrial area, three block valve stations located along the pipeline and a facility at the former TGT site including shutdown, isolation and dune valves. Access roads and construction compounds are also included.

Beyond MLWS the CO₂ will be transported through the existing offshore pipeline to the depleted Viking gas fields for secure permanent storage in the southern North Sea. These offshore elements are the subject of a separate consenting regime and do not form part of the proposals for which a DCO is being sought.



Figure 0-1 Viking CCS project showing onshore Viking CCS Pipeline (in red)

The nature and scale of the project is such that it is deemed to be a Nationally Significant Infrastructure Project by virtue of section 14(1)(g) and section 21 in the Planning Act 2008 (as amended) as it includes the construction of a new cross-country pipeline from Immingham to Theddlethorpe measuring more than 16.093 km in length. Pre application discussions took place with the Planning Inspectorate during 2022 and 2023 prior to submitting the application for a DCO.

This report outlines the need for the Viking CCS Pipeline in the Humber region, the support for the scheme at both a national and local level and the economic benefits the project could bring to the Humber and surrounding regions.

The UK government has set a target of achieving Net Zero by 2050. In 2022, the Committee for Climate Change stated that there is no route to net zero by 2050, nor decarbonising industry while safeguarding jobs, without deploying carbon capture and storage (CCS) projects at scale (Ref 1).

The Humber area emits approximately 20 million tonnes of CO₂ per year and emits more CO₂ than any other UK region due to the volume and type of industry and energy operations in the area (Ref 8). Regional and local initiatives are taking place to address this, and the industry-led Humber Zero project to decarbonise industry in and around the Immingham industrial area using CCS is underway. By decarbonising, industry in the Humber region will remain competitive with other similar industries around the world, helping the region continue to thrive, and supporting tens of thousands of jobs in the area (Ref 13). The Viking CCS pipeline gives local decarbonisation projects a route to secure CO₂ storage, equipping the region with high capacity, reliable low-carbon infrastructure which could promote inward investment and attract new industries. (Ref 3).

The Viking CCS Pipeline will provide unique access for industry in the Immingham industrial area to export CO₂ to the 300 million tonnes of verified CO₂ storage capacity in the depleted Viking gas fields of the southern North Sea. The Viking CCS Pipeline has the potential to provide transport for up to 10 million tonnes per annum (mtpa) of CO₂ by 2030 and 15 mtpa by 2035 – potentially providing access to storage for more than 50 per cent of CO₂ emissions from the region.

1 Introduction

1.1 Overview

- 1.1.1 This Need Case has been prepared on behalf of Chrysaor (UK) Limited (the applicant) in support of an application for a Development Consent Order (DCO) which is being submitted to the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ) under Section 37 of the Planning Act 2008 ('the PA 2008'). The application is for the Viking CCS Pipeline, a new onshore underground pipeline approximately 55.5km long from Immingham to the former Theddlethorpe Gas Terminal (TGT) and transportation through the existing LOGGS (Lincolnshire Offshore Gas Gathering System) Pipeline to MLWS (Mean Low Water Springs) which is the average maximum level for high tide along the coast. The application includes associated infrastructure and ancillary works including three block valve stations, inspection, monitoring, venting and handling facilities and temporary construction compounds, storage areas and access roads. The development for which a DCO is being sought, including all ancillary works, is referred to in this report as the 'Viking CCS Pipeline'.
- 1.1.2 This document provides information that demonstrates the need for the Viking CCS Pipeline. It outlines the national, regional and local need to provide for CCS, and details a) the carbon dioxide emissions from the Humber region and b) the capacity the project will provide to convey and store carbon dioxide emissions to assist the government in achieving net zero. This document also outlines the benefits of the scheme in supporting existing employment and promoting the Humber Region as a low carbon energy producer and industrial area. This report includes a summary of the government policy and objectives to deliver net zero carbon for energy and industrial clusters across the UK including the Humber region, in addition to relevant planning policy.
- 1.1.3 The Viking CCS Project (referred to in this document as 'the Project') is a carbon transportation and storage project that includes the Viking CCS Pipeline, the existing offshore LOGGS pipeline, a new-build offshore injection platform and the depleted Viking gas fields in the southern North Sea (see Figure 1).
- 1.1.4 The Viking CCS Cluster comprises the sources of CO₂ in the Immingham industrial area along with the Viking CCS Pipeline, the existing offshore LOGGS Pipeline and depleted Viking gas field in the southern North Sea.

