

Candidate PCI projects in cross-border carbon dioxide (CO₂) transport networks

in view of preparing the 5th PCI list

This document includes information regarding all cross-border carbon dioxide transport networks projects submitted by projects promoters between 27 November 2018 and 8 March 2021 in view of assessment and preparation of the fifth Union list of Projects of Common Interest, to be adopted in October 2021 .

1 CO₂TransPorts

The overall objective of CO₂TransPorts is to establish the necessary infrastructure to facilitate the large-scale capture, transport and storage of CO₂ from three of the most important ports of Europe. CO₂TransPorts will provide an 'open access' CO₂ transportation service for CO₂ capture sites in the Port of Rotterdam, Antwerp and the North Sea Port partnership. It will be developed and operated by capable and trusted parties, in close cooperation with the port authorities and supported by national governments.

CO₂TransPorts addresses the needs outlined above by:

- Establishing a Project of Common Interest initiative as a platform for clear dialogue and coordination between the Port Authorities of Rotterdam and Antwerp, and North Sea Port, as well as national gas infrastructure entities and CO₂ storage authorities, concerning the efficient and timely development of CO₂ transport infrastructure in the region.
- Through a physical cross-border connection, provide Belgium with access to safe and suitable CO₂ storage sites on the Dutch Continental Shelf.
- Send a clear message to industry in the region that access to transport and storage infrastructure is being actively planned for by port authorities.
- Managing the financial risk to public and private investors by implementing a carefully planned phased approach, increasing the transport capacity incrementally as demand from industry arises.
- Aligning with the directions of Member States in the vicinity of the North Sea, through a recognition of the "sensible locations for initial infrastructure development" as established by the North Sea Basin Task Force (2017).
- In advanced phases of the plan, CO₂TransPorts includes possibilities for expansion of infrastructure beyond the needs of the represented Member States for potential transport and storage of CO₂ from or in third-party Member States.

Development phases

CO₂TransPorts will be developed in 3 phases, listed below (with an indicative timeline). Phases 1 and 2 will provide CO₂ transport infrastructure for up to a maximum of 16 MtCO₂/year. However, existing studies indicate that extra capacity will be needed. This will be investigated in Phase 3.

- **Phase 1 (2024):** This phase is focused on the development of CO₂ transport and storage infrastructure at the Port of Rotterdam. This involves the development of an onshore pipeline through the port of Rotterdam, a compressor station, and an offshore pipeline to access the P18 gas fields for CO₂ storage. The optionality of shipping CO₂ from Rotterdam from 2025 onwards is also being investigated. FEED studies are now almost

finalised for these Port of Rotterdam infrastructure developments and a final investment decision (FID) is expected in Q1 2022. Based on a positive FID outcome, the Phase 1 Rotterdam infrastructure is expected to begin construction in 2022 and become operational in 2024.

- **Phase 2 (2026):** In this phase the cross-border transport of CO₂ from Antwerp and North Sea Port will be initiated. A CO₂ pipeline collection network and potential shipping links to Rotterdam will be developed in Antwerp and the North Sea Port areas. Through an interconnection between North Sea Port and Port of Antwerp the CO₂ sources in the south will be connected to Rotterdam. This infrastructure provides access to CO₂ storage sites in the North Sea for Dutch and Belgian CO₂ sources, however this will require additional offshore pipelines being developed to access further CO₂ storage sites on the Dutch Continental Shelf to increase storage capacity. Further feasibility work will be required in addition to that conducted for Phase 1 by Porthos to allow for further storage site selection. Pre-FEED work is also required on the extension of the offshore transport system from Rotterdam to the Phase 2 storage fields. North Sea Port and the Port of Antwerp are currently conducting feasibility studies for these Phase 2 infrastructure developments. North Sea Port will complete the feasibility stage Q1 2021, and the Port of Antwerp has recently begun the FEED phase for their location collection network. FEED studies will begin on all Phase 2 infrastructure in the upcoming PCI period.

