

# CO<sub>2</sub> Storage Regulation

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[www.npd.no](http://www.npd.no)



# International Treaties

## Marine Treaties

- **UNCLOS**
- **The London Protocol**
- **The OSPAR Convention** (regulates polluting activities in the sub-seabed and subsoil)

There are several pieces of legislations on the protection of marine environments and these will have a bearing on CCS regulatory activities. The most important of these legislations is the United Nations Convention on the Law Of the Sea (UNCLOS) 1982 which provides protection for all marine areas. Another is the London Protocol 1996 which replaced the London Convention of 1975 and whose purpose is to protect marine environments and prevent dumping of waste at sea.

- **CCS Regulation in the EU (CCS Directive)** The Directive sets out a regulatory regime for permitting of exploration and storage. The Directive applies to projects with intended storage of more than 100 ktonnes of CO<sub>2</sub>.

## Legal framework

The directive on the geological storage of CO<sub>2</sub> (so-called "CCS Directive") establishes a legal framework for the environmentally safe geological storage of CO<sub>2</sub> to contribute to the fight against climate change. It covers all CO<sub>2</sub> storage in geological formations in the EU, and lays down requirements covering the entire lifetime of a storage site.

- **Ensuring there is no significant risk of leakage or damage to health or the environment** (extensive requirements for the site selection)
- **Preventing any adverse effects on the security of the transport network or storage site** (The CO<sub>2</sub> stream must consist overwhelmingly of CO<sub>2</sub> , closely monitored, closure and post-closure obligations, financial security )

# CCS– just expensive and difficult?

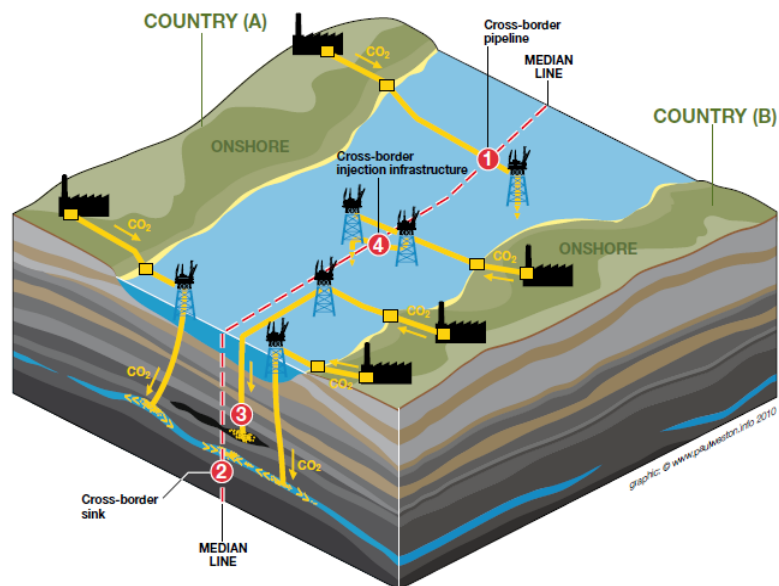
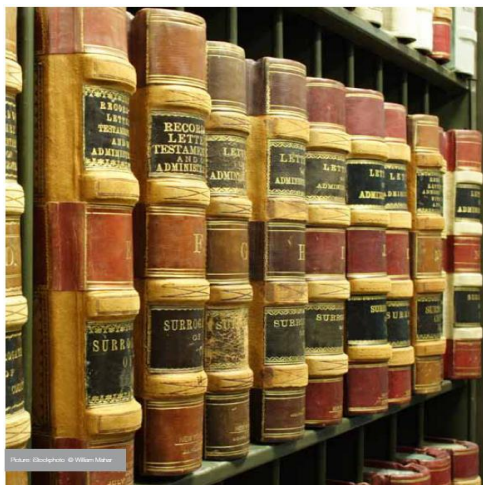
or can it be a part of a sustainable value creation

