



▶ **CCS DEVELOPMENTS IN THE NETHERLANDS**

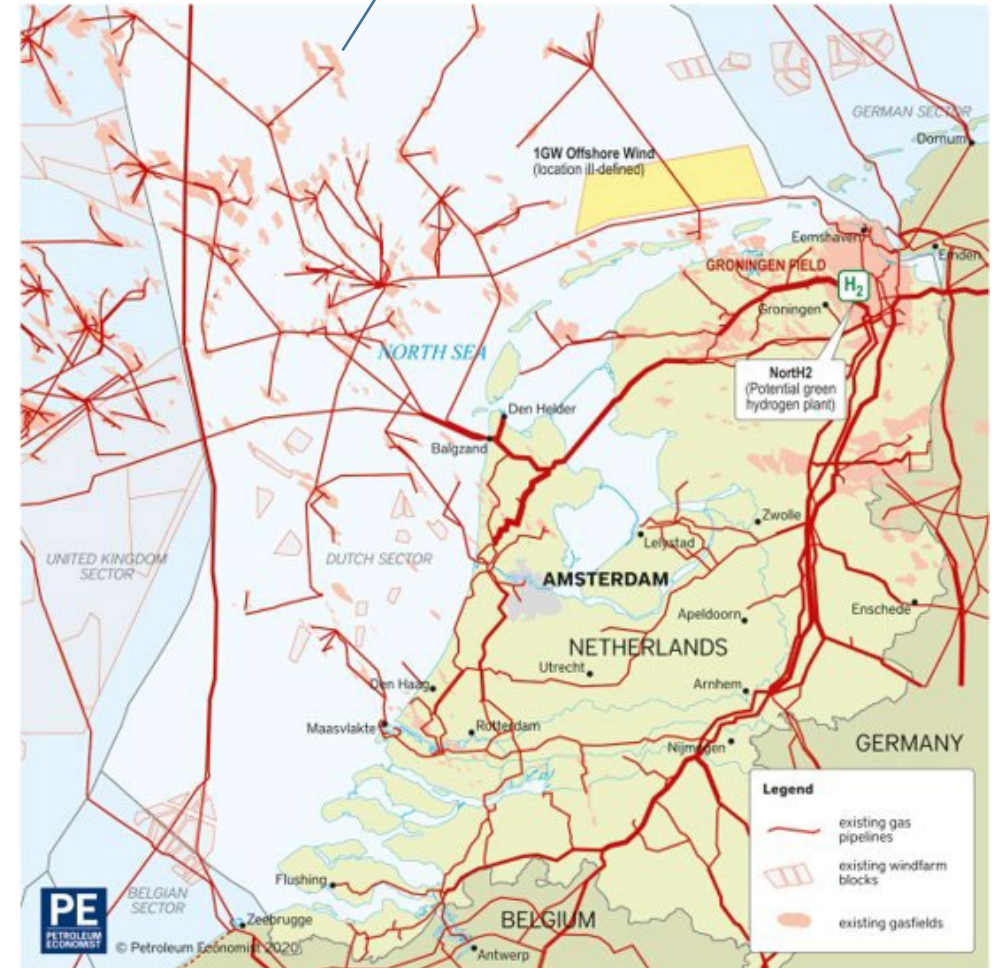
**FILIP NEELE**

**JAPAN CCS FORUM, 15 NOVEMBER 2023**

# CO<sub>2</sub> TRANSPORT AND STORAGE GOALS

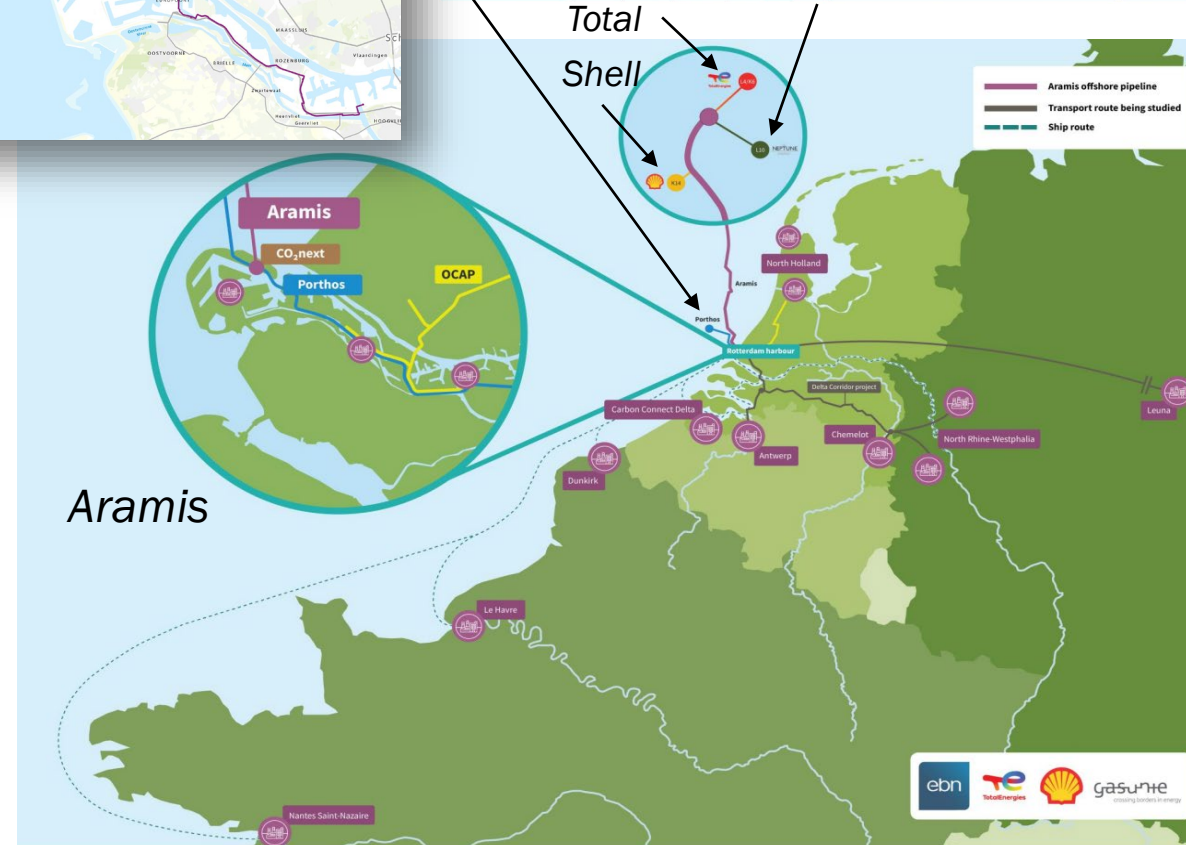
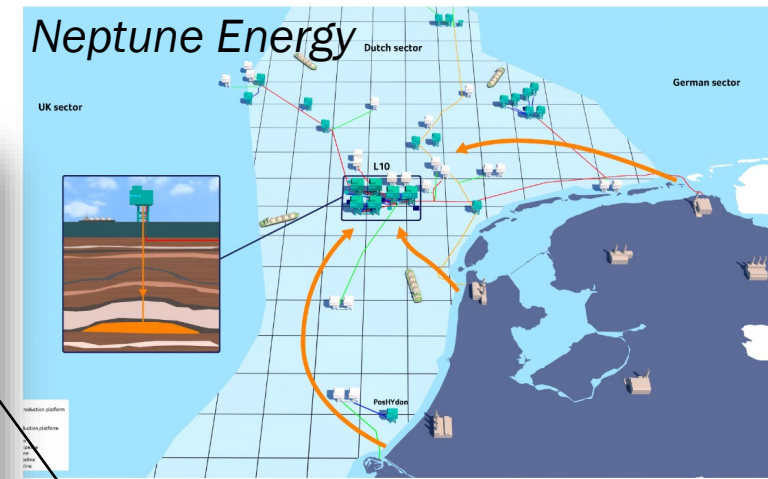
- › CCS: essential technology to meet climate goals
  - › NL government: CCS central role in strategy to meet emission reduction goals in 2030, 2050
  - › Focus on offshore
  - › Focus on depleted fields
  - › Development of CCS projects is market driven
- › Subsidy schemes in place to support policy; examples:
  - › National schemes: contract for difference
  - › EU: Connecting Europe Facility (CEF): provides (partial) funding for construction of transport and/or storage infrastructure
  - › EU: Innovation Fund (IF): funding for construction and operation of CCS projects

