HyNet North West

NEEDS CASE

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulations 5.(2)(q)

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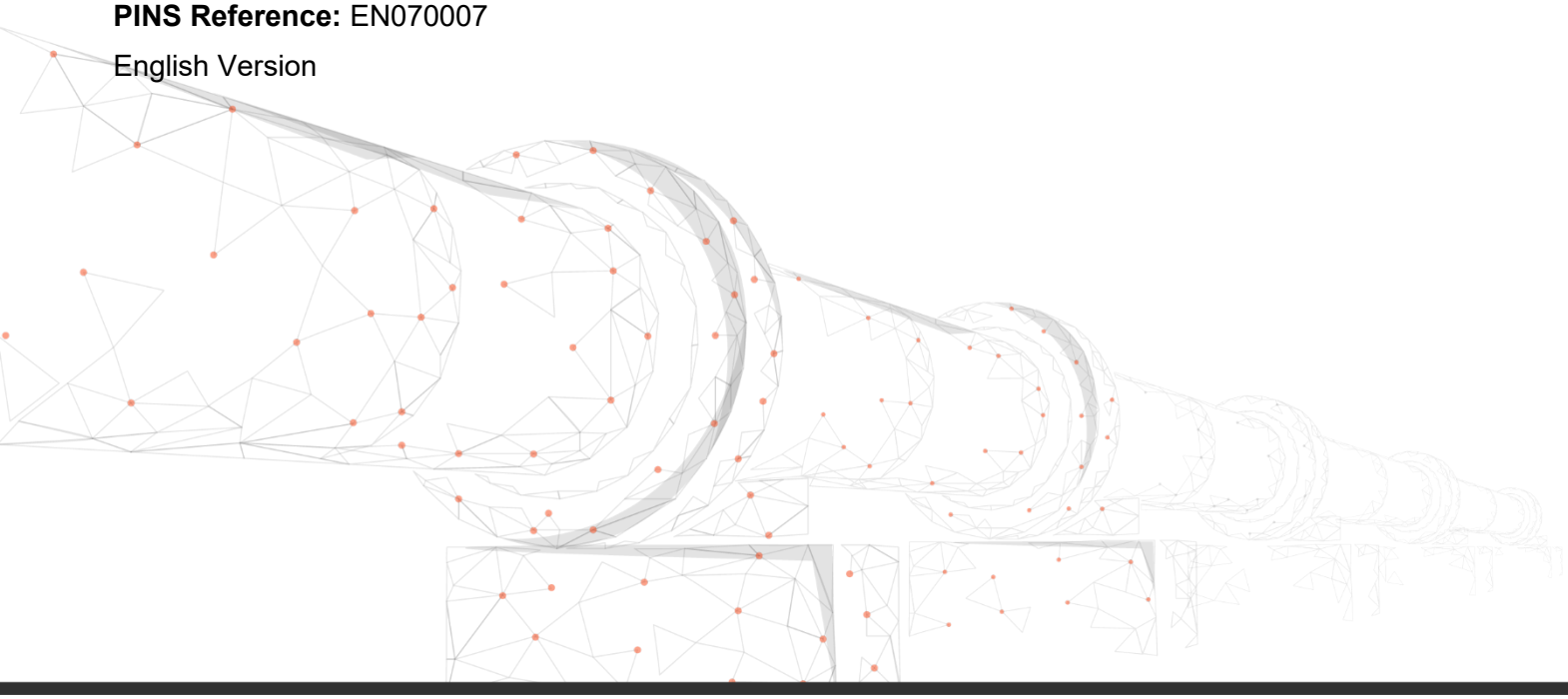

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EXECUTIVE SUMMARY

There is clear evidence that climate change is underway and urgent action is needed. Rapid and unprecedented shifts are required across all aspects of society to avoid catastrophic climate change. New infrastructure can contribute to this by decarbonising industry, flexible power generation, and other hard to abate sectors by capturing and storing the damaging carbon dioxide (CO_2) emitted by these processes.

HyNet ('the Project') has been selected by the UK Government as one of the Track-1 Clusters (alongside the East Coast Cluster) to begin decarbonising industry from the mid 2020's. The Project will support the UK in its energy transition, capturing CO_2 at a material scale (and later producing low carbon hydrogen) which will help meet both National and Local Government ambitions and policies for Net-Zero.

Through this Development Consent Order (DCO) Application, Liverpool Bay CCS Limited ('the Applicant') proposes to authorise the building and operation of a new underground CO_2 pipeline from Cheshire, England to Flintshire, Wales with necessary Above Ground Installations (AGIs) and Block Valve Stations (BVSs).

This Report outlines the needs case for the DCO Proposed Development in the context of the UK Government's objectives for a more resilient energy network and greenhouse gas emission reductions. Chapter 1 provides an overview of the DCO Proposed Development and purpose of this Report. Chapter 2 sets out the need for the CO_2 pipeline in the context of the need for new energy infrastructure and need for Carbon Capture and Storage (CCS) technology. Chapter 3 gives an overview of the relevant planning policy and legislation relating to the Project covering the UK and Welsh Government policy, as well as other Government support and other policy considerations.

There are clear international, national and local policies, ambitions and statements that support the transition to a low carbon economy and to act on climate change including legally binding legislation.

There is demonstrable support for the use of CCS to support the transition to a low carbon economy, to meet the Net-Zero target and help decarbonise industrial clusters in the North-West of England and North Wales. Furthermore, the DCO Proposed Development enables further elements of the Project to be developed which includes the production of low carbon hydrogen and a hydrogen distribution network. Without the CO_2 Pipeline, the wider Project and cluster, cannot be delivered.

The DCO Proposed Development will enable the Project to deliver many benefits for the local area, region and the country. The timing of the DCO Proposed Development will help the Government meet its targets for carbon capture and low carbon hydrogen production and will lead more rapidly to a decarbonised economy.

1. INTRODUCTION

1.1. OVERVIEW

1.1.1. This Needs Case has been prepared on behalf of Liverpool Bay CCS Limited ('the Applicant') to support an application ('the Application') for a Development Consent Order (DCO) that has been submitted to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS) under Section 37 of the Planning Act 2008 ('the PA 2008'). The Application relates to the CO_2 pipeline which constitutes the DCO Proposed Development.

1.1.2. The HyNet North West Project ('the Project') is an innovative Carbon Capture and Storage (CCS) and low carbon hydrogen energy project that will unlock a low carbon economy for the North West of England and North Wales, and put the region at the forefront of the UK's drive to Net-Zero.

1.1.3. From the mid 2020s, the Project will capture and store CO_2 from industry in the North West of England and North Wales and produce, store and distribute low carbon hydrogen. The Project will use state-of-the-art technology to build new infrastructure whilst also upgrading and reusing existing infrastructure which is currently involved in fossil fuel production.

1.1.4. This revolutionary project has the potential to reduce CO_2 emissions by up to 10 million tonnes every year by the early 2030s – the equivalent of taking 4 million cars off the road, and produce enough low carbon hydrogen (4GW) to meet 40% of the UK's Net-Zero targets (noting that the UK hydrogen target was increased to 10GW in April 2022) (HyNet North West, 2021).

