



# Unlocking potential of the North Sea

Dutch Exploration Day 2023  
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Scientific lead North Sea Energy

North Sea Energy 2023-2025 - Adaptive and inclusive design for North Sea  
offshore energy  
hubs

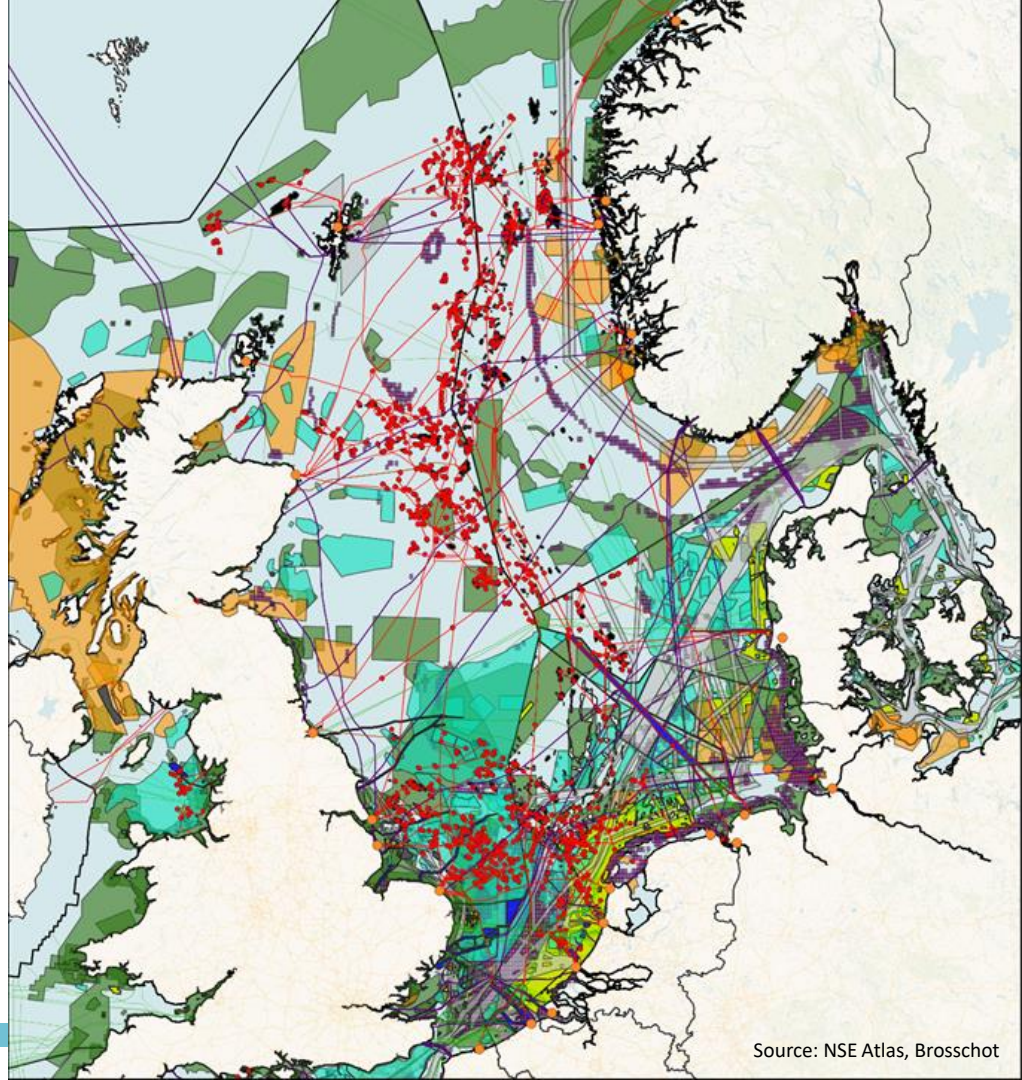
# North Sea Energy

offshore  
