

Energy markets are challenged by intermittent renewable energy

CFEM Inauguration Event, October 14, 2010

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Agenda

- Who are we?
- What do we do?
- What's the problem?
- What's the solution?

Who are we?

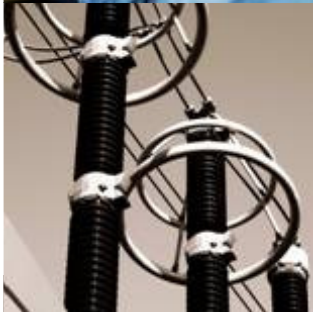


- Independent public company owned by the Ministry of Climate and Energy
- Supervisory Board
- Established December 2004, before two companies in the two Danish areas (west and east)
- Approx. 500 employees, most of whom work in Erritsø and Ballerup
- Owns and operates the energy highways
 - The main electricity and natural gas grids
 - The regional electricity grid in North Zealand

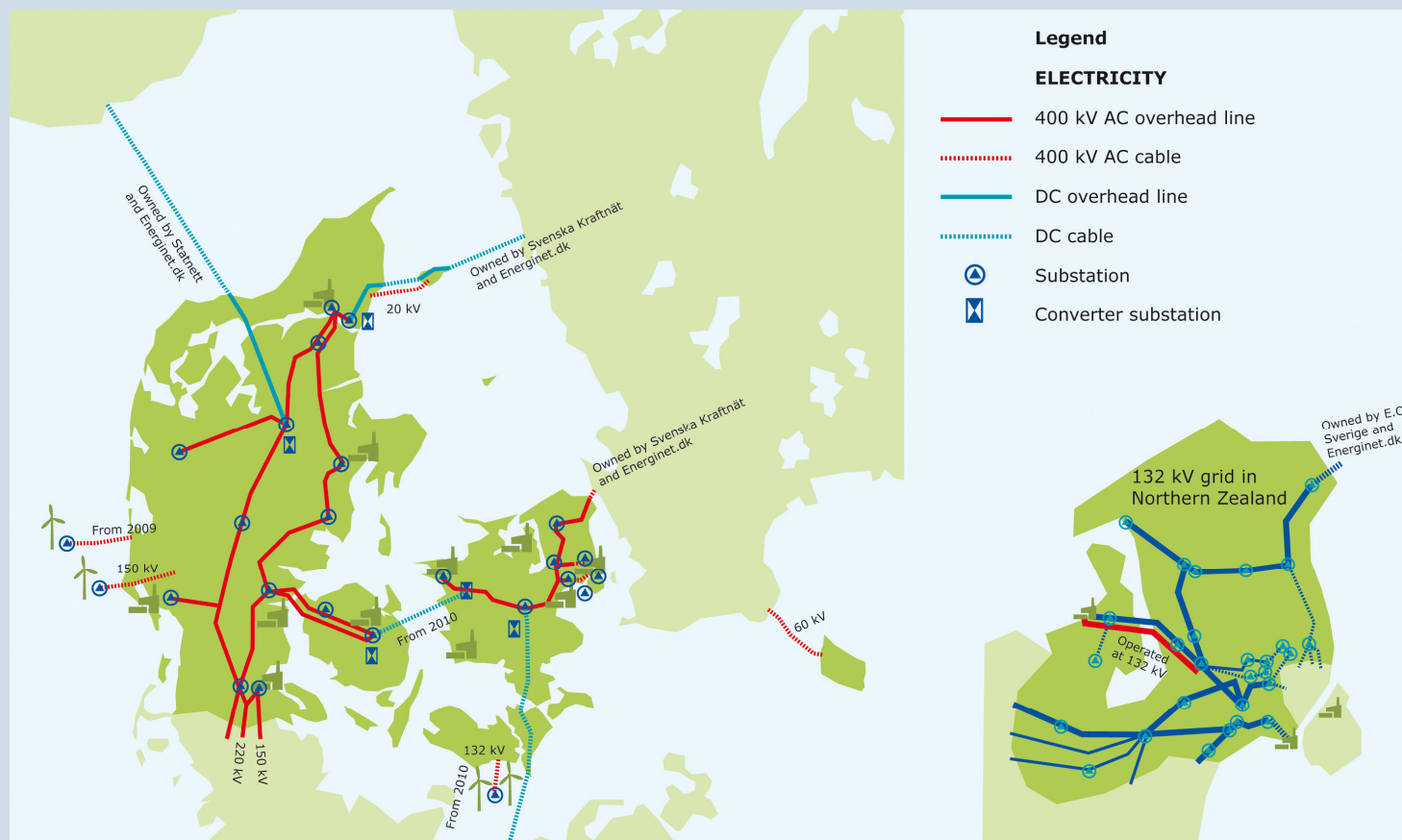
What do we do?