1.1.5. The Project will, through until 2030, result in over £5 billion of capital investment and create over £3.7 billion GVA (Gross Value Added). This will create over 6000 jobs annually (Mace and The University of Chester , 2021).

1.1.6. The Project will support the UK in its energy transition through capturing CO_2 and producing low carbon hydrogen which will help meet both National and Local Government ambitions and policies for Net-Zero.

1.1.7. The Project will be developed in stages with the DCO Proposed Development (to which this Application relates) contributing to the first stage, alongside a new low carbon hydrogen production plant at Stanlow Manufacturing Complex and the building of a hydrogen pipeline network.

1.1.8. The Applicant intends to build and operate a new underground CO_2 pipeline from Cheshire, England to Flintshire, Wales with necessary Above Ground Installations (AGIs) and Block Valve Stations (BVSs).

1.1.9. The DCO Proposed Development is a critical component of the Project, which by facilitating the transportation of CO_2 to a permanent storage site offshore, enables the rest of the Project to be low carbon. The low carbon hydrogen

production and CO_2 capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.

1.1.10. The DCO Application will seek consent for the construction, operation and maintenance of the following components which form part of the DCO Proposed Development, namely:

- **Ince AGI to Stanlow AGI Pipeline** – a section of new underground onshore pipeline (20" in diameter) to transport CO_2;
- **Stanlow AGI to Flint AGI Pipeline** – a section of new underground onshore pipeline (36" in diameter) to transport CO_2;
- **Flint AGI to Flint Connection Pipeline** – a section of new underground onshore pipeline (24" in diameter) to transport CO_2;
- **Flint Connection to Point of Ayr (PoA) Terminal Pipeline** - a section of the Connah's Quay to PoA underground onshore pipeline (24" in diameter) which currently transports natural gas but would be repurposed and reused to transport CO_2;
- **Four AGIs** - Ince AGI, Stanlow AGI, Northop Hall AGI, and Flint AGI;
- **Six BVSs** - located along:
  - The new Stanlow AGI to Flint AGI Pipeline (three in total);
  - The existing Flint Connection to PoA Terminal Pipeline (three in total);
- Other above ground infrastructure, including Cathodic Protection (CP) transformer rectifier cabinets and pipeline marker posts;
- Utility Connection infrastructure, including power utilities and Fibre Optic Cable (FOC); and
- Temporary ancillary works integral to the construction of the CO_2 Pipeline, including Construction Compounds and temporary access tracks.

1.1.11. Further details of each element of the DCO Proposed Development are set out in **Chapter 3** of the Environmental Statement (ES) (**Document reference D.6.2.3**).

1.1.12. The DCO Proposed Development is in the Local Planning Authority areas of Cheshire West and Chester Council (CWCC) in England and Flintshire County Council (FCC) in Wales.

1.1.13. The objectives for the DCO Proposed Development are:

- To deliver a pipeline capable of transporting CO_2 from the Ince area, the Stanlow Manufacturing Complex and regional process emitters to the PoA Terminal for onward transport to a CO_2 storage location within Liverpool Bay;

- To maximise the opportunity to substantially reduce CO_2 emissions to air from industry within North West England and North Wales, by ensuring any pipeline provides the opportunity for all major emitters to connect.

1.1.14. The guiding principles of the DCO Proposed Development are:

- To avoid, minimise and manage impacts upon the environment and local amenity;
- To ensure the transportation of the CO_2 is undertaken safely and securely;
- To optimise the potential local socio-economic benefits within the region;
- To be technically viable and constructible with minimum disruption;
- To be cost-effective.

1.1.15. Through the Cluster Sequencing Process, launched in 2020, the UK Government aimed to "*identify at least two CO_2 transport and storage organisations whose readiness suggests they are most naturally suited to deployment of a CO_2 transport and storage network*" (BEIS, 2021).

1.1.16. On 19 October 2021, the Minister of State for Energy, Clean Growth and Climate Change announced the Project had been selected as one of the Track-1 Clusters (alongside the East Coast Cluster) to begin decarbonising industry from 2025 (Department for Business, Energy & Industrial Strategy, 2021).

1.1.17. On 12 August 2022, BEIS announced the outcome of the Phase 2 Cluster Sequence process, shortlisting five industrial carbon capture projects and one low carbon hydrogen production project for HyNet. These include what will become the UK's first carbon capture plant at a cement plant (Hanson's Padeswood plant) and carbon capture at the UK's largest Energy from Waste facility (Viridor's Runcorn plant). All of these six projects will now proceed into a due diligence process and commercial negotiation prior to award of a support contract. All of these projects are reliant on the DCO Proposed Development.

1.2. PURPOSE OF THIS REPORT

1.2.1. This Needs Case Report ('the / this Report') outlines the needs case for the DCO Proposed Development in the context of the Government's objectives for a more resilient energy network and greenhouse gas emission reductions.

1.2.2. This Report should be read in conjunction with the Planning Statement (**Document reference: D.5.4**) and the other documents submitted as part of the DCO Application.

1.3. STRUCTURE OF THIS REPORT

1.3.1. This Report is structured as follows:

- Chapter 1: Introduction;

- Chapter 2: The Need for the CO_2 Pipeline;
- Chapter 3: Policy and Legislation;
- Chapter 4: Summary;
- Chapter 5: References.

2. THE NEED FOR THE CO_2 PIPELINE

2.1. INTRODUCTION

2.1.1. The Project will be developed in stages, the first of which is the CO_2 pipeline and permanent storage infrastructure in Liverpool Bay, initial industrial carbon capture plants, the initial low carbon hydrogen production plant and the development of the UK's first hydrogen network.

2.1.2. Other industrial CO_2 capture projects will be developed subsequently along with increasing hydrogen production capabilities, new hydrogen pipelines and large-scale underground storage for hydrogen.

2.1.3. The CO_2 will be captured using a process known as Carbon Capture and Storage (CCS), also referred to in this document as Carbon Capture, Usage and Storage (CCUS).

2.1.4. The DCO Proposed Development will comprise of two main parts: the construction of new underground CO_2 pipelines from Ince (via Stanlow) to Flint, which then connects with an existing natural gas pipeline that will be repurposed to transport CO_2 from Flint to the PoA Terminal. A full description of the DCO Proposed Development is provided in **Chapter 3** of the ES (**Document reference D.6.2.3**).

2.1.5. The DCO Proposed Development is a critical part of the Project as it enables the captured CO_2 to be transported to the Point of Ayr Terminal, before being stored offshore.

2.1.6. **Figure 2.1** shows the CO_2 pipeline (coloured in red) within the context of the wider Project.

