

# The European Hydrogen Storage Database

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Hydrogen Storage Database  
HyUSPRe Project

140 sites  
420 TWh

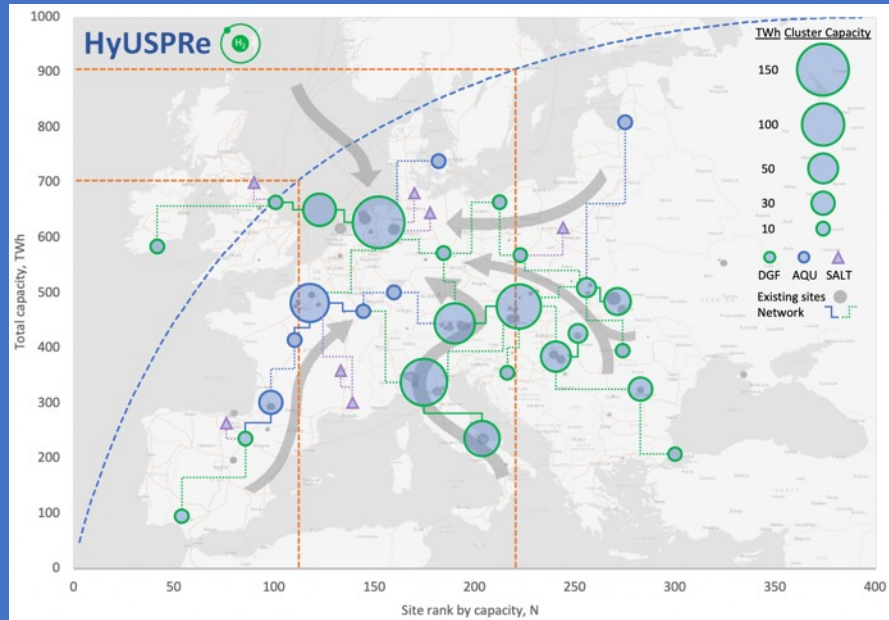
EU+UK  
500M

Forecast Demand  
Additional Storage Required

2050  
250 sites

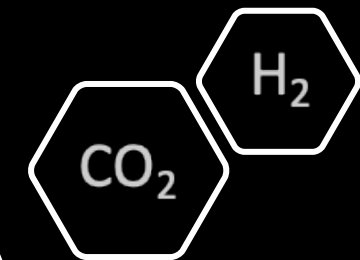
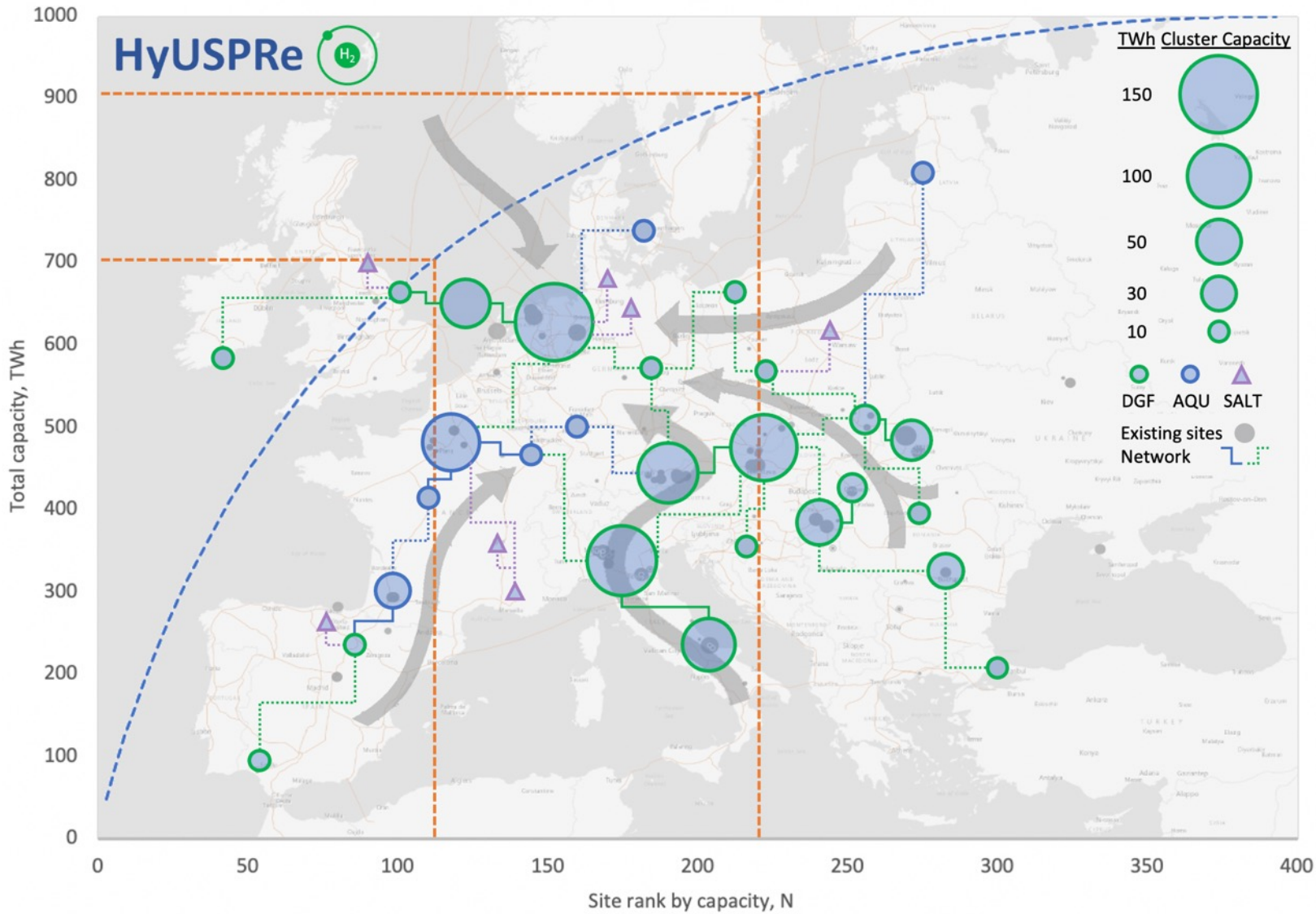
3 PWh  
1 PWh