- **Phase 3 (2030+):** The CO₂TransPorts consortium has identified that under certain, reliable economic and regulatory conditions, the total CO₂ transport demand from the three regions may exceed the maximum design capacity of 16 Mt/year expected in Phases 1 and 2. Furthermore, demand for CO₂ transport may arise from third-party countries needing access to offshore storage sites. In order to prepare the necessary capacity (pipelines, shipping and storage) this will start with a pre-feasibility study. The results will be input for decisions on pipeline dimensioning, shipping and storage capacity within Phases 1 and 2. Realisation of Phase 3 is expected from 2030 onwards.

Anticipated start date of operations:

- Phase 1 – 2024
- Phase 2 – various dates between 2024 and 2029
- Phase 3 – 2030+

This timeline is based on the (operation of) pipeline infrastructure. During the PCI period 2019-2021 FEED studies have been conducted for Phase 1, feasibility and FEED studies have been conducted for Phase 2 and Phase 3 is currently in the pre-feasibility stage.

2 Northern Lights

(Northern Lights European CO₂ Transport EcoSystem, abbreviated as “N-LiTES”)

The Northern Lights PCI is intended to be a commercial CO₂ transport connection project between several European capture initiatives and the storage site on the Norwegian Continental Shelf, as well as providing alternative storage to other CCS projects.

Main objectives of the N-LiTES PCI:

1. To develop commercial CO₂ transport connections between European CO₂ emitters/emitting clusters and NL-JV. Capacity of the transport connections will increase through different development phases: up to 1.5 Mtpa of CO₂ during Phase 1, up to 5 Mtpa of CO₂ during Phase 2, and potential additional growth beyond 5 Mtpa of CO₂ during Phase 3.

AND

2. To facilitate the broader implementation of CCS in Europe through the development of a widespread and reliable CO2 removal ecosystem including a network of storage sites willing to act as reciprocal, alternative, storage locations to one another. This reciprocity can be used in case of scheduled and un-scheduled maintenance, drilling of new injection wells, or any other operational upsets.

The main goal of the N-LITES PCI is to collect and transport anthropogenic carbon dioxide from multiple sources (single or cluster industrial installations) for the purpose of permanent geological storage under the seabed in Norway. The PCI project includes and addresses the development of the main components of the CO2 handling and transport chain, which are:

1. CO2 loading terminals Individual loading terminals located on the emitters' side and where captured CO2 is liquified, temporarily stored, and then loaded onto ships are in the scope of this PCI. It includes buffer storage and liquefaction (single-modules or trains), loading arms, jetty and quay facilities, as well as connecting pipelines. Inland pipelines interconnecting CO2 emissions cluster and export terminals located at seaside and mutualised loading terminals are also included here where relevant.
2. Shipping of CO2: Shipping is the selected method of transboundary transportation of CO2 from the various capture sites. This transportation method, while currently excluded from TEN-E, represents a cost effective, flexible, and scalable way to transport large, industrial, volumes of CO2 without the construction of extensive, and expensive international pipeline networks. LCO2 (Liquid CO2) ships can reach a geographically widespread network of industrials and transport their liquefied and pressurised CO2 emissions to the Northern Lights CO2 Receiving Terminal.
3. CO2 Receiving Terminal: LCO2 ships will offload at the Northern Lights CO2 Receiving Terminal where the liquid CO2 will be temporarily stored prior to its export to the permanent offshore storage site.
4. Transport to the storage site: Liquid CO2 will be exported from the CO2 receiving terminal to the offshore storage site via pipeline for ca. 100km. The design of the pipeline includes tie-in options to allow for connection to future wells or pipelines.

i) Anticipated start of operation

Different promoters on the emitter-side of this PCI have varying timelines for their start of operations; these vary between 2024 and 2028.

ATHOS

(Amsterdam-IJmuiden CO2 Transport Hub & Offshore Storage)

ATHOS PCI proposes an open access CO2 transport infrastructure to enable a one-stop shop solution for Carbon Capture Utilisation and offshore Storage in the North Sea. The project involves dedicated pipelines - onshore and offshore- that will be used to transport CO2 from the industrial port area of Amsterdam (IJmuiden), The Netherlands, for geological storage in gas reservoirs according to Directive 2009/31/EC.