~1600 Mt storage capacity in offshore depleted fields



# CO<sub>2</sub> TRANSPORT AND STORAGE DEVELOPMENTS IN NL

- › Currently ongoing: phase 1 of several projects
  - › **Porthos** project (FID taken October 2023)
    - P18 gas field cluster (~40 Mt, **2.5 Mtpa**)
  - › **Aramis** project = Shell, TotalEnergies, EBN, Gasunie
    - Trunkline Rotterdam – K,L blocks: **22 Mtpa**
    - Shell: K14-FA (47 Mt, **2.5 Mtpa**)
    - TotalEnergies: L4-A, K6-CA (40 Mt, **2.5 Mtpa**)
    - CO<sub>2</sub>Next collection hub + ship terminal Rotterdam
  - › **Neptune Energy**
    - L10 fields (120-150 Mt, **5 Mtpa**)
  - › WintershalIDEA CMS
    - Q1B, P6 (~60-70 Mt, ? Mtpa)



# CO<sub>2</sub> TRANSPORT AND STORAGE

## CURRENT PROJECTS: PCI/PMI CANDIDATES

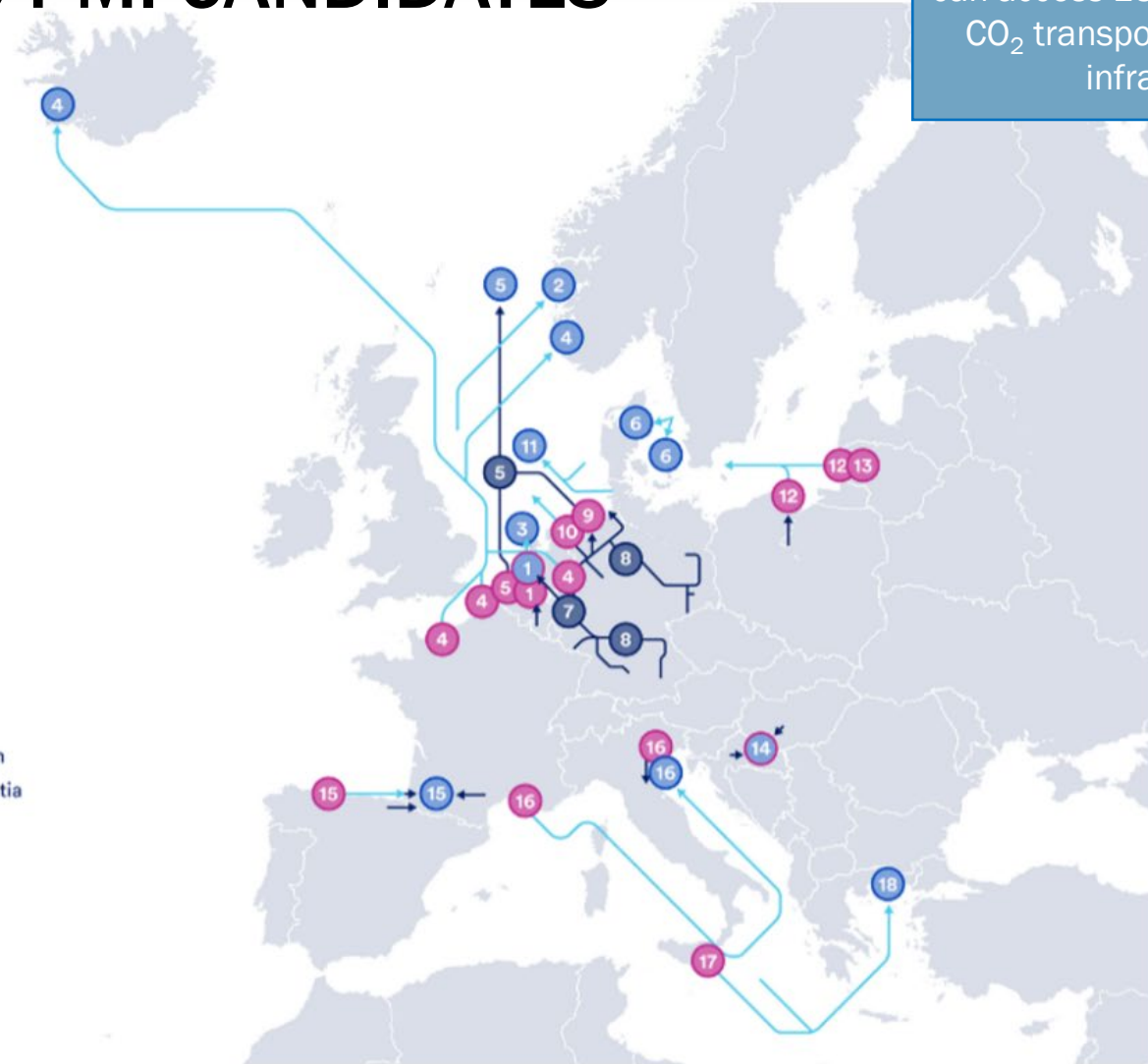
PCI: Project of Common Interest  
 PMI: Project of Mutual Interest

