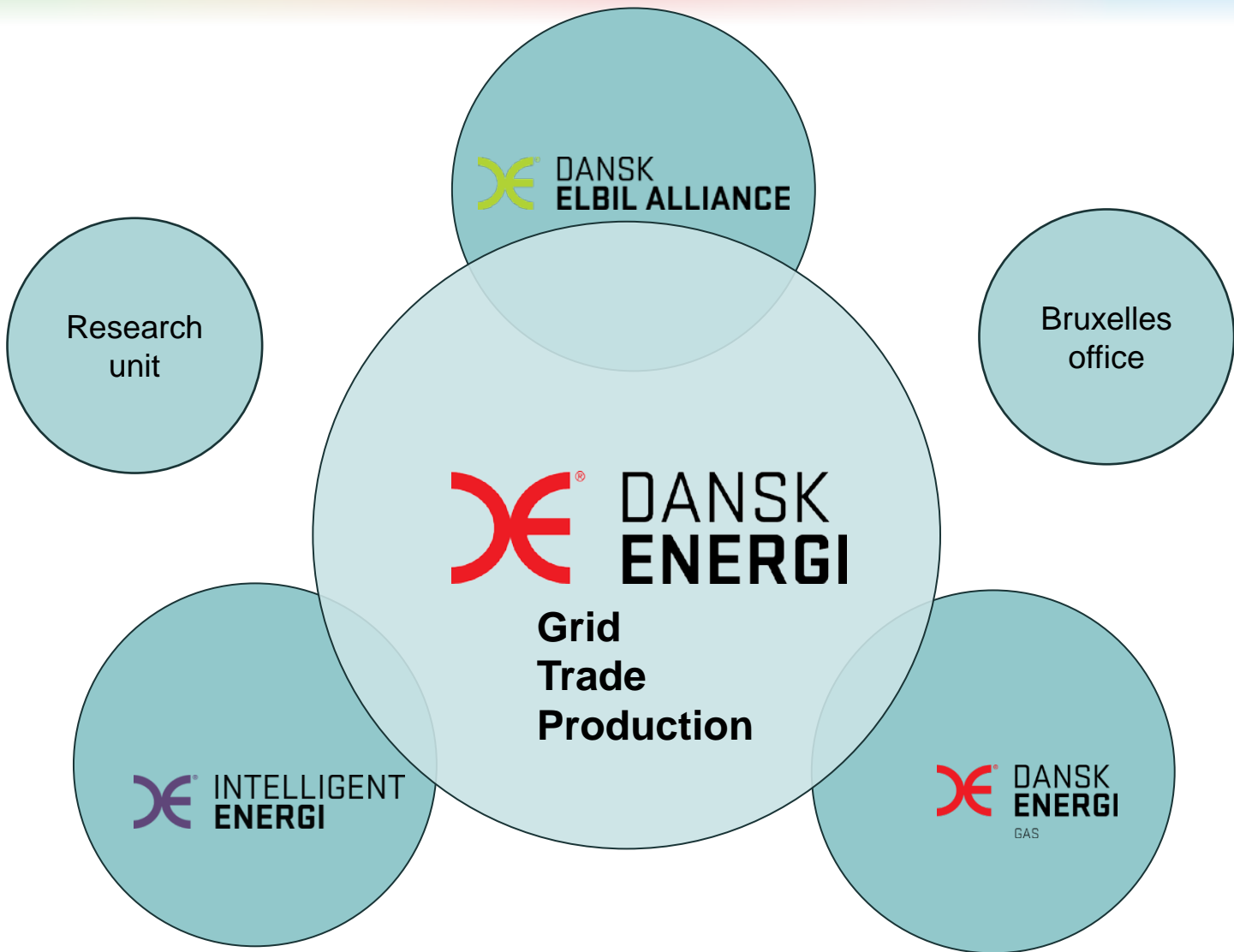


Developments in Danish Power Market Challenges in Grids and Markets

Presentation at Agora Energiwende, November 12, 2015

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Danish Energy Association

We are an industry organisation for energy companies

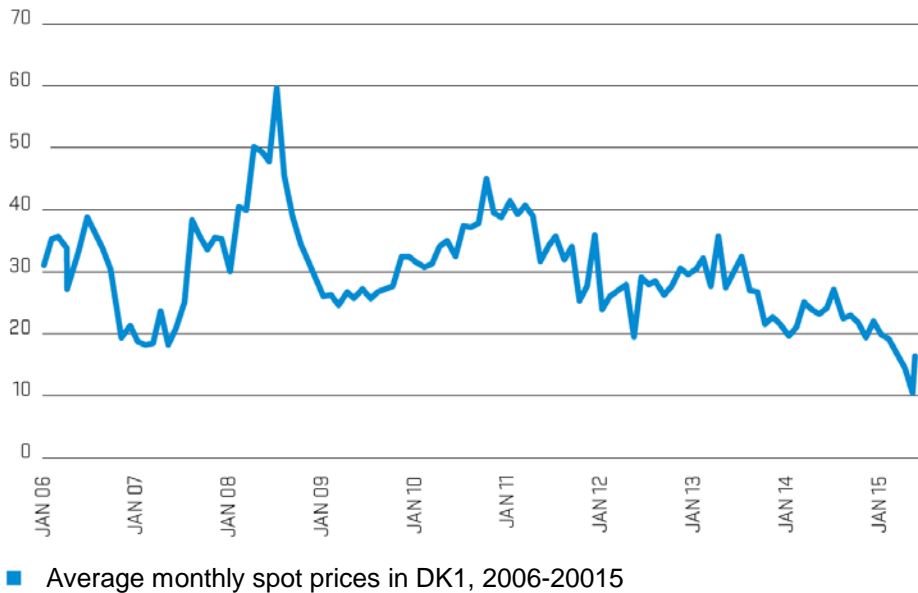


