Market transparency through a common data platform:
Evidence from Nord Pool

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STOCKHOLM SCHOOL OF ECONOMICS
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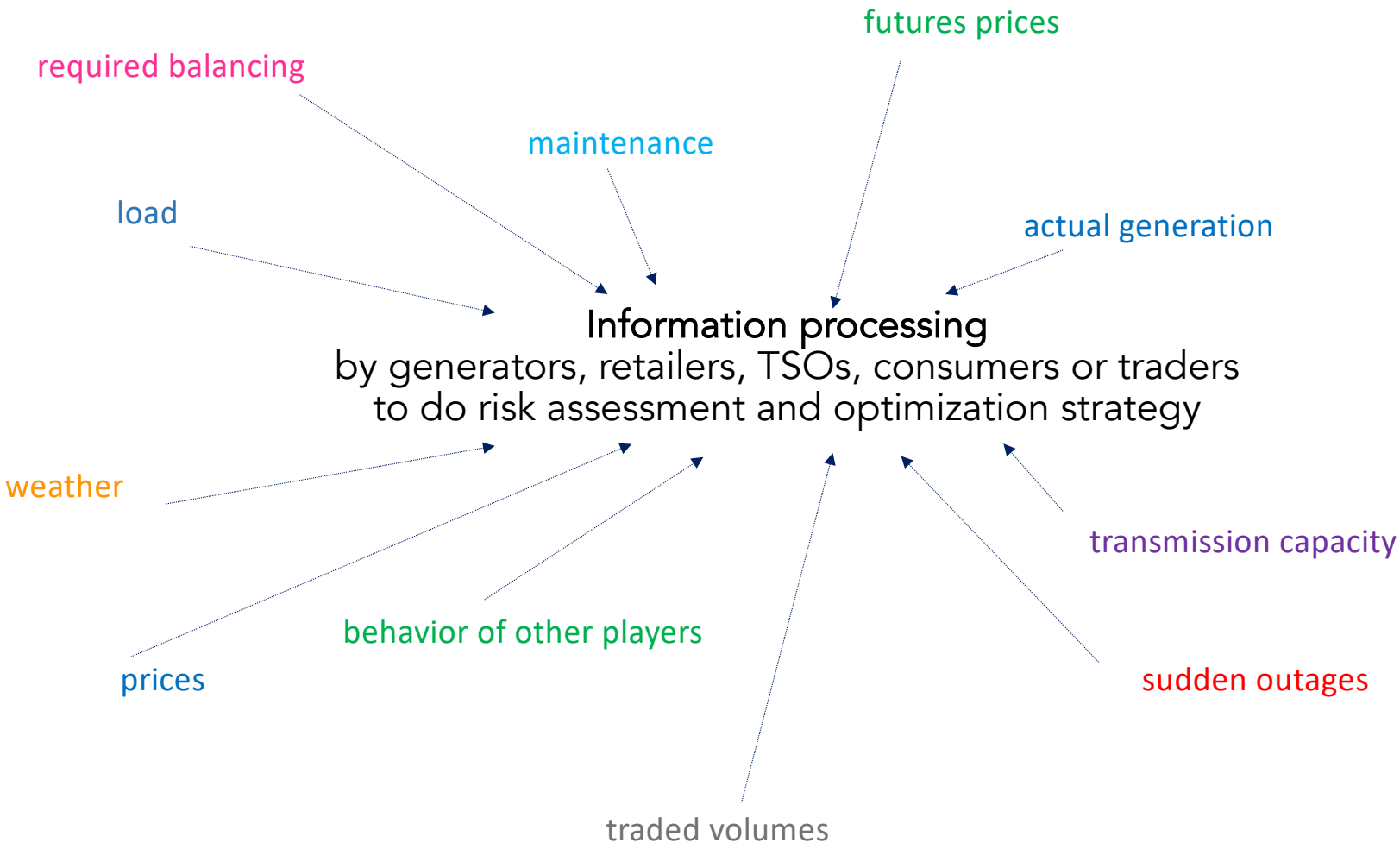

futures prices
required balancing
maintenance
load
actual generation
Information processing
by generators, retailers, TSOs, consumers or traders
to do risk assessment and optimization strategy
weather
transmission capacity
behavior of other players
prices
sudden outages
traded volumes

Main question

Does more information lead to more *efficient* outcomes in the electricity markets?

