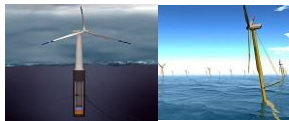


HyNor
Presentation for IPHE, March 9, 2009

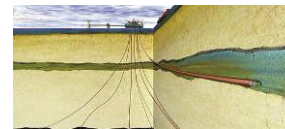
Ulf Hafsel, Head of Business Development Hydrogen, StatoilHydro



New energy portfolio



Wind



CCS



Biofuel



Hydrogen



Tidal



Energy systems



Wave



Kyoto CDM/JI

StatoilHydro delivers hydrogen solutions for Europe

- **ECTOS/HyFLEET:CUTE/SmarrH2**
Hydrogen station Reykjavik
- **CUTE/HyFLEET:CUTE –**
Hydrogen station Hamburg
- **CEP Berlin**
Hydrogen production Messedam
Planning new station in Holzmarkstrasse
- **Utsira Wind-Hydrogen plant**
- **HyNor –**
Grenland Hydrogen station, Oslo and
Drammen car stations, Risavika



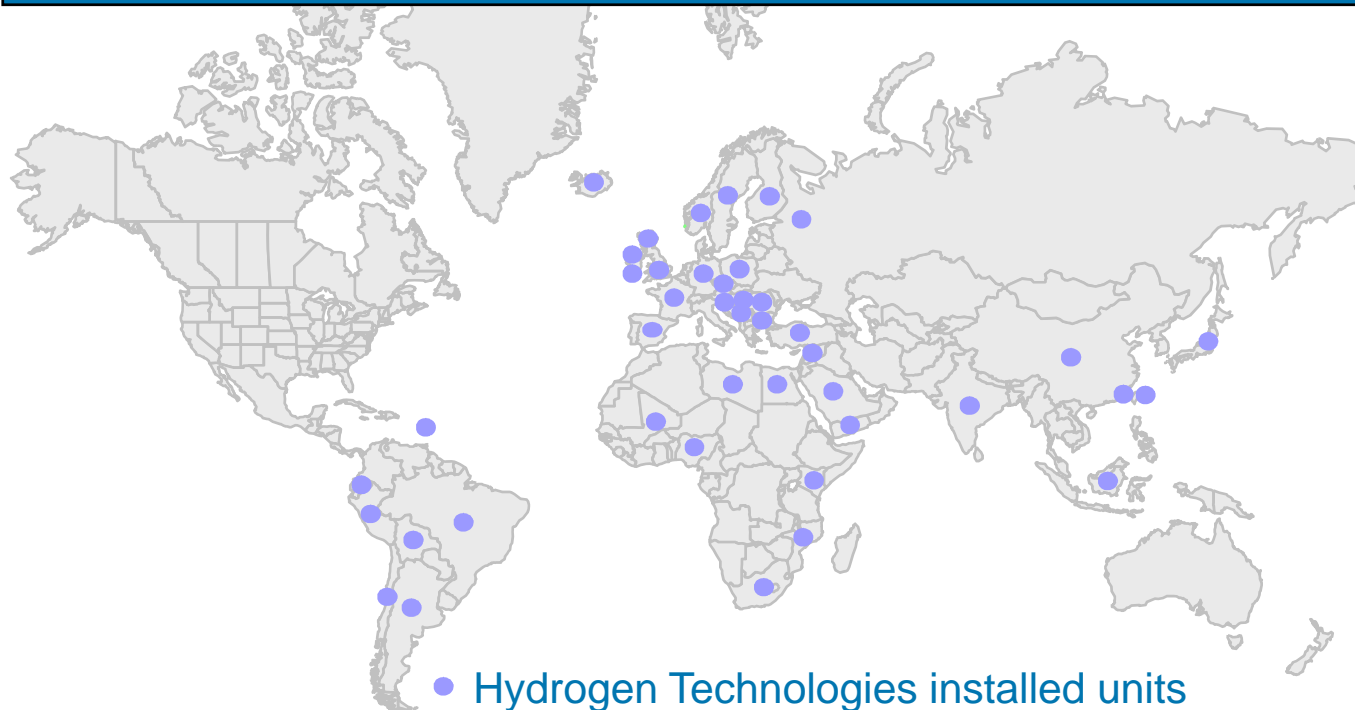


Developing Hydrogen as a transport fuel

- Participating in demonstration projects on hydrogen to transport
- Developing solutions for hydrogen stations
- Developing a hydrogen fuel market
- Establishing business and operational models

75 years of experience with electrolyzers

StatoilHydro has – through Hydrogen Technologies – more than 75 years of experience in water electrolysis and has supplied more than 500 plants worldwide.





The Hydrogen Road of Norway

HyNor

StatoilHydro

HyNor Objective

- The HyNor project was established in 2003 with the objective of a broad market demonstration of hydrogen for transportation in Norway, described by the following vision:

“In 2009 it shall be possible to drive hydrogen fuelled vehicles between Stavanger and Oslo ”

- This is to be achieved by establishing local nodes along the 580 km long road – “The hydrogen road of Norway”