This project entails the development of a large-scale, open-access interoperable high-volume CO2 transportation infrastructure from mainland Europe and Ireland to CO2 storage locations in the Dutch section of the North-Sea to enable emission reduction for industrial CO2 emitters in the Noord Zee Kanaal Gebied (and potentially from the Irish capture plants (located at the Aghada & Whitegate CCGTs and the Irving Oil refinery) and the Ruhr area of Germany.

The Amsterdam-IJmuiden CO₂-Transport Hub & Offshore Storage (ATHOS) project will develop an open-access cross-border interoperable high-volume transportation structure for CO₂ capture, storage and utilisation. N.V. Nederlandse Gasunie (Gasunie) is the promoter of Project ATHOS.

The primary focus of ATHOS is to provide open access CO₂ transport infrastructure from the Amsterdam industrial port area. Additionally, ATHOS aims to provide import facilities for maritime CO₂ transport vessels from other EU Member States.

The North Sea Channel has been identified as a focus area for CCUS due to the high CO₂ emissions resulting from the nearby energy intensive clusters including steel and energy production as well as waste management.

The PCI is currently in an ongoing study stage which will serve to achieve a solid front end definition of the project and thus contributes to the realisation of a backbone transport infrastructure with a capacity of 8 MtCO₂/a. The studies will ultimately serve as input for the Final Investment Decision. The subsequent implementation stage aims for realisation of the infrastructure by 2026. Once operational, emitters from wider surroundings and other EU Member States will be asked to join the open access network and as ATHOS works towards the integration of the system into a North Western EU cross-border carbon dioxide network.

The main objectives of the ATHOS PCI are:

- Establish a large-scale, open-access infrastructure for CO₂ transport, to enable CO₂ utilisation and storage and support the emission reduction for industrial CO₂ emitters in the Noord Zee Kanaal Gebied area and secondary Member States.
- Oversized pipelines, compression and utility equipment to allow future use by other Member States based on priority CO₂ transport corridors;
- Cross-border cooperation to share knowledge and expertise regarding technical, economic, environmental and regulatory challenges of developing and implementing an open access CO₂ transport infrastructure;

The ATHOS PCI has made important steps forward in the implementation of the PCI. All preparatory activities have been concluded or are about to be concluded. This paves the way for the next and currently ongoing step, which is carrying out a study project under the CEF programme to bring the project to the point where there is sufficient certainty on costs and the technical implementation to take the final investment decision. The subsequent construction and implementation phase could then directly be started with all preparations in place.

The foundational work for the ATHOS PCI is a feasibility study that was carried out by the consortium of ATHOS in 2019. The overall conclusion of this report was that the ATHOS project seemed technically feasible, but further research was needed..

Anticipated start of operation

The anticipated start date of operations of the ATHOS project is end of 2026.

4 ARAMIS

The Project of Common Interest put forward by the Aramis Project proposes a Carbon Dioxide (CO₂) transport system to transport anthropogenic and biogenic CO₂, captured by various sources and from multiple industrial clusters, via dedicated offshore pipelines for permanent geological storage in depleted gas reservoirs in the North Sea in line with Directive 2009/31/EC. Several of the stakeholders (emitters) will transport captured CO₂ to the main onshore hub at Rotterdam via shipping and onshore pipelines. The project comprises dedicated collection pipelines at the remote

industrial clusters to transport CO₂ from more than one source, the main trunk line between Rotterdam and the offshore hub as well as the interfield pipelines transporting CO₂ to the respective permanent storage locations.

The Member States involved in the Aramis Project are the Netherlands, Belgium, France and Germany. These are all members of the North Sea Basin Task Force (NSBTF) and contribute in the strategic regional plan of 2017 aiming to develop common principles for managing and regulating the transport, injection and permanent storage of CO₂ in the North Sea sub-seabed.

The Aramis Project has the ambition to develop a pan-European, robust, competitive, modular and integrated CO₂ permanent and safe storage project with multiple transport options (shipping, inland barge, onshore pipeline) to reach the depleted gas reservoirs in the Dutch sector of the North Sea.

