



System Development Statement

April 2025

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Symbols and abbreviations

| | |
|-------------|--|
| AGI | Above Ground Installation |
| APDP | Approved Project Development Plan |
| BOC | Teesside Hydrogen CO ₂ Capture |
| CCS | Carbon Capture and Storage |
| CS006 | The Boundary offered by NSTA in Carbon Dioxide Appraisal and Storage Licence CS006. |
| CS007 | The Boundary offered by NSTA in Carbon Dioxide Appraisal and Storage Licence CS007. |
| FEED | Front-End Engineering Design |
| H2T | H2Teesside |
| HCCP | Humber Carbon Capture Pipeline, collectively made up of the Humber Onshore and Offshore Transportation Systems |
| Mt | Megatonnes of CO ₂ |
| MTPAi | Megatonnes of CO ₂ per annum on an instantaneous basis |
| NEP | Northern Endurance Partnership |
| NSTA | North Sea Transition Authority |
| NZT Power | Net Zero Teesside Power |
| ONC | Obligated Network Capacity, being the network capacity that must be made available to the users on aggregate |
| PCC | Power Capture and Compression, being the power and capture plant and HP compression facilities located at the Teesworks Site |
| T&S | Transportation and Storage |
| TCCP | Teesside Carbon Capture Pipeline, collectively made up of the Teesside Onshore and Offshore Transportation Systems |
| TRI Licence | Transportation and Storage Regulatory Investment Licence |
| Xmas Tree | Subsea Christmas Tree for Injection Wells |

1 Introduction

The Northern Endurance Partnership (NEP) is developing onshore and offshore infrastructure needed to transport CO₂ from carbon capture projects across Teesside and the Humber – collectively known as the East Coast Cluster - to secure storage under the North Sea.

The infrastructure is crucial to achieving net zero in the UK's most carbon intensive industrial regions.

NEP, via the Endurance saline aquifer and adjacent stores, has access to up to 1 billion tonnes of CO₂ storage capacity.

In December 2024, NEP announced financial close, giving the green light to proceed to the execution phase. NEP expects to commence construction from the middle of 2025 with start-up expected in 2028.

NEP is also progressing development work for the Humber Carbon Capture Pipeline - the proposed infrastructure that would transport CO₂ from carbon capture projects in the Humber region to secure offshore storage under the North Sea. The infrastructure would enable a connection to carbon capture projects in the Humber selected by DESNZ through the East Coast Cluster expansion process.