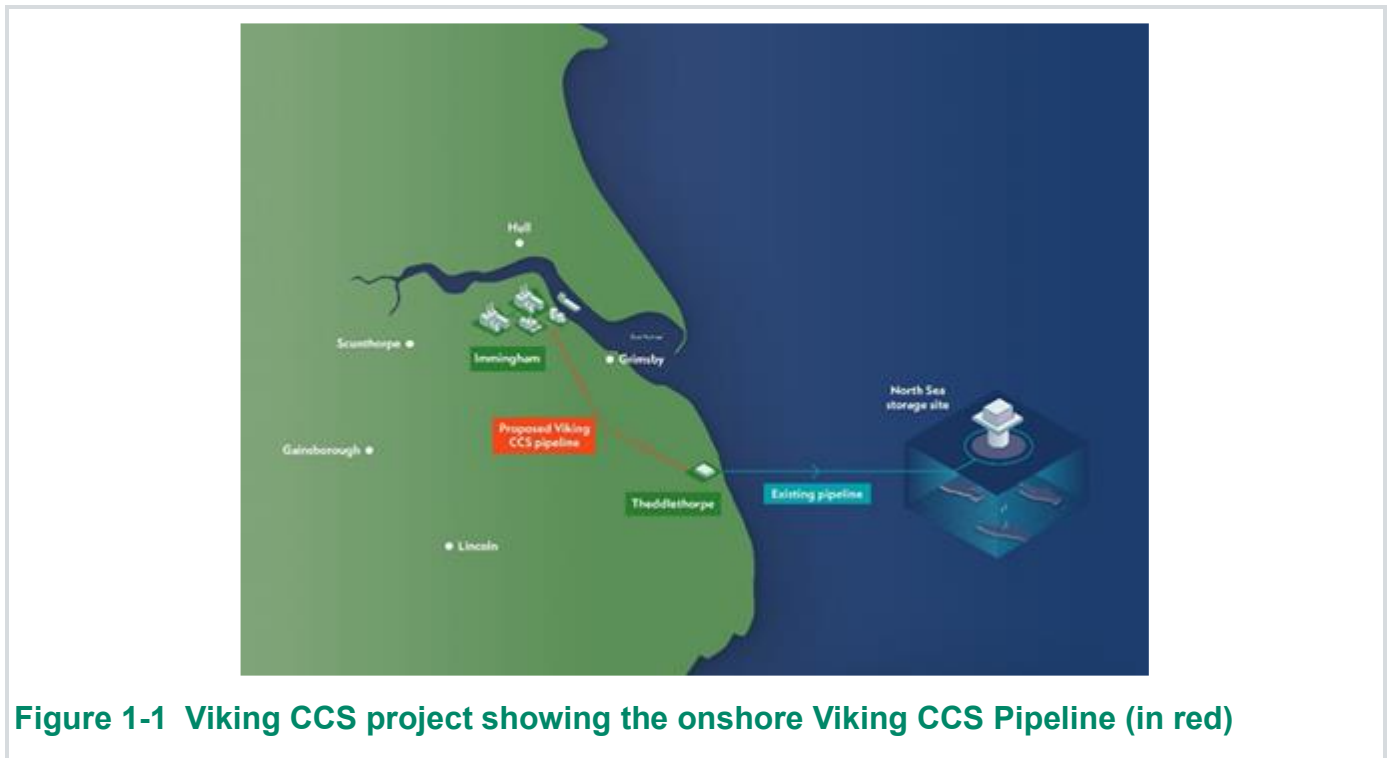


Figure 1-1 Viking CCS project showing the onshore Viking CCS Pipeline (in red)

1.2 The need for new infrastructure to achieve net zero

- 1.2.1 The UK government has set a target of achieving Net Zero by 2050 (Ref 16). In 2022, the Committee for Climate Change stated that there is no route to net zero by 2050 nor decarbonising industry while safeguarding jobs, without deploying CCS at scale. (Ref 1).
- 1.2.2 The south bank of the Humber estuary is a long-established industrial area and while this provides significant regional employment, this industry also makes the Humber region the largest emitter of CO₂ in the UK, emitting approximately 20 million tonnes per annum (mtpa) of CO₂. Figure 1-2 below shows the CO₂ emissions for industrial regions in England, Scotland and Wales.

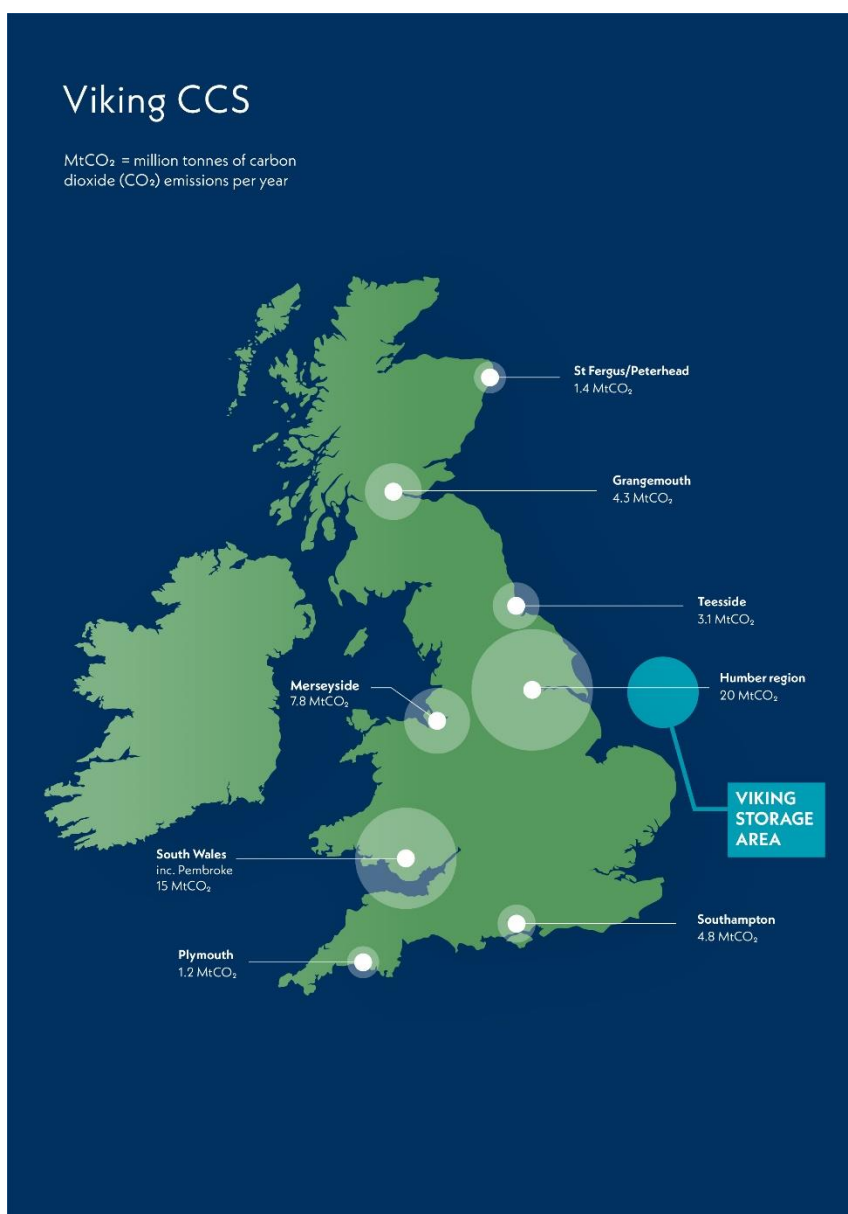


Figure 1-2 Carbon dioxide emissions by region (shown in million tonnes of CO₂ per year)

- 1.2.3 The depleted Viking gas fields in the southern North Sea have been independently verified as having storage capacity for up to 300 million tonnes of CO₂. However there is currently no link to transport CO₂ from industry in the Humber region to the Viking gas fields.
- 1.2.4 The proposed Viking CCS Pipeline comprises approximately 55km of onshore underground pipeline that is essential for transporting CO₂ from sources in the Immingham industrial area to the secure offshore storage facilities in the southern North Sea. The Viking CCS Pipeline is the only potential route to the storage facilities of the Harbour-operated depleted Viking fields.
- 1.2.5 In its Ten Point Plan, the UK Government committed to establish 4 industrial clusters for Carbon Capture Utilisation and Storage (CCUS), with 2 clusters to be established by the mid-2020s and 4 to be established by 2030 (Ref 15) to provide certainty to industry in the CCS sector. Two clusters have been progressed through the previously awarded Track 1 process (where HyNet and East Coast Cluster were deployed). On July 31st 2023 the Viking CCS Project was awarded Track 2 status as part of the UK Government's cluster sequencing process. The announcement marked an important milestone for the Project,

allowing it to move into front end engineering and design (FEED) and discussions with the government over the terms of the economic licence.

