

CO₂ reduction through storage under the North Sea



Sytze Ferwerda, September 26th 2023



Co-financed by the
Connecting Europe Facility
of the European Union

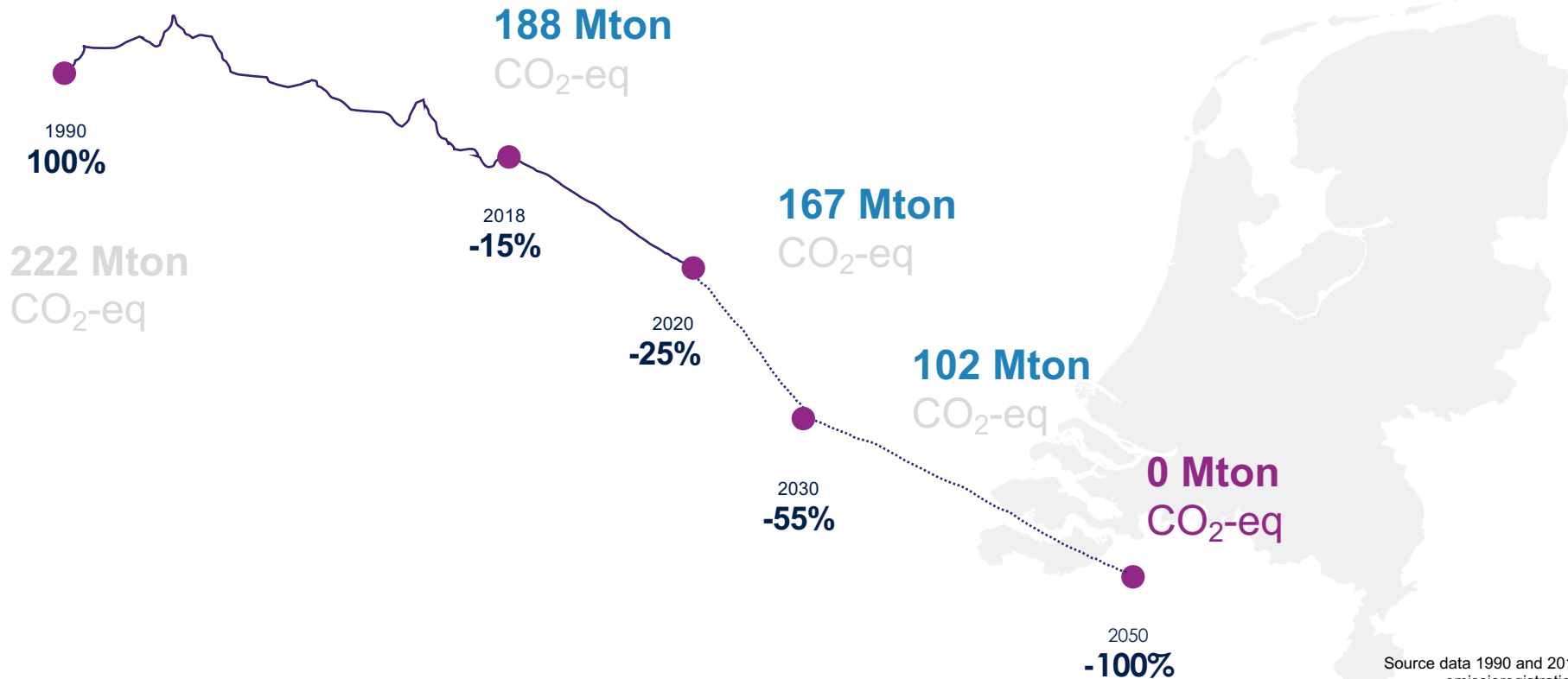


Porthos
CO₂ TRANSPORT & STORAGE

Agenda

1. **Introduction**
2. Recap: what is Porthos?
3. Project status

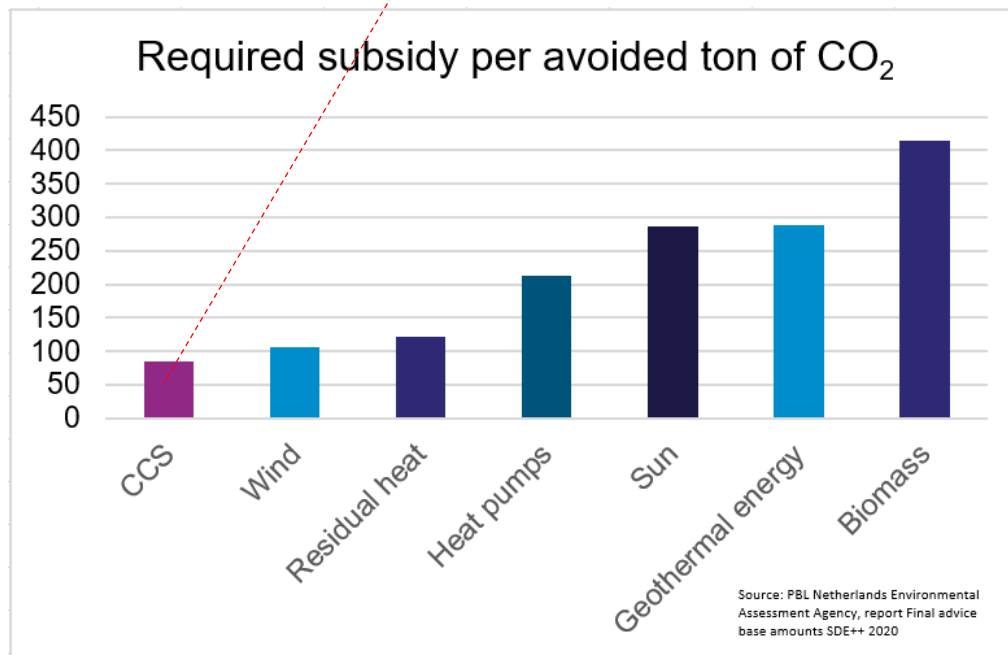
Climate objectives of the Netherlands



Why CC(U)S?