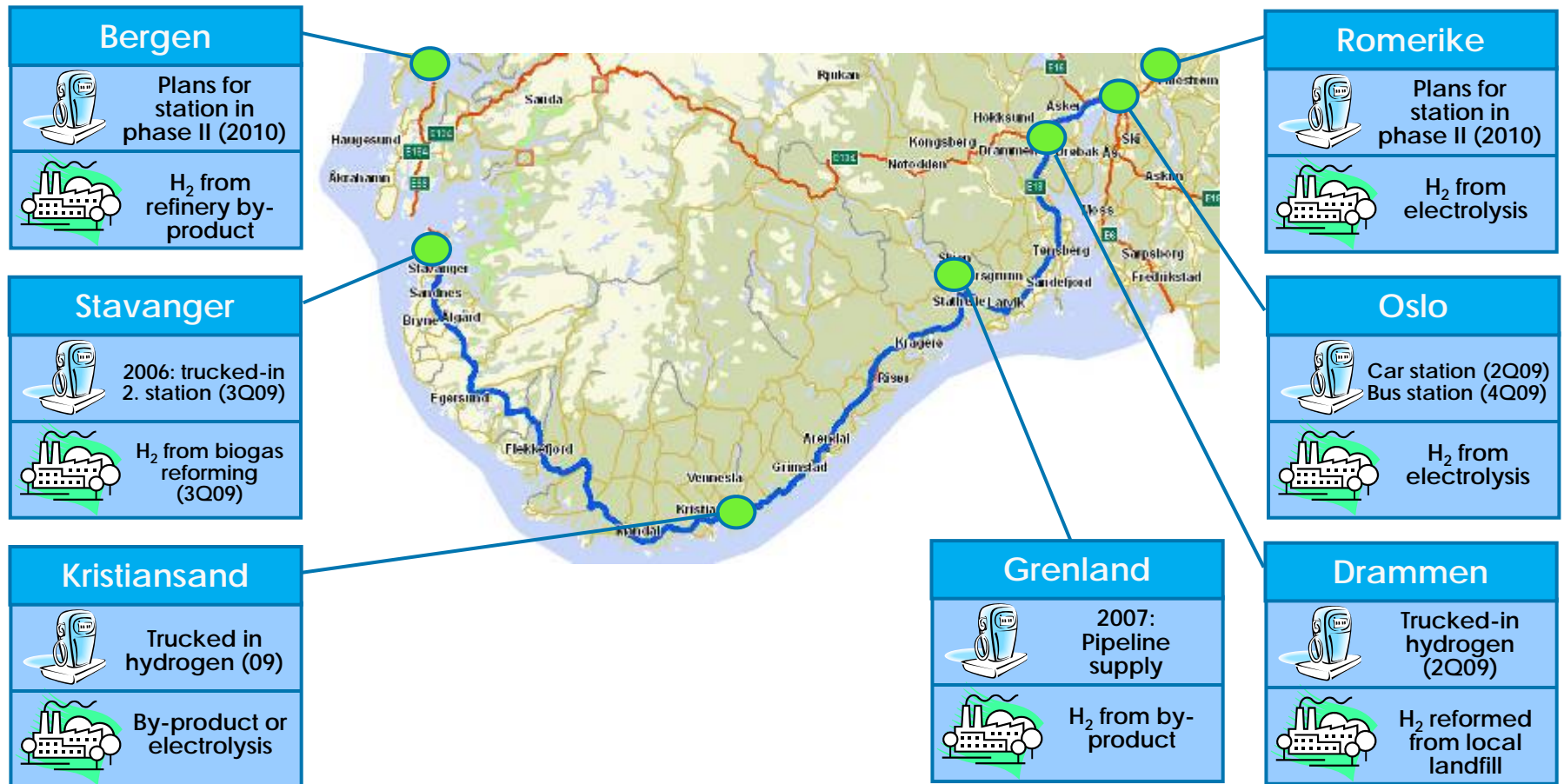


The Hydrogen Road of Norway

HyNor: Public Private Partnership at work

- Introducing a new fuel requires a major co-operation effort
 - HyNor has more than 50 partners organised in the various nodes
- PPPs are needed in the early development phase
 - HyNor is a good example of successful implementation of PPPs
- Example Grenland:
 - Partners in HyNor Grenland are:
Høgskolen i Telemark, Zero, TelTek, Miljøbil Grenland, Ineos (Hydro Polymers), Telemark Fylkeskommune and StatoilHydro
 - with car partners: Quantum Technologies, Porsgrunn Kommune, Vekst i Grenland, Skagerak Energi, HiT, Choice Hotels, Hydro and StatoilHydro
 - and funding from Department of Transport via Norwegian Research Council

The HyNor nodes





HyNor Stavanger – Norway's 1st Hydrogen Station

- Opened August 2006 as an integrated part of a petrol station
- Hydrogen, NaturalHy (8% H₂ in Natural Gas) and Natural Gas
- Start-up with trucked in hydrogen, dispensers for 350 and 700 bar hydrogen
- Phase II with production of H₂ from biogas + second filling station



HyNor Grenland – A World class hydrogen station

- Several technology innovations
- Directly linked to large scale hydrogen production, scalable solution
- Possibility for supply and back-up for other HyNor stations
- 10 hydrogen cars in operation at the station
- Upgrading to 700 bar technology



