

# Porthos: CO<sub>2</sub> Transport and Offshore Storage

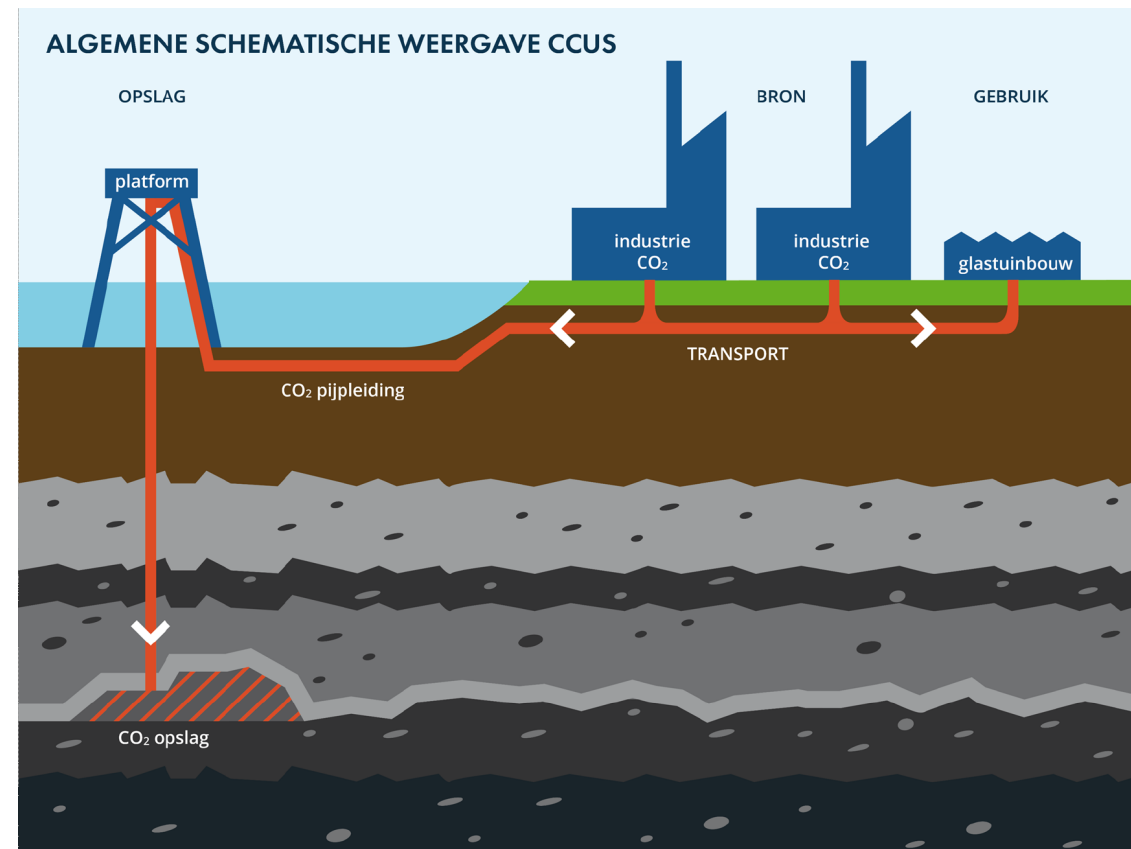
KIVI symposium Future of the North Sea 21 November 2019