- Has the potential to reduce **large volumes** of CO₂
- Can be realized in the **short term**, crucial in terms of carbon budget
- It is **cost effective**
- Potential for **utilisation**, mainly in greenhouses
- Important for the development of **hydrogen**: via blue to green
- On the long term: **commodity** for industrial use (circular)

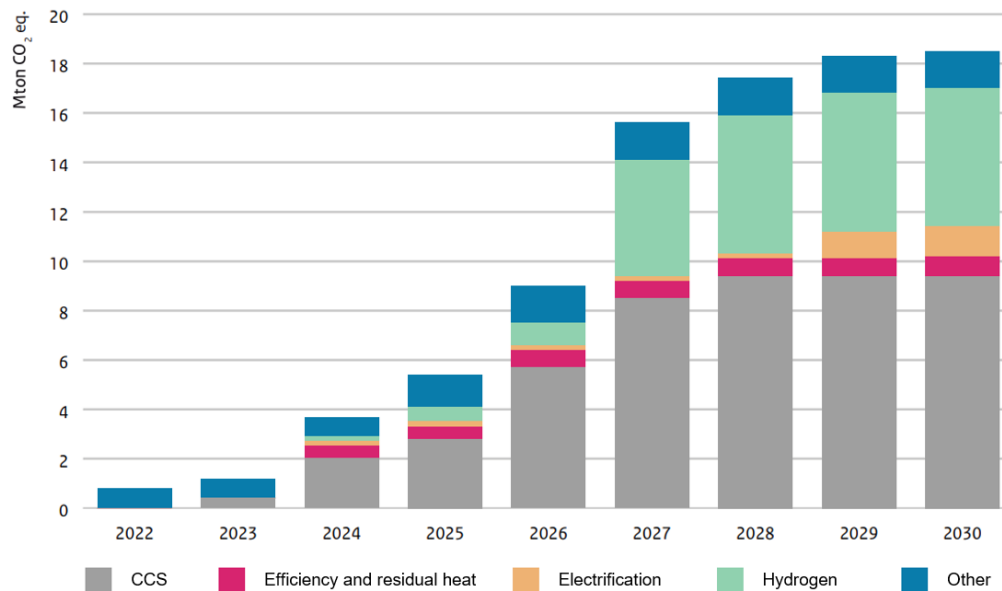
With ETS-price of €23/ton (!)