HyNor Oslo and Drammen

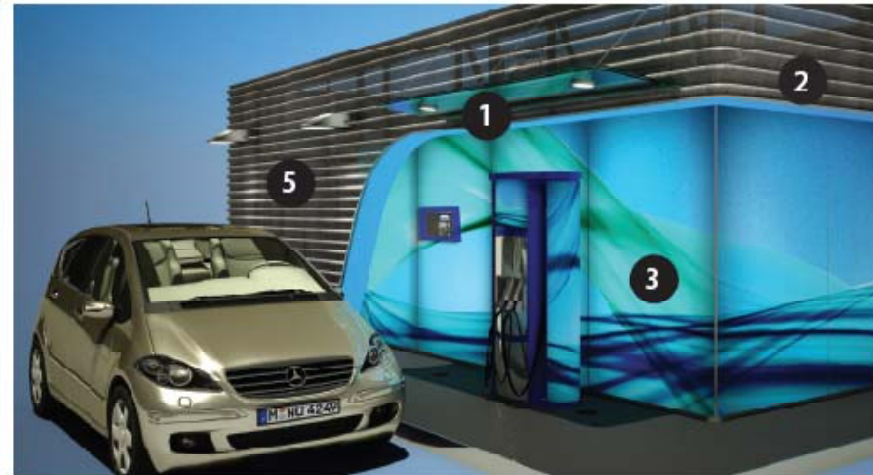
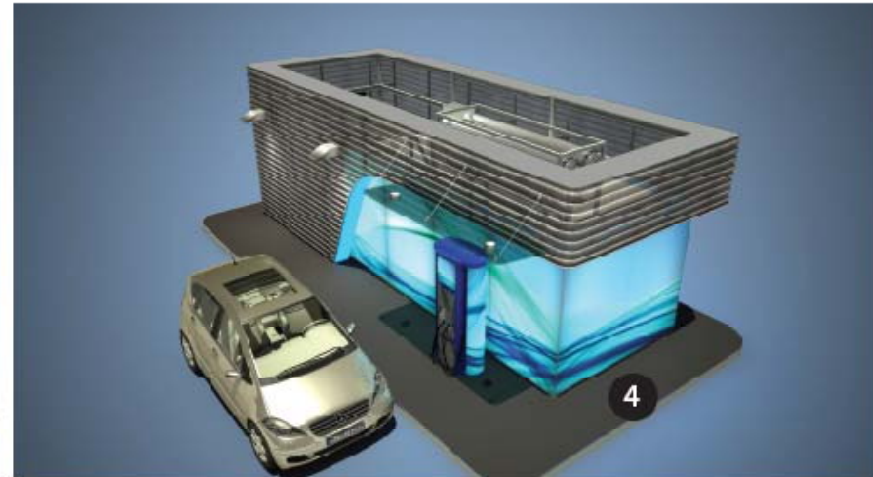
- Plan for 4 buses and 20 cars
- Car stations will be in operation by May 2009
- Production sites demonstrating leading technology
 - Bus station in Oslo with production of hydrogen from water with electrolysis
 - Drammen with hydrogen produced from bio waste



