

Bidding zone configuration in the German and the Nordic electricity market.

A comparative analysis of main ideas, strategies, and interests

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Introduction – why compare Germany and the Nordics?

- Work builds on research article published in 2022
- <https://www.sciencedirect.com/science/article/abs/pii/S2210422422000788>
- Main research questions:
 - How do zonal electricity market designs differ?
 - why have Nordic countries and Germany chosen radically different zonal configurations?
 - and what are the implications for the energy transition?



The screenshot shows the top portion of a research article page. At the top, there is a dark blue navigation bar with a white icon of a building, the text "Access through your institution", and a "Purchase PDF" link. Below this, the journal title "Environmental Innovation and Societal Transitions" is displayed in a large, dark font, with the Elsevier logo to the left and a small thumbnail image to the right. Underneath the journal title, it says "Volume 45, December 2022, Pages 132-153". The main title of the article, "The power of power markets: Zonal market designs in advancing energy transitions", is prominently displayed in a large, bold, dark font. Below the title, the author's name "Marie Byskov Lindberg" is listed with an email icon. There is a "Show more" link with a downward arrow. At the bottom of the article information, there are icons for "Add to Mendeley", "Share", and "Cite". A DOI link "https://doi.org/10.1016/j.eist.2022.08.004" is provided at the bottom left, and a "Get rights and content" link is at the bottom right.

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The power of power markets: Zonal market designs in advancing energy transitions

Marie Byskov Lindberg 

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Methodology

- Qualitative analysis
- Comparison of data on system costs and hedging volumes (until 2018)
- Data:
 - 26 qualitative interviews & background expert talks (conducted during 2019-2020)
 - Assessment of consultation responses, publicly available documents
 - Techno-economic literature review
- Sample: Key stakeholders in the electricity sector
 - utilities, renewable energy actors, traders, energy exchanges, industry associations, TSOs, regulators, think tanks, NGOs, scientists,

The case studies

Nordic countries, here represented
by Sweden, Norway and Denmark:
11 bidding zones

Germany: only one price zone



Zonal designs

‘Copper plate approach’	‘Regional optimization’
Zonal border = national border (or bigger)	Zonal border = physical grid bottlenecks
Congestion management measures: <ul style="list-style-type: none">➤ Redispatch➤ Countertrade➤ Curtailment (EinsMan)	Congestion management: <ul style="list-style-type: none">➤ Bidding zones are main measure➤ Some redispatch



The Nordic power market is the world's oldest and most successful international power market.

(Pöyry, 2017).



The German market is the most successful and the most liquid power market in Europe

(EFET, 2017 own translation)

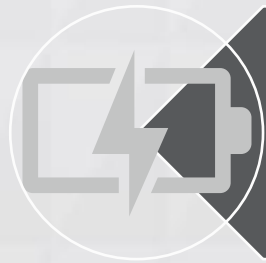
Results – strategies & ideas (I)

	GERMANY	NORDIC ELECTRICITY MARKET (NO+SE+DK)
Overall systems strategy and 'system logic'	<p>Eliminate structural bottlenecks by strengthening the network</p> <p>Enable unlimited trade within entire country (bidding zone) regardless of physical limitations</p>	<p>Market design should reflect structural network congestions (i.e. bottlenecks)</p> <p>Compliance between physical power flow and market trade</p>
Overall objective	<p>A liquid long-term market</p> <p>Enabling all market participants to hedge to competitive prices</p> <p>Unified price</p>	<p>An efficient (spot) market, defined as 'correct' trade through cooperation and fair competition with neighboring countries</p>

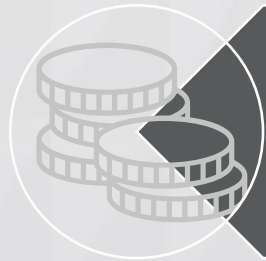
Results – strategies & ideas (II)

	GERMANY	NORDIC ELECTRICITY MARKET (NO+SE+DK)
DOMINANT IDEAS	Unified electricity price for the entire country is of high value («Ein hohes Gut»)	An efficient market ensures optimal allocation and use of resources.
	Avoid disadvantages for producers and consumers at any location	Differentiated prices provide incentives for moving production/consumption to advantageous locations
	Long-term market is the main market Correct price signals in long-term market = highest priority	Spot market is the main market Correct price signals in spot market = highest priority
	Market integration = larger market areas	Market integration = more and 'better' trade

Zonal design – implications for the ongoing transition



Flexibility & portfolio effect



System costs



Hedging opportunities



Results – Flexibility & portfolio effects

GERMANY

- No price signals for flexibility
- No signals where there is congestion and where flexibility is needed in the power system
- Larger portfolio effect (for aggregators), BUT does not reflect actual usage of portfolio assets for the system

NORDIC

- The market (here: market design and smaller bidding zones) facilitates “the most efficient allocation of electricity”
- Market signals handle much of the operation services that must be done “manually” in Germany, by intervening in the market dispatch