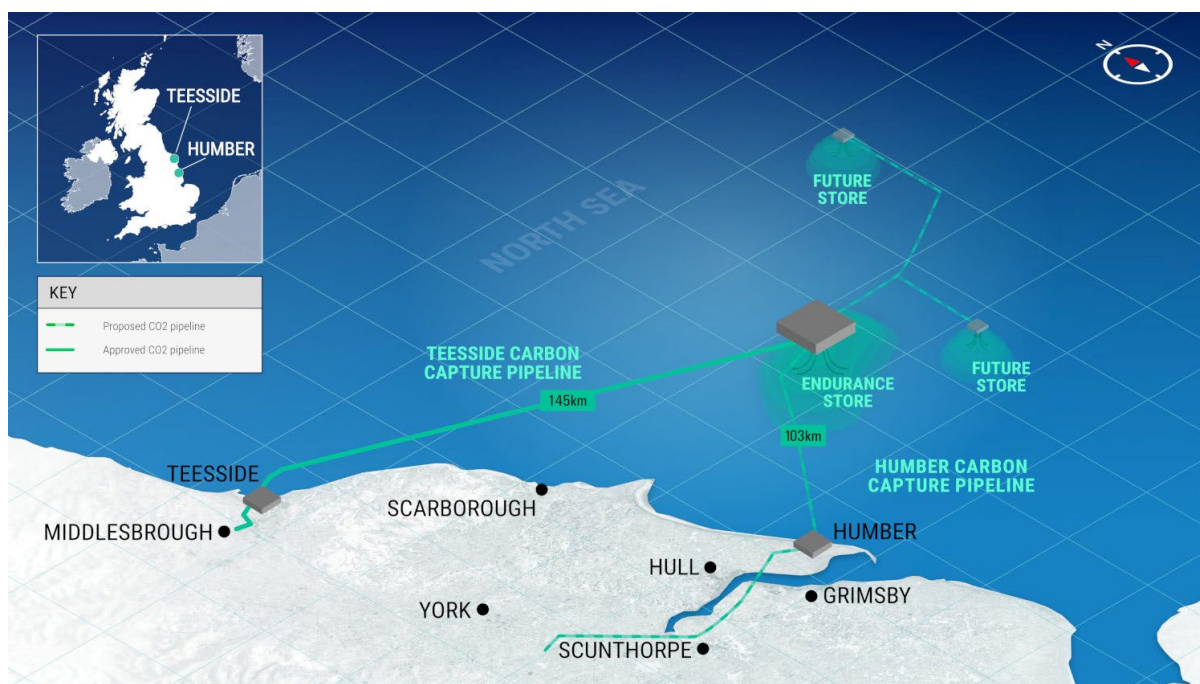


Figure 1: Overview of Northern Endurance Partnership

2 Purpose of this document

This System Development Statement has been prepared and published in accordance with Standard Condition B2 of the Carbon Dioxide Transport and Storage Regulatory Investment (TRI) Licence issued to Net Zero North Sea Storage Limited on 9th December 2024.

The TRI License grants approval to NEP, via its registered operating company Net Zero North Sea Storage Limited, to develop maintain and operate the T&S (Transportation and Storage) Network in accordance with the Approved Project Development Plan (APDP).

3 System description

The system will be constructed and commissioned across two phases.

Phase 1 involves the construction of the initial network:

- The Teesside Onshore Transportation System
- The Teesside Offshore Transportation System
- The Endurance Offshore Storage System

The Teesside Onshore and Offshore Transportation Systems collectively make up the “Teesside Carbon Capture Pipeline”.

Construction is planned to commence by mid-2025.

Following completion of construction, NEP expects to commence commissioning of the following systems under Phase 1 in 2028:

- The connection point to NZT Power
- The Teesside Offshore Transportation System, including the Teesside Compression System.
- The Endurance Offshore Storage System

Phase 2 will involve the commissioning of:

- The connection to phase 2 users – H2T and BOC
- The Teesside CO₂ Gathering Pipeline and H2T and BOC spur lines

3.1 Teesside Onshore Transportation System

The Teesside Onshore Transportation System connects industrial network users to the Teesside Compression System in the Teesworks site. This has several components:

- The CO₂ Gathering Network, which runs from an above-ground installation (AGI) close to BOC on the North bank of the Tees to the Teesside Compression System. There is also a dedicated spur line from the BOC site to the AGI.
- A dedicated spur line from an AGI in the H2T plot to the Teesside Compression System

Figure 2 provides an overview of the Teesside Onshore Transportation System.

Table 1 provides further detail and capacities from each of these segments.

