



NordREG
Nordic Energy Regulators

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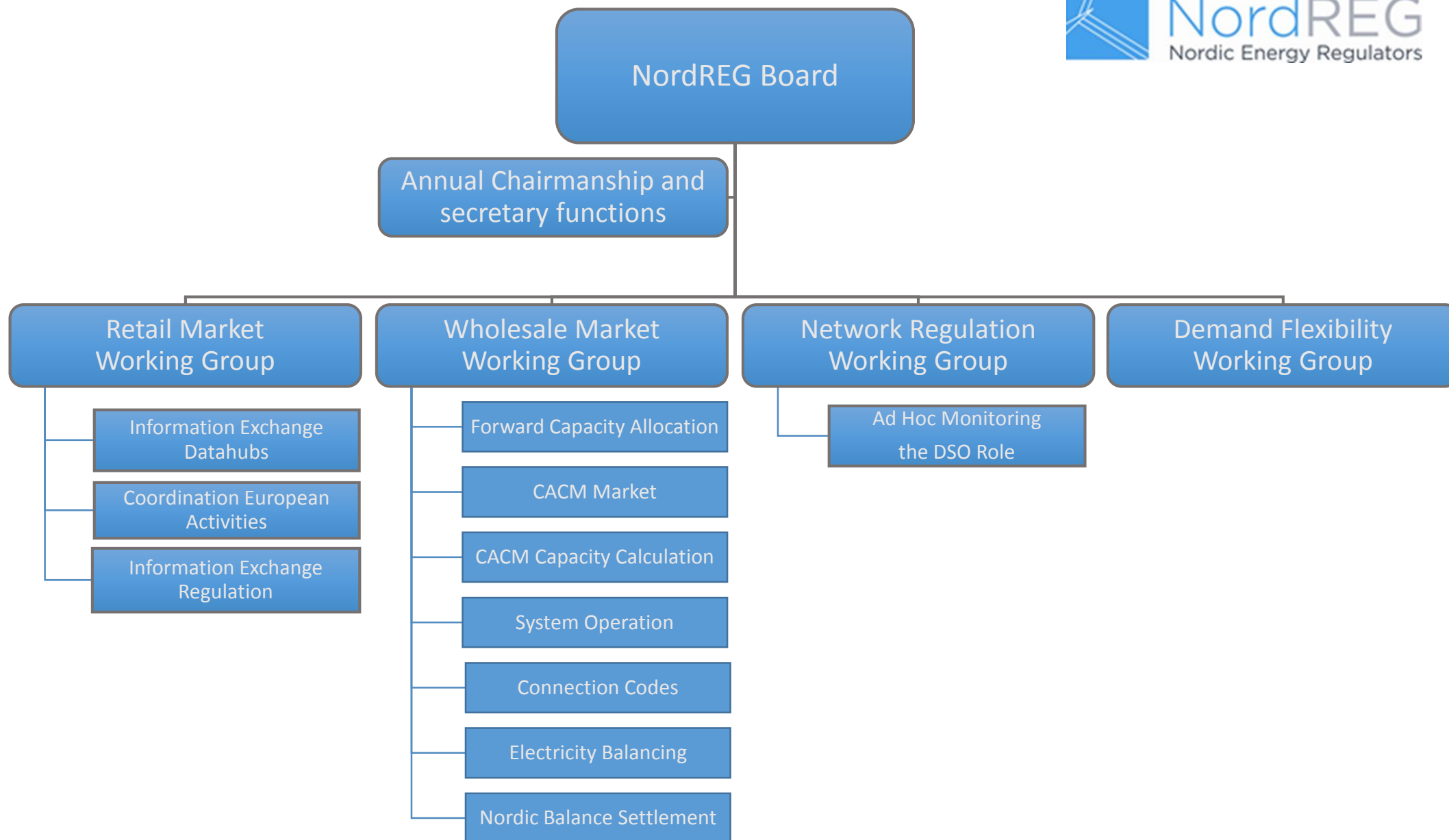


