Norwegian Carbon Capture and Storage Projects

Tor Fjærän, Senior Vice President
Corporate HSE, Statoil

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Carbon Capture and Storage Projects

- Snøhvit
- Halten CO₂
- Sleipner

Norway
The Sleipner experience – our starting point

- Started in 1996 separating and injecting 1 mill. tons CO₂ annually
- Storing in saline aquifer above reservoir
- Global demostration case
CO₂ injection in the Utsira formation

Sleipner A

CO₂ injection well

Utsira formation

Ty formation

2001 perspective view of CO₂ accumulations

2004 2001 1999

Thickness maps of the most extensive layer

1999 1996

Bright seismic reflections indicate thin layers of CO₂
Sleipner CO$_2$ dissolution model

After 25 yrs

After 400 yrs

After 600 yrs

After 3000 yrs

After 5000 yrs

Source: Gemini No. 1, 2004 (NTNU and Sintef)
Snøhvit LNG – offshore piped and stored CO₂

- Starts in 2007
- Piped CO₂ from onshore LNG plant
- Storing 700,000 tons CO₂ annually
- Injecting below reservoir
Snøhvit – Gas and CO₂ flow

Wellstream

CO₂

OFFSHORE

ONSHORE
Reinjecting 700,000 tons CO$_2$/year
The Halten CO$_2$ Project
Halten CO₂ value chain principles

Power plant 2011/12
CO₂ Capture 2011/12
Draugen 2011/12
Heidrun 2018/24
An Industrial Solution

A win-win-win for:

• Industry
  – Large-scale CO₂ for EOR
  – Improved security of supply

• Environment
  – Reduction of CO₂ and NOx emissions through offshore electrification
  – Industrial utilisation of greener fossil fuel technologies with a global market potential

• Society
  – Prolonged field life and increased oil recovery
  – National electricity grid benefits
R&D key to future solutions

Storage
- GESTCO
- CO₂STORE
- SACS
- CASTOR-S
- CO₂SINK
- CO₂ReMoVe?

Transport
- Pipeline
- Ship
- CO₂NET
- OK!

Capture
- ENCAP
- CASTOR-C
- 2005
- Hypogen Coal?
- Dynamis?
- Hypogen Gas?

TRUST

COST

STATOIL
Summary and conclusions

- CCS technically proven
- Enormous potential
- Value chain approach
- Financial mechanisms key to initiate projects
- Key element in meeting the global climate challenge