- Security of supply – electricity and gas
- Development of the energy system
- Markets
- Research

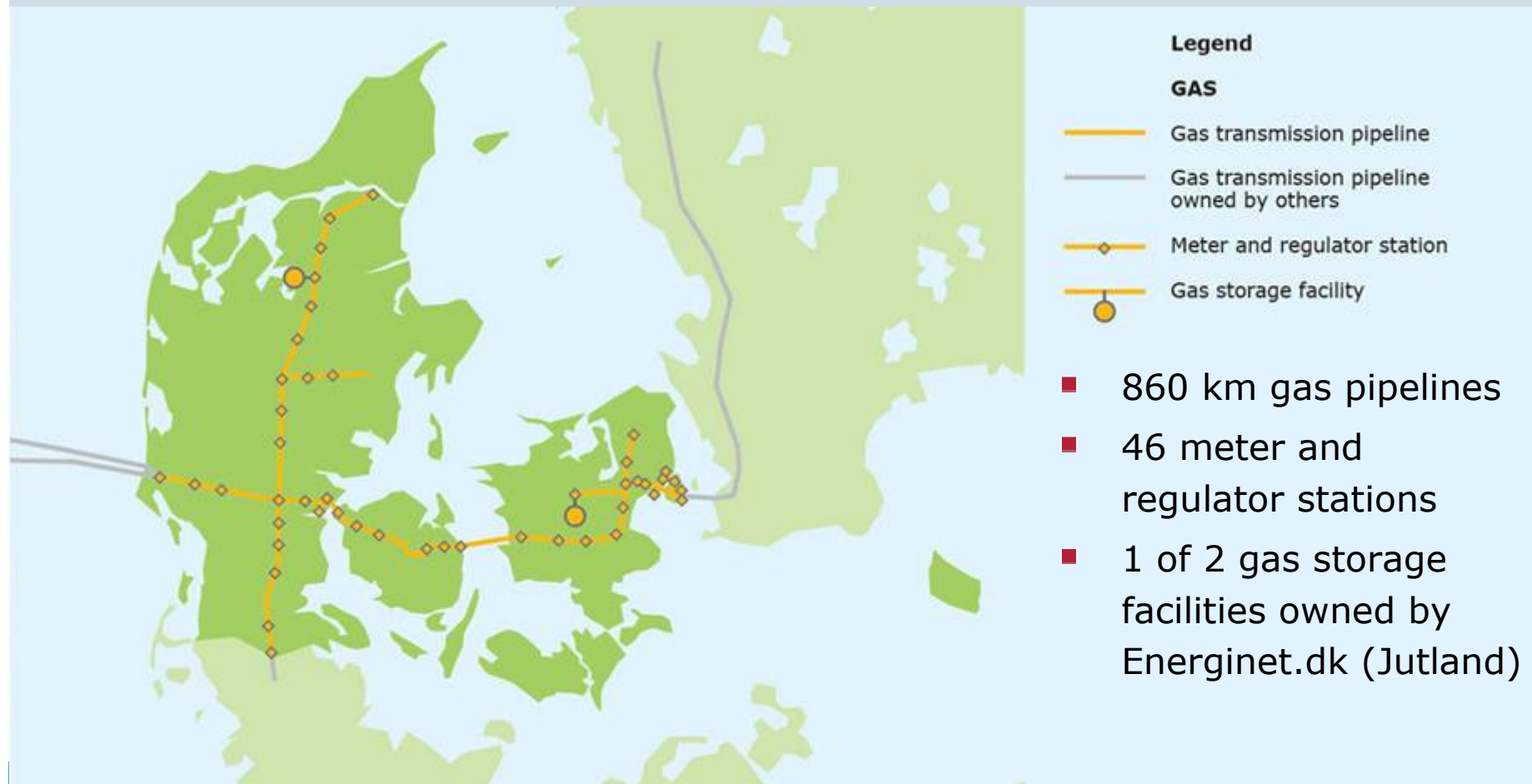


Main electricity grid



- 1,571 km of cables and overhead lines
