Session 5: Market opportunities in a changing world

General Assembly, Brussels 26-27 October 2009

Inger Pihl Byriel, R&D Coordinator, Energinet.dk

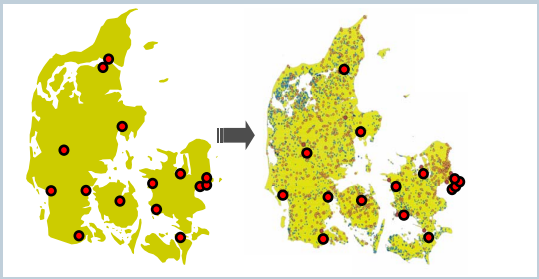
ipb@energinet.dk

Energinet.dk in brief

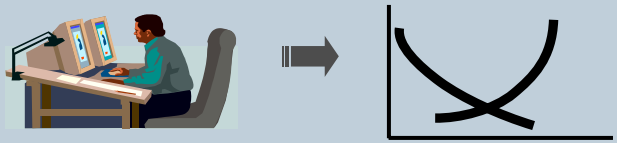
- **Independent public enterprise** under the Ministry of Climate and Energy with Approx. 500 employees
- Owns and operates the motorways of **electricity** and **gas**
- The consumers contribute to our activities via **tariffs** on their **electricity and gas bills**
- We are responsible for the general short-term and long-term **security of electricity and gas supply**
- We **plan** and **expand** the **Danish electricity and gas systems**, and ensure the preparedness of the energy sector
- We ensure **well-functioning competition** on the electricity and gas **markets**
- We support **research, development and demonstration** of new electricity technologies, **including fuel cells and electrolyzers**.

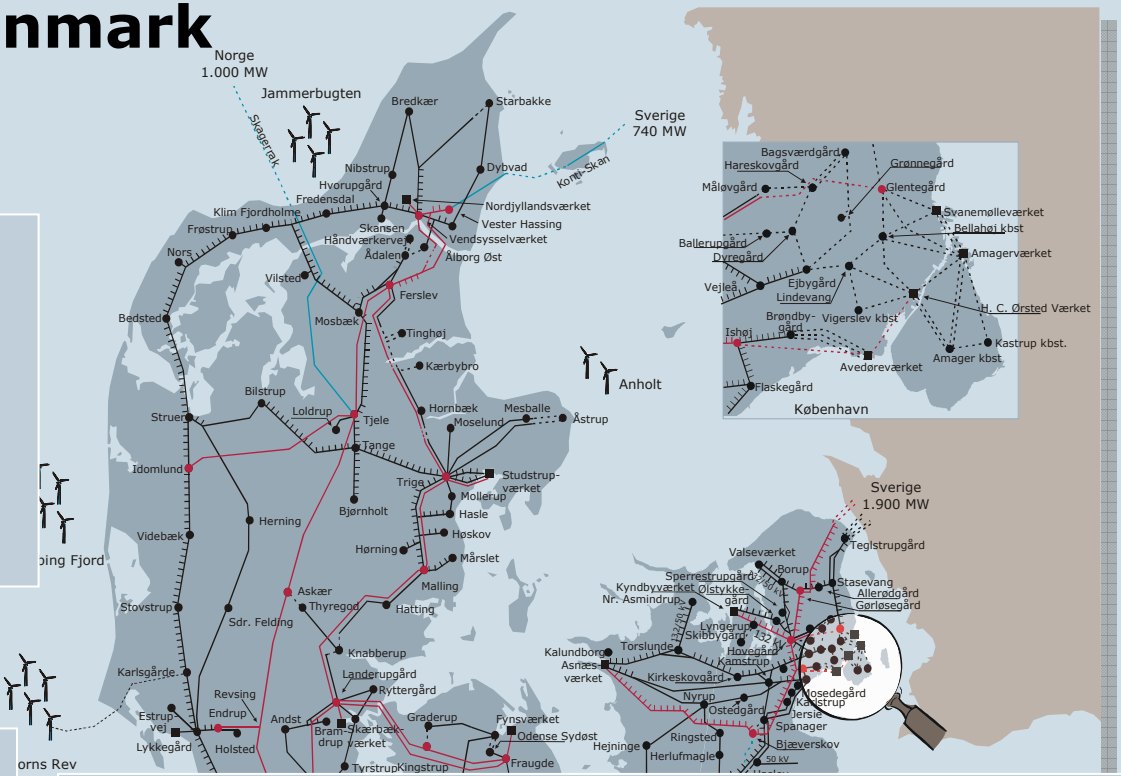
Electricity in Denmark
- the challenges...

