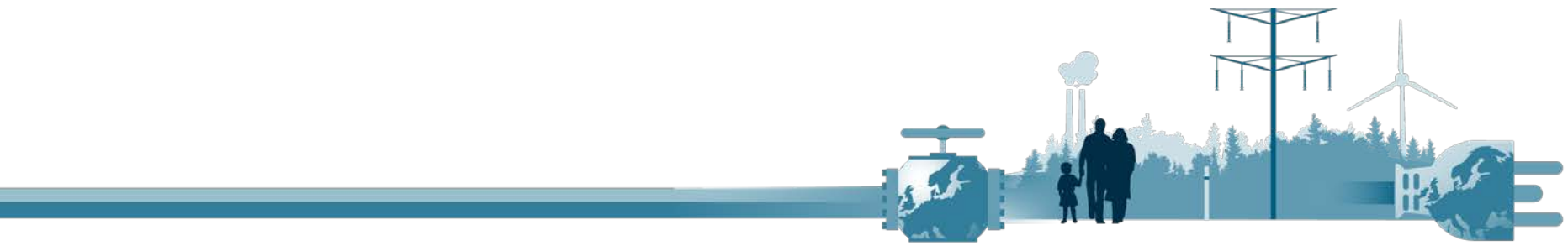
# Danish developments on interconnectors/wind integration

## Danish Meets German Energy Transition

*Bjarne Brendstrup*



# Main points

**Technology trends**

There are huge changes in technology these years. Hard to predict and thereby plan for the future best estimates

**Market**

Well functioning markets is a prerequisite for a cost efficient green transition. A well-developed infrastructure is a prerequisite for a well-functioning market

**Flexibility**

Consumer flexibility is an important part of the green transition. However the value is dependent on European development

**”**

A combination of internal investments such as heat pumps, and strong interconnectors is a part of the optimal solution

