



Policy and Legal Status -

- CO₂ Storage in European and Norwegian context

Policy and Legal

CONTENTS

- **International Politics**
- **International law**
- **European law**
- **Norway**
- **Summing up**

This is it!



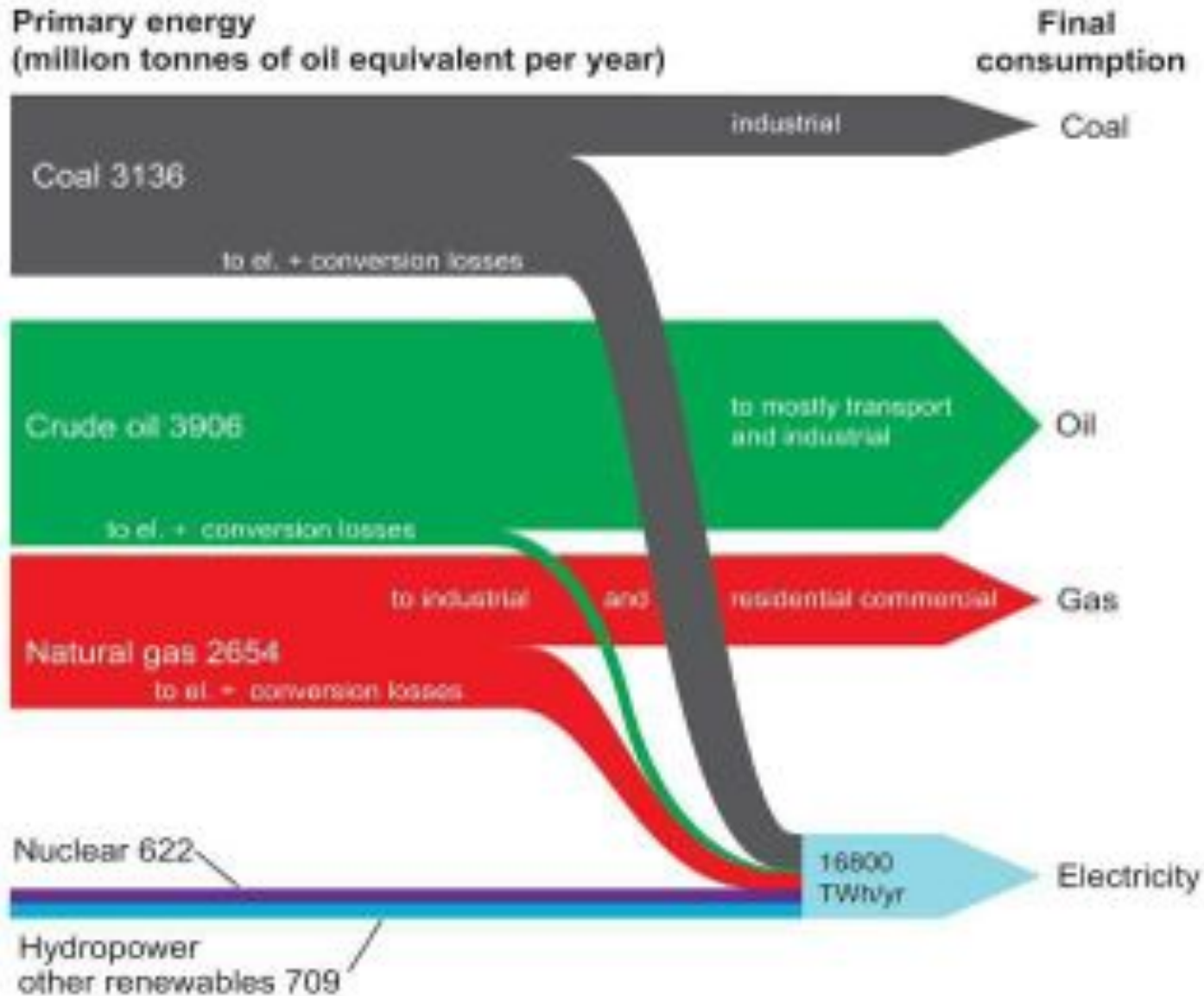
Dr. Ing. Tore A. Torp, CO2 Storage Adviser

Worst case scenario
is business as usual!