This paper

Objective:

estimate the impact of an increased market transparency on wholesale electricity prices

Empirical strategy:

- implementation of a common data platform in 2015 for the EU's electricity market

=> *a natural experiment*

- Nord Pool: multi-national Nordic power market (Denmark, Sweden, Finland, and Norway)

=> a measure of market efficiency: the unique wholesale electricity market price

Empirical setting

The Transparency Platform (since 5 January 2015)

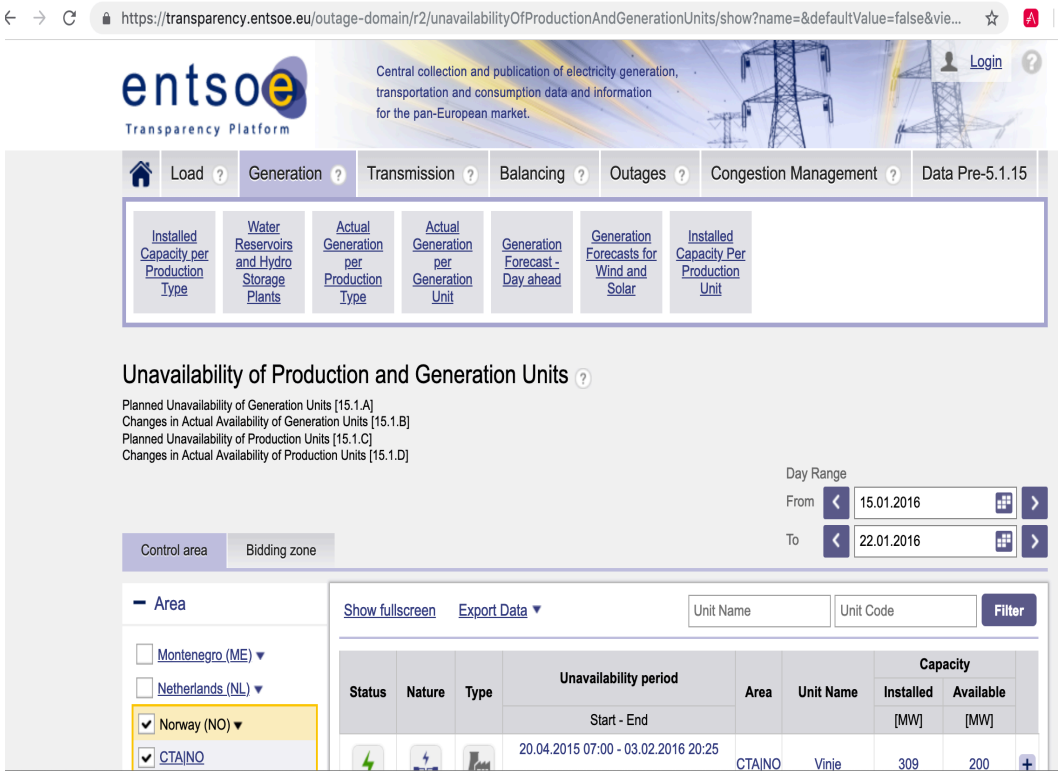
- Developed and operated by ENTSO-E (association of transmission system operators)

-Regulation on **submission and publication of data** in electricity markets (SPDEM, 2013)

- Detailed information on

  Load, Generation, Transmission, Balancing, Outages and Congestion Management (49 data items)

