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5. Policy Context

5.1 Introduction

- 5.1.1 This Chapter of the Environmental Statement (ES) provides an overview of the legislative and policy context that is relevant to the Proposed Developments.
- 5.1.2 As described in ES Chapter 1, this ES relates to two Proposed Developments – the Proposed VPI Development and the Proposed Phillips 66 Development – which together comprise the first phase of the Humber Zero project.
- 5.1.3 As confirmed in ES Chapter 1 (Section 1.4), consent for the Proposed Developments will be sought under the Town and Country Planning Act 1990 (TCPA). Two separate planning applications will be submitted to the Local Planning Authority (LPA) North Lincolnshire Council (NLC), seeking planning permission for the Proposed Phillips 66 Development and the Proposed VPI Development respectively.
- 5.1.4 Section 70(2) of the TCPA states that in dealing with an application for planning permission, the LPA shall have regard to the provisions of the development plan, as far as it is material to the application, and any “*other material considerations*”.
- 5.1.5 This chapter of the ES provides an overview of the development plan policy that may be material to the Proposed Developments and refers to national planning, energy and climate change policy that may also be material and relevant to the determination of the planning applications.
- 5.1.6 Development plan policy and any other material considerations, including national policy, which may be relevant to the Proposed Developments, will be considered in detail within the Planning Statement that will form part of the planning applications submitted to NLC.
- 5.1.7 The chapter has been written by DWD LLP.

5.2 Development Plan Policy

- 5.2.1 The Development Plan for North Lincolnshire comprises the North Lincolnshire Local Development Framework (LDF) and the ‘Saved Policies’ of the North Lincolnshire Local Plan (NLC, 2007).
- 5.2.2 The LDF comprises a suite of Development Plan Documents (DPDs) that set out the local planning policy for the area for the period to 2026. The DPD documents that are considered to be of relevance to the Proposed Developments are:
- the Core Strategy (adopted June 2011) (NLC, 2011); and
 - the Housing and Employment Land Allocations DPD and Proposals Map (adopted March 2016) (NLC, 2016a).
- 5.2.3 The North Lincolnshire Local Plan was adopted in May 2003. This plan has been largely replaced by the LDF however, a number of its policies have been saved, and are still therefore potentially material to the determination of planning applications.
- 5.2.4 NLC is currently in the process of preparing a new Local Plan. A ‘Publication Draft’ of the new Local Plan was subject to public consultation in October and November 2021 (NLC, 2021). It is anticipated that the Local Plan will be submitted to the Secretary of State for Levelling Up, Housing and Communities for examination during 2022 with adoption following during 2023. In accordance with paragraph 48 of the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MCHLG), 2021) the policies in this plan may be afforded weight in decision making.

- 5.2.5 The Proposed Development Sites ('the Sites') are shown upon Inset 57 'South Humber Bank' of the LDF Proposals Map (NLC, 2016b). The Sites are subject to the following allocations/designations:
- Proposed Employment Land;
 - South Humber Bank Landscape Initiative;
 - Defined Industrial Buffer; and
 - Landscape Enhancement Scheme.
- 5.2.6 The Core Strategy (Policy CS12) (NLC, 2011) and Housing and Employment Land Allocations DPD (Policy SHBE-1) (NLC, 2016) identify the South Humber Bank as a 'Strategic Employment Area'. Within this area around 900 hectares is identified for new employment and industrial development and there is recognition of the importance of the area as a location for port activities, oil, chemicals, power generation and for renewable energy and emerging technologies such as Carbon Capture and Storage (CCS). These policies also state that it will be important to protect and enhance the biodiversity and landscape character of the South Humber Bank.
- 5.2.7 Saved Local Plan Policy LC20 (NLC, 2003 and 2007) relates to 'The South Humber Bank – Landscape Initiative' and confirms that the aim of this is to achieve environmental enhancement across the South Humber Bank, improve the appearance of the industrial zones and retain buffer areas between those and the residential areas. The initiative extends across much of the South Humber Bank.
- 5.2.8 Saved Local Plan Policy IN6 'Defined Industrial Buffer Areas' (NLC, 2003 and 2007) states that development will not be permitted within the defined amenity buffer areas associated with the South Humber Bank in order to maintain the separation between industry and residential areas. Within the buffer areas schemes for indigenous tree and shrub planting and habitat creation will be required.
- 5.2.9 Saved Local Plan Policy LC15 'Landscape Enhancement' (NLC, 2003 and 2007) identifies areas for landscape enhancement within the South Humber Bank, including new and informal landscape areas, wildlife habitats and also to provide visual screening and improve the appearance of the area.
- 5.2.10 The policies within the Core Strategy and Housing and Employment Land Allocations DPD (NLC, 2016a) that it is considered may be relevant to the determination of the planning applications include:
- Policy CS1: Spatial Strategy for North Lincolnshire;
 - Policy CS2: Delivering more Sustainable Development;
 - Policy CS3: Development Limits;
 - Policy CS5: Delivering quality design in North Lincolnshire;
 - Policy CS6: Historic Environment;
 - Policy CS11: Provision and Distribution of Employment Land;
 - Policy CS12: South Humber Bank Strategic Employment Site – A Broad Location;
 - Policy CS16: North Lincolnshire's Landscape, Greenspace and Waterscape;
 - Policy CS17: Biodiversity;
 - Policy CS18: Sustainable Resource Use and Climate Change;
 - Policy CS19: Flood Risk;
 - Policy CS20: Sustainable Waste Management;
 - Policy CS25: Promoting Sustainable Transport; and
 - Policy SHBE-1: South Humber Bank Strategic Employment Site.