The key objectives of the 'Aramis Cross Border CO₂ Transport and Storage project' are:

- Establish a large-scale, CO₂ transportation system, to enable CO₂ storage and support the emission reduction for industrial CO₂ emitters in several industrial clusters in the Netherlands and other EU Member States. Accessible offshore storage sites can provide up to over 400 million tonnes of CO₂ storage capacity;
- Develop a phased approach in line with the pace of industrial decarbonisation in the region and the subsequent demand for CO₂ storage. The development is scalable with the phase I realisation targeting 5 Mtpa. Further phases would benefit from more than 400 Mt overall storage capacity. They will be developed on par with CO₂ storage demand evolution to support economic decarbonisation;
- Catalysing future CCS projects by integration with other PCIs and CO₂ transport networks to create a more versatile and larger CCS hub across EU Member States;
- Further decarbonisation of industrial clusters in EU Member States, by enabling low carbon industrial activities in hard-to-abate sectors;
- Cross-border cooperation to share knowledge and expertise regarding technical, economic, environmental and regulatory challenges of developing and implementing an interoperable CO₂ transportation system.

Anticipated start of operation

The anticipated start date of operations of the ARAMIS project is early 2026.

5 Dartagnan

(CO₂ export Multimodal HUB from Dunkirk and its hinterland)

Dartagnan project aims to create an open access multi-modal CO₂ Export Hub from Dunkirk harbour and its hinterland. This PCI project will allow to connect, by way of shipping, main industrial emitters in Dunkirk harbour and its hinterland with key CCS projects under development in the North Sea and Netherlands for permanent storage of CO₂.

Developing infrastructures on both ends of the CCS chain, in France close to important emitters and in the Netherlands close to permanent storage location is essential to establish and densify an effective, efficient, European and cross border CCS network and value chain. Developing capacities

on both ends will benefit all actors along the value chain, reducing costs through economies of scale and improving reliability and the robustness of the European CCS value chain as a whole.

Dartagnan, representing up to 3 MTons of CO₂ per year during the 2025-2030 period, will have a significant impact in the prevention of further global warming. This project will thus directly contribute to the ambitions of the Paris Agreement, the French roadmap on low carbon strategy, the Dutch Climate Agreement, and more globally to the objectives of the European Union toward carbon neutrality in 2050.

Dartagnan: Dunkirk CO₂ multimodal Terminal – Enabling an interconnection road, railways, river boats, ship and pipeline -based European CO₂ Transport and Storage Network to connect France to North Sea CCS hub and the Netherlands.

The project can be divided into 3 phases:

- Phase 1: 2025 - 2030 3 MT CO₂/y,
- Phase 2: 2030 - 2035 3 - 6 MT CO₂/y,
- Phase 3: 2035 - 2050 6 - 12 MT CO₂/y.

Dartagnan PCI project aims at implementing CO₂ primary infrastructures to collect and export CO₂ from emitters based on Dunkirk harbour and its hinterland to permanent storage location in the North Sea basin, notably in Rotterdam. This new export “Hub”, meaning, the place where CO₂ from emitters is collected prior to its export by ship and then by pipeline, will play a key role in the carbon neutrality strategy of Dunkirk, which remains a very industry intensive area. Located in the Port of Dunkirk, the LCO₂ export hub will collect the CO₂ from emitters for further loading to ship transport.

The offloading facilities of LCO₂ and import hubs will be located in the North Sea basin connected to the CO₂ geological storages.

This inter-regional CCS initiative will be a step towards reaching the climate targets of North of France with use of emerging measures of carbon storage in the North Sea basin. Well-developed CO₂ transportation infrastructure will also enable for future expansion of commercial CO₂ capture capabilities in the European CO₂ Transport and Storage Network, cost optimization through scale effect which in turn will help address industrial emissions in France and more globally in the European Union. The project will make available world class CO₂ export infrastructures to allow French industry and primarily hard to abate sectors to get, via Liquid CO₂ shipping, effective and competitive access to the North-Sea CCS Hub.