5 challenges of the Danish power market

1. Markets do not incentivise new investment
2. Low availability on interconnectors limit trade
3. Legislation not suited to handle new market conditions
4. Increase use of renewable production
5. Internal market needs to take next steps

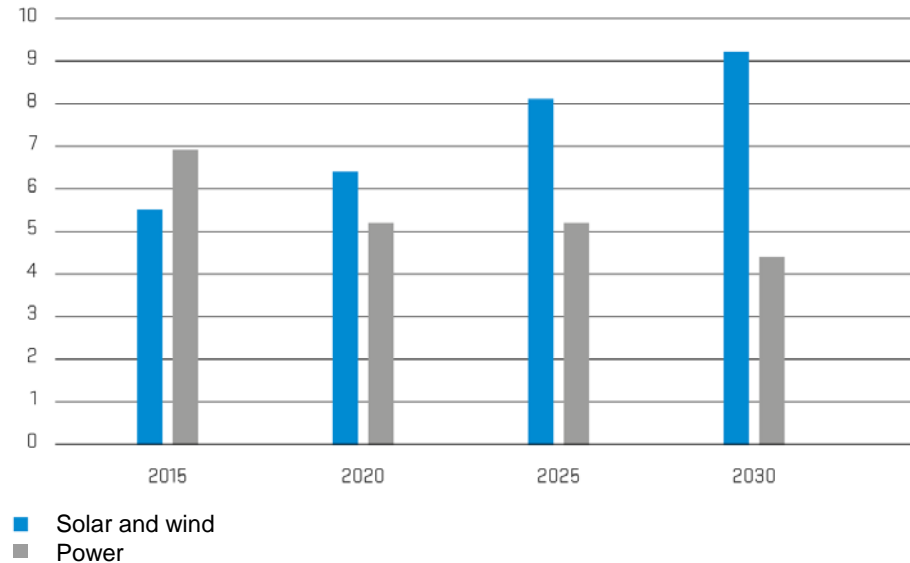
Challenge 1. Market prices do not incentivise new investment