- 9000 registered users



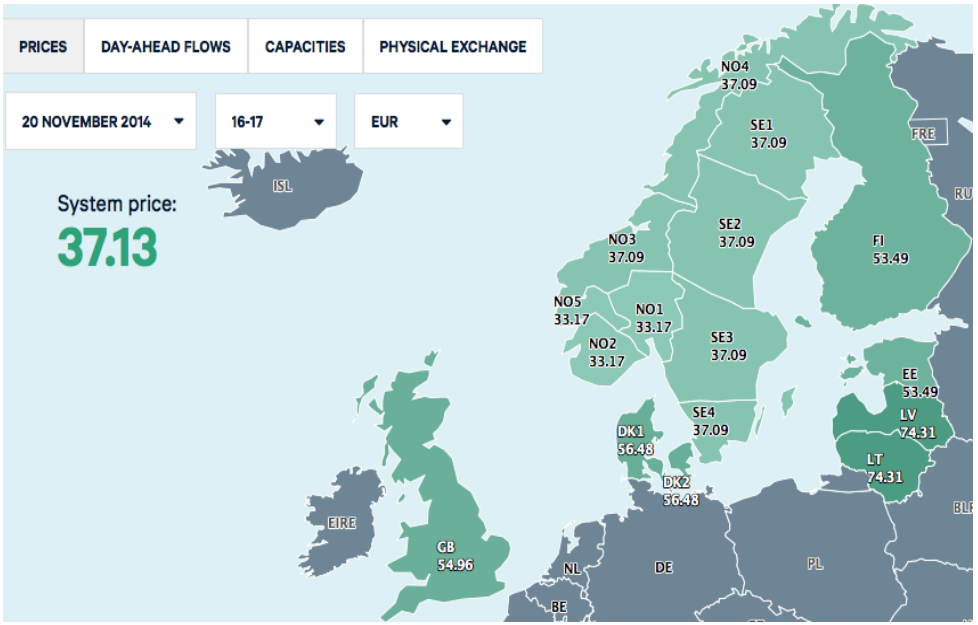
Nord Pool's day-ahead market

- Nordic market: well-developed liquid market, little evidence of market power
  - -large shares of hydropower and nuclear, relative small share of RES (26%)

- The day-ahead market: an auction where power is traded for delivery each hour the *next* day (**the *System Price*)**
  - -95% of the produced electricity is traded

