

European Fuel Cell and Hydrogen Week • 13-15 October 2008

# **Addressing European Challenges First Stakeholders General Assembly 14 October 2008**

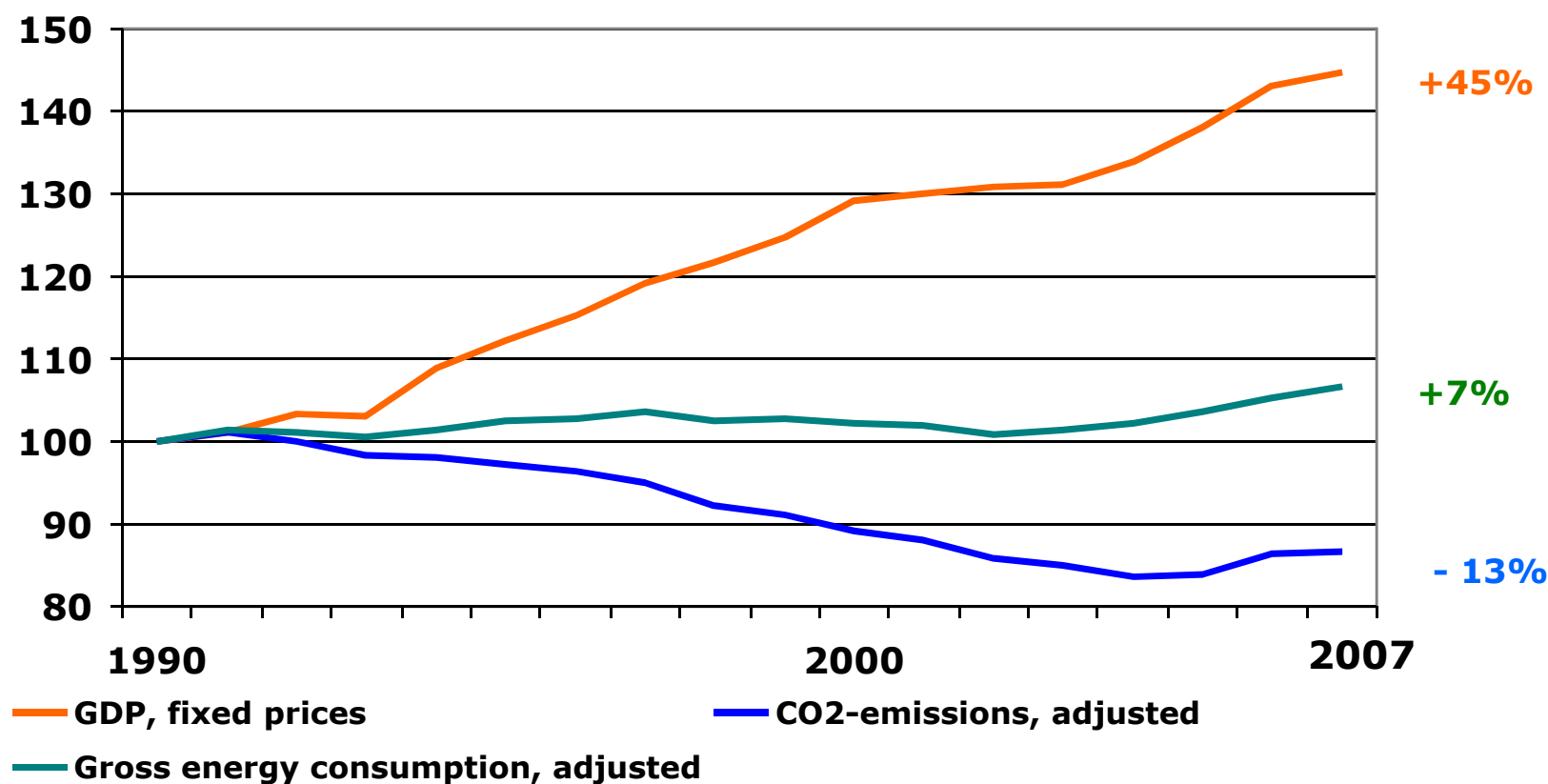
**Programme Manager Aksel Mortensgaard**