- ✓ Gas with high CO<sub>2</sub> content - Sales gas specification (Sleipner, Snøhvit)
- ✓ Enhanced hydrocarbon recovery
- ✓ Increased industrial production
- ✓ Offer good quality storage sites – business opportunities

**...and reduce the CO<sub>2</sub> emissions**



# Legal and regulatory issues



EU CCS Directive  
National regulations

Cross-border challenges

- Legal rights to transport CO<sub>2</sub> across borders
- Regulation of cross-border transport of captured CO<sub>2</sub>
- Storage complex spanning national boundaries
- Cross border impacts from storage operation
- Emissions accounting
- Mechanism to facilitate cross-border project development

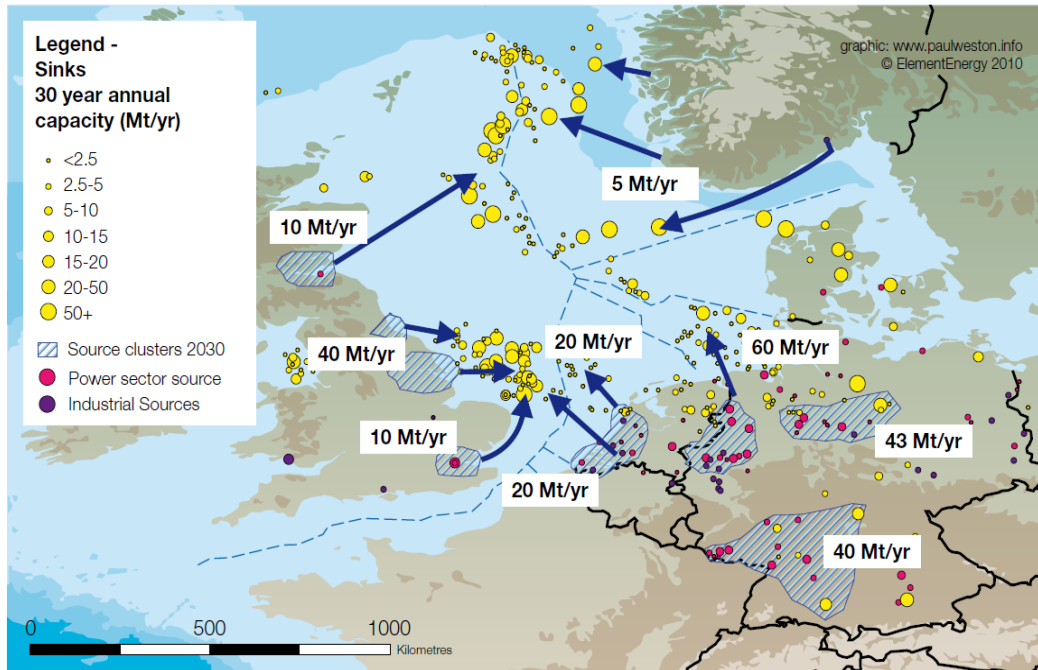
# CCS DIRECTIVE

- Exploration Permits
- Site Characterisation
- Site Certification and Storage Permits
- Scale of Projects
- Risk Assessment
- Classification and Composition of CO<sub>2</sub>
- Access, Property Rights and Ownership
- Site Operation and Closure
- Post-closure, transfer of responsibility and Liability Issues
- Financial Issues

