



Session 2a. National legislation in the CGS Europe countries: case studies

Geological carbon storage: towards a Danish implementation plan

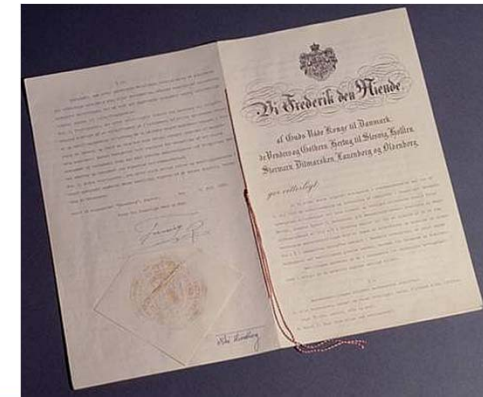
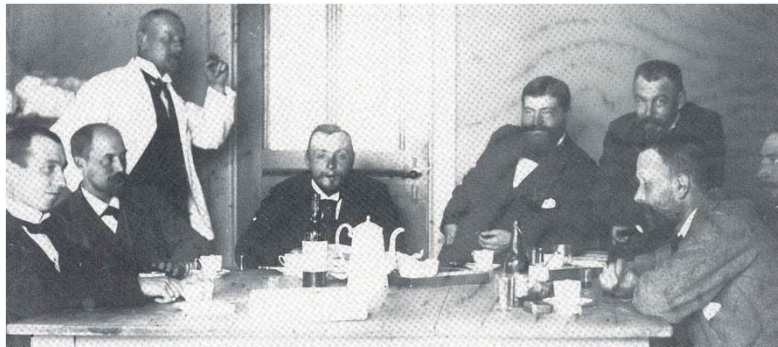
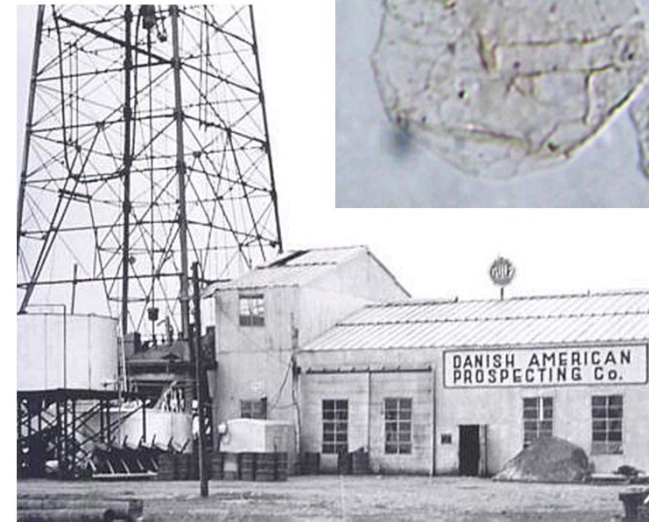
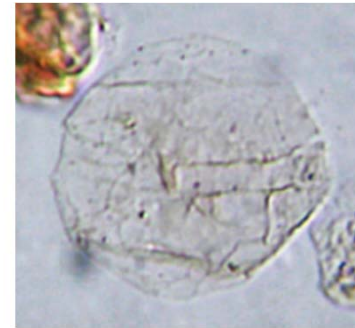
Niels Poulsen - GEUS



CGS Europe Kick-Off meeting - 29-30 November, Paris

History of the Danish subsoil Act

- 1929 First exploration boreholes
- 1932 Denmark's first Subsoil Act was adopted
- 1934 F.F. Ravlin first concession for oil exploration
- 1936 Found salt, lead to first concession, 50 years of concession (oil, gas, salt, sulphur) to include whole country
Ravlin established the Danish American Prospecting company DAPCO
- 1938 DAPCO sold to Gulf Refining Co.
- 1947 Recovered salt in deep wells
- 1948 Ravlin's salt find at Harte was fake
- 1950 New subsoil act
- 1950 Gulf was granted 50 years of concession (initial exploration period 10 years)



History of the Danish subsoil Act

1957 Gulf resold the shares to Standard Oil of New Jersey (Esso)

1959 The concession was abandoned in 1959, it had as well as comprehensive geophysical surveys conducted in all 31 deep wells without being able to detect oil or gas producible quantities