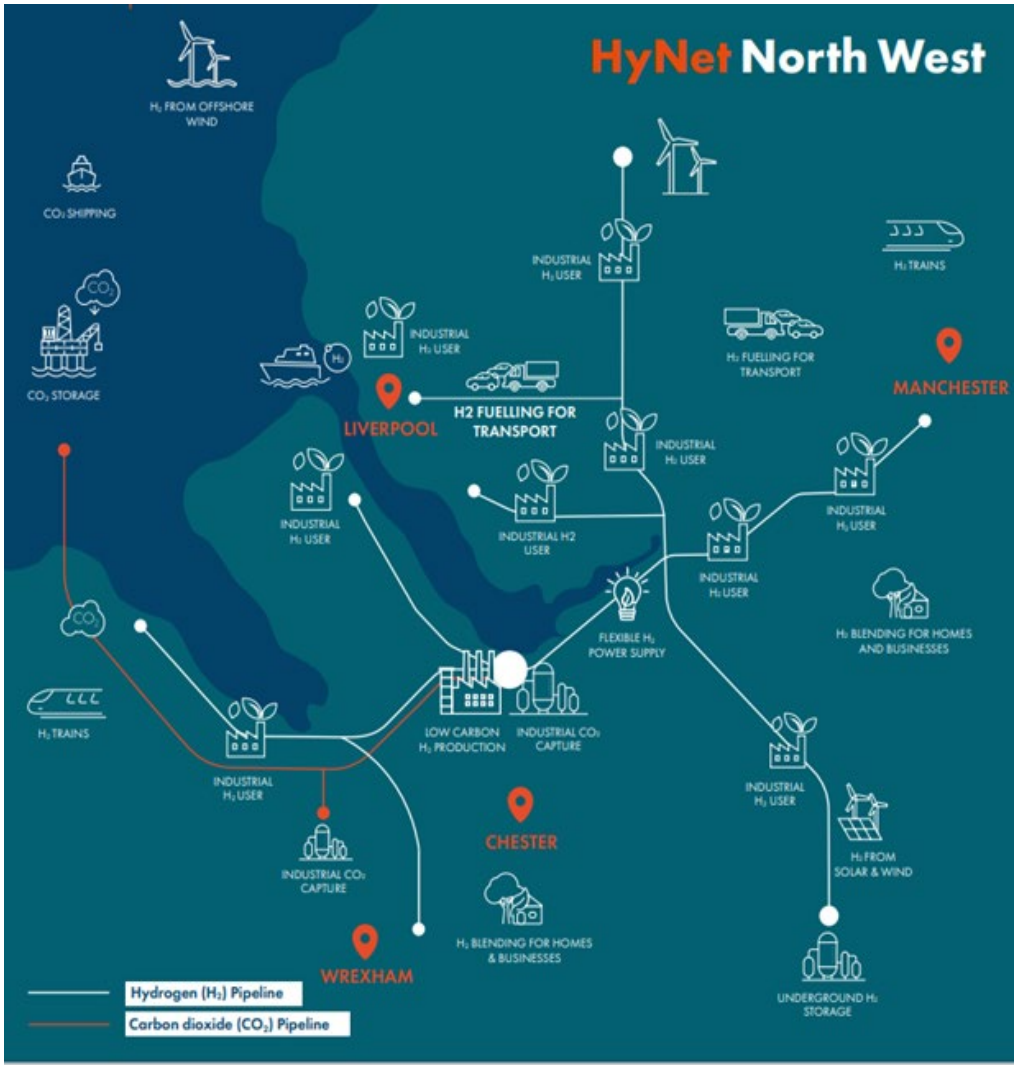
HyNet North West
H2 FROM OFFSHORE WIND
CO2 SHIPPING
CO2 STORAGE
INDUSTRIAL H2 USER
H2 TRAINS
H2 FUELLING FOR TRANSPORT
MANCHESTER
LIVERPOOL
H2 FUELLING FOR TRANSPORT
INDUSTRIAL H2 USER
INDUSTRIAL H2 USER
INDUSTRIAL H2 USER
INDUSTRIAL H2 USER
INDUSTRIAL H2 USER
FLEXIBLE H2 POWER SUPPLY
H2 BLENDING FOR HOMES AND BUSINESSES
H2 TRAINS
LOW CARBON H2 PRODUCTION
INDUSTRIAL CO2 CAPTURE
INDUSTRIAL H2 USER
INDUSTRIAL H2 USER
CHESTER
H2 FROM SOLAR & WIND
INDUSTRIAL CO2 CAPTURE
H2 BLENDING FOR HOMES & BUSINESSES
WREXHAM
UNDERGROUND H2 STORAGE
Hydrogen (H2) Pipeline
Carbon dioxide (CO2) Pipeline

Figure 2.1 - CO_2 Pipeline within the wider Project

2.2. THE NEED FOR NEW ENERGY INFRASTRUCTURE

National Government Response to Climate Change and Net Zero

2.2.1. There is clear evidence that climate change is underway and urgent action is needed. The Intergovernmental Panel on Climate Change (IPCC, 2018) has stated that global warming is “unequivocal”, and it is “extremely likely” that human activity has been the “dominant cause” of the rising temperatures witnessed during the 20th century. Rapid and unprecedented shifts are required across all aspects of society to avoid catastrophic climate change.

2.2.2. The Climate Change Act 2008 (as amended) (‘the Act’) is the primary legislative driver to deliver the UK’s response to climate change. The Act put an obligation on the UK Government to set a carbon budget (maximum level of the net UK carbon account) which covers a five-year period and is released 11 years prior to coming into force. It is set in parallel with an impact assessment on businesses and the voluntary sector.

2.2.3. The sixth (and latest) carbon budget was set in 2021 and covers the period 2033-2037. It set the carbon budget at 965 $MtCO_2e$ or 965,000,000 tonnes of CO_2 equivalent. This represents a 78% reduction in emissions on 1990 levels and is 760,000,000 tonnes lower than the fifth carbon budget (HM Government, 2021).

2.2.4. The Act also provided for the establishment of the independent Committee on Climate Change, now the Climate Change Committee (CCC) which advises the UK Government and Devolved Administrations on setting and meeting carbon budgets.

2.2.5. In May 2019, the CCC released its report entitled “Net Zero: The UK’s contribution to stopping global warming” and recommended that the UK should legislate to reach net-zero greenhouse gas emissions by 2050 and this should cover all sectors of the economy. The CCC also stated that CCS is essential and encouraged the creation of clusters (more in **section 2.3** of this Report).

2.2.6. The Act was amended in June 2019 through The Climate Change Act 2008 (2050 Target Amendment) Order 2019, which set the target for the UK’s net

carbon account for 2050 at least 100% lower than the level in 1990 i.e. Net-Zero.

2.2.7. The CCC submitted a report in June 2021 to Parliament titled 'Progress in reducing emissions' which identified that "*despite the recent willingness of the Government to raise ambition to cite emissions, delays in policy implementation continue…delivery must accelerate and broaden*" (page 9).

2.2.8. The UK Government released "Net Zero Strategy: Build Back Greener" in October 2021, which set out how the UK will meet its sixth carbon budget. The document discusses reducing emissions across the economy including in power, fuel supply and hydrogen, industry, heat and buildings, transport, natural resources, waste and F-gases and greenhouse gas removals.