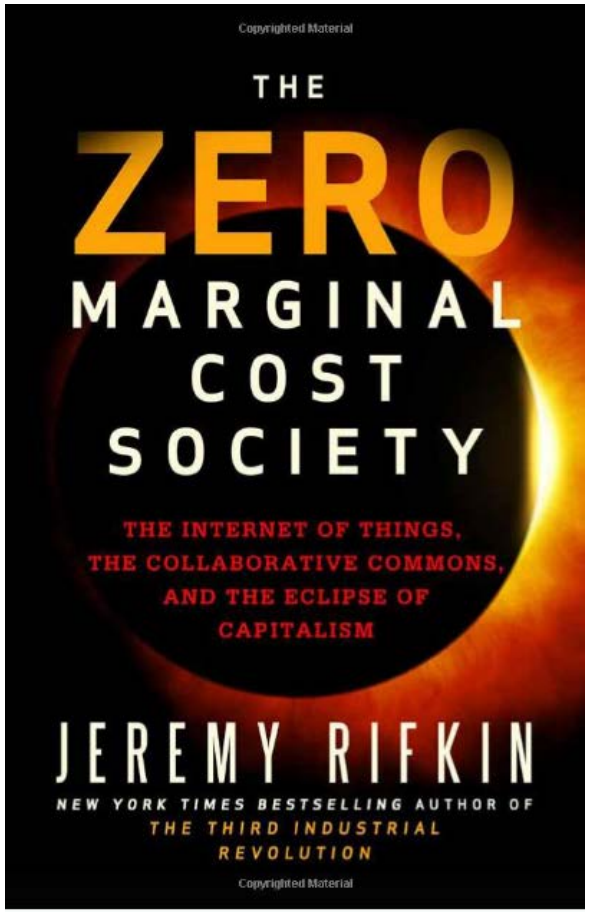
**Upcoming interconnectors**

Several interconnectors are on the way

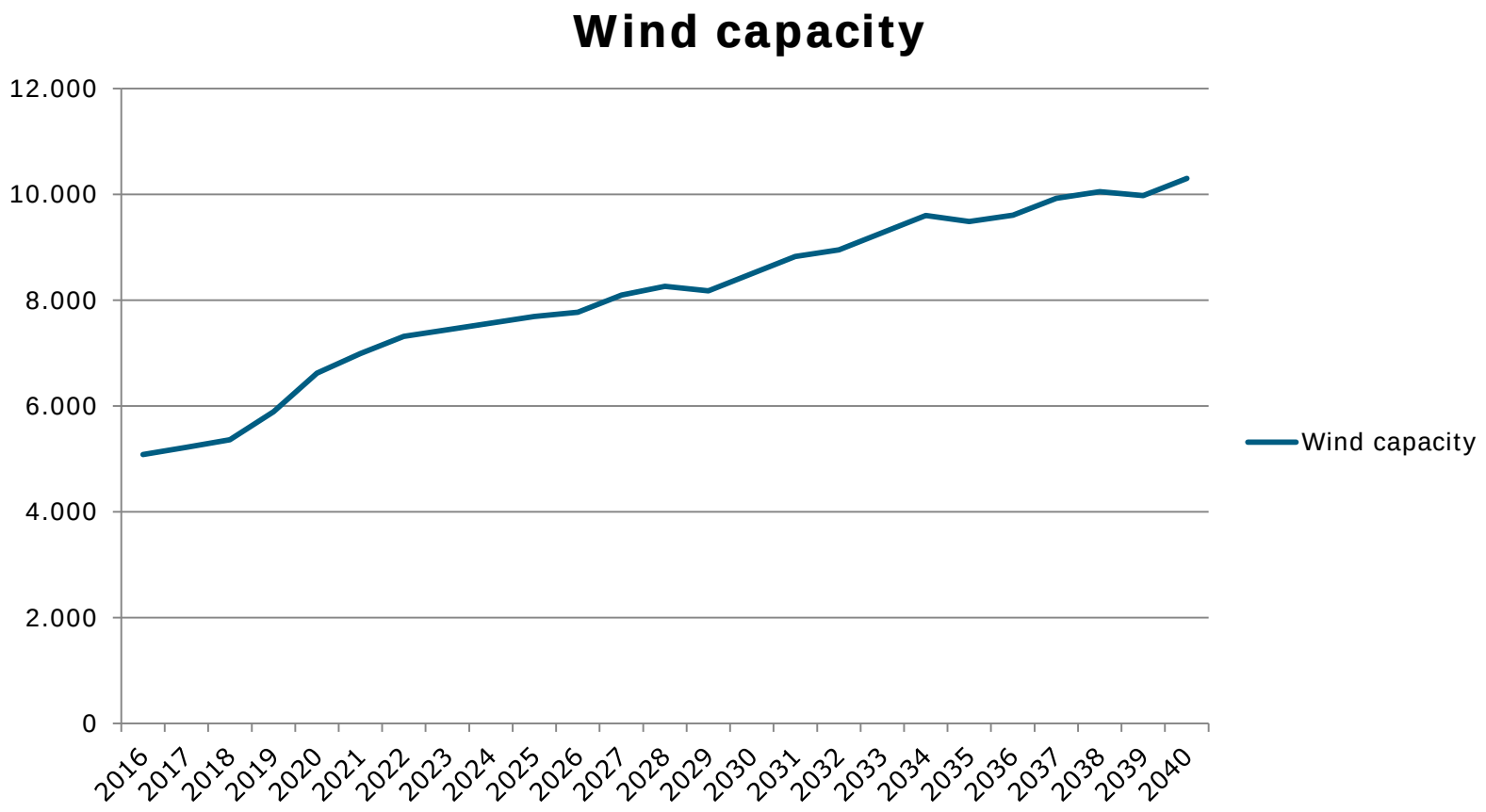
# Towards Zero marginal cost?