CCS and the climate objectives

Impact of Dutch Climate Agreement and Fit for 55 plans in the Netherlands:

- Higher ambition in relation to Climate Agreement: 55% to 60% CO₂ reduction by 2030
- Industry: 18.8 Mton reduction towards 2030
- Starting point PBL Netherlands Environmental Assessment Agency: 9 Mton CCS in 2030 = around **50%** industry



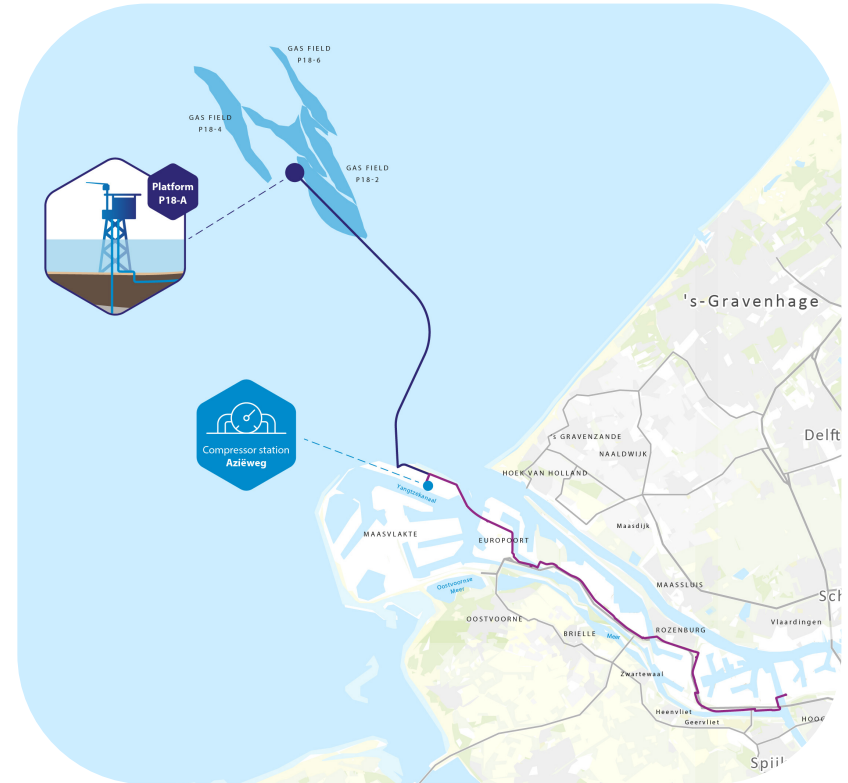
Agenda

1. Introduction
- 2. Recap: what is Porthos?**
3. Project status



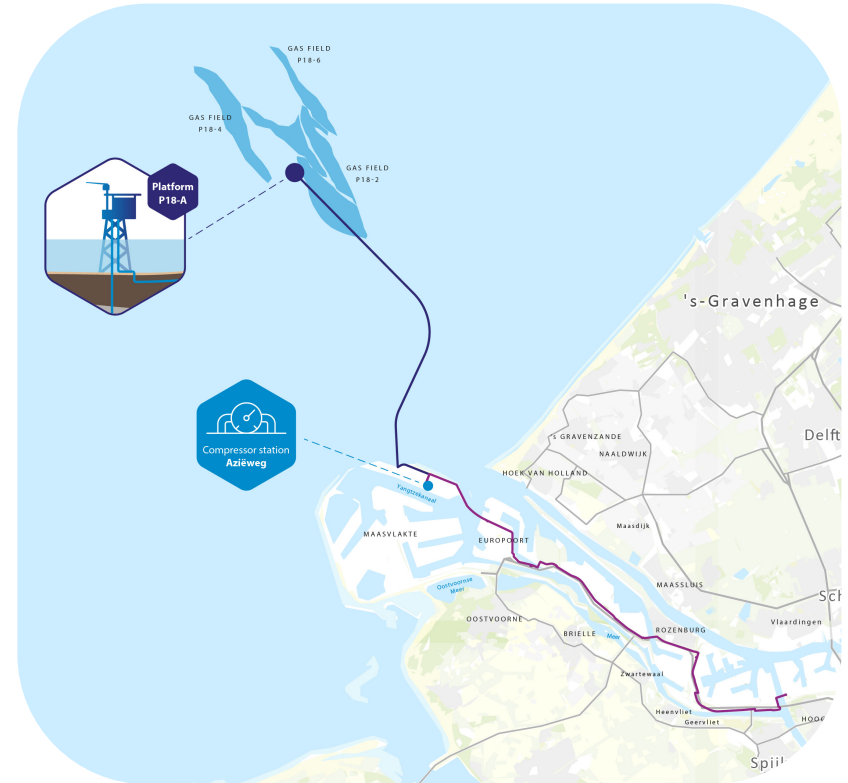
Project overview

- Infrastructure for CO₂ transport and storage
- CO₂ capture by customers
- Collective pipeline through Rotterdam port area
- Compressor station on the Maasvlakte
- Offshore pipeline to platform on the North Sea
- Storage in empty gas fields beneath the North Sea



Project overview

- Dutch state-owned parties: EBN, Gasunie, Port of Rotterdam Authority
- Customers: Air Liquide, Air Products, ExxonMobil, Shell
- Capacity P18 fields: ~ 37 Mton
- Storage: ~ 2.5 Mton per year



Agenda

1. Introduction
2. Recap: what is Porthos?
- 3. Project status**

Public-private partnership for a successful project

State owned companies

Lead role,
invest in infrastructure



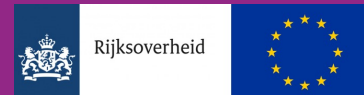
Private companies

Invest in capture,
pay for storage



Public authorities

Funding, mandate,
responsibility



CEF funding

The World News Monitor

Business Information for Sustainable Development

102 million euros in funding on the horizon for Porthos carbon storage project

Hellenic Shipping News | Oct 6, 2020 at 2:00 AM



