LNG technologies - Norway as a frontrunner

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- The petroleum sector’s share of GDP: 21%
- The petroleum sector’s share of total investment: 24%
- The petroleum sector’s share of total exports: 47%
- The petroleum sector’s share of State revenues: 28%

Sources: Statistics Norway, White Paper no. 31 (2004-2005), Ministry of Finance
Gas investment requirements 2003-2030

• Cumulative investment in the natural gas supply chain over the projection period will be $2.7 trillion.

• North America alone will account for over a quarter of total investment in natural gas.

• By 2030, half of inter-regional gas trade is projected to be in the form of LNG.

The Norwegian Gas Sector

- 50 fields producing gas
- About 4000 miles of large offshore pipelines
- Two of the larger gas processing plants in the world
- Supplies about 14% of European gas consumption
Ministry of Petroleum and Energy

Norwegian Gas Resources

North Sea - 115 TCF
Norwegian Sea – 64 TCF
The Barents Sea – 27 TCF

Total: 206 TCF

Produced (16%)
Discovered (52%)
Undiscovered (32%)

Source: NPD
Norwegian gas production

- Gas injection*
- Additional Sales
- Historical and contracted volumes

*Including fuel and flaring
Snøhvit LNG

- Recoverable reserves:
  - 6.7 TCF gas
  - 133 MMbbls condensate
- Production start: 2006
- Investment costs: 6 bill. USD
- Gas production 0.55 bcf/d
  - Destinations: USA and Europe
- Import capacity acquired at Cove Point
- Statoil – main gas marketer

Map showing the route from Melkøya to Cove Point with a 20 days roundtrip.
Government Principles for R&D

• Forging links
• Developing networks
• Creating synergies
• Co-funding

Research Institutions

Oil Companies

Supply Industry
Onshore LNG regasification terminals

AkerKvaerner:
Exclusive partnership with IHI on 50/50 basis for U.S.A and Canada
Norwegian LNG Technology

Aker Kværner Offshore LNG terminals
→ Northern Baja California.

ChevronTexaco
→ North Adriatic Sea.

The Kværner group developed LNG carriers with spherical tanks in the early 1970s.

This design now dominates the market, accounting for about 50 percent of the world fleet.

Source: Statoil/AkerKværner
HiLoad LNG Regas

Source: Remora Technology AS
Conclusion

• The NCS is a stable long-term source of supply for both oil and gas.

• LNG receives increasing focus.

• Strong R&D clusters - a key to unlock further values in the LNG chain.

• Co-operation with international partners is paramount.
Internet address

www.oed.dep.no

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The global LNG market

Gas value chain

Field Development

Onshore

Liquefaction

Offshore

Offshore

Receiving

Onshore

Gas Distribution

Power Generation