Cavanagh et al 2023 | Report: [hyuspre.eu/downloads/report/D1.3](https://hyuspre.eu/downloads/report/D1.3)

ArcGIS version of this map: [www.hyuspre.eu/atlas](https://www.hyuspre.eu/atlas)

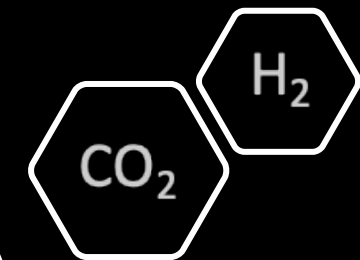
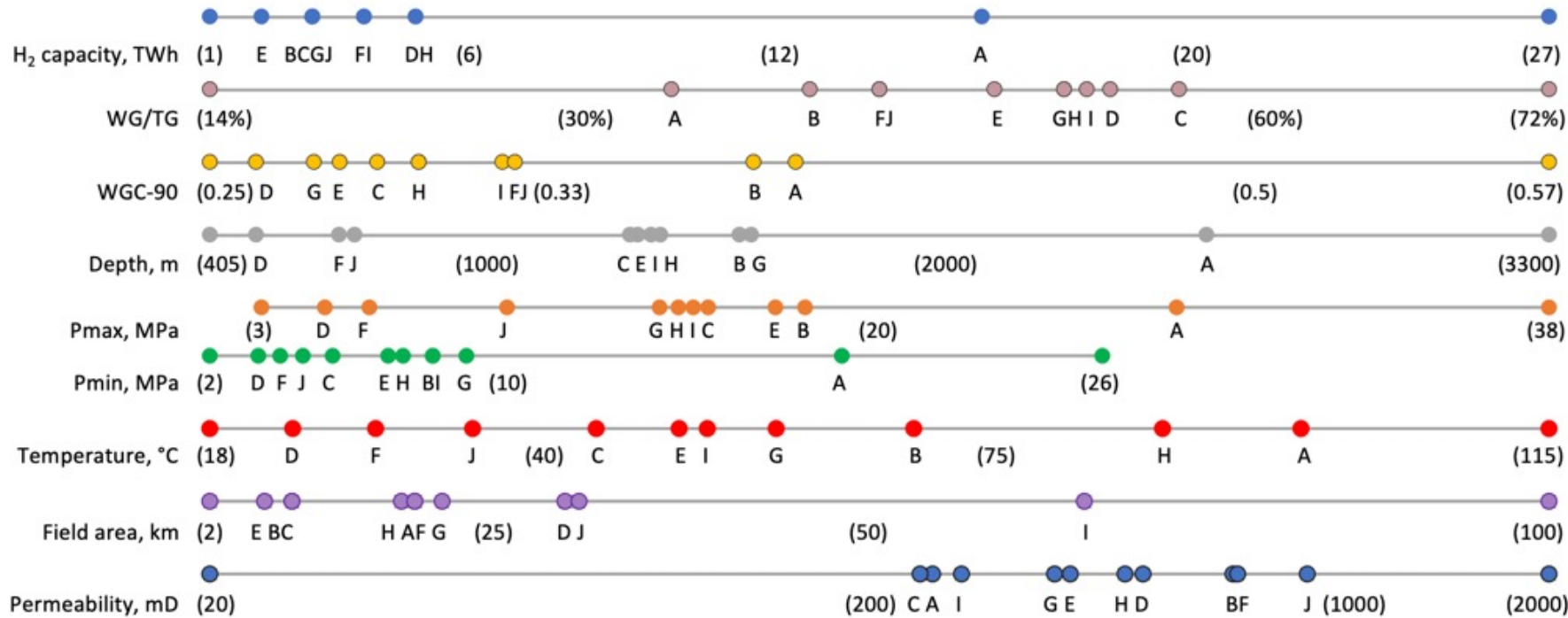


H<sub>2</sub> storage:  
1,000 TWh

80% gas fields  
10% aquifers  
10% salt caverns

250 sites, 10 clusters

Cavanagh et al 2023 | Report: [hyuspre.eu/downloads/report/D1.3](https://hyuspre.eu/downloads/report/D1.3)



Capacity: 1-5 TWh  
 Working gas: 30% - 60%  
 Conversion factor: 1/4 - 1/3  
 Pmax: 5-20 MPa  
 Pmin: 3-10 Mpa  
 Depth: 500-1500m  
 Temp: 20-100 °C  
 Field area: 3-30 km<sup>2</sup>  
 Perm: 200-1000 mD

