DYNAMIS SP4
Storage of CO_2

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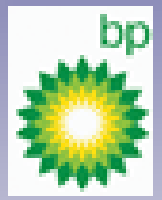
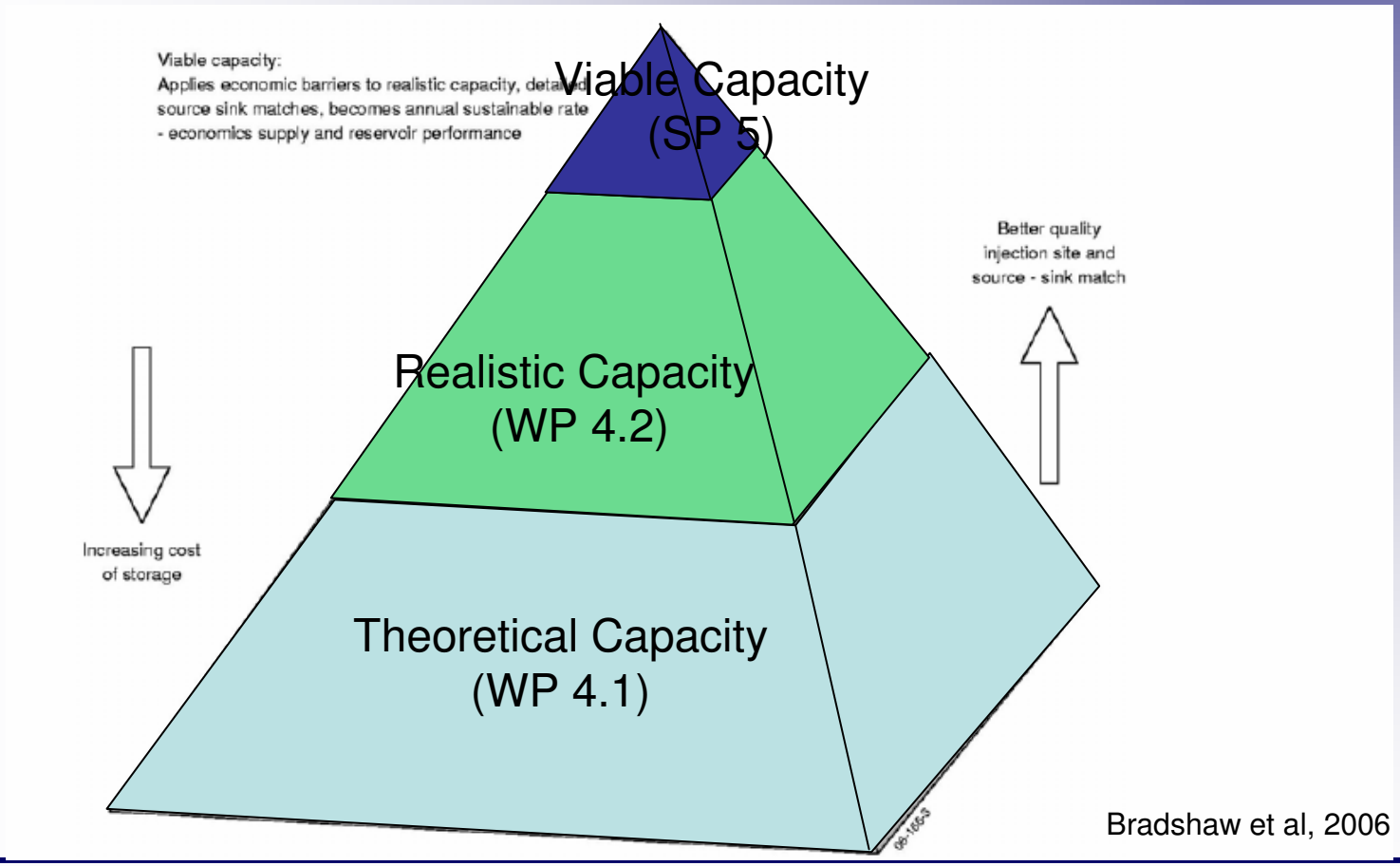
Objectives of the work

- Generate the basis for recommendations of plausible storage sites for CO_2 and industrial alternatives (EOR – EGR)
- storage sites constraints :
  - suitable time: be ready when needed EOR/EGR
  - suitable size: at least 60 Mt of CO_2 i.e. 2 Mt/y
  - suitable storability: long enough residence time for CO_2
  - suitable environment : HSE
  - suitable accessibility : distance to source, regulatory, economics

