

# CHANGING MARKETS AND MODELS

**Ketil Fodstad, Senior Vice President, Nordic Energy**  
**22.05.2013, Brukermøte produksjonsplanlegging**

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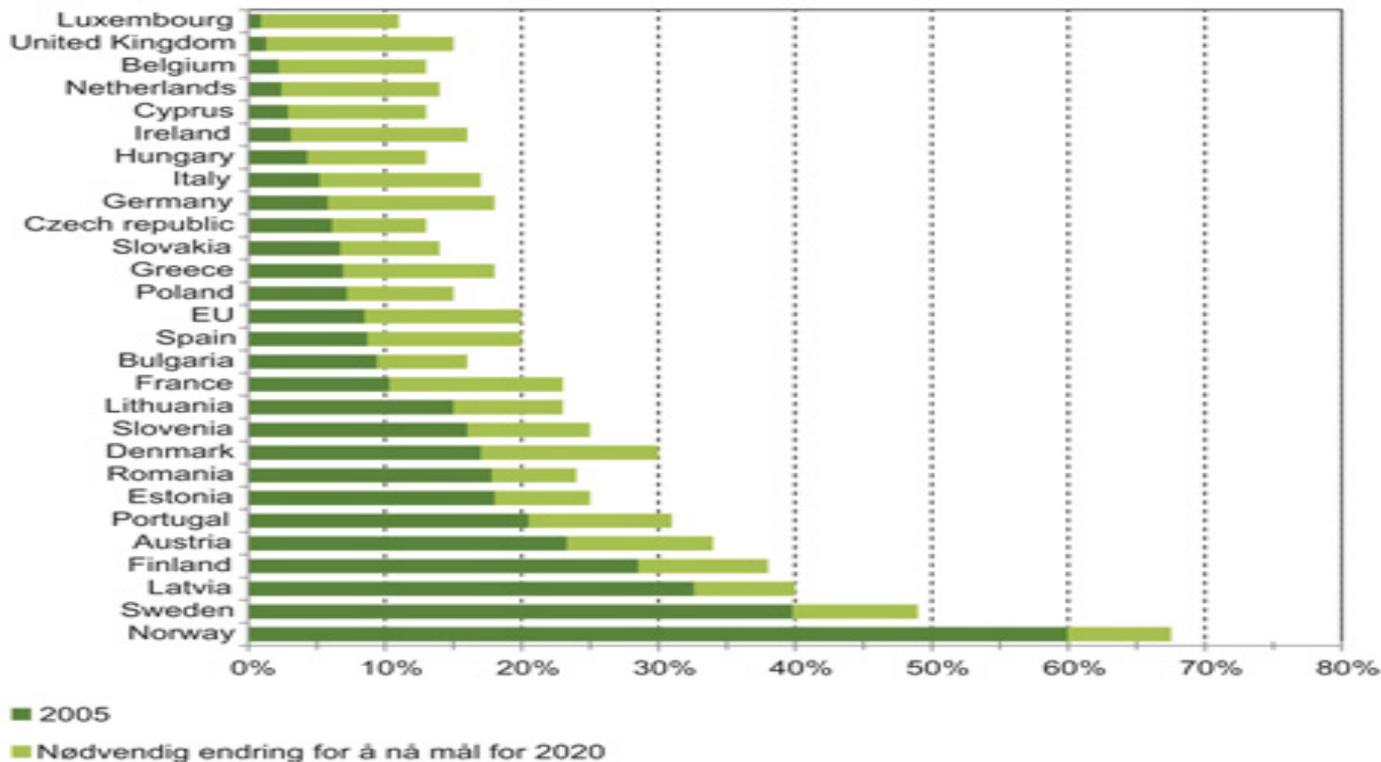
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# THE 2020 TARGETS FOR RES IN EUROPE