H<sub>2</sub>

CO<sub>2</sub>

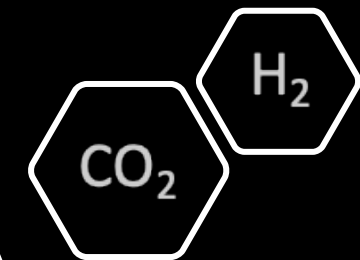
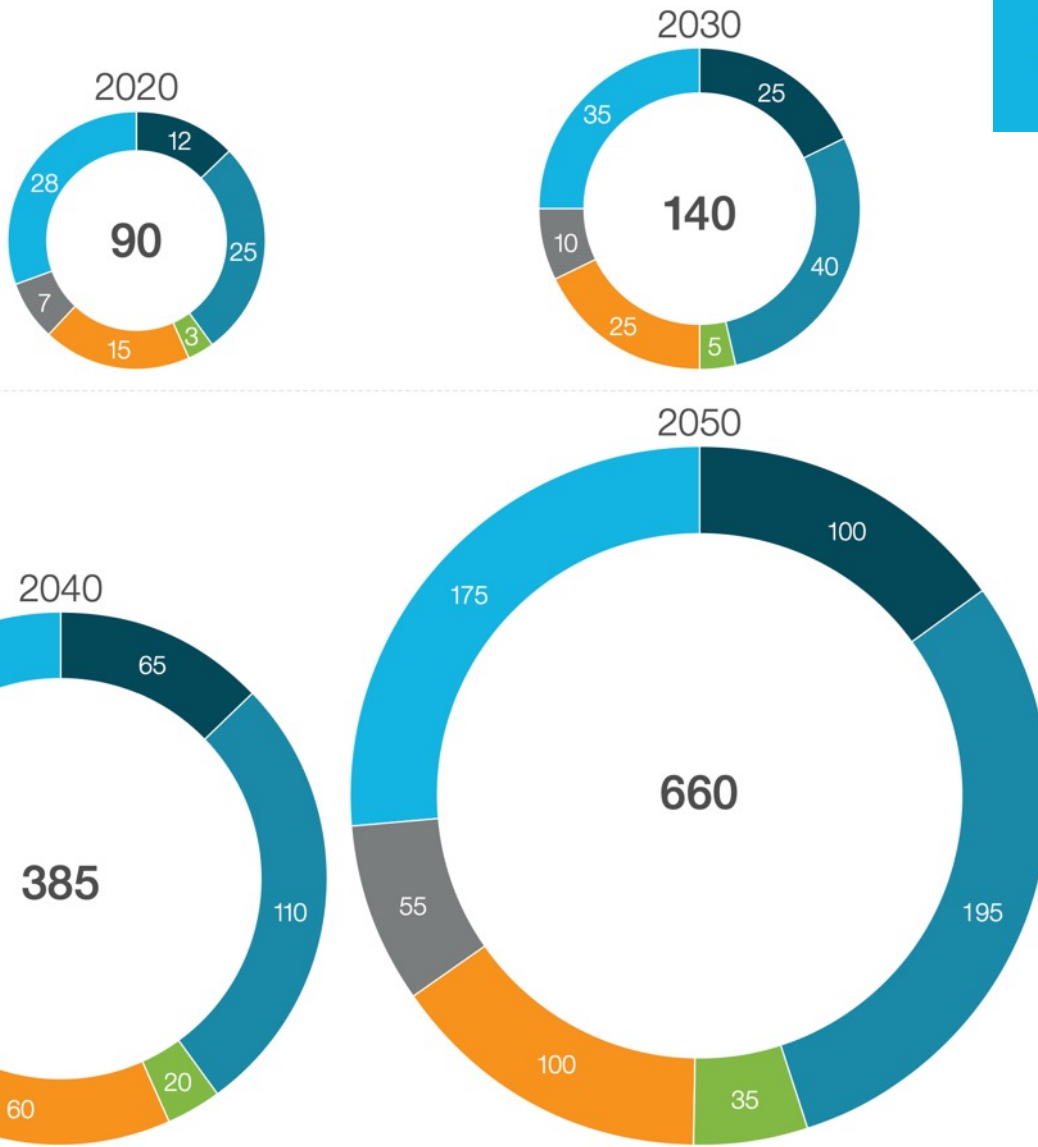


# Hydrogen Council

McKinsey & Company Report | October 2022

# Hydrogen Council

- Europe
- China
- Japan and Korea
- North America
- India
- Rest of world



**Europe 2050:**  
100 Mt H<sub>2</sub>  
3,300 TWh

12 Gt of CO<sub>2</sub>  
stored by 2050

# Financial Times June 2023

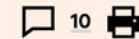
## EU turns to Africa to build green hydrogen supply

The bloc insists the proposal is mutually beneficial for Europe and Africa, but critics accuse it of resource grabbing



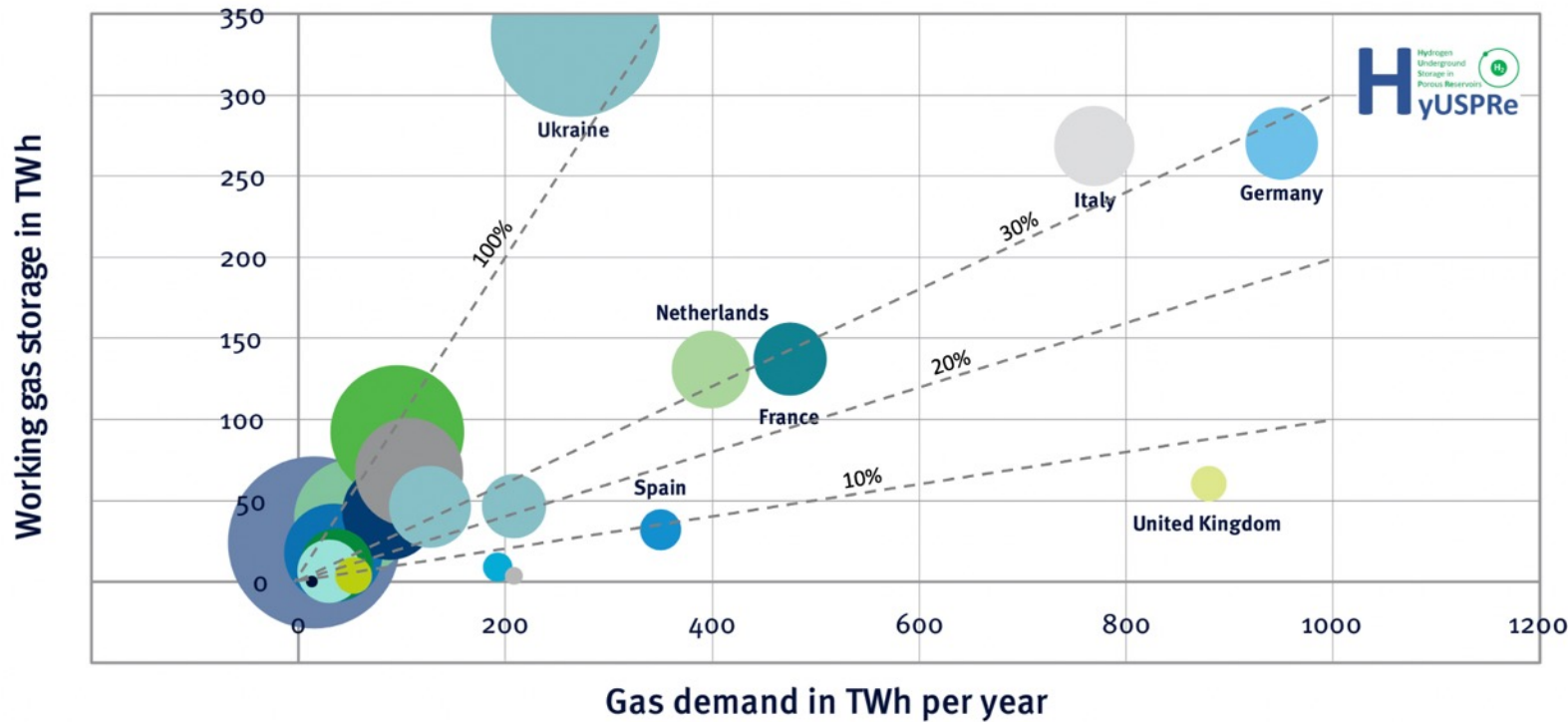
High potential: producing green hydrogen requires a lot of energy, and Africa is well placed to provide cheap solar power © Fadel Senna/AFP via Getty Images