Bringing hydrogen into the petrol station

StatorilHydro

Hydrogen station > Concept overview, part 2

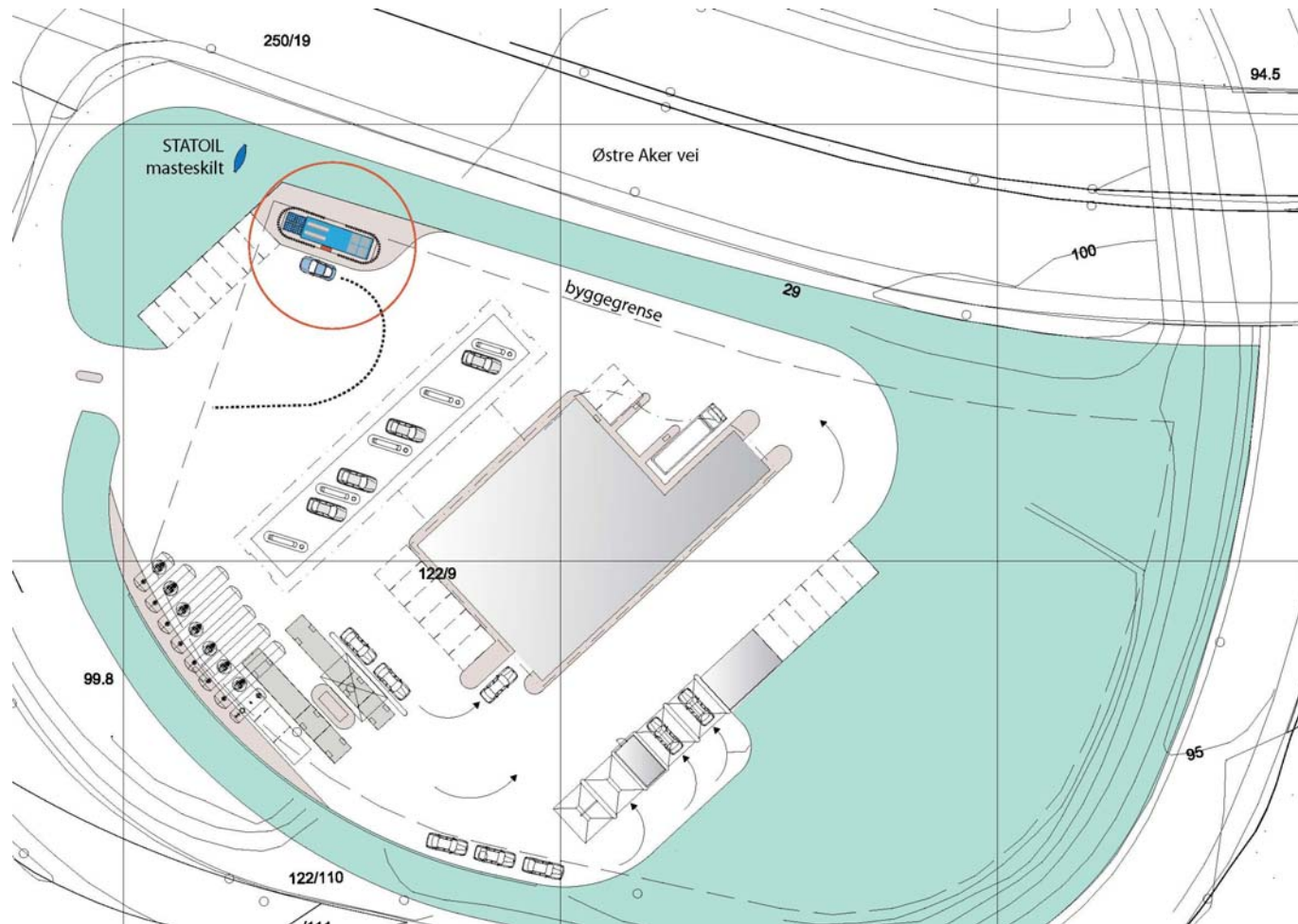


References

1. Glas canopy
2. Facade panels, perforated steel
3. Perforated print panels
4. Elevated floor surface

5. Steel frame with LED light insert

Hydrogen station Økern



VEHICLE FLEET IN HYNOR/SHHP



Hydrogen Prius:
converted to
hydrogen operation
by Quantum US, 15
