

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

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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

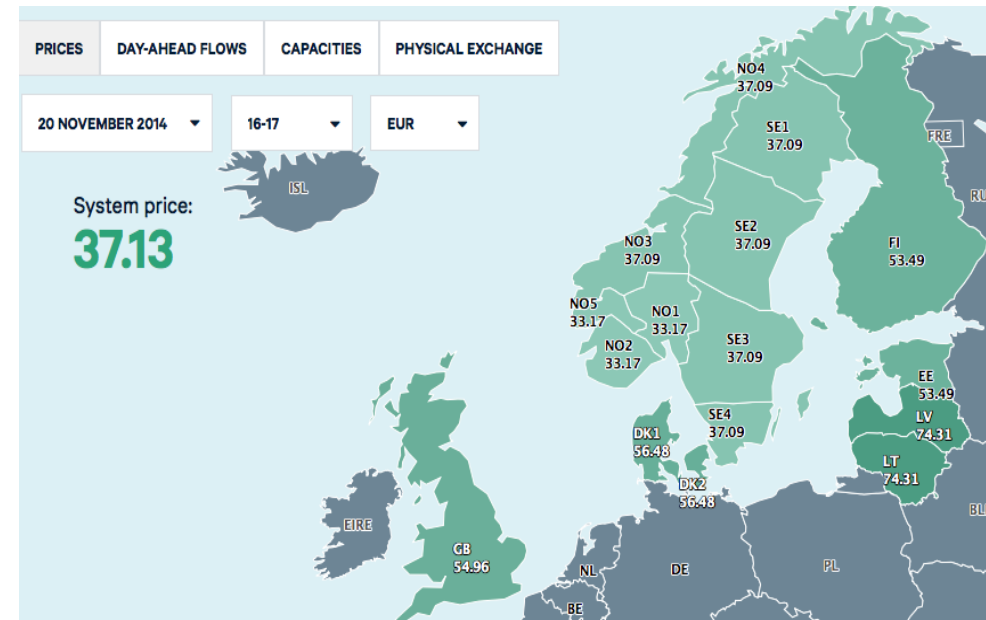
The screenshot displays the ENTSO-E Transparency Platform interface. The header includes the ENTSO-E logo and a description: 'Central collection and publication of electricity generation, transportation and consumption data and information for the pan-European market.' The main navigation bar contains tabs for Load, Generation, Transmission, Balancing, Outages, Congestion Management, and Data Pre-5.1.15. Below this, a row of links provides access to various data types: Installed Capacity per Production Type, Water Reservoirs and Hydro Storage Plants, Actual Generation per Production Type, Actual Generation per Generation Unit, Generation Forecast - Day ahead, Generation Forecasts for Wind and Solar, and Installed Capacity Per Production Unit.

The current view is 'Unavailability of Production and Generation Units'. It lists several data items: Planned Unavailability of Generation Units [15.1.A], Changes in Actual Availability of Generation Units [15.1.B], Planned Unavailability of Production Units [15.1.C], and Changes in Actual Availability of Production Units [15.1.D]. A 'Day Range' selector is set to 'From 15.01.2016' to 'To 22.01.2016'. Below this, there are tabs for 'Control area' and 'Bidding zone'. The 'Area' section shows a list of countries with checkboxes: Montenegro (ME), Netherlands (NL), Norway (NO), and CTAINO. The 'Show fullscreen' and 'Export Data' options are available. A table displays the unavailability data for the selected area (CTAINO) and unit (Vinje).

Status	Nature	Type	Unavailability period Start - End	Area	Unit Name	Capacity	
						Installed [MW]	Available [MW]
			20.04.2015 07:00 - 03.02.2016 20:25	CTAINO	Vinje	309	200