Developing infrastructures on both ends of the CCS chain, in France close to major emitters and in the Netherlands close to permanent storage location is essential to establish and densify an effective, efficient European and cross border CCS network and value chain. Developing capacities on both ends will benefit all actors along the value chain, reducing costs through economies of scale and improving reliability and the robustness of the European CCS value chain as a whole.

The Project will ensure also the compatibility of all export facilities with the import facilities in the North Sea. The solution of LCO₂ transport from Port of Dunkirk by ship gives a flexibility to the

emitters to access open storage sinks without necessity to develop storage location by themselves and where no geological storage is available in close distance for the pipeline connection.

Dartagnan will then enhance CCS Market fluidity and provide an incentive for capacity build-up. By interconnecting north of France with the North-Sea, the project will contribute to establish a fully European CO₂ Network to help achieve the CO₂ reduction objectives of the EU and of France and further contribute to create a fluid CCS market in Europe.

By providing additional significant CO₂ volume to the various storage providers in the North Sea, Dartagnan will also provide an incentive to further expand the permanent storage capacities and the related Liquid CO₂ import infrastructures, to the benefit of the European industry in the Union. Dartagnan then will fully complement the emerging EU CO₂ transport network.

Anticipated start date of operations:

For phase 1, first operations are planned to start in 2025 - 2026.

6 POLAND EU CCS INTERCONNECTOR

Poland EU CCS interconnector has an ambition to establish an open access multi-modal CO₂ Export Hub from Gdansk and its hinterland. The project objective is to connect the main industrial CO₂ emitters in Gdańsk and hinterland to the CCS chain (under development in the North Sea) for permanent storage.

The infrastructures establishment on both ends of the CCS chain: in Poland close to CO₂ emitters and in the permanent storage location of the North Sea basin consecutively, is essential to establish an effective and efficient cross border CCS network and value chain with an European stamp.

Thus, developing capacities on both ends will benefit all actors along the value chain, by reducing costs through the economy of scale and through the improvement of the reliability and the robustness of the European CCS value chain as a whole. This will enable Polish industries and sectors experiencing difficulties to abate CO₂, to access the North Sea CCS network through liquid CO₂ shipping and a world class CO₂ export infrastructure.

The project is scheduled to transport 2.7M Ton of CO₂ per year between 2025-2030 period reaching 8.7M Ton of CO₂ between 2030-2035 period leading to a significant impact in global warming prevention. Capture and liquefaction solutions will be fed with a low carbon footprint mix of renewable energy and national grid footprint decreasing as per the 2040 Polish Energy roadmap and will be based on the low carbon transport (LNG, hydrogen and renewable power). Thus, this project will directly contribute to the ambitions of the Paris Agreement, the Polish low carbon strategy until 2040, the French roadmap on low carbon strategy, the Dutch Climate Agreement, and more globally to the objectives of the European Union towards carbon neutrality in 2050.

POLAND EU CCS INTERCONNECTOR - is a project of an open access multi-modal liquid CO₂ (LCO₂) export terminal in Port of Gdańsk with related CO₂ transport infrastructure from the facilities of emitters to European CO₂ transport and storage network in the basin of North Sea with a use of transport via roads, railways, pipelines and ships (in future also possible by river with inland barges).

In the long term, the alternate storage sinks at the Baltic Sea could be investigated for connection with pipelines or with adaptation of the existing infrastructure connecting crude oil or gas fields on the Baltic Sea with the coast of Poland. This solution would provide a reliable and flexible CO₂ transport and storage network across Europe

The strategic objective of the project is to build a CCS interconnector between Poland and the CCS hub emerging in the North-Sea basin. This inter-regional CCS initiative will be a step towards reaching the climate targets of Poland with use of emerging measures of carbon storage in the North Sea basin. Well-developed CO₂ transportation infrastructure will also enable for future expansion of commercial CO₂ capture capabilities in the European CO₂ Transport and Storage Network, cost optimization through scale effect which in turn will help address the problem of industrial emissions in Poland and more globally in the European Union. The project will make available world-class CO₂ export infrastructures to allow Polish industry and primarily hard to abate sectors to get, via liquid CO₂ shipping, effective and competitive access to the North-Sea CCS Hub.