Spot price, Western Denmark Ore/KWh, 2006-2015



Source: Nord Pool Spot

Capacity development MW, 2015-2030

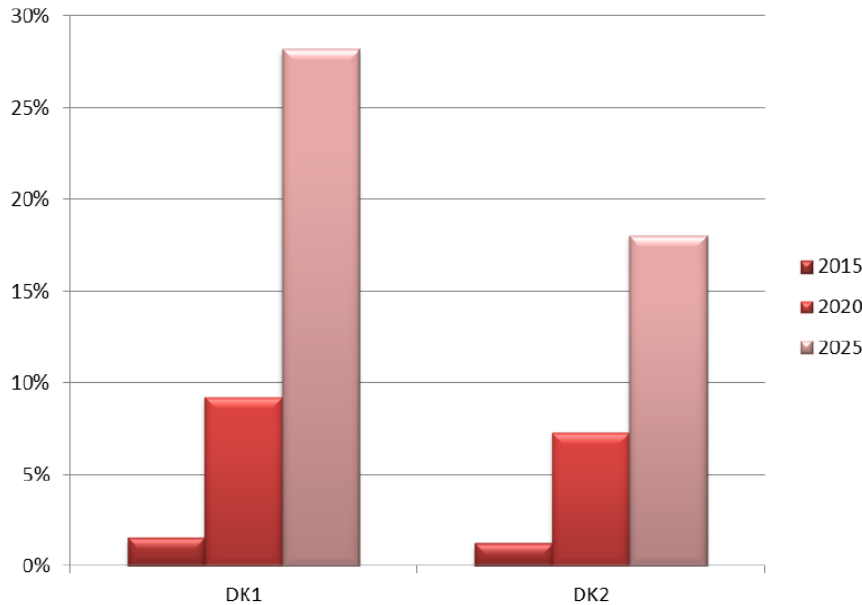


Source: Energinet.dk, Markedsmodel 2.0, september 2015.

Capacity closure

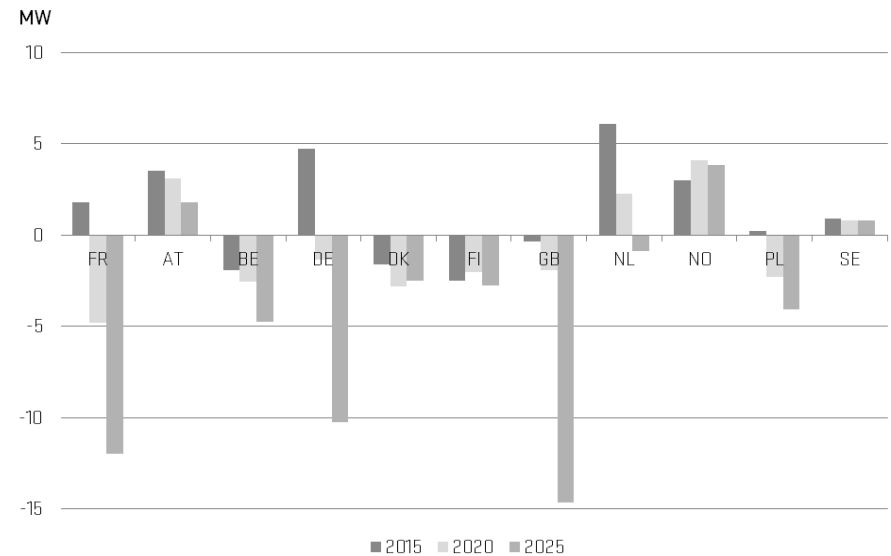
Strong increase in import dependence

Danish Import dependence 2015-2025



Source: Danish Energy Agency, 'Elforsyningsikkerhed i Danmark 2015'.