Nord Pool's day-ahead market

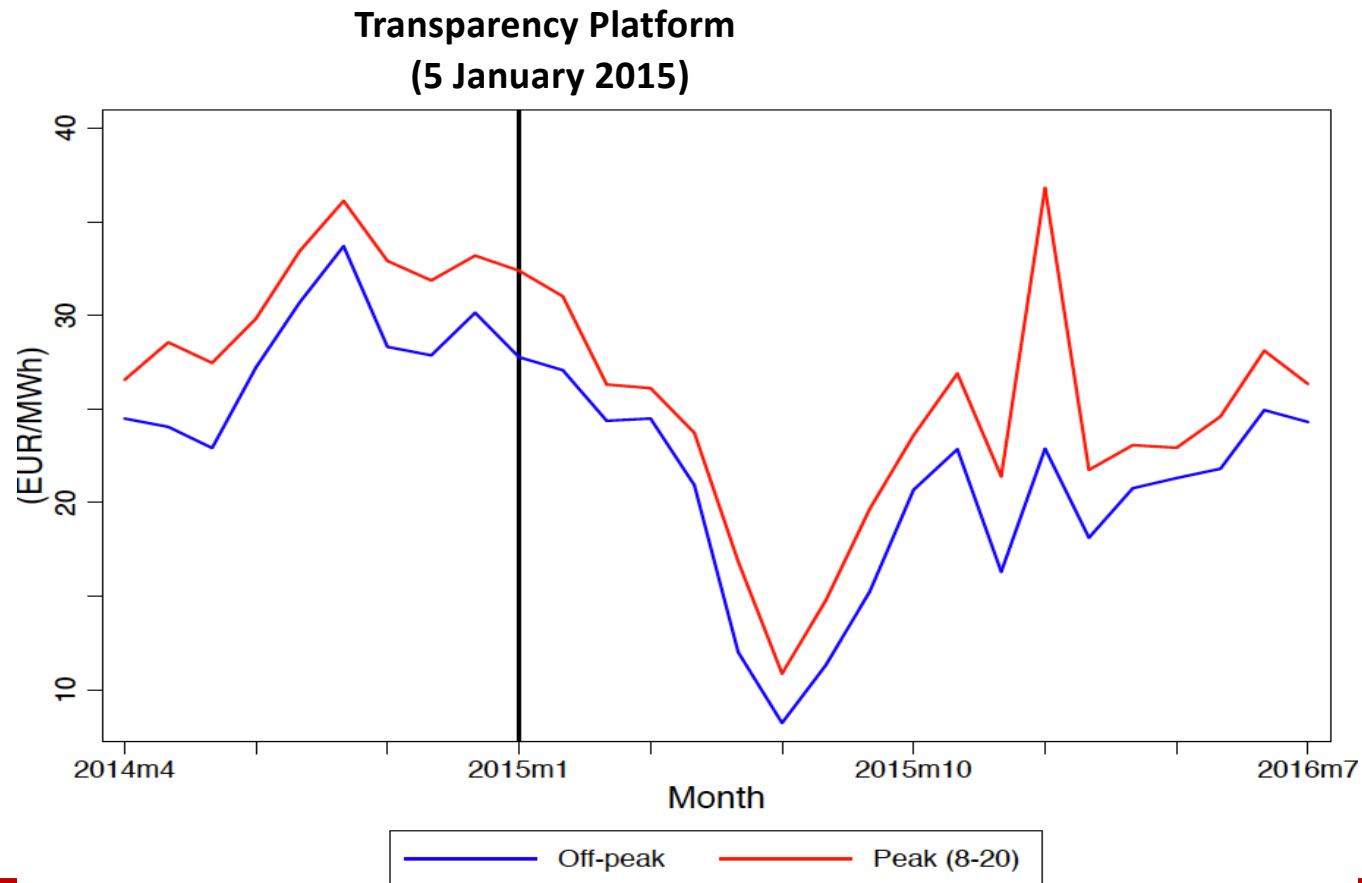
- Nordic market: well-developed liquid market, little evidence of market power
 - large shares of hydropower and nuclear, relative small share of RES (26%)
- The day-ahead market: an auction where power is traded for delivery each hour the next day (**the System Price**)
 - 95% of the produced electricity is traded
- Real-time **aggregated** information
- No data on the number of operating units
(*≠ 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