**Danish Energy Agency**

**Chairman for The Danish Partnership for Hydrogen and Fuel Cells**

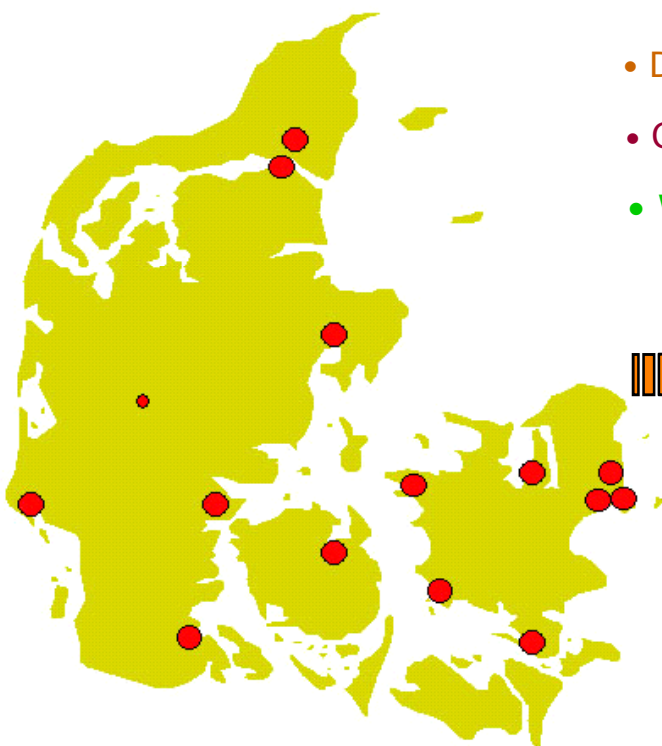


## De-linking Growth and Energy Consumption: 1990-2007



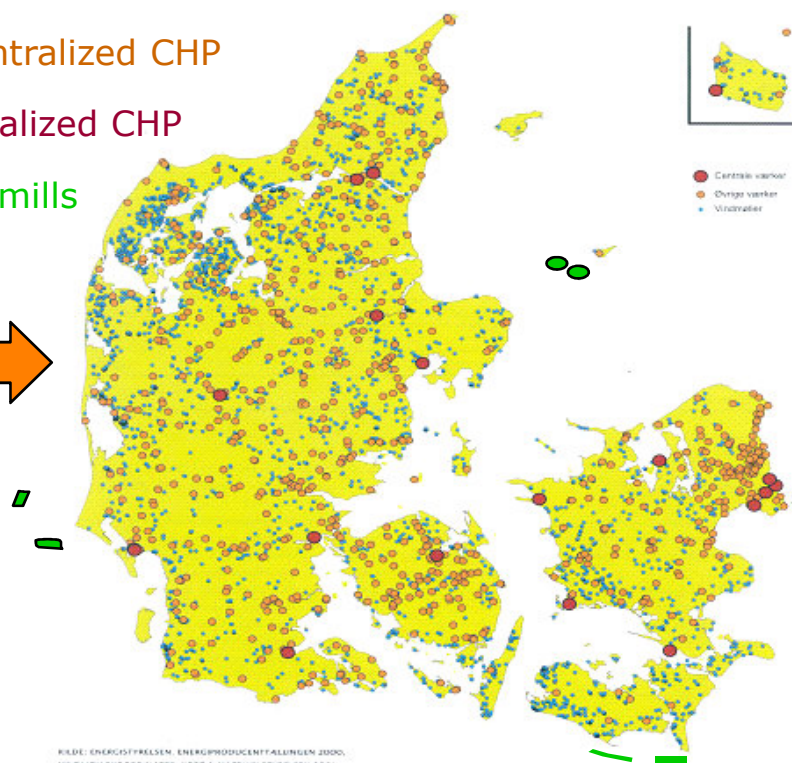
## Denmark – Energy Supply

**Centralized production  
in the mid 80's**



**Decentralized production  
of today**

- Decentralized CHP
- Centralized CHP
- Windmills



KILDE: ENERGISTYRELSEN, ENERGIPRODUKENTFALLENDE 2000, VINDMØLLERKORDINATER, KORT 4, MATRIKELSTYRELSEN 2001

