



OLJE- OG ENERGIDEPARTEMENTET

# Member Statement Norway

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# Strategy for Norwegian hydrogen activities

- Joint process between
  - Ministry of Transport and Communication
  - Ministry of Petroleum and Energy
- Follow-up of the Norwegian Hydrogen Commission's report (2004)
- Presented by the two ministers in August 2005
- Coordination of different authorities' hydrogen programmes and activities – creating a national hydrogen platform.
- From 1 January 2006



# Why?

- Why focus on hydrogen RD&D in Norway?
  - exploit Norwegian natural gas resources
  - develop new industry – value creation
  - reduce emissions – particularly in transport
  - participate in an international research agenda
- Why a strategy?
  - coordinate hydrogen activities
  - increase focus and attention on hydrogen
  - create a common vision and common goals
  - clarify actors roles and responsibility

# National Hydrogen Platform

- Create a national hydrogen platform where today's activities are coordinated under one umbrella
- Comprising basic research, applied R&D and demonstration activities
- Support projects covering production, storage, distribution and/or use of hydrogen
  - within transportation or in stationary applications
- Support information and education activities as well as international co-operation activities
- Contribute to the development of safety criteria, codes and standards, regulations, certificates, etc.

Hydrogen strategy

## Hydrogen platform

Co-ordinate – focus – inform – one address

**SECRETARIAT**  
administration

### INFORMATION AND EDUCATION

Info. activities:

- Publications
- Web-sides
- Program info.
- Project info.

Education activities:

- User competence
- Demo projects

### PROJECTS

Research Council

- New renewables
- Materials
- Basic research

Enova: RES demo

Gassnova: No CO<sub>2</sub>

Innovation Norway

International

### INTERNAT. CO-OP.

Strategic processes and arenas

- EU
- IEA
- Nordic
- IPHE
- Others

**STRATEGIC ADVISORY BOARD**

Safety

Standards

Regulations

Certification

Others

# Involved Authorities

- Ministry of Petroleum and Energy
- Ministry of Transport and Communications
- Ministry of Education and Research
- Ministry of Trade and Industry
- The Research Council of Norway (**secretariat**)
- Enova – public enterprise for new renewables and energy efficiency
- Gassnova - centre for environmentally friendly gas technologies
- Innovation Norway – promotion of nationwide industrial development
- Norwegian Water Resources and Energy Directorate
- Directorate of Roads
- Directorate for Civil Protection and Emergency Planning
- Norwegian Pollution Control Authority

# HyNor – The Hydrogen Road of Norway

- Demonstrate the commercial viability of hydrogen production and use in the transport sector
- Real life implementation of hydrogen infrastructure along a route of 580 km from Oslo to Stavanger
- Demonstration period 2005-2008



# HyNor (cont.)

- Includes various hydrogen production technologies and uses of hydrogen
- 5-7 filling stations. Hydrogen from:
  - electrolysis (hydro, waste, solar panels)
  - biomass
  - petrochemical plant
  - natural gas steam reforming
- Buses, taxis, private cars
- Urban, inter-city, regional, long national transport





# HYTREC – Hydrogen Technology Research Centre

- A research and demonstration centre comprising of
  - hydrogen production units
  - hydrogen storage unit
  - hydrogen filling station
  - visitors and research centre
- Production of hydrogen from
  - water electrolysis
  - natural gas steam reforming with CO<sub>2</sub> capture
- Use of hydrogen for
  - transportation
  - heating/electricity production

# HYTREC (cont.)

- To be established in Trondheim, Norway
- Partners
  - Statoil - CO<sub>2</sub> free energy from natural gas
  - Statkraft - Environmentally friendly energy
  - DNV - Safety, classification, certification
- Time schedule: 2005 - 2008
  - Start up 2005
  - Visitors and research centre 2006
  - Hydrogen production 2007
- Tentative budget: 55 MNOK (USD 9 mill.)

# TH!NK hydrogen

- A battery driven car
- Manufactured in Norway
- With a hydrogen fuel cell range extender
- Doubling the driving range to 300 km
- Prototype in 2005
- Small series in 2007