Rotterdam **CCUS**  
project Porthos

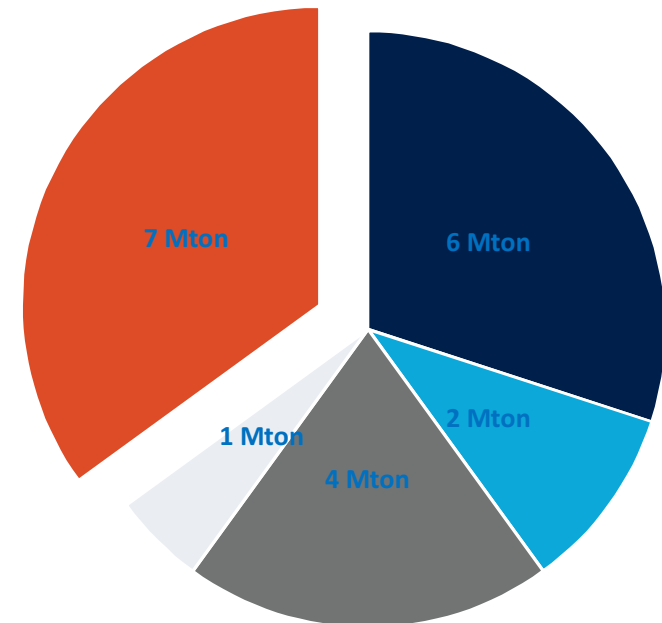
# How does CCUS work in general?

- CCUS consists of four components:
  1. CO<sub>2</sub> is captured at the emissions site
  2. CO<sub>2</sub> is transported either for use or storage
  3. CO<sub>2</sub> is used in industrial processes or greenhouses
  3. CO<sub>2</sub> is permanently stored in geological formations, deep underground