cars in Norway



Think Hydrogen:
A hydrogen/electric
hybrid, 5 cars to
HyNor in 2009



Mazda RX8:
Hydrogen/petrol,
dual fuel, 30-40 cars
to HyNor/SHHP in
2008 - 2010



Buses:
Plans for 8
buses in HyNor
2010-2011



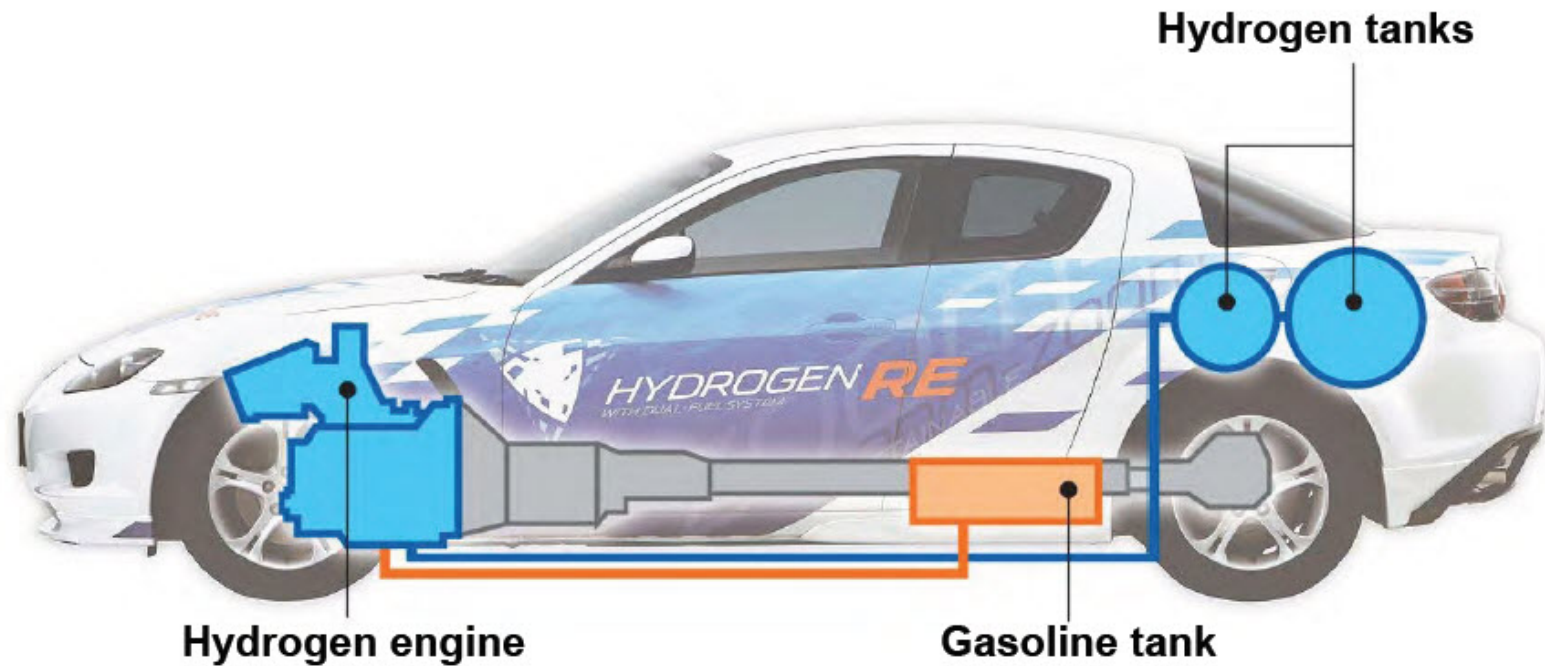
More cars:
Dialogue
ongoing with
several car
manufacturers
for larger series
of cars to
HyNor and
SHHP



Agreement between Mazda and HyNor signed November 7, 2007