Philippa Nuttall JUNE 15 2023

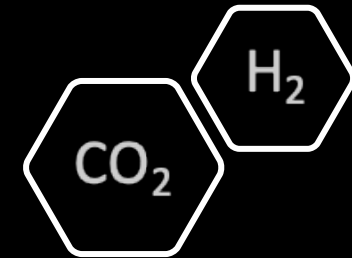


Europe has set an ambitious target of producing 10mn tonnes of renewable-based hydrogen by 2030, and importing the same amount — and, as so many times before, it is looking to Africa to supply the resources it needs.



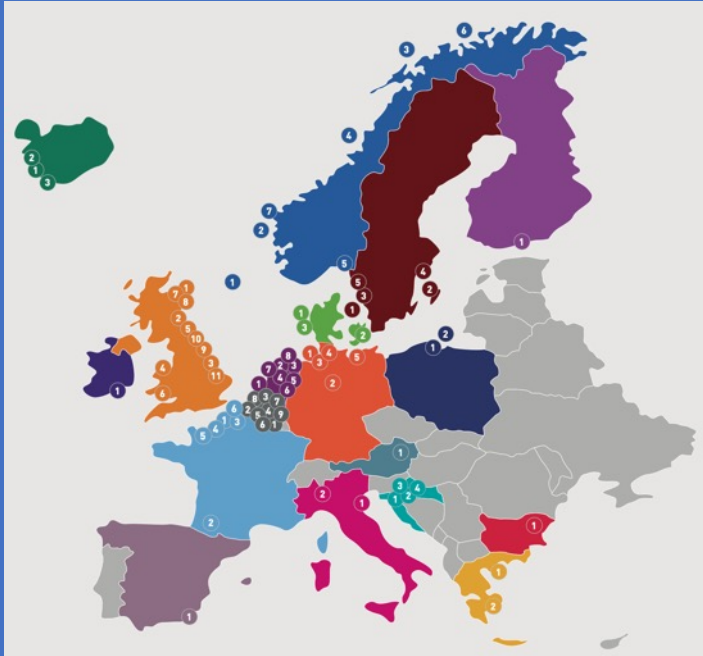


Adapted from *The Flexibility of Gas*, Imperial College Report, Speirs et al. (2020)

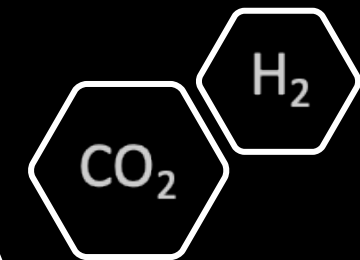
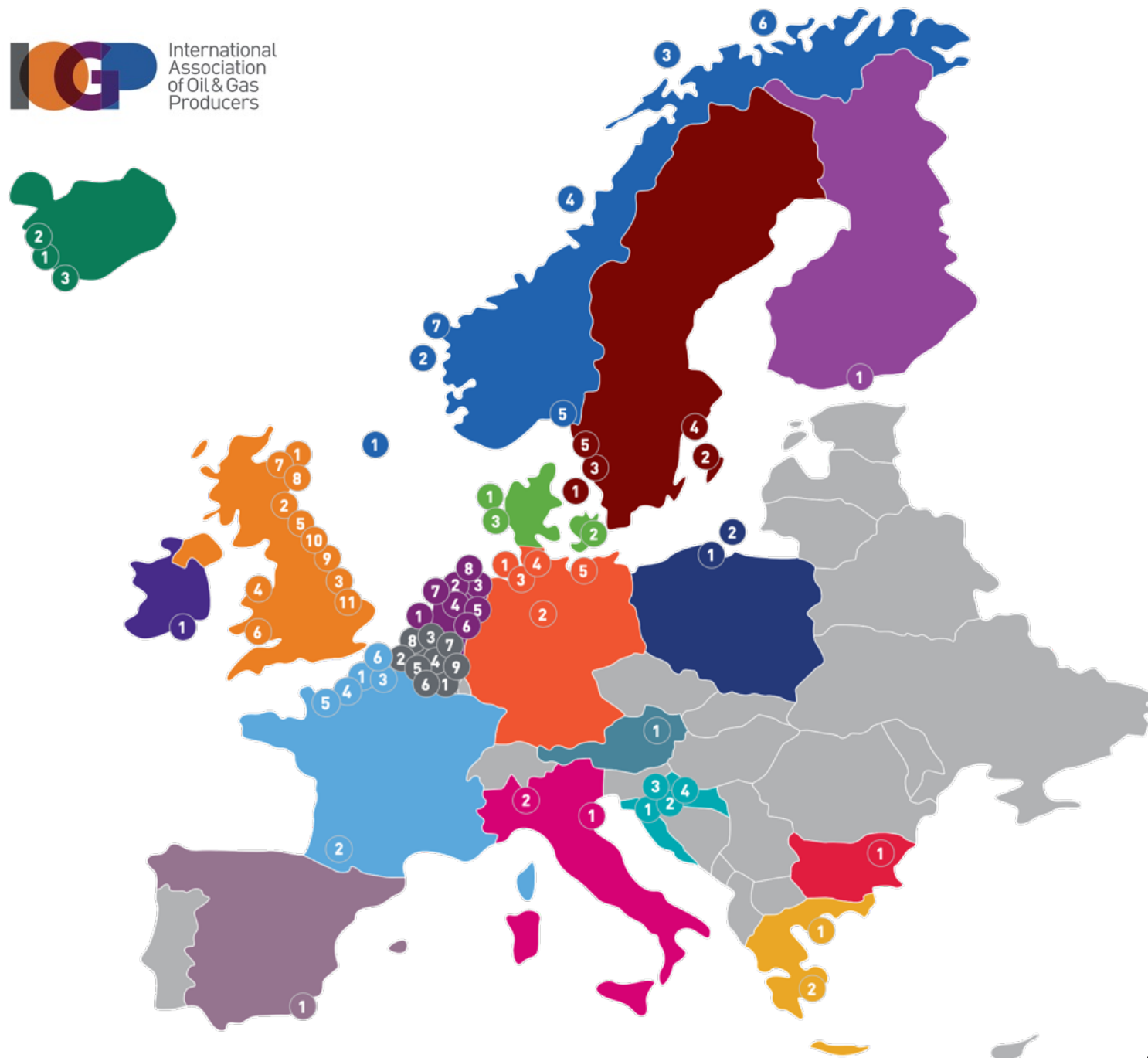