- 24 substations and converter stations

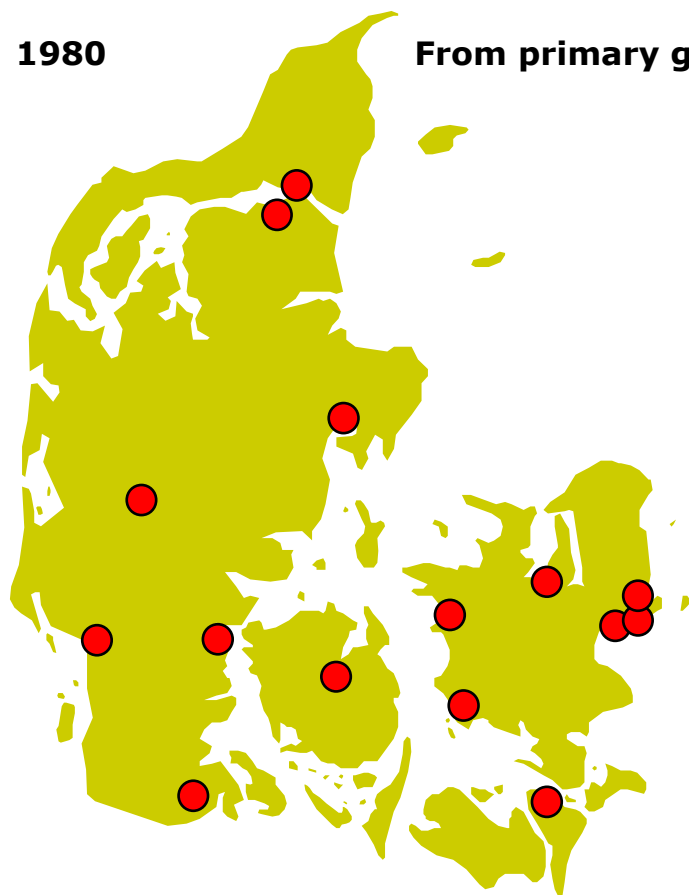
Energinet.dk's natural gas grid



Electricity generation

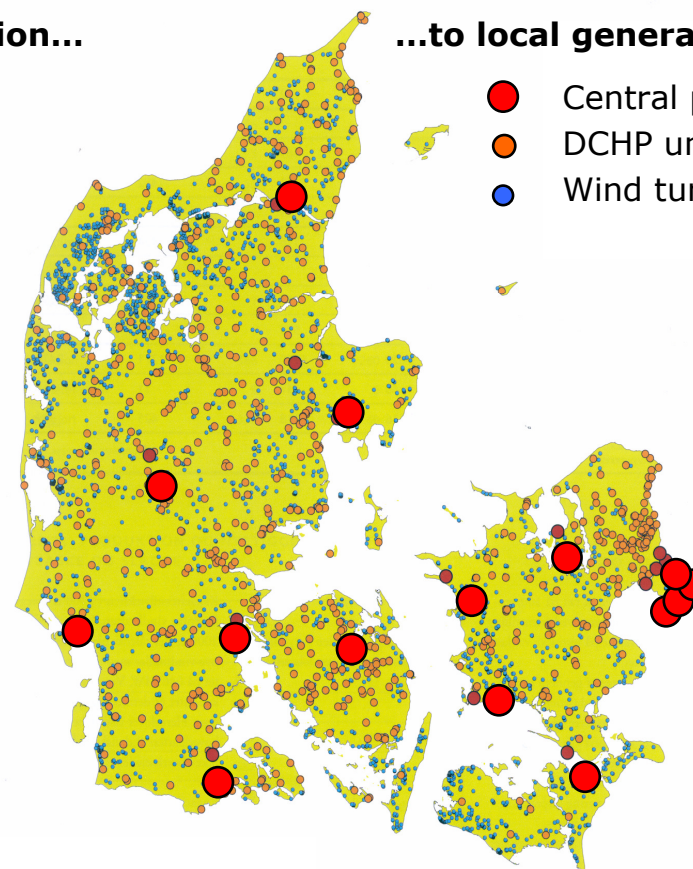
1980

From primary generation...