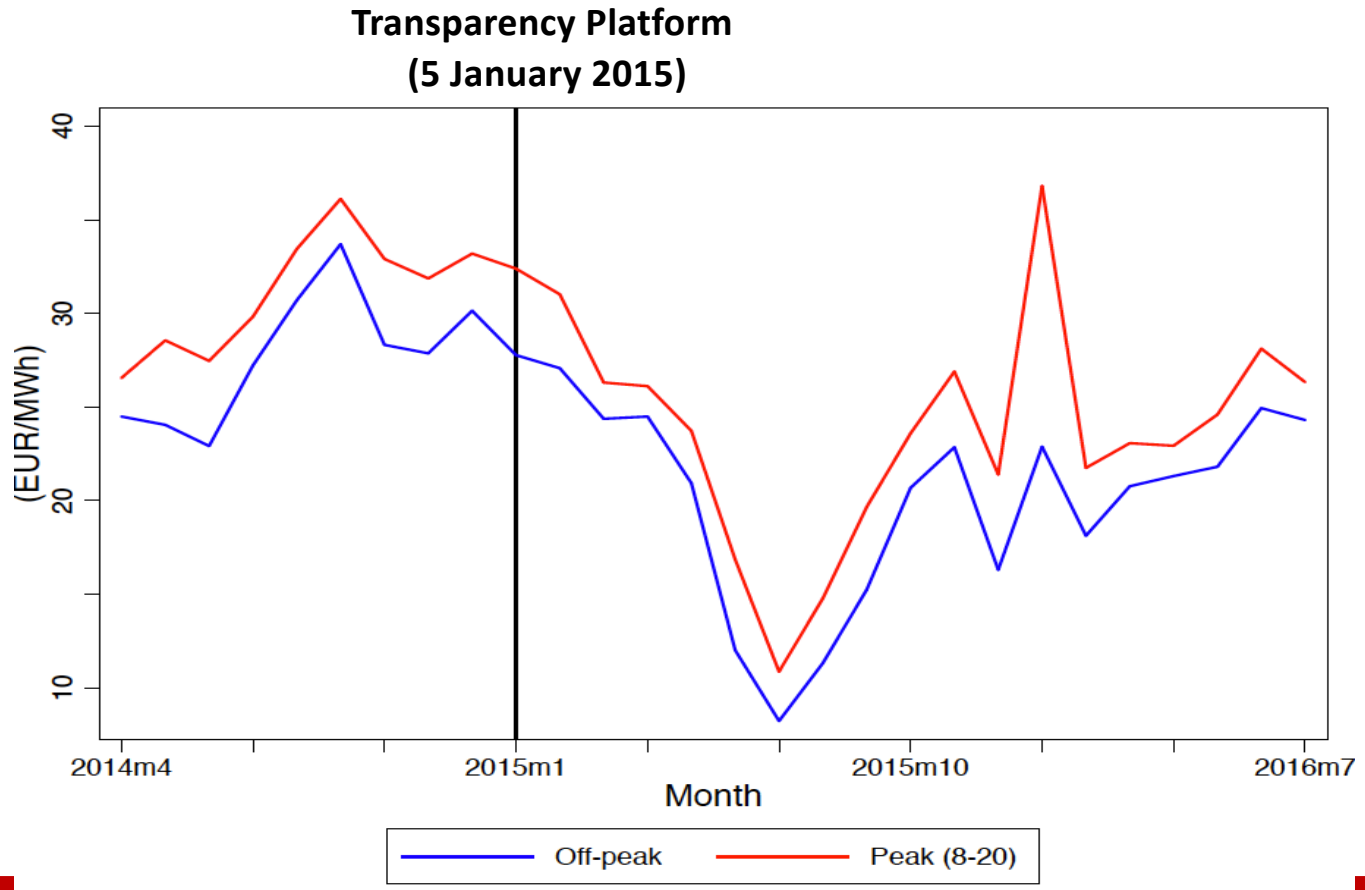
- Real-time aggregated information

- No data on the number of operating units ($\neq Transparency\ Platform$)



Platform's impact
on the wholesale electricity prices (*the System Price*)

Monthly average system price



Platform's impact on the System Price

Variables	Short run (9 months before & after)	Mid run (1 year before & after)
Peak hours (8-20)	0.265 *** (0.101)	0.205*** (0.09)
Platform	-9.498*** (0.522)	-7.359*** (0.321)
Peak x Platform	0.290** (0.133)	0.356*** (0.115)

Additional variables:
Temperature, wind generation (MWh), wind squared, hydro reservoir (GWh),actual production (log),
EU ETS price (EUR), Coal price (USD), Oil price (USD) and dummies for Holidays, day of the week, month, year

Platform's impact on *regional* market competition (zonal pricing)