system  
integration

North Sea Energy Atlas and Multi-use of  
Offshore Space

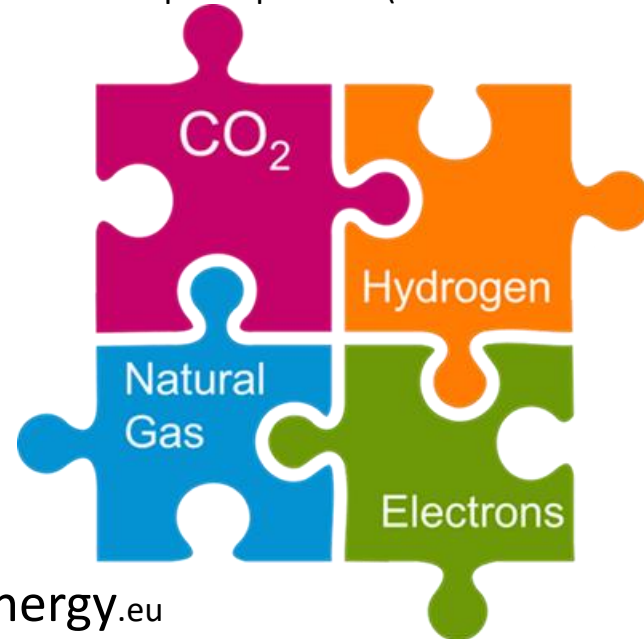
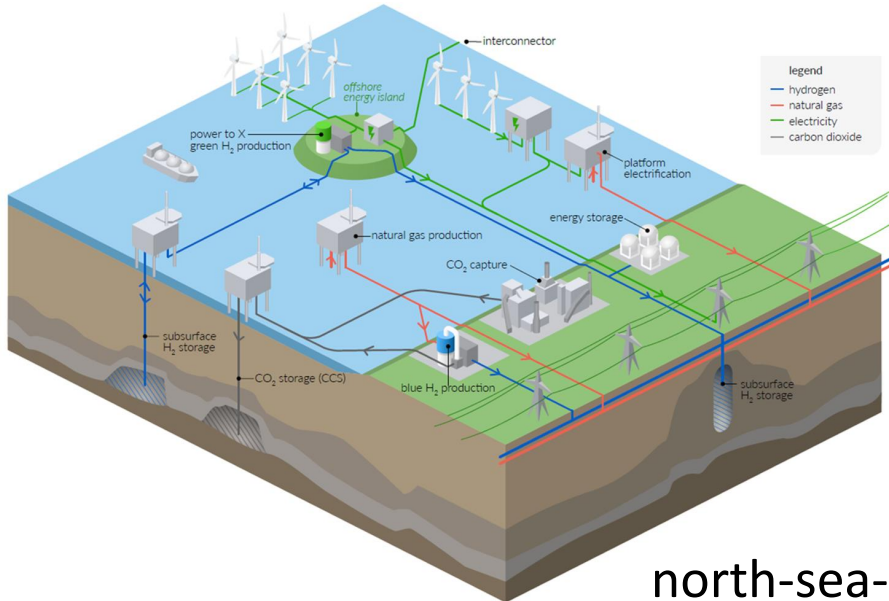
# Energy transition on and around the North Sea

- Safe and reliable
- Clean
- Affordable
- Fast
- Many stakeholders
- Calls for Integrated approach