NordREG MISSION

In cooperation, we actively promote legal and institutional framework and conditions necessary for developing the Nordic and European electricity markets

NordREG VISION

All Nordic electricity customers will enjoy free choice of supplier, efficient and competitive prices and reliable supply through the internal Nordic and European electricity market



The Nordic market – developments and features



1993 - Norwegian Power Exchange opened to all actors

1995 - Nordic Ministerial Declaration on a borderless Nordic market

1996 - Common PX Norway-Sweden, NordPool

1998 - Finland joins NordPool

2000 - Denmark joins NordPool

2002 - Physical and financial markets separated (NPS & Nasdaq)

2002 - Nordic Balancing Market initiated

2009 - Common pricing model for balancing services

2009 - Nordic Intraday Market

2012 - First Nordic Grid Development Plan

2013 - DataHub in Denmark

2016 – Supplier centric model in Denmark

2017 - Nordic Balance Settlement Fi-Sw-No

**Transparent and liquid
wholesale market**

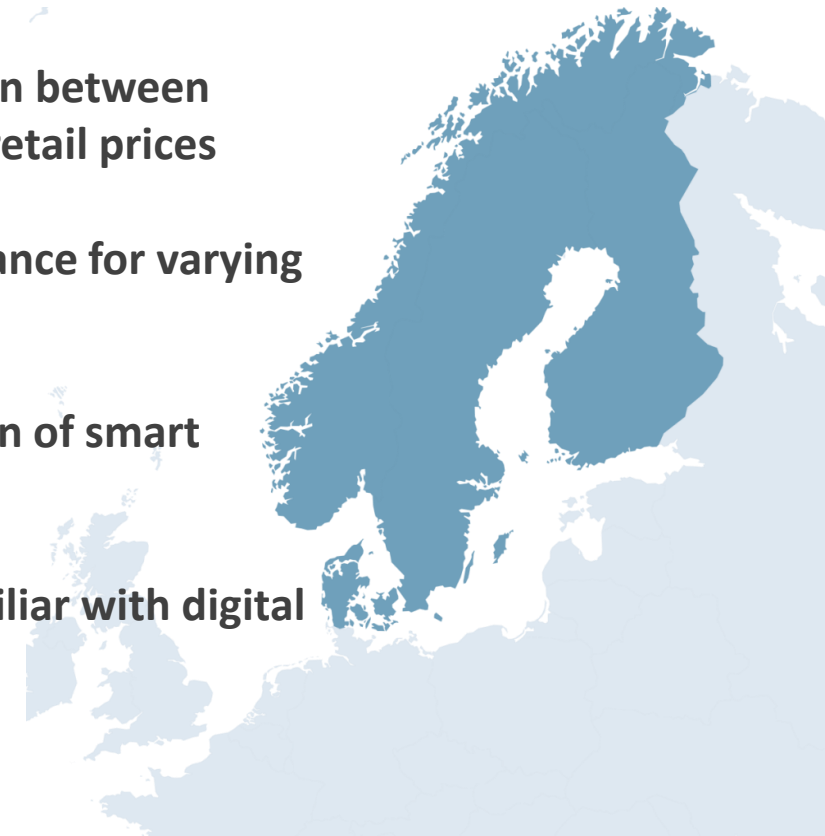
**System price facilitates efficient
financial hedging**