- The European Commission has proposed awarding 102 million euros in funding to the Porthos project.
- The European Commission wants to financially support the construction of Porthos because the capture and sequestration of CO2 (known as Carbon Capture and Storage, CCS) is widely seen as a necessary measure to keep global warming below 2 degrees Celsius.
- The precise amount of this fee is determined by the costs incurred by Porthos for the system's construction and exploitation (including the energy costs for the pressurised injection of CO2 in the deeper substrate).

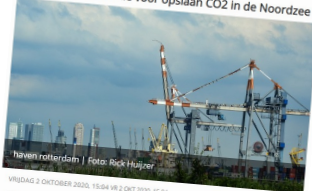
ship.energy

EC proposes €102 million funding for Porthos carbon capture project

The project will store CO2 supplied by the Rotterdam operations of Air Liquide, Air Products, ExxonMobil and Shell in the North Sea seabed

Rijnmond

100 miljoen subsidie voor opslaan CO2 in de Noordzee



VRIJDAG 2 OKTOBER 2020, 15:54 W 3:207:000, 15334

De Europese Commissie wil 102 miljoen euro uittrekken aan subsidie voor de ondergrondse opslag van CO2 onder de Noordzee. Dat zou moeten gebeuren in lege gasvelden door de kust van Hoek van Holland.

UTILITIES



Porthos krijgt mogelijk 102 miljoen euro EU-subsidie

Publicatie 5 Okt 2020
Categorie Utilities
Soort Nieuws
Tags CCS, CCUS, Porthos

gasworld

€102m proposed for Porthos CCS project

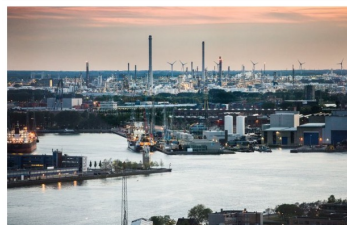
By Molly Burgess | 12 October 2020

The European Commission has proposed a €102m award to a Netherlands-based carbon capture and storage project, as part of a necessary measure to keep global warming below 2 degrees Celsius.

