

CHANGING MARKETS AND MODELS

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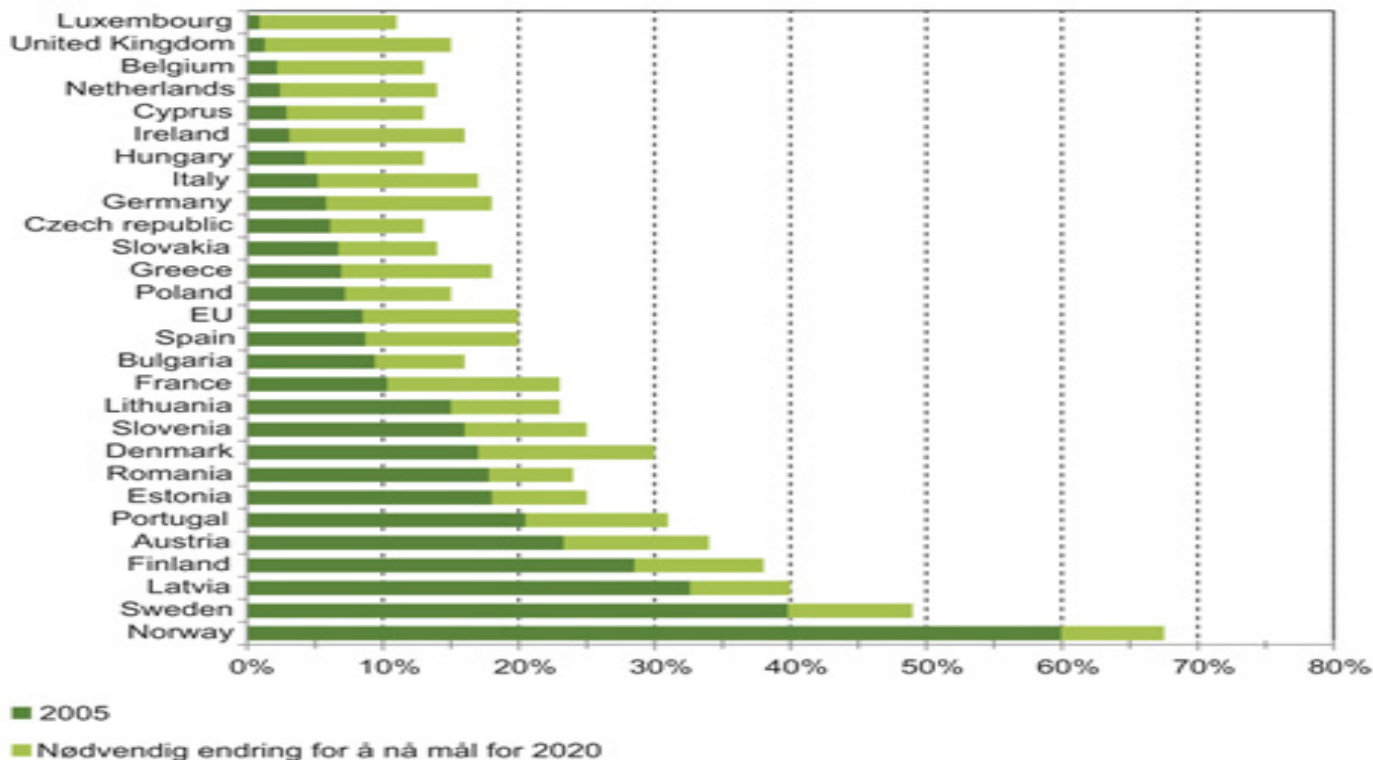


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THE 2020 TARGETS FOR RES IN EUROPE

→ Andel fornybar energi i 2005 og mål for 2020



KILDE: EU/Eurostat, 2012 / miljøstatus.no

Nordic: The power balance is getting stronger

2012

2020

2025

2035

Power balance TWh



ELECTRIFICATION

INDUSTRIAL demand

GENERAL consumption

Olkiluoto 3 in FI
Upgrading in SE

Olkiluoto 4 ?