- from few to lots



- from monopoly to market





A visinary Danish Energy policy:

+ 3.000 MW wind power i 2025 (~

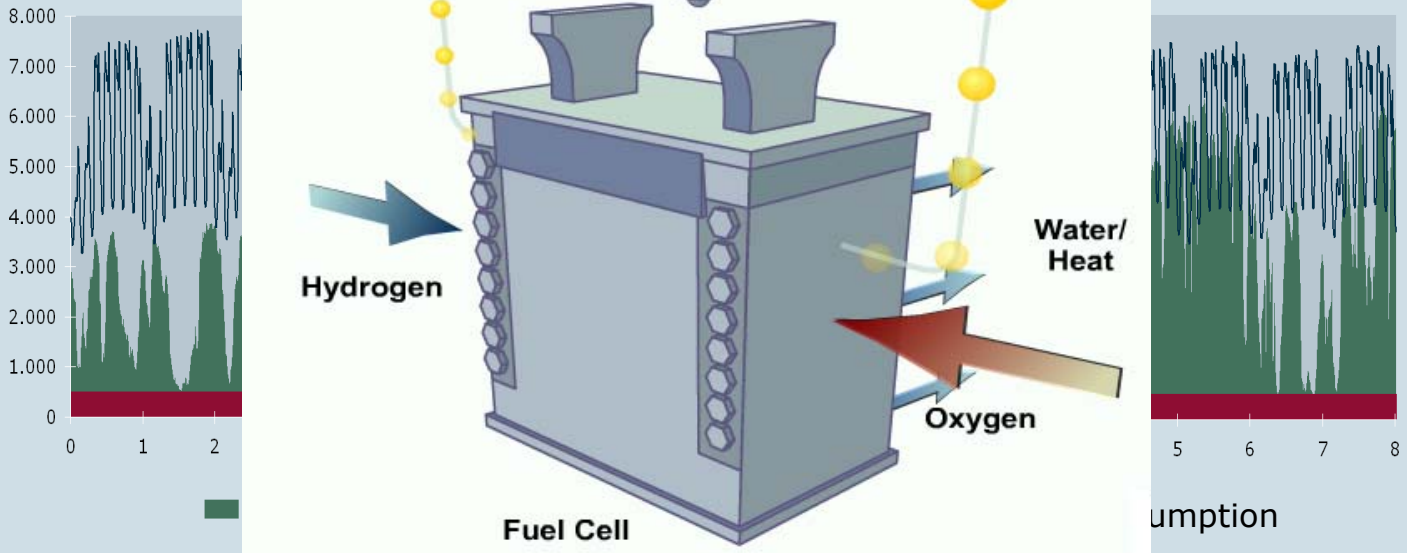
Installed capacity in DK 2009: 13.118 MW

Yearly electricity consumption: 36,6 TWh

Integration of additional 3,000 MW wind power

National goals:
- additional 1.300 MW wind by 2011
- additional 3.(

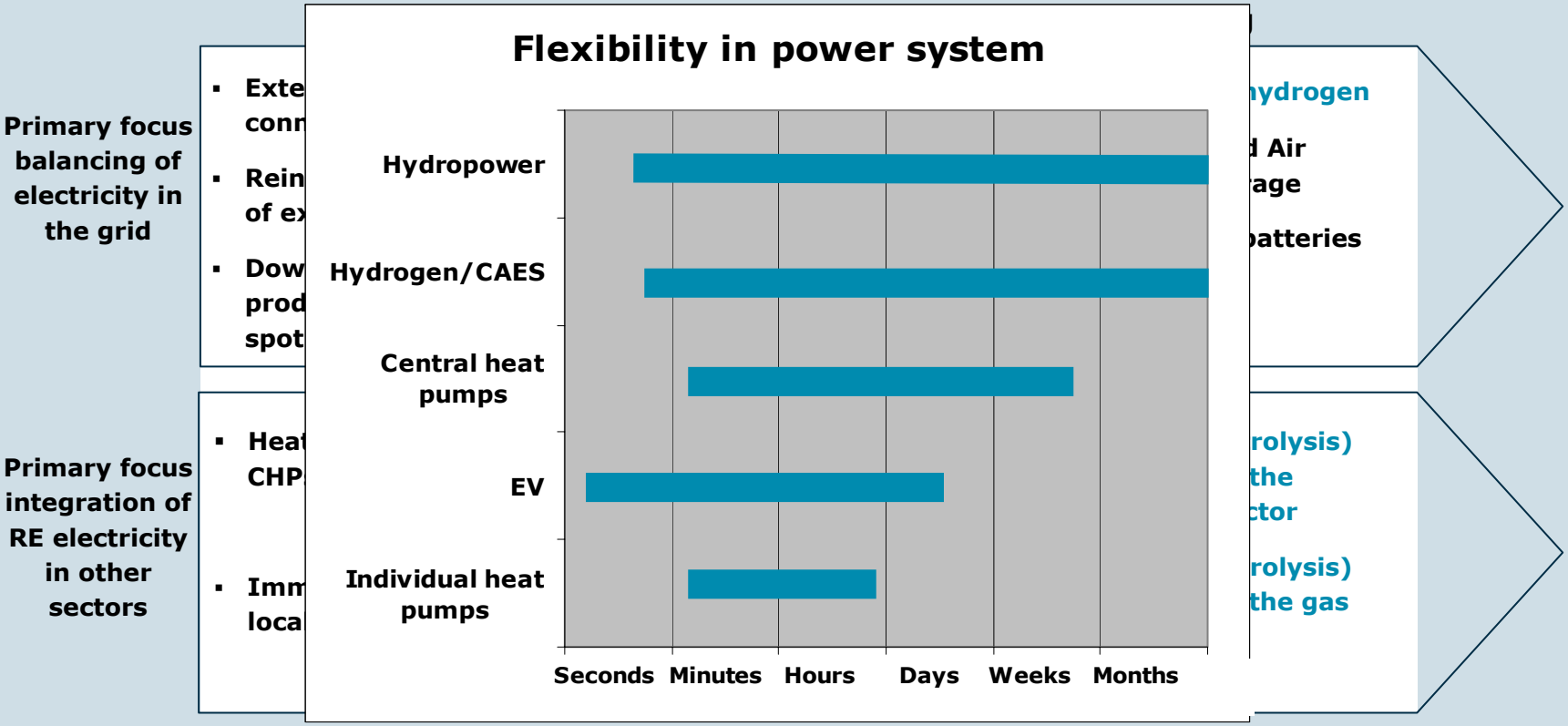
EU goal for Denmark:
- 30 pct RE in the energy system