SP4 partners



CO_2 storage within Dynamis



Bradshaw et al, 2006

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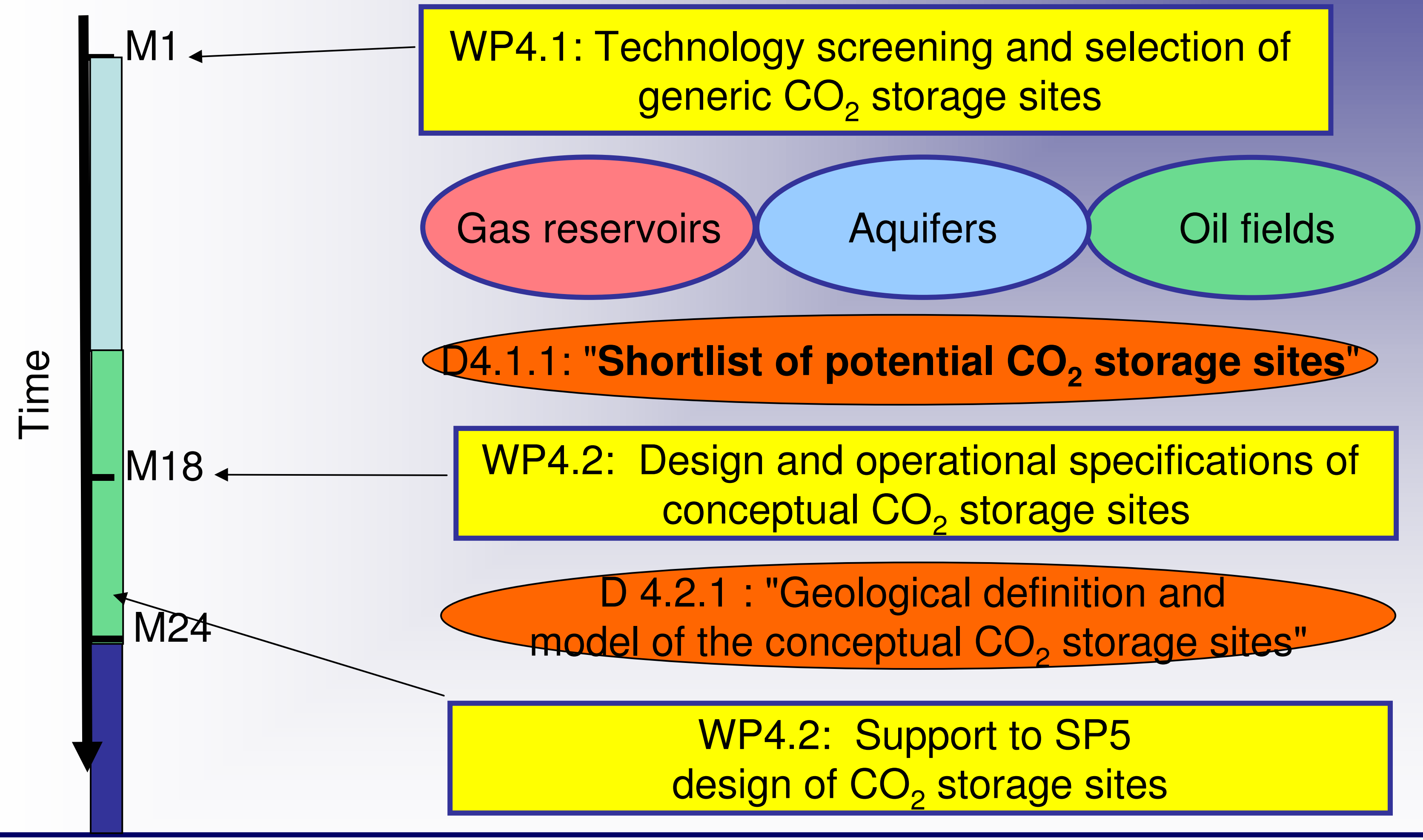
SP4: Layout of working plan