2.2.9. The Net Zero Strategy states the success of the Project as a Track-1 cluster for the mid-2020s following the Cluster Sequencing process. The Strategy confirms that the Project will be taken forward into Track-1 negotiations.

2.2.10. The Net Zero Strategy is aligned with legislation and sets the UK on course for hitting Net-Zero by 2050 by meeting its sixth carbon budget and looking beyond. The strategy also brought forward the UK Government's commitment to a fully decarbonised power system by 15 years to 2035.

2.2.11. The Welsh Government released their Carbon Budget 2 in October 2021, which covers the years 2021-2025 and sets out proposals on how it will be met. The document recognises the Project will provide an opportunity for businesses in North Wales to decarbonise industrial processes (Welsh Government, 2021) (Welsh Government, 2021).

2.2.12. The Net-Zero journey in the UK started with the Paris Agreement, ratified on 17 November 2016. This is a legally binding international treaty on climate change. Article 2, section 1(a) of this agreement stated that:

"Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change" (United Nations, 2015).

2.2.13. In this agreement the parties invited the IPCC to provide a Special Report on the impacts from global warming of 1.5°C above pre-industrial levels. The IPCC report identified that exceeding the 1.5°C 'aspirational' target set by the Paris Agreement would seriously increase risks to all aspects of human wellbeing. Limiting global warming to 1.5°C requires "rapid and far-reaching" transitions in land, energy, industry, buildings, transport and cities (Intergovernmental Panel on Climate Change, 2018). The IPCC's report was approved by world governments in 2018.

2.2.14. The IPCC's Special Report stated that for no or limited overshoot of 1.5°C, net human CO_2 emissions must decline by 45% by 2030 from levels seen in 2010 and reach Net-Zero by 2050.

2.2.15. Nearly 70% of local authorities in England and Wales declared a climate emergency with many setting Net-Zero goals earlier than the national 2050 target (Climate Emergency UK, 2021).

2.2.16. CWCC unanimously declared a climate emergency on 21 May 2019. The Council is targeting *"the earliest date before 2045"* to become Net-Zero (Cheshire West and Chester Council, 2019).

2.2.17. CWCC has released a Climate Emergency Response Plan to meet this aim. In this plan, the Project is described as *"the most transformative and offers the greatest potential for carbon reduction"* and also outlines that *"the project has a critical role in the global fight against climate change and is essential for rapidly transforming the borough into a low carbon place to live and work"* (Cheshire West and Chester Council, 2020).

2.2.18. *'CWCC will work with Government and local industrial stakeholders to develop the funding mechanisms to ensure the economic viability of blue hydrogen[1] as a transitionary step towards green hydrogen, to enable the delivery of initial HyNet infrastructure by 2025'* (Cheshire West and Chester Council, 2020).

2.2.19. Welsh Government has declared a climate emergency in Wales and has set plans for the public sector to be carbon neutral by 2030 (Welsh Government, 2019). As a result, FCC has set the target date of 2030 to decarbonise council operations and promote the protection and enhancement of the county's natural environment. FCC has published a Climate Strategy – 2029/30) to help meet this goal (Flintshire County Council, 2021).

2.2.20. This demonstrates that CWCC, FCC and Welsh Government all recognise the climate emergency and the importance of achieving Net-Zero carbon emissions. All are striving to reach Net-Zero ahead of the UK target of 2050 and the Project, including and enabled by the DCO Proposed Development, will play a key role in supporting these ambitions across England and Wales.

[1] *"Blue hydrogen", alternatively called 'CCS-enabled hydrogen" is used to describe the process by which low carbon hydrogen is manufactured from natural gas, capturing the resulting carbon dioxide as part of the process for permanent storage. "Green hydrogen", alternatively known as 'electrolytic hydrogen" is used to describe the process by which low carbon hydrogen is manufactured using low carbon electricity to split water atoms into hydrogen and oxygen. Initial development of hydrogen production infrastructure for HyNet will be CCS-enabled, but will, over time, transition to a greater level of electrolytic-hydrogen. BEIS has developed a Low Carbon Hydrogen Standard, and all sources of hydrogen connecting to HyNet infrastructure will be compliant with this standard.*

SUMMARY

2.2.21. There is a clear need for action by Government and industry to work to decarbonise the economy and combat emissions which are leading to a climate emergency. National and international experts have demonstrated that we need to go harder and faster in our response to meet the target of keeping global temperature below 1.5°C above the pre-industrial average.

2.2.22. New energy infrastructure can contribute to this by decarbonising industry, flexible power generation, and other hard to abate sectors by capturing the damaging CO_2 which results from these processes. The DCO Proposed Development will transport CO_2 from greenhouse gas emitting industries and the production of low carbon hydrogen, contributing to the reduction of CO_2 in our atmosphere and making a significant contribution to the international, national and local effort against the climate emergency.

2.3. THE NEED FOR CARBON CAPTURE AND STORAGE

2.3.1. CCS is a suite of technologies that involves the capture of CO_2 from large point sources including power generation and industrial facilities. The captured CO_2 is compressed and transported to be used in a range of applications or injected into geological formations such as depleted oil and gas reservoirs for permanent storage (International Energy Agency, 2021)(International Energy Agency, 2021).

2.3.2. CCS is a proven technology which has been capturing CO_2 since the 1970's and 1980's and currently has the capacity to capture 40 $MtCO_2$ per year (International Energy Agency, 2021). CCS can capture the significant proportion of CO_2 emissions produced in industrial processes, and industrial capture projects in the Project are targeting capture rates of up to 95%. CCS is a critical element of the wider Project and will be a key element of abating emissions.

2.3.3. The first step of CCS involves installing technology that will capture CO_2 emissions that are generated from burning carbon-based fuel or as part of manufacturing processes. For the Project, CO_2 will be captured from existing industrial plants in the Ince and Stanlow areas, as well as CO_2 that is produced from the new low carbon hydrogen production plant at Stanlow.

2.3.4. The CO_2 is compressed so that it can be transported safely via an underground pipeline. The HyNet CO_2 pipeline runs from Ince to the Stanlow Manufacturing Complex in Cheshire and then using existing and new pipelines, to the PoA Terminal in Flintshire for onward transport to a CO_2 storage location within Liverpool Bay.

2.3.5. The CO_2 will be stored underground in carefully selected offshore sites. The Project's CO_2 storage site is a development of three depleted natural gas fields beneath Liverpool Bay, which have securely held natural gas for millions of

years. Extraction of the natural gas has progressively left storage volume within the sandstone reservoir that can be used for CO_2 storage.

2.3.6. Industrial processes produce a huge amount of CO_2 that is released to the atmosphere. To meet the aims and commitments set out in **section 2.2** of this Report, these emissions need to be dramatically reduced. This can be achieved by directly capturing the emissions or by switching to low carbon fuel types, such as hydrogen.

2.3.7. While the majority of industrial CO_2 emissions arise from the combustion of carbon-based fuels, some industries, such as cement and lime manufacturing, produce CO_2 through the basic chemistry of their process. Even if the process is switched fully to low carbon fuels, the majority of emissions remain, and these can only be abated by CCS technology. (HM Government, 2018).