- Rifkin: ”*Transmission companies will profit more from managing energy use more efficiently and selling less rather than more electricity*”

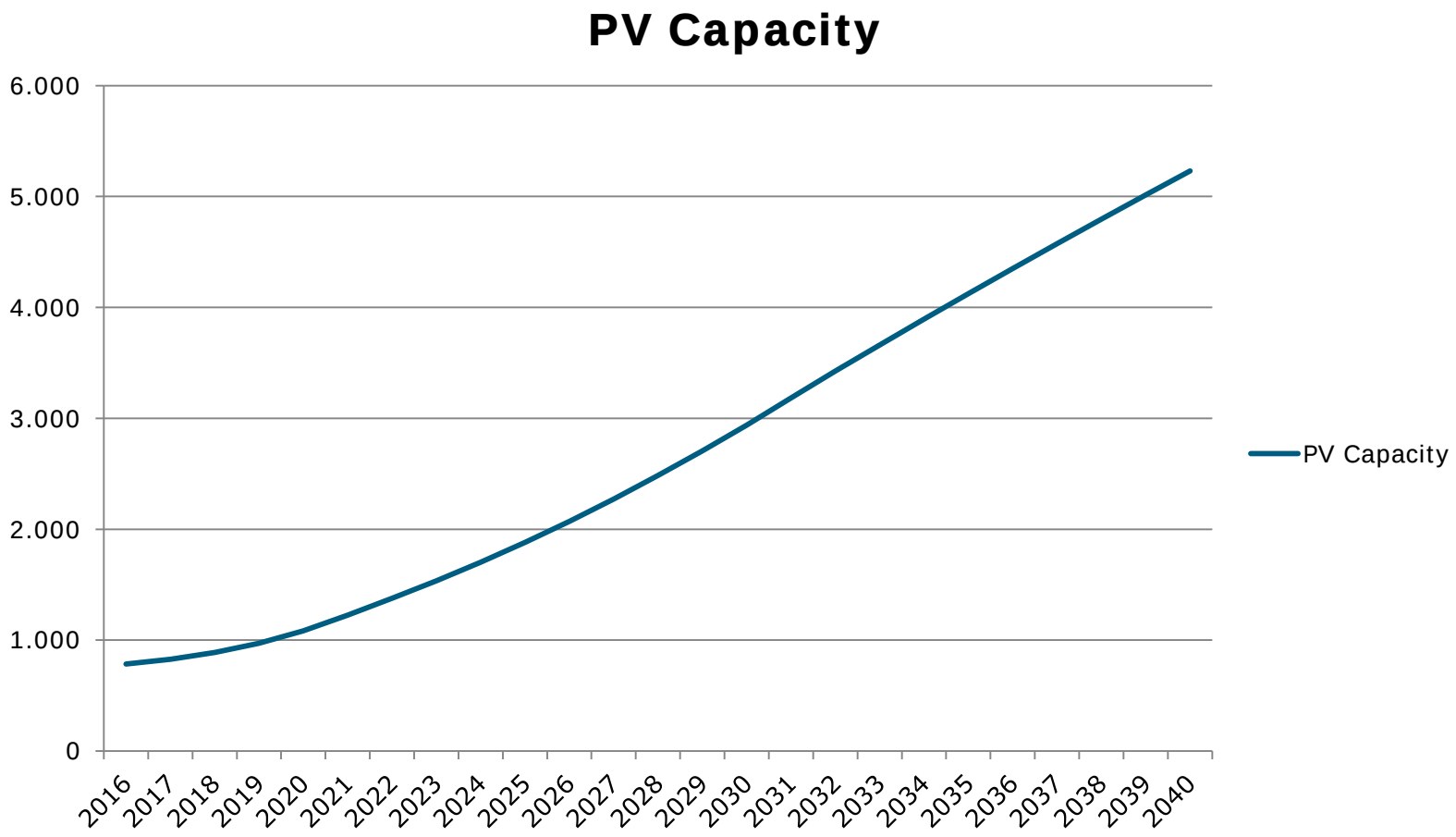
- There entire value chain may change in the near future



