

# Increased Integration of the Nordic and German Electricity Systems

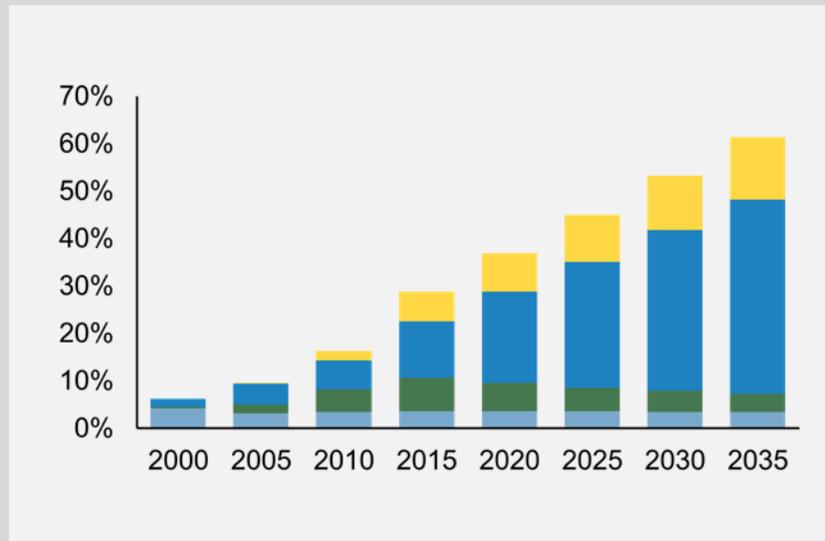
## - Economic and Climate Effects

STEPHANIE ROPENUS, 1ST DISSEMINATION EVENT  
11TH JUNE 2015

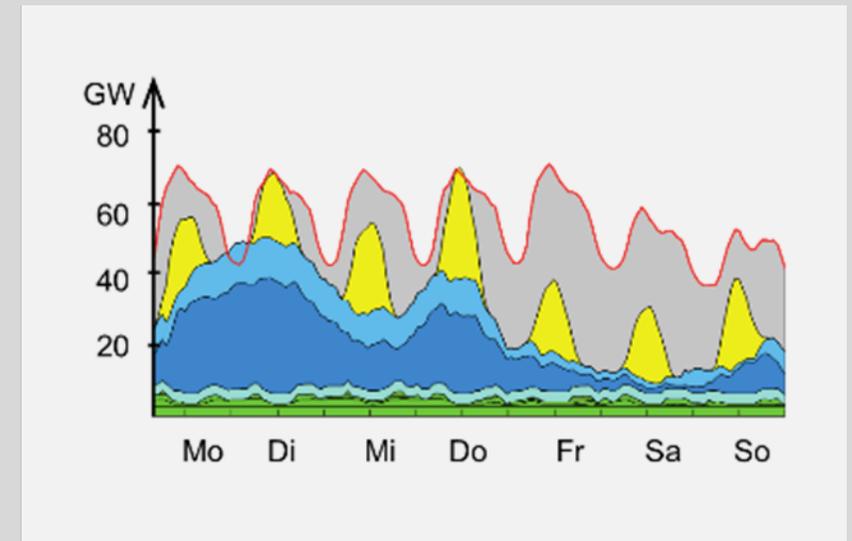


# Increasing shares of variable renewables will completely change the picture.

E.g., in Germany increasing shares of wind and solar PV.



- weather-dependent**
- capital-intensive**
- zero marginal cost**





## Aim of this study

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- Assessment and discussion of economic and climate **effects of increased integration** of the **Nordic and German electricity systems**.
- Impact on **power system** with varying shares of renewables analysed by means of a market simulation model of the electricity sector (**Work Package 1**).
- Macroeconomic effects and **distributional effects** among different stakeholders such as power consumers and producers on “both sides of the border“ (**Work Package 2**).
- This study may serve as the base for continued regional dialogue on the sharing of costs and benefits for increased integration.

## Approach of this study – Nordic-German Cooperation at all levels

→ Initiated as a common project by Stockholm-based think tank **Global Utmaning** and Berlin-based **Agora Energiewende**.



→ **International research consortium** consisting of Ea Energy Analysis, Technical University of Denmark (Work Package 1) and DIW Berlin (Work Package 2).