Projects with PCI and PMI status can access EU funding to develop CO<sub>2</sub> transport and/or storage infrastructure

### Carbon Capture, Removal, Transport and Storage in Europe

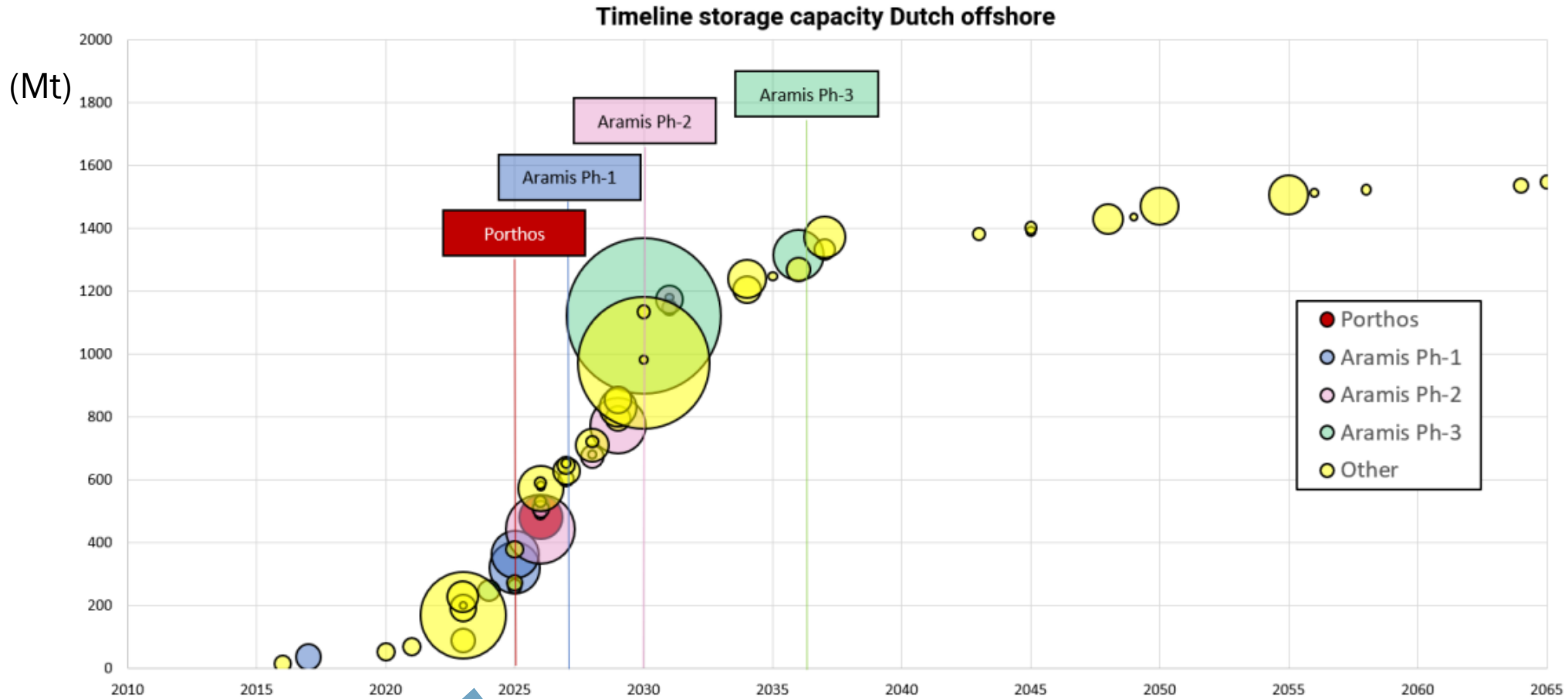
- Emitter Hub and/or CO<sub>2</sub> Export Terminal
- Pipeline Project
- Geological CO<sub>2</sub> Storage and/or Import Terminal
- Co-Located Emitters and Storage
- Ship Transport of CO<sub>2</sub>
- Pipeline Transport of CO<sub>2</sub>