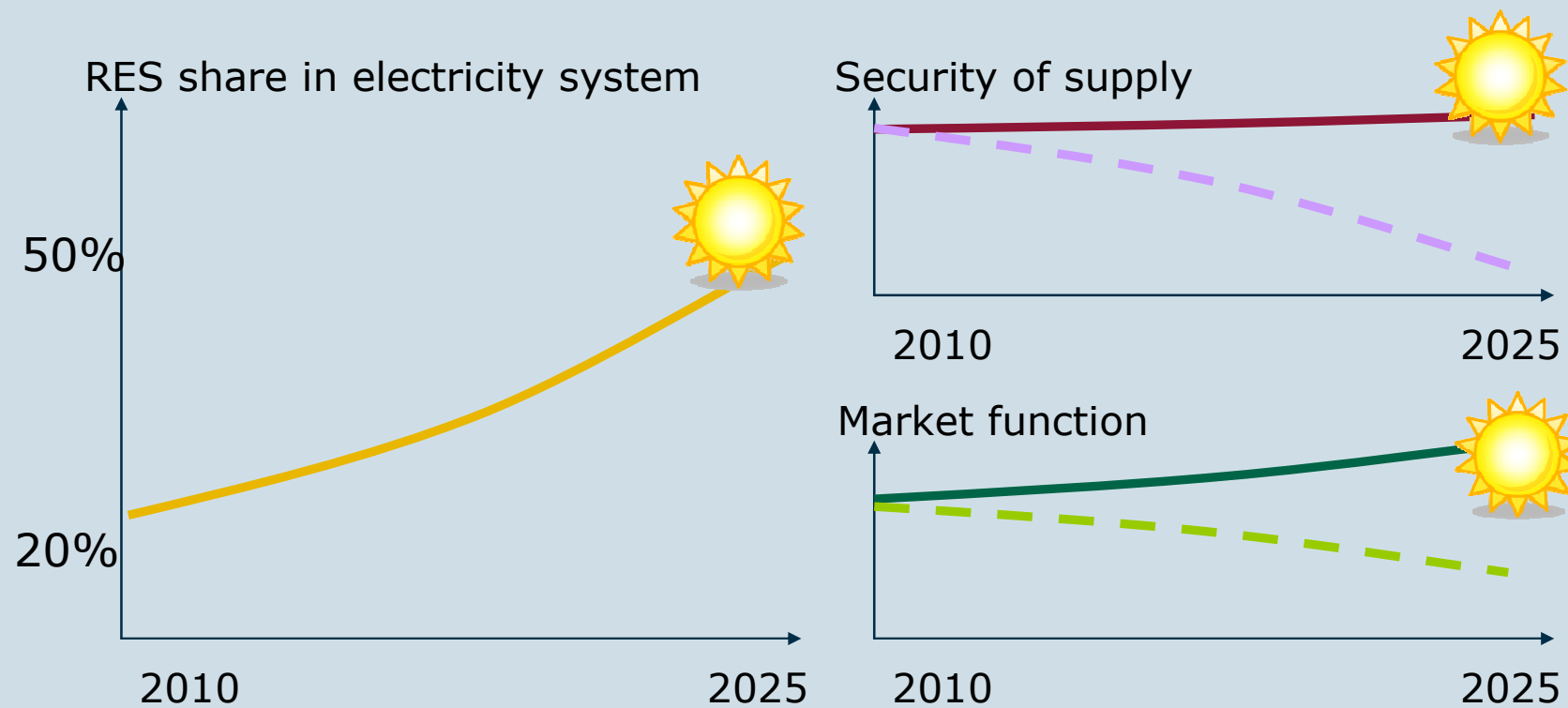


...to local generation - Today

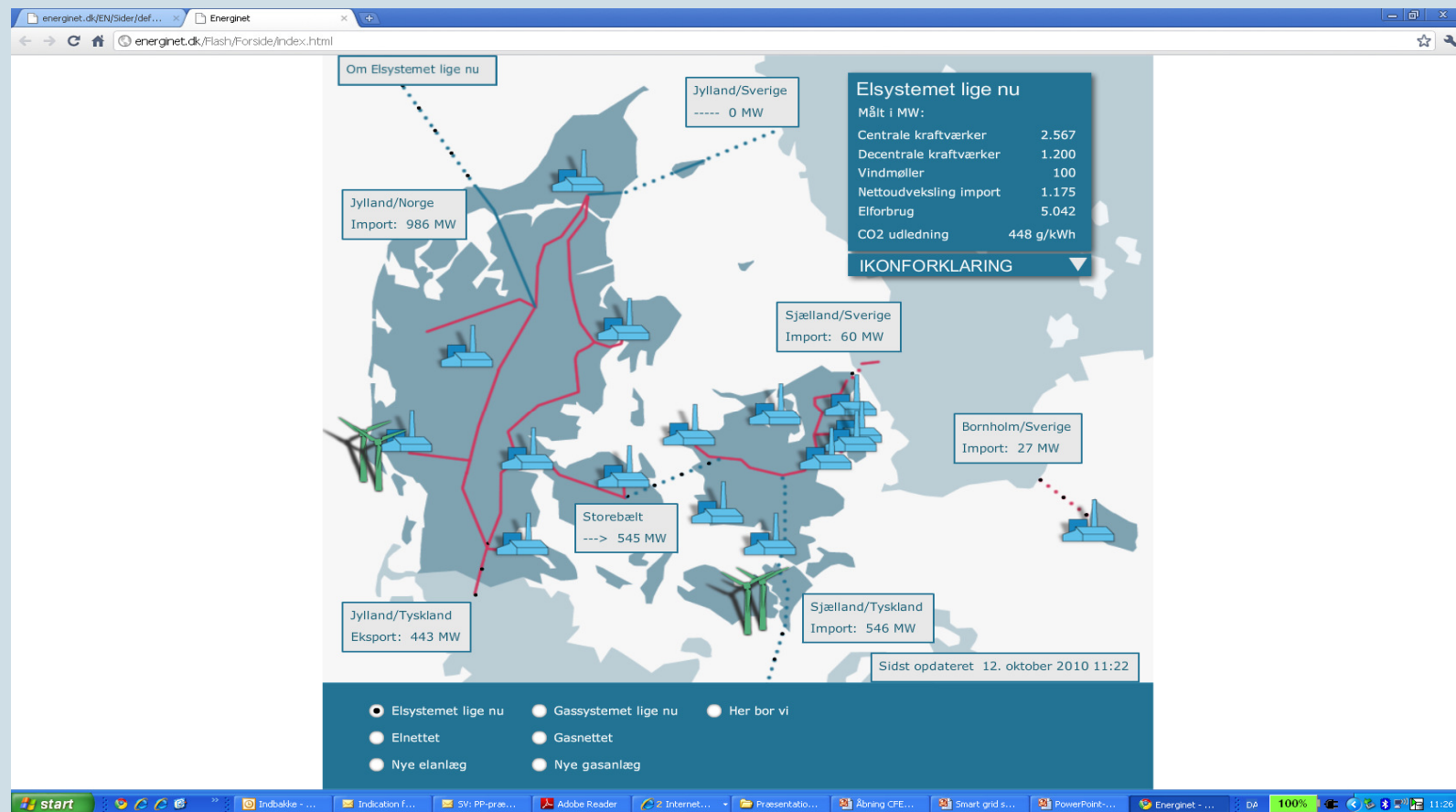
- Central power station
- DCHP unit
- Wind turbine