- 1.2.6 The Viking CCS Project will develop the infrastructure necessary to transport CO₂ to secure offshore storage sites. The Project is potentially transformational on the UK's journey to net zero. Located in the Humber, the UK's most industrial and CO₂-emissions-intensive region (Ref 8), the Project is uniquely placed to help the UK decarbonise and grow, by providing a gateway for investment and the development of a regional low-carbon hub.
- 1.2.7 The Project will form an essential element of a CO₂ capture, transportation, and storage network targeting a reduction of 10 million tonnes of UK CO₂ emissions per annum by 2030 and up to 15 million tonnes by 2035. This would meet up to one third of the UK's CCS target, enabling the large-scale decarbonisation of industrial and energy emissions (Ref 4). The Project will provide safe, cost-effective, high-quality, high-volume CO₂ storage to meet the high demand that exists in the Humber region.
- 1.2.8 The Project can make a fast and substantial difference in helping the UK to reach its net zero targets by 2050, achieve energy security and grow the economy of Humberside and Lincolnshire.
- 1.2.9 From 2025 to 2035, it is anticipated that the Project will enable decarbonisation of industry in the Humber region and assist in the continuation of industry and manufacturing in this region while also working towards Net Zero. While protecting existing employment in this area, the Project will also assist in generating up to £7 billion investment across the CCS value chain, with up to 10,000 direct and indirect new employment roles created from this investment (Ref 3).

1.3 Carbon Capture and Storage (CCS) overview

- 1.3.1 CCS is recognised by the government as one of the key ways the UK can achieve its target of net zero emissions by 2050 (Ref 1). CCS is the capture of CO₂ emissions from industrial sources before it can enter the atmosphere, with the captured CO₂ then transported to deep underground geological sites where it is permanently stored. In the UK, all prospective CO₂ storage sites are located offshore (Ref 18), with a large storage potential under the North Sea (Ref 17).
- 1.3.2 The Viking CCS project will take CO₂ that has been captured from industries in the Immingham industrial area, and transfer it to deep offshore storage sites in the southern North Sea. The CO₂ will be transported from Immingham through a new onshore pipeline to the former Theddlethorpe Gas Terminal (TGT). At TGT, the CO₂ will transfer into the existing offshore pipeline to be transported 140km off the coast of Lincolnshire.
- 1.3.3 Finally, the CO₂ will be injected into the depleted (empty) gas reservoirs 9,000 feet (2.7km) below the seabed. This process will be one of several important ways for the UK to achieve its target of achieving net zero carbon emissions by 2050.

1.4 UK Government support for CCS Clusters

- 1.4.1 A CCS cluster is defined as multiple carbon dioxide (CO₂) emitters using shared transportation infrastructure (Ref 6). The UK government began a cluster sequencing process in 2021 to identify at least two clusters suited to deployment in the mid-2020s (Ref 21). These clusters were identified as 'Track 1' clusters. In 2021 Government confirmed that HyNet (in the North West of England) and the East Coast Cluster (in Teeside and Humber) were the first 2 clusters chosen to progress into Track 1 negotiations for an economic licence (Ref 2). This was an important first step in building the UK's CCS industry and decarbonising its economy. The £1 billion CCS Infrastructure Fund (CIF) was confirmed in 2020 (Ref 19).

£40 million of the CIF was committed to support early stage design work in industrial clusters via the Industrial Decarbonisation Challenge (IDC) Fund.

- 1.4.2 The next part of the cluster sequencing process, Track 2, was announced on 30 March 2023. This aimed to establish the next 2 clusters which could enter negotiations for an economic licence (Ref 7). At the time of the Track 2 announcement, Government viewed Viking CCS and a second project known as Acorn (Scottish Cluster) as being 'best placed to deliver on the objectives for Track 2, subject to value for money and due diligence assessments.' (Ref 21). On July 31st 2023 the Viking CCS Project (and also Acorn CCS) was awarded Track 2 status as part of the cluster sequencing process. The announcement marked an important milestone for the Project, allowing it to move into front end engineering and design (FEED) and discussions with the government over the terms of the economic licence.(Ref 24).
- 1.4.3 The sequencing of these CCUS clusters through the Track 1 and Track 2 processes demonstrates the UK government's continued support for the development of CCS in the UK.

1.5 Regional support for CCS

- 1.5.1 The Humber area emits approximately 20 million tonnes of CO₂ per year and emits more CO₂ than any other UK region due to the volume and type of industry and energy operations in the region (Ref 8). The Viking CCS Pipeline will provide transport for up to 10 mtpa of CO₂ by 2030 and 15 mtpa by 2035 – potentially providing access to storage for more than 50 per cent of CO₂ emissions from the region.
- 1.5.2 Meeting the UK's target of achieving net zero emissions by 2050 will mean reducing emissions of CO₂ from existing industries within the Humber and Lincolnshire region. CCS offers a way to maintain these vital energy intensive industries while also reducing emissions of carbon to the atmosphere. The technology allows the transition to a low carbon economy while retaining existing jobs in the Humber and Lincolnshire region, and provides the infrastructure needed to promote the development of new industries and investment in the area.
- 1.5.3 The Viking CCS Pipeline will be transformational for the Humber. It can equip the region with high-capacity, reliable low-carbon infrastructure to promote inward investment and attract new industries. In the future it could also support the challenge facing businesses with stranded emissions beyond the Humber region, through the development of pipeline infrastructure networks (Ref 3)
- 1.5.4 Humber Zero is an industry-led project by Phillips 66 Limited and VPI Immingham. The project proposes to use the Viking CCS pipeline as a potential offtake route. The aim of Humber Zero is to decarbonise industry in and around the Immingham industrial area using CCS. By decarbonising, industry in the Humber region will remain competitive with other similar industries around the world which have also embraced decarbonisation. This will help the region to thrive, supporting tens of thousands of jobs (Ref 13).
- 1.5.5 Planning applications for post-combustion carbon dioxide capture plants were submitted to North Lincolnshire Council in March 2023 by Phillips 66 Limited and VPI Immingham. Both planning applications refer to the Viking CCS Pipeline as one of two routes to carbon storage for their captured CO₂ emissions (Ref 9 and 10 and Fig 2).
- 1.5.6 As the UK progresses to net zero, further Humber industry will need to decarbonise. The high capacity of the Viking CCS Pipeline means that it will be able to accommodate future additional CO₂ streams.
- 1.5.7 The Viking CCS Pipeline would give the Humber region unique access via the LOGGS offshore pipeline to the Viking gas fields, 140 km off the Lincolnshire coast. These reservoirs

are depleted (empty) gas fields which can now be used to store CO₂. Independent verification has confirmed storage capacity at 300 million tonnes (Ref 11).