## SOFC Manufacturing Facility in Lyngby, Denmark



**Owner:** Topsoe Fuel Cell A/S      **Area:** 5000m<sup>2</sup>

**Capacity:** 5 MW annually      **Start up:** Q4, 2008

**Investment:** >13 mill. EUR 4.7 mill EUR from EU Life Environment

# Power Backup to the Tele Sector

## Pilot project

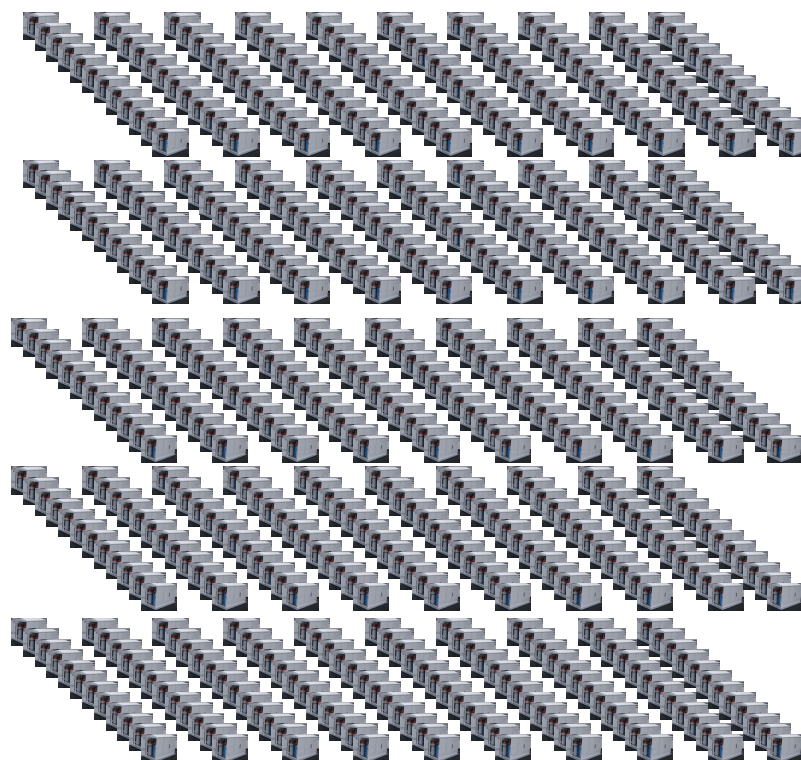
60 kWe installed 2007

Lab Test  
1 unit in 2007



## Full scale demonstration

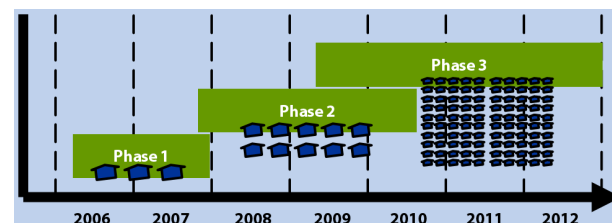
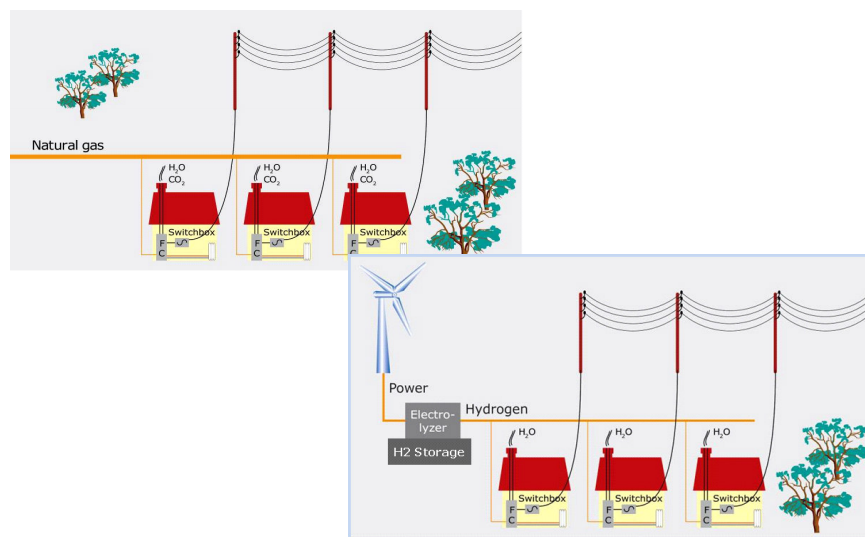
500 kWe installed 2008/9