Europe 2050:  
100 Mt H<sub>2</sub>  
3,300 TWh

30% storage  
1,000 TWh



IOGP 2023 | Report: [iogpeurope.org/uploads/map\\_of\\_eu\\_ccus](https://iogpeurope.org/uploads/map_of_eu_ccus)



CCS 2030:  
80 Mt/yr

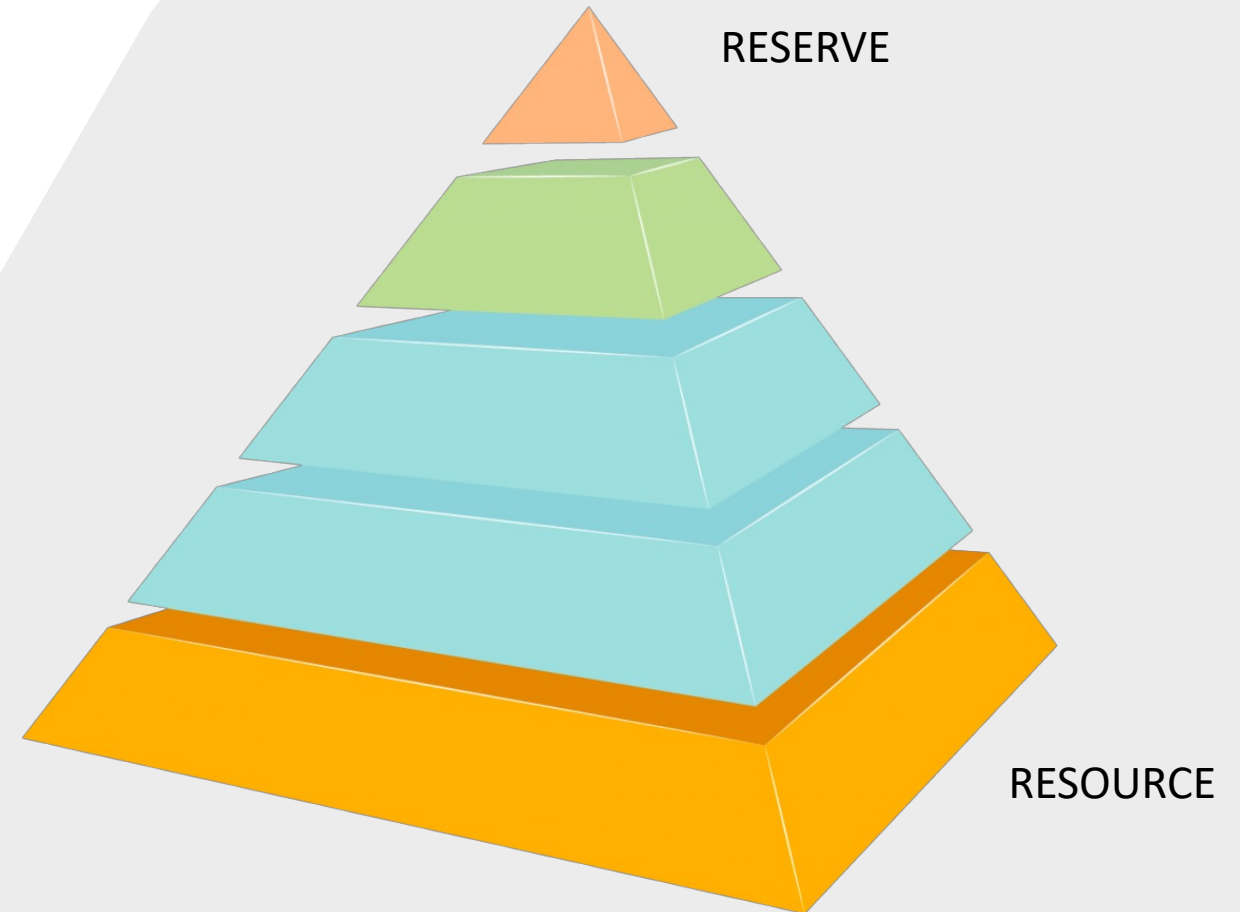
72 projects  
50 North Sea