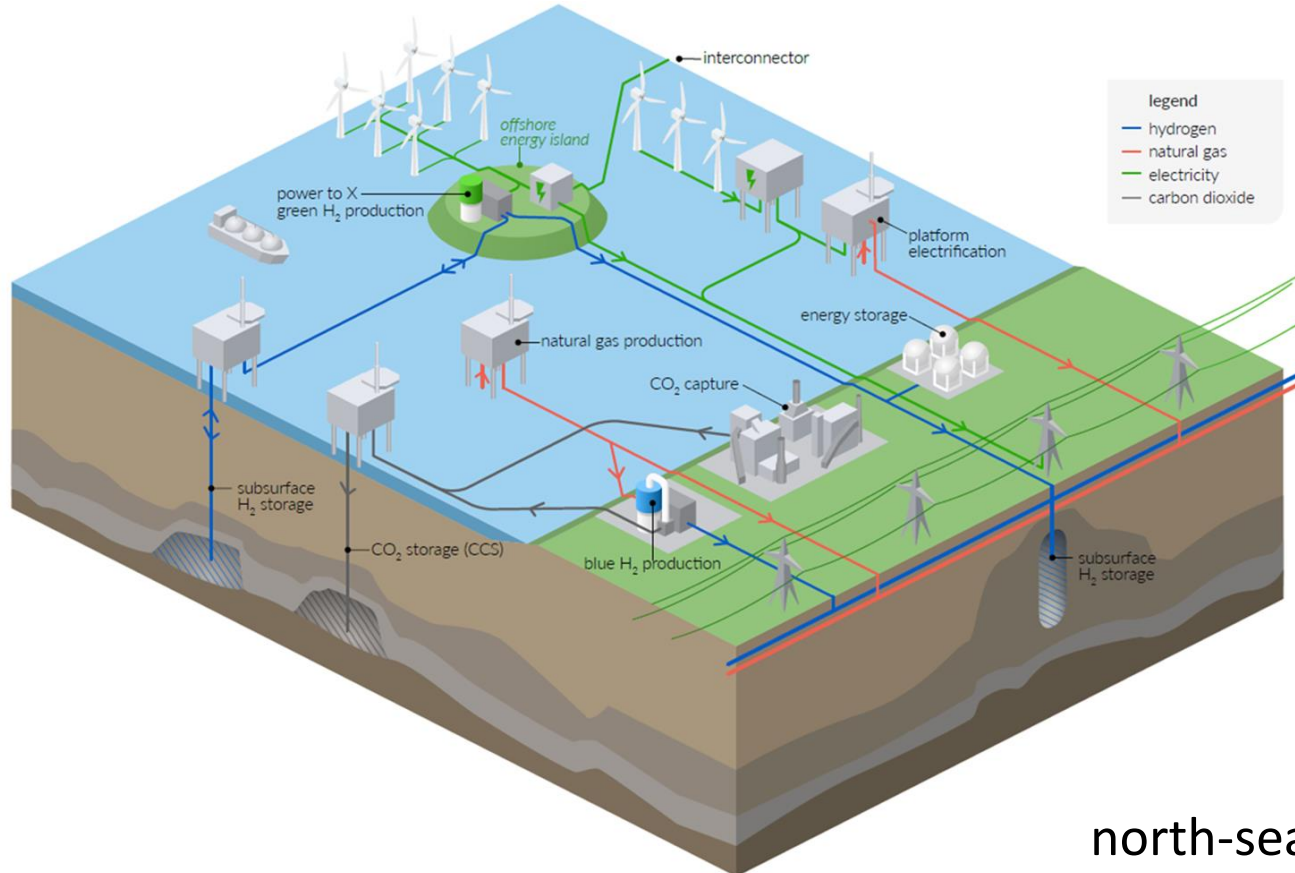
# North Sea Energy Program

- Innovation Program to develop new concepts for offshore system integration
- Smart offshore connections will save society costs, time, space, ecological impacts and CO<sub>2</sub> emissions.
- Use the potential of the North Sea as a pioneer region for Europe.
- Initiates pilots and projects to test and demonstrate innovative concepts in practice (such as PosHYdon).

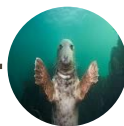




# System integration North Sea



# Our North Sea



Nature



Safety



Livelihood



Recreation



Energy



# Our North Sea Energy atlas

## Public access to objective information

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Energy hubs ▾

Make your own map



### An interactive atlas of the North Sea

The North Sea is spatially dominated by either offshore economic activities or reserved areas. A large variety of offshore activities have their claim on the North Sea domain, like fishery, offshore wind energy and offshore hydrocarbon production. Large shipping routes cross through the area and there is always a delicate balance with reserved areas for environmental protection or safety (defence area).