Located in the Port of Gdańsk harbour, the LCO₂ export hub will collect the CO₂ from emitters for further loading to ship transport. The offloading facilities of LCO₂ and import hubs will be located in the North Sea basin connected to the CO₂ geological storages (see Figure 3 - map of the Poland EU CCS interconnector).

The project will ensure the compatibility of all export facilities with the import facilities in the North-Sea. The solution of LCO₂ transport from Port of Gdańsk by ship gives a flexibility to the emitters to access open storage sinks without necessity to develop storage location by themselves and where no geological storage is available in close distance for the pipeline connection. As capture solution is accessible to many emitters, increase of LCO₂ volumes in common European CCS infrastructure with transport and storage, allows to reduce overall cost of facilities thanks to the large scale and standardization effect.

The CCS Interconnector will enhance CCS Market fluidity and provide an incentive for capacity buildup. By interconnecting Poland with the North-Sea, the project will contribute to establish a fully European CO₂ Network to help achieve the CO₂ reduction objectives of the EU and of Poland and further contribute to create a fluid CCS market in Europe.

As per the provisions of the CCS Directive⁸, the CCS Interconnector will have access to all storage sites in Europe. The various emitters in Poland, shall have, through the CCS Interconnector, open, transparent and non-discriminatory access to every storage location in Europe and symmetrically no storage locations shall have any exclusive or preferential access to the CCS Interconnector. The development of an independent shipping solution will ensure effective and competitive access to the various storage sites and contribute to market fluidity.

By providing additional significant CO₂ volume to the various storage providers in the North-Sea, the CCS Interconnector will also provide an incentive to further expand the permanent storage capacities and the related Liquid CO₂ import infrastructures, to the benefit of the European industry in the Union.

Additionally, the project will build industrial expertise, competences and new employment in Poland related to the CO₂ capture, transport, storage with engagement of corresponding resources for engineering, construction, logistics and operations (in port, shipyard, engineering and construction entities, rail and transport etc.).

The CCS interconnector will consist primarily of the following infrastructures:

1. a multi-modal Liquid CO₂ Export Terminal in Gdańsk 2. a CO₂ collector backbone in the Port of Gdańsk, to provide industries in the vicinity of the Port with effective access to the Terminal 3. primary export infrastructures in the Gdańsk hinterland to provide industries located in the hinterland of Poland to access the Terminal via railcars shuttle, trucks, inland waterways, or pipeline.

2. Multi-modal Liquid CO₂ Export Hub in Gdańsk

The project of a multi-modal LCO₂ export hub will strengthen the strategic position of the Port of Gdańsk and its key role in decarbonization of the region. It is aligned with the objectives of the Port of Gdańsk for the environmental protection covering among the other measures against the air pollution.

The infrastructure planned to be developed in the Port of Gdańsk in Stage 1:

- liquefaction unit
- LCO₂ buffer storage tanks
- railcars unloading facilities
- truck unloading facility
- import and export metering facility
- ship loading facility.

2. CO₂ collector backbone in the Port of Gdańsk

Gaseous CO₂ pipeline “backbone” connecting nearby emitter with H₂ and in the long term potential future emitters in the region in case of additional CO₂ volumes to be exported from the region.

Anticipated start date of operations

Start-up of first facilities is planned in 2025 – 2026.

7 CO₂ liquefaction and buffer storage in Wilhelmshaven

The aim of the project is to investigate and pilot a CO₂ liquefaction and buffer storage infrastructure in the Energy Park in Wilhelmshaven, Germany. This will serve as an initial demonstrator of the hub’s capacity and strategic value in the Hydrogen and CO₂ European network. The objective will be to then expand this network to the other EU countries (e.g. Netherlands) and within Germany to assure the safe buffer storage and further transportation for re-use of CO₂.