→ 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



**Olkiluoto 3 in FI  
Upgrading in SE**

**Olkiluoto 4 ?**

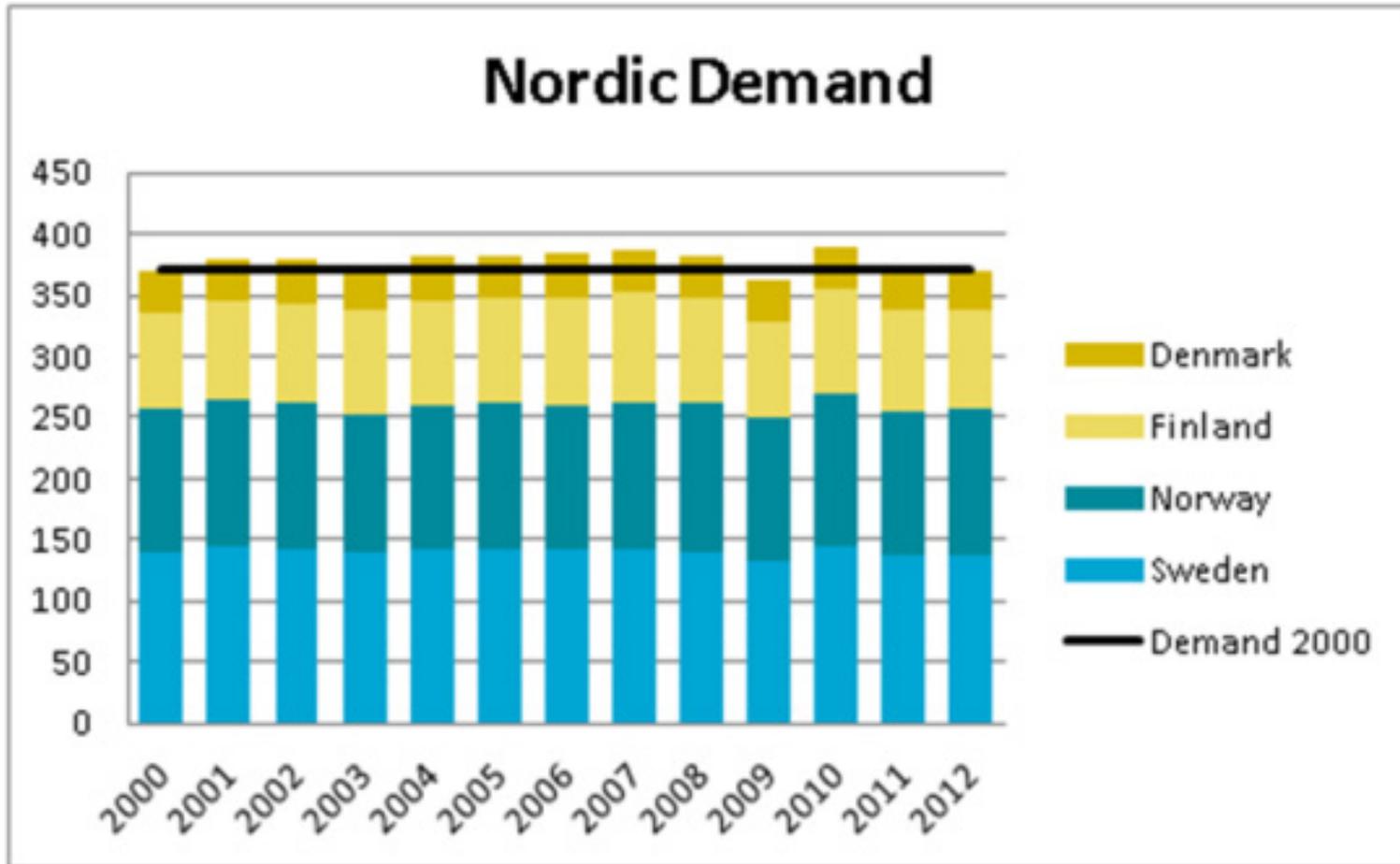
**Fennovoima /Loviisa?  
Decommissioning /New build SE?**