### Suggested themes



Energy



# North Sea Energy

offshore  
system  
integration

Example 1

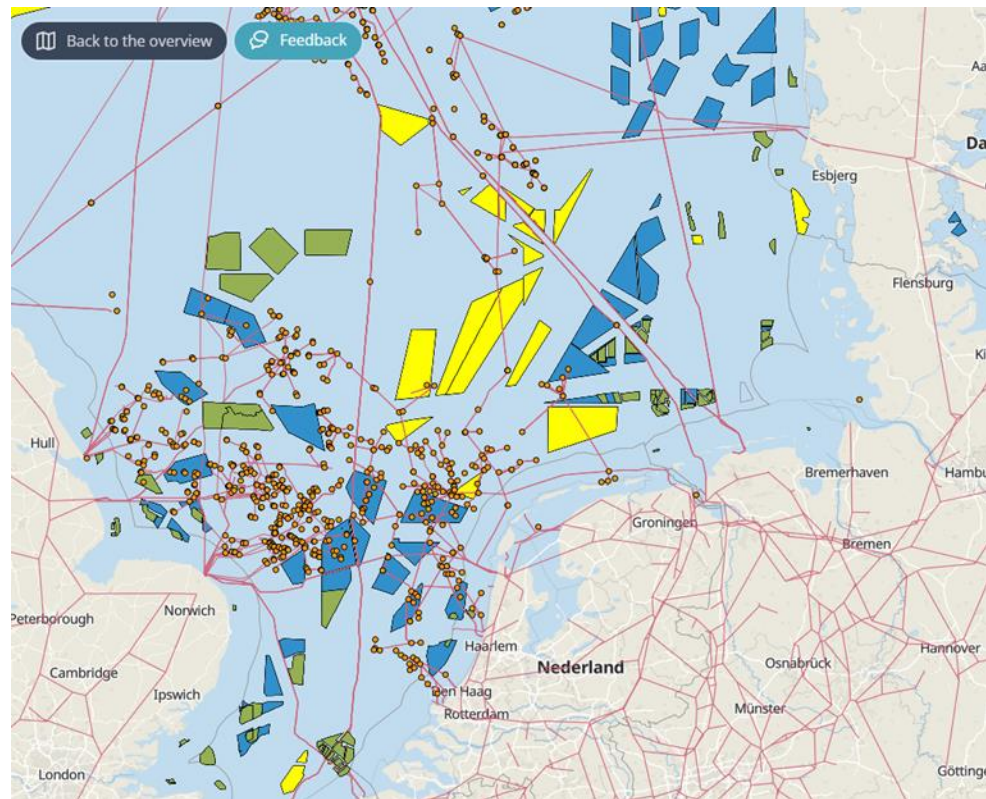
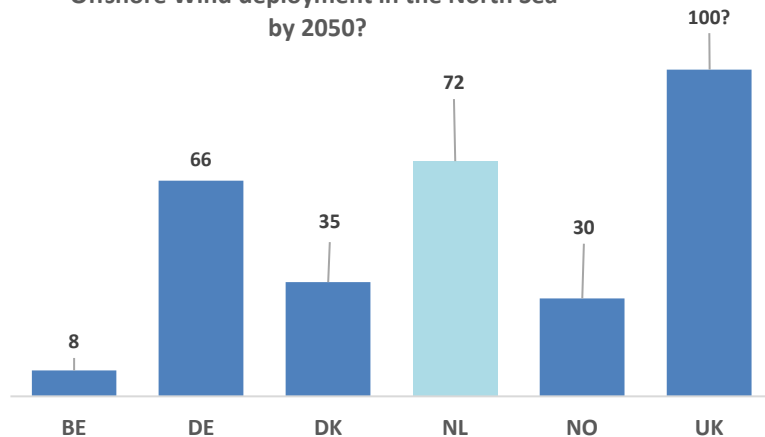


# Offshore wind in the Netherlands

## Vast potential and pivotal to reach Paris targets.

- 2023: 4.5 GW installed
- 2030: 21 GW installed
- 2040: 50 GW installed
- 2050: ~70 GW total capacity

Offshore Wind deployment in the North Sea by 2050?