## A Danish Demo Project on Fuel Cell Based Micro CHP

Danish Fuel Cell Stacks LT PEM/HT PEM/SOFC. Total: 100  $\mu$ CHP units

Natural Gas or Hydrogen as Fuel- Project Economy: 20 million €



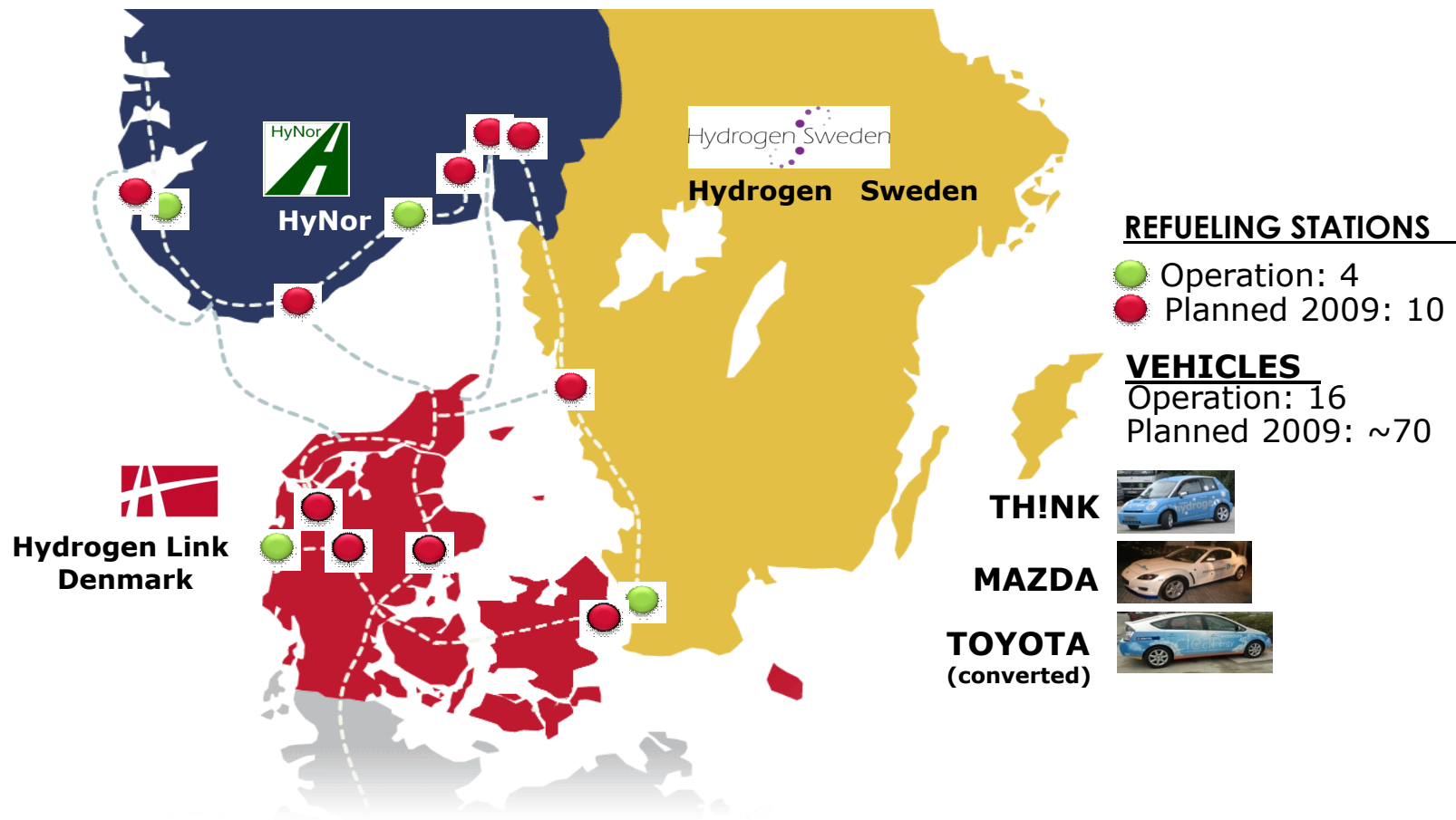
**DANISH  
MICRO  
COMBINED  
HEAT &  
POWER**  
Heat & Power  
from Fuel Cells



The Project Team



## Scandinavian Hydrogen Highway Partnership





# Danish Hydrogen & Fuel Cell Partnership

(Secretariat: Danish Energy Industries Federation)