If endorsed by the European Parliament, Project Porthos will benefit from the new capital that will help to push forward its goals and contribute to the Netherlands' achievement of its climate targets.

AD NIEUWS REGIO SPORT ABONNEREN

Almelo Alphen Amersfoort Amsterdam Apeldoorn Meer...



▲ De raffinaderij van Shell Pernis. © Anja Kievit

Europese subsidie in aantocht voor belangrijk milieuproject van de Rotterdamse haven

Een groot milieuproject in de Rotterdamse haven staat op de nominatie voor meer dan 100 miljoen euro Europese subsidie. Dat is ongeveer een vijfde van de totale kosten van het Porthos-plan.

Leon van Heel 02-10-20, 15:12

rtl.nieuws

Pijpleiding voor CO2

EC wil Rotterdams CO2-opslagproject 102 miljoen euro subsidie geven



De haven van Rotterdam vanuit de lucht met onder meer industriegebied Vondelingenplaat, de Tweede Petroleumhaven en de raffinaderij van Shell.

Het grootste klimaatproject in de haven van Rotterdam is een grote stap dichterbij gekomen. De Europese Commissie wil 102 miljoen subsidie geven voor de aanleg van een systeem voor de opvang en opslag van CO2 van de zwaar vervuulende industrie in de haven.

NT Nieuwsblad Transport

Europa wil Porthos 102 miljoen euro subsidie geven

CO2-OPSLAG
De Europese Commissie heeft voorgesteld het CO2-opslagproject Porthos 102 miljoen euro subsidie te geven. Het is een project om CO2 van de industrie op te slaan onder de Noordzee. Als het Europees Parlement akkoord gaat, draagt Europa een flink deel van de investering van Porthos van in totaal 450 tot 500 miljoen euro.

NATHALIE VAN HERK 5 oktober 2020 12:04



Porthos
CO2 TRANSPORT & STORAGE

Sea Wanderer

102 million euros in funding on the horizon for Porthos carbon storage project

The European Commission has proposed awarding 102 million euros in funding to the Porthos project

Oct 5, 2020 - 06:50



The Porthos project centres on the capture and storage of CO2 in the North Sea floor. If the European Parliament endorses this proposal, Europe will bear a substantial share of the investment in Porthos, which totals 450 to 500 million euros.

SCHUTTEVAER

102 miljoen EU-geld voor Porthos project (opslag CO2 in Noordzee)

ROTTERDAM - 03 OKTOBER 2020, 18:10

SDE++ subsidy

Bloomberg Green

Energy & Science

Netherlands Pledges \$2.6 Billion Subsidy to Bury CO₂ Under the Sea

The project at Rotterdam port could capture 2.5 million tons of emissions per year from oil refineries and hydrogen plants



A&E - Clima

Olanda, 2 miliardi da governo per cattura carbonio Rotterdam
Progetto di Shell e Exxon, stoccaggio in giacimenti esauriti

DE TIJD

'Het CO₂ moet naar waar het vandaan komt: de grond in'



Echo
"Le CO₂ doit repartir d'où il vient: dans le sol"

RIJNMOND

De hele wereld kijkt naar CO₂-project Rotterdam: 'Als het hier slaagt, gaan anderen volgen'



EURACTIV

Dutch government grants €2 billion in subsidies to huge carbon storage project

NOS

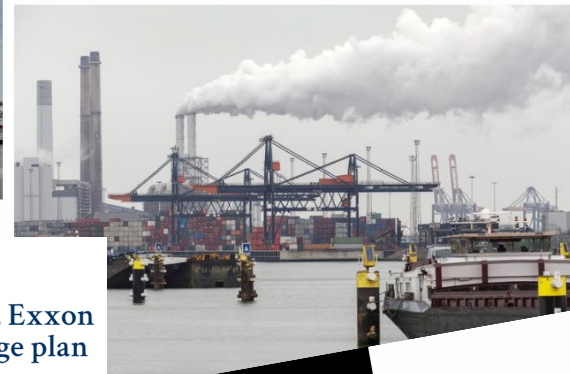
Miljardensubsidie voor CO₂-opslag onder Noordzee is rond