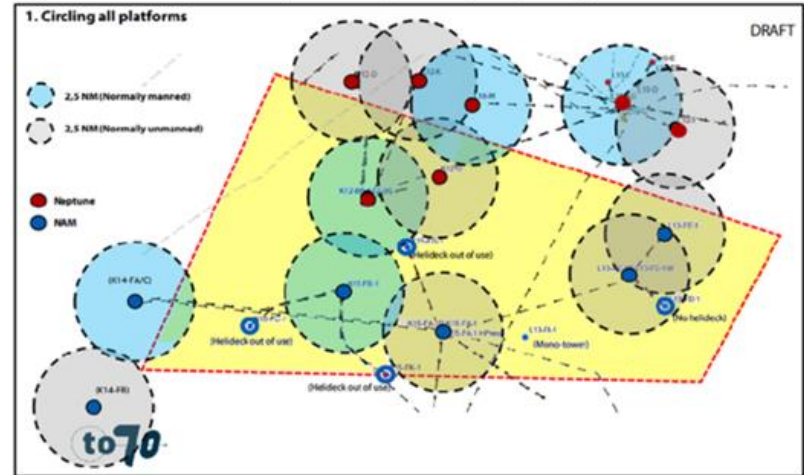
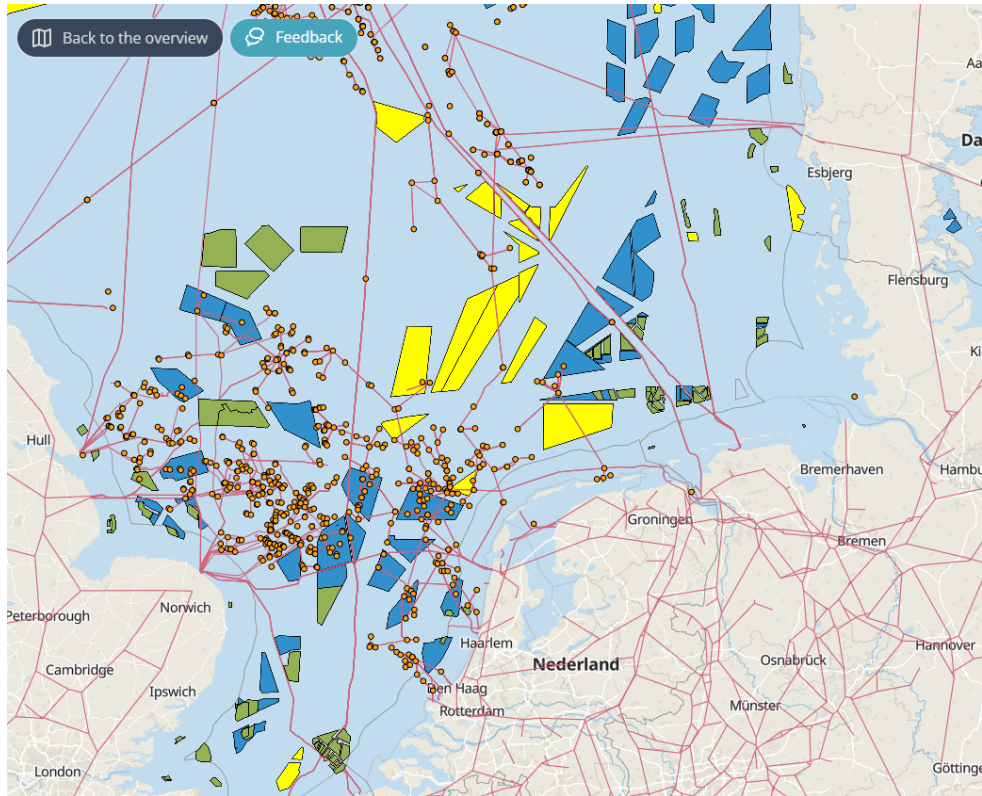


# Example offshore wind and hydrocarbons

- Search areas for wind as part of 2030 roadmap towards 21 GW
- Lagelander (#9 in map)
- Area 750 km<sup>2</sup> ~ 8GW
- Reduced wind farm area due to hydrocarbon production (8 GW → 2-3 GW)
- Conclusion: excluded from roadmap