2.3.8. The Climate Change Committee (2019) stated:

"*Carbon capture and storage is essential. We previously recommended that the first CCS cluster should be operational by 2026, with two clusters, capturing at least 10 MtCO_2, operating by 2030. For a net-zero target it is very likely that more will be needed. At least one of the clusters should involve substantial production of low-carbon hydrogen. The Government will need to take a lead on infrastructure development, with long-term contracts to reward carbon capture plants and encourage investment*". The Project has been selected as one of these first two clusters, and will involve the substantial production of low carbon hydrogen.

2.3.9. The DCO Proposed Development will enable the Project to significantly reduce carbon emissions as well as deliver substantial economic, environmental and social benefits to the region and the UK. These include:

ECONOMIC

HyNet CO_2 Pipeline

2.3.10. Mace and The University of Chester (2021) undertook an assessment into the likely economic impacts of the Project. The report broke the wider Project down into "components".

2.3.11. Employment opportunities generated by the programme for the CCS and network distribution will fall into the following sectors:

- General construction and civil engineering;
- Mechanical, electrical and process engineering construction;
- Pipeline network construction and connection

Wider HyNet Project

2.3.12. Mace and The University of Chester (2021) also undertook an assessment into the likely economic impact of the DCO Proposed Development and operation of the wider Project in both the North West of England and the UK through to 2030.

2.3.13. The assessment concluded that the Project would include substantial investment including capital expenditure of £5.4 billion for a specific project scope.

2.3.14. Of the £5.4 billion of capital expenditure, £1.7 billion is calculated as construction expenditure, and £2.8 billion as equipment.

2.3.15. The Gross Value Added (GVA) is calculated as £2 billion for the North West Region, £2.8 billion for the UK as a whole, and £3.7 billion overall.

2.3.16. There will be average annual job creation figure of 6,200 jobs through until 2030, peaking at 7,400 jobs in the region in 2026.

2.3.17. The discounted monetised environmental benefit was also assessed, and it was found that the Greenhouse Gas Emissions (GHG) reductions provided monetised benefits to the environment of £1.65bn to 2030 and £14.5bn to 2050.

2.3.18. Furthermore, the health benefits of reduced pollutant emissions are likely to be between £70m and £80m cumulatively by 2030.

2.3.19. The Mace and The University of Chester Report which looked at workforce development states that *"HyNet will promote the North West within the global Hydrogen and CCUS sectors"* and *"will enable the North West to achieve a world leading status and offer opportunity to export technical skills and experience".*

2.3.20. The report estimates the wider Project will support over 33,600 jobs in pre-construction, construction, operational and manufacturing sectors. These will be a mix of specialist, skilled and operative, direct and indirect positions. The Project *"will sustain a workforce and skills base that harness the industrial and manufacturing infrastructure already in place creating conditions that support sustainable industrial growth across sectors".* The report also states that *"the work associated with the delivery of this project is highly specialised and provides an opportunity to deliver a reduction in the labour gap in the region"* (Mace and The University of Chester , 2021).

ENVIRONMENTAL

2.3.21. There is to be a potential reduction of up to 10 million tonnes of carbon emissions a year by the early 2030s – the equivalent of taking four million cars off the road.

2.3.22. The wider Project will provide up to 40% of the total hydrogen needed to meet the UK's low carbon hydrogen production target, as set out in the Hydrogen Investor Roadmap in April 2022.

SOCIAL

2.3.23. Thousands of new jobs created during construction and operation will support the local, regional and national economy, and will help to protect many more jobs for the future.

2.3.24. There will be greater opportunities for local people, tapping into the area's blend of industrial experience and scientific expertise, which together will create a hotspot for innovation and growth.

2.3.25. By reducing CO_2 emissions, local air quality will improve and make the region a safer and healthier place for future generations to thrive.

2.4. THE NEED FOR THE DCO PROPOSED DEVELOPMENT CONSIDERING THE GOVERNMENT'S POSITION

2.4.1. **Section 2.2** of this Report set out the changes that the UK must take to tackle climate change and reach Net-Zero. It outlined the main policy drivers and considerations which have showed a clear need for the DCO Proposed Development.

2.4.2. International, national and local policies all make clear the urgent nature of tackling climate change to ensure the world does not exceed 1.5°C above pre-industrial levels.

2.4.3. To meet the UK's sixth carbon budget the Government has outlined an ambition to capture and store 20-30 $MtCO_2$ per year by 2030 (HM Government, 2021) and the CCC have stated that the first cluster will need to be operational by 2026 and at least one cluster should involve low carbon hydrogen (Committee on Climate Change, 2019).

2.4.4. The DCO Proposed Development enables the operation of the first cluster. The transportation of CO_2 through the new and repurposed existing pipeline means that industry in the region will be able to reduce their emissions and a new low carbon hydrogen plant can be built with the majority of CO_2 captured. Without the CO_2 pipeline, the wider Project cannot be realised.

2.4.5. The Project has the potential to capture up to $10MtCO_2$ per year by the early 2030s, the equivalent of taking 4 million cars off the road or the equivalent of heating 5 million households with natural gas boilers (HyNet North West, 2021).

2.4.6. The importance of the Project has been recognised in the Government's choice in taking forward the Project in Track-1 of its Cluster Sequencing process (Department for Business, Energy & Industrial Strategy, 2021). This Project will be key to meet the ambitious but critical targets set by The Climate Change Act

2008 (as amended) and sets the way forward for other industrial clusters in the UK and abroad to decarbonise industry and the economy.

2.4.7. The North West of England and North Wales are perfectly set up to deliver a low cost and low risk CCS and low carbon hydrogen project. The North West industrial cluster is located close to ideal geological structures for both the permanent offshore storage of CO_2 in storage reservoirs beneath Liverpool Bay, and the onshore storage of low carbon hydrogen in salt caverns in Cheshire. The natural gas reservoirs in Liverpool Bay continue to produce but will reach the end of their production life ahead of re-purposing for CO_2 storage to begin in the mid 2020s.

2.4.8. Further potential for CO_2 storage also exists in the Morecambe Bay gas fields to the north of Liverpool Bay, which similarly could be repurposed for CO_2 storage in future. Both these sets of fields are relatively close to shore, reducing CO_2 transport and storage costs.

2.4.9. Reusing existing natural gas infrastructure for CO_2 transport and storage minimises the capital cost of the Project. Typically, operators and Government both share the costs of decommissioning oil and gas assets. By repurposing the depleted gas reservoirs, the Project negates the need to decommission them, significantly reducing the burden on UK taxpayers.

2.4.10. The Cheshire salt basin is already used extensively for natural gas storage and is suitable and available for hydrogen storage for the Project.

2.4.11. The wider Project involves the production, distribution, storage and end-use of material quantities of low carbon hydrogen. This allows cost-effective decarbonisation of the combustion emissions associated with industrial manufacturing processes, and the ability to store hydrogen at scale allows flexible power generation to be decarbonised for periods when renewable energy production is insufficient. The low carbon hydrogen elements of the Project are subject to separate consenting processes, but are reliant on the CO_2 pipeline, without which low carbon hydrogen cannot be produced at sufficient scale to materially decarbonise industrial emissions across the region.