H<sub>2</sub>

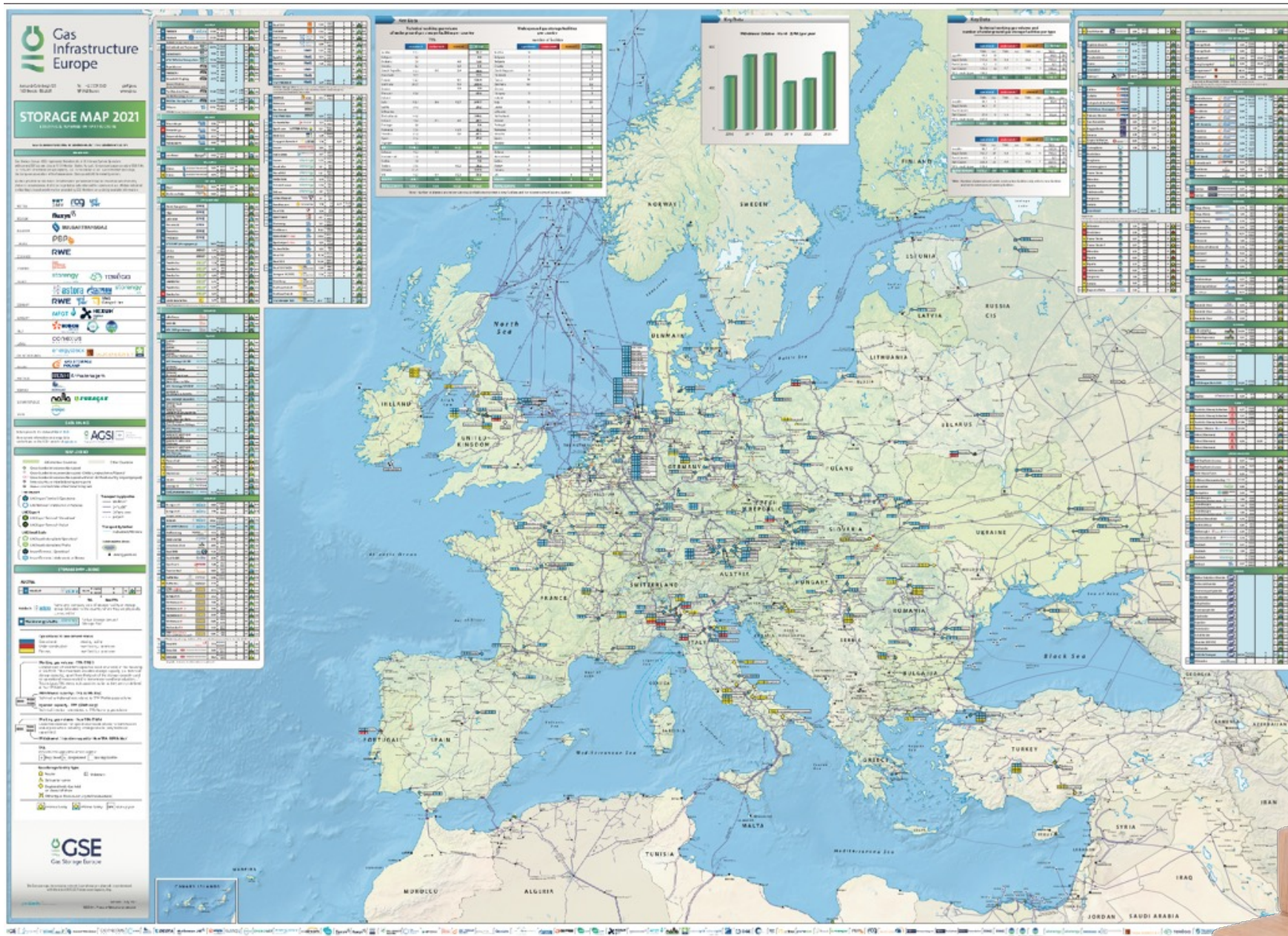
CO<sub>2</sub>

### GAP ANALYSIS

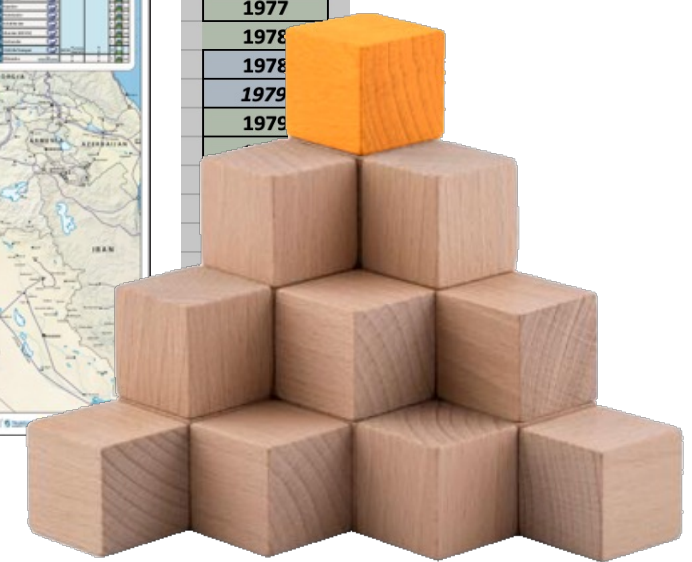
- How much?
- Where?
- What?
- When?



TERR pyramid: Techno-Economic-Resource-to Reserve-estimate  
*Bachu, Bradshaw, Holloway, IJGGC vol. 1, 2007*