Need to get started now!



Simplified global energy flows 2007



DECARBONISATION OF FOSSIL FUELS TO ELECTRICITY AND HYDROGEN



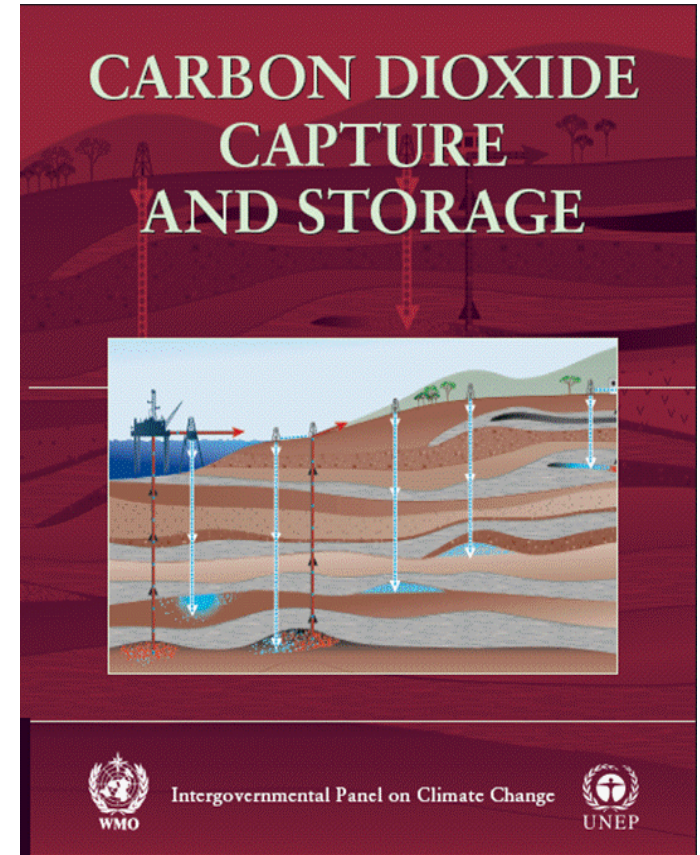
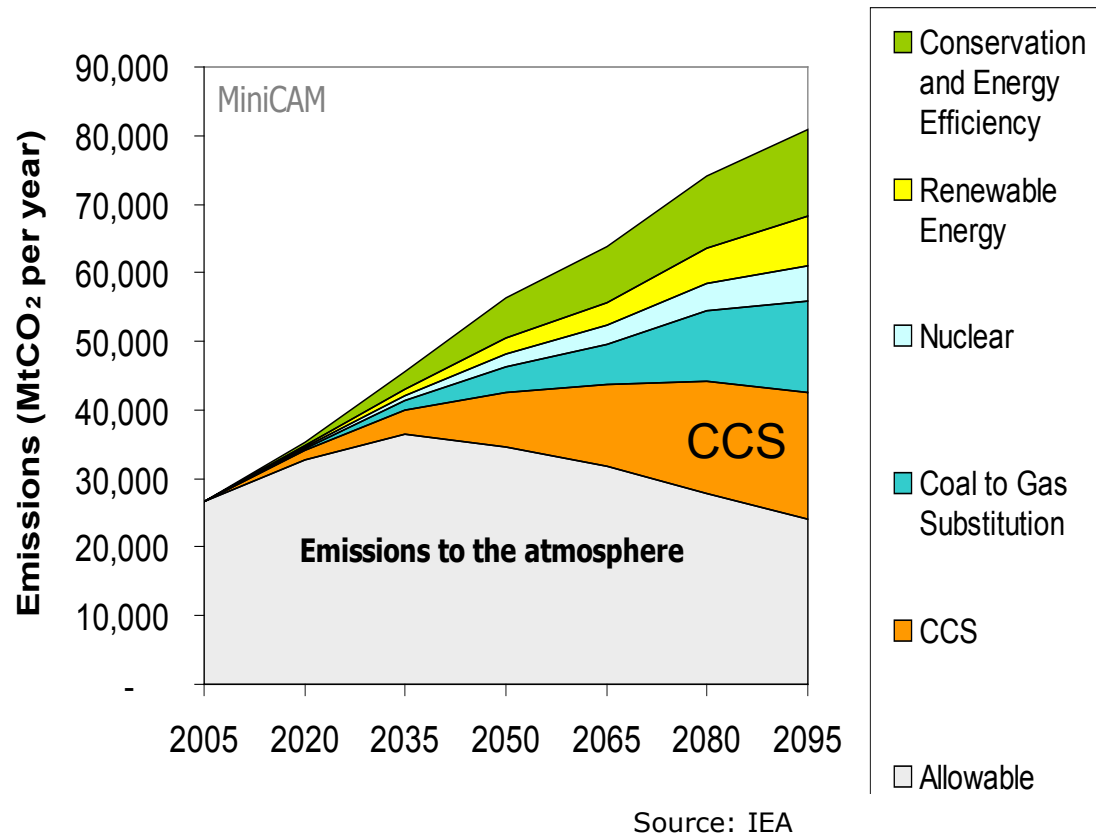
International Politics – Environment & Climate