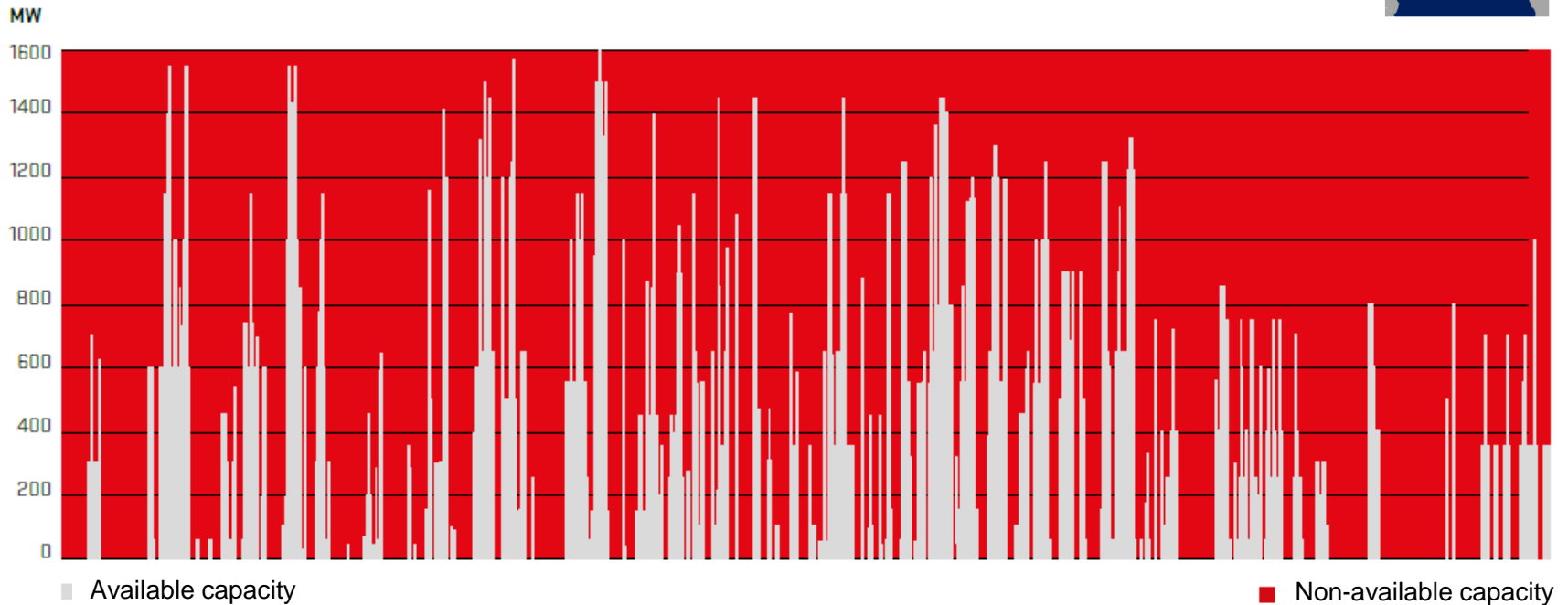
Surplus capacity 2015-2025



Source: ENTSOE. System Adequacy Forecast 2014 – 2025. Conservative scenario.

