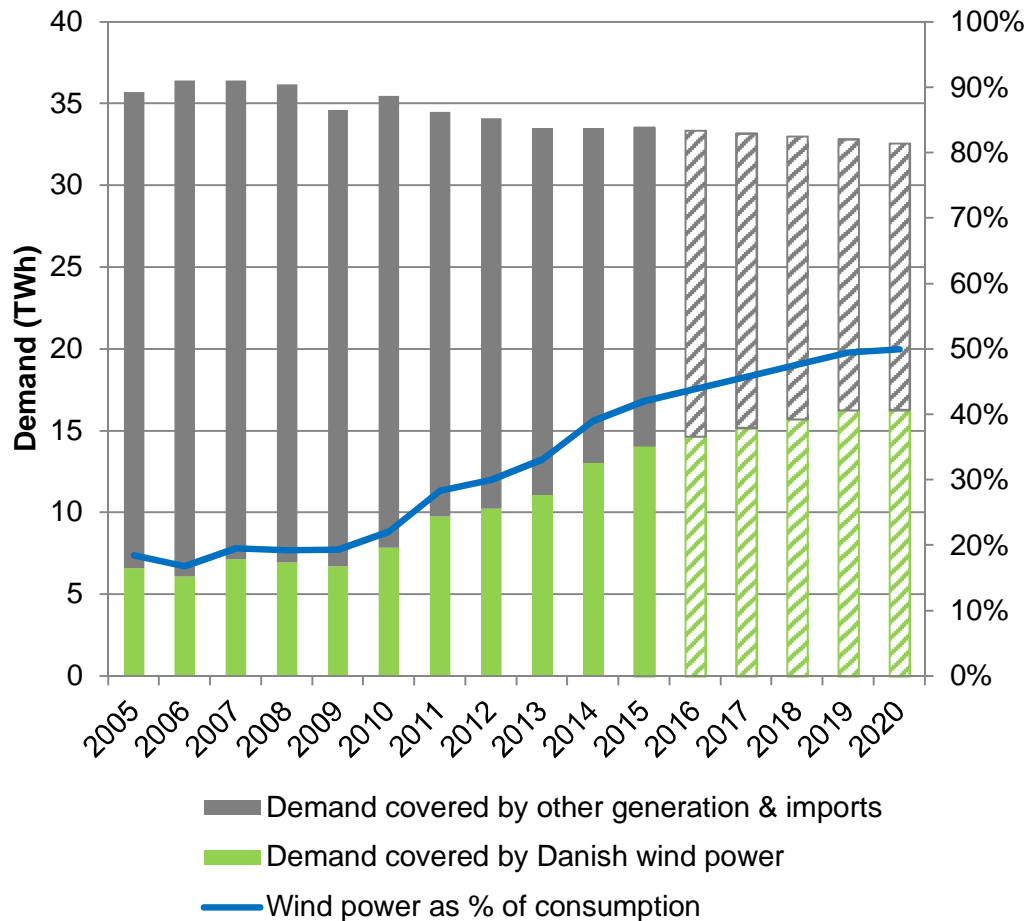


Investment signals for the low-carbon electricity sector

Danish experiences and challenges

Danish electricity system will soon be dominated by renewable energy, that is highly integrated in the market



50% wind power in 2020

- Integration into the Nordic Power market/system
- Strong interconnectors increases market access

