# Greensand $CO_2$ transport & storage project

Biogas Danmark Konference 2021

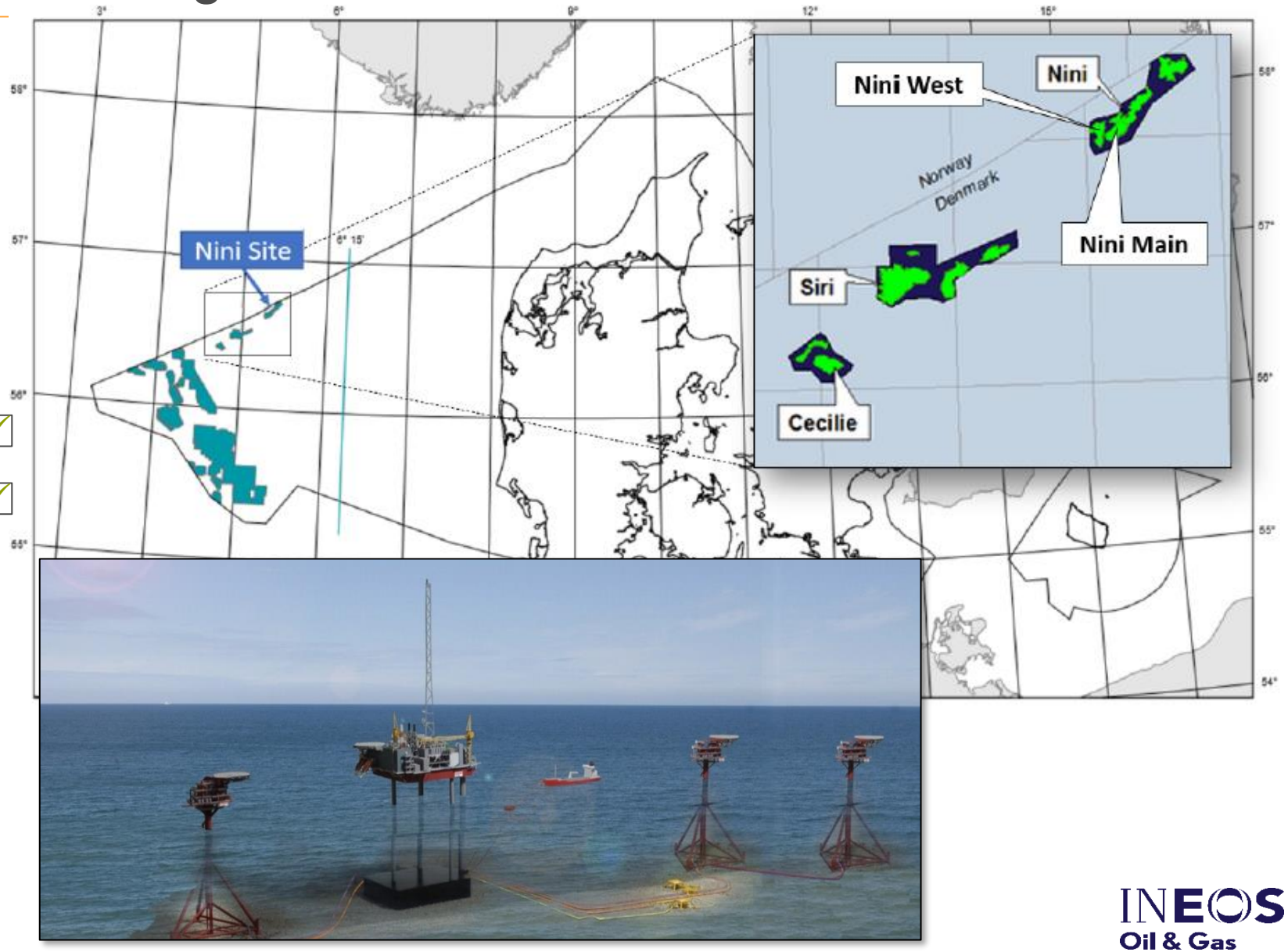
**08-12-2021**

Søren Reinhold Poulsen, Greensand Project Director

INEOS Oil & Gas

# Greensand Project – Safe, Reliable and Cost efficient $CO_2$ storage offshore in the Siri Fairway depleted oil and gas resevoirs