Challenge 2. Low availability on interconnectors limit trade

Available capacity on interconnector from Western Denmark to Germany



Note: Data shows availability on interconnector for first half of 2015

Source: Energinet.dk

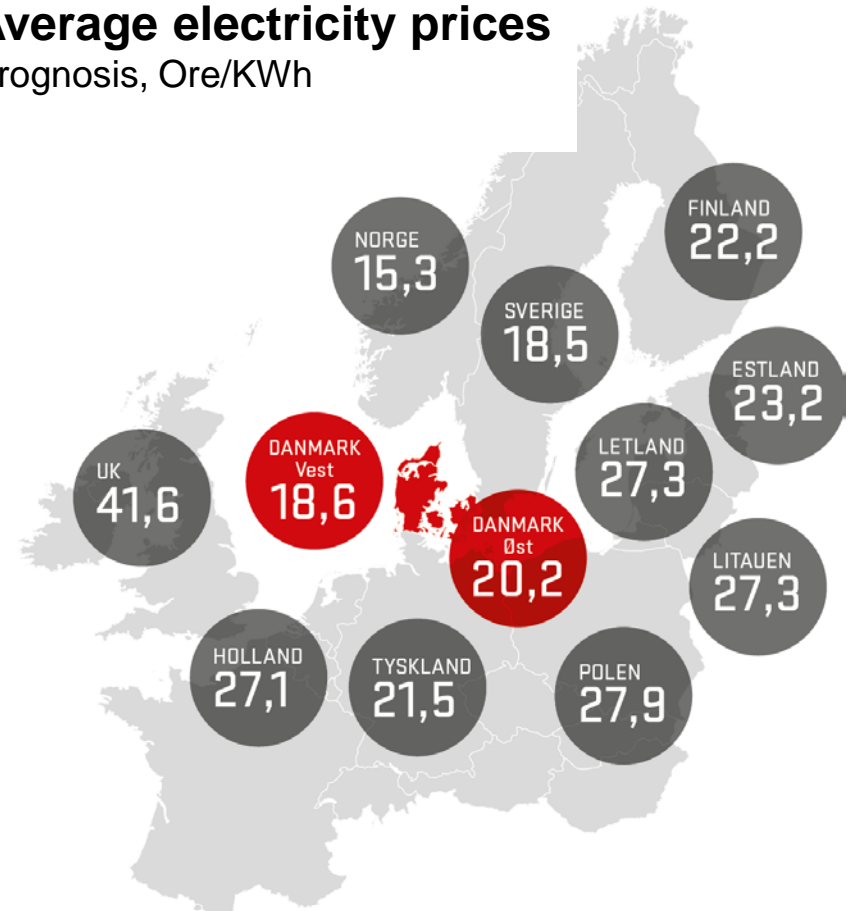
Congestions not just a Nordic problem

Congestions



Source: ENTSOE

Average electricity prices Prognosis, Ore/KWh