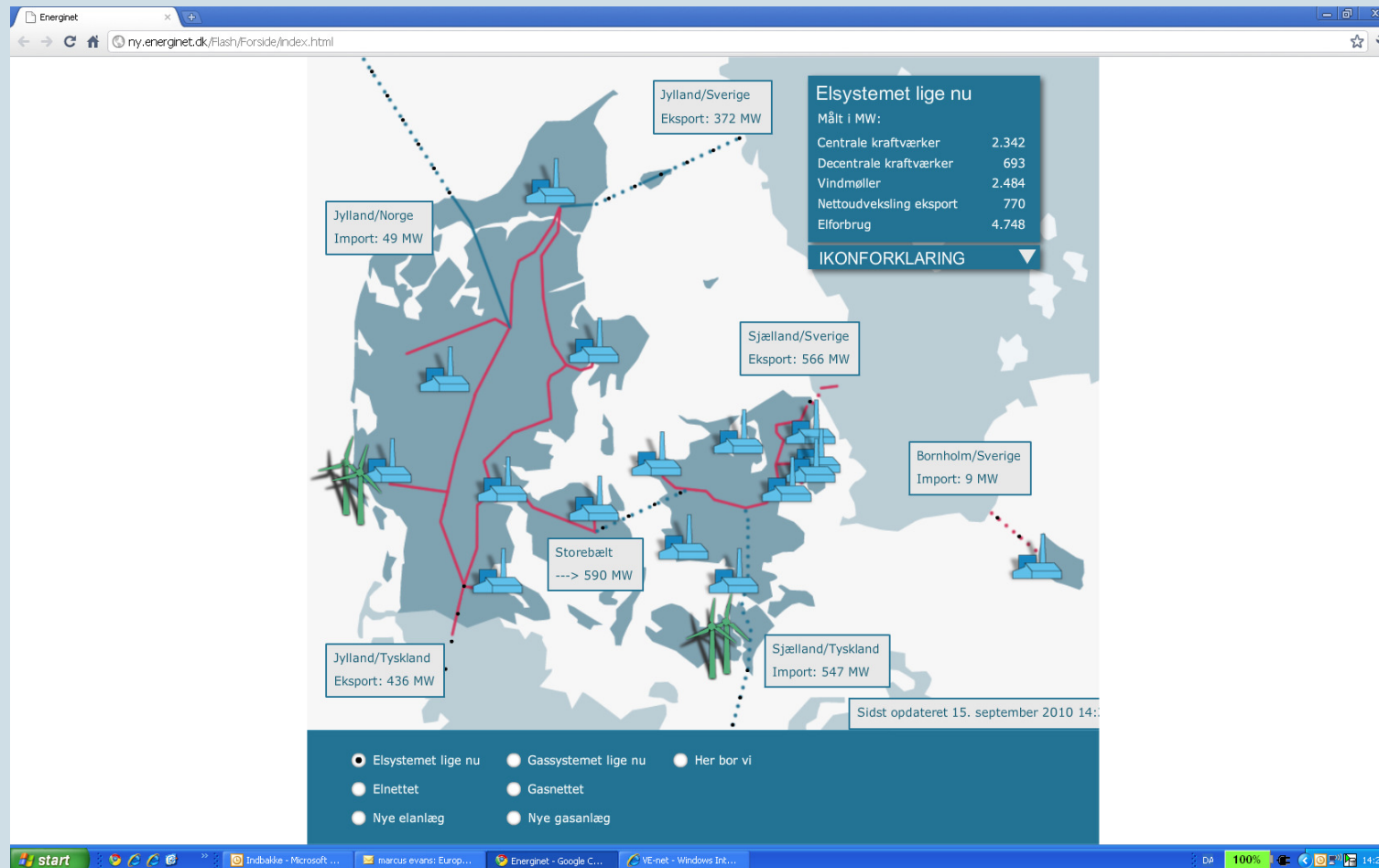
Denmark: political vision – and challenges



The Danish electricity system with low wind...