2.4.12. Further to this, a UK Government study has found that the Hamilton gas field in Liverpool Bay is the UK's most suitable, safe site for CO_2 storage (Energy Technologies Institute, 2016) and in the CCS Deployment Pathway report by the Government it includes the East Irish Sea as a key location for the potential opportunity for oil and gas infrastructure re-use (HM Government, 2018).

3. POLICY AND LEGISLATION

3.1. OVERVIEW OF THE RELEVANT PLANNING POLICY AND PLANNING CONTEXT

3.1.1. This section of the Needs Case sets out the relevant UK and Welsh Government policies on energy Nationally Significant Infrastructure Projects (NSIPs) and climate change.

3.2. UK AND WELSH GOVERNMENT POLICY

3.2.1. The development and use of CCS and hydrogen are supported by the UK and Welsh Governments in key policy documents. The key UK Government documents which are relevant to this Application are:

- Overarching National Policy Statement for Energy (NPS EN-1) (July 2011);
- Draft Overarching National Policy Statement for Energy (Draft NPS EN-1) (September 2021);
- National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) (July 2011);
- Draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (Draft NPS EN-4) (September 2021);
- The Clean Growth Strategy (April 2018);
- National Infrastructure Assessment (July 2018);
- National Infrastructure Strategy (November 2020);
- Prime Minister's Ten Point Plan for a Green Industrial Revolution (November 2020);
- Energy White Paper - Powering our Net Zero Future (December 2020);
- Industrial Decarbonisation Strategy (March 2021);
- UK Hydrogen Strategy (August 2021);
- Net Zero – Build Back Greener (October 2021);
- White Paper - Levelling Up the United Kingdom (February 2022);
- British Energy Security Strategy (April 2022);
- Hydrogen Investor Roadmap – Leading the Way to Net Zero (April 2022); and
- CCUS Investor Roadmap - Capturing Carbon and a Global Opportunity (April 2022).

3.2.2. The key Welsh Government policy documents relevant to CCS and climate change are:

- Prosperity for All: A Low Carbon Wales (June 2019);

- A Carbon Capture, Utilisation, & Storage Network for Wales (March 2021);
- Net Zero Wales Carbon Budget 2 (2021-25) (October 2021);
- Wales Infrastructure Investment Strategy (December 2021).

3.2.3. These policies are summarised below. Further detail on the relevant policy considerations are set out in more detail in the Planning Statement (**Document reference D.5.4**).

UK GOVERNMENT POLICY

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

3.2.4. Section 105 requires the SoS to determine applications having regard to any matters which the SoS thinks are both "important and relevant". While NPSs may not have effect in relation to schemes determined under section 105, matters incorporated within them are nonetheless likely to constitute important and relevant considerations in determining such applications and have therefore been considered where applicable below.

3.2.5. NPS EN-1 sets out national policy for energy infrastructure and states the Government's ambition to reach the legally binding target by 2050.

3.2.6. NPS EN-1 recognises that *"the most likely method for transporting the captured CO_2 is through pipelines"* (paragraph 4.7.7). It also recognises the considerable investment in pipelines that will be required for the demonstration programme. It states that the:

"*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*" (paragraph 4.7.7).

3.2.7. On CCS, the NPS EN-1 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" (paragraph 3.6.4).

3.2.8. The current NPS EN-1 reflects policy at the time of writing in 2011 which anticipated the use of CCS primarily for the production of low carbon electricity. In the decade since this was written, policy now reflects a cluster approach to the use of CCS technology, with it being used for industry, power generation and low carbon hydrogen production. The Draft NPS EN-1 now reflects this broader use case for the technology (see below).

Draft Overarching National Policy Statement for Energy (September 2021)

3.2.9. NPS EN-1 is currently being updated by Government. The Applicant will keep the draft document and any future changes under constant review to ensure compliance with the latest Government policy.

3.2.10. Draft EN-1 mentions CCS and states that the "*Government is developing business models to incentivise the deployment of Carbon, Capture, Utilisation and Storage (CCUS) facilities and hydrogen in the UK*" (paragraph 2.4.4).

3.2.11. Draft EN-1 states, "*there is an urgent need for all types of low carbon hydrogen infrastructure to allow hydrogen to play its role in the transition to net zero*" (paragraph 3.4.16). The DCO Proposed Development will enable the production of low carbon hydrogen at Stanlow by transporting the produced CO_2 to be stored, which enables low carbon hydrogen to be used in the transition to Net-Zero.

3.2.12. Draft EN-1 also states, "*CCS infrastructure will also be needed to capture and store carbon dioxide from hydrogen production from natural gas, industrial processes, the use of bioenergy (BECCS) and from the air (DACCS). CCS infrastructure could be new or repurposed infrastructure*" (paragraph 3.5.1).

3.2.13. Draft EN-1 also states, "*the government will expect applicants to take into account foreseeable future demand when considering the size and route of their investments and applicants may therefore propose pipelines with a greater capacity than demand at the time of consenting might suggest*" (paragraph 4.8.7). The DCO Proposed Development has taken into account future demand and has sufficient capacity for more industrial users to connect to the CO_2 pipeline.

National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (July 2011)

3.2.14. The policy is part of the suite of Energy NPSs and should be read in conjunction with NPS EN-1 and Draft NPS EN-1.

3.2.15. NPS EN-4 discusses the possible impacts that a new pipeline may have such as noise and vibration, major accident hazards and soil and geology, among others.

Draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (September 2021)

3.2.16. NPS EN-4 is also currently being updated by Government. The Applicant will keep the draft document and any future changes under constant review to ensure compliance with the latest Government policy.

The Clean Growth Strategy (April 2018)

3.2.17. This Strategy was laid before Parliament to show how the UK Government aims to meet the fourth and fifth carbon budgets.

3.2.18. The Strategy discusses the aim of investing in CCS and declares that the Government will continue to work with ongoing initiatives to *"test the potential for development of CCUS industrial decarbonisation clusters"* including in Merseyside (page 70). There are also many actions/milestones that involve CCS in the Strategy including the production of a deployment pathway for CCS.

3.2.19. The Strategy discusses the potential for hydrogen to be used for transport, industry and heating. The Strategy recognises that CCS can be used as part of a decarbonised production method for hydrogen.

National Infrastructure Assessment (July 2018)

3.2.20. Once per Parliamentary session (or every five years) the National Infrastructure Committee (NIC) releases the National Infrastructure Assessment which outlines a strategic vision over 30 years and recommends how these needs are met. The first assessment was released in July 2018 and the next report is due to be published in Autumn 2023.

3.2.21. The 2018 report states that CCS can be used for the reduction of emissions from industrial processes and the *"most pressing reason to develop it at scale is likely to be for the manufacture of low carbon hydrogen"* (page 43).