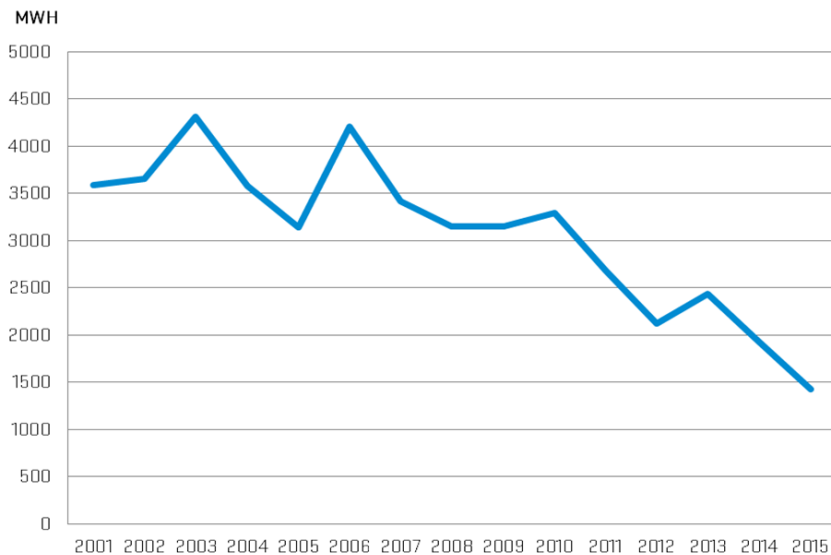


Source: Syspower, Energomix, Nasdaq OMX

Challenge 3. Legislation not suited to handle new market conditions

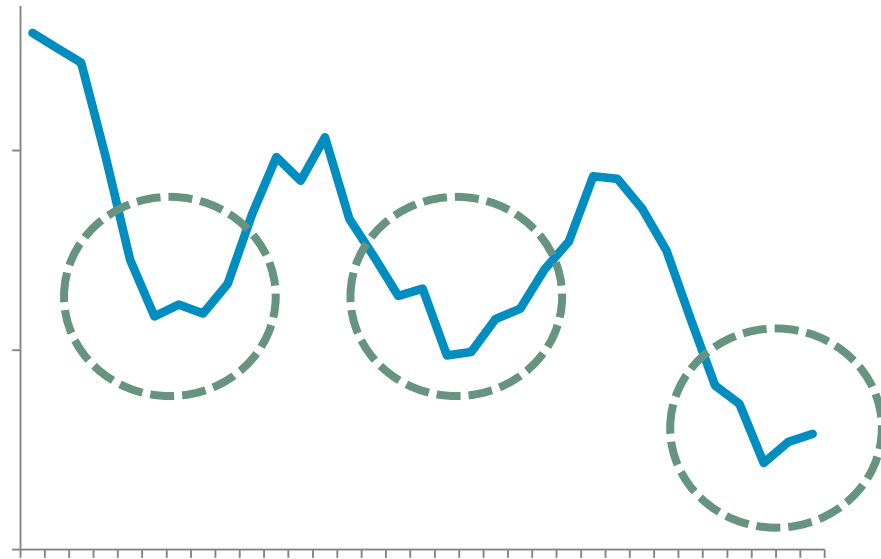
Average production in power stations

MWh/h



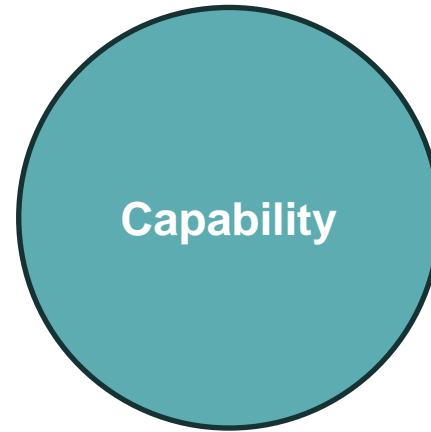
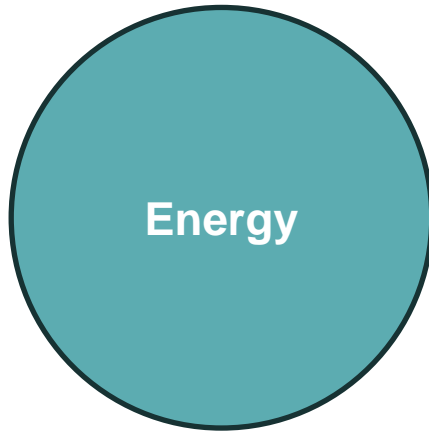
Source: Energinet.dk, Udtræk af markedsdata