5.2.11 The 'Saved' policies of the Local Plan (NLC, 2003 and 2007) that it is considered may be relevant to the determination of the planning applications include:

- Policy IN1: Industrial Development Location and Uses;
- Policy IN6: Defined Industrial Buffers;
- Policy T1: Location of Development;
- Policy T2: Access to Development;
- Policy T18: Traffic Management;
- Policy LC1: Special Protection Areas, Special Areas of Conservation and Ramsar Sites;
- Policy LC2: Sites of Special Scientific Interest and National Nature Reserves;
- Policy LC5: Species Protection;
- Policy LC6: Habitat Creation;
- Policy LC7: Landscape Protection;
- Policy LC12: Protection of Trees, Woodland and Hedgerows;
- Policy LC15: Landscape Enhancement;
- Policy LC20: South Humber Bank – Landscape Initiative;
- Policy HE9: Archaeological Excavation;
- Policy DS1: General Requirements (Development Standards);
- Policy DS7: Contaminated Land;
- Policy DS9: Development of Land in the Vicinity of Established Hazardous Installations and Pipelines;
- Policy DS10: New Hazardous Installations and Pipelines;
- Policy DS11: Polluting Activities;
- Policy DS12: Light Pollution;
- Policy DS13: Groundwater Protection and Land Drainage;
- Policy DS14: Foul Sewage and Surface Water Drainage;
- Policy DS15: Water Resources; and
- Policy DS16: Flood Risk.

5.2.12 The 'emerging' policies of the Publication Draft of the North Lincolnshire Local Plan (NLC, 2021) that, it is considered, may be material consideration in the determination of the planning applications include:

- Policy SS3: Development Principles;
- Policy SS10: Strategic Site Allocation – South Humber Bank;
- Policy EC4: South Humber Bank Landscape Initiative
- Policy DQE5: Managing Flood Risk;
- Policy DQE7: Climate Change;
- Policy WAS6: Waste Management;
- Policy DM2; Temporary Buildings;
- Policy DM3; Environmental Protection; and
- Policy ID1: Delivering Infrastructure.

5.2.13 NLC's 'Planning for Renewable Energy Development' Supplementary Planning Document ('SPD') (NLC, 2011) provides guidance on the existing renewable energy policies in the LDF

and is also considered to be a material consideration in the determination of the planning applications. Paragraph 3.10 describes how the South Humber Gateway is ideally located for carbon capture development and the opportunity this presents both environmentally and economically. The most relevant policies of the SPD include:

- Policy 1: Biodiversity;
- Policy 5: Soil and Hydrology; and
- Policy 6: Flood Risk.

5.3 National Planning Policy Framework

5.3.1 The latest version of the NPPF was published in July 2021 (MHCLG, 2021). The NPPF sets out the Government's planning policies for England. Those policies are expanded upon and supported by the Planning Practice Guidance (Department for Levelling Up, Housing and Communities (DLUHC) and MHCLG, 2021). Paragraph 2 of the NPPF states that it (the NPPF) is a material consideration in planning decisions, including the determination of planning applications.

5.3.2 The planning policies within the NPPF that it is considered may be of relevance to the Proposed Developments can be found within the following chapters of the NPPF:

- Chapter 2: Achieving Sustainable Development;
- Chapter 6: Building a Strong, Competitive Economy;
- Chapter 11: Making Effective Use of Land;
- Chapter 12: Meeting the Challenge of Climate Change, Flooding and Coastal Change;
- Chapter 15: Conserving and Enhancing the Natural Environment; and
- Chapter 16: Conserving and Enhancing the Historic Environment.

5.3.3 Of particular relevance is paragraph 158 which states:

“When determining planning applications for renewable and low carbon development, local planning authorities should (...) not require applicants to demonstrate the overall need for renewable or low carbon energy (...) and approve the application if its impacts are (or can be made) acceptable.”

5.4 National Policy Statements

5.4.1 While National Policy Statements apply to Nationally Significant Infrastructure Projects (NSIPs) rather than local planning applications, nevertheless they can have points of relevance and can be a material consideration in the determination of local planning applications.

5.4.2 In July 2011 the Secretary of State for the Department of Energy and Climate Change (now Business, Energy and Industrial Strategy or BEIS) designated a number of National Policy Statements (NPSs) relating to nationally significant energy infrastructure. The NPSs are the primary policy used by the Secretary of State for BEIS in determining applications for development consent for energy infrastructure that fall under Sections 14 to 21 of the Planning Act 2008.

5.4.3 The designated NPSs include an ‘Overarching NPS for Energy (EN-1)’ (Department of Energy and Climate Change (DECC), 2011a) setting out general policies and assessment principles for nationally significant energy infrastructure and a number of technology specific NPSs. EN-1 states (paragraph 1.2) that in England and Wales the NPSs are likely to be material considerations for LPAs in determining planning applications under the TCPA.