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

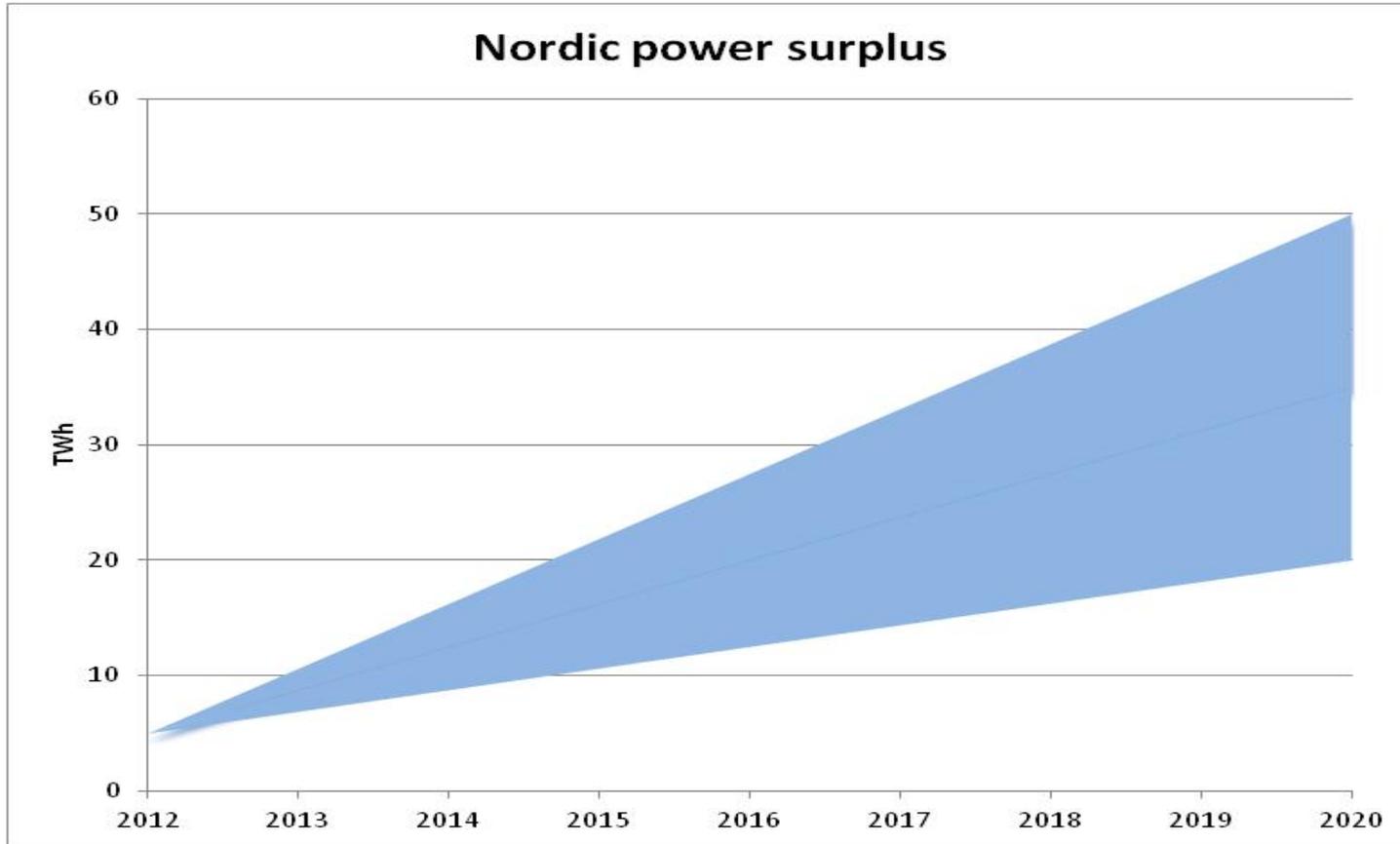
**Support mechanisms RES?**

**Decommissioning of fossil fuel based CHP and CONDENSE plants**

# Nordic Power demand not growing



# Large Nordic power surplus expected 2020



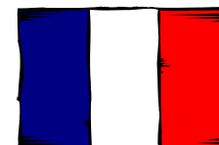
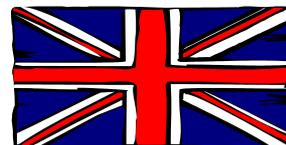