3.2.22. The report goes on to say, "*removing and storing the carbon from natural gas as part of producing hydrogen is a simpler process than capturing it as it is burnt in a power station*" (page 43).

National Infrastructure Strategy (November 2020)

3.2.23. The National Infrastructure Strategy was produced by HM Treasury in response to the National Infrastructure Assessment, published by the NIC. The Strategy aims to make the UK a world leader in new technologies including CCS and hydrogen production. The report states CCS *"will also be essential to decarbonising large parts of industry, producing low emissions hydrogen and in delivering greenhouse gas removal technologies, permanently locking away carbon dioxide"* (page 53).

Prime Minister's Ten Point Plan for a Green Industrial Revolution (November 2020)

3.2.24. The Prime Minister's Ten Point Plan for a Green Industrial Revolution outlines a vision for "*Building back better, supporting green jobs, and accelerating our path to net zero"* and includes aims for CCS and low carbon hydrogen in the UK.

3.2.25. Point 2 of the plan is "*Driving the Growth of low carbon hydrogen*" which includes a target for 5GW of low carbon hydrogen production capacity by 2030 and the desire to see "SuperPlaces" which are hubs with renewable energy, CCS and hydrogen. Growth in the low carbon hydrogen sector could deliver support for 8,000 jobs and over £4bn of private investment by 2030 (pages 10-11).

3.2.26. Point 8 of the plan is *"Investing in Carbon Capture, Usage and Storage"* which has an ambition to capture 10Mt of CO_2 a year by 2030. It discusses SuperPlaces and will look to establish two industrial clusters by the mid-2020s (of which the Project has been subsequently selected as one) and three to four clusters by 2030. These clusters could be the beginning of a new carbon capture industry for the UK which could support 50,000 jobs by 2030 (pages 22-23).

Energy White Paper - Powering our Net Zero Future (December 2020)

3.2.27. The Energy White Paper sets out the policies and commitments by the Government to put the UK on course to achieve Net-Zero. The White Paper includes support for the development of CCS in four industrial clusters by 2030, two of these by the mid-2020's (of which the Project has been subsequently selected as one). This includes an ambition to see 10 $MtCO_2$ captured per year by 2030. The White Paper states that Government will also work with industry to develop 5GW of low carbon hydrogen production capacity by 2030.

Industrial Decarbonisation Strategy (March 2021)

3.2.28. The Industrial Decarbonisation Strategy aims to show how the UK can have an industrial sector that is successful but also aligned to Net-Zero preventing the pushing of emissions and business abroad.

3.2.29. The Strategy states that clustered industrial sites produce 37.6 $MtCO_2e$ which is more than those emissions of dispersed sites which contribute 33.6 $MtCO_2e$. Merseyside cluster emissions in 2018 were 5$MtCO_2e$.

3.2.30. The Strategy expects that emissions will need to fall by two-thirds by 2035 and to do this 3$MtCO_2$ of primarily process emissions will be captured each year. Wider industrial decarbonisation of combustion emissions will be delivered through fuel-switching to low carbon fuels, including hydrogen.

3.2.31. The Strategy reiterates the Governments position on the development of two clusters by the mid-2020's (of which the Project is one that benefits from this support) and four by 2030 with the goal of capturing 10MtCO_2 per year by 2030.

UK Hydrogen Strategy (August 2021)

3.2.32. The UK Hydrogen Strategy looks to develop a thriving UK hydrogen sector and it set out the measures needed to enable the production, distribution, storage and use of hydrogen.

3.2.33. The Strategy outlines the importance of low carbon hydrogen and outlines the ability of CCS to make the hydrogen production process low carbon.

3.2.34. The Strategy mentions the Project as looking at CCS and exploring the distribution and transmission of hydrogen within gas networks. The DCO Proposed Development is critical to the wider Project, as it provides the means to transport captured CO_2, which enables low carbon hydrogen production and distribution.

Net-Zero: Building Back Greener (October 2021)

3.2.35. This document was presented to Parliament in October 2021 and sets out what the UK Government will do to meet the sixth carbon budget. This document confirms the Project as a Track-1 cluster in the Cluster Sequencing process. The document states the Project and the East Coast Clusters *"will act as economic hubs for green jobs in line with our ambition to capture 20-30 MtCO_2 per year by 2030"* (page 21). The document states that this puts the region *"among the potential early SuperPlaces which will be transformed over the next decade"* (page 21). This document increases the commitment from the Energy White Paper for the capture of 10 MtCO_2 to 20-30 MtCO_2 by 2030 using CCS.

White Paper - Levelling Up the United Kingdom (February 2022)

3.2.36. This White Paper repeats the announcement made in the Net Zero Strategy that the North West / North Wales is one of the first two industrial clusters where funding to support new investment in CCS will be given, and describes the clusters as *"the starting point for a new carbon capture industry"* (page 169).

3.2.37. The document also mentions the UK Government's ambition for 5GW of hydrogen production capacity. The DCO Proposed Development will enable the new low carbon hydrogen production plant at Stanlow Manufacturing Complex by transporting captured CO_2, making the plant low carbon and assisting the UK in meeting its Net-Zero targets.

British Energy Security Strategy (April 2022)

3.2.38. This document outlines proposed actions and ambitions of the UK Government to increase energy security and bring down energy bills. The strategy reiterates the Government's ambition for investing in CCS – this includes a 2025 ambition

to see "*up to 1GW of CCUS-enabled [hydrogen] operational or in construction by 2025"* (page 32) (HM Government, 2022).

3.2.39. The DCO Proposed Development would support these ambitions with an operational date of mid 2020s.

Hydrogen Investor Roadmap – Leading the Way to Net Zero (April 2022)

3.2.40. This document sets out the UK Government's investor roadmap for hydrogen. It states that *"Low carbon hydrogen will be vital to achieving net zero by 2050, with the potential to help decarbonise key UK industrial sectors and provide energy across power, transport and heat"* (page 2).

3.2.41. Furthermore, this roadmap doubled the UK Government's ambition to up to 10GW of low carbon hydrogen production capacity by 2030, with the expectation that *"up to 2GW of low carbon hydrogen production capacity will be in operation or construction by 2025"* (page 2).

3.2.42. The Project has the potential to produce enough low carbon hydrogen (4GW) to meet 40% of this target by the early 2030's.

CCUS Investor Roadmap - Capturing Carbon and a Global Opportunity (April 2022)

3.2.43. This document sets out the UK Government's investor roadmap for CCS which reiterates the aim to capture 20-30MtCO_2 per year by 2030 and mentions HyNet specifically as a Track-1 cluster.

WELSH GOVERNMENT POLICY

Prosperity for All: A Low Carbon Wales (March 2019)

3.2.44. This document set out how Wales would meet its first carbon budget (2016-2020) and recognises in Proposal 18 the need for collaboration on CCS across the border between North West England and North Wales.

A Carbon Capture, Utilisation, and Storage Network for Wales (March 2021)

3.2.45. This sets out the approach that the Welsh Government would like to see regarding CCS. The document recognises CCS as *"a feasible technical option to support Wales in achieving its statutory emissions reduction targets"* (paragraph 1). The DCO Proposed Development will transport CO_2, once captured, from industrial processes. As recognised by this document, there will be opportunities for sites in North-East Wales to connect to the Project, which will aid in the meeting of statutory targets in Wales.