- |                                 |                                    |
|---------------------------------|------------------------------------|
| 1. CO <sub>2</sub> TransPorts   | 10. Noordkaap                      |
| 2. N-LITES                      | 11. Bifrost                        |
| 3. Aramis                       | 12. ECO <sub>2</sub> CEE           |
| 4. Nautilus                     | 13. CCS Baltic Consortium          |
| 5. EU2NSEA                      | 14. Geothermal CCS Croatia         |
| 6. Norne                        | 15. Pycasso                        |
| 7. Delta Rhyne Corridor         | 16. Callisto                       |
| 8. German Carbon Transport Grid | 17. Augusta C <sub>2</sub>         |
| 9. WH2V (eNG Hub phase 1)       | 18. Prinos CO <sub>2</sub> Storage |



# CO<sub>2</sub> STORAGE IN THE NETHERLANDS

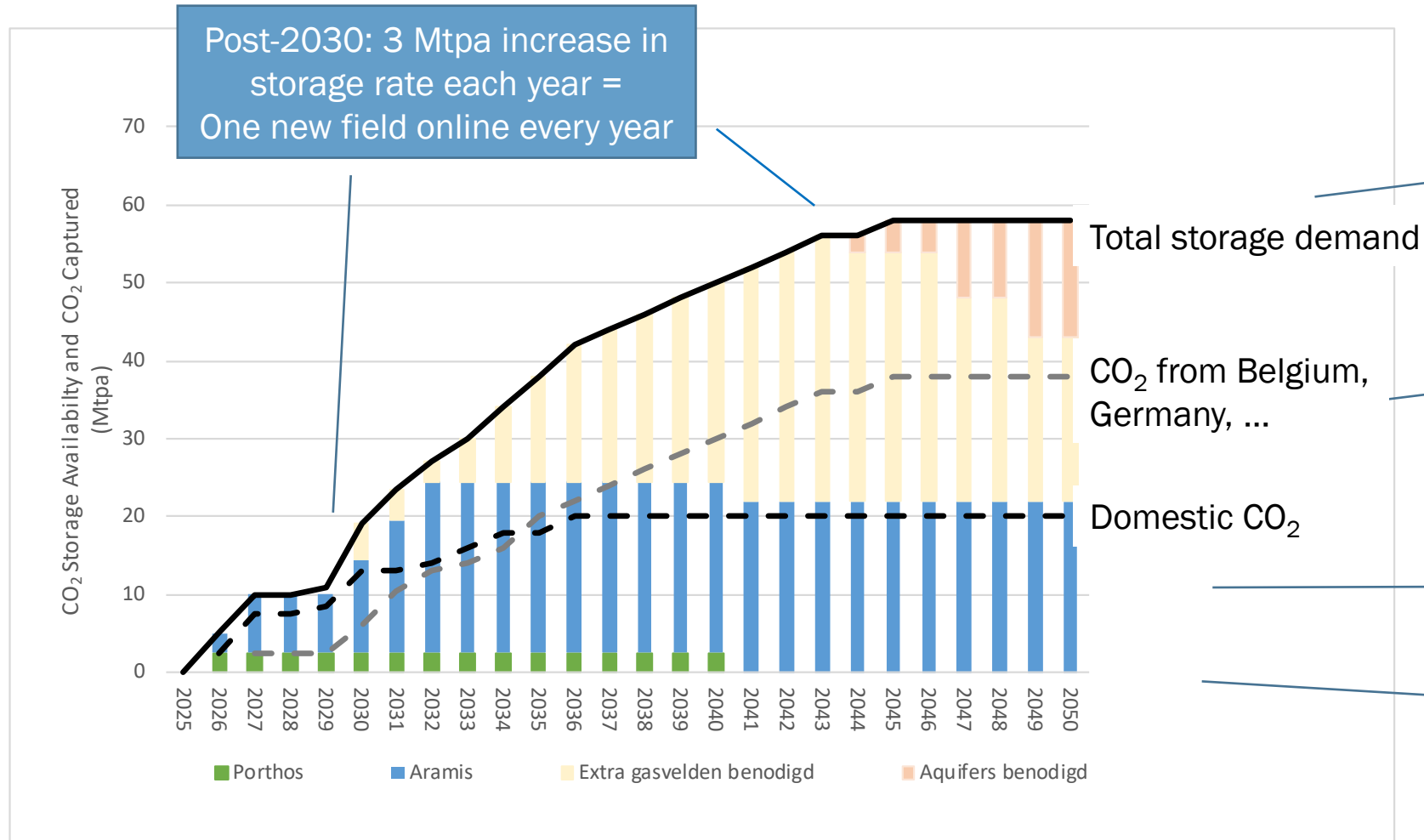
## STORAGE CAPACITY AVAILABLE IN DEPLETED FIELDS



Today

# CO<sub>2</sub> STORAGE IN THE NETHERLANDS

## EXPECTED DEMAND FOR STORAGE CAPACITY



Orange: storage in aquifers (post 2040, need time to develop)