WP4.1 main results

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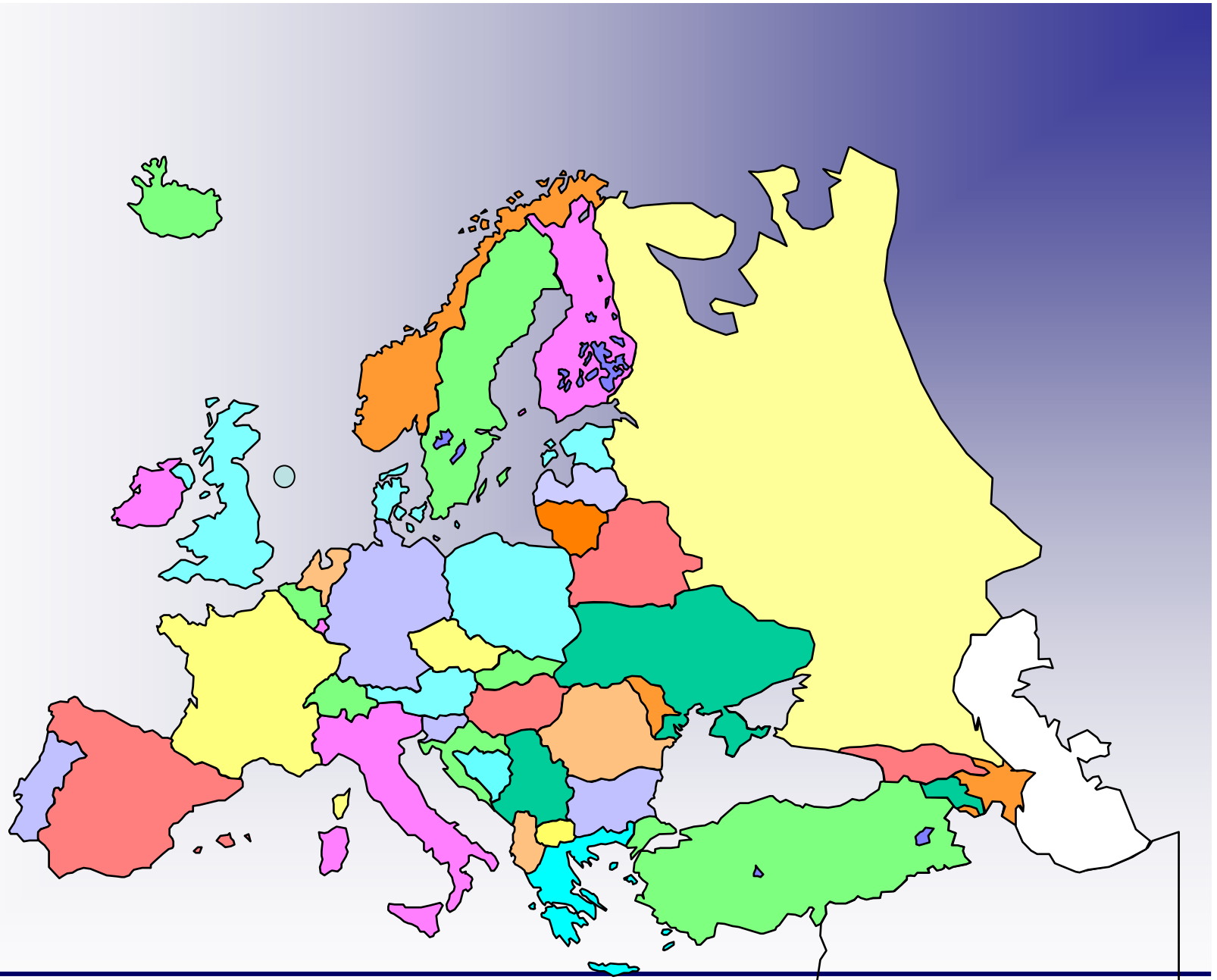