Seasonal fluctuations in production



Source: Energinet.dk, Udtræk af markedsdata

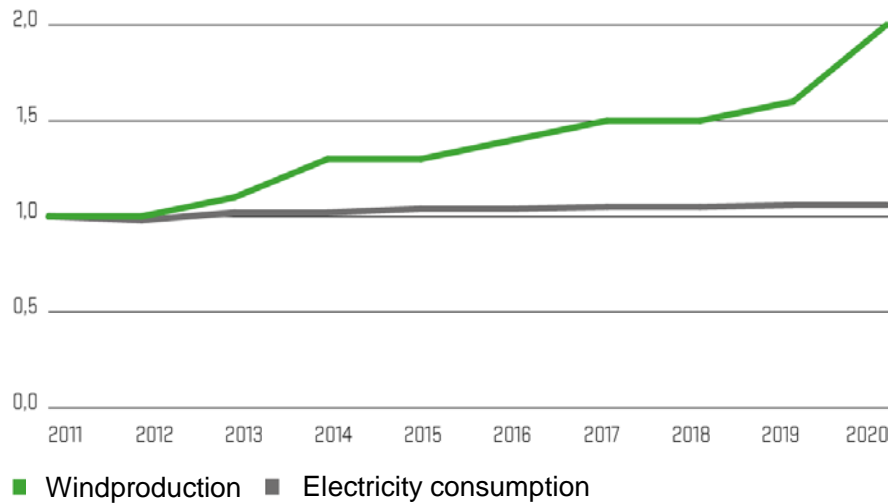
New products needs to be marketed



Challenge 4: Increase use of renewable production

Increasing wind production Stagnation in consumption

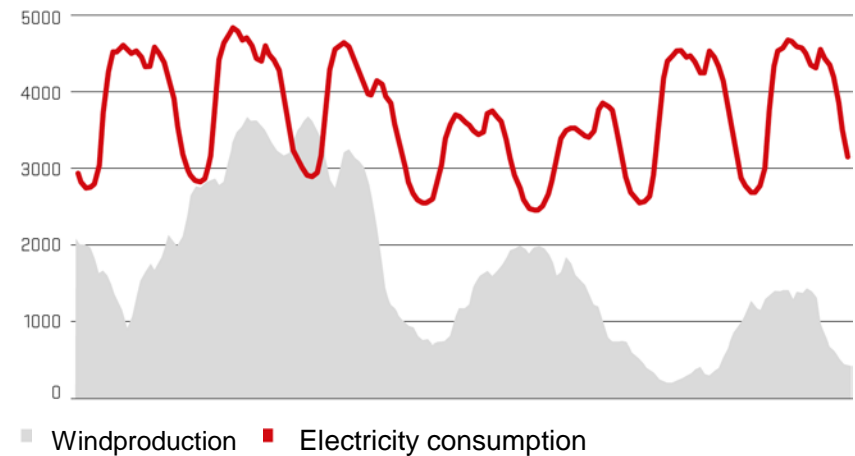
Index 2011 = 1



Source: Energinet.dk, Analyseforudsætninger

Large differences between windproduction and consumption

Timespan 1 week, MWh/h



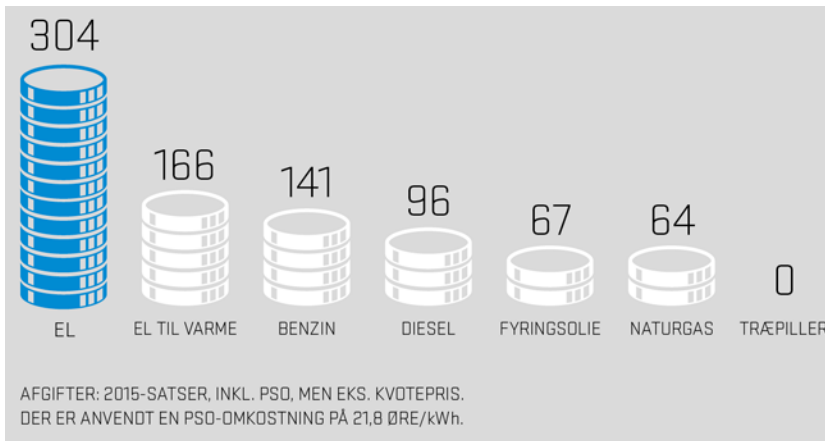
Source: Energinet.dk, Udtræk af markedsdata

Good initiatives limited by levies

Electricity highly taxed

Levies by fuel

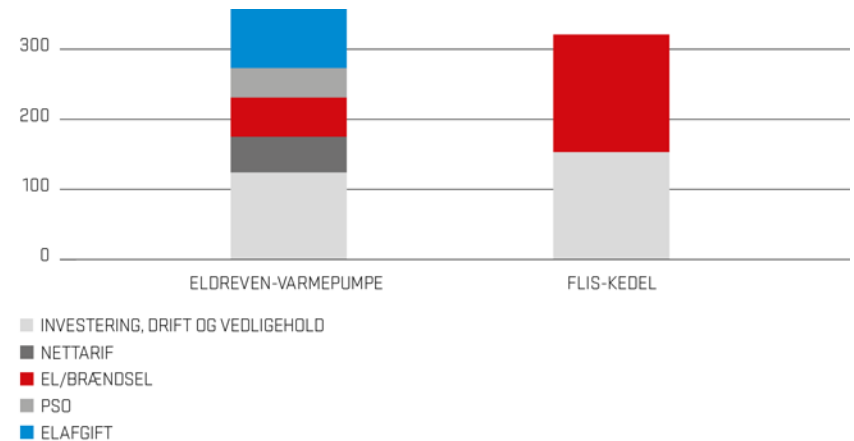
Prognosis 2015-2025, DKK/GJ



Source: Danish Ministry of Taxation

Heat pumps vs. biomass-fired boiler

Prognosis 2020, DKK/MWh



Source: Danish Energy Association

Challenge 5. Internal energy market not always moving in same direction

- Market rules gradually harmonised through Network Codes
 - Day-ahead coupled since 2014
 - Intra day markets progressing
 - Ancillary service markets next step for EU electricity market integration
- National capacity mechanisms emerging
 - Understand concerns
 - Cross-border effects
 - Regional approach important
 - Denmark expected to implement peak load reserve from 2016
- Need a stronger regulatory framework



Source: Energinet.dk, Markedsmodel 2.0, 2015

Coupling of ancillary service markets next step for European power market integration

Product	Market	Status 2015
Primary reserve; FNR/FDR	Common market DK1-SE	Success!
	Common market DK2-DE	Success!
Secondary reserve	Nordics	Pilot project
	Continent	Poor outlook
Regulating power	Nordics	Success!
	Continent	Proposed start Jan 1, 2019 – unlikely

Source: Danish Energy Association

3 recommendations

MORE MARKET

- Markets for all products needed to operate to energy system
- Power stations need freedom to react to the market's price signals
- Market price to fully reflect value of flexibility

MORE ELECTRIFICATION

- Increase in wind production to be complemented by increase in use of electricity
- Make use of electricity and add flexibility to demand
- Heat pumps, electric boilers and EVs

MORE EUROPE

- 2050 targets to test internal market – no country can do it alone
- Need for solutions at EU and regional levels
- More infrastructure + available capacity

Thank you for your attention

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