StatoilHydro

Mazda RX8 Dual Fuel



H2 \rightleftharpoons **Gasoline**

Fuel selector switch

Viking Rally and EVS24



www.vikingrally.no

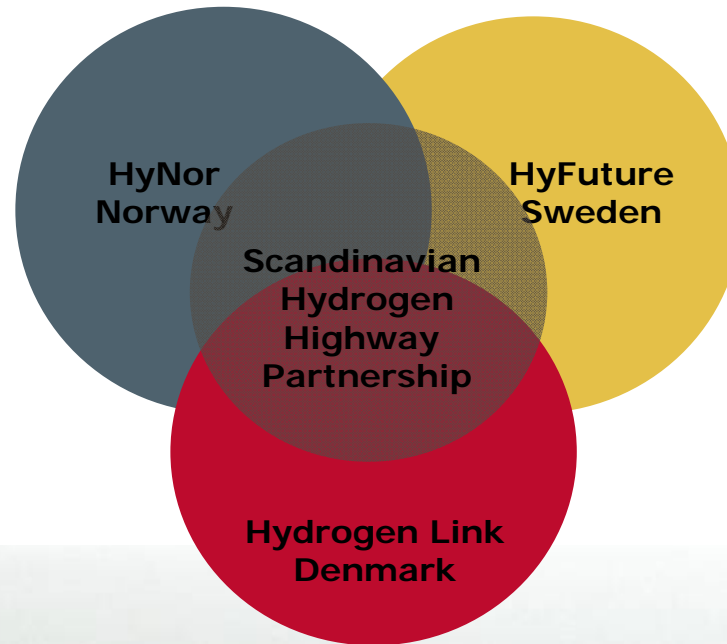
www.evs24.org

StatoilHydro

The Scandinavian Hydrogen Highway Partnership



JOINING FORCES



Making the Scandinavian Region one of the first regions in Europe where hydrogen is commercially available and used in a network of refuelling stations