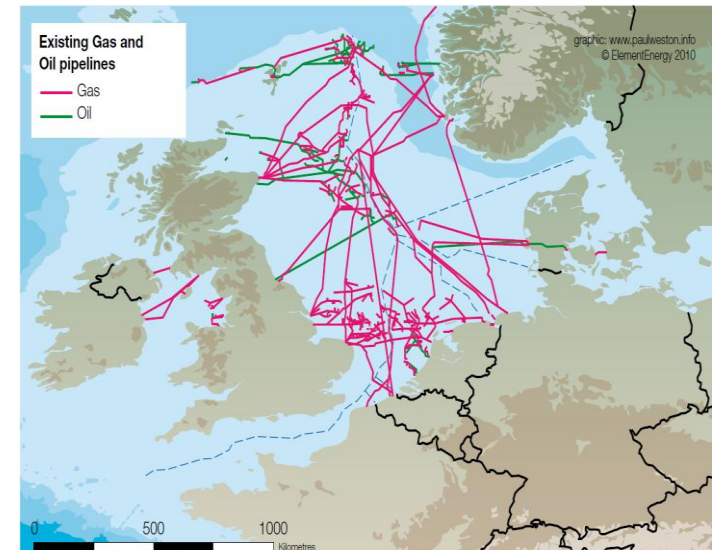
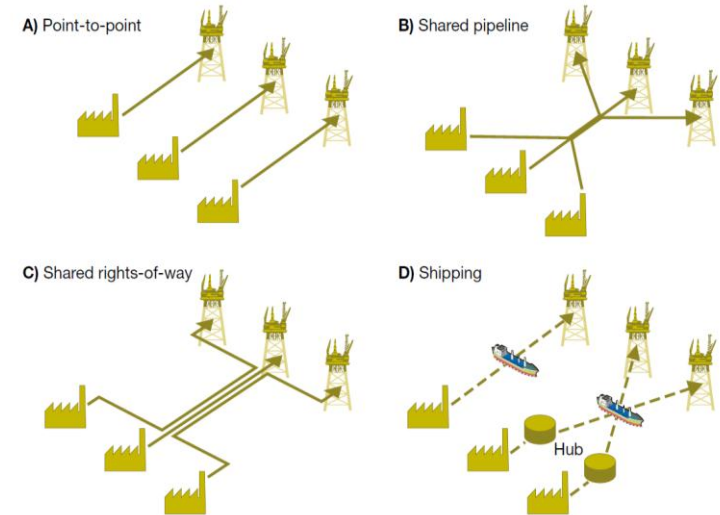


# CO<sub>2</sub> emissions and transportation

CCS transport and storage 2030 (Very high scenario)