**Close connection between
wholesale and retail prices**

**Political acceptance for varying
prices**

**High penetration of smart
meters**

**Consumers familiar with digital
solutions**



Retail Market WG

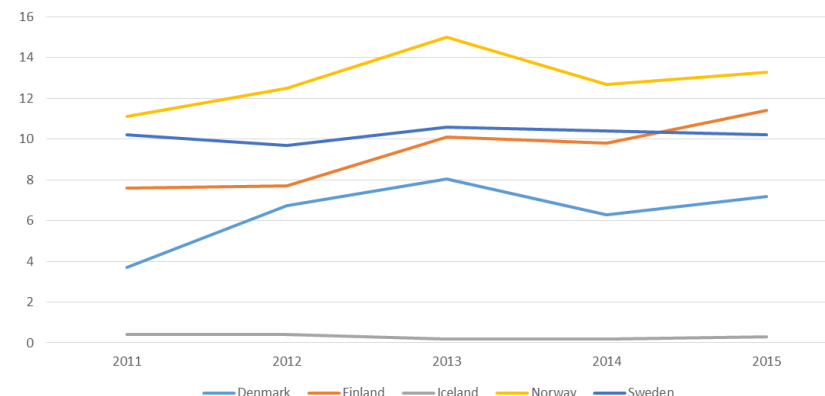
- Recommendations for harmonized Nordic market

Supplier centric market model

Common standards for switching and moving process

DataHub

Consumers own their data



Putting consumers at the heart of the regulation

Demand Flexibility WG



Sharing experience and information

Co-operate on specific tasks that require a Nordic perspective

Two studies recently completed. NordREG will identify possible areas for further work

Flexibility is the new currency

Network Regulation WG

Sharing experience and best practice

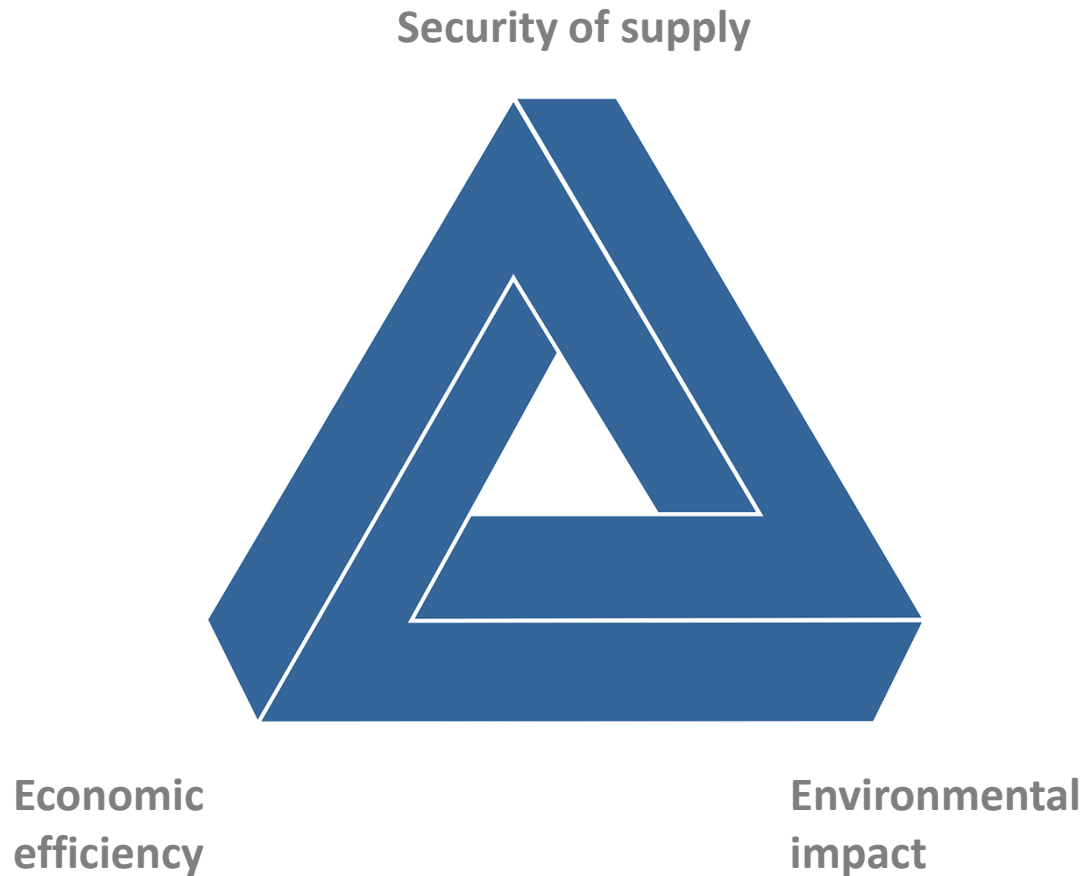
Development trends in the regulation of DSOs