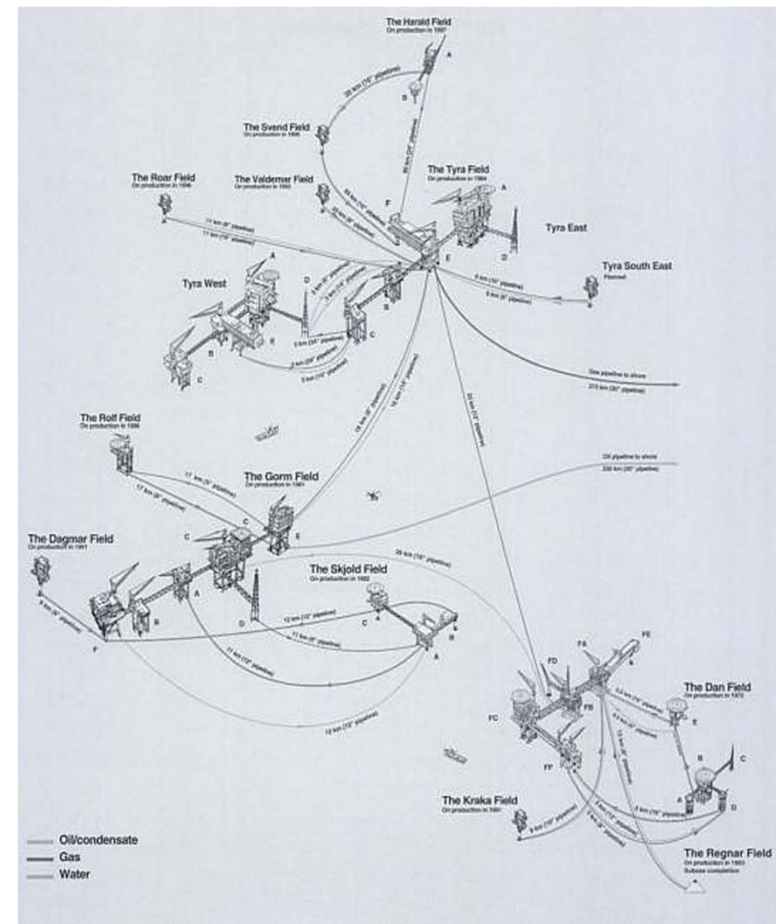
1962 A.P. Møller gets concession for 50 years for exploration and production of hydrocarbons in the Danish underground

1963 Danish Drilling Company A/S, A/S Steamship Company Svendborg and Steamship Company of 1912 A/S will jointly exercise for a period of 50 years to explore and extract raw materials anywhere in the Danish underground



History of the Danish subsoil Act

- 1970 DUC (A.P. Møller, Shell, Texaco)
exploration in the Danish sector of the
North Sea
- 1971 Dan field
- 1972 DONG (importation, distribution,
transportation and storage of natural gas)
- 1975-76 Negotiations for a new concession
- 1977 Skjold, Valdemar and Adda fields
- 1981 Law on the Use of the Danish
underground.
- 1982 New agreement DUC keeps it's finds, but
area relinquishment rules.
- AP Møller designated licence areas to be
returned and submit proposals for work
programs
- The relinquished areas have formed the basis
for new licensing rounds. There have been
held six rounds in Denmark from 1984 to
2006.



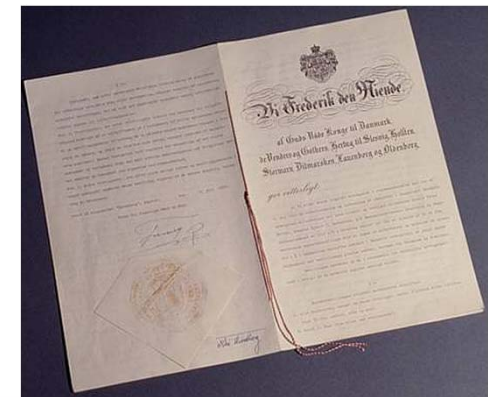
Danish Subsoil Act

- The existing Danish Subsoil act addresses the use of the subsoil for storage purposes
- The Danish Subsoil is used for more than just the production of oil and gas. The subsoil is used to extract salt and geothermal heat and to store natural gas, and also the potential future use for storage of CO₂