# Wind power development



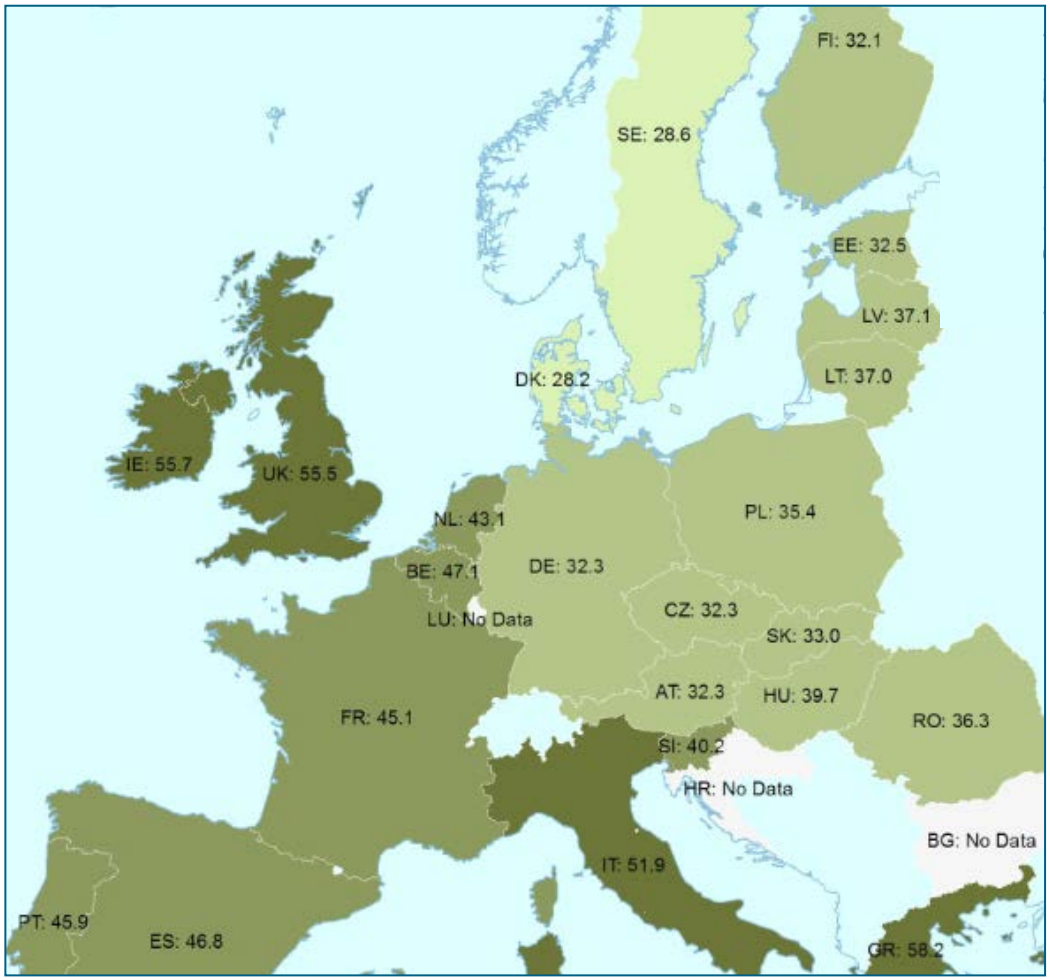
# Photovoltaic capacity development



# Denmark has one of the lowest spot prices in the EU

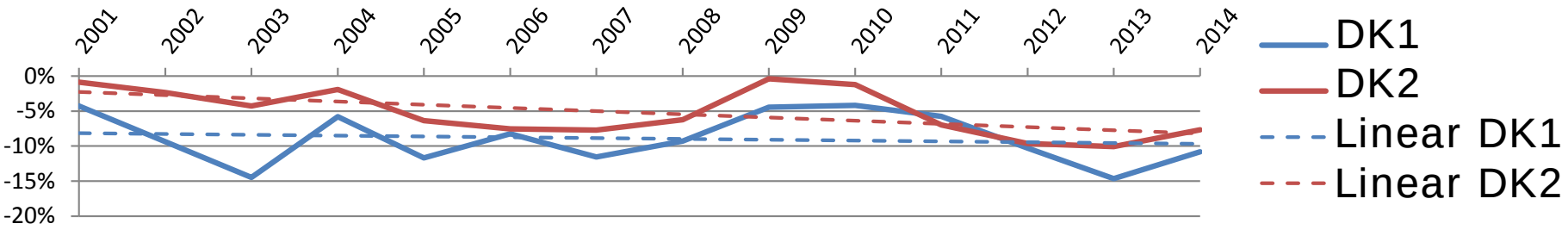
EU-Commission energy-market report - first quarter 2015