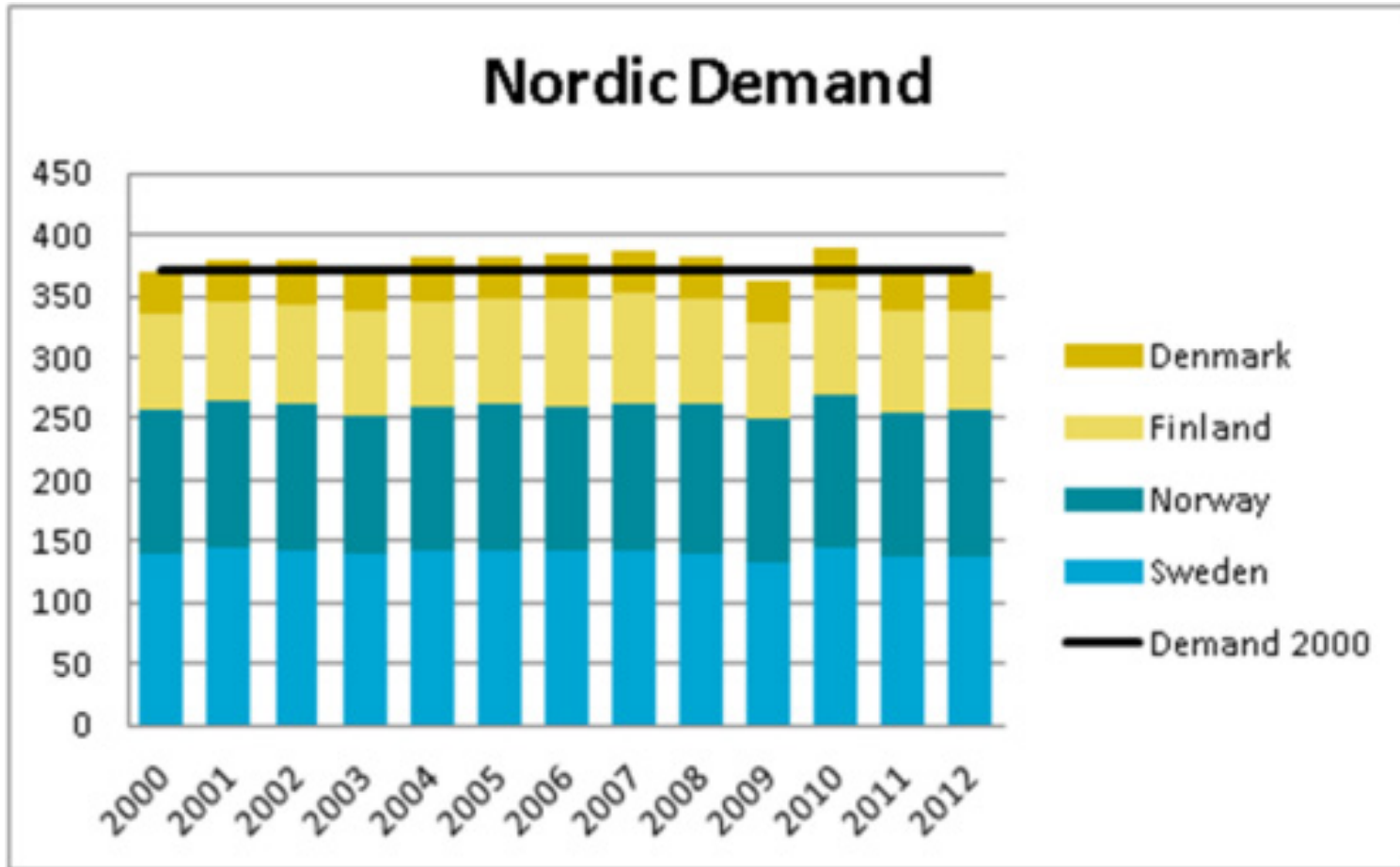
Fennovoima /Loviisa?
Decommissioning /New build SE?