Yellow: 'additional' depleted fields developed for storage

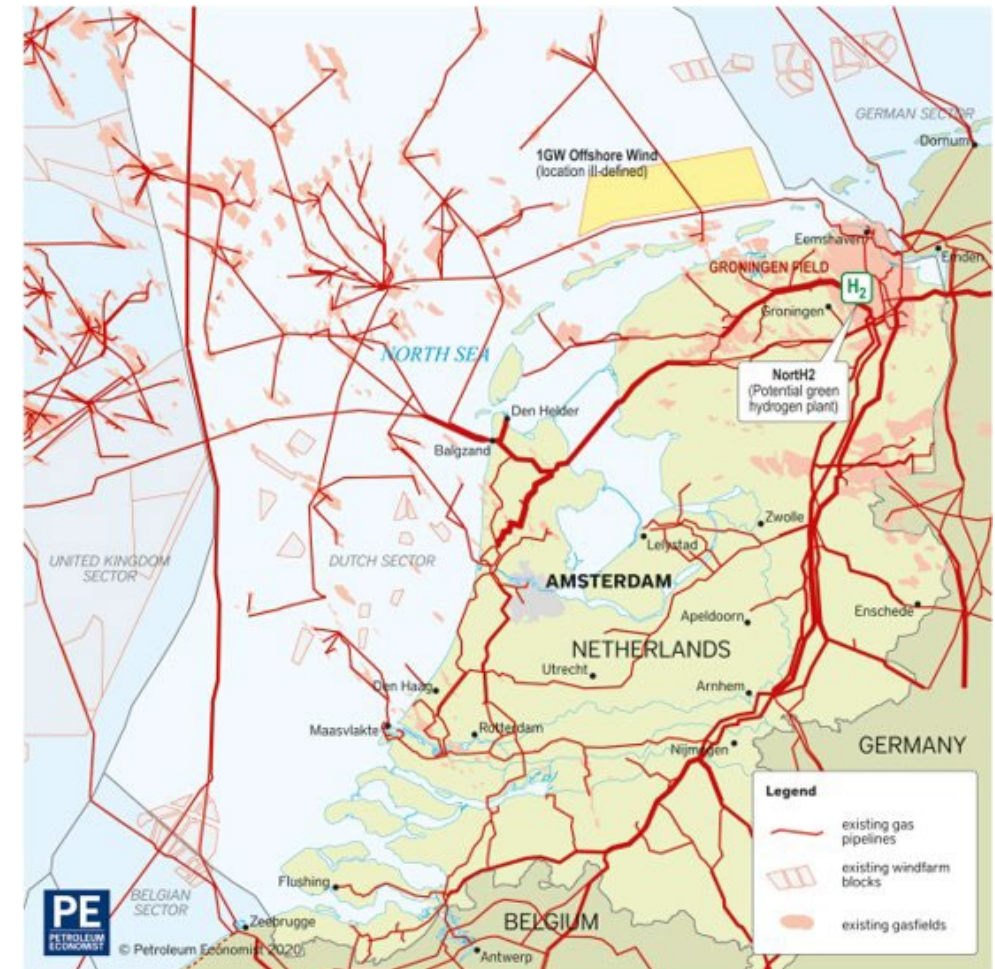
Blue: Aramis (Shell, TotalEnergies, Neptune), 22 Mtpa

Green: Porthos (~40 Mt, 2026 - 2041, then full and closes)

Report on negative emissions (in Dutch)

# › CO<sub>2</sub> STORAGE IN THE NETHERLANDS WRAP UP

- › Several transport and storage projects in development
  - › First project now past FID and constructing
  - › Start first operations 2026
- › Several projects ongoing by 2030
  - › Storage rates close to 10 Mtpa
  - › Several suppliers, close to 10 wells
- › Significant task ahead, post 2030
  - › ~3 Mtpa increase in supply and storage rate, or
  - › 1 new depleted field online for storage each year
- › Industry and governments to develop best practices
  - › Speed up licensing
  - › Remove remaining uncertainties



*Current gas network  
Future CCS network complexity?*



› **THANK YOU FOR  
YOUR TIME**

**TNO** innovation  
for life