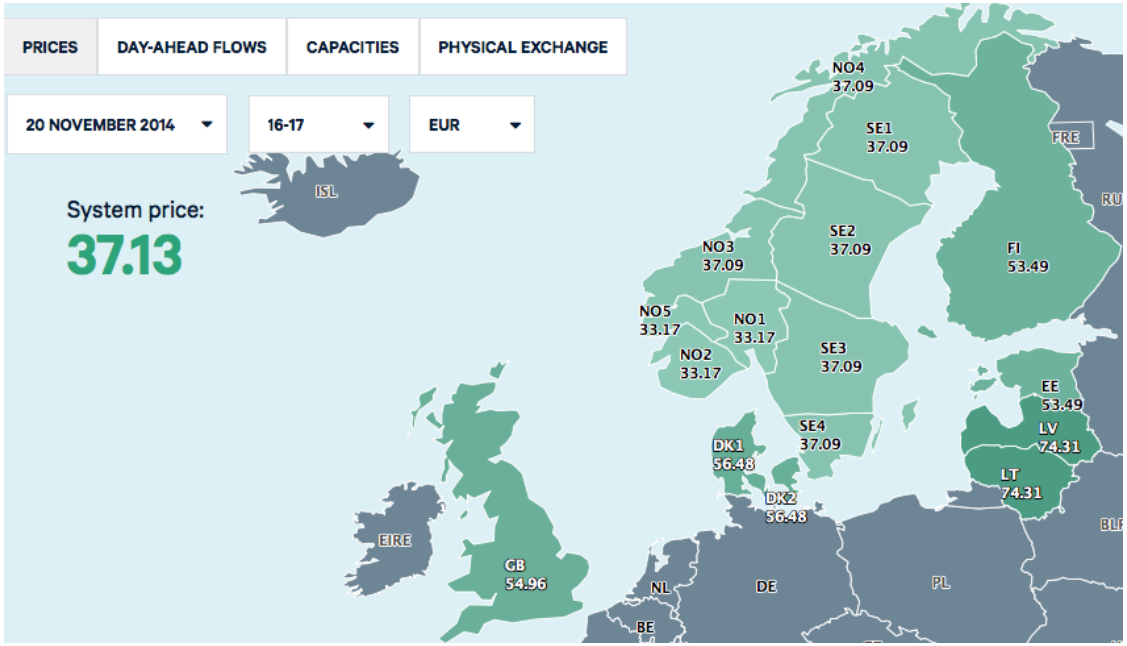
Nord Pool's bidding areas

- In case of congestion splits into regions which are under the same regulatory regime
  - -5 bidding areas in Norway, 4 in Sweden, 2 in Denmark, 1 in Finland