NO, SE: EL-CERT MARKET (+26,4)
DK, FI: other support mechanisms

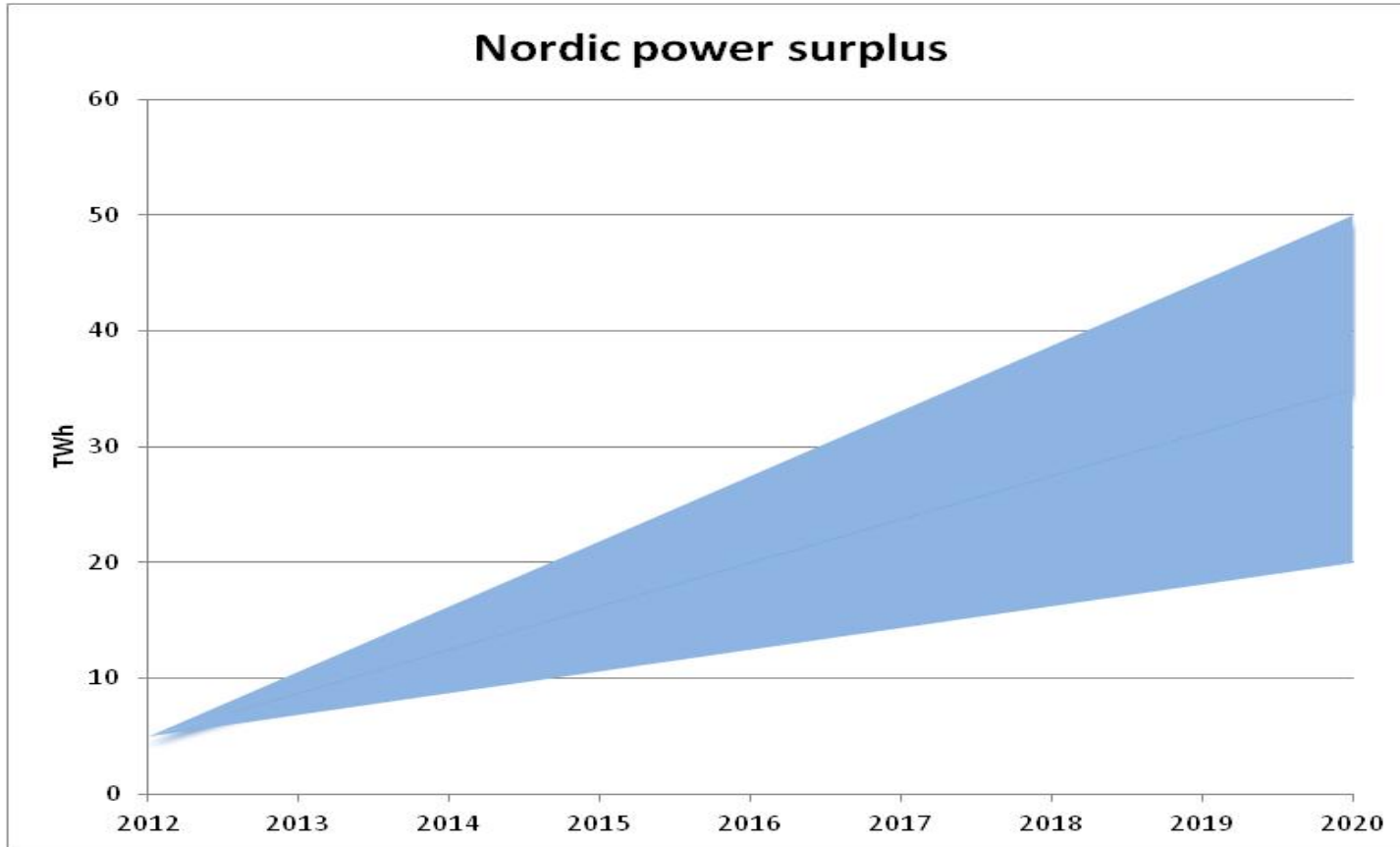
Support mechanisms RES?

Decommissioning of fossil fuel based CHP and CONDENSE plants

Nordic Power demand not growing



Large Nordic power surplus expected 2020



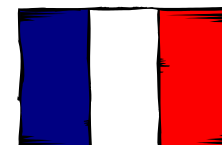
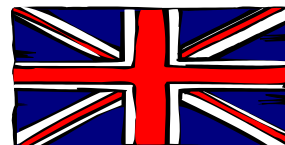


POLICY AND REGULATION DEVELOPED ON EUROPEAN AND NATIONAL LEVEL



20 % cut of CO2 emissions
20 % of EU energy consumption from renewable sources
20 % cut in consumption due to energy efficiency