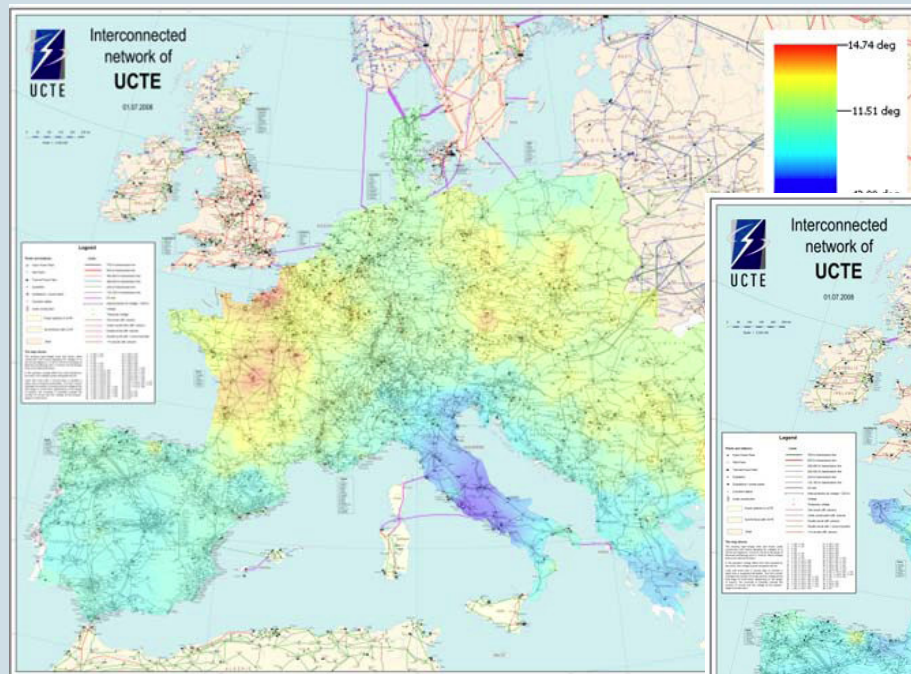


...and with 50 % RES

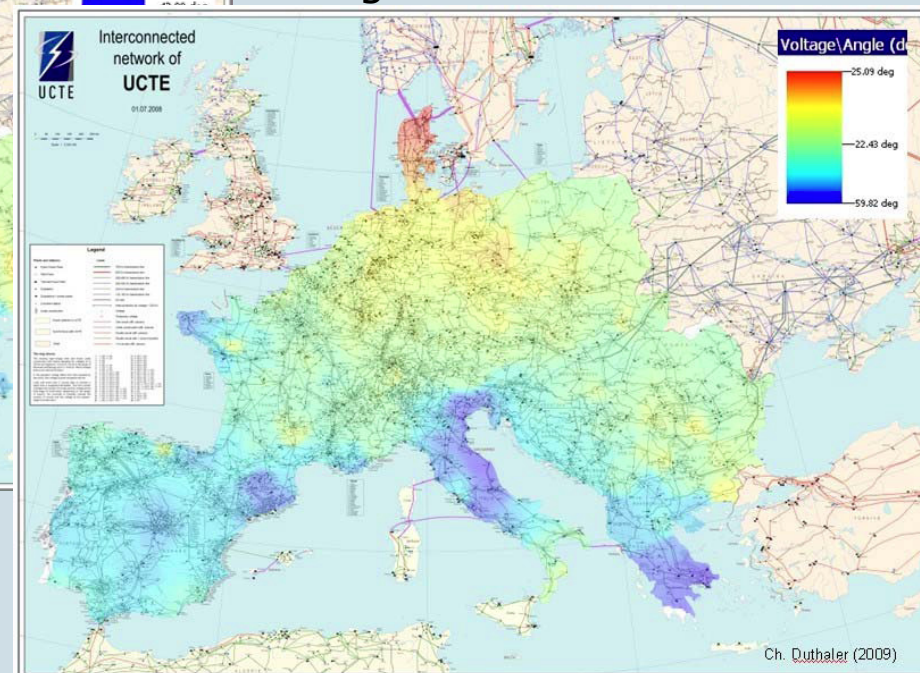


The challenge is pan-European

Low wind



High wind

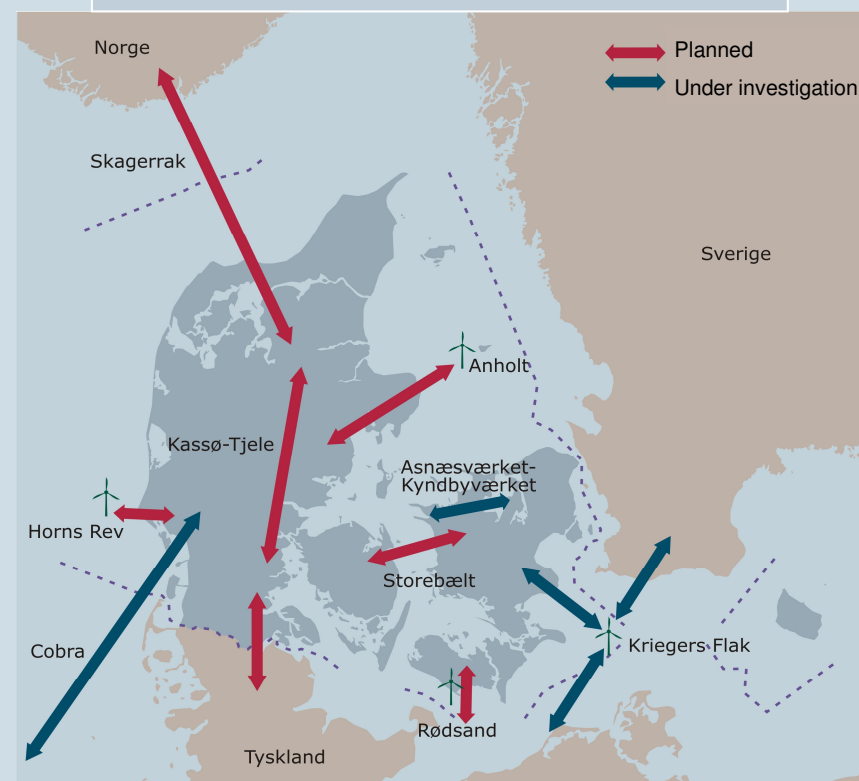


Strong Transmission Grid and Interconnections

Planned offshore Wind parks

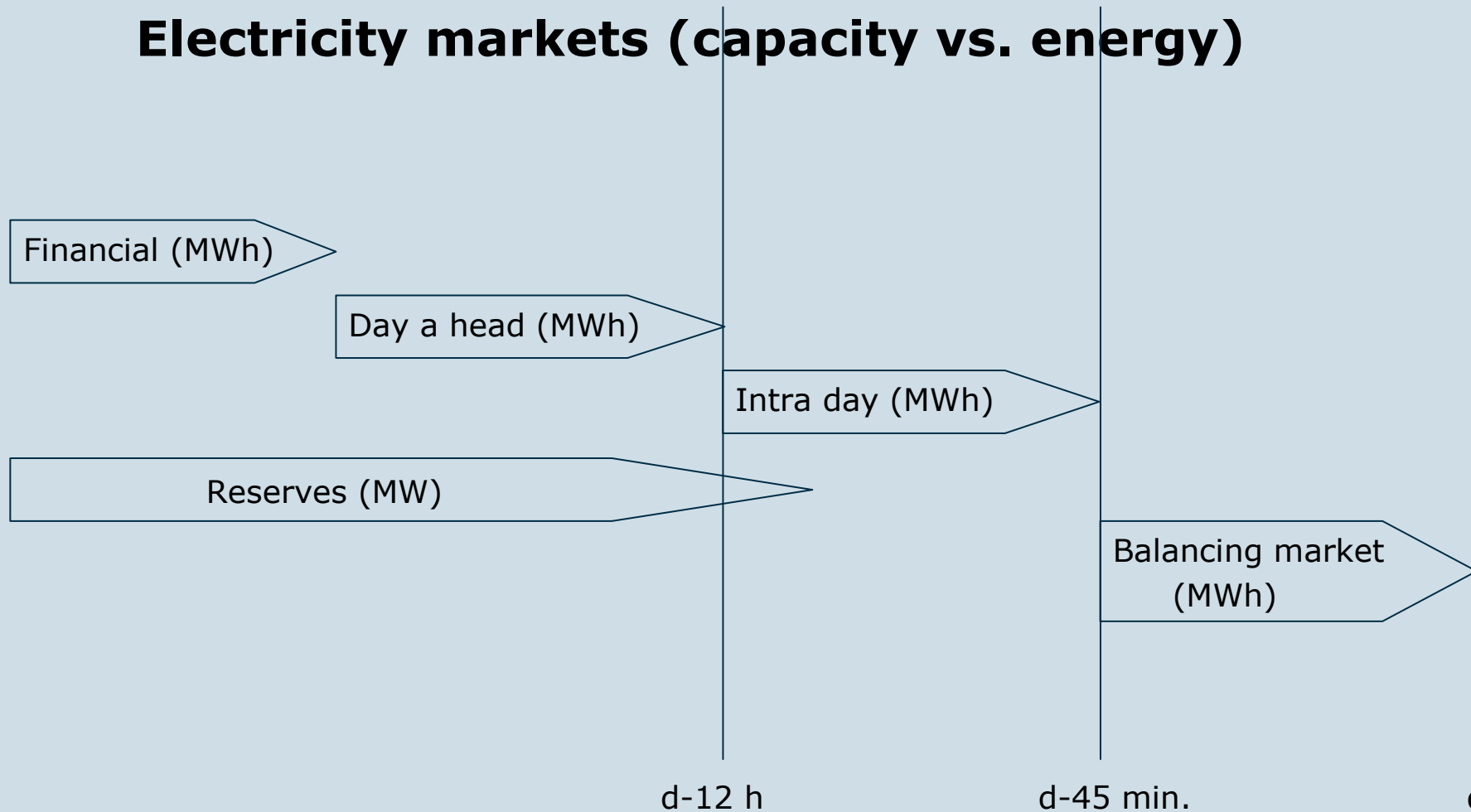


Planned Grids and interconnections

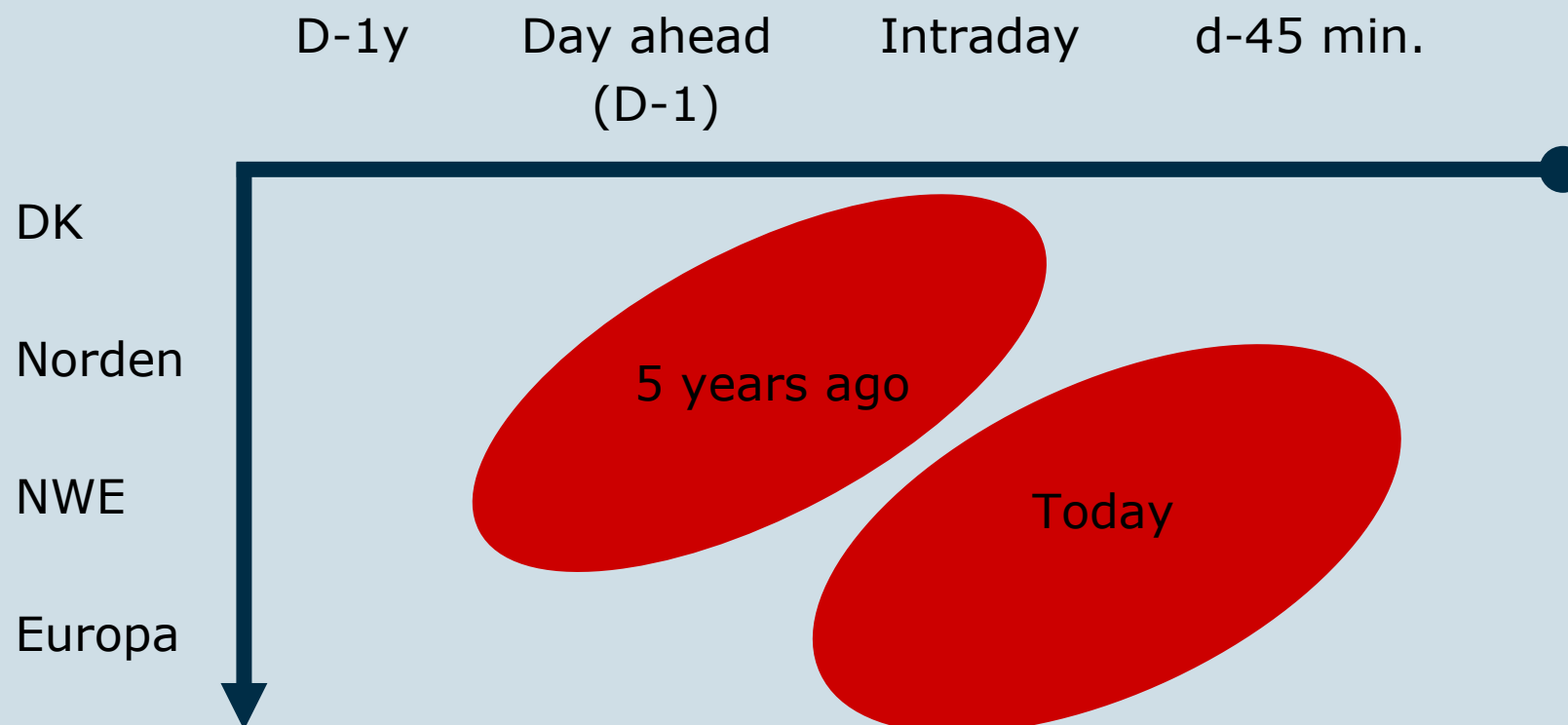