5.4.4 The NPSs considered to be of relevance to the Proposed Developments are the:

- Overarching NPS for Energy (EN-1) (DECC, 2011a); and the

- NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b).
- 5.4.5 Paragraphs 3.6.4 to 3.6.7 of EN-1 relate specifically to Carbon Capture and Storage (CCS). They explain the role CCS can have in meeting emissions targets while also maintaining security of supply (allowing fossil fuel fired power stations to provide flexible low carbon electricity generation) and that the technology has the potential to reduce carbon dioxide emissions by up to 90%. Paragraph 3.6.8 of EN-1 further underlines the need for fossil fuel generation to be linked to CCS:
- “It is important that such fossil fuel generating capacity should become low carbon, through development of CCS, in line with carbon reduction targets. Therefore there is a need for CCR fossil fuel generating stations ...”*
- 5.4.6 Paragraph 2.3.4 of EN-2, which is of relevance to the Proposed VPI Development, refers back to EN-1, setting out how combustion generating stations of a certain capacity are required to demonstrate Carbon Capture Readiness. Paragraph 2.3.5 goes on to state a number of requirements that should be imposed on any consents so that operators retain the ability and land for carbon capture equipment, and submit update reports on the technical aspects of Carbon Capture Readiness until CCS is retrofitted.
- 5.4.7 In response to the Government’s commitment to achieve net zero in terms of greenhouse gas emissions by 2050 and the publication of the Energy White Paper (the EWP) in December 2020 (BEIS, 2020a), the Secretary of State for BEIS is undertaking a review of the suite of NPSs for energy infrastructure to ensure that these reflect the policies set out in the EWP, and that the Government continues to have a planning policy framework that can deliver the investment required to build the infrastructure needed for the transition to net zero by 2050. The Secretary of State has recently consulted on draft updated energy NPSs (BEIS, 2021c) but the next steps are currently unclear.

5.5 National Energy and Climate Change Policy

- 5.5.1 Recent UK Government energy and climate change policy is also considered to be both material and relevant to the Proposed Development. These policy documents set out important Government objectives for decarbonising the power and industrial sectors, including through the large-scale deployment of CCS and the production and use of hydrogen in order to achieve net zero by 2050. These include:
- The Clean Growth Strategy (BEIS, 2017);
 - Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway – An Action Plan (BEIS, 2018);
 - The Ten Point Plan for a Green Industrial Revolution (BEIS, 2020b);
 - National Infrastructure Strategy: Fairer, faster, greener (HM Treasury, 2020);
 - The Energy White Paper (BEIS, 2020a);
 - Industrial Decarbonisation Strategy (BEIS, 2021a);
 - North Sea Transition Deal (BEIS, 2021d); and
 - Net Zero Strategy: Build Back Greener (BEIS, 2021b).
- 5.5.2 As stated above, development plan policy and national planning, energy and climate change policy that may be material and relevant to the Proposed Developments, will be considered in detail within the Planning Statements that will form part of the planning applications submitted to NLC, in addition to the Proposed Developments’ compliance with that policy.

5.6 Clean Growth Strategy

- 5.6.1 The ‘Clean Growth Strategy – Leading the way to a low carbon future’ (BEIS, 2017) (‘the CGS’) sets out the aims of the Government to deliver increased economic growth while reducing carbon emissions. It estimates that the low carbon economy could grow 11% per

year between 2015 and 2030, four times faster than the projected growth of the economy as a whole.

- 5.6.2 The Executive Summary (page 9) confirms that for the UK to achieve its fourth and fifth carbon budgets (2023 - 2027 and 2028 - 2032) it will be necessary to drive a significant acceleration in the pace of decarbonisation. The Executive Summary (pages 12-16) also sets out a number of key policies and proposals relating to 'Improving Business and Industry Efficiency'. These include to:

"5. Demonstrate international leadership in carbon capture usage and storage (CCUS), by collaborating with our global partners and investing up to £100 million in leading edge CCUS and industrial innovation to drive down costs.

6. Work in partnership with industry, through a new CCUS Council, to put us on a path to meet our ambition of having the option of deploying CCUS at scale in the UK, and to maximise its industrial opportunity.

7. Develop our strategic approach to greenhouse gas removal technologies, building on the Government's programme of research and development and addressing the barriers to their long-term deployment."

- 5.6.3 Chapter 3 (page 47) of the CGS sets out the Government's approach and states:

"...we must create the best possible environment for the private sector to innovate and invest. Our approach will mirror that of our Industrial Strategy: building on the UK's strengths ...; improving productivity across the UK; and ensuring we are the best place for innovators and new business to start up and grow. We are clear about the need to design competitive markets and smart regulation to support entrepreneurs and investors who will develop the new technologies at the scale we need.

... we are laying the groundwork for major decisions in the areas where we face greatest uncertainty and challenge: in how we work with industry to make carbon capture, usage and storage (CCUS) a viable future option."

- 5.6.4 Page 49 of the CGS goes on to state that:

"We want to use the power of Government to support innovation in a low carbon economy using all the tools available to us, including market design, taxation and regulation, as well as investment in our education systems, our science base and innovative companies. Our aim is to become one of the best places in the world for low carbon innovation."

- 5.6.5 Chapter 3 of the CGS 'Our Clean Growth Strategy' sets out the various projects that have been announced as part of the 'BEIS Energy Innovation Programme' (BEIS, 2017) (page 50). This includes up to £20 million of investment in a carbon capture and utilisation demonstration (CCUD) programme.

- 5.6.6 The Proposed Developments would accord with the Government's approach set out above, in particular, removing uncertainty and working with industry to make CCUS a viable option.