Efficient internal market within power and gas by 2014



Renewables shr 2008**

8.9 %

2.2 %

11.0 %

Renewables shr 2010**

11.0 %

3.3 %

13.5 %

Energy Target for 2020**

18 %

15 %

23 %

Major policy initiative

Energiekonzept
2050

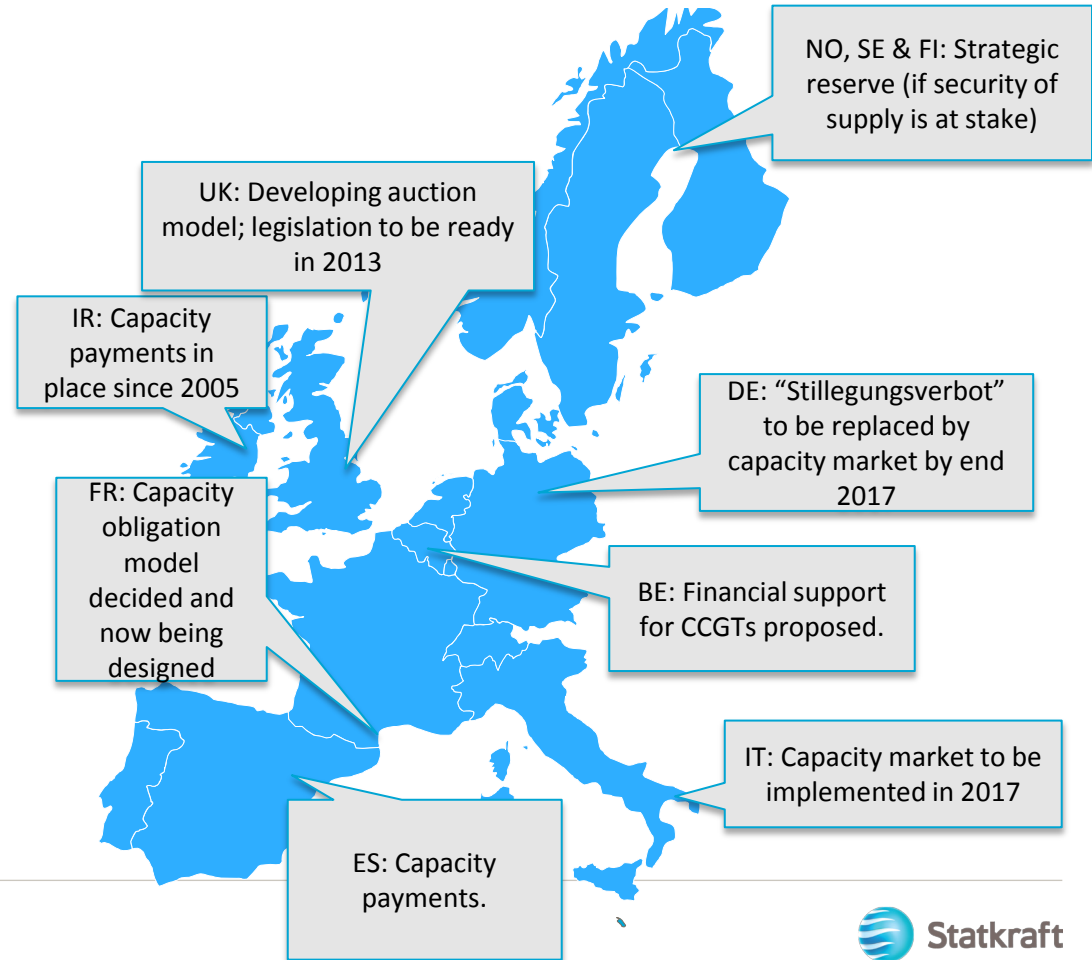
Electricity Market
Reform (EMR)

NOME*

National capacity mechanisms being implemented despite EU's call for coordinated action



EU: "If mechanisms are not well designed, set up prematurely or without proper coordination at EU level, they may be counterproductive."



CHANGING MARKETS AND MODELS



PROCESS & MODEL DEVELOPMENT IN STATKRAFT WITHIN HYDROLOGY

Last 2 years:

- > Improved calculator functionality in SmG
 - GUI and user defined functions
- > Finalised 2 R&D projects as part of the 5 year long ENKI project portfolio
 - Glasskula; Handling uncertainty information from observed to forecasted hydrometeorological parameters
 - OppModTil ; Updating of model states and methodology for calibration
- > Implementation of a semi operational distributed model, ENKI
 - SINTEF; Separated core from service interface and GUI
 - Statkraft; Developed service interface for semi operational run
 - ENKI core released as an Open Source product (<http://www.opensource-enki.org/>)

Next 2 years:

- > Run project for large scale data management in SmG (Powel's "New Reality")
 - Targeted final delivery fall 2015
- > Run ENKI in parallel with operational HBV models for selected areas
 - Testing and expected improved decision support
- > Implementation of prioritised results from the finalised R&D projects
- > Support the SINTEF project for operationalisation of ENKI
- > Support the SINTEF project "A Stochastic Weather and Inflow Generator"

PROCESS & MODEL DEVELOPMENT IN STATKRAFT WITHIN LT PRODUCTION PLANNING & ANALYSIS

▶ Last 2 years

- 3 h resolution in long term price forecasting
- Scenarios for continental prices. Nordic and continental models integrated
- Detailed modelling of wind power
- Transmission capacity dependent of load / wind
- Delayed consumption price response

▶ Next 2 years

- 3 h resolution in operative forecasts
- Parallel seasonal model
- Time series database
- Tools for handling time series input and results
- Sequential detailed dispatch (ReOpt)
- Model Baltic countries

PROCESS & MODEL DEVELOPMENT IN STATKRAFT WITHIN ST PRODUCTION PLANNING & ANALYSIS

- ▶ Last 2 years
 - Daily planning and day-ahead bidding in Sweden
 - Reduced optimization time
 - Spot market bidding
 - Creek intake modelling (ongoing)
 - FNR-planning (ongoing)
- ▶ Q1 2012- Q1 2015 Nordic Scheduling Systems Program (NSS)
- ▶ Next 2 years
 - Intra-day planning (NSS)
 - Better coupling and consistency between LT and ST models
 - Validation of stochastic short-term optimization model (SHARM)

PURE
ENERGY