- **London Convention** of 1972 protecting the seas:
 - London Protocol permits subsea CO₂ storage,
 - London Protocol agreed transboundary movement, Ratified **when ?**
- **OSPAR Convention:** (North East Atlantic++, else as LP)
- **Rio Convention** of 1992 protecting the climate:
 - **Kyoto Protocol 1997-2012. Prolonged -> 2020**
 - **Copenhagen – Dubai – Durban - ?**
 - **Agreed to agree 2015 on Protocol 2020 – CO₂ price?**

International Politics - CCS

- IEA (= OECD countries)
 - Defined cuts necessary to keep below +2 degree C by year 2050
 - **CCS on large emission points => 20 % of cuts needed**
- CSLF – 24 countries around the globe: Develop Technology
- G8 -> 9 -> 20 – Economic large countries consensus
 - **CCS R&D targets**
 - **Need to map storage capacities**
- London Convention / OSPAR Protocol
 - **CO2 storage below the oceans permitted**
 - **CO2 transboundary transport agreed – not yet ratified**
- IPCC Special report on CO2 Capture and Storage
 - **CCS feasible, effective and safe**
 - **Expects 99% retained after 1000 years?**

Potential for CCS – Power and Industry



Source: IPCC - Special Report on CCS (2005)

International law – CO2 Storage **under** oceans

- **London Convention** – Protecting the seas against dumping
(See OSPAR)
- **OSPAR Convention** – Protecting the North Atlantic against dumping
CO2 Sub-seabed storage permitted provided:

Operator:

- **EIA** – Environmental Impact Assessment
- **RA** – Risk Assessment
- **Plans** – Operate – monitor – (remedy?) - report – close – abandon

National authorities:

- **Permit** – Terms and conditions
- **Review** – Renew permit or demand corrective actions

International law – on CO2 Storage

- **Rio Convention / Kyoto Protocol**
Flexible Mechanisms:
 - **JI - Joint Implementation**
 - **CDM – Clean Development Mechanism**
Durban/Dubai meeting accepted CCS, i.e. CO2 Storage
 - **QT – Quota Trade**
- **ISO TC265 CCS 2012**
 - **WG Capture, Transport, Storage, Q&V and Cross Cutting**