- 5.6.7 Chapter 4 of the CGS deals with different sectors of the UK economy. Pages 61-71 deal with 'Improving Business and Industry Efficiency and Supporting Clean Growth'. Page 62 confirms that business and industry account for approximately 25% of the UK's emissions and 50% of its electricity use. This section of Chapter 4 sets out various policies and proposal to increase energy efficiency on business and industry. However, it is acknowledged (page 64) that energy intensive industries will require steps beyond energy efficiency:

"Out to 2030, this will require industry to make progress in switching from fossil fuel use to low carbon fuels such as sustainable biomass, in line with broader Government priorities in delivering on clean air, and clean electricity. Beyond 2030, this switching will need to substantially increase in scale and be coupled with the deployment of new technologies, for example, carbon capture, usage and storage (CCUS). Over the course of this

Parliament, we will therefore also develop a framework to support the decarbonisation of heavy industry.”

5.6.8 Page 69 deals with CCUS in detail. It states:

“There is a broad international consensus that carbon capture, usage and storage (CCUS) has a vital role in reducing emissions. This could be across a wide range of activities such as producing lower-emission power, decarbonising industry where fossil fuels are used and/or industrial processes as well as providing a decarbonised production method for hydrogen which can be used in heating and transport. This makes CCUS a potentially large economic opportunity for the UK. The International Energy Agency estimates there will be a global CCUS market with over £100 billion – even a modest share of this global market, UK GVA could increase between £5 billion and £9 billion per year by 2030.”

5.6.9 Subsequently one of the ‘Grand Challenges’ missions set by government (first published in September 2019 and most recently updated 26 January 2021) (BEIS, 2021e) was confirmed as “to establish the world’s first Net-Zero carbon industrial cluster by 2040 and at least 1 low-carbon cluster by 2030”. The Grand Challenges were updated in January 2021, with the mission now to have at least four low carbon clusters by 2030. In March 2020, £800 million funding was confirmed in the Budget to establish two or more new carbon capture and storage clusters by 2030. The Proposed Developments are sited to be able to connect into the Zero Carbon Humber (ZCH) transmission and storage network (also known as Humber Local Carbon Pipelines) (promoted by National Grid). Furthermore, BEIS ran a consultation between February and March 2021 entitled “Carbon capture, usage and storage: market engagement on cluster sequencing” which sets out the proposed approach to prioritising two clusters for deployment in the mid-2020s. The East Coast Cluster was subsequently prioritised, with the Proposed Phillips 66 Development being shortlisted as one of the first industrial emitters to the East Coast Cluster.

5.6.10 Pages 93 – 101 of Chapter 4 cover ‘Delivering Clean, Smart, Flexible Power’. The overriding objective is to deliver a reduction in emissions from the power sector. Page 96 states that in order to achieve this it will be necessary to continue to bring down the costs of low carbon generation from renewables and nuclear and ensure that the UK can deploy CCUS at scale during the 2030s. Page 101 reiterates that Government’s commitment to supporting CCUS innovation and deployment through the BEIS Energy Innovation Programme.

5.6.11 The Proposed Developments would clearly contribute to the delivery of the CGS in terms of the Government’s objective to decarbonise both the industrial and energy sectors.

5.7 Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway – An Action Plan

5.7.1 ‘Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway – An Action Plan’ (BEIS, 2018) (‘the Action Plan’) was published by the Government in 2018. The Executive Summary (pages 5 and 6) confirms that the Government’s vision is for the UK to become a global leader in CCUS. The Action Plan is aimed at enabling the development of the first CCUS facility in the UK, with commissioning in the mid-2020s, which would support the ambition of being able to deploy CCUS at scale during the 2030s, subject to the costs coming down sufficiently. It goes on to state (page 6):

“Through our Clean Growth Strategy, we re-affirmed our commitment to the domestic deployment of CCUS subject to cost reductions. This Plan sets out our next steps to progress this commitment.”

5.7.2 The Action Plan states that this can only be achieved through close Government and Industry partnership (page 14). The Climate Change Committee (CCC), is quoted as emphasising the importance of CCUS to cost reductions “as well as its crucial role in enabling deeper emissions reduction beyond that”. Modelling by the Energy Systems Catapult (ESC) for the Energy

Technologies Institute (ETI) supports the conclusion by the CCC that energy system decarbonisation could be up to 50% cheaper by 2050 if CCUS is deployed at scale and concludes that delaying deployment beyond the 2020s will increase the risks of decarbonising the UK's energy system. Both the CCC and ETI analysis conclude that initial deployment is required during the 2020s in order to have the option of deploying at scale during the 2030s, and in particular to keep open the option of UK CCUS deployment towards the scale that both state are required in 2050. This timeline was endorsed by the CCUS Cost Challenge Taskforce, and the conclusion was also reached by the Parliamentary Advisory Group on CCS. A key message from all these independent bodies is that deployment of CCUS during the 2020s is essential to unlock the greatest opportunities for cost reduction.

- 5.7.3 At page 32 (Industrial decarbonisation with CCUS) the Action Plan highlights the importance of CCUS in decarbonising energy intensive industries (EIs), including iron and steel, cement, chemicals, and oil refining. It goes on to state:

“Some of these industries produce volumes of emissions from chemical processes, in addition to combustion of fossil fuels, for example, up to 70% of emissions from cement production are from the process of producing cement, rather than from energy use. These emissions cannot be abated by fuel switching or electrification. Overall, CCUS could provide 37% of the total abatement potential in EIs by 2050. A recent study by McKinsey on decarbonising EIs showed that where carbon dioxide storage sites are accessible, CCUS is the lowest-cost decarbonisation option at current commodity prices. CCUS also enables the large-scale use of hydrogen as an industrial fuel, which the recent CCC and Element Energy reports have indicated could be one cost-effective pathway to industrial decarbonisation.”