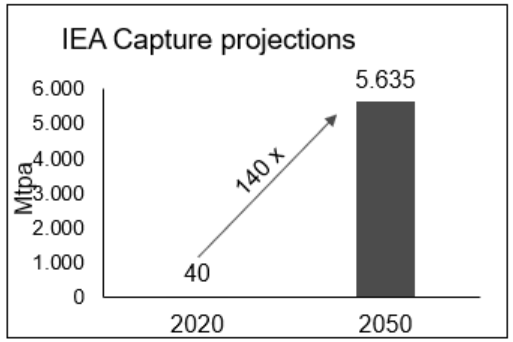
- Proven containment with very very low risk of leakage
- Use of existing infrastructure
- Build on extensive operational and subsurface experience
- Project phases:
  - Phase 0 Business Screening ✓
  - Phase 1 Injection Feasibility ✓
  - Phase 2 Pilot Project
  - Phase 3 Full Scale Project
  - Siri Area Expansion projects






INEOS Oil & Gas

# CCS projects underway in NWE
# Greensand CCS Project in the front seat – timing & capacity




The Energy Technology and Demonstration Programme

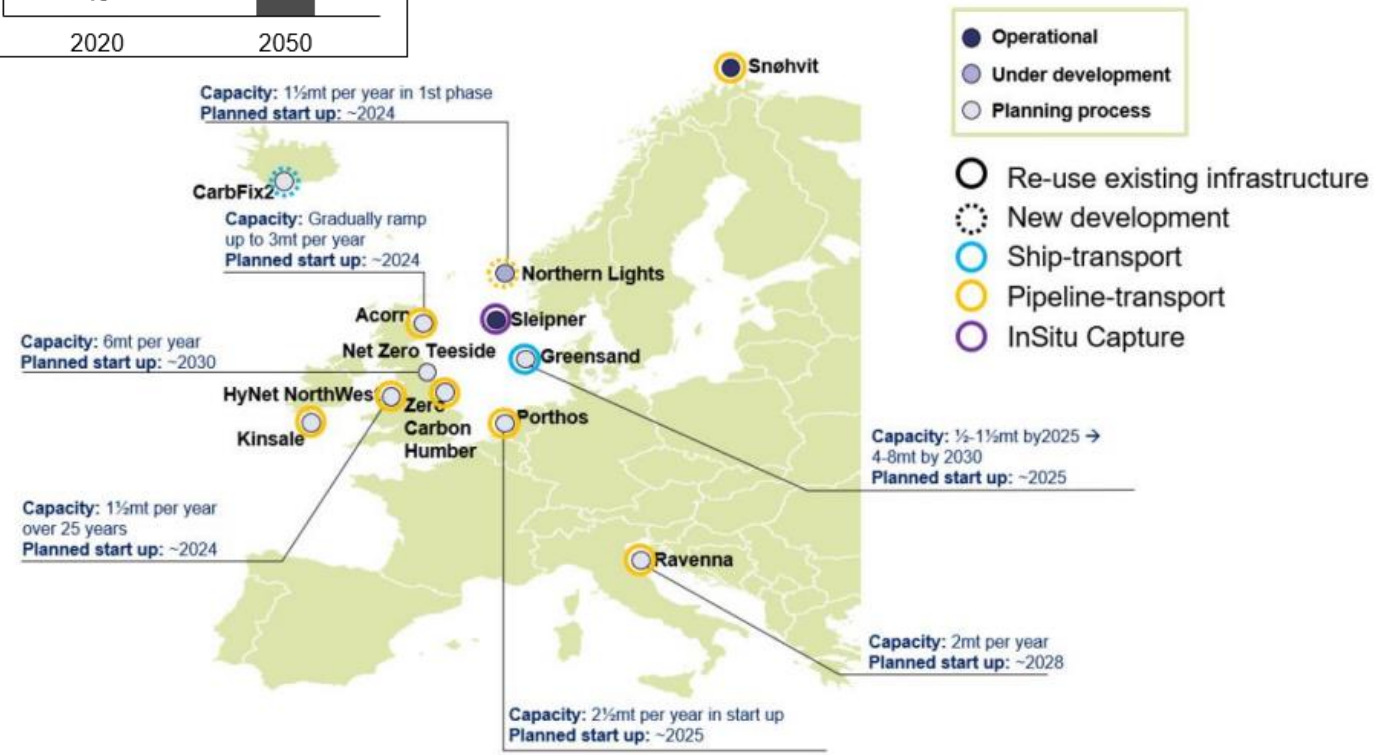
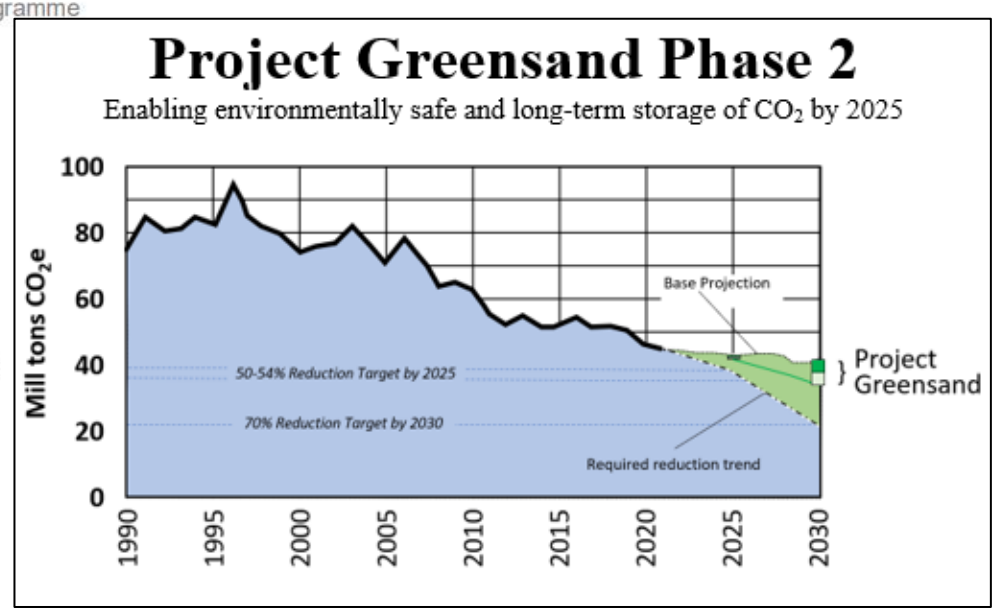