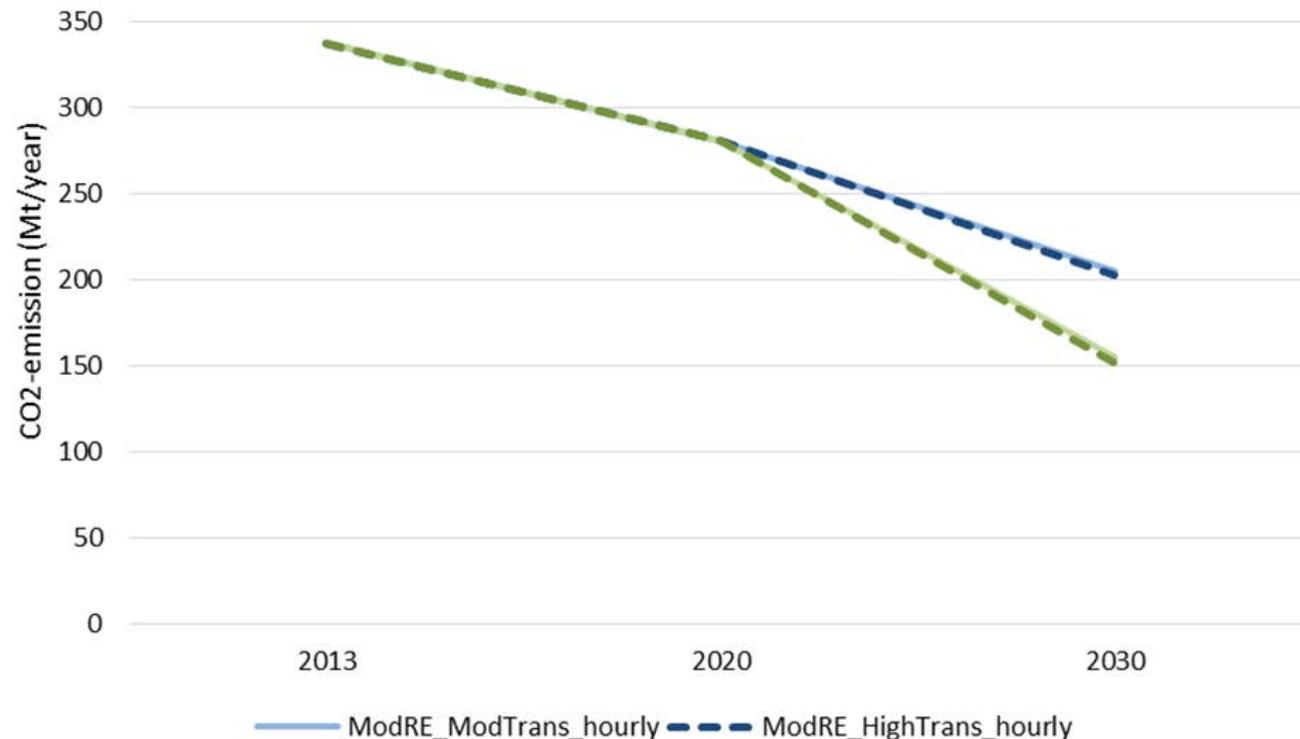
→ **Nordic-German Stakeholder Advisory Group**: two Advisory Group meetings (in Stockholm and in Berlin) and invitation of stakeholders to participate in consultation of draft final reports.

→ Continuation of Nordic-German knowledge exchange

– please feel invited to join the **“Coffee and Cake-Time for Talks“** today after the event!

## Key Findings of the Study 1& 2

### CO<sub>2</sub> Emissions in the Nordics and Germany (*Preview of WP1*)



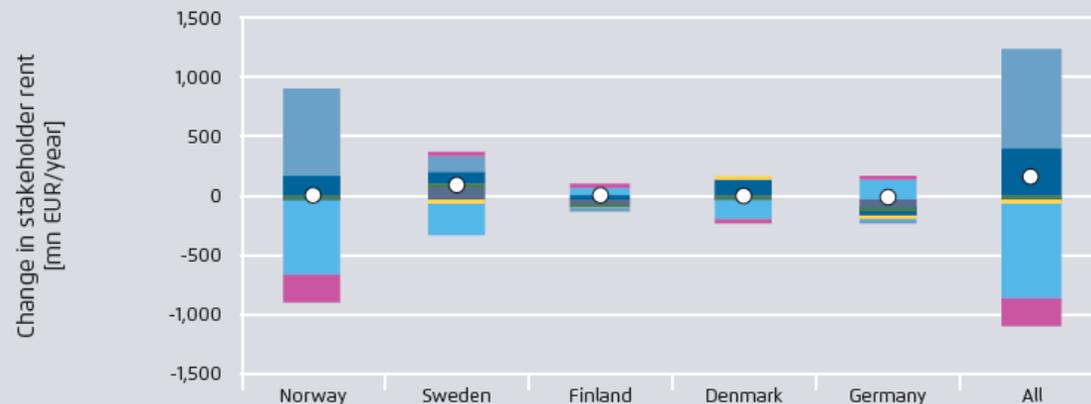
Ea and DTU, 2015

→ Additional generation from renewables will **increase the value of transmission capacity**. There is great potential for trade, due to hourly differences in wholesale electricity prices throughout the year.

→ A closer integration of the Nordic and German power systems will **reduce CO<sub>2</sub> emissions due to better utilisation of renewable electricity**. This is caused by reduced curtailment of renewables, improved integration of additional renewable production sites, and increased competitiveness of biomass-fuelled power plants.

## Key Findings of the Study 3& 4

### Distributional effects among stakeholders (*Preview of WP2*)



→ Higher integration will lead to the **convergence of wholesale electricity prices** in the Nordics and Germany. Additional integration will lead to slightly higher wholesale prices in the Nordics and to slightly lower prices in Germany. **But this will be counteracted by the decreasing price effect that higher wind shares in the Nordics have.**

→ **Distributional effects** from increased integration are **significantly higher across stakeholder groups within countries than between countries.** Distributional effects need to be taken into account for creating public acceptance for new lines and for the cross-border allocation of network investments.

DIW, 2015

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**Tusen takk for oppmerksomheten!**

**Tack så mycket för er uppmärksamhet!**

**Vielen Dank für Ihre Aufmerksamkeit!**

**Tak for opmærksomheden!**

***Thank you for your attention!***

**Comments are highly welcome:**  
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