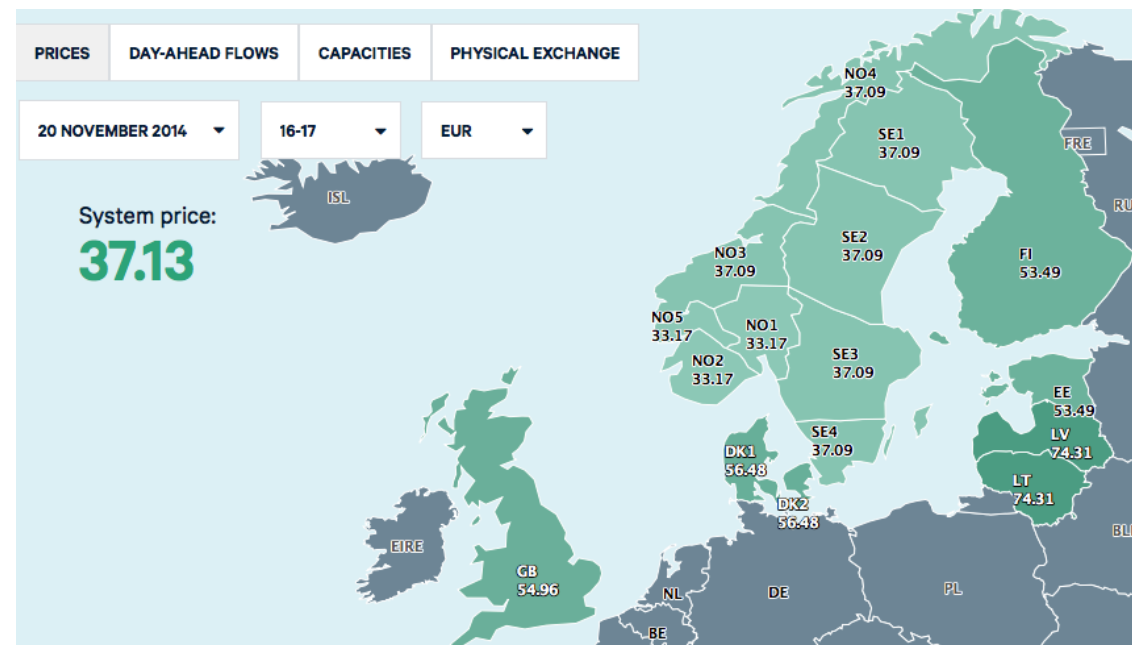


Platform's impact
on *regional* market competition (zonal pricing)

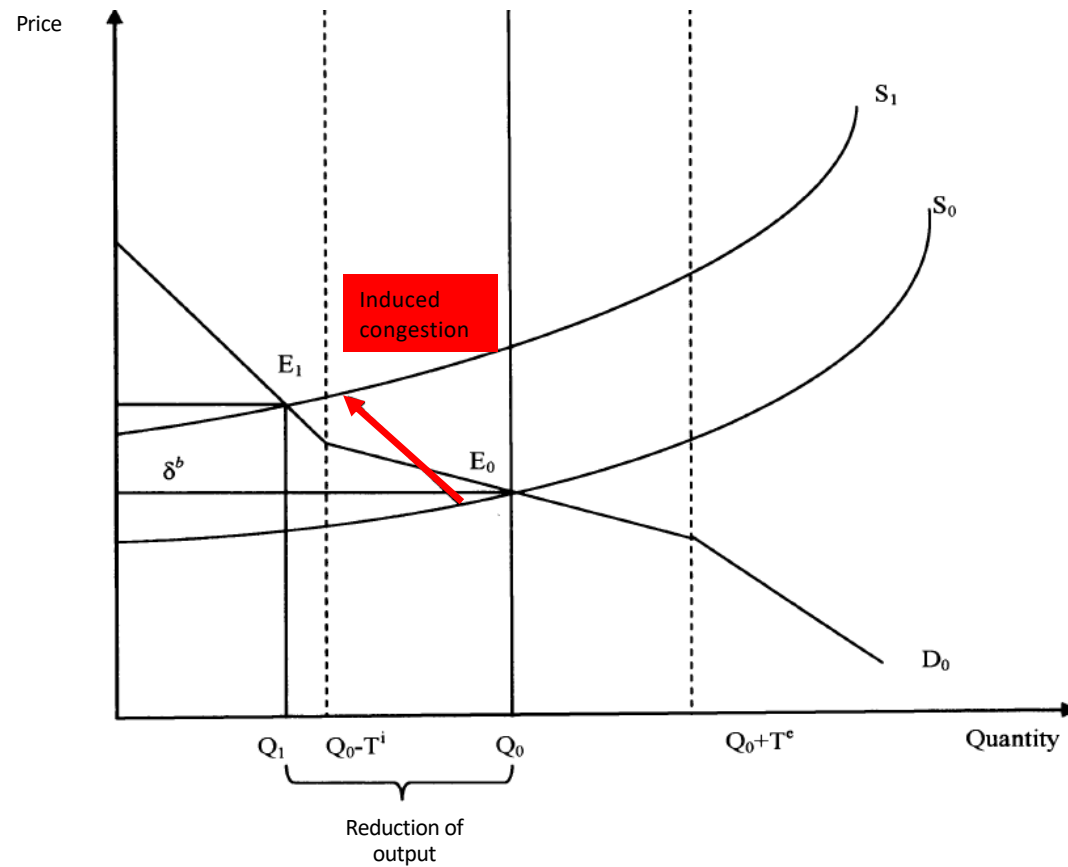


Nord Pool's bidding areas

- 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



