Norwegian Minister of Petroleum and Energy, Einar Steensnæs

Norwegian Energy Scene

Global Energy Foresight Seminar
Norwegian Academy of Technological Sciences

Stavanger 26 May 2004
Energy Production & Total Final Consumption, 2003

- Coal, Coke
- Bio
- Electricity
- Gas
- Petroleum Products
- Crude Oil

Ministry of Petroleum and Energy
Production and Net Export of Liquids* 2003
(kilde: Petroleum Economics Ltd)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production</th>
<th>Net export</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>9,88</td>
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<tr>
<td>Russia</td>
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<td>Norway</td>
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<td>Algeria</td>
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</tbody>
</table>

* includes both crude oil and NGL
Norwegian Natural Gas Exports 2003

Total exports: 71,1 BCM

- Germany: 34.2%
- France: 18.8%
- Great Britain: 12.3%
- Netherlands: 8.9%
- Belgium: 9.2%
- Spain: 3.4%
- Czech Republic: 3.5%
- Italy: 7.9%
- Austria: 1.1%
- Denmark: 0.1%
- Poland: 0.6%

Source: NPD
The Long Term Scenario

- Undiscovered resources
- Resources in discoveries
- Increased recovery
- Reserves
- The long term scenario

Source: MPE/NDP
Sources of National CO₂ Emissions by Sector

- Road traffic: 23%
- Oil and gas operations: 28%
- Heating: 17%
- Coastal traffic and fishing: 9%
- Other industrial processes: 17%
- Other mobile sources: 6%

Source: MPE 2004
World Energy-Related CO₂ Emissions

World emissions will increase to 70% above 2000 levels in 2030
Carbon Sequestration and Hydrogen
EOR and the Norwegian Resource Base

Source: Norwegian Petroleum Directorate
Policy for Realization of Gas-Fired Power Plants with Carbon Capture and Storage

A strategy for more cost effective solutions, which may lead to an earlier realization of full scale gas-fired power plants with carbon capture and storage:

- Government grants for R&D
- Investment support from 2006
- Establishment of a innovation company
- Facilitating the use of carbon dioxide for EOR
Increased Efforts to Develop Carbon Capture Technologies

- The Norwegian Government increases the efforts to develop carbon capture technologies to gas-fired power plants.

- A fund of NOK 2 billions ($290 mill) to support pilots and demonstration projects.
Increased Renewable Energy Production

The Government’s objectives are to:

– Increase annual use of central heating based on new renewable energy sources, heat pumps and waste heat of 4 TWh by the year 2010

– Install wind power capacity of 3 TWh by the year 2010

– Limit energy use considerably more than if developments were allowed to continue unchecked
The Norwegian Hydrogen Commission

• Appointed by the Norwegian Government

• Is to formulate national goals, actions and incentives in order to develop hydrogen as an energy carrier.

• The Commission shall elaborate a national program covering
  – production,
  – storage,
  – distribution and
  – use of hydrogen in the transport sector and in stationary applications.
The Norwegian Hydrogen Commission

- Should cover institutional organization of the program
- Legal and administrative terms shall be raised
- The Commission will present its report to the Minister of Petroleum and Energy and the Minister of Transport and Communications by 1 June 2004.
Oil and Gas Innovation in Norway
Main Instruments

5 Focus Areas

- Environment
- Increased recovery
- Deep water
- Small fields
- Gas value chain

Coordinated R&D

- Energy industry
- Service and supply comp.
- Institutes and universities

New technology
OG21 Priorities & Technology Targets Areas (TTAs)

OG 21 Priorities

- Environment
  - Increased recovery
- Deep water
  - Small fields
- Gas value chain

Technology Target Areas

- Environment
  - Zero harmful discharge to sea
  - 30% reduction in emissions to the atmosphere
- Deep water
  - Stimulated recovery
  - Cost effective drilling
  - Real time reservoir management
  - Deep water floating technology
  - Long range transport of well stream
  - Seabed and downhole processing
- Small fields
- Gas value chain
  - Competitive gas production and offtake
Carbon Sequestration Leadership Forum
International Partnership of the Hydrogen Economy
Conclusions

- New technological solutions required to shape our energy future
- International partnerships important
Internet address

- [Norway] www.oed.dep.no
- [UK] www.mpe.dep.no