Prices in EUR/MWh

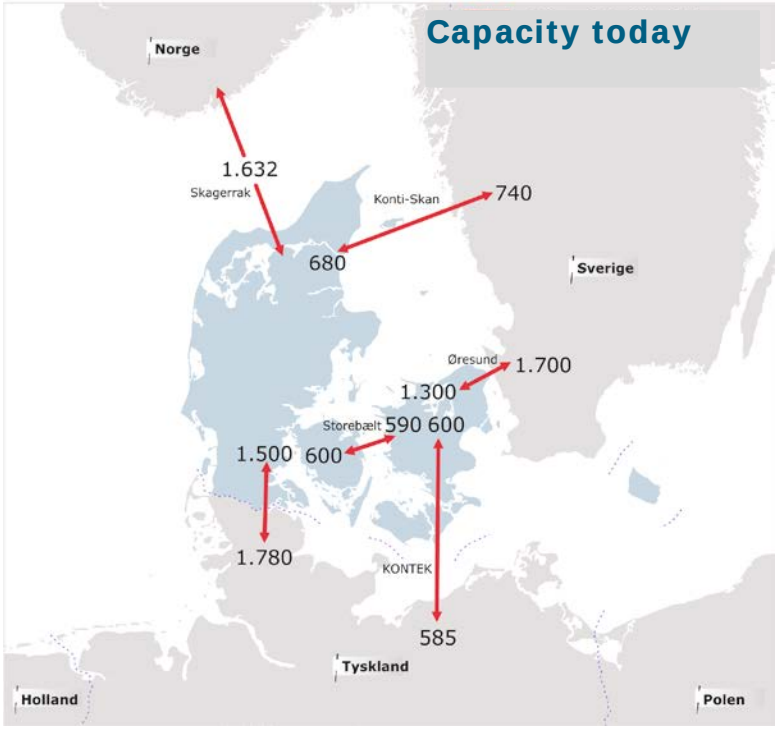


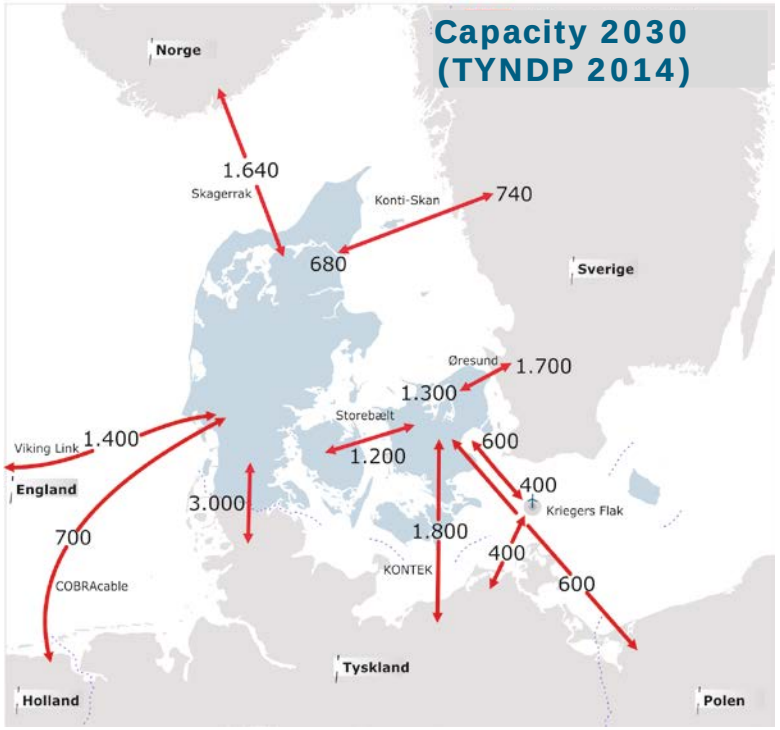
# Value of wind power

Relative value compared to the mean power price in Denmark



# European development from a Danish perspective

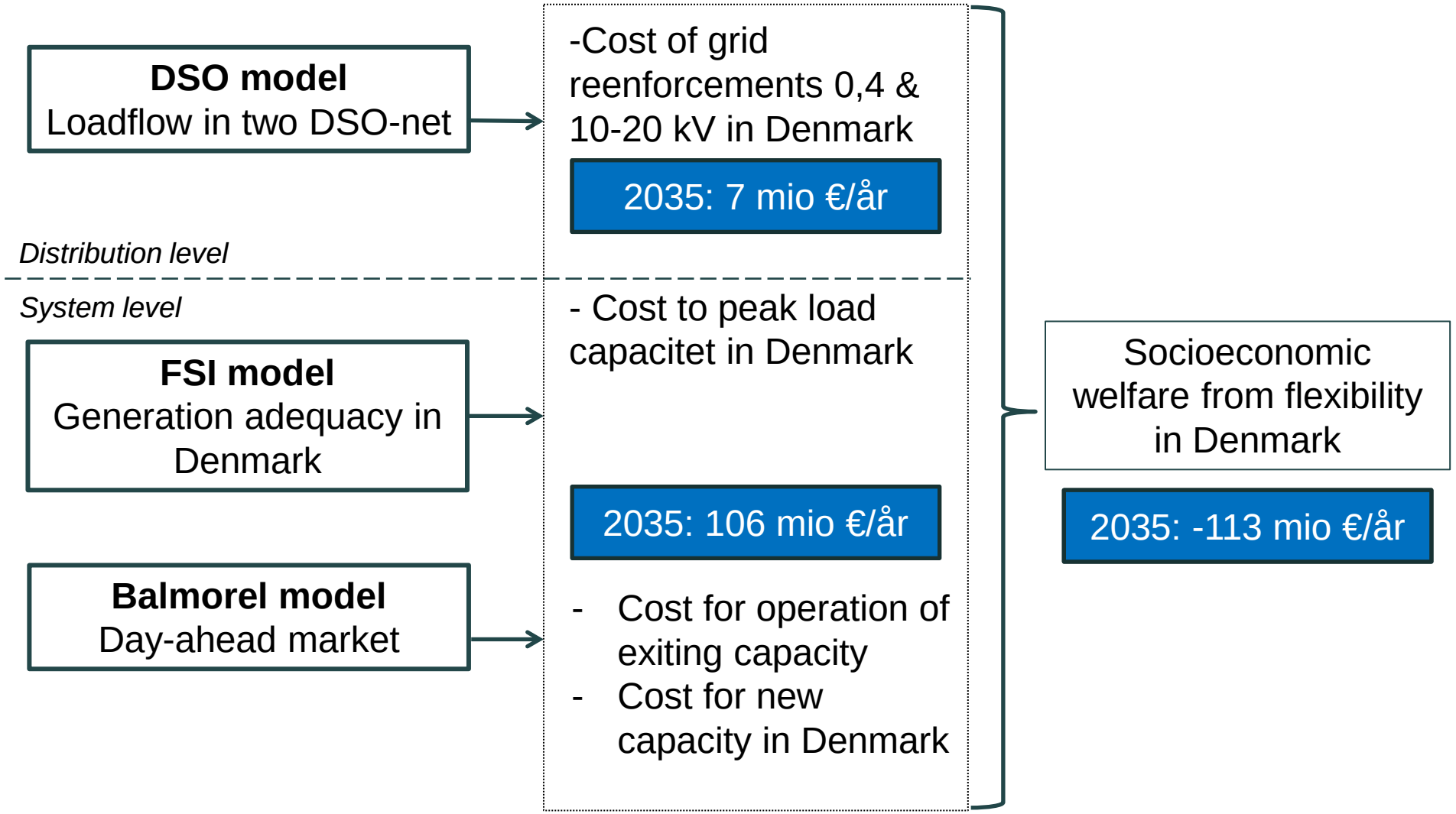


# Flexibility is an important (joint study with Dansk Energi)

- **Increased flexibility will have a value for society**
  - Primarily from lower cost of power production both in Denmark but also across Europe..
- **The main value is on the system level and not on the distribution level**
- **The Value in Denmark is dependent on the development of flexibility across Europe. There is a first mover advantage.**
- **On of the main tasks is to remove barriers for flexible solutions.**
- **The price effect due to higher flexibility implies that:**
  - Higher prices for wind power
  - All consumers including the non flexible consumer will have a smaller electricity bill.