Investigation of the functionality of the network grid

Administration of energy storage/batteries and EV charging

Monopoly regulation is a delicate balance

XB trade reduces trade-offs and improves deliveries



Complementary mix of natural resources and generation technologies

Trust among stakeholders

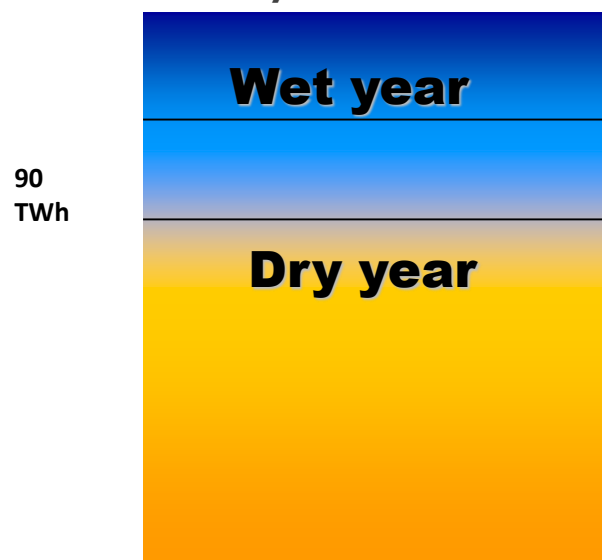
Rooted in the Nordic energy ministers' determination to expand and integrate the regional electricity market co-operation

Transparent processes, balanced solutions

Gains from crossborder trade

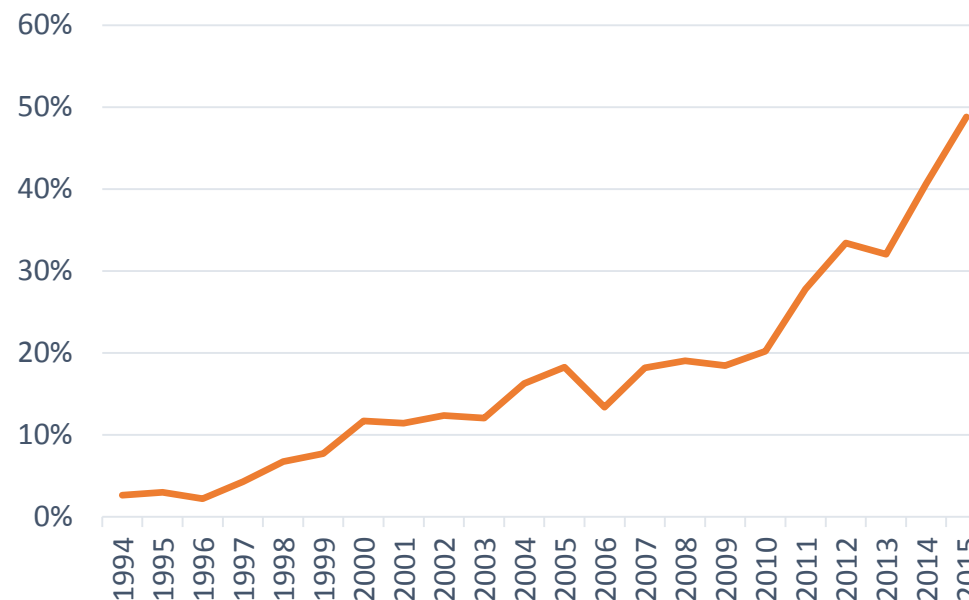
Connecting what's different and enabling more renewable energy