Fuel Cell  
Materials

Fuel Cell &  
Stacks

System  
Components

Fuel Cell  
Applications

End  
Users

## Research institutions



## Industry

TOPSOE FUEL CELL



Ser:energy

Danfoss



DONG  
energy

UTILITIES

## Public Authorities

Ministry of Science

Energinet.dk

Danish Energy Agency

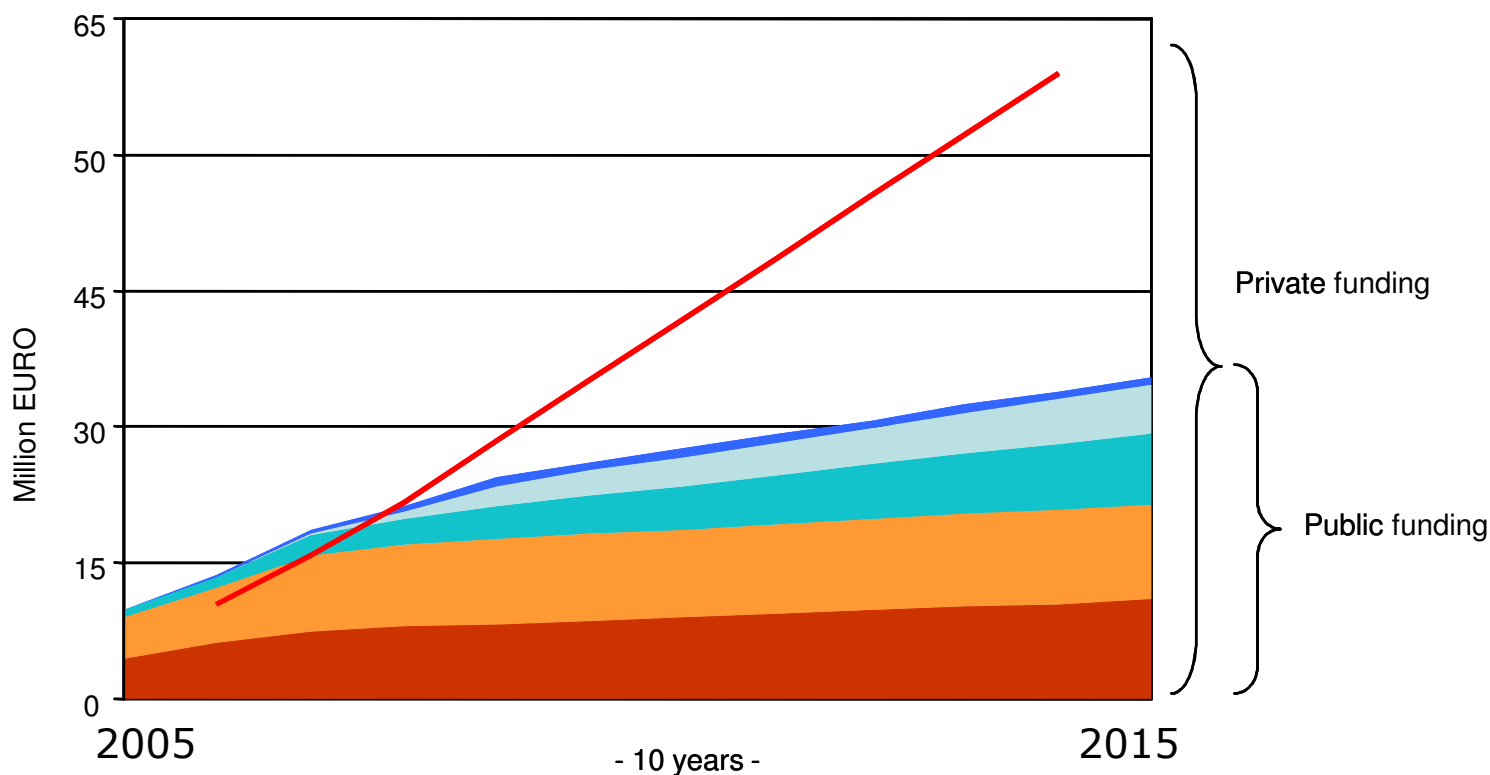
Cemtec

HIRC





## Future Challenges and the Costs involved in R,D&D in Hydrogen and Fuel Cell Technologies.



Fuel cells R&D  
Hydrogen R&D  
Analyses etc.

Fuel cells, demo  
Hydrogen, demo  
Industrial financing of energy (trend)

## Danish Expectations to the JTI

- **Promote vertically integrated projects rather than horizontally integrated**
- **Equal opportunities for small and large companies**
- **Support for large scale demonstration in Europe - Scandinavia as test area for the automotive industry**
- **JTI - Co-operation with member states, companies end user**
- **Real influence by industry - plus relevant applied research**