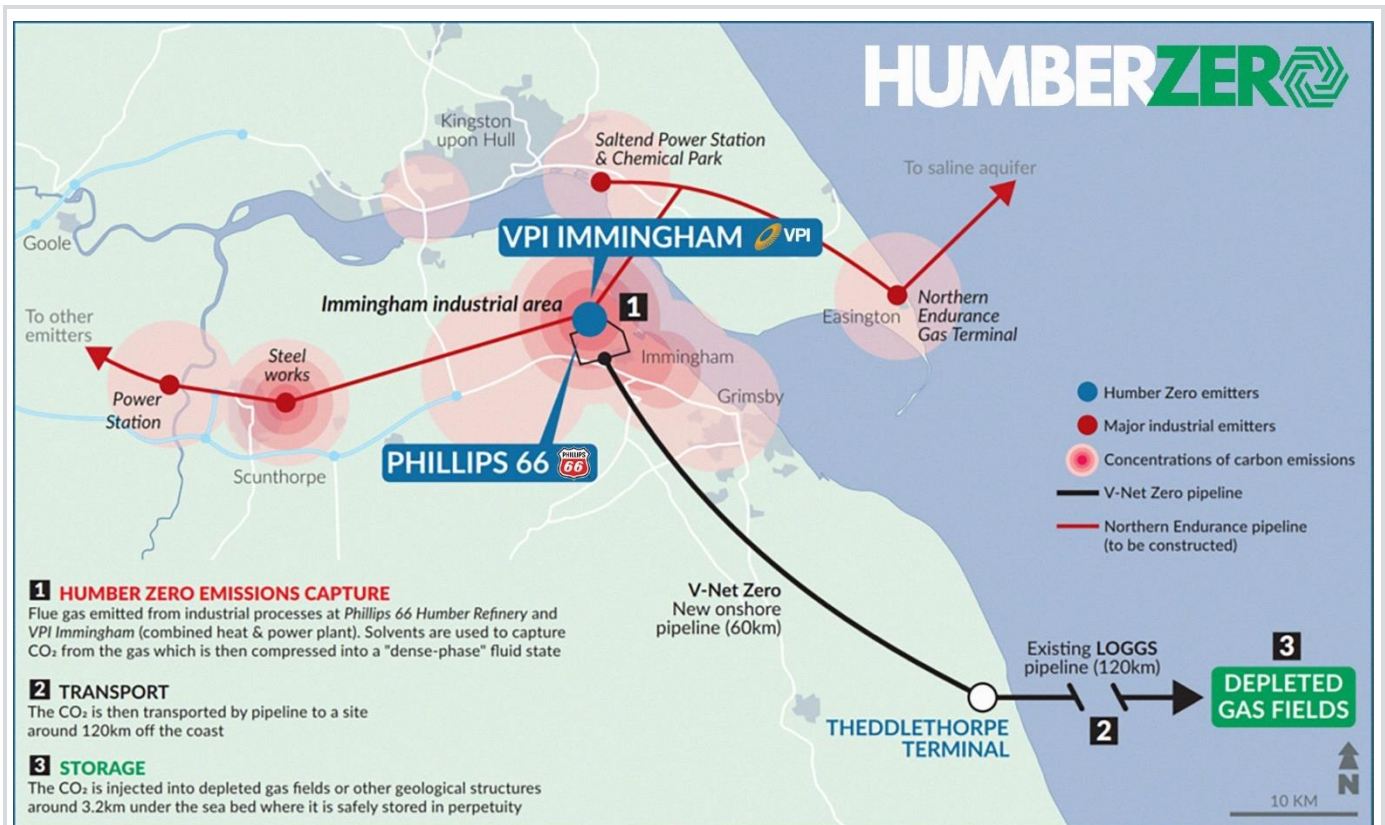


Figure 1-2. HumberZero map showing Viking CCS pipeline as potential offtake route (ref 12) NB The Viking CCS Pipeline is shown here under its previous branding (V Net Zero pipeline)

1.6 Timing and benefits delivered

- 1.6.1 The UK has the potential to be a global leader in CCS, and the Project is well-positioned to play a key role. The project plans to store 10 mtpa of CO₂ by 2030 and 15 mtpa of CO₂ a year by 2035, which would meet up to one third of the UK's CCS target (Ref 4). This would significantly contribute to the UK's net zero targets and strengthen its ambition as a world leader in decarbonisation.
- 1.6.2 The delivery of the wider Viking CCS project (in future and across all Cluster members) could be transformational for the region, potentially unlocking up to £7 billion of investment across the full CO₂ capture, transport, and storage value chain over the next decade, creating over 10,000 direct and indirect jobs during construction, and providing an estimated £4 billion of gross value added (GVA) to the Humber and its surrounding areas (Ref 3).
- 1.6.3 The Project would also assist in enabling the development of lower-carbon markets for electric vehicle manufacturing supply chain, sustainable aviation fuel (SAF) and flexible and dispatchable power generation that can supplement variable weather-dependent renewables. This will support a vibrant new lower-carbon industrial ecosystem, attracting industry, investment and employment. (Ref 3)
- 1.6.4 The UK Climate Change Committee (CCC) recognises the need for 15GW of flexible low-carbon energy generation by 2050 (Ref 14), particularly during low production of weather-dependent renewables. Abated gas-fired power generation – that is gas-fired power stations

with CCS – can provide a firm, reliable source of dependable low-carbon supply to the UK electrical system. In the future, the Viking CCS Pipeline could provide the route to storage that will decarbonise over 5GW of low-carbon gas-fired power by the early 2030s, meeting one third of the CCC Balanced Pathway target and materially supporting the required 50TWh of low-carbon dispatchable generation needed to ensure security of supply by 2035. (Ref 3)