Hydro power production.
Norway



XB trade is vital to handle seasonal variations in hydro power production

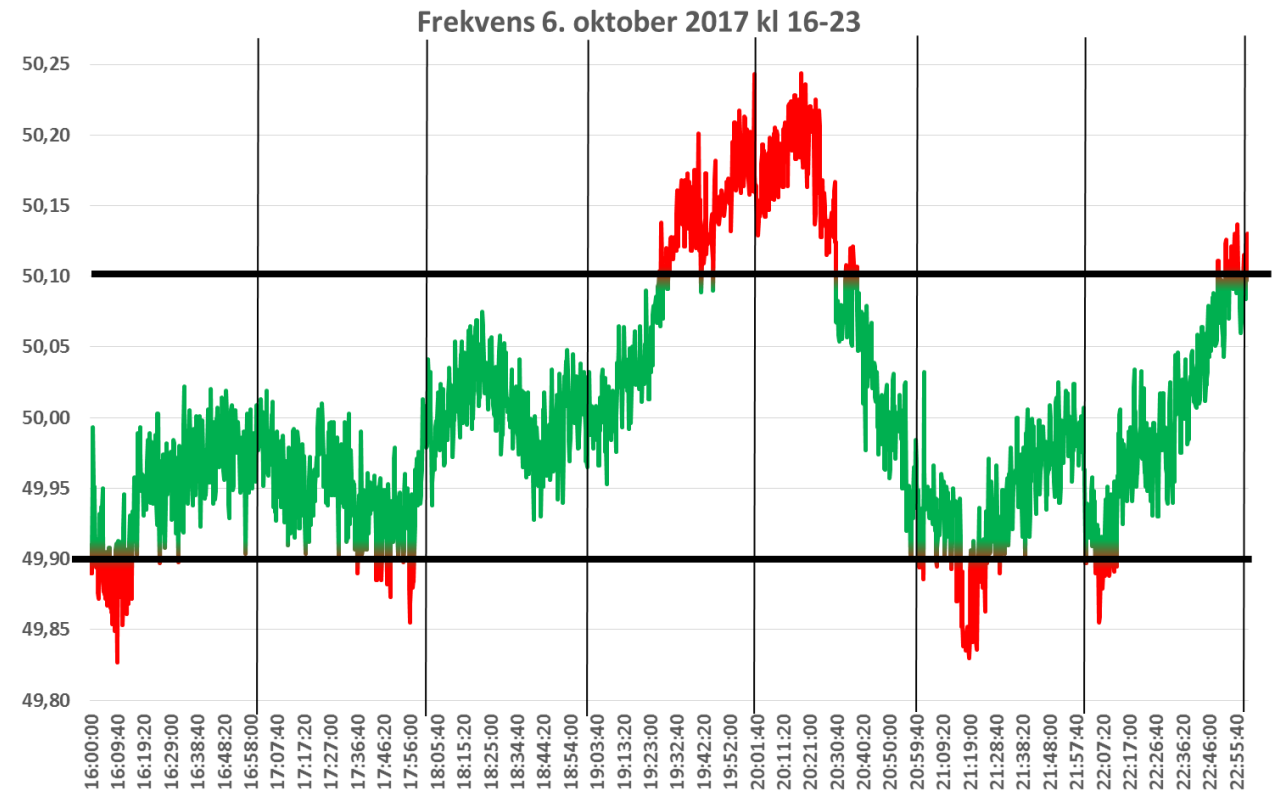
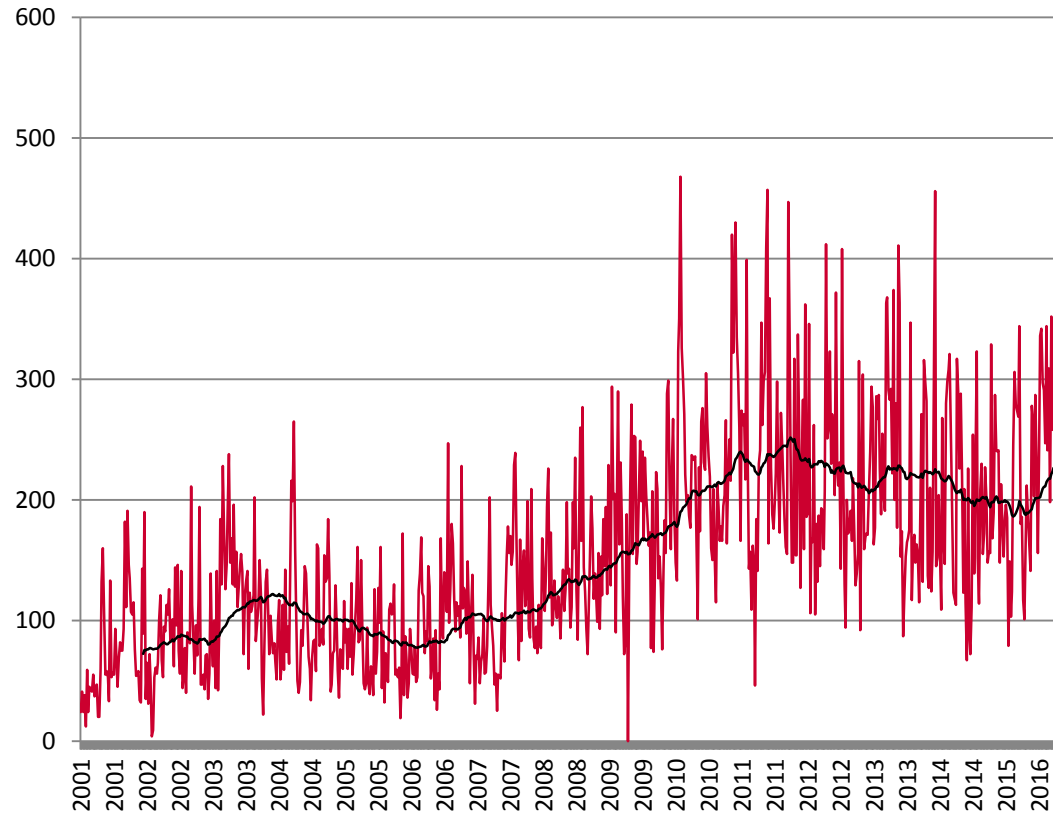
Windpower's share of elproduction
1994-2015. Denmark