*Figure 9: Overview of the operational, developing and planned $CO_2$ storage projects in Europe.*




Greensand is expected to be able to cover 40% of the Danish $CO_{2e}$ reduction goal in 2030

- 0.5 – 1.5 MTPA by 2025
- Up to 8 MTPA by 2030

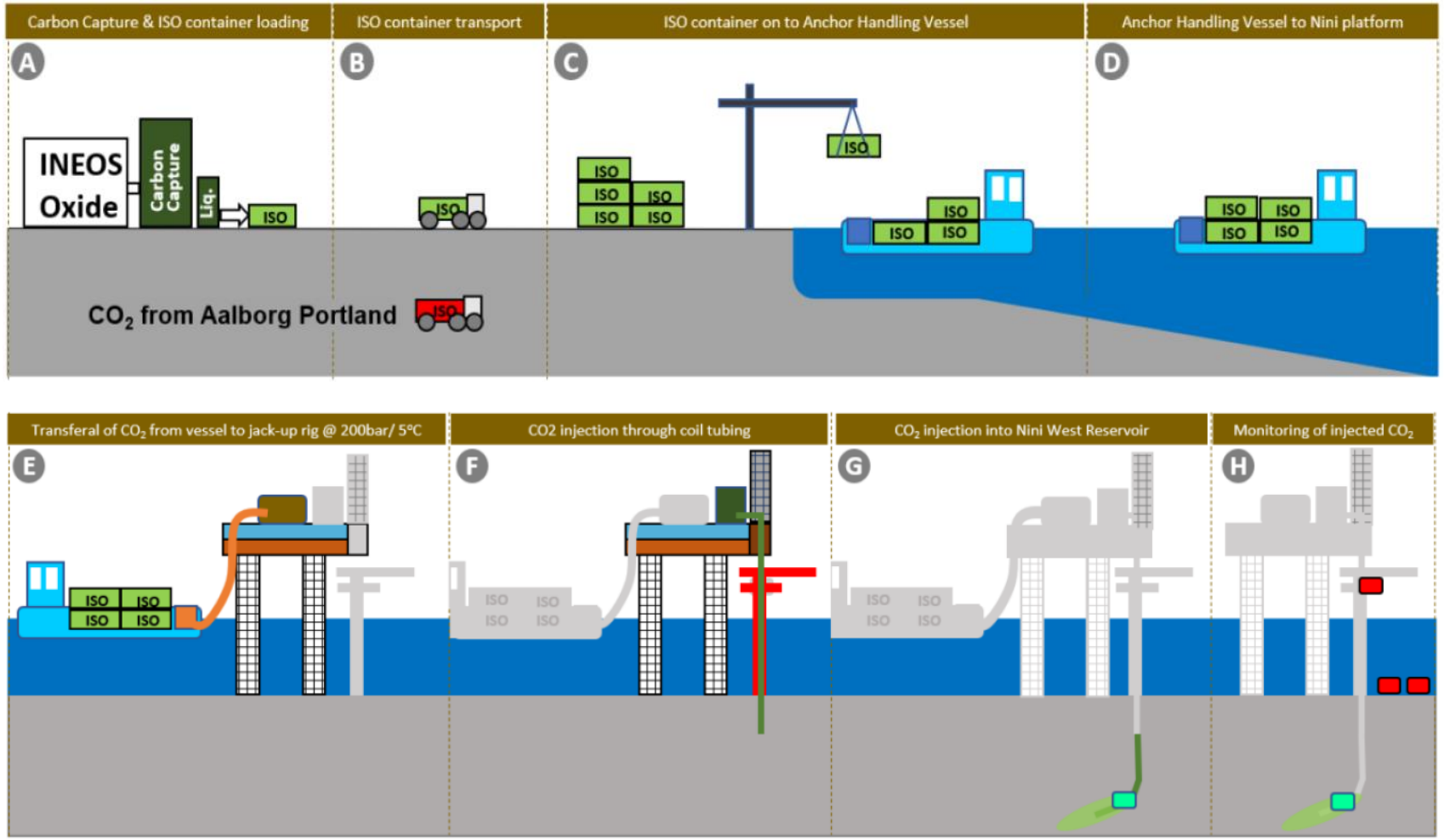
Scalable to match demand



INEOS Oil & Gas

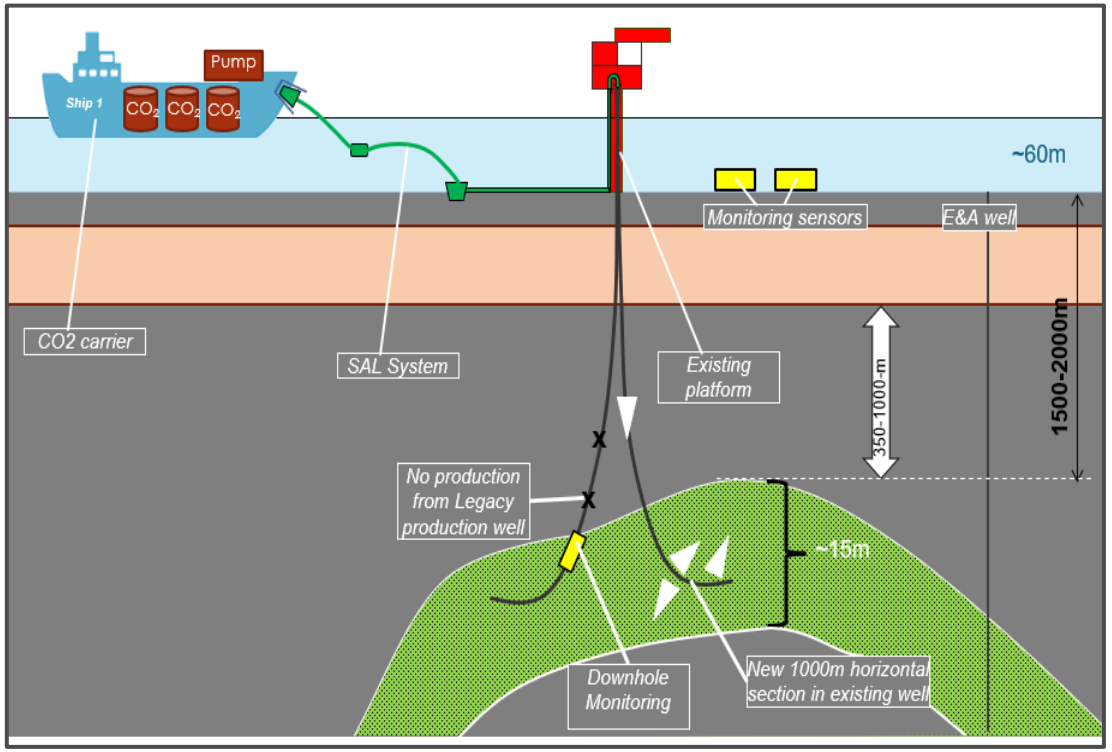
# Greensand Phase 2
# $CO_2$ Offshore Injection Pilot Project