- 5.7.4 The Action Plan (pages 35 to 37) also highlights the role of CCUS in decarbonising electricity generation, alongside an expansion of other forms of low and zero-carbon power generation to achieve ‘deep decarbonisation’ of the UK power sector.
- 5.7.5 The Proposed Developments are consistent with the vision and ambition of the Action Plan.

5.8 The Ten Point Plan for a Green Industrial Revolution

- 5.8.1 The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating our path to net zero’, was published by the Government on 18 November 2020 and is aimed at delivering a ‘Green Industrial Revolution’ in the UK, with the foreword by the Prime Minister stating that the Ten Point Plan will aim to mobilise £12 billion of government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs. As mentioned above, the Ten Point Plan is followed on from and built on by the EWP.

- 5.8.2 The Introduction to the Ten Point Plan (pages 5 – 6) states that:

“We will generate new clean power with offshore wind farms, nuclear plants and by investing up to half a billion pounds in new hydrogen technologies. We will use this energy to carry on living our lives, running our cars, buses, trucks and trains, ships and planes, and heating our homes while keeping bills low. And to the extent that we still emit carbon, we will pioneer a new British industry dedicated to its capture and return to under the North Sea...”

- 5.8.3 The ‘Ten Points’ of the Plan are summarised at page 7 of the document. Of particular relevance to the Proposed Developments is Point 8 – “Investing in Carbon Capture, Usage and Storage (CCUS)”, dealt with at pages 22 – 23 of the Ten Point Plan. The Plan states that CCUS will be an exciting new industry to capture the carbon we continue to emit and revitalise the birthplaces of the first Industrial Revolution. It states that the Government’s ambition is to capture 10Mt (million tonnes) of carbon dioxide a year by 2030, the equivalent of four million cars’ worth of annual emissions. It goes on to set out the Government’s commitment to invest up to £1 billion to support the establishment of CCUS in four industrial clusters, creating

‘transformative SuperPlaces’ in areas such as the North East, the Humber, North West, Scotland and Wales. It notes that the Government will bring forward details in 2021 of a revenue mechanism to bring through private sector investment into industrial carbon capture and hydrogen projects via new business models to support these projects.

- 5.8.4 The Ten Point Plan (page 24) highlights the function and necessity of CCUS in achieving a green economy and the Government’s commitment to establish CCUS in two industrial clusters by the mid-2020s:

“CCUS technology captures carbon dioxide from power generation, low carbon hydrogen production and industrial processes, storing it deep underground where it cannot enter the atmosphere. This technology will be globally necessary, but no one country has yet captured the market. The UK has an unrivalled asset – our North Sea, that can be used to store captured carbon under the seabed. Developing CCUS infrastructure will contribute to the economic transformation of the UK’s industrial regions, enhancing the longterm competitiveness of UK industry in a global net zero economy. It will help decarbonise our most challenging sectors, provide low carbon power and a pathway to negative emissions. We will establish CCUS in two industrial clusters by mid 2020s, and aim for four of these sites by 2030, capturing up to 10 Mt of carbon dioxide per year. Developed alongside hydrogen, we can create these transformative “SuperPlaces” in areas such as the heart of the North East, the Humber, North West and in Scotland and Wales. Our £1 billion CCUS Infrastructure Fund will provide industry with the certainty required to deploy CCUS at pace and at scale. These clusters will be the starting point for a new carbon capture industry, which could support up to 50,000 jobs in the UK by 2030, including a sizeable export potential. Alongside this, we will bring forward details in 2021 of a revenue mechanism to bring through private sector investment in industrial carbon capture and hydrogen projects, to provide the certainty investors require.”

- 5.8.5 The Proposed Developments would establish CCUS and would therefore support delivery of Point 8 of the Ten Point Plan and the creation of the type of ‘hub’ or ‘SuperPlace’ envisaged by the Plan where renewable energy, CCUS and hydrogen technologies could congregate and generate significant numbers of jobs.

5.9 National Infrastructure Strategy: Fairer, Faster, Greener

- 5.9.1 The National Infrastructure Strategy (NIS) was published by HM Treasury on 25 November 2020, a week after the Prime Minister’s Ten Point Plan. The NIS sets out the Government’s plans to deliver an infrastructure revolution in the UK, while “levelling the country up” and achieving its Net Zero target by 2050. It also provides the Government’s formal response to the NIC’s recommendations on infrastructure provision in their National Infrastructure Assessment (NIC, 2018).

- 5.9.2 Chapter 2 ‘Levelling up the whole of the UK’ (page 27) highlights how the Government wants to use infrastructure to unite and level up the UK by prioritising those areas that have received the least support in the past and to create ‘regional powerhouses’. One of the measures identified to achieve this, is backing new green growth clusters in traditional industrial areas, with investment in CCS, offshore wind, port infrastructure and low-carbon hydrogen production.

- 5.9.3 A key theme of the NIS is ‘Decarbonising the economy and adapting to climate change’ and this is dealt with at Chapter 3. The Government identifies that (page 48) new technologies and skills will need to be developed to continue decarbonising and recognises that it will have a role to play in driving both the development and deployment of such technologies, including:

“Investment in these areas, where the UK has competitive advantage, can create the knowledge and skills needed for a green industrial revolution, driving leadership in the industries of the future, reducing national and global emissions, as well as providing the platform for significant economic growth. Where these investments are brought together to create place-based industrial clusters they can transform local economies, creating

productive jobs, developing specialist skillsets, and attracting private investment. For example, the North East of England could become a home of choice for companies delivering carbon capture and storage; making hydrogen power a part of daily life; and designing, building and maintaining offshore wind turbines.”