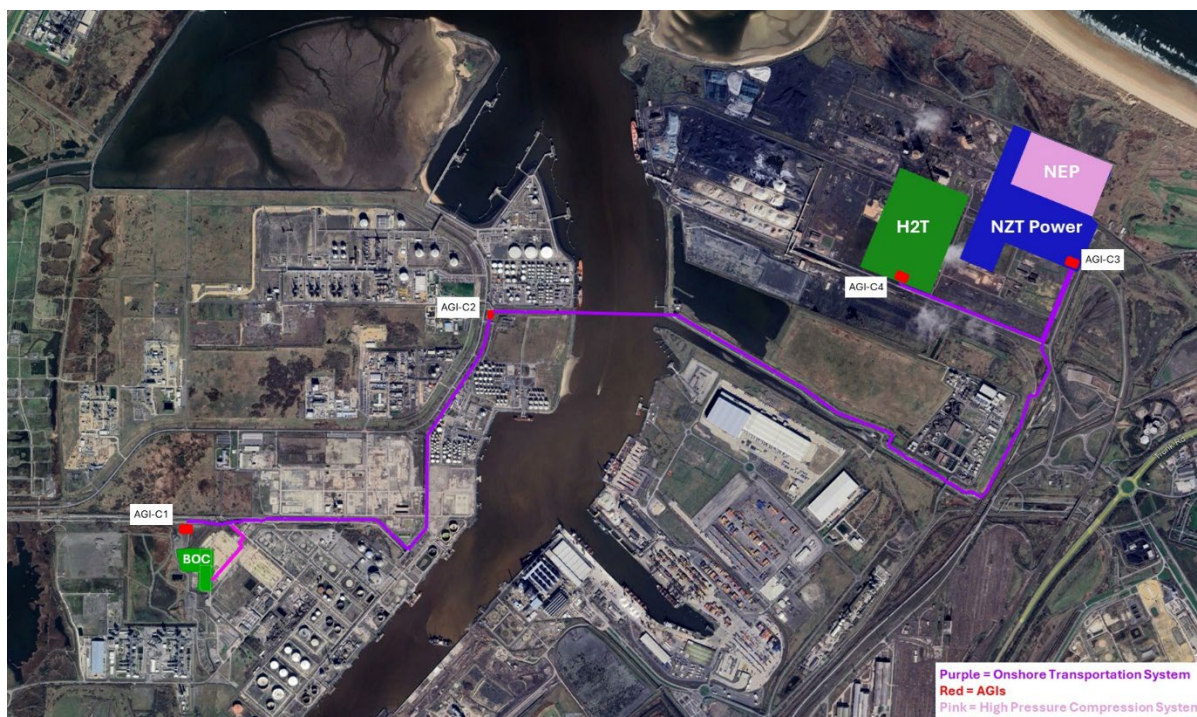


Figure 2: Teesside Onshore Transportation System map¹

Table 1: Teesside Onshore Transportation System overview and capacities

| Network Segment/Item | Description | Design Capacity |
|--|--|---|
| Teesside Onshore Transportation System | | |
| CO ₂ Gathering Pipeline | 22" pipeline connecting an above-ground installation (AGI) near BOC on the North Bank of the Tees to the Teesside Compression System | 3.80 MTPAi |
| H2T Spur line | 22" pipeline from an AGI within the H2T plot to the Teesside Compression System | 3.60 MTPAi (to allow for future expansion of H2T and/or connection of other users on the Teesworks site) |

The network will be constructed to allow for potential future expansion in the Teesside area. This includes:

- Tie-ins for two 20" CO₂ pipelines at the Teesside Compression System, which could serve additional users on the South bank of the Tees.
- The AGI (C1) close to BOC could allow for additional expansion of the CO₂ Gathering Network on the North Bank of the Tees beyond the initial route.
- The AGI (C2) in the CO₂ Gathering Pipeline on the North Bank of the Tees could allow for the connection of an additional spur line connecting additional users from the Seal Sands area.

¹ Figure 2 has been created using images obtained from Google Maps

- The AGI (C4) in the H2T plot could allow for additional users in the Teesworks site to connect to the H2T spur line.

3.2 Teesside Offshore Transportation System

The Teesside Offshore Transportation System consists of both the Teesside Compression System and the Teesside Offshore Pipeline infrastructure. The offshore pipeline is 145km, from the Teesside Compression System to the Endurance Offshore Storage System.

The Teesside Compression System will be co-located and constructed along with NZT Power on the Power Capture and Compression (PCC) plot on the Teesworks site, as shown on Figure 2.

An overview of the Teesside Offshore Transportation System, along with the Endurance Offshore Storage System, can be seen in Figure 3. Further details and system capacities are shown in Table 2.