Denmark must utilise **domestic resources** and **trade with neighbours**

Security of supply maintained - the value of wind power maximised

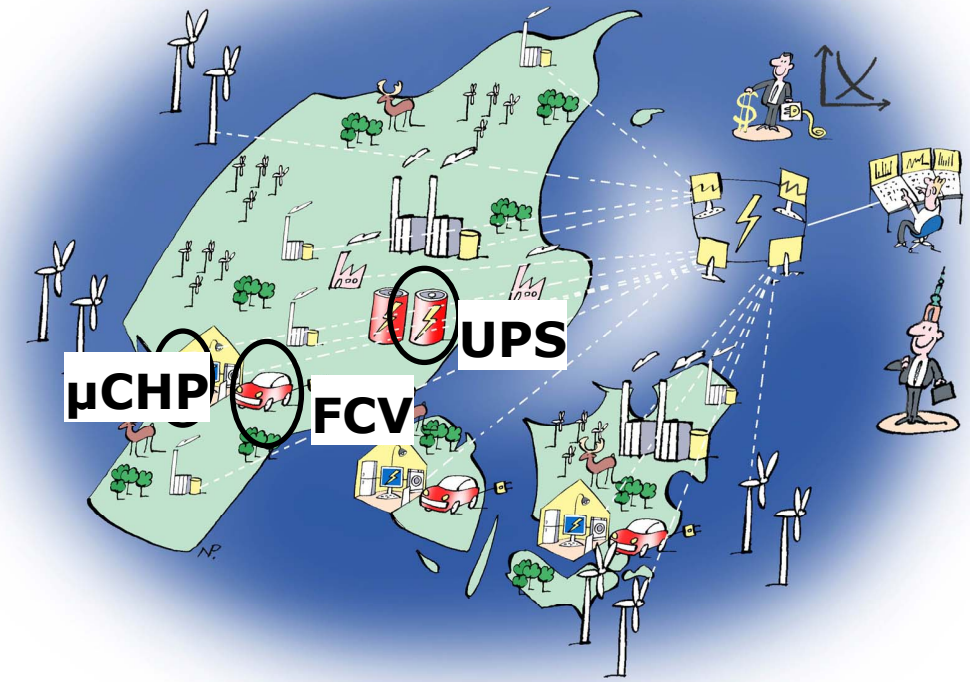
Power balancing and stability in power system



- A need for a market that addresses the need for balancing the power system together with the other energy systems
- Fuel Cells and Electrolyzers can play a key role in this market
- 50 pct. wind power requires **both** strong exchange connections **and** a range of domestic instruments

Mobilization of distributed resources

- Avoid overflow of 90 GWh/year in 2025 in a system with 6700 MW wind power (~50%)
- Improve security of supply
- Improve the socio-economy
- Reduce need for reinforcements of distribution grid
- Reduce the need for regulating power



Future needs

- The energy efficient, flexible, and socio-economic solutions should be promoted – could be fuel cells and electrolyzers!
- Standards for intelligent communication should be developed
- Intelligent metering is a requirement