- 5.9.4 The future role of CCS in contributing to the Net Zero target is further underlined in Chapter 3 of the NIS (pages 50 – 53). In terms of power, it is recognised that even by 2050, given the intermittent nature of renewables, there will still be requirement for more reliable sources of power, from nuclear or power stations that burn hydrogen or gas with CCS. Power stations with CCS could provide valuable low carbon electricity when renewables are not generating by capturing the emissions from biomass or gas-fired generation. CCS is also seen as essential to decarbonising large parts of industry, producing low carbon hydrogen and in delivering greenhouse gas removal technologies, permanently locking away carbon dioxide.
- 5.9.5 Importantly (page 53), the NIS recognises the CCS/ CCUS technology has not yet been delivered at scale and that there is a key role for government to play in bringing this forward. Consistent with the Ten Point Plan, it therefore sets out the Government’s increased ambition to support CCS with £1 billion of funding (up from £800m) to bring forward four CCS clusters by the end of the decade, with construction to begin on two by the mid-2020s with the aim of capturing 10Mt of carbon dioxide a year by 2030.
- 5.9.6 The Proposed Developments comprise investment in CCS and contribute to the creation of a regional powerhouse. They will contribute to decarbonising the economy and contributing to the UK Government’s Net Zero target.

5.10 The Energy White Paper – Powering our Net Zero Future

- 5.10.1 The EWP was presented to Parliament in December 2020 and builds on the Prime Minister’s Ten Point Plan for a Green Industrial Revolution (HM Government, 2020a), which is discussed below. At the core of the EWP is the commitment to achieve Net Zero and tackle climate change. The EWP seeks to put in place a strategy for the wider energy system that transforms energy, supports a green recovery and creates a fair deal for consumers (page 4). As with the Ten Point Plan, the EWP confirms the Government’s support for CCUS (drawing upon the resource provided by the North Sea) and new hydrogen technologies.
- 5.10.2 The Government estimates (Introduction, page 15) that the measures in the EWP could reduce emissions across power, industry and buildings by up to 230 Mt of carbon dioxide equivalent (CO₂e) in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to Net Zero.
- 5.10.3 The EWP (pages 16 – 17) provides an overview of the Government’s key policies and commitments to put the UK on the course to Net Zero. These are grouped under a number of headings, including ‘Transform Energy’, ‘Support a Green Recovery from Covid-19’ and ‘Creating a Fair Deal for Consumers’. Those of particular relevance to the Proposed Developments are as follows:
- Transform Energy:
“Supporting the deployment of CCUS in four industrial clusters including at least one power CCUS project, to be operational by 2030 and putting in place the commercial frameworks required to help stimulate the market to deliver a future pipeline of CCUS projects”.
 - Support a Green Recovery from Covid-19:
“Increasing the ambition in our Industrial Clusters Mission four-fold, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.

Investing £1 billion up to 2025 to facilitate the deployment of CCUS in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting our ambition to capture 10Mt CO₂e per year by the end of the decade.”

- 5.10.4 Chapter 2 of the EWP deals with ‘Power’ with the stated goal being to use electricity to enable the transition away from fossil fuels and decarbonise the economy cost-effectively by 2050. Figure 3.2 ‘Electricity demand, Net Zero scenarios’ (page 42) highlights how electricity demand could double by 2050 as electricity replaces the use of petrol and diesel in transport and to some extent, gas for heating. This would require a four-fold increase in clean electricity generation with the decarbonisation of electricity being required to underpin the delivery of the Net Zero target.
- 5.10.5 Despite the push to increase clean electricity generation and decarbonise the power sector, the EWP states that the Government is not targeting a particular generation mix by 2050 and its view remains that the electricity market should determine the best solutions for very low emissions and reliable supply, at a low cost to consumers (page 42). While the EWP (page 43) states that a low-cost, net zero consistent system is likely to be composed predominantly of wind and solar, in order to ensure the system is reliable, it needs to be complemented by technologies which provide power, or reduce demand, when the wind is not blowing, or the sun does not shine. This includes gas with CCS and short-term dispatchable generation providing peaking capacity, which can be flexed as required.
- 5.10.6 Figure 3.4 of the EWP (page 44) details different potential electricity mixes to 2050 and it is notable that gas with CCS is an important component of those mixes. Furthermore, linked to the commitment to support the deployment of at least one power CCUS project, the EWP (page 47) recognises that:

“In the power sector, gas-fired generation with CCUS can provide flexible, low-carbon capacity to complement high levels of renewables. These characteristics mean that deployment of power CCUS projects will play a key role in the decarbonisation of the electricity system at low cost.

We will support at least one power CCUS plant to come forward and be operational by 2030 and will put in place a commercial framework which will enable developers to finance the construction and operation of a power CCUS plant and stimulate a pipeline of projects. This will enable at least one power CCUS project to be developed in one of the four industrial clusters as part of our mission to decarbonise them ...”