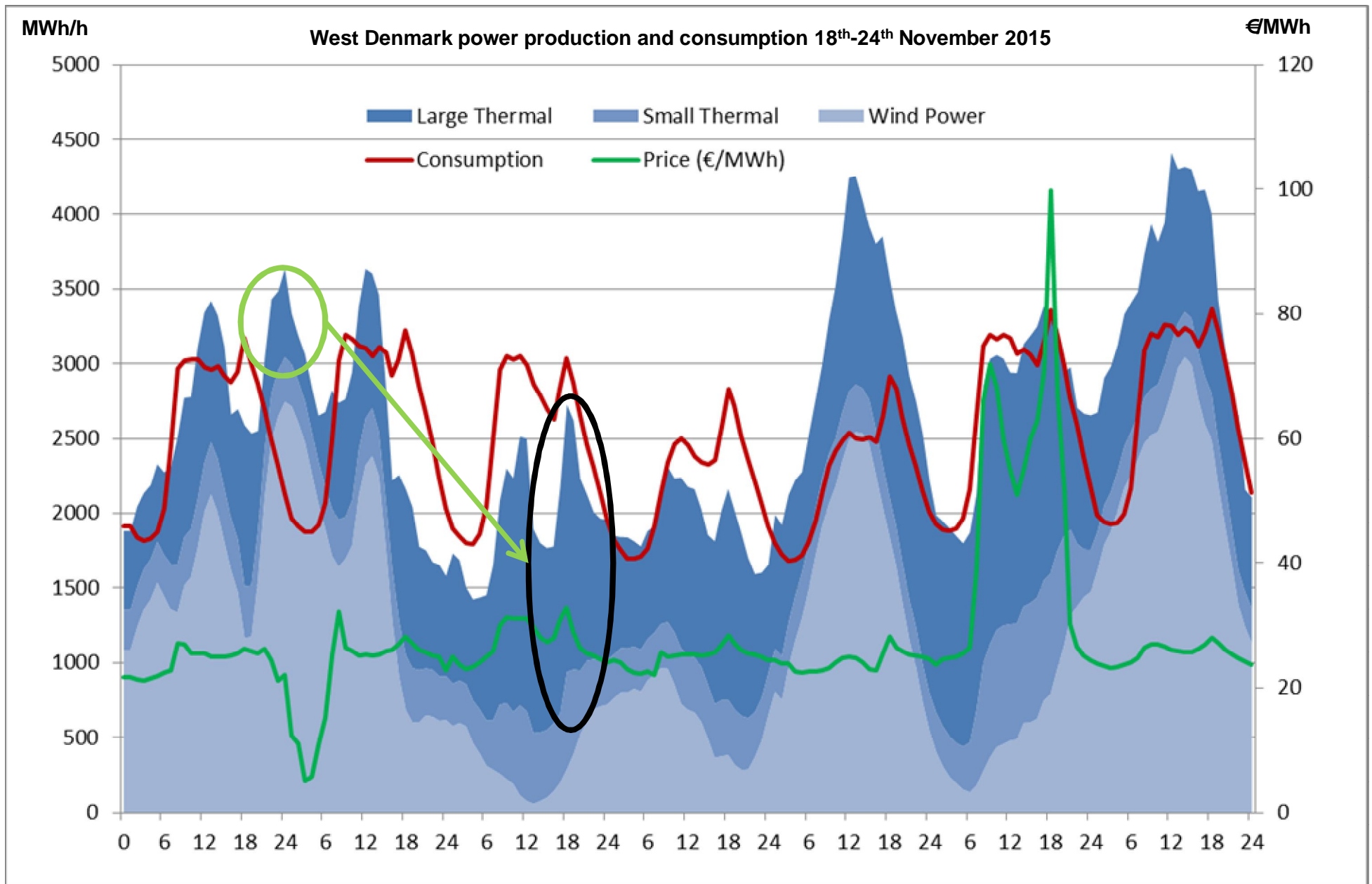
Incentives through the market (thermal and wind)

- Energy only market including payment for flexibility
 - (in principle) No priority dispatch
 - No must run
 - All market players exposed to negative prices
 - All market players participates in balancing market
- No capacity payments (potential strategic reserve)