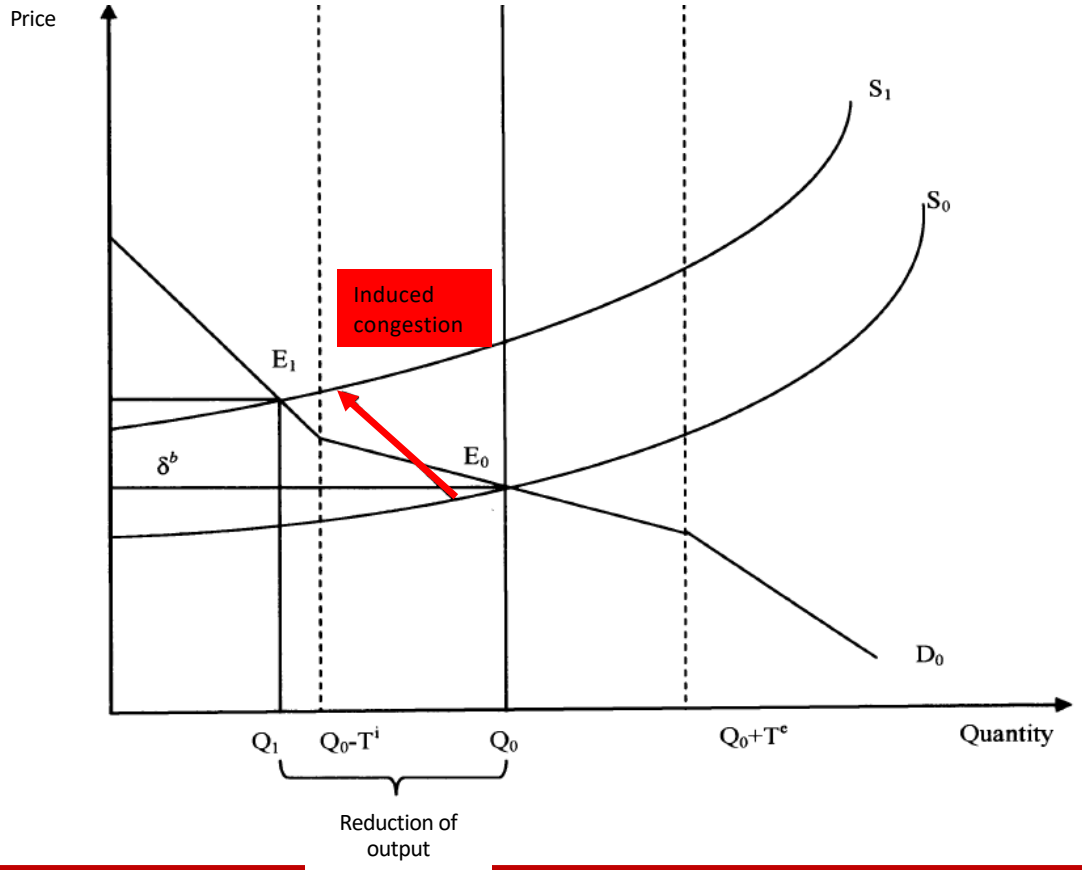
- System price vs. zonal price

-system price: calculated based on sale and purchase orders disregarding available transmission capacity between bidding areas in the Nordic market

-zonal price: Nord Pool calculates a price for each bidding area



Induced congestion and price determination

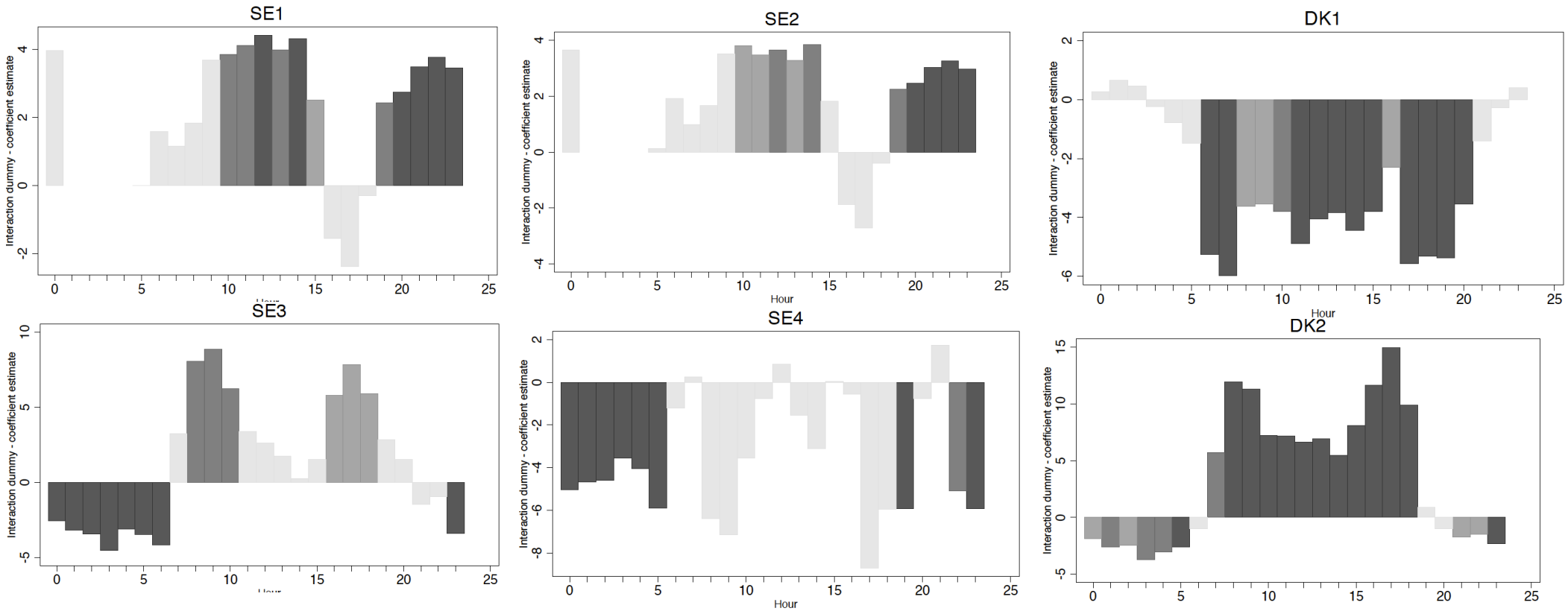


Platform's impact on zonal prices

- 35% of peak hours and 24% of off-peak hours have significantly ***higher*** zonal prices after the implementation of the platform