- 5.10.7 Chapter 3 ‘Energy System’ of the EWP addresses ‘The Role of Natural Gas’ in a Net Zero world (page 84). It confirms that natural gas currently represents almost 30% of final energy consumption and 40% of electricity generation (page 84) and notes that we will continue to rely on natural gas for some years, even as we work to largely eliminate carbon emissions from the energy system, including those from gas. It goes onto state:

“We will therefore make sure the natural gas markets and networks evolve in a way which enables continued investment and ensure secure supplies but also promotes the use of low-carbon options, wherever possible. This will reduce emissions now and help build the networks of the future which will need to accommodate technologies such as hydrogen and Carbon Capture, Usage and Storage. We will need investment in the gas network to support the ambition set out in the Prime Minister’s Ten Point Plan for a potential Hydrogen Town before the end of the decade.”

- 5.10.8 The challenge of decarbonising industry is covered at Chapter 5 ‘Industrial energy’ of the EWP, in particular, the need for emissions from industry to fall by around 90% from today’s levels by 2050 if the Net Zero target is to be met (page 118). The EWP (page 120) highlights how about half of all emissions from manufacturing and refining are concentrated in the UK’s major industrial clusters (EWP Figure 8.1). These ‘hubs’ are seen as critical drivers of local and regional economic activity and a vital component of the UK’s national economy. It goes on to state (page 122):

“Improved efficiency in the energy performance of buildings and industrial processes will lay the groundwork for the transformation of industrial energy. But we cannot rely on energy efficiency alone to reduce emissions in line with our 2050 goal. Manufacturing industry will need to capture their carbon for onward storage and switch from using fossil fuels to low-carbon alternatives.”

- 5.10.9 The EWP notes (page 124) that many clusters are located in regions in need of economic revitalisation and that decarbonising those clusters can act as a driver of prosperity for the surrounding areas. Furthermore, that investments in key technologies like CCUS will be crucial to enhancing local economic growth and creating jobs together with prosperity.
- 5.10.10 CCUS is dealt with in detail at pages 125 and 126 of the EWP. The EWP confirms that the deployment of CCUS is fundamental to the decarbonisation of energy intensive industries such as steel, cement, oil refining and chemicals. It highlights the role of CCUS in helping to secure the long-term future of these industries and enabling the production of low-carbon hydrogen at scale. It reaffirms the Government’s commitment to invest £1 billion (up from the £800m promised in the CCS Infrastructure Fund) up to 2025 to facilitate the deployment of CCUS in two industrial clusters by the mid-2020s, and a further two clusters by 2030, supporting its ambition to capture 10Mt CO₂ emissions per year by the end of the decade. It stresses how the UK is in a strong position to become a global technology leader in CCUS, with the potential to store 78 billion tonnes of carbon dioxide. It recognises that deployment of CCUS could create new markets for UK businesses, at home and abroad, as other countries look to meet their emissions reduction commitments and could support 50,000 jobs in the UK by 2030.
- 5.10.11 The important supporting role of CCUS in the production of clean hydrogen is underlined at pages 127 and 128 of the EWP.
- 5.10.12 The Proposed Developments would clearly help deliver key Government policies and commitments on CCUS set out in the EWP (HM Government, 2020).

5.11 Industrial Decarbonisation Strategy

- 5.11.1 The Industrial Decarbonisation Strategy was presented to Parliament in March 2021 and builds on the ambition and actions set out in the Industrial Decarbonisation and Energy Efficiency Roadmaps to 2050 (ECC and BEIS, 2015) project to reduce greenhouse gas emissions and improve energy efficiency across heat-intensive industrial sectors. The Industrial Decarbonisation Strategy seeks to update the pathways analysis and adapt actions to reflect the UK’s net zero target, considering fully the role of hydrogen and resource efficiency, and expand the decarbonisation across other industry sectors (page 16). The Decarbonisation Strategy confirms the Government’s support for CCUS (drawing upon the resource provided by the North Sea) and covers emerging hydrogen and carbon capture, usage and storage technologies.
- 5.11.2 The Government estimates (Our ambition, page 19) that the emissions from the industry need to fall by around two thirds by 2035 to keep the industry on target to meet net zero. The government recognises that around 50Mt CO₂ of industry emissions need to be captured annually and low carbon fuels, such as hydrogen, electricity, and bioenergy, would need to replace 20TWh of fossil fuels annually, unless combined with carbon capture technologies by 2030 to remain on target.
- 5.11.3 Funding challenges to reduce industrial emissions are addressed in Chapter 2 ‘Getting investors to choose low carbon’. The Governments commits to

“Action 2.1: Use of carbon pricing as a tool to send a clear market signal, providing certainty over our net zero ambition for industrial sectors

Action 2.2: Put in place funding mechanisms to support deployment and use of CCUS and low carbon hydrogen infrastructure

Action 2.3: Establish the right policy framework to ensure uptake of fuel switching

Action 2.4: Take initial steps to create a market for negative emissions technologies

Action 2.5: Establish a targeted approach to mitigating carbon leakage

Action 2.6: Work with stakeholders to understand how an EU Carbon Border Adjustment Mechanism could affect the UK”

- 5.11.4 To accelerate the switch from fossil fuel to low carbon technologies in energy-intensive industries (Chapter 6), for example the refining industry, the government promotes innovation in new technologies and seeks out potential electrification projects, including making the industry retro-fit ready. Phillips 66 Limited Humber Refinery is explicitly listed as a case study:

“Innovation in the industry can be seen in the development of hydrogen firing of furnaces and boilers and also in development of synthetic graphite for the manufacture of high-performance lithium-ion electric vehicle batteries. With the Phillips 66 Humber refinery being one of the world’s leading production facilities for graphite coke, there is significant potential for the UK to lead innovation in this area.”