3.2.46. The document also states that there is a dependency on North Wales for the DCO Proposed Development and refers specifically to the Project (page 9), stating:

"The Welsh Government should enhance its collaboration with the HyNet project in North West England to secure sufficient capacity in the project to meet the needs of the CO_2 emitters in North Wales".

Net Zero Wales Carbon Budget 2 (2021-25) (October 2021)

3.2.47. This document released by the Welsh Government focuses on how Wales will meet its second carbon budget which spans the years 2021-2025. However, the document also looks beyond this time period and builds the foundations for the third carbon budget and looking towards the target of Net-Zero by 2050. The document discusses industrial clusters using CCS in Proposal 18 (page 134) and states:

"*The HyNet project presents significant opportunities to businesses across North Wales to decarbonise existing industrial processes*."

3.2.48. The document discusses the reduced opportunity in South Wales for the storage of CO_2 *"due to the lack of suitable nearby geological stores"* (page 133). This further highlights the advantageous position in which the Project is situated with the surrounding geological environment.

Wales Infrastructure Investment Strategy (December 2021)

3.2.49. This document reinforces the argument *"that this must be the decade of action in terms of tackling climate change in Wales"* (paragraph 1, page 3). The strategy aligns with that of the Net Zero Wales Carbon Budget 2 document in its ambition to build *"a greener Wales for our future generations"* (paragraph 9, page 25).

3.3. OTHER UK GOVERNMENT SUPPORT

3.3.1. The UK Government has set out a range of other non-policy documents and support for CCS and low carbon hydrogen. This support includes:

- Clean Growth – The UK CCUS Deployment Pathway (November 2018);
- Carbon capture, usage and storage (CCUS) supply chains: a roadmap to maximise the UK's potential (May 2021);
- 2021 Progress Report to Parliament (June 2021); and
- The Growth Plan 2022 (September 2022).

Clean Growth – The UK CCUS Deployment Pathway (November 2018)

3.3.2. This outlines the vision of the UK Government for CCS uses. It includes the East Irish Sea as a key location for the potential opportunity for oil and gas infrastructure re-use. The document references the CCS Cost Challenge Taskforce and Lord Oxburgh's Parliamentary Advisory Group on CCS which recommended the deployment of CCS in industrial centres. It states that CCS in industrial centres *"has the potential to allow a number of carbon capture*

applications – from industry, to hydrogen" (page 29). The document also states, *"a successful proposition will be one that is supported by local and regional communities, authorities and businesses"* (page 30).

CCUS Supply Chains Roadmap (May 2021)

3.3.3. This document describes CCS as *"essential"* to tackling climate change and meeting the UK's target of Net-Zero by 2050.The DCO Proposed Development will transport the captured CO_2 and enable the Project to capture and safely store CO_2, contributing to the UK's Net-Zero target.

CCC 2021 Progress Report to Parliament (June 2021)

3.3.4. The CCC 2021 Progress Report sets out where the UK is regarding its commitment to reach net-zero by 2050. These progress reports are released each year. The report calls on the Government to have in place by the end of 2022 *"CCUS business models decided for power, hydrogen and manufacturing and construction"* (page 144) and to support at least one power CCS project by 2030. The report also states:

"The Government should commit to phasing-out the use of unabated gas for electricity generation by 2035, subject to ensuring security of supply. It should publish a comprehensive long-term strategy in 2021 for achieving this. That should include through developing and deploying CCUS and hydrogen in electricity generation, and by ensuring new gas plant are properly CCUS-and/or hydrogen-ready as soon as possible and by 2025 at the latest" (page 177).

3.3.5. The DCO Proposed Development will be operational by mid 2020s and enable the production of low carbon hydrogen. This low carbon hydrogen will potentially be supplied to power stations across the region, aiding in the decarbonisation of electricity generation. Without the ability to transport the captured CO_2, which is provided by the DCO Proposed Development, low carbon hydrogen cannot be produced.

The Growth Plan 2022 (September 2022)

3.3.6. This plan lists *"infrastructure projects which will be accelerated as fast as possible"*. The projects listed in the document *"may benefit from acceleration through planning reform, regulatory reform, improved processes or other options to speed up their development and construction, including through development consent processes"* (page 35) (HM Treasury, 2022).

3.3.7. Within the Energy and CCS sections of the Plan – the HyNet Cluster was named as one of these projects. The critical importance of the DCO Proposed Development to the wider Project has been discussed in this Needs Case, therefore any expediting of the processes for the DCO Proposed Development has the potential to deliver the wider Project more quickly.

3.4. OTHER POLICY CONSIDERATIONS

Paris Agreement – COP 21

3.4.1. The Paris Agreement, which was ratified in the UK on 17 November 2016, is an international treaty seeking to substantially reduce greenhouse emissions around the globe. The agreement outlines measures relating to mitigation, adaptation, and finance.

3.4.2. One of the core sections of the agreement is a requirement for all involved countries to prepare national plans setting out the means for achieving their respective reduction targets.

3.4.3. Another purpose of the Paris Agreement is to enable member countries to adapt to the adverse effects of climate change and foster climate resilience.

Glasgow Climate Pact – COP 26

3.4.4. The Glasgow Climate Pact was signed at COP 26 on 13 November 2021 and is designed to *"accelerate action on climate this decade"* (page 3) - it focused on four areas: mitigation, adaptation, finance and collaboration. It is thought that if the pledges made by countries in Glasgow are fully implemented, this will keep warming below 2°C.

3.4.1. The Pact keeps the Paris Agreement's aim of pursuing '1.5°C alive' and countries have been encouraged to come up with improved commitments in 2022.

3.4.2. After COP 26, over 90% of global GDP is covered by net zero commitments. The Pact also saw 70 countries come together to deliver a hydrogen breakthrough – to make affordable, renewable and low carbon hydrogen globally available by 2030.

4. SUMMARY

4.1.1. There is a clear need for action to avoid catastrophic climate change. CO_2 is a large contributor to climate change and to limit global warming to 1.5^{o}C above the pre-industrial peak, action will need to be taken.

4.1.2. There are clear international, national and local policies, ambitions and statements that support the transition to a low carbon economy and to act on climate change including legally binding legislation.

4.1.3. There is demonstrable support for the use of CCS to support the transition to a low carbon economy, to meet the Net-Zero target and help decarbonise industrial clusters in the North-West of England and North Wales. Furthermore, the DCO Proposed Development enables further elements of the Project to be developed which includes the production of low carbon hydrogen and a hydrogen distribution network. Without the CO_2 Pipeline, the wider Project and cluster, cannot be delivered.

4.1.4. The DCO Proposed Development will enable the Project to deliver many benefits for the local area, region and the country. The timing of the DCO Proposed Development will help the Government meet its targets for carbon capture and low carbon hydrogen production and will lead to a decarbonised economy, more quickly.

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