Increasing share of intermittent production:
XB trade offers flexibility

Increasing system complexity

- Calls for broader and deeper co-operation on Nordic and European level



Increasing system complexity

- Calls for broader and deeper co-operation on Nordic and European level



Increased share of intermittent production

Larger influence from interconnected systems

Congestions in the Nordic synchronous area

Actions required

Improved market design and system operation products

Digital, automatic, real-time operational procedures

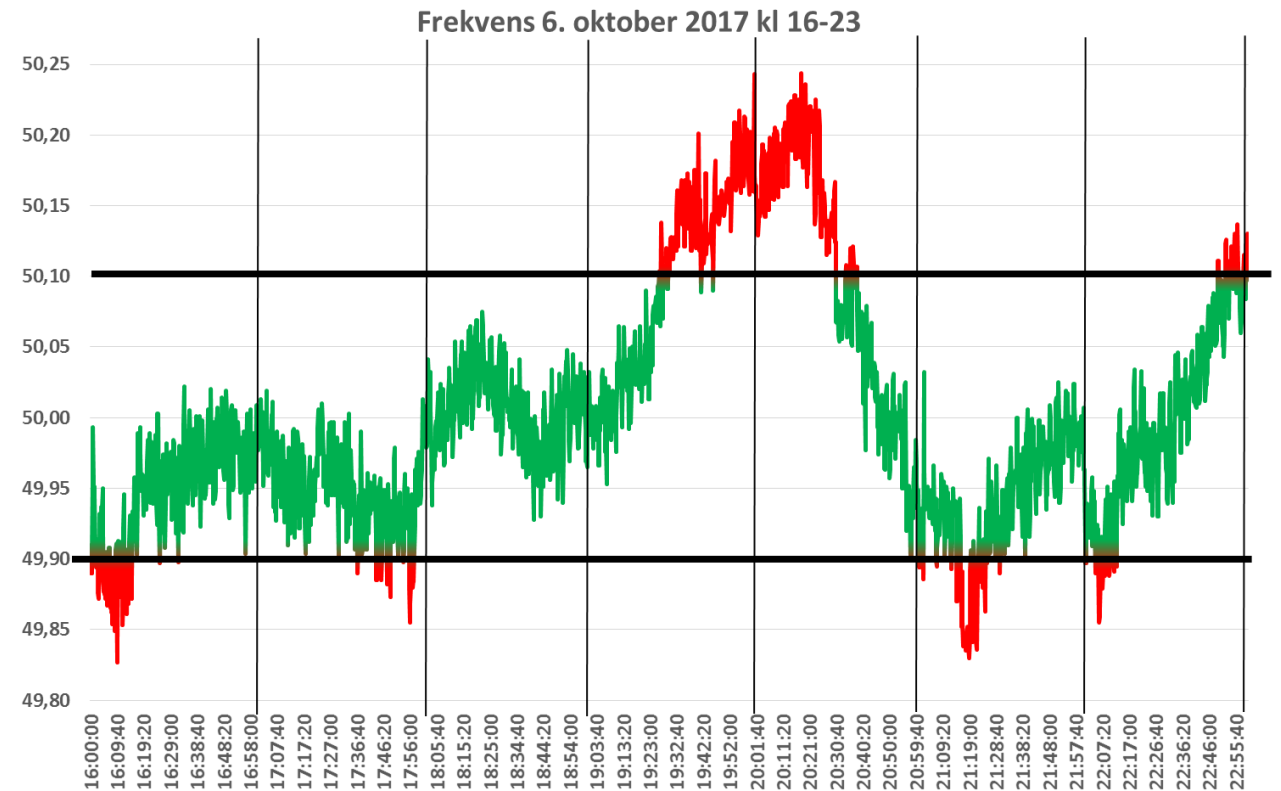
Holistic approach

Market design - wholesale & retail

System operation

Grid development planning - transmission & distribution

Monopoly regulation - TSO & DSO



Network Codes and Guidelines

- CACM



Nordic TSOs have proposed Flow Based Capacity Calculation Methodology

Proposed Nordic Flow Based (FB) includes a module for optimal allocation of flows on DC-interconnectors
Not included in current CWE FB / Core FB proposal

Go-live of Nordic FB is not foreseen before 2021. Nordic NRAs will allow for
full fledged testing and extensive parallel runs
to ensure that the new capacity calculation method works efficiently before the launch

More NEMOs enter the Nordic market

Regulatory framework outlined in CACM
NRAs' coordination on regional level is not mandatory
Nordic NRAs have coordinated closely on a voluntary basis (eg. cost sharing and -recovery)

Nordic Energy Co-operation



- Strong today – stronger tomorrow

A success story – being challenged

The next 5-10 years crucial in creating the right dynamics for the green transition

Further development of market based solutions in the energy-only market


Need for renewed political guidance in close dialogue with stakeholders

A Nordic Forum should be governed by Ministerial level

Important to clearly specify the intended aims of the forum, and to ensure involvement from all relevant stakeholders

Nordic NRAs are ready to contribute





Thank you for your attention!

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