# System integration North Sea – synergy/conflict?



# North Sea Energy

offshore  
system  
integration

## Example 2





# Our North Sea Energy atlas

## Forthcoming features 2024

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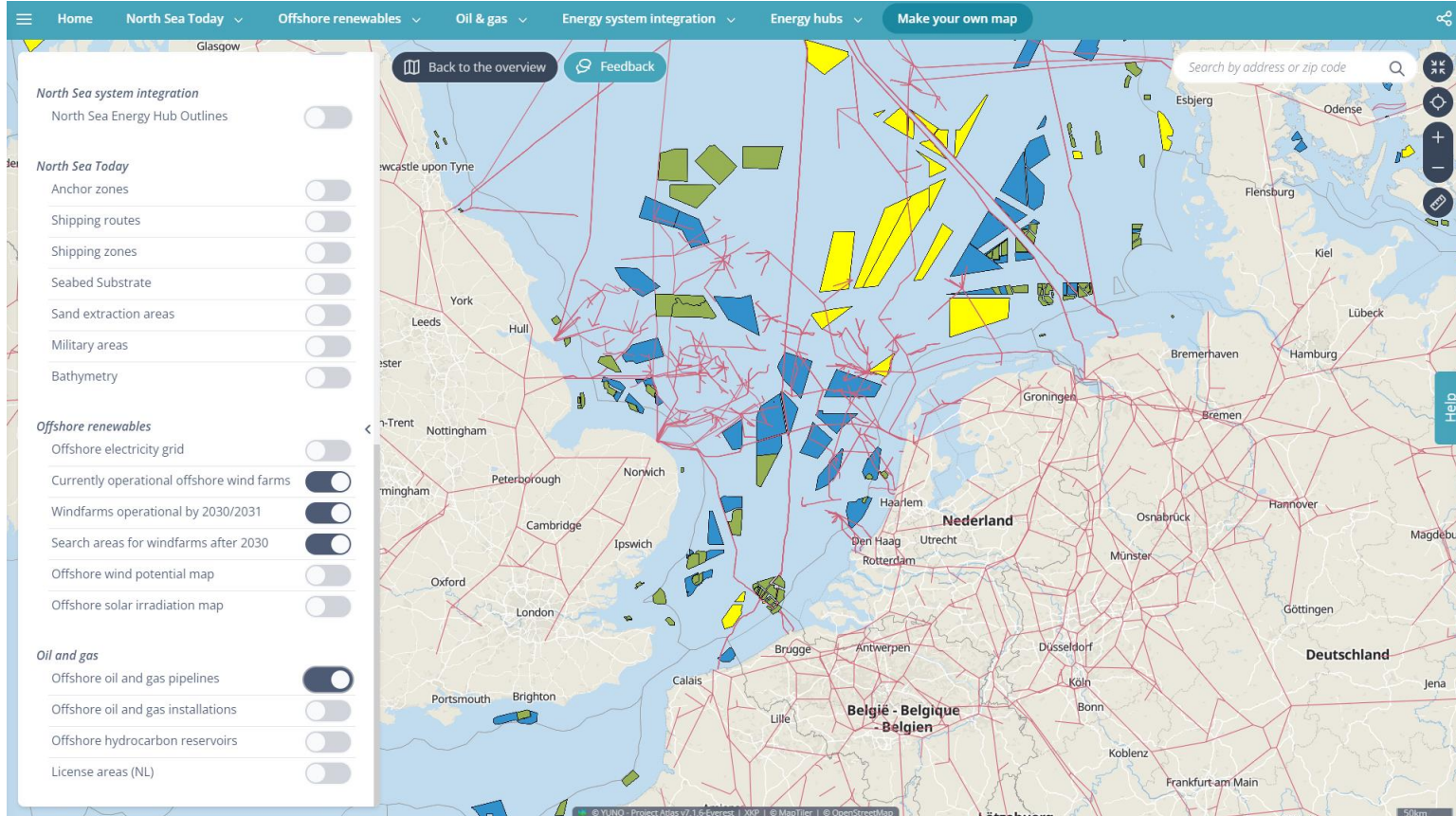
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### Suggested themes