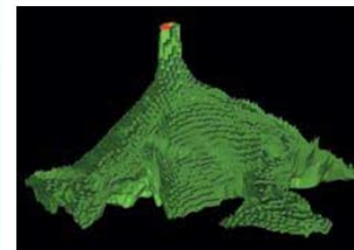
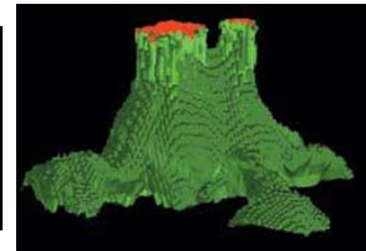
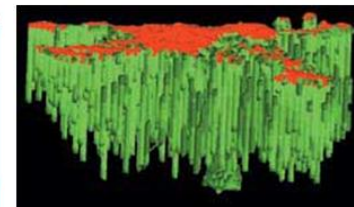
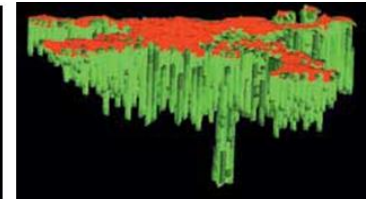
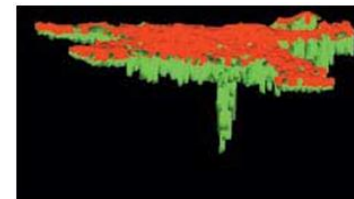
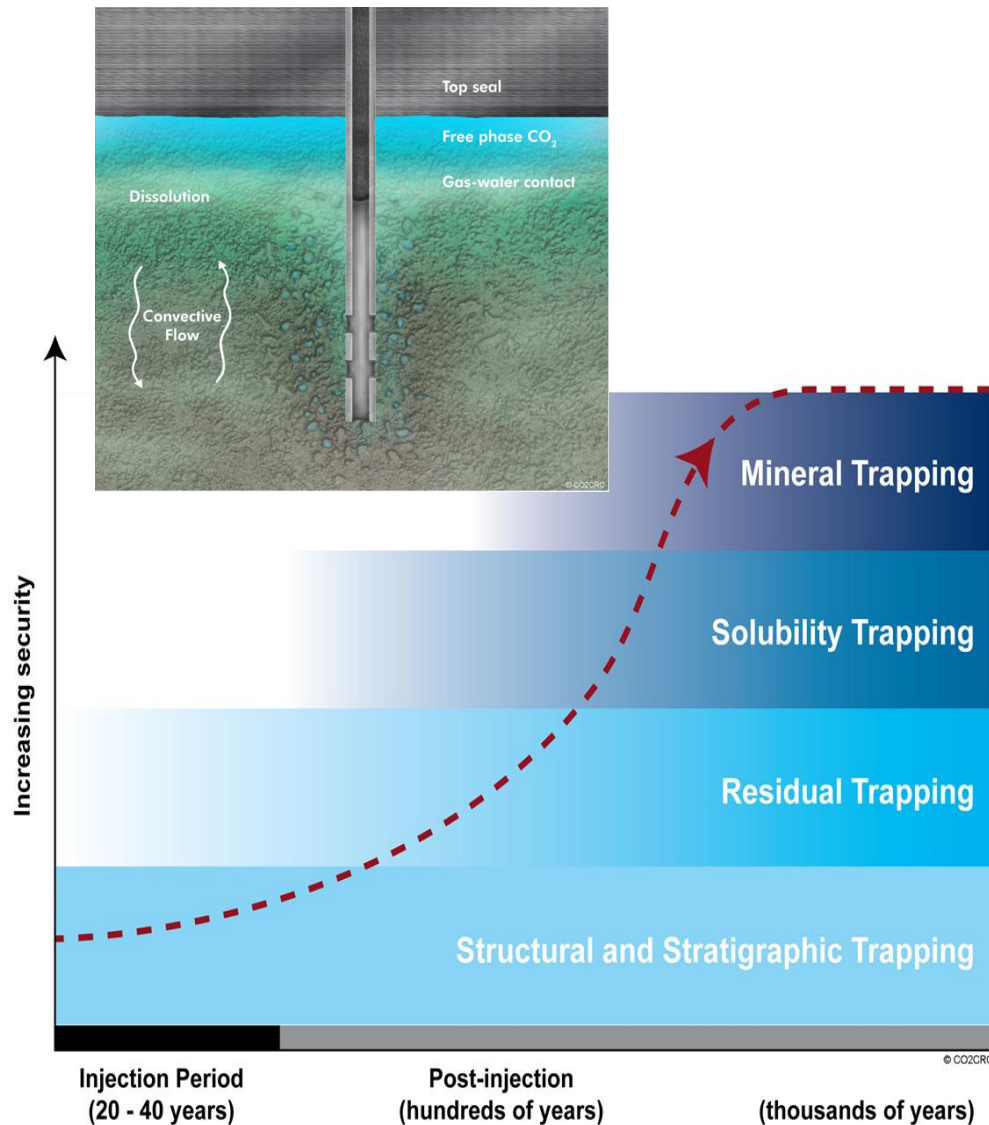


## Transport network topologies



Source: "One North Sea" 2010

# ..and after termination of CO<sub>2</sub>- injection?



source: Gemini nr 1, 2004  
(NTNU og Sintef)



# Before startup of CO<sub>2</sub> injection

- Make risk assessment
- Have a good monitoring programme in place
- Have a clear remediation and mitigation plan

...and do a baseline inspection

*“ With **appropriate site selection** informed by available subsurface information, a **monitoring program** to detect problems, a **regulatory system**, and the **appropriate use of remediation methods** to stop or control CO<sub>2</sub> releases if they arise, the local health, safety and environment risks of geological storage would be comparable to risks of current activities such as natural gas storage, EOR, and deep underground disposal of acid gas.”*