2 The need for the Viking CCS Pipeline

2.1 National need and context

- 2.1.1 In 2022, the Committee for Climate Change stated that there is no route to net zero by 2050, nor decarbonising industry while safeguarding jobs, without deploying CCS at scale. (Ref 1)
- 2.1.2 On 30 March 2023, the UK Government announced that it remains committed to its ambition to achieve 20-30mtpa of carbon dioxide storage and four operational CCUS clusters by 2030. The Track 2 cluster process was launched on the same day. On July 31st 2023 the Viking CCS Project was awarded Track 2 status as part of the UK Government's cluster sequencing process. The announcement marked an important milestone for the Project, allowing it to move into front end engineering and design (FEED) and discussions with the government over the terms of the economic licence (Ref 24).
- ~~2.1.3~~ The Viking CCS project has the potential to meet one third of the UK Government's target to capture and store up to 30 million tonnes of CO₂ a year by 2030.
- 2.1.4 Located in the Humber, the UK's most industrialised region and largest emitter of CO₂, the project is central to establishing a world leading carbon capture industry in the UK and meeting the Government's net zero emissions targets.
- 2.1.5 The Project will reuse an existing offshore pipeline and utilise decommissioned gas fields in the southern North Sea to provide UK industries with a competitive option for the transport and storage of their CO₂ emissions.

2.2 Regional need and context

- 2.2.1 The recent Government-commissioned Net Zero Review states that infrastructure is the key that will unlock net zero (Ref 1). The Humber region has the opportunity to be at the epicentre of a UK infrastructure and industrial rejuvenation. The Humber is home to some of the largest UK offshore wind farms, has an existing large industrial base through refining, petrochemicals, manufacturing and power generation, and hosts the UK's largest port complex by tonnage, in the Port of Immingham.
- 2.2.2 The Viking CCS Pipeline (see Figure 1) will play a pivotal role in enabling decarbonisation of the strategic industries located in the Humber and Lincolnshire regions. The Viking CCS Pipeline provides a unique, low-cost opportunity to connect customers at Immingham to a repurposed offshore pipeline routing to the depleted Viking gas fields, which recently had their 300 million tonnes of CO₂ storage capacity independently verified (Ref 11).
- 2.2.3 The Project's high-capacity, reliable low-carbon infrastructure could act to promote inward investment to the area and attract new industries, stimulating national and local economic growth, at the same time as supporting the UK in reaching its net zero targets.
- 2.2.4 Development of the Viking CCS Pipeline will play a critical role in contributing to:
- 1) the creation of the jobs and skills required for a sustainable national CCS supply chain and UK export of lower-carbon products and services.
 - 2) the production of lower-carbon products and services, including promoting investment in decarbonisation technologies and future interconnection of CO₂ transport networks to increase the region's economic attractiveness to industry and investors.

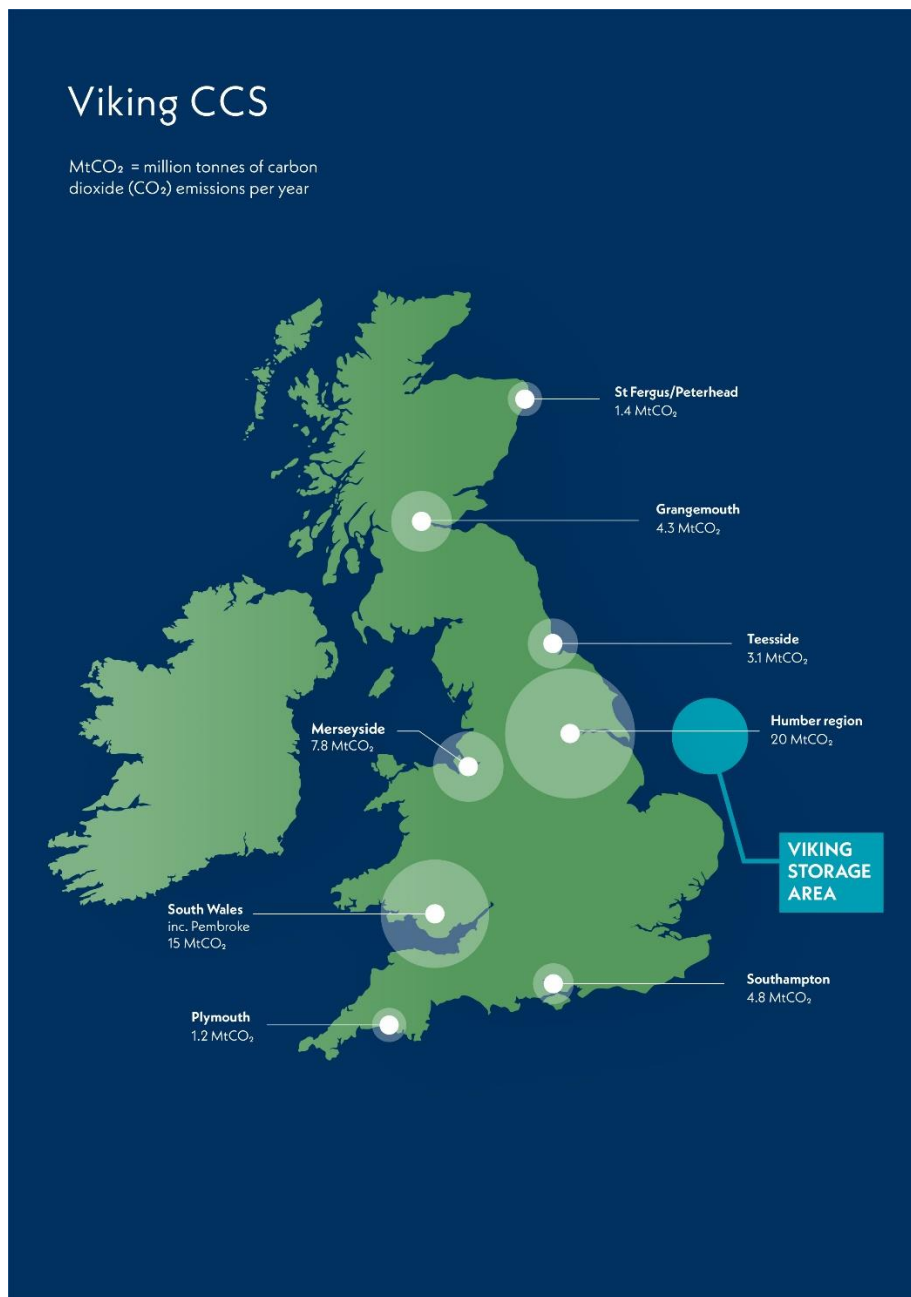


Figure 2-1. UK CO₂ emissions by industrial region (Ref 3)