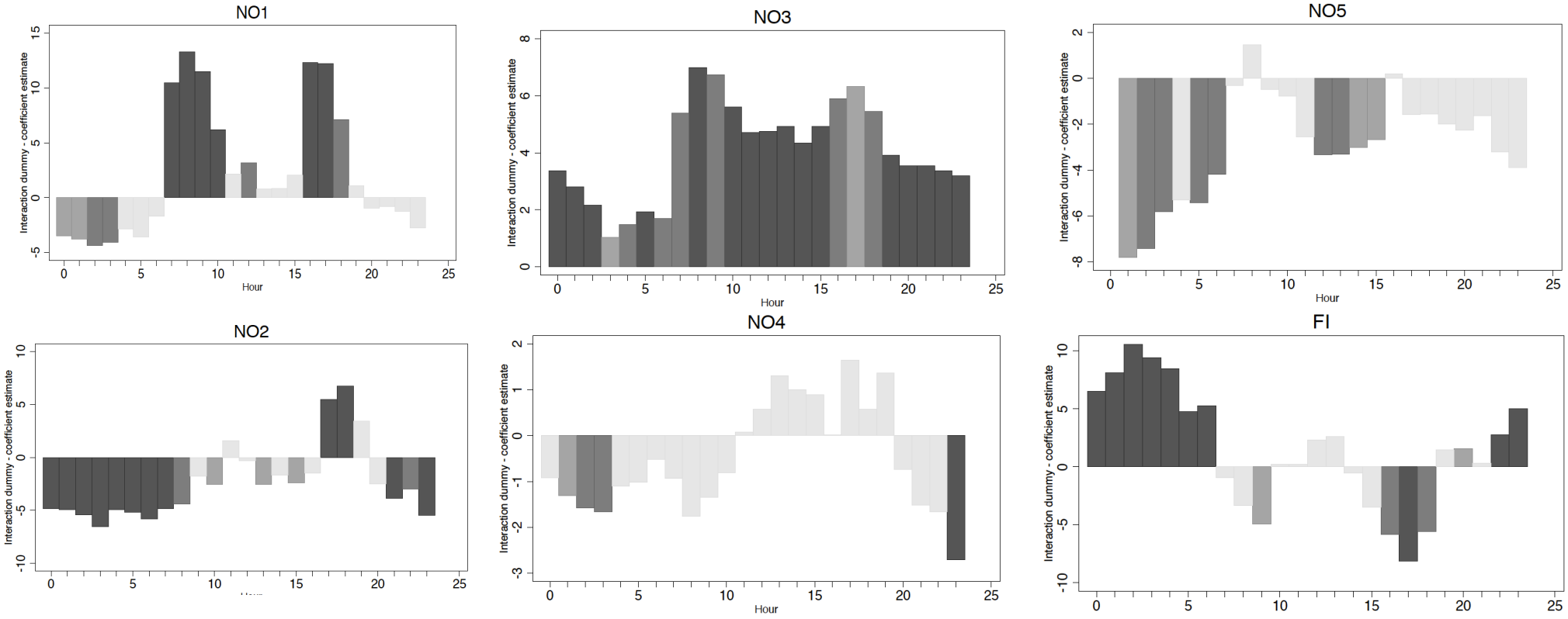
- 10% of peak hours and 32% of off-peak hours have significantly ***lower*** zonal prices after the implementation of the platform

Platform's impact by zone (Sweden & Denmark)



Platform's impact by zone

(Norway & Finland)



Conclusion

- Transparency platform can promote efficiency but "too" detailed information may carry substantial costs

- Effects present even in an electricity market originally known for relative high market transparency
  - likely stronger effect in less transparent markets?

- Zonal vs. Nodal prices: should the Nordics (and even Europe) go for nodal pricing?