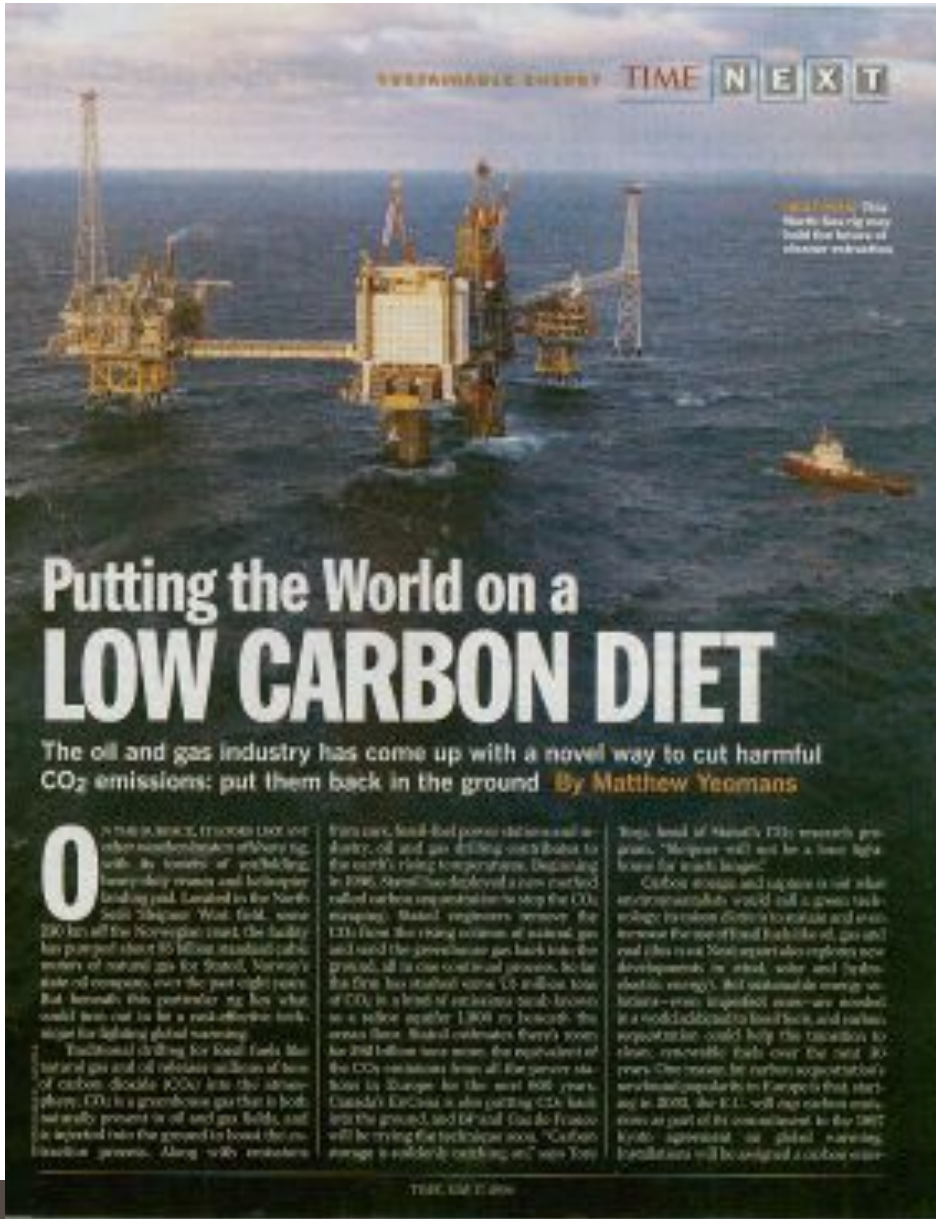
European law

- **ETS – European Trading System – «Cap and Trade»**
MRG – Measurement & Reporting Guidelines
 - Large Points (Power, steel, cement, refineries, aluminium, **paper**, etc.)
 - Transport (Pipelines, **ships, tank cars**, etc.)
 - **Storage (Underground and subsea)**
- **CCS Capture & Transport – Safety & Environmental laws and standards**
- **CCS Storage Directive**
 - National authority permit; 2 steps: 1) Explore and 2) Store
 - Operator document plans to protect safety and environment:
Develop – store – monitor – (remedy?) - report – close – abandon.
 - Operator responsible and guarantee
 - National authority decide when to take long term responsibility

CCS Directive - Norway

- **Petroleum and Environmental Protection laws** in force
 - **Sleipner** and **Snohvit**, both **on-going**