- 2.2.5 The Viking CCS Cluster includes large existing industrial emitters and power stations that plan to construct and operate CO₂ capture plants. The Viking CCS Pipeline will provide the CO₂ offtake route to storage for those emitters, enabling them to decarbonise. For instance, Phillips 66 Limited and VPI Immingham, investment partners in HumberZero (see Figure 2), recently applied for planning permission for carbon capture plants, referring to the Viking CCS Pipeline as one of two potential routes to storage for those emissions (Ref 12).
- 2.2.6 Humber Zero is a series of projects to reduce the carbon emissions of critical industry in the Immingham industrial area using carbon capture (Ref 13). The project aims to remove 8 million tonnes of CO₂ a year. The carbon emissions from some processes at the VPI Immingham Combined Heat and Power Plant and Phillips 66 Limited Humber Refinery will be captured and compressed. As part of Phase 1 of the wider Humber Zero decarbonisation project, VPI Immingham aims to retrofit two of its gas and steam turbines with CCS,

capturing up to 3.4 mtpa of CO₂ a year. Phillips 66 Limited Humber Refinery is also developing new lower carbon business streams, so it can transition its business to one that is ready for the future and can contribute to decarbonising other sectors.

- 2.2.7 As an example of future potential enabled by the Viking CCS Pipeline, RWE recently announced development plans to investigate the construction of a new gas-fired power station at Stallingborough, close to the Humber estuary. RWE has developed a partnership with the Viking CCS Project to develop transportation and storage options. The RWE development would provide up to 800 MW, enough to power one million homes. (Ref 23) This would be purpose built with carbon capture technology, with an investment in the region of £1 billion. (Ref 3)

Table 1. Summary of Government and regional targets for reductions in carbon emissions

The UK government has set a target of achieving Net Zero by 2050.

In 2022, the Committee for Climate Change stated that there is no route to net zero by 2050, nor decarbonising industry while safeguarding jobs, without deploying CCS at scale. In its Ten Point Plan, the UK Government committed to establish 4 industrial clusters for Carbon Capture Utilisation and Storage (CCUS) by 2030.

On 30 March 2023, the UK Government announced that it remains committed to its ambition to achieve 20-30mtpa of carbon dioxide storage and four operational CCUS clusters by 2030.

The Humber area emits approximately 20 million tonnes of CO₂ per year and emits more CO₂ than any other UK region due to the volume and type of industry and energy operations in the region.

Humber Zero is a regional decarbonisation programme focused on the industrial area of Immingham. The first phase of Humber Zero aims to remove up to 3.8 million tonnes of CO₂ annually. Humber Zero then aims to remove up to 8 million tonnes of CO₂ per annum from the Immingham industrial cluster by 2030.

Table 2. Viking CCS Pipeline capacity targets

The Viking CCS Pipeline will provide access to 300 million tonnes of verified CO₂ storage capacity in the depleted Viking gas fields of the southern North Sea.

The Viking CCS Pipeline has the potential to provide transport for up to 10 mtpa of CO₂ by 2030.

The Viking CCS Pipeline has the potential to provide transport for up to 15 mtpa of CO₂ by 2035.

The Viking CCS Pipeline could provide access to storage for more than 50 per cent of CO₂ emissions from the Humber region.

The Viking CCS Pipeline Project could meet up to one third of the UK's CCS target by 2030.

3 Future benefits for the Humber Region

3.1 Introduction

3.1.1 The Project brings future benefits to the Humber and its surrounding regions. These opportunities could shape the area into a low-carbon hub defined by a world-leading CCS Cluster and supporting the existing skilled workforce employed within the region. This will underpin future low-carbon investment as well as the growth of new supply chain businesses and state-of-the-art products and markets. (Ref 3)

3.2 Infrastructure investment

3.2.1 More than 100 million tonnes of CO₂ could be permanently stored by 2035 through the Project. Humber Zero is a large-scale decarbonisation programme, being progressed by Phillips 66 Limited and VPI Immingham LLP. (Ref 9) It aims to remove up to 8 mtpa of CO₂ from the Immingham industrial cluster by 2030. The first phase of Humber Zero could remove up to 3.8 mtpa of CO₂ annually by capturing carbon from the Phillips 66 Limited Humber Refinery's FCC stack and two of the gas turbines and auxiliary boilers at the VPI Immingham CHP Plant. The Viking CCS Pipeline is an offtake option for this CO₂.

3.3 Economic opportunity

3.3.1 It is anticipated that the Project will assist in the continuation of industry and manufacturing in the Humber region, protecting existing employment in this area (Ref 3). The new low-carbon energy infrastructure presents opportunities for developing broader supply chains, with the availability of decarbonised power, industrial skilled labour and access to CCS infrastructure acting as a magnet to other industries. The new infrastructure is a way to promote sustained inward investment, and can help underpin long-term job creation in the region.

3.4 Supply chain opportunity

3.4.1 The capital investment of the Viking CCS Cluster through to the mid-2030s will generate sustained demand for skilled jobs in the supply chain across the regional and national economies. (Ref 3). The delivery of the wider Viking CCS project (in future and across all Cluster members) could be transformational for the region, potentially unlocking up to £7 billion of investment across the full CO₂ capture, transport, and storage value chain over the next decade, creating over 10,000 jobs during construction and across the CCS Cluster, providing an estimated £4 billion of gross value added (GVA) to the Humber and its surrounding areas. (Ref 3)

3.5 Regional skills opportunity

3.5.1 Skills demand for a CCS industry presents an opportunity to develop new low-carbon expertise in the Humber and Lincolnshire areas. By decarbonising the industrial basin in the Humber, the Viking CCS Cluster can help to ensure existing jobs directly and indirectly linked to these industries are safeguarded, while creating new job opportunities.