The present project will be part of the newly built **European Energy Logistics Park in Wilhelmshaven**, which will become the anchor point of a multinational, CO₂ neutral value-added cycle (the NGE2050 project). **In the first stage, approximately 4.3 million tonnes of CO₂ per annum**, deriving from the facilities own capture and from the pilot connection with a third party power plant, will be exported. NGE2050 thus makes a significant contribution to meeting the demand gap for renewable energies, decarbonizing the industry and filling in the buffer storage gaps in the CO₂ infrastructure. **This will amount, in the final expansion phase, up to 150 million tonnes of CO₂ savings are anticipated per year. This takes into account the usage of the CH₄ in the circular economy and direct CC(U)S from industrial hubs.**

However, for these to contribute to the climate neutrality and CO₂ neutral goals, there is a need to create a liquefaction and buffer storage facility that will allow the future transport of set CO₂ via pipelines or ships, which will be part of the Energy-park developments occurring in the plot of land in Wilhelmshaven.

Therefore, the aim of this PCI is to provide for a liquefaction and storage facility, capable of receiving, storing, and barging up to 1 million Mtons CO₂ annually.

Furthermore and according to Third Party Access (TPA) provisions of the CC(U)S Directive, the company will ensure that all potential operators can obtain “fair and open” access to the CO₂ transport and storage infrastructure. However, the Directive provides little detail on the nature of these arrangements, with Member States given the discretion to determine the precise means of providing such access. As such, the company has already initiated discussions with the national authorities to ensure the fair use of these installations.

This infrastructure is the first stepping stone for the development of a fully new value chain of CO₂, with future plans being the creation of a LCH₄ and CO₂ jetty to allow for the import and export of LCH₄ and CO₂. This export of CO₂ can be for the production of green CH₄, or for permanent storage in geological sites (e.g. Northern Lights).

The liquefaction and buffer storage facility will be fully located in the Federal Republic of Germany. However, the creation of the connecting pipeline infrastructure and the jetty will ensure that industries from Germany and other European nations (e.g. Netherlands, Denmark, Norway) can have access to this essential technology.

Anticipated start of operation

The beginning of operations is anticipated to start in Q3 2026, but the project will continue the constructions endeavours to expand the capacity and connections.

8 Downstream CO₂ pipeline Hastedt – Bremen

The aim of the project is to investigate and pilot a CO₂ pipeline infrastructure connecting a carbon intensive industry hub in Bremen to the Energy Park in Wilhelmshaven, Germany. This will serve as an initial demonstrator of the hub’s capacity and strategic value in the hydrogen and CO₂ European network. The objective will be to subsequently expand this network to the other EU countries (e.g. Netherlands) and within Germany to assure the safe buffer storage and further transportation for re-use of CO₂.

The present project will be part of the newly built **European Energy Logistics Park in Wilhelmshaven**, which will become the anchor point of a multinational, CO₂ neutral value-added cycle, deriving from the facilities own capture and from the pilot connection with a third party power plant, will be exported.

However, for these to contribute to the climate neutrality and CO₂ neutral goals, there is a need to create a liquefaction and buffer storage facility that will allow the future transport of set CO₂ via pipelines or ships, which will be part of the Energy-park developments occurring in the plot of land in Wilhelmshaven.

Therefore, the aim of this PCI is to provide for the connecting pipeline from the first CO₂ provider to the liquefaction and storage facility, capable of receiving, storing, and barging up to 1 million Mtons CO₂ annually.

Furthermore and according to Third Party Access (TPA) provisions of the CC(U)S Directive, the company will ensure that all potential operators can obtain “fair and open” access to the CO₂ transport and storage infrastructure.

This infrastructure is the first stepping stone for the development of a fully new value chain of CO₂, with future plans being the creation of a LCH₄ and CO₂ jetty to allow for the import and export of LCH₄ and CO₂. This export of CO₂ can be for the production of green CH₄, or for permanent storage in geological sites (e.g. Northern Lights).

The pipeline installation will be fully located in the Federal Republic of Germany. However, the creation of the connecting pipeline infrastructure and the jetty will ensure that industries from Germany and other European nations (e.g. Netherlands, Denmark, Norway) will have access to this essential infrastructure.

Anticipated start of operation

The beginning of operations is anticipated to start in Q3 2026, but the project will continue the constructions endeavours to expand the capacity and connections.