EU'S CCS directive

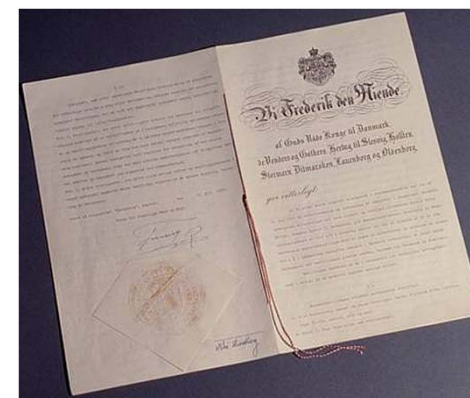
- It is still up to the individual member states to take a position as to whether they want to use this technology and, if so, determine the areas in which CO₂ will be stored.
- The new directive is now be implemented into Danish legislation. This is expected to take place by an **amendment of the Danish Subsoil act**, among other statutory provisions.
- The Draft Law amending the Law on the Use of the Danish underground. Implementation of the **CCS Directive**, exploration for and production of **geothermal** power, injunction third party access to facilities for extraction, processing and transportation of oil and gas, etc.



Draft Law amending the Law on the Use of the Danish Underground

Timetable

- Brought in the Parliament on 9 February 2011
- 1st treatment in Parliament 25-02-2011
- 2nd treatment scheduled for treatment scheduled for 17-05-2011
- Deadline for questions 31-03-2011
- Deadline for Response 26-04-2011
- Political Debate in Parliament 28-04-2011
- Deadline for political remarks and proposed amendment 02-05-2011
- Report Submission planned for 05-05-2011
- **3rd treatment in Parliament scheduled for 24-05-2011**
- **Division**



House prices in jeopardy due to possible natural disasters



The area will be uninhabitable



INFO Kæmper mod CO2-lager

Med formanden Asger Møller Madsen i spidsen drager foreningen 'Nej til CO2-lagring' torsdag til København. Her vil den nordjyske flok demonstrere i Københavns gader for at råbe folketingspoliikerne op og forsøge at sikre sig, at Vattenfall ikke får lov at deponere CO₂ i den nordjyske undergrund

23.02.2011

2:20



Stop seismic investigations Put them up here



Kæmper mod CO2-lager
Med formanden Asger Møller Madsen i spidsen drager foreningen 'Nej til CO2' nordjyske flok demonstrere i Københavns gader for at råbe folketingspolitikerne på, at de ikke får lov at deponere CO2 i den nordjyske undergrund.



Local demonstration of position in respectively Denmark and Germany



Joint demonstration of position at the Danish Parliament



Climate and Energy minister Lykke Friis: No CO₂ storage onshore preliminary

March 31th 2011 Climate and Energy Minister Lykke Friis dropped plans for a controversial CO₂ storage in northern Denmark

- The reality is now that we should not implement CO₂ storage onshore in the foreseeable future. We can look at it again in 2020 when we looked at experience in other countries, and then the parliament have a principled discussion of CO₂ storage on land, says Lykke Friis.
- It is the energy company Vattenfall, which for years has worked towards establishing CO₂ storage underground in large parts of Jammerbugt Municipality (Vedsted project), but the minister calls to a halt for the project now.



Lykke Friis:

No CO₂ storage onshore preliminary

Concern among local citizens

- Citizens in the area have been worried that the gas would leak out from underground stores and damage the countryside and farmland.
- Climate Minister Lykke Friis believes that interest must now unite for CO₂ storage under the seabed (off shore). According to the minister, the technology is here more thoroughly tested, not least in the U.S.. And companies must comply with a number of security precautions, said the minister.

Maersk wants storage in North Sea

- Specifically, the minister points to that Maersk and partners wants to get started with a project, where CO₂ will be used for EOR (Enhanced Oil Recovery) in the North Sea. The idea here is to use CO₂ to squeeze more oil and gas from the fields. The project will be implemented around 2015, according to Lykke Friis.