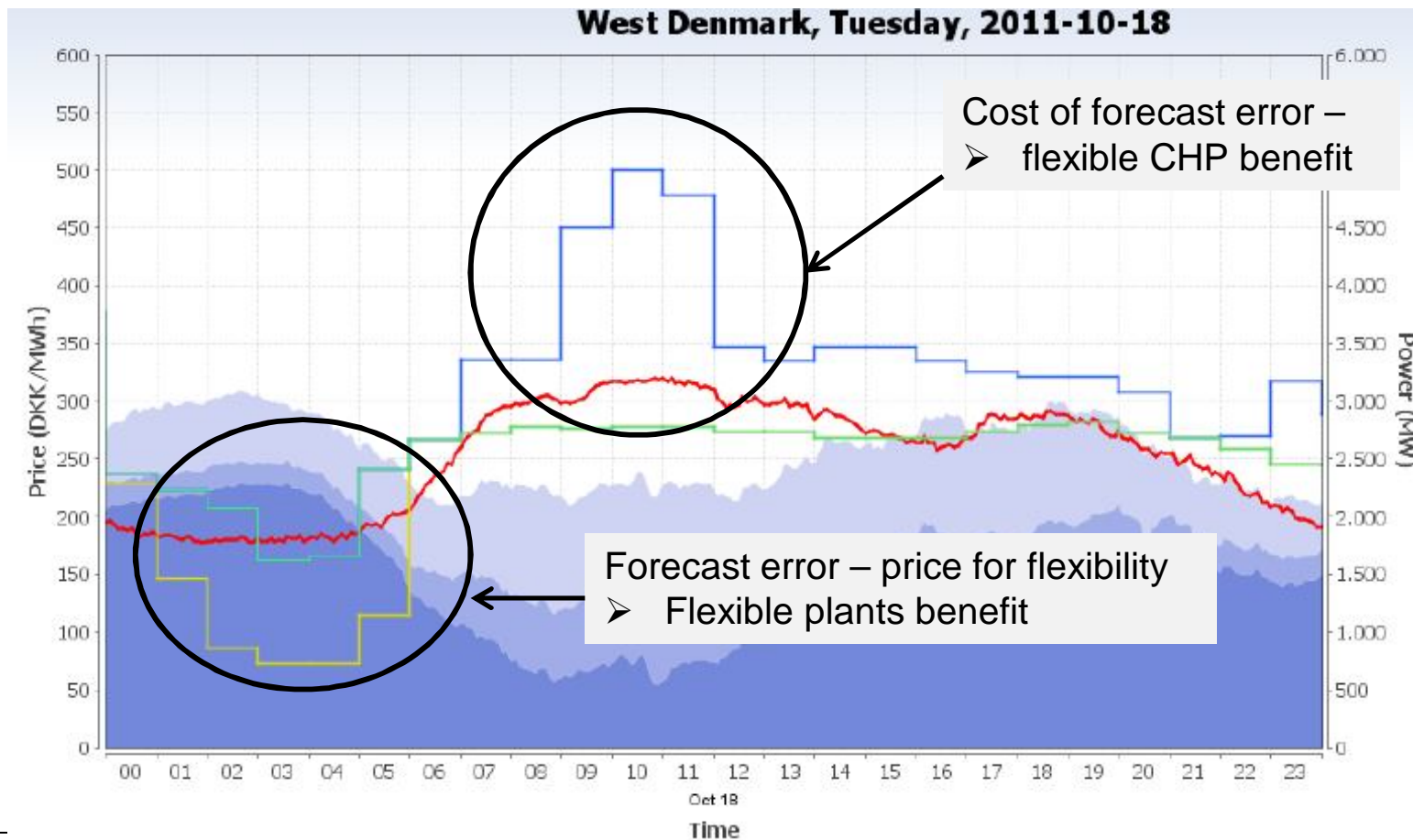
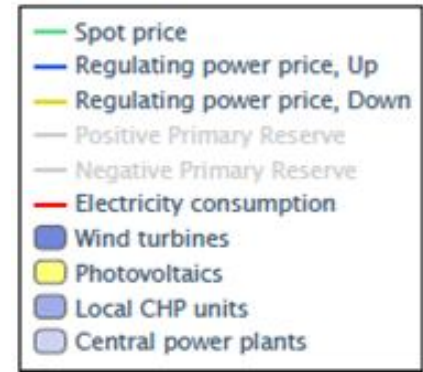
Incentives through subsidies