## $CO_2$ transported using PSV and injected in existing Nini well via Coil Tubing




- 27 Consortium Partners in addition to Nini JV partners: INEOS Energy and Wintershall DEA

# Greensand Phase 3
# 0.5 to 1.5 MTPA Full Scale Project

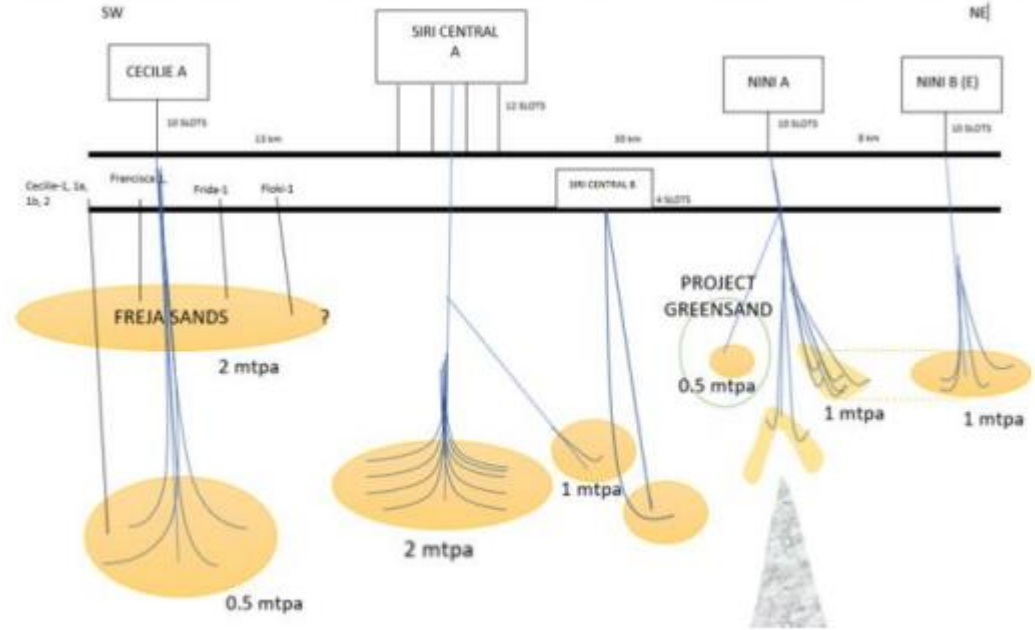



- Storage of 0.5 – 1.5 MTPA $CO_2$ in Nini West/Main reservoirs
- FID / Project Sanction in 2023
- Injection starts in 2025 / 2026
- Sources of liquified $CO_2$
  - DK Emitters
    - Point sources (Waste incineration, Biomass, Cement, Refinery, etc.)
    - Cluster sources (Biogas, small emitters, etc.)
  - EU Emitters
- New dedicated $CO_2$ Injection wells
- Transport of liquified $CO_2$ from onshore $CO_2$ sources to Nini using a number of new build $CO_2$ carrier ships
- Injection performed directly from ships equipped with $CO_2$ discharge & injection equipment (heating & pumping) through a SAL system at Nini