Results – System costs

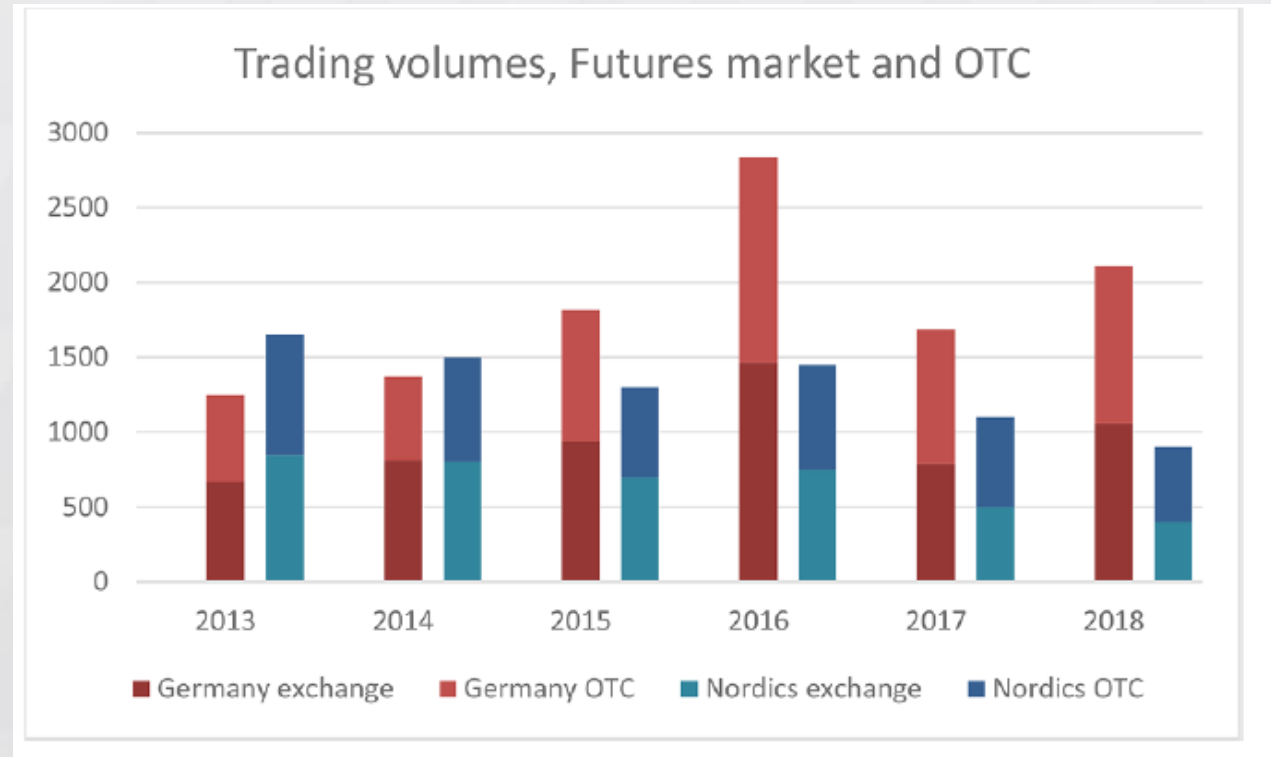
- Costs for system services and projected grid investments are **much higher** for Germany than for the Nordic countries.
 - Due to redispatch, countertrade and EinsMan
- Confronted with this fact, some German stakeholders countered that this is neglectable compared to the total costs of the energy transition in Germany.
- Nordics: Also large needs for grid strengthening and expansion.
- However, Nordic TSOs claim that it is not cost-efficient to strengthen the grid to such an extent that bottlenecks are removed.

Hedging opportunities

The relationship between hedging opportunities (long-term market liquidity) and bidding zone configuration is one of the most controversial issues in this debate.

→ Very strong preferences and interests at stake.

In Germany, the large bidding zone is perceived as a *prerequisite* for a large long-term market, i.e. with high trading volumes Nordic actors challenge this view.



Source: BNA, 2019, Nasdaq, 2020

- There are different explanations for why liquidity has decreased. Bidding zone configuration is only one explanation
- Large discussion: What are optimal hedging products, how do we support market liquidity?

Summary

Strong agreement about the Nordic and German model in both countries / regions

- Germany:
 - Consensus among the main political parties to maintain the single bidding zone
 - Also RE stakeholders prefer the single bidding zone because of current design of the support scheme and fear of lower prices with market split
 - TSOs are divided in their views. Some argue that the grid expansion strategy will resolve the main issues, others that it will not work with higher shares of RE. One TSO reports positive experiences with the split of the German–Austrian bidding zone.
 - But also: increasing demand for market splitting from EU/ACER and many market experts
- Nordic:
 - Stakeholders express high degree of satisfaction with the Nordic model, in particular the TSOs, regulators, energy economists.
 - Energy traders are very discontent.
 - Market liquidity in the long-term market at the energy exchange has decreased – but: does this mean that hedging opportunities are insufficient? Instead: bilateral trade, PPAs.
 - After the energy crisis (2021/2022): Price differences skyrocketed, more debate about market design.



Thank you!

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