- Support for renewable energy are provided by subsidies and partly by ETS

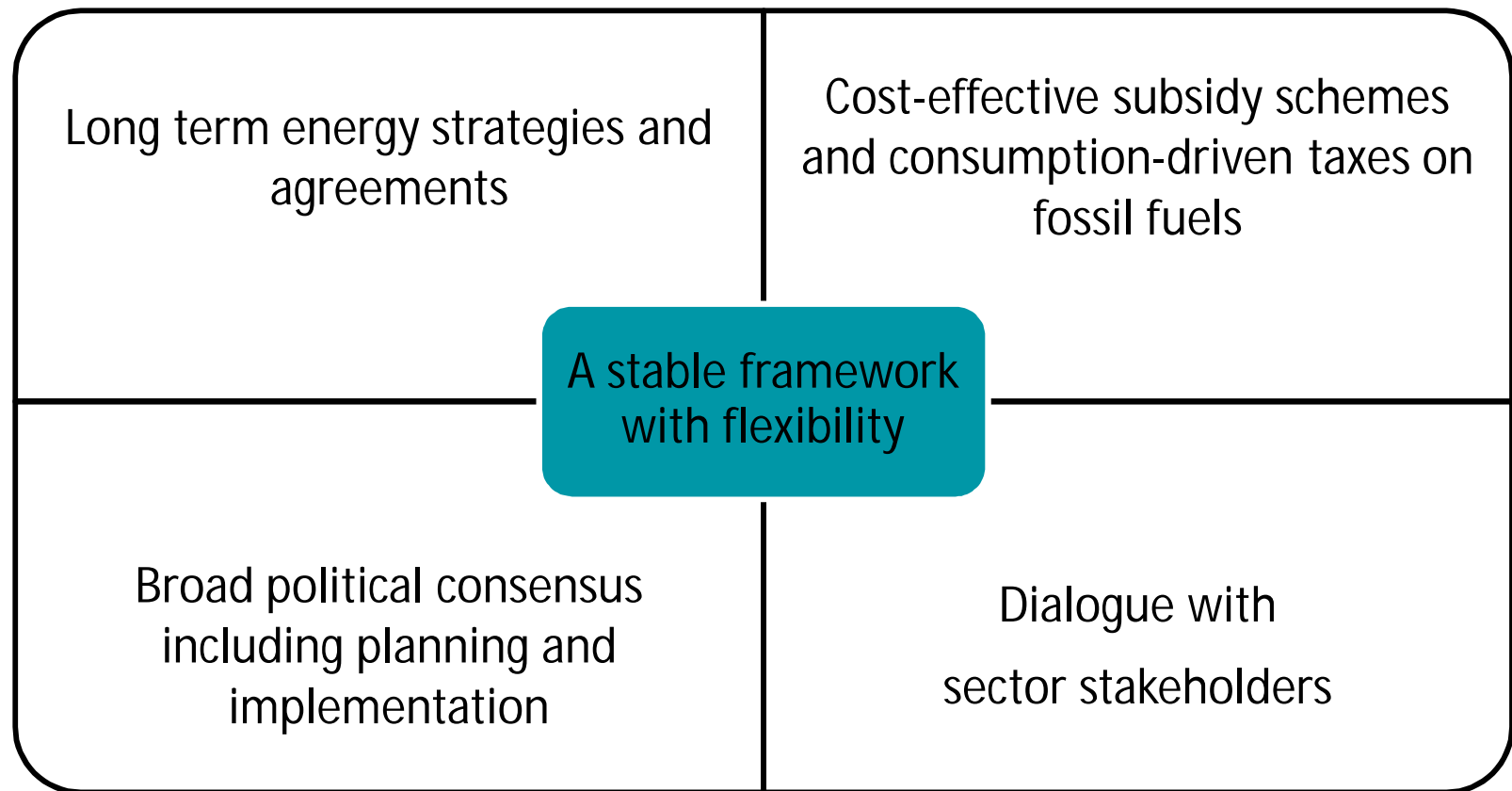
Flexibility in system operation – thermal plants



The market balances the power system by rewarding flexibility



Key Elements of Danish Energy Policy over time



How to ensure long term investment signals

Existing market design is out-dated

- Existing market design is largely tailored to the electricity system that existed when the liberalisation process began
- New design must accommodate wide range of technologies with different technical capabilities
- Must capture value of various technical capabilities in a power system with a heterogeneous technology mix
- More market, less TSO - Sys Op art. 4, 2 (d) - *ensure TSOs make use of market-based mechanisms as far as is possible to ensure network security and stability*



Improvements needed

- EOM (incl. flexibility payment) is main instrument
 - Strong day-ahead markets (high price cap)
 - Capacity mechanisms are temporary measure of last resort
- Enlarged markets: Clear market rules for efficient and fair utilisation of international connections
- Strong ETS – real investment driver
- Minimum distortive subsidies
- Intra-day market - efficient hedge against the cost of imbalances
 - Two roles for balancing market
 - i. purchasing regulating power
 - ii. ensuring sufficient manual reserves

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THANK YOU