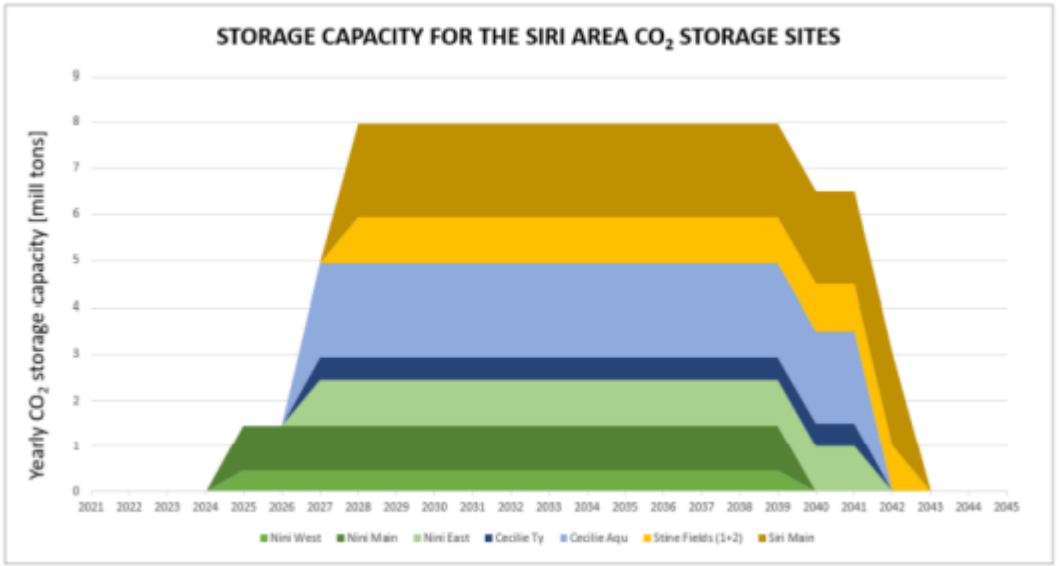


INEOS Oil & Gas

# Greensand beyond Phase 3
# Siri Fairway Project Expansion Project

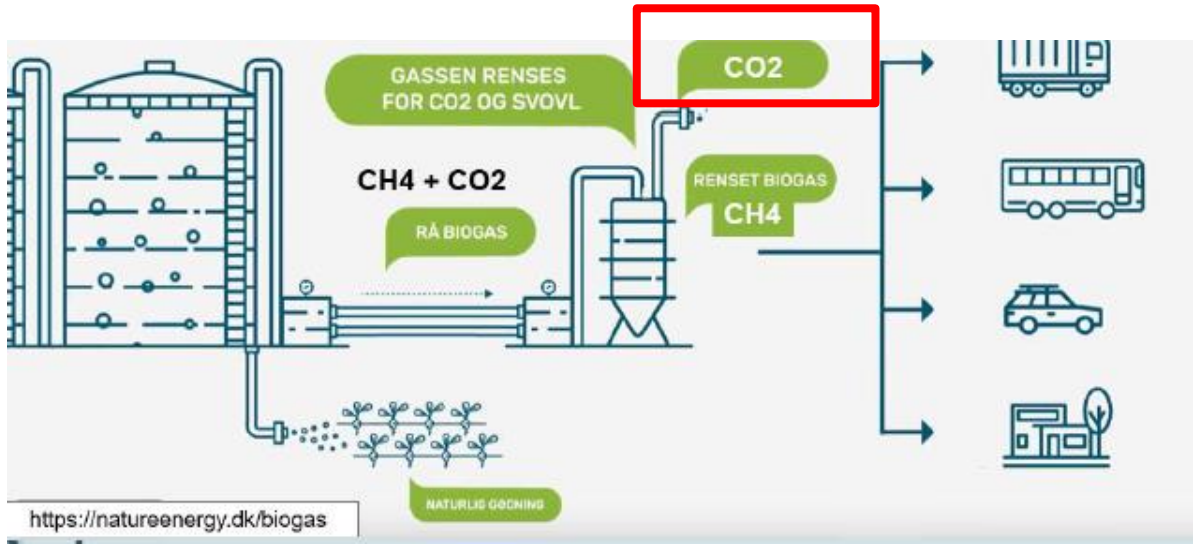


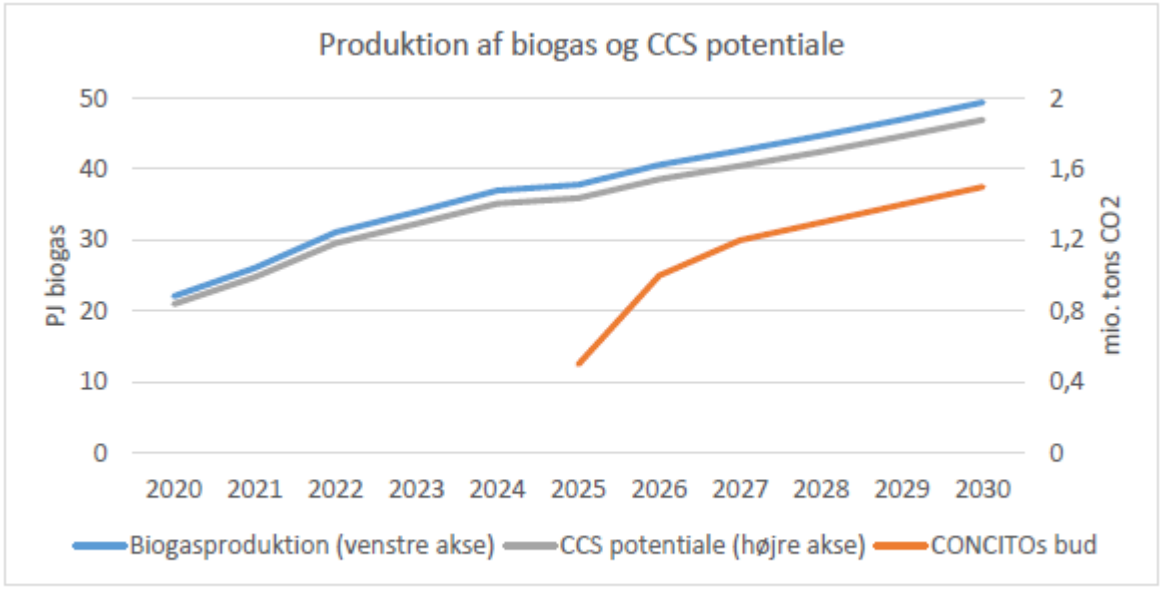

| | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | Storage Capacity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase 1 | | | | | | | | | | | | |
| Phase 2 - Pilot (Nini West) | | | | | | | | | | | | |
| - Offshore injection period | | | | | | | | | | | | |
| Full Scale (Nini West/Main) | | | | | | | Start Storage | | | | | Up to 1.5 MTPA |
| Siri Fairway Expansion Project | | | | | | | | | | | | Up to 8 MTPA |



# Biogas originated CO2 captured – significant potential to deliver negative emissions to meet the Danish GHG emission reduction ambitions

- Potential of delivering 0.5 MTPA captured CO2 from 2025
- Government backing now in place to support creation of negative emissions value chain
- Good match to the Greensand timeline and storage capacity
- 2030 potential of 1.5 MTPA : Multiple usage




*Figur 8: Produktion af biogas og potentialet for CCS. Kilde: KF21 og egne beregninger*