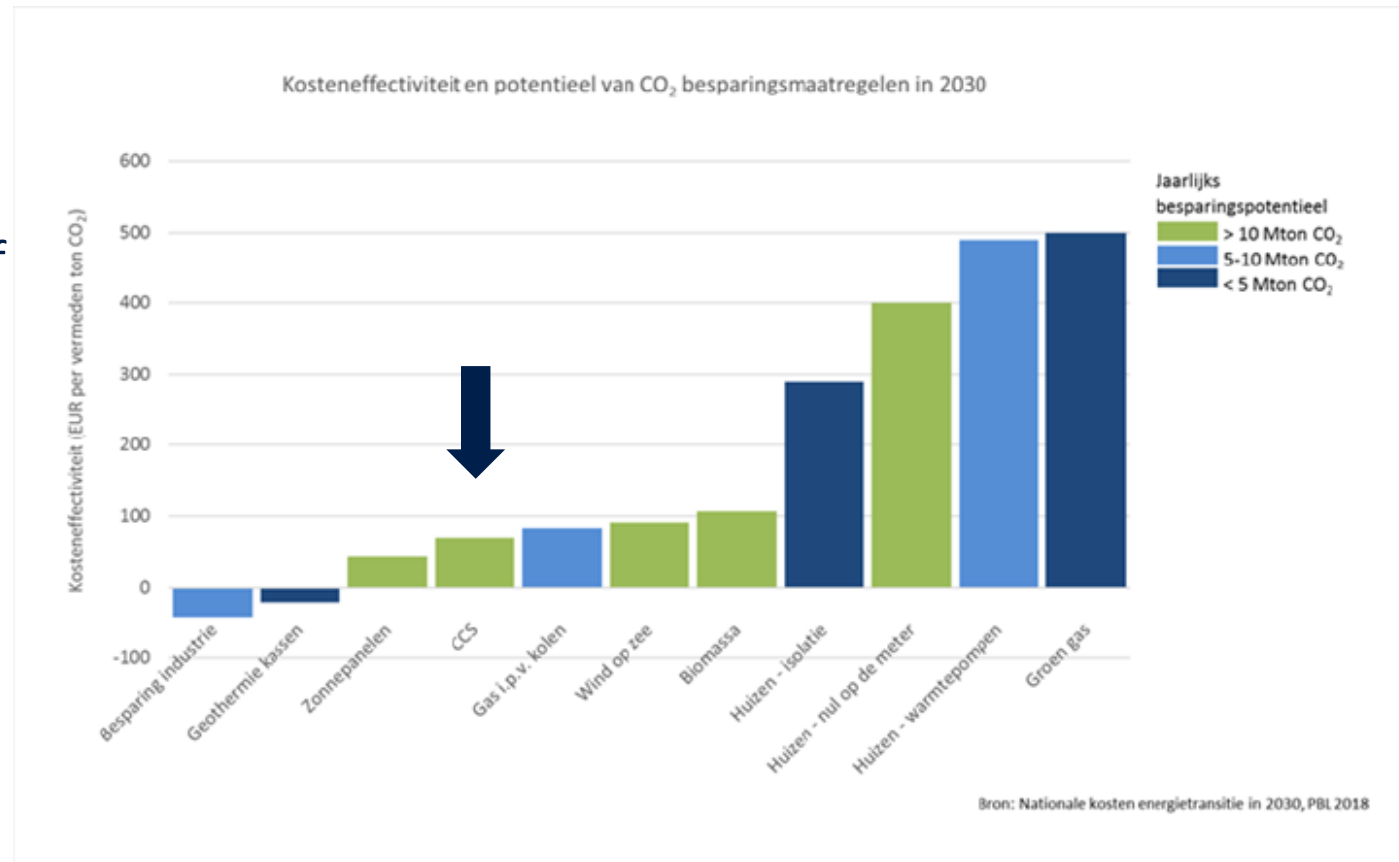
# Situation in the Netherlands

- Climate target Dutch government: 49% reduction CO<sub>2</sub> by 2030
- National Climate Agreement:
  - Industry 14,3 Mton reduction per year, 7,2 Mton CCS = 50%
- But financial support for CCS is restricted by:
  - Ceiling: not more than 7,2 Mton
  - Horizon: no longer than 2035
  - Sieve: only for those industrial processes where there is no alternative



# Why choose CCS?

- CCS has a high potential of large volumes reducing CO<sub>2</sub>
- It can be realized on the short term – crucial in terms of carbon budget
- It is cost effective
- Essential for development of hydrogen market
- Longer term, CO<sub>2</sub> becomes a commodity for industrial use