- 5.11.5 The government recognises and supports the need to overcome the technical challenges with Carbon Capture and Storage (CCUS) innovations as most industries require bespoke solutions depending on individual conditions on site. One of the sectors where CCUS carbon abatement is highest is the refining industry.

5.12 North Sea Transition Deal

- 5.12.1 The North Sea Transition Deal was published in March 2021 (BEIS, 2021d) and seeks to shift the UK’s oil and gas offshore production to clean growth and deliver commitments set out for the oil and gas sector in The Energy White Paper and The Ten Point Plan. The North Sea Transition Deal aims to reduce emissions from oil and gas production by 10% by 2025, by 25% by 2027 and 50% by 2030 compared to 2018 as milestones to achieve net zero by 2050.

- 5.12.2 The oil and gas sector will invest £2-3bn to create the transport and infrastructure to capture 10Mt per year of CO₂ by 2030. Distributed over four clusters the government will deliver a £1bn Carbon Capture and Storage Infrastructure Fund.

- 5.12.3 The industry with the government’s support will invest in key technologies, e.g., carbon capture and storage, and support the delivery of four low-carbon clusters to increase decarbonisation in the industry.

- 5.12.4 The North Sea Transition Deal states:

“Developing carbon transport and storage infrastructure will require large upfront capital expenditure, to construct offshore and onshore pipelines and develop storage sites and wells. The government will help to put in place this critical network, as the foundation for the scaling up of CCUS across the UK.”

- 5.12.5 The government expects the carbon capture industry to support 50,000 jobs in the UK by 2030. The oil and gas sector estimates the £2-3bn investment will provide 6,600 direct and indirect jobs in the local supply chain. UK’s oil and gas workers are skilled to transition into the low carbon sector.

- 5.12.6 The North Sea Transition Deal states:

“Many of the skills present in industry today are transferrable across the wider energy spectrum. Offshore renewables, as well as the future CCUS and hydrogen industries, will rely heavily on many of the current skillsets in the oil and gas industry such as geologists, project managers, a wide variety of engineers and craftspeople. A carefully managed transition will help to ensure that the UK retains people with these key skillsets, so that they can help unlock these vital and emerging low carbon sectors.

Deployment of CCUS could create new markets for UK businesses, at home and abroad, as other countries look to meet their emissions reduction commitments. Action now can

harness the UK's strengths in engineering, procurement, construction, and management services, with export opportunities from CCUS estimated at £3.6 billion by 2030."

5.13 Net Zero Strategy: Build Back Greener

5.13.1 The Net Zero Strategy: Build Back Greener was presented to Parliament in October 2021 (HM Government, 2021b) and builds on The Ten Point Plan. It sets out the steps to reduce emissions by 68% on 1990 levels and create opportunities and investment into net zero creating up to 440,000 jobs by 2030.

5.13.2 The government aims to:

"Support up to 54,000 jobs in 2030 industry.

Start to mobilise additional public and private investment of at least £14 billion in industry, in line with our 2037 delivery pathway.

Deliver four carbon capture usage and storage (CCUS) clusters, capturing 20-30 MtCO₂ across the economy, including 6 MtCO₂ of industrial emissions, per year by 2030."

5.13.3 Carbon capture usage and storage from power generation and industrial processes is among the key features of the net zero transition identified in the Net Zero Strategy: Build Back Greener and can abate emissions from fossil fuels.

5.13.4 The Net Zero Strategy states:

"Carbon capture is expected to need to reach capacity for a total of ~20-30 MtCO₂ per year by the early 2030s across the economy - more than double what was set out in the Ten Point Plan – and at least ~50 MtCO₂ by the mid-2030s."

5.13.5 The Government commits to:

"Implement the Dispatchable Power Agreement (DPA) to support the development of first of a kind power CCUS plant(s).

Ambition to deliver 6MtCO₂ per year of industrial CCUS by 2030, and 9 MtCO₂ per year by 2035.

Support the deployment of CCUS through £1 billion CCS Infrastructure Fund."

5.13.6 The government aims to support and reskill 40,000 jobs in the supply chain and encourage skill transfer from high carbon into low carbon industries, such as renewable energies, carbon capture and storage as well as hydrogen production supported by the Heat Network Skills Programme and Public Sector Low Carbon Skills Fund.

5.13.7 The Net Zero Strategy: Build Back Greener aims to create 'SuperPlaces', where CCUS technologies can be used to capture and store 20-30 MtCO₂ annually by 2030. The Humber is one among the potential early SuperPlaces to be decarbonised and transformed within this timeframe.

5.13.8 The Government supports the industry through the Industrial Decarbonisation and Hydrogen Revenue Support funding scheme to deploy low carbon hydrogen and industrial carbon capture facilities.

5.13.9 The Philipps 66 Limited Humber Refinery is explicitly listed as a case study:

"The sector can already compete on the world stage and provide domestic resilience by producing products essential for decarbonisation. UK refining includes a global leader and the only European producer of high-grade speciality coke for batteries used in electric vehicles and consumer electronic goods. The Philipps 66 Humber refinery's world scale production capability is equivalent to 1.3 million electric vehicles (EV) per year. Whilst the majority is currently exported, it has the potential to underpin a domestic UK battery industry and development of a broader EV battery manufacturing base in the UK."

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