- 1956
- 1956
- 1957
- 1960
- 1964
- 1965
- 1965
- 1966
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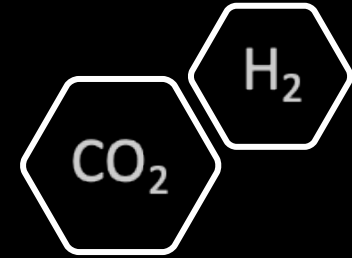
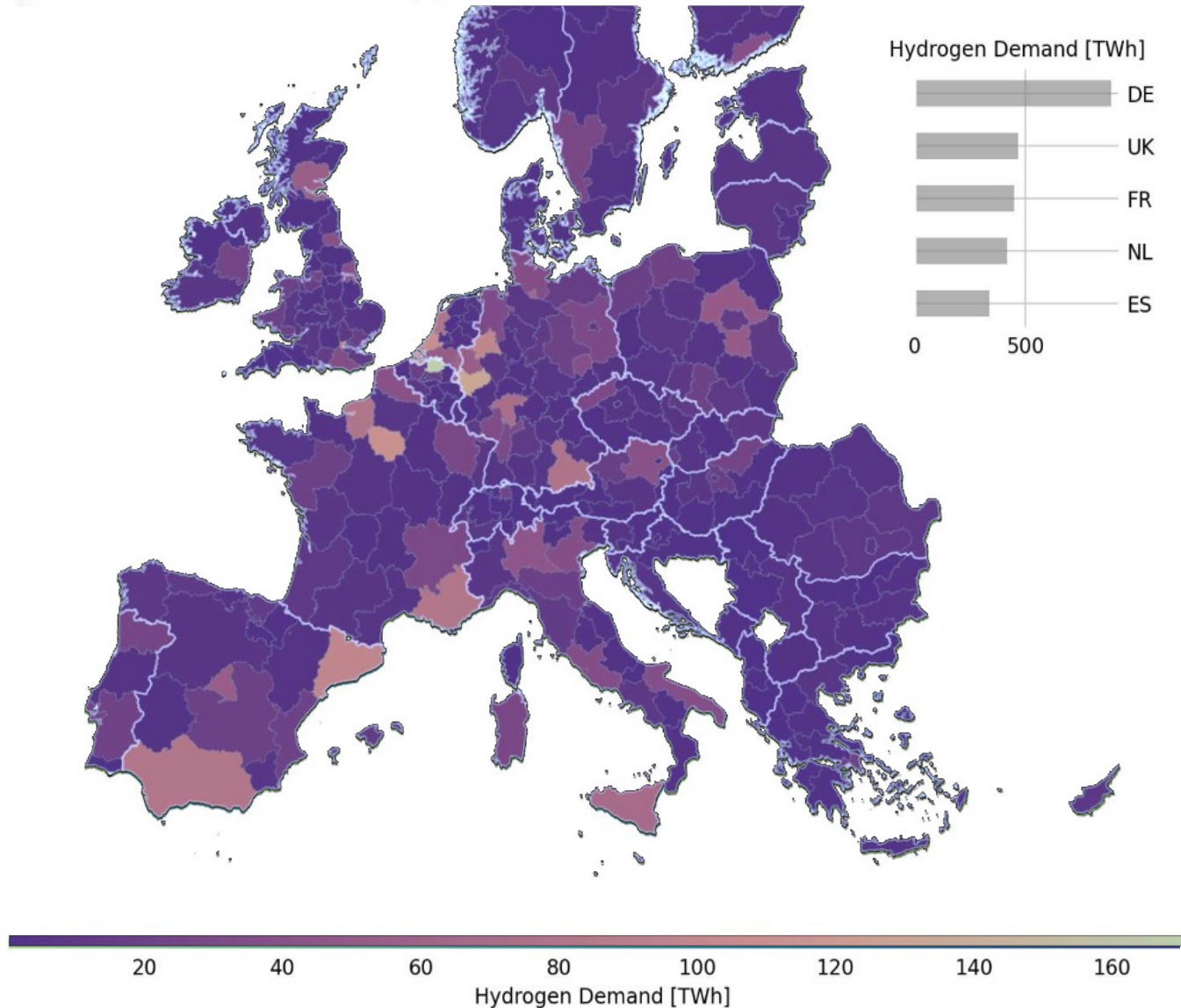


# DEMAND



Co-funded by  
the European Union

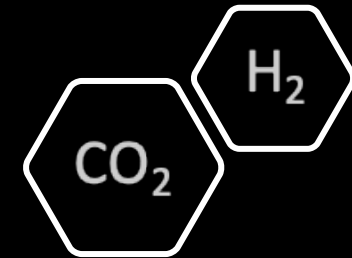
HyStorPor Conference, ECCI, Edinburgh 12 July 2023



H<sub>2</sub> 2050:  
2-4 PWh

Theresa Groß et al.  
HyUSPRe 2022

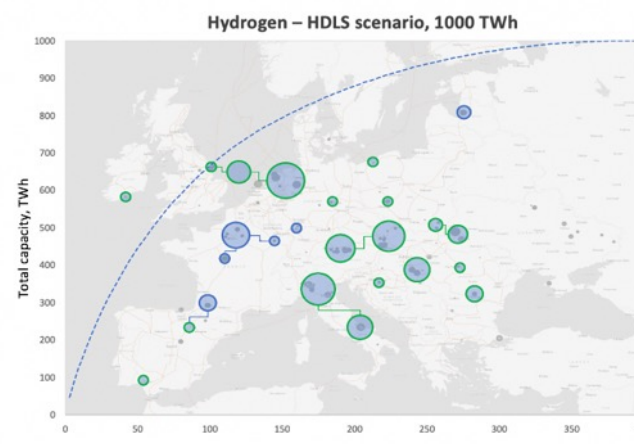
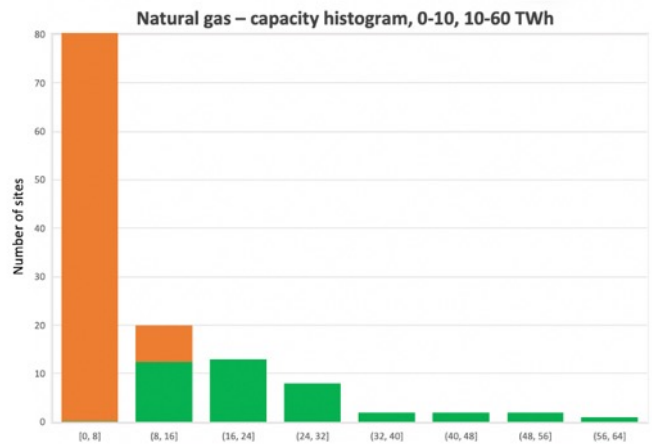
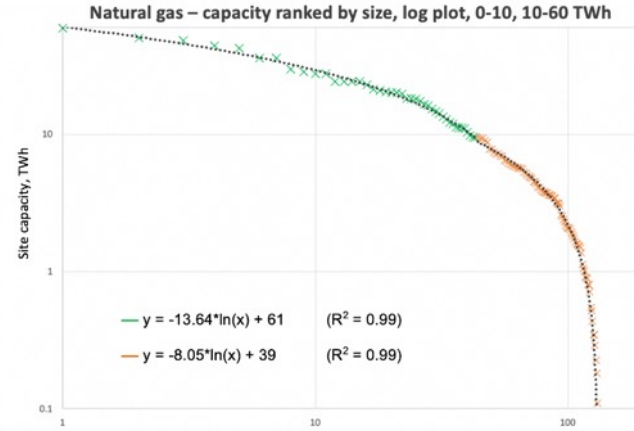
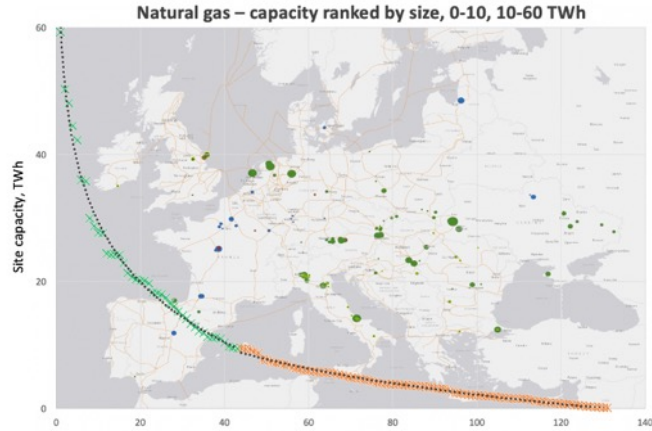