3.6 Low-carbon products and inward investment opportunity

- 3.6.1 The successful completion of the Project will enable project members in the Humber and beyond to decarbonise their current and future product lines, shaping the Humber into a low-carbon hub.

4 Relevant government policy and regulations

4.1 Overview of the relevant planning policy and planning context

4.1.1 This section of the need case provides an overview of the relevant UK planning policy and guidance for energy projects, Nationally Significant Infrastructure Projects (NSIPs), climate change and Net Zero. A full detailed review of the scheme's compliance with planning policy is contained within the Planning Statement [application document reference 7.1].

4.2 The National Policy Statements (NPSs)

4.2.1 Section 104 of the Planning Act 2008 outlines that the Secretary of State must have regard to the NPSs which has effect in relation to a Proposed Development. While there is not a specific NPS for CCS project, there are NPS EN-1 and NPS EN-4 include relevant matters for consideration. The NPSs set out planning policy which are a important in determining applications for Nationally Significant Infrastructure Projects (NSIP) and they establish the need for certain types of infrastructure, as well as identifying potential key issues that should be considered by the decision maker. The NPSs were established against obligations made as part of the Climate Change Act 2008 (CCA2008). The adopted NPSs for Energy were published in 2011 and are now 12 years old. Draft NPSs were published in March 2023 for consultation and carry weight in the determination of applications for NSIPs as they include current knowledge and experience of CCS.

4.3 Overarching National Policy Statement for Energy (NPS EN-1) (July 2011)

4.3.1 NPS EN-1 sets out the national policy for energy infrastructure and is an overarching document that does not specifically cover CCS. However it does include high level support for CCS projects. NPS EN-1 outlines the Government's ambition to reach the legally binding net zero target by 2050. NPS EN-1 recognises that: *"the most likely method for transporting the captured CO₂ is through pipelines"*.

4.3.2 It also recognises the considerable investment in pipelines that will be required for the demonstration programme. It states that:

"Investments could form the basis of a wider carbon dioxide pipeline network, which is likely to require greater capacity pipelines". The decision maker "should therefore take into account that the Government wants developers to bear in mind foreseeable future demand when considering the size and route of their investments and may therefore propose pipelines with a greater capacity than necessary for the project alone".

4.3.3 On CCS, the NPS EN-1 (2011) states:

"Carbon Capture and Storage (CCS) has the potential to reduce carbon emissions by up to 90%, although the process of capturing, transporting and storing carbon dioxide also means that more fuel is used in producing a given amount of electricity than would be the case without CCS. The complete chain of CCS has yet to be demonstrated at commercial scale on a power station. Whilst there is a high level of confidence that the technology involved in CCS will be effective, less is known about the impact of CCS on the economics of power station operation. There is therefore uncertainty about the future deployment of CCS in the

economy, which in the Government's view cannot be resolved without first demonstrating CCS at commercial scale”.

- 4.3.4 Since publication of NPS EN-1 the need to reduce carbon emissions globally and locally has become more urgent. The progress made by other low-carbon technologies and initiatives which were expected to deliver a low-carbon electricity system have also not delivered as quickly as expected. CCS technology has also moved on significantly and is now a critical part of the UK's decarbonisation strategy. Policies in NPS EN-1 should be interpreted in this context.

4.4 Revised draft Overarching National Policy Statement for Energy (NPS EN-1) (March 2023)

- 4.4.1 The government's December 2020 Energy White Paper signalled a review of the existing NPSs. Draft revisions for consultation of NPS EN-1 were published in September 2021; and revised drafts were published in March 2023 for consultation between 30th March and 25th May 2023 and later extended to the end of June 2023.

- 4.4.2 The revised draft NPS EN-1 was published in March 2023. In comparison to the version adopted in 2011, the revised draft NPS EN-1 places more importance on the need for new CCS infrastructure to meet the net zero ambition than the current NPS EN-1. At paragraph 3.5.2 it states that:

‘the Committee on Climate Change states CCS is a necessity not an option. As well as its role in reducing emissions associated with generating electricity from natural gas, CCS infrastructure will also be needed to capture and store carbon dioxide from hydrogen production from natural gas, industrial processes, the use of BECCS and from the air’

- 4.4.3 The revised draft NPS EN-1 goes on to state that:

‘The alternatives to new CCS infrastructure for delivering net zero by 2050 are limited, with alternative methods for decarbonising industry including the improvement of energy efficiency, electrification of heat and fuel switching to hydrogen or biomass as fuel or feedstock. Noting that these alternatives are limited as many emissions are process emissions’.

4.5 National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) (July 2011)

- 4.5.1 NPS EN-4 is a part of the suite of Energy NPSs and as such should be read in conjunction with NPS EN-1 and the revised draft NPS EN-1. NPS EN-4 addresses the impacts that a new pipeline may have and this includes noise, vibration, major accident hazards and soil and geology, amongst others.

4.6 Revised draft National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) (March 2023)

- 4.6.1 As one of the Energy NPSs, NPS EN-4 is currently being updated by Government. A draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines was published for consultation in September 2021 and a revised Draft NPS EN-4 was published in March 2023.

- 4.6.2 The title of the revised draft NPS EN-4, 2023 has been changed to include Natural Gas Supply Infrastructure and Gas and Oil Pipelines. The inclusion is to emphasise the support

for gas supply infrastructure that can be low carbon when fitted with CCS. The revised draft NPS EN-4 includes additional text on vibration and noise at paragraph 2.22.3 to 2.22.8, which includes that applications should undertake modelling to predict and understand the construction impact on hydrology, habitat loss and impacts on species from increased water noise.

4.6.3 Policies within NPSs EN-1 (Overarching NPS for Energy) and EN-4 (Gas Supply Infrastructure and Gas and Oil Pipelines) are important and relevant to this proposal. The policies which are of particular relevance and importance to this examination are further explored within the Planning Statement [application document deference 7.1].

4.7 Local Planning Policy and Guidance

4.7.1 A full detailed assessment with regards to how the scheme accords with local development plan policies is presented within the planning policy and the planning appraisal sections of the planning statement.

4.7.2 This section presents an overview of the local planning policy support for working towards net zero by 2050, CCS and climate change.