- **CCS Directive** valid:
 - **NOT YET implemented** - **“Not urgent?”**

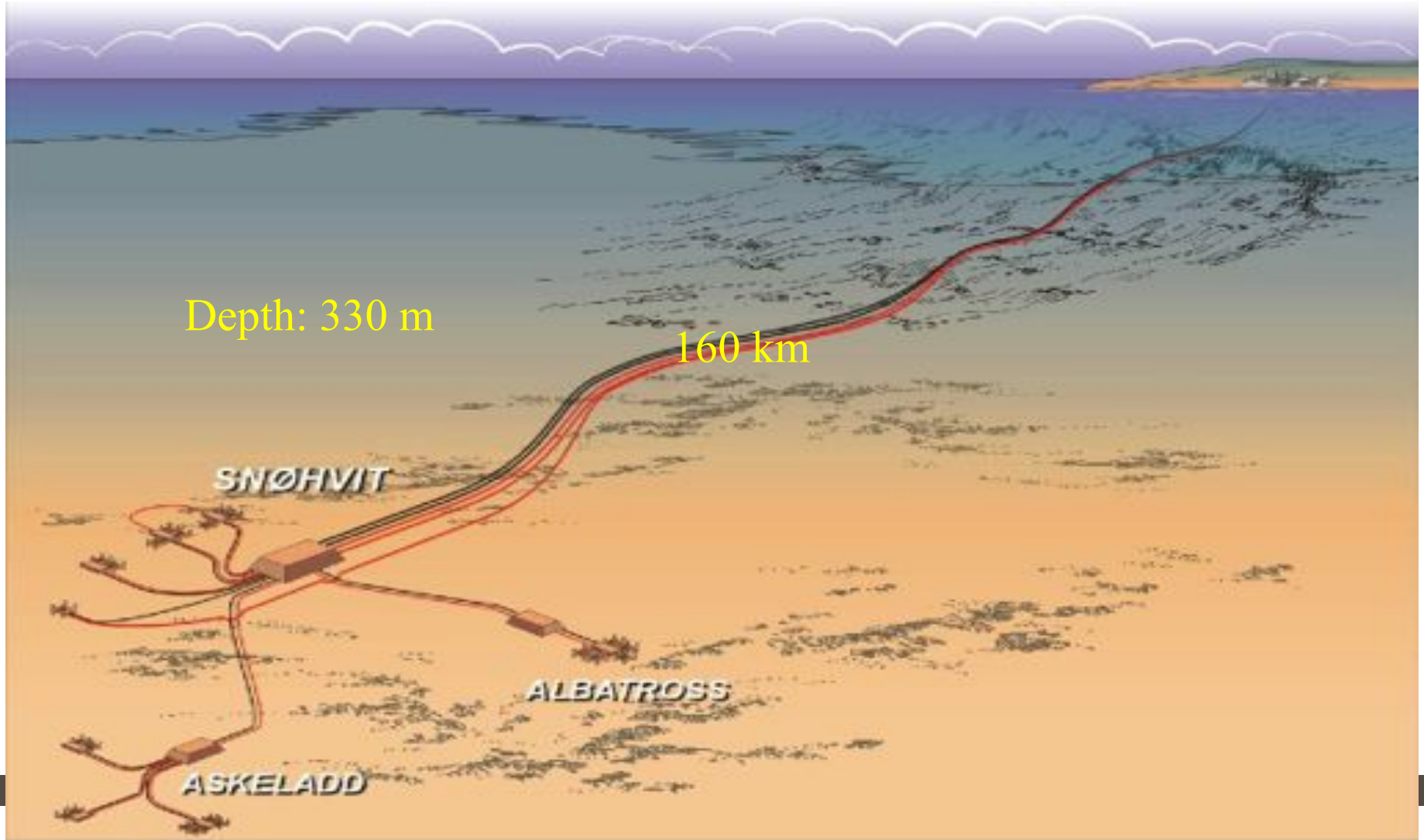


Sleipner CO₂ injection:

- Decided in 1992
- In operation since 1996
- 1 million tonne CO₂/year

Time Magazine,
17. May 2004

Snohvit 2008 – All subsea



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Summing up

- **Rio Convention**
 - Kyoto Protocol extended - **CDM**
 - Agreement in 2015 about 2020 – **Beijing Protocol ?**
- **IEA** – Power and Industry **CCS can cut 20%**
 - **Industry** smaller and lower cost ?
- **EU**
 - Target -80% in 2050 maintained
 - ETS & CCS Directives in force
 - **Small Industry CO2 Storage Pilots?**
- **Norway**
 - **Petroleum and Environmental Protection laws**
 - **Sleipner & Snohvit on-going**
 - **EU Directive implementation delayed**
- **ISO TC265 CCS – WG's started**