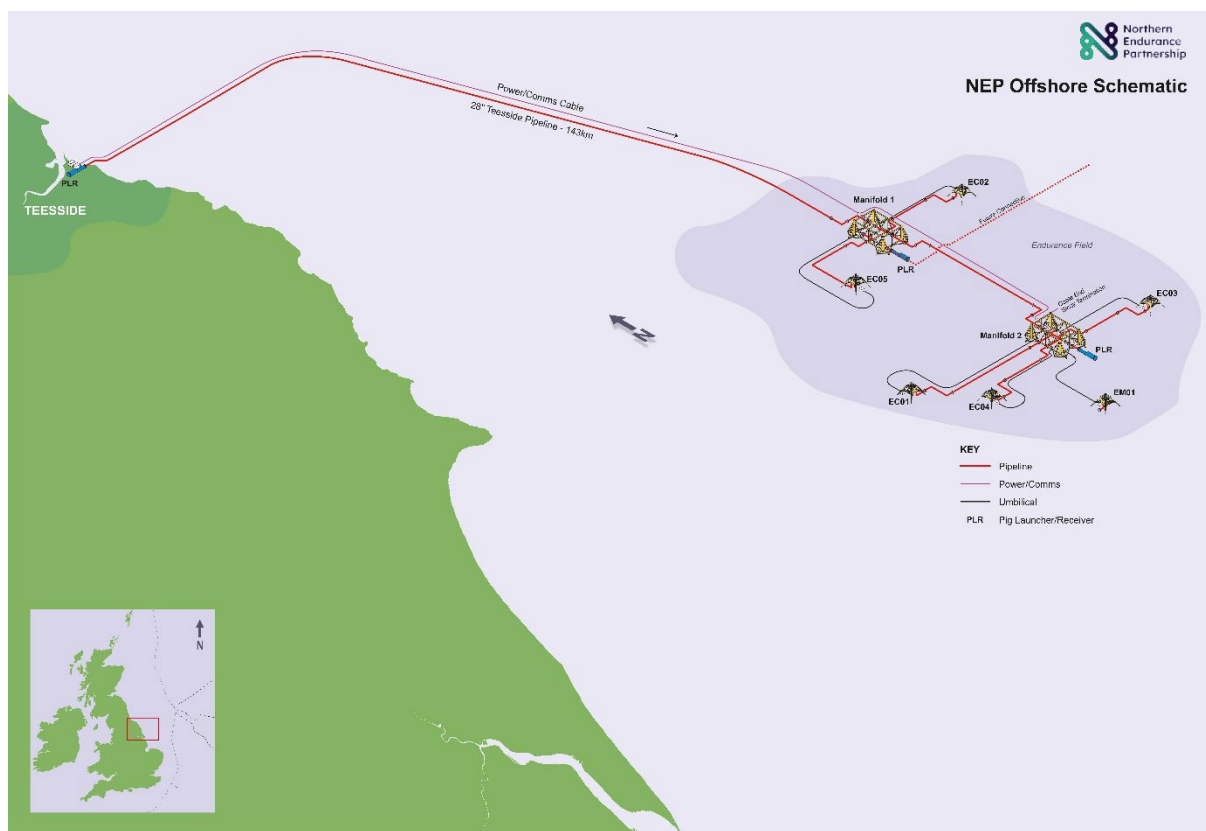


Figure 3: Offshore Transportation and Endurance Storage System schematic

Table 2: Teesside Offshore Transportation System overview and capacities

| Network Segment/Item | Description | Design Capacity |
|---|--|-----------------|
| Teesside Offshore Transportation and Storage System | | |
| Teesside Compression System | 3 x 2Mtpai high-pressure compressors in an N+1 arrangement | 4.00 MTPAi |
| Teesside Offshore Pipeline Infrastructure | 28" pipeline connecting the Teesside Compression System to the Endurance Offshore Storage System | 10.00 MTPAi |

Pre-investment will be made in the Teesside Compression System so that it can be expanded later to 10MTPAi in an N+1 configuration to allow for potential future network expansion.

3.3 Endurance Offshore Storage System

The Endurance Offshore Storage System consists of the subsea infrastructure needed to connect the Teesside Offshore Pipeline System to the Endurance Store, including Manifolds, flowlines, injection and monitoring wells, as well as supporting equipment. An overview of the Endurance Offshore Storage System can be seen in Figure 3. Table 3 provides a detailed description of the key components and their capacities.

Table 3: Endurance Offshore Storage System Overview and Capacities

| Network Segment/Item | Description | Design Capacity |
|-----------------------------------|--|-------------------------|
| Endurance Offshore Storage System | | |
| Manifold 1 | Manifold combining flows from the Teesside Offshore Transportation and Storage System and a potential future Humber Offshore Transportation System. Contains slots for: <ul style="list-style-type: none"> - 2x injection wells - 28" flowline to connect to Manifold 2 - Pig receiver or potential future stores | 27.00 MTPAi |
| Manifold 2 | Additional manifold containing slots for: <ul style="list-style-type: none"> - 3x injection wells - 1x monitoring well - 1x spare injection well slot - Pig receiver or potential future stores | 15.00 MTPAi |
| Infield Flowlines | 5x 8" infield flowlines from the manifolds to the injection Xmas trees. | 1.50 MTPAi per flowline |

The system is designed to allow for potential additional expansion through the spare slots in Manifolds 1 and 2 to allow connection to potential future stores, and for an additional potential injection well from the spare slot in Manifold 2.