Table 3. Local policy support for CCS and Net Zero

Local Authority	Document/Policy	Policy Summary
Lincolnshire County Council	Minerals and Waste Local Plan M10: Underground Gas Storage	Policy supports developments of underground gas storage facilities, provided that the proposal accords with all other relevant development management policies set out in the plan.
	Minerals and Waste Local Plan DM2: Climate Change	Supports proposals which would encourage carbon reduction/carbon measures to be implemented.
	Carbon Management Plan, 2019	The Carbon Management Plan (CMP) sets out the strategy and action plan for continuing to reduce carbon emissions over the next 5 years.
North East Lincolnshire Council	Local Plan Policy 32: Energy and Low Carbon Living	Supports development that would achieve energy efficient and low carbon development.
	Net Zero Carbon Roadmap, 2021	<p>The Net Zero Roadmap seeks to:</p> <ul style="list-style-type: none"> • make the council a net zero organisation by 2040; • Help the community adapt to climate change and a zero carbon future; • Support and work with all other relevant agencies and stakeholders to make the borough net zero for carbon emissions by 2050.

Local Authority	Document/Policy	Policy Summary
East Lindsey Council	Local Plan Core Strategy, July 2018. Policy 27: Renewable and Low Carbon Energy,	Supports large-scale renewable and low carbon energy development, development for the transmission and interconnection of electricity and infrastructure required to support such development.
	Carbon Reduction Action Plan, August 2020	The Carbon Reduction Plan sets out a commitment to an ambitious target of reducing carbon emissions to net zero by 2040, with a minimum emissions reduction of 45% by 2027.
West Lindsey District Council	Central Lincolnshire Local Plan, April 2023. Policy S11: Embodied Carbon	Supports development proposals which seek to reduce the embodied carbon content through design, use and source of materials.
	Central Lincolnshire Local Plan, April 2023. Policy S14: Renewable Energy	Supports proposals for renewable energy schemes as a means to support the transition to a net zero carbon future
	Central Lincolnshire Local Plan, April 2023. Policy S16: Wider Energy Infrastructure	Supports proposals which are necessary for the transition to a net zero carbon sub-region
	Sustainability, Climate Change and Environment Strategy, June 2021	The Strategy sets out how WLDC will reduce its carbon footprint to net-zero by 2050 at the latest whilst playing a leadership role to ensure the whole district can achieve the same position within the same timescale
	Carbon Management Plan 2021-2026, 2021	This Plan sets out a number of recommendations that WLDC should initially work towards in order to accelerate carbon reduction across the Council. WLDC has set a carbon reduction target of achieving net zero emissions across their own operations by 2050.
North Lincolnshire Council	Local Plan submission document, November 2022. Policy DQE7: Climate Change and Low Carbon Living	Sets out how the Council expects development proposals to contribute to tackling climate change through mitigation and resilience measures, in addition to other policies contained within the local plan.
	Humber Vision 2030, 2022	This strategy centres around eight aims including that by 2030 the council will achieve net zero and will end the council's contribution to global warming.

5 Conclusion

- 5.1.1 The UK government has set a target of achieving Net Zero by 2050. In 2022, the Committee for Climate Change stated that there is no route to net zero by 2050, nor decarbonising industry while safeguarding jobs, without deploying CCS at scale (Ref 1). The Government is advancing the development of CCS in the UK by sequencing projects through Track 1 and Track 2 cluster sequencing processes. The Viking CCS Pipeline project has been included in the Track 2 process.
- 5.1.2 The Overarching National Policy Statement for Energy (NPS EN-1) published in July 2011 sets out the national policy for energy infrastructure and states the Government's ambition to reach the legally binding net zero target by 2050. NPS EN-1 recognises that: *"the most likely method for transporting the captured CO₂ is through pipelines"* and that *"Carbon Capture and Storage (CCS) has the potential to reduce carbon emissions by up to 90%, ..."*
- 5.1.3 The draft Overarching National Policy Statement for Energy (NPS EN-1) published in March 2023 places more importance on the need for new CCS infrastructure to meet the net zero ambition and states that *'the Committee on Climate Change states CCS is a necessity not an option and 'The alternatives to new CCS infrastructure for delivering net zero by 2050 are limited...'*
- 5.1.4 The Humber area emits approximately 20 million tonnes of CO₂ per year and emits more CO₂ than any other UK region due to the volume and type of industry and energy operations in the region (Ref 8).
- 5.1.5 By decarbonising, industry in the Humber region could remain competitive with other similar industries around the world which have also embraced decarbonisation. This will help the region to thrive, supporting tens of thousands of jobs in the region (Ref 13). Industry in the area is already planning for the implementation of CCS. Planning applications for post-combustion carbon dioxide capture plants were submitted to North Lincolnshire Council in March 2023 by Phillips 66 Limited and VPI Immingham, as part of the Humber Zero project, an industry-led project by Phillips 66 Limited and VPI Immingham to decarbonise industry in and around the Immingham industrial area using CCS. The Viking CCS Pipeline offtake facility will be adjacent to the Phillips 66 Limited and VPI Immingham facilities and provides a route to transport CO₂ to secure storage.
- 5.1.6 The Viking CCS Pipeline would give the Immingham industrial area and Humber region unique access (via the LOGGS offshore pipeline) to the depleted Viking gas fields which have confirmed storage capacity of 300 million tonnes and can now be used to store CO₂ (Ref 11). The Viking CCS Pipeline could provide transport for up to 10 million tonnes per annum (mtpa) of CO₂ by 2030 and 15 mtpa by 2035 potentially providing access to storage for more than 50 per cent of CO₂ emissions from the region.
- 5.1.7 The total Viking CCS Cluster investment (to develop all of the planned projects within the Viking CCS Cluster) is projected to bring £7 billion of private-sector-led capital investment between 2025 and 2035 across capture, transport and storage projects. (Ref 3) The first phase of this investment is enabled by the construction of the onshore Viking CCS Pipeline.
- 5.1.8 This scale of sustained private-sector investment will generate significant demand for skilled jobs across a broad range of industries, and develop secondary benefits across the region as these new workers seek services in the local economies.
- 5.1.9 Access to CCS infrastructure and growth in the market for lower-carbon products, such as sustainable aviation fuel, the electric vehicle battery supply chain and abated gas-fired power, can attract other inward investment to the region as evidenced by RWE's recently announced development partnership with the Viking CCS project to explore the

development of a new-build gas-fired power station on the South Humber bank fitted with carbon capture that could connect to the Viking CCS Pipeline.

5.1.10 The potential investment in the Viking CCS Cluster will help secure the UK's energy future, ensuring a fast and material reduction in CO₂ emissions, while stimulating both regional and national growth.

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