Gate closure times

Electricity markets (capacity vs. energy)

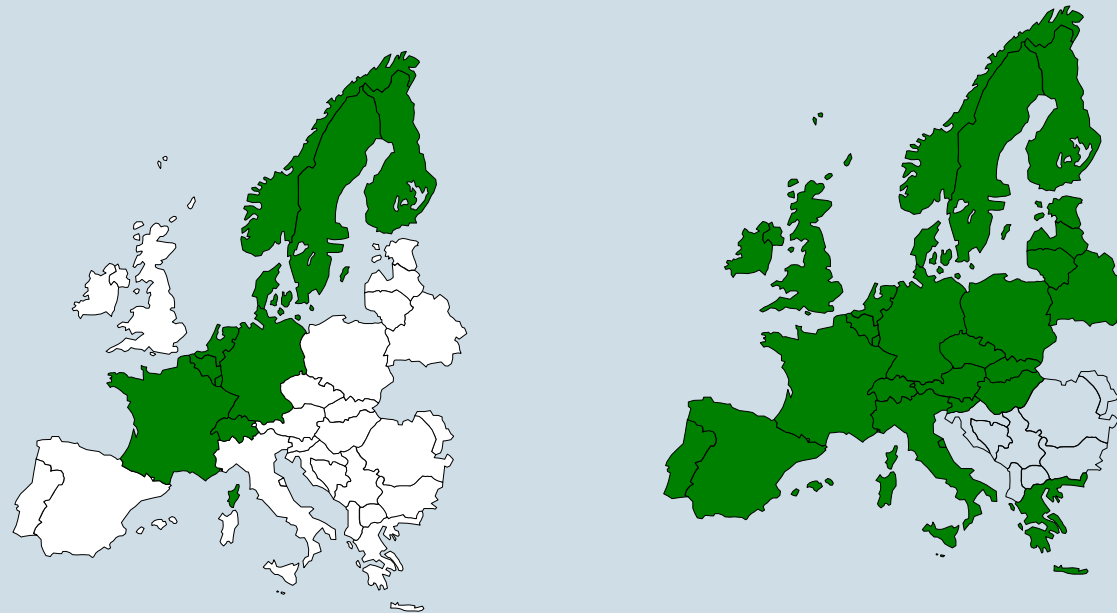


The new challenges



Day a head market

- A success – November market coupling Nordic-NWE
- Goal – common European day ahead market



The same market development process for balancing markets is expected

- Description of target model – Mid term: Multilateral TSO-TSO model
- Regional start – European finish
- Advanced electronic markets crucial
- Help!!

- TSOs supply the market with the needs for balancing
- TSOs supply the market with transfer capacities (flow based vs. ATC)
- Demand and generation bid in up- and down regulation
- It works in the Nordic region

Thanks and good luck!

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