The world's largest offshore wind farm supplies its first power

| 2012 | MW | Mt CO ₂ |
|--------------|-------------|--------------------|
| Nysted | 132 | 0.5 |
| Horns Rev | 160 | 0.6 |
| Horns Rev 2 | 209 | 0.8 |
| Rødsand 1 | 166 | 0.6 |
| Rødsand 2 | 215 | 0.8 |
| Anholt | 400 | 1.5 |
| Total | 1282 | 4.9 |

Wind power 2008: 20 % of electrical power

The wind power capacity from wind farms offshore Denmark in 2012 will be

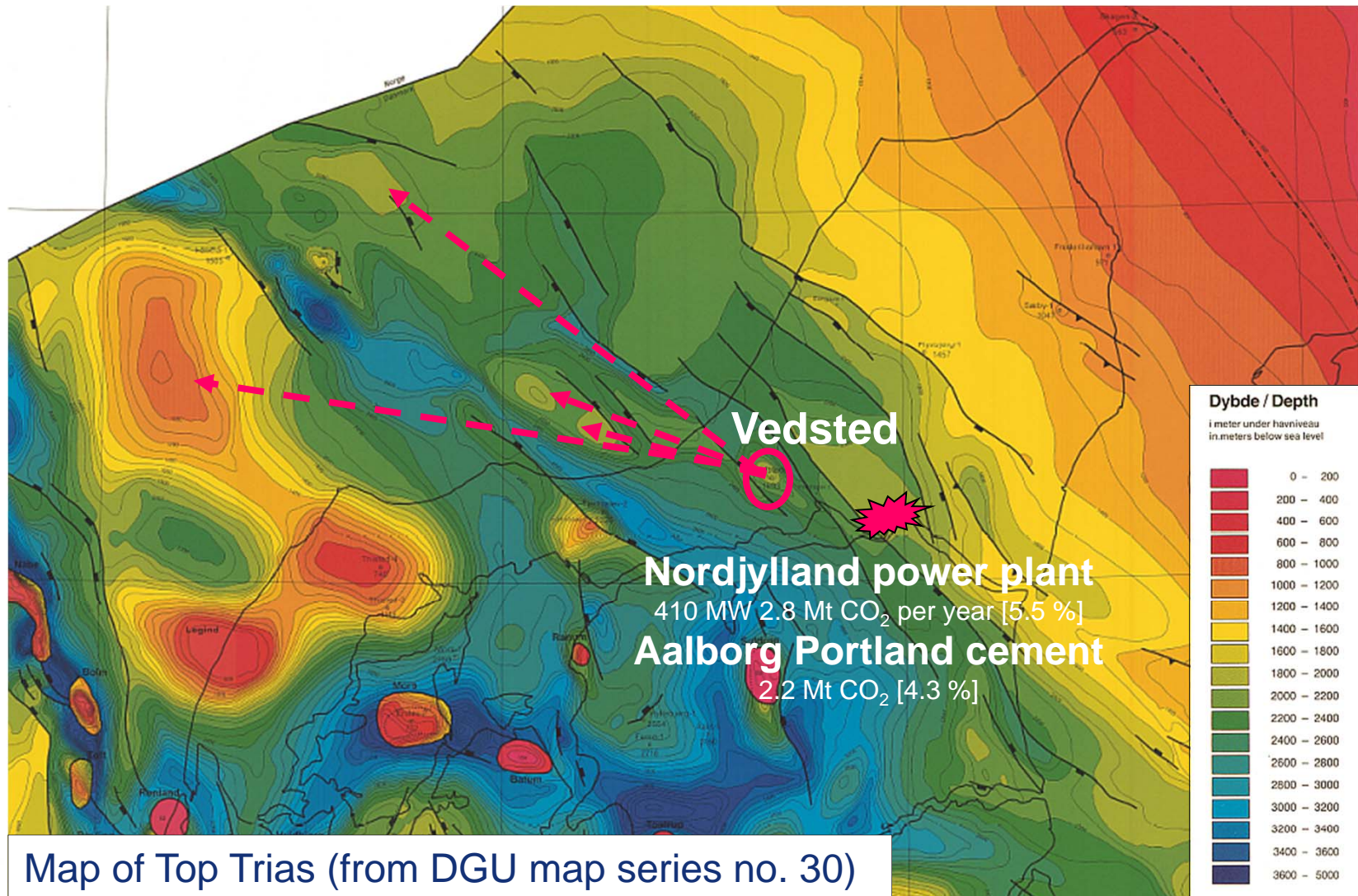
1282 MW ~ 4.9 Mt CO₂ [10 %]

Denmark 51 Mt CO₂ per year

Nordjylland power plant 410 MW
2.8 Mt CO₂ per year [5.5 %]

Aalborg Portland cement
2008 2.2 Mt CO₂ [4.3 %]

Top Trias \Leftrightarrow top Gassum Formation



Thank you for your
attention