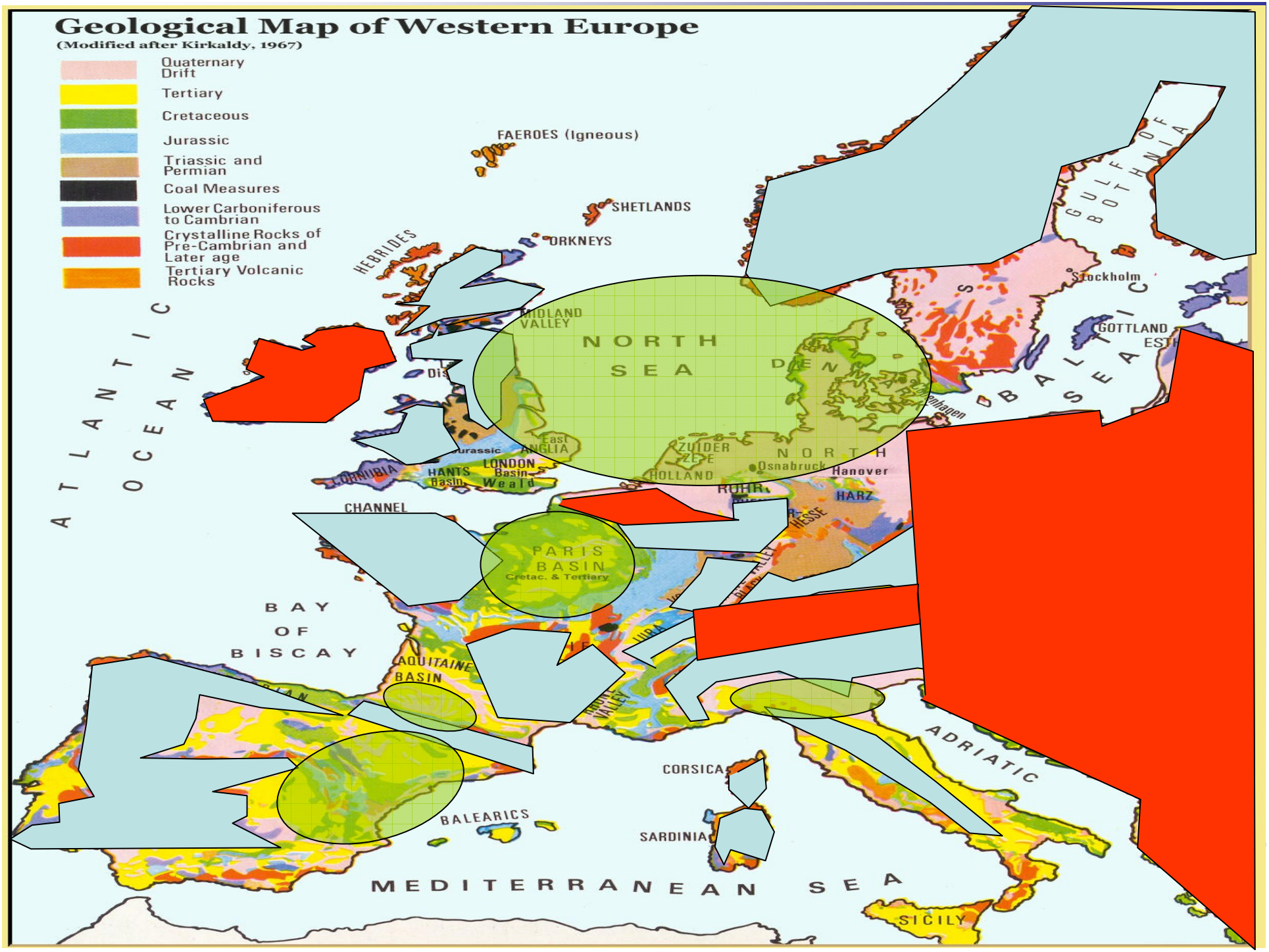
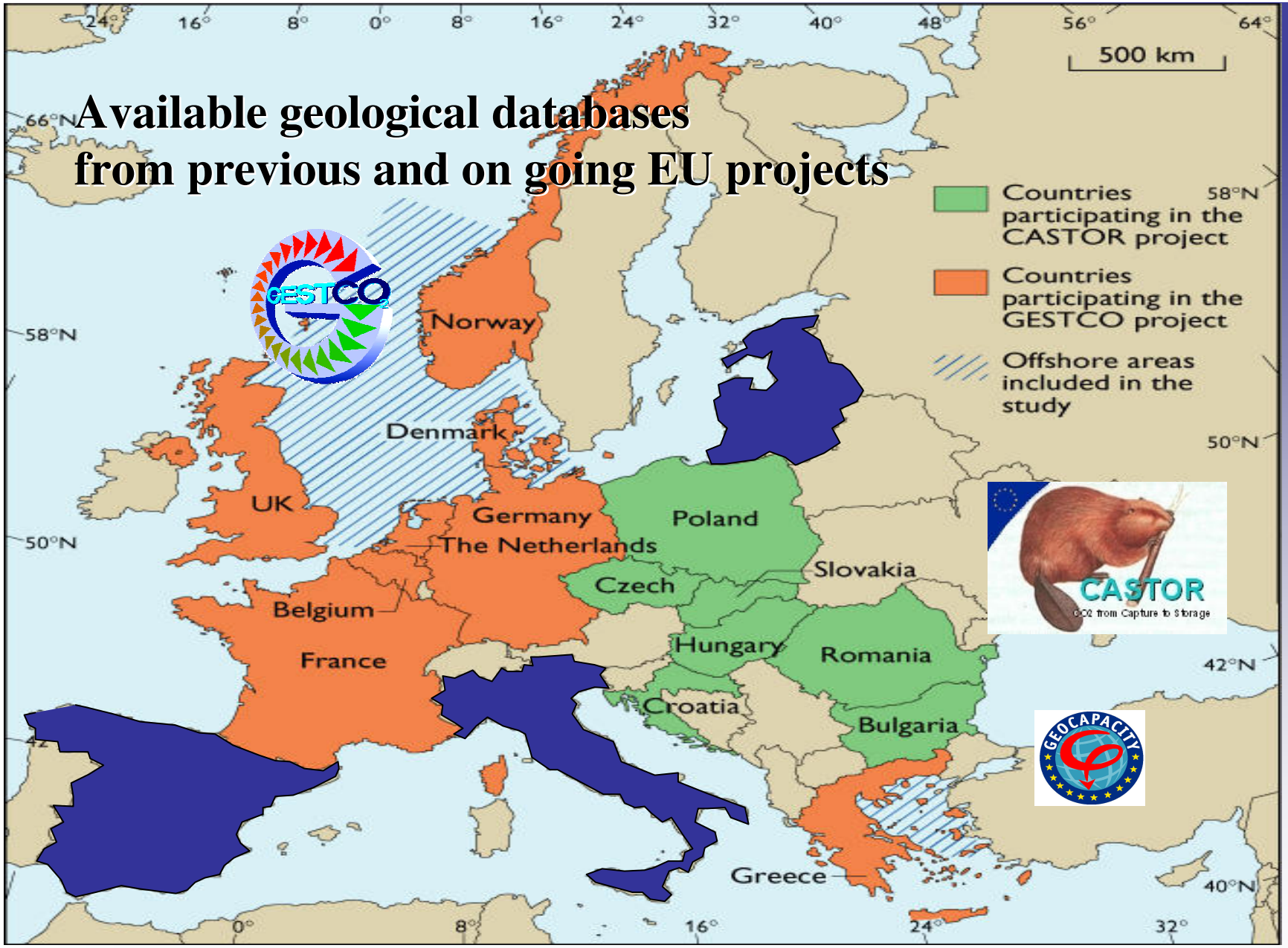
Criteria list (1/2)