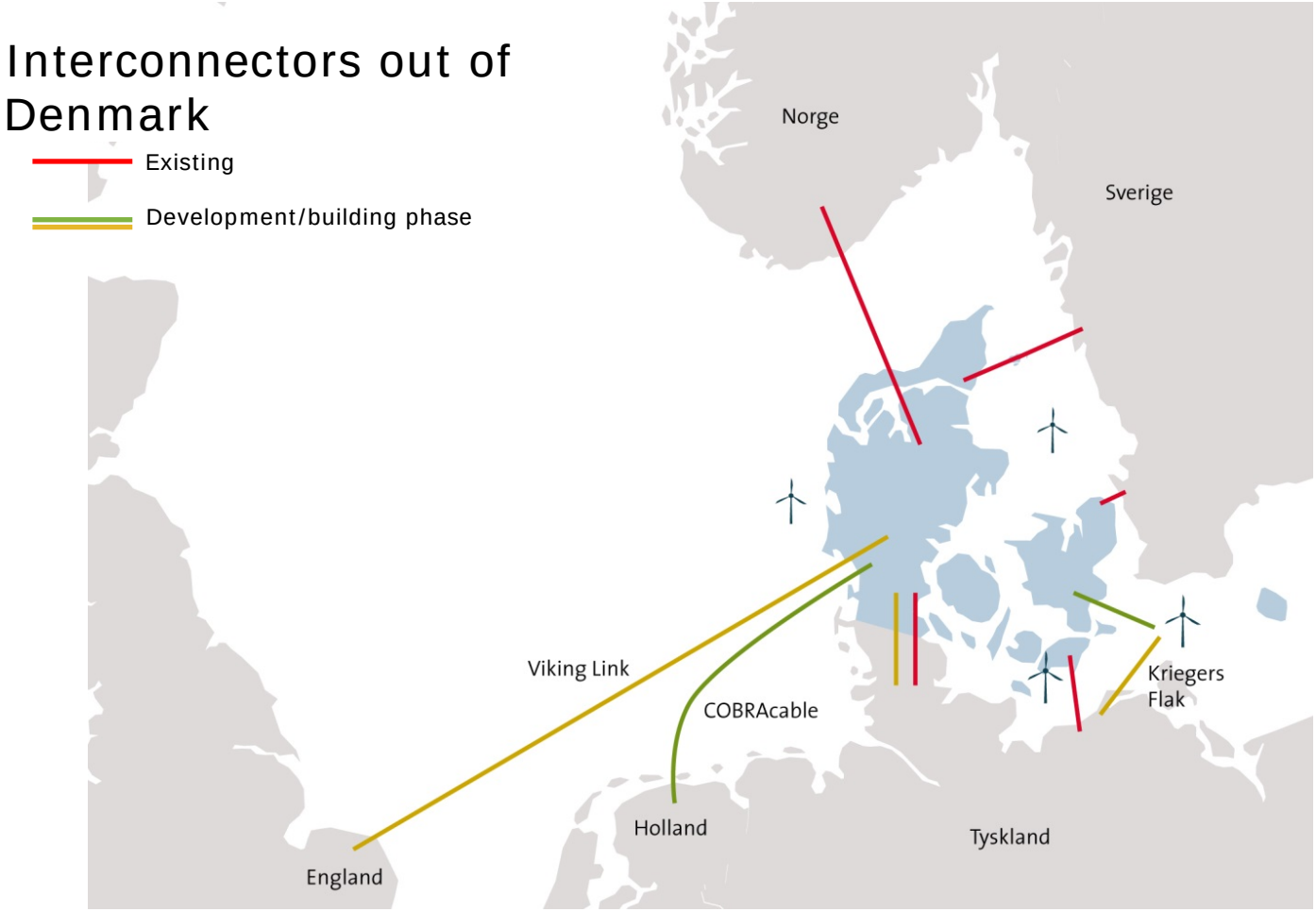
# Methods and results



# Internal measures

EA Energianalyse concludes that a combination of internal measures such a heat pumps, and interconnectors such as Viking Link/West Coast provides the highest socioeconomic welfare.

# Interconnectors



# Viking link and the Westcoast connection