# POLICY AND REGULATION DEVELOPED ON EUROPEAN AND NATIONAL LEVEL



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



<b>Renewables shr 2008**</b>	8.9 %	2.2 %	11.0 %
<b>Renewables shr 2010**</b>	11.0 %	3.3 %	13.5 %
<b>Energy Target for 2020**</b>	18 %	15 %	23 %
<b>Major policy initiative</b>	Energiekonzept 2050	Electricity Market Reform (EMR)	NOME*

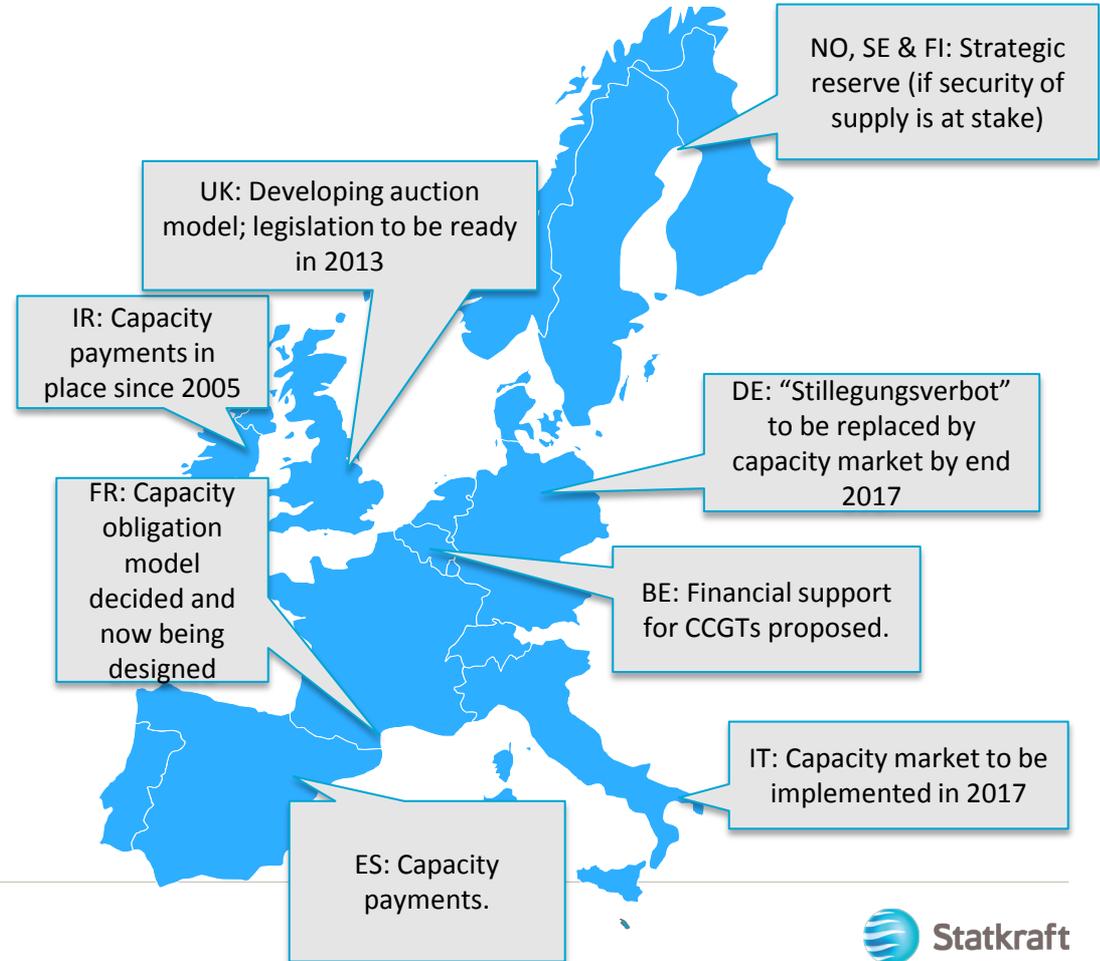
\* Nouvelle Organisation du Marché de l'Électricité

\*\* All refer to renewable production as share of total energy consumption

# 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."



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# 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