World Oil

Dutch government invites Shell, Exxon to join \$2.6B subsea carbon storage plan

REUTERS

Dutch govt grants \$2.4 billion in subsidies to huge carbon storage project



zonebourse
Air Liquide au coeur d'un gros projet de captage de CO₂ aux Pays-Bas

ALJAZEERA

Economy | Oil and Gas

Dutch g'ovt gives \$2.4bn in subsidies to fund carbon capture plan

The plan, which starts in 2024, aims to reduce emissions in the industrial cluster surrounding Europe's largest port.



upstream
ENERGY EXPLORED

OPINION: CCS has role to play in a geared approach to energy transition

I·C·I·S
Industrial Cluster
Intelligence Services

Dutch government to provide €2.1bn Porthos CCS subsidy

Porthos is ready for FID

Contracts with customers

have been signed, subsidies have been reserved

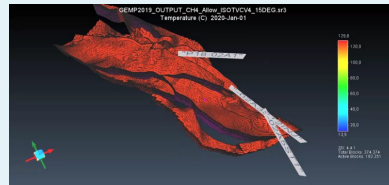
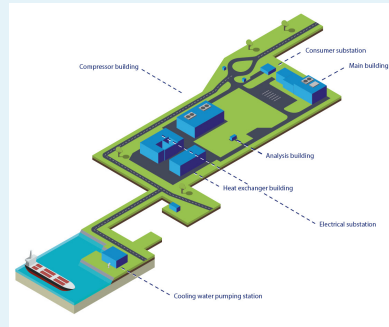
Air Liquide, Air Products, ExxonMobil, Shell



Dutch gov't grants \$2.4 billion in subsidies to huge carbon storage project



FEED engineering has been completed



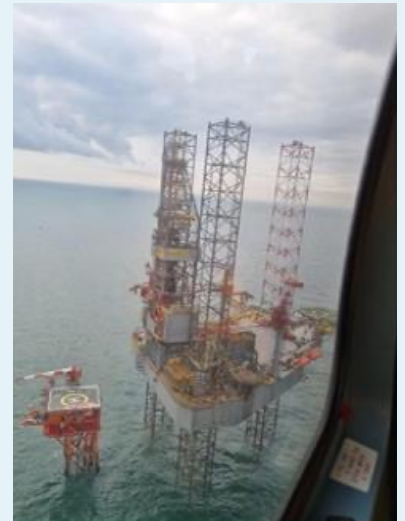
Irrevocable storage permits

received from Ministry



Successful decommissioning

of complex well



Porthos is ready for FID



Positive ruling Council of State

- November 2021: ngo MOB appeals against nature permits Porthos (nitrogen issue)
- November 2022: construction exemption lapses in ruling Council of State
- August 2023: positive ruling Council of State on ecological assessment Porthos

➤ Final Investment Decision (FID)



Dutch court rules huge carbon capture project can go ahead

De Telegraaf
Raad van State geeft groen licht voor CO2-opslagproject Porthos

de Volkskrant
Raad van State: klimaatproject Porthos mag doorgaan



Omstreden CO2-opslagproject Porthos mag doorgaan

NOS
Raad van State keurt project voor opslag CO2 in Noordzee goed



CO2-opslag Rotterdamse haven mag doorgaan, klimaatdoelen niet in gevaar

Status and planning



Current

- Preparing for FID
- Preparing for construction phase
- European tenders for construction compressor station



End of 2023

- Final Investment Decision (FID)