4 System usage and capacity

4.1 Obligated Network Capacity

The Obligated Network Capacity (ONC) is the network capacity that must be made available to the users on aggregate. This is expressed in terms of:

- Maximum instantaneous flow
- Maximum annual cumulative flow
- Minimum instantaneous flow
- Overall store capacity

Table 4: Breakdown of obligated network capacity

| Component of Obligated Network Capacity | Value |
|---|------------------------|
| Maximum Instantaneous Flow Rate | 4.21 MTPA _i |
| Maximum Annual Cumulative Flow | 4.00 Mt |
| Minimum Instantaneous Flow Rate | 0.2 MTPA _i |
| Overall Store Capacity | 100 Mt |

4.2 Initial users

Three carbon capture projects were selected to be initial users under the Track-1 cluster sequencing process². Their details are shown below in Table 5.

Table 5: Details of initial users

| Planned Initial User | Commissioning Phase | Connection Location |
|---|---------------------|-------------------------------|
| Net Zero Teesside Power ("NZN Power") | 1 | Teesworks Site |
| Teesside Hydrogen CO ₂ Capture ("BOC") | 2 | AGI-C1, close to the BOC site |
| H2Teesside ("H2T") | 2 | Teesworks Site |

4.3 Network demand forecast

An estimate of the combined demand from the three initial network users, for the first 10 years of operation, is provided in Figure 4.

² [Cluster sequencing Phase-2: Track-1 project negotiation list, March 2023 - GOV.UK](#)

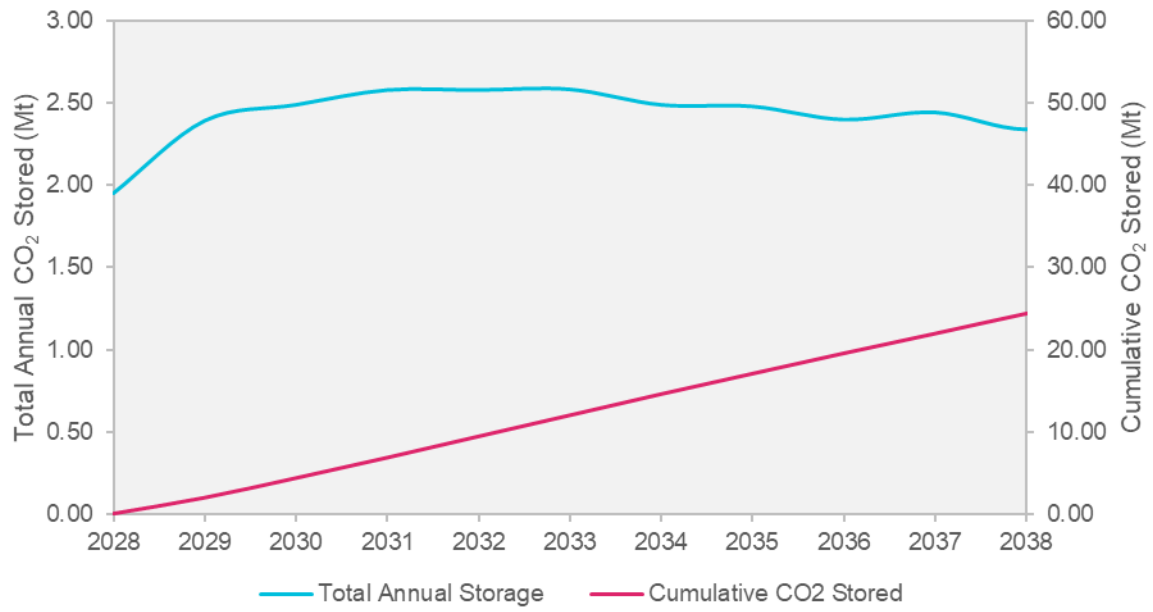


Figure 4: Network demand forecast

5 Development and Expansion

NEP will carry out development activities to facilitate expansion of the network. These activities relate to:

- The Humber Carbon Capture Pipeline (HCCP)
- Expansion storage systems CS006 and CS007

Finalisation of the expansion scope will be contingent on the outcome of expansion store appraisal well analysis and will be subject to an additional investment decision.

The users who will form part of the expansion scope have not yet been selected by the Government under the Track-1 expansion process. Any changes to the network required to accommodate additional selected users will require a scope change approval for the APDP.

5.1 Humber Carbon Capture Pipeline

The Humber Carbon Capture Pipeline (HCCP) is the collective name for both the Humber Onshore and Humber Offshore Transportation Systems. This pipeline is intended to connect selected industrial users in the Humber to the Endurance and expansion stores, via a pumping station located at Easington. This is at an earlier stage of development than the Teesside Carbon Capture Pipeline, with a public non-statutory consultation for the Humber Onshore Transportation System having been carried out in Summer 2024³. FEED and Development Consent Order (DCO) application are the next stages of the development.