- Location of site compared to Power/Hydrogen Market
- Plant size (30-year operation):
  - Gas power plant (~2 Mt/y) => 60 $MtCO_2$
  - Coal power plant (~3.3 Mt/y) => 100 $MtCO_2$
- Availability of site by 2012
- Variety of geological conditions
- Variety of storage types




Geological Map of Western Europe
(Modified after Kirkaldy, 1967)
Quaternary Drift
Tertiary
Cretaceous
Jurassic
Triassic and Permian
Coal Measures
Lower Carboniferous to Cambrian
Crystalline Rocks of Pre-Cambrian and Later age
Tertiary Volcanic Rocks
FAEROES (Igneous)
SHETLANDS
ORKNEYS
HEBRIDES
ATLANTIC OCEAN
MIDLAND VALLEY
NORTH SEA
DENMARK
Copenhagen
Stockholm
GOTTLAND
ESTI
BALTIC SEA
GULF OF BOTHNIA
East ANGLIA
LONDON Basin
Weald
HANTS Basin
HOLLAND
ZUIDER ZEE
NORTH
Osnabruck
Hanover
HARZ
ROHR
HESSE
CHANNEL
PARIS BASIN
Cretac. & Tertiary
BAY OF BISCAY
AQUITAINE BASIN
RHONE VALLEY
ADRIATIC
CORSICA
SARDINIA
BALEARICS
MEDITERRANEAN SEA
SICILY