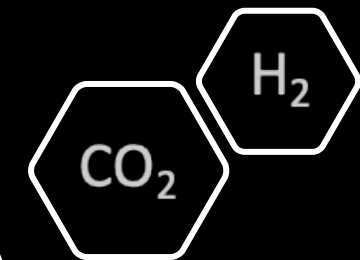
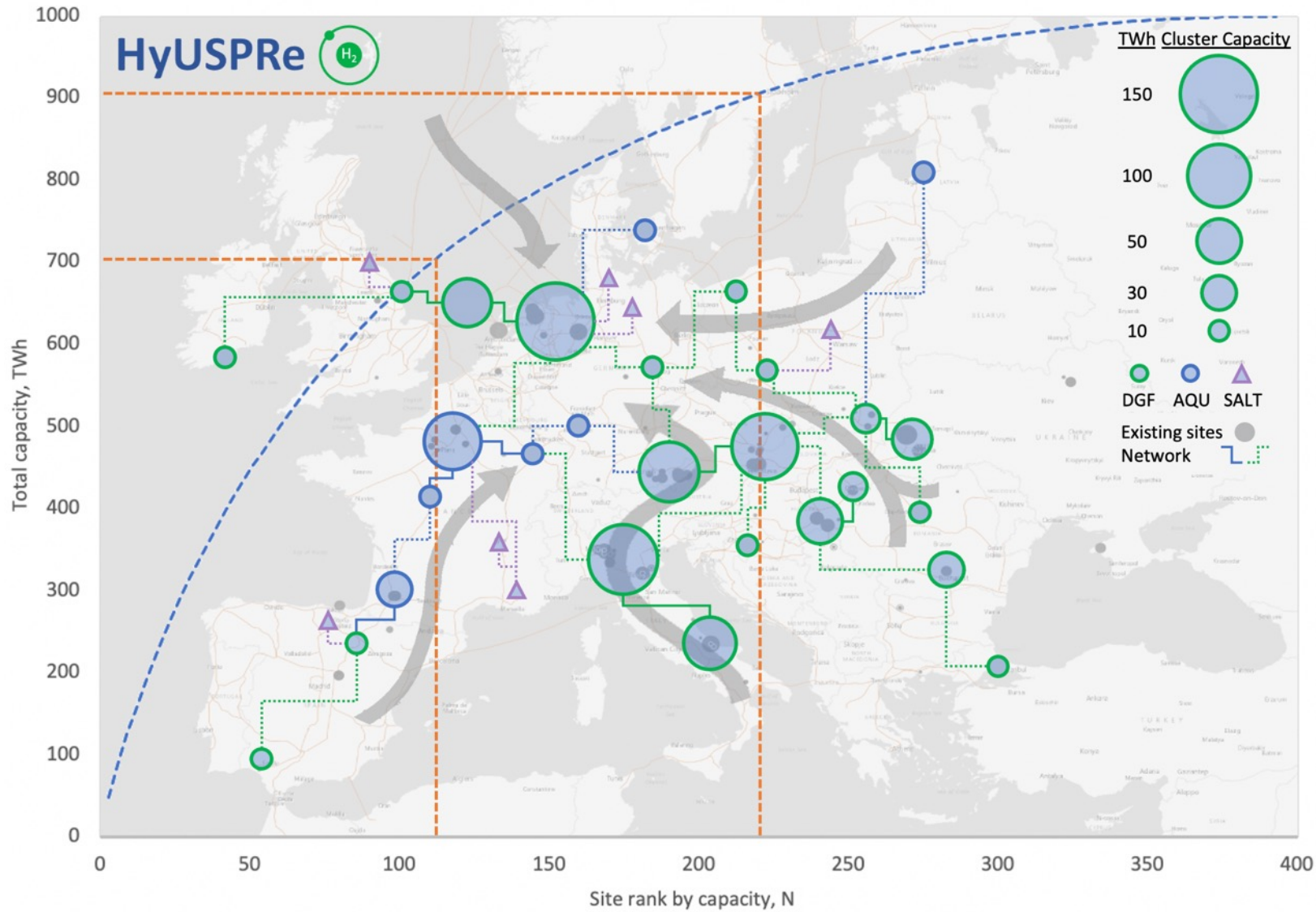
# Natural gas storage market

## logarithmic distribution

70/30







1,000 TWh

250 sites, 10 clusters

120 sites, 5-15 TWh

130 sites, 1-5 TWh

150 sites < 1 TWh

Cavanagh et al 2023 | Report: [hyuspre.eu/downloads/report/D1.3](https://hyuspre.eu/downloads/report/D1.3)

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- Rest of world