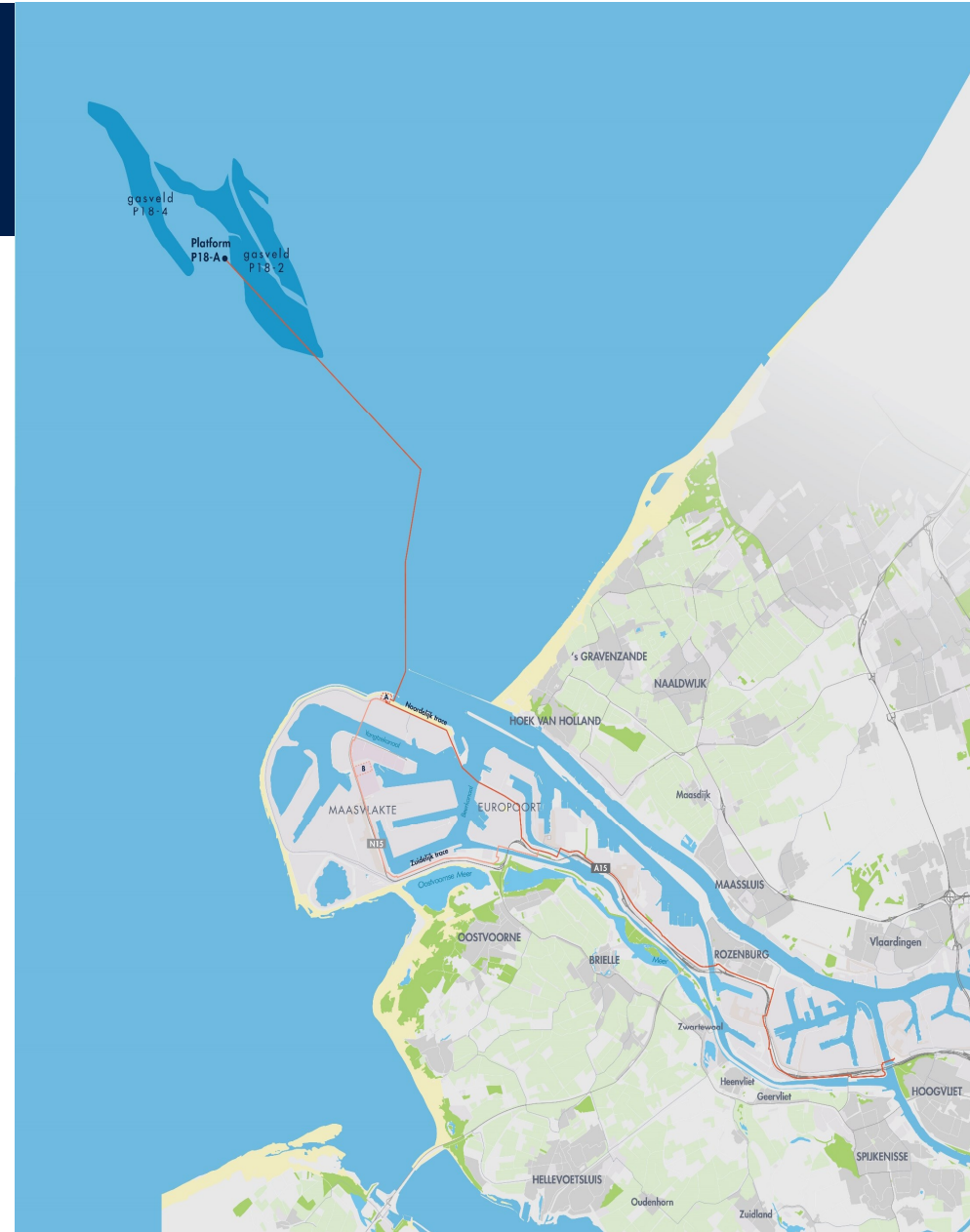
# Rotterdam ideal location

- Port of Rotterdam unique location for CCUS
  - ~ 17% national CO<sub>2</sub> emissions
  - Large industrial cluster
  - Relatively small area
  - Cost effective
  - Storage location offshore
  - Combination with other developments in the port, e.g. hydrogen



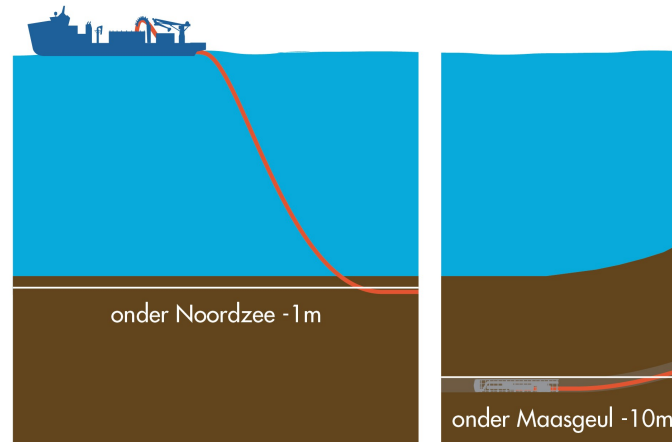
# Rotterdam CCUS Project Porthos

- Open access CO<sub>2</sub> transport and storage network
- Rotterdam as CCUS hub with storage in offshore P18 gas fields
- Initiated by 3 state-owned parties; EBN, Gasunie, Port of Rotterdam.
- Ambition: ready for FID in 2020 and operational in 2023/2024



# Transport: offshore pipeline

- From the Maasvlakte (compressorstation) under the bottom of the North Sea to the P18 fields
- Diameter: maximal 60 cm
- Total length: 21 km
- Capacity fields: 37 Mton
- Maasgeul: drilling
- At sea: pipe laying ship