Available geological databases from previous and on going EU projects



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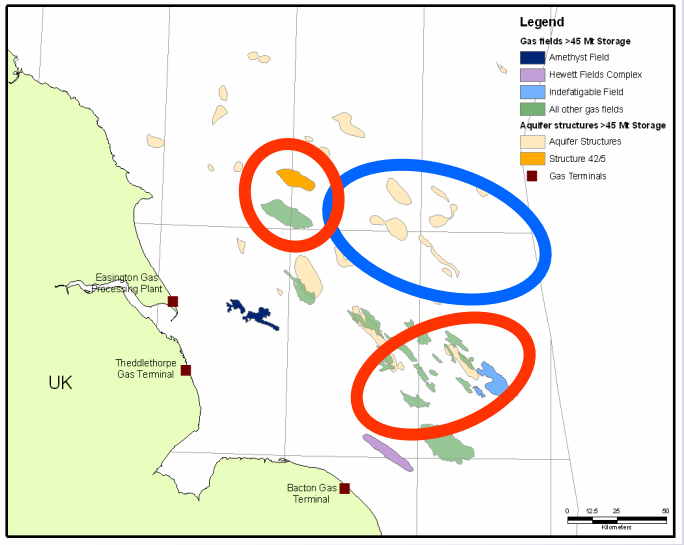
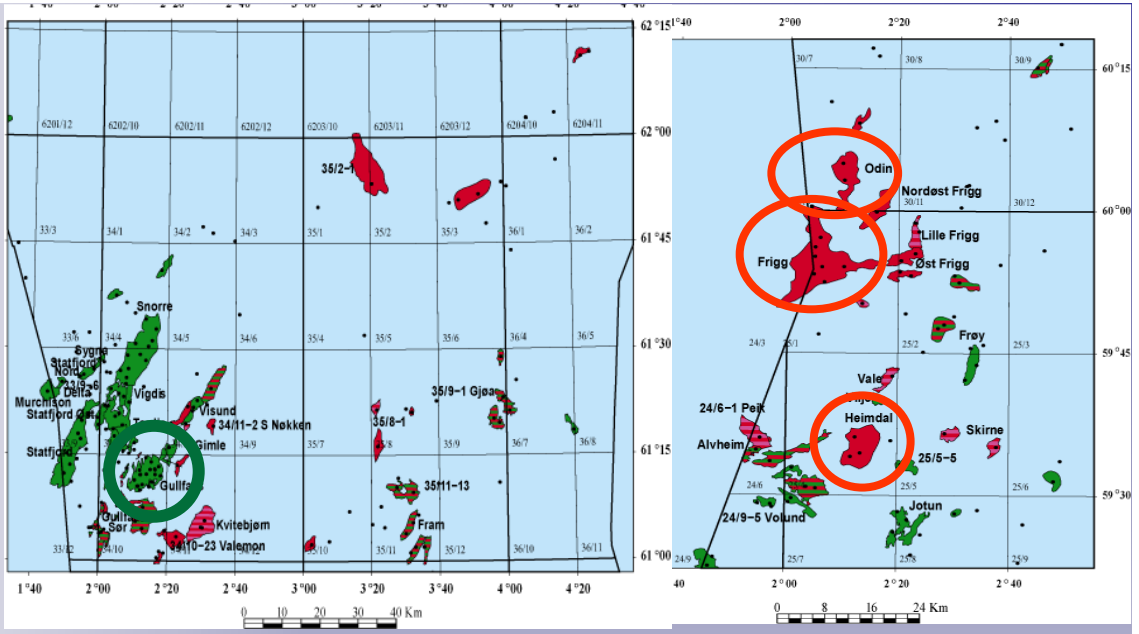
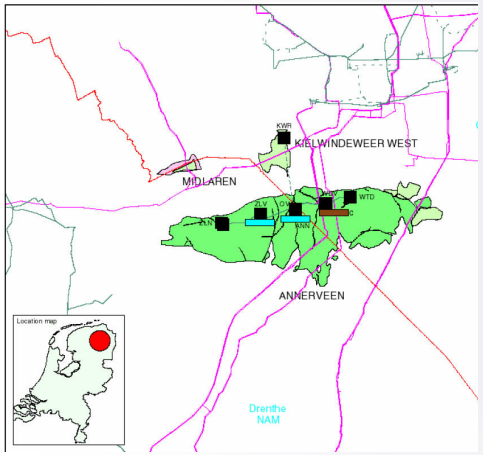
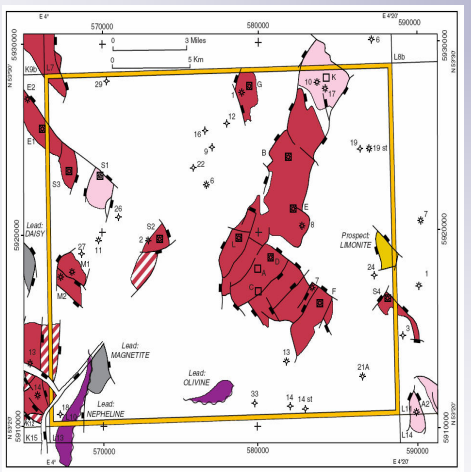
Criteria list (2/2)