Approved development activities in support of the HCCP include:

- Humber Onshore Transportation System pre-FEED and FEED
- Humber Offshore Transportation System FEED revalidation.
- Interface work with the Endurance Offshore Storage System
- Applications and receipt of necessary Licences, permits and consents
- Initial procurement activities

Figure 5 provides an overview of the proposed Humber Onshore Transportation System routing based on the proposed pipeline corridor as part of the preparation for the Development Consent Order (DCO).

³ <https://nephccp.co.uk/>

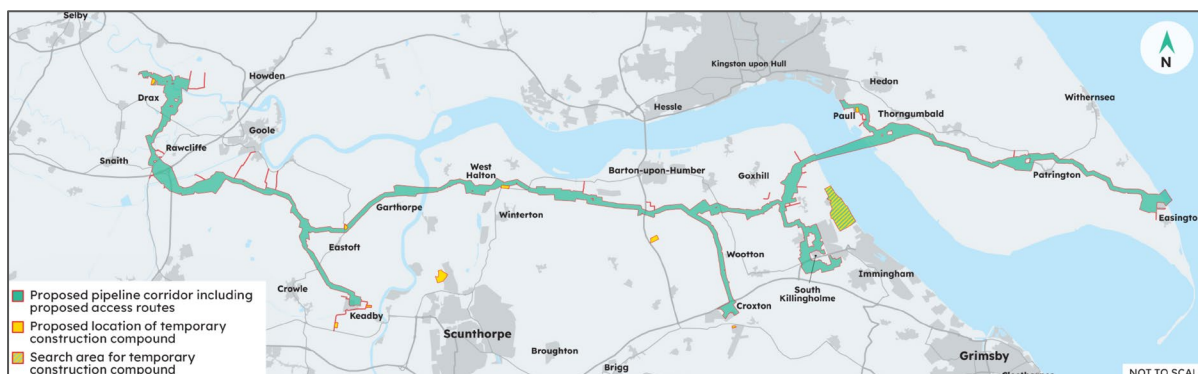


Figure 5: Map of proposed Humber Onshore Transportation System route

5.2 Expansion Storage Systems CS006 and CS007

Additional storage capacity is potentially available to connect additional users to the network. NEP has been awarded carbon storage licenses for the CS006 and CS007 storage systems, adjacent to Endurance.

Approved development activities related to the CS006 and CS007 Storage Systems include the drilling of appraisal wells, remediation works, data gathering, permitting and licencing required to build confidence in the storage system capacity.

The outcome of the appraisal activities will dictate the potential expansion capacity and scope.

The CS006 storage system is expected to include:

- Four injection wells
- A pipeline connecting CS006 to the Endurance Storage System

The CS007 storage system is expected to include:

- Three injection wells
- A pipeline connecting CS007 to the CS006 storage system

6 System modification plans

There are currently no plans for modification of the system, as described in Section 3.

7 System remediation plans

There are currently no plans for remediation of the system, as described in Section 3.

8 Decommissioning plans

As required under Carbon Dioxide Transport and Storage Licence Standard Conditions C2 and D2, 18 months prior to the Commercial Operations Date, Net Zero North Sea Storage Limited will submit information relating to decommissioning to the regulator, including:

- Onshore decommissioning plans.
- Estimated decommissioning fund costs for onshore and offshore.
- Proposed structure and investment strategy for the decommissioning fund.

Following approval by the regulator, Net Zero North Sea Storage Limited will calculate the Onshore Decommissioning Fund Allowance and Offshore Decommissioning Fund Allowance for each charging year. Net Zero North Sea Storage Limited will commence monthly payments into these funds in line with the Decommissioning Fund Allowances after the Commercial Operations Date.

Enquiries and connection applications

Prospective network users seeking to apply for network capacity and existing users seeking to apply for additional network capacity must first make that application through the Government-led Cluster Sequencing Process.

Following selection under this process, applicants are then invited to enter the connection process under the CCS Network Code by completing and submitting a Connection Application. A template will be provided on the Network portal.

Please send any queries relating to connections and any completed Connection Applications to enquiries@nep-eastcoastcluster.co.uk.