# Phased Offshore Development

## 1. Phase 1: 2-4 Mton per year:

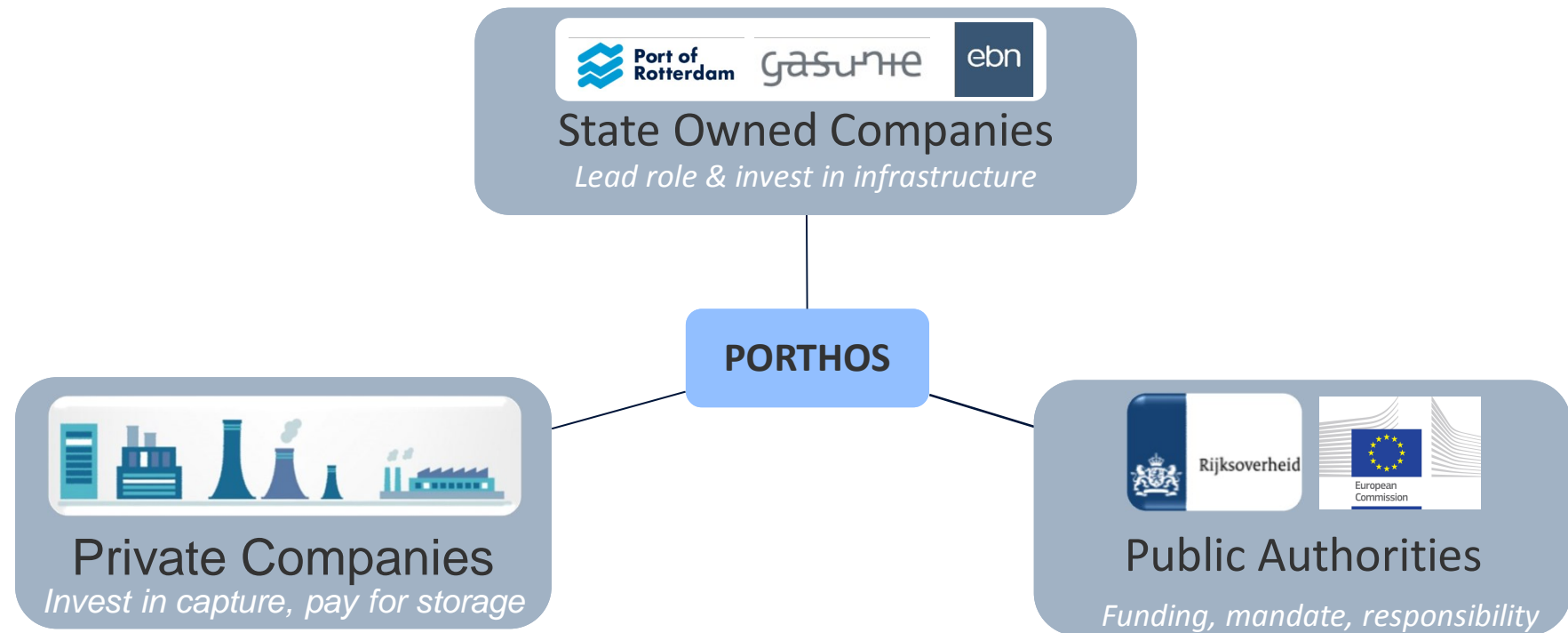
- Near shore
- Pilot project character
- Base for network

## 2. Phase 2: > 4 Mton per year or > 37 Mton stored

- To large and efficient storage capacity
- Use of empty gas pipelines
- Offshore network expansion



# Public private partnership for succesfull CCUS



# Status of the Porthos project

- ✓ CCS included in preliminary Dutch Climate Accord  
subsidy support mechanism (SDE++)
- ✓ PORTHOS finalized Feasibility and Concept Select phases  
started Define Phase (Front End Engineering and Design)
- ✓ Expression of Interest process done  
Industry expressed sufficient interest
- ✓ Started Environmental Impact Assessment (EIA) procedure  
Public consultations in Rotterdam Industrial Area conducted

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Thank you for your attention



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