2024

- Start of construction works

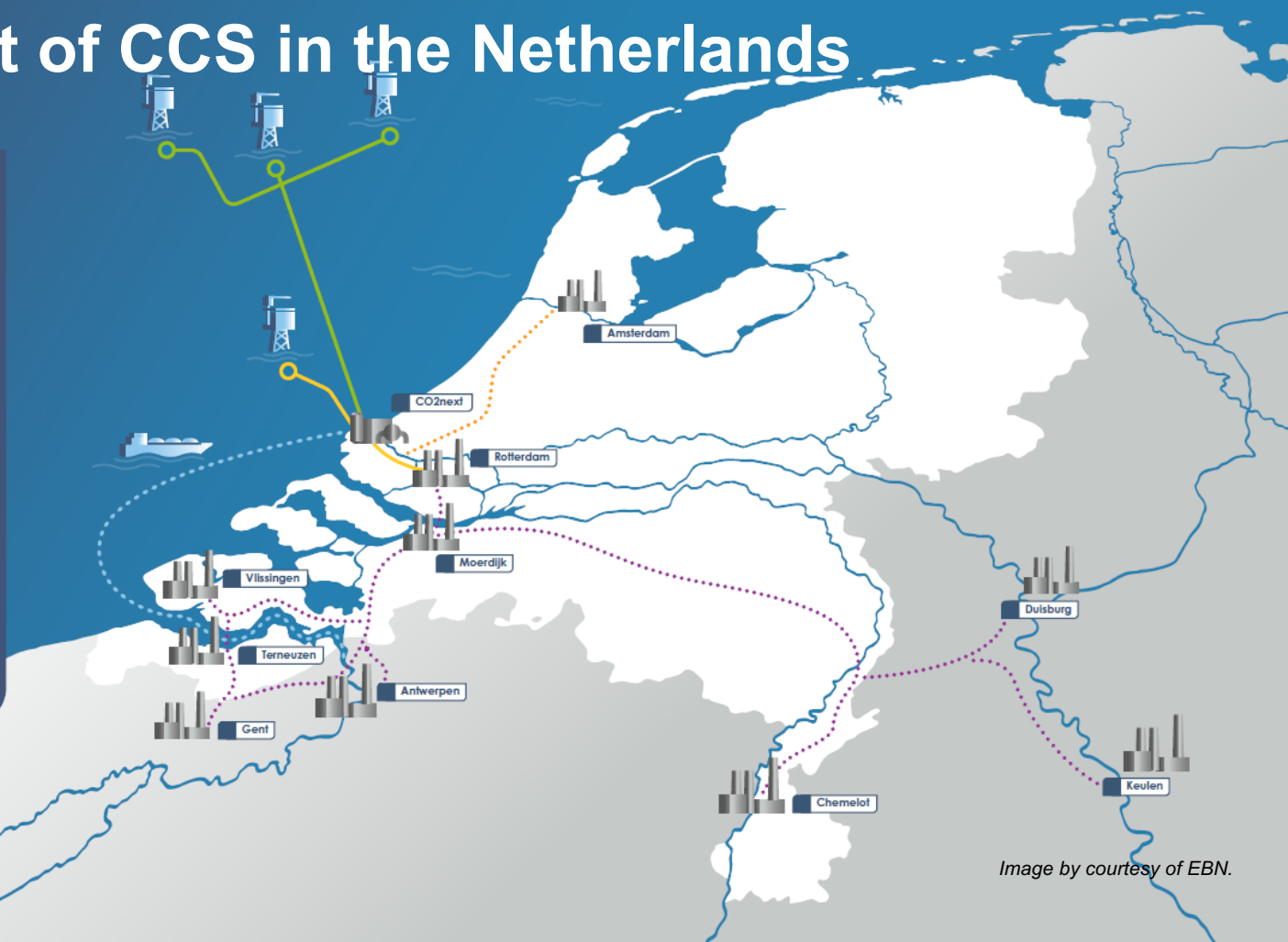


2026

- System operational



Development of CCS in the Netherlands



Thank you for your attention!

For more information, please visit:
www.porthosCO2.nl



The contents of this presentation are the sole responsibility of Porthos and do not necessarily reflect the opinion of the European Union.



Co-financed by the
Connecting Europe Facility
of the European Union



Porthos
CO₂ TRANSPORT & STORAGE