# Hydrogen production, transport & storage

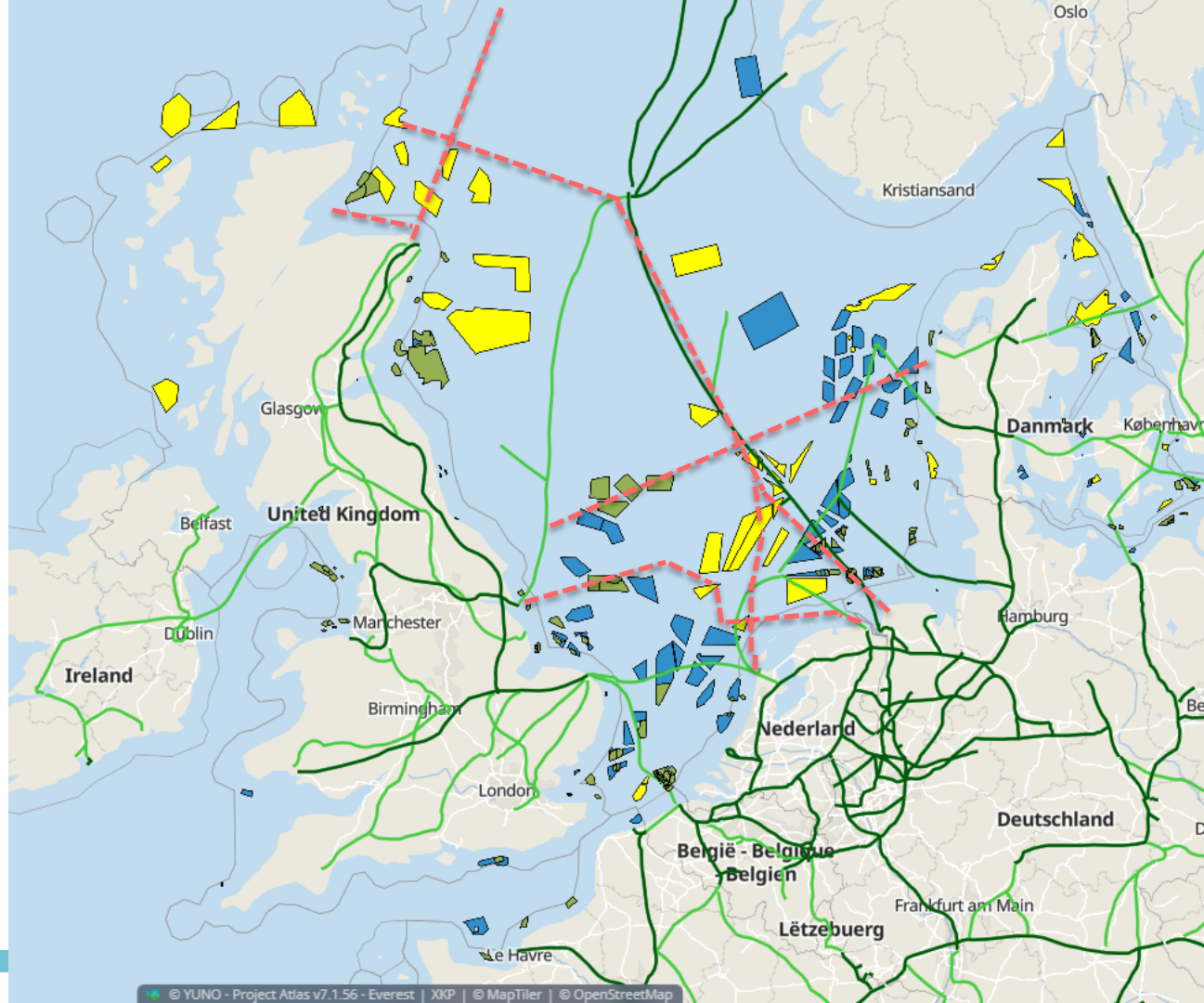






# 2050?

- Tens GW scale interconnectors (also re-use)
- Tens of GW of offshore H2 production capacity
- TWh scale hydrogen storage subsurface (gasfields/caverns)



# Key insights

- 1) Multi-use of offshore space to save at system level: time to develop, cost to transition and maintain security of supply
- 2) Transparency where possible and allowed to much better inform stakeholder process on subsurface opportunities and challenges in relation to marine spatial planning
- 3) Cooperation towards new solutions with net societal gains that have been un(der)explored





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