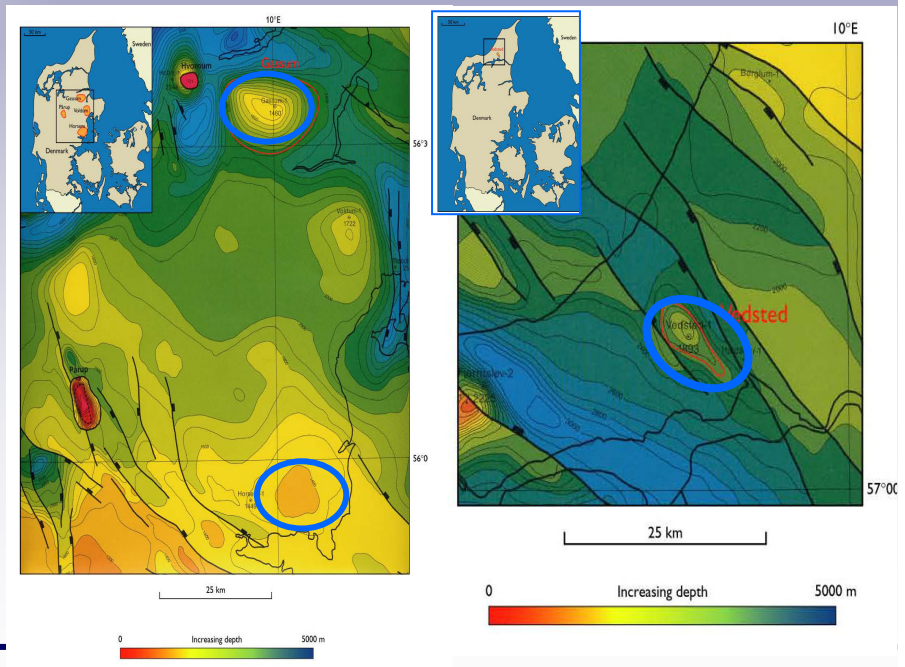
- Depth > 800 m or initial pressure> 80 bar or supercritical CO_2
- Total storage capacity > 60 Mt CO_2
- Injectivity > 2.0 Mt CO_2 per year
- Integrity of seal in terms of thickness, faults etc.











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Short list of storages

- **UK**: Hewett (237), Indefatigable (357), Amethyst (63), Structure 42/5 (836)
- **Germany**: Greifswalder Bodden (443), Scheinwrich (432)
- **France**: Paris Basin Trias (659), Dogger (8.64 - 4320)
- **Denmark**: Gassum (705), Horsens (490), Vedsted (320)
- **Norway**: Frigg (363), Gullfaks (272), Heimdal (107), Odin (102), Utsira...
- ~~**Netherlands**: Annerveen (160), L10 CDA (90)~~

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Conclusions from WP4.1

- 16 sites on the short list
- Key parameters in selection:
  - depth
  - storage capacity
  - injectivity

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WP4.2 Design and operational specifications of conceptual CO_2 storage sites

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Data collection and Clustering analysis

- Use the (US) oil industry experience
- Cluster the storage by classes based upon dimensionless numbers and preserve the parameter (field) variations
  - 16 sites from WP4.1
  - 80 sites pre qualified in the data base
  - 5 additional from SP5: 4 aquifers + 1 oil field

Preliminary Conclusions of WP5.2

- Publicly available data is scare in particular for aquifer e.g. no indication of heterogeneities or internal structure
- Proposed dimensionless analysis is falling short due to lack of data (publicly available)