Building a network of hydrogen stations



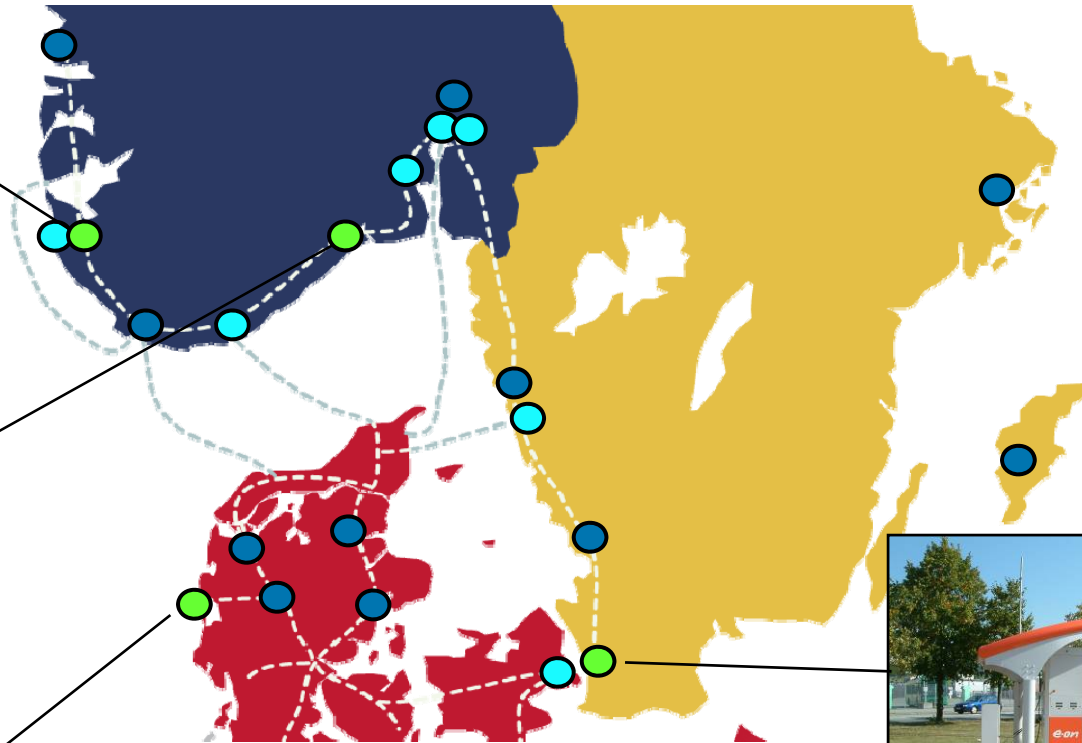
Stavanger



Porsgrunn (Grenland)



Ringkøbing



- 4 stations are opened
- 7 planned for 2009
- 11 sites under evaluation



Malmö



RAISING THE AMBITIONS



- We are looking at the next level of development for 2009 – 2015
 - SHHP aims to become a Lighthouse Project in EU
- A network of Hydrogen stations
- A large fleet of vehicles
- H2 Moves Scandinavia
 - Proposal for a demonstration project in the EU – JU 1. call
 - Location Oslo



Conclusions

- HyNor is among the leading hydrogen infrastructure projects in Europe
- SHHP is expanding the hydrogen transport activities to Scandinavia
- StatoilHydro is an active player in developing the new hydrogen fuel market



Thank you for your attention!