CONCITO
DANMARKS GRØNNE TÆNKETANK

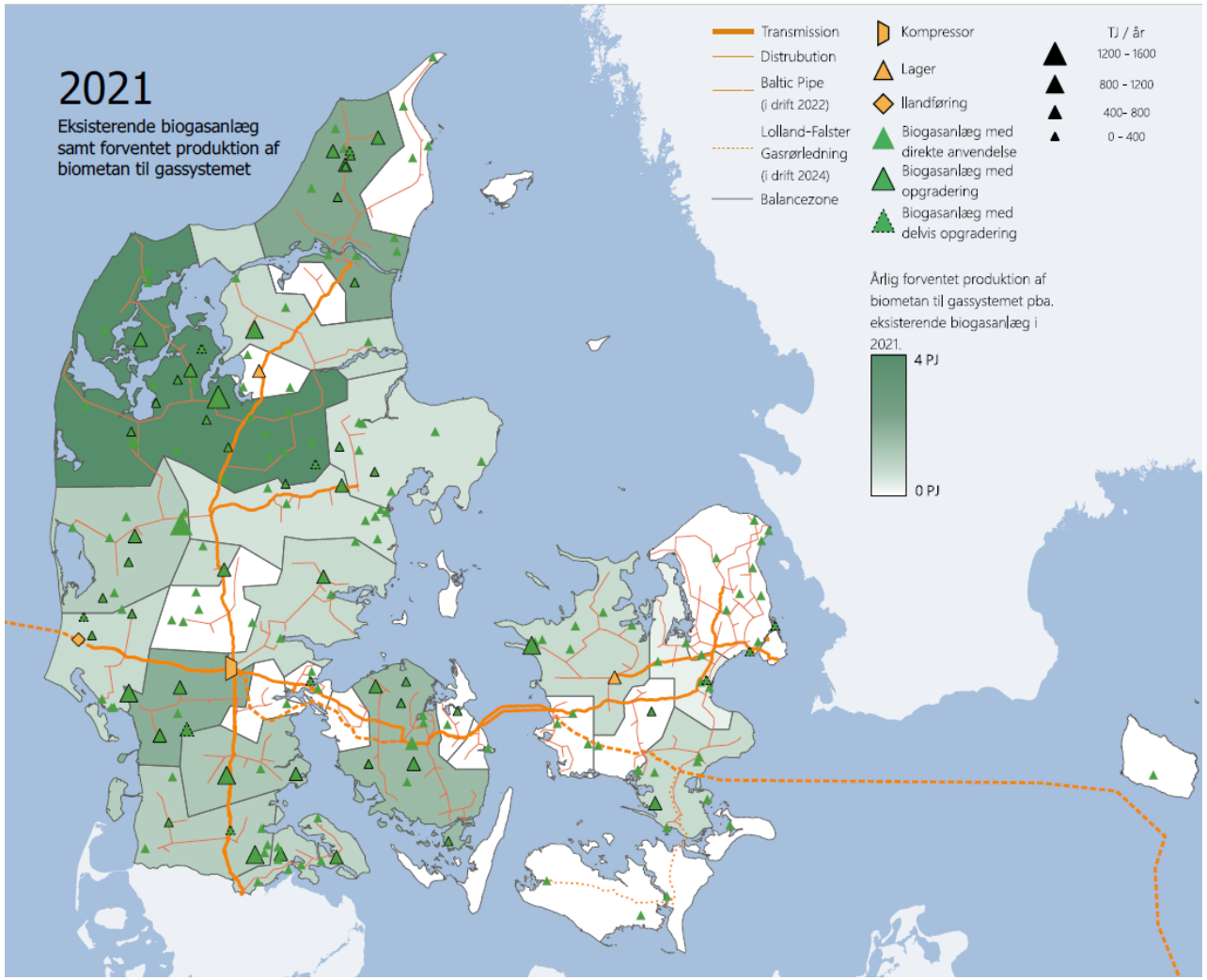
Notat: Det bæredygtige potentiale for $CO_2$-fangst og lagring

*Af Karsten Capion og Tobias Johan Sørensen, oktober 2021*

INEOS Oil & Gas

# Biogas $CO_2$ captured – to become part of value chain to support GHG emission reductions

- Capture $CO_2$ locally and cluster up
  - Share infrastructure cost
  - Grid advantages
  - Public acceptance
- Gather liquified $CO_2$ for temporary storage and conditioning at regional and strategically positioned locations (hubs)
  - Economies of scale
  - Local job creation and access to human resources
  - Export/Import optionality
- Create “One Stop Shop” $CO_2$ hubs as part of:
  - CCS value chain
  - CCU value chain
  - Deliver $CO_2$ for other consumption needs




Source: [Dansk produktion af biogas | Energistyrelsen (ens.dk)]



INEOS Oil & Gas

# Greensand CO2 transport & storage project

Biogas Danmark Konference 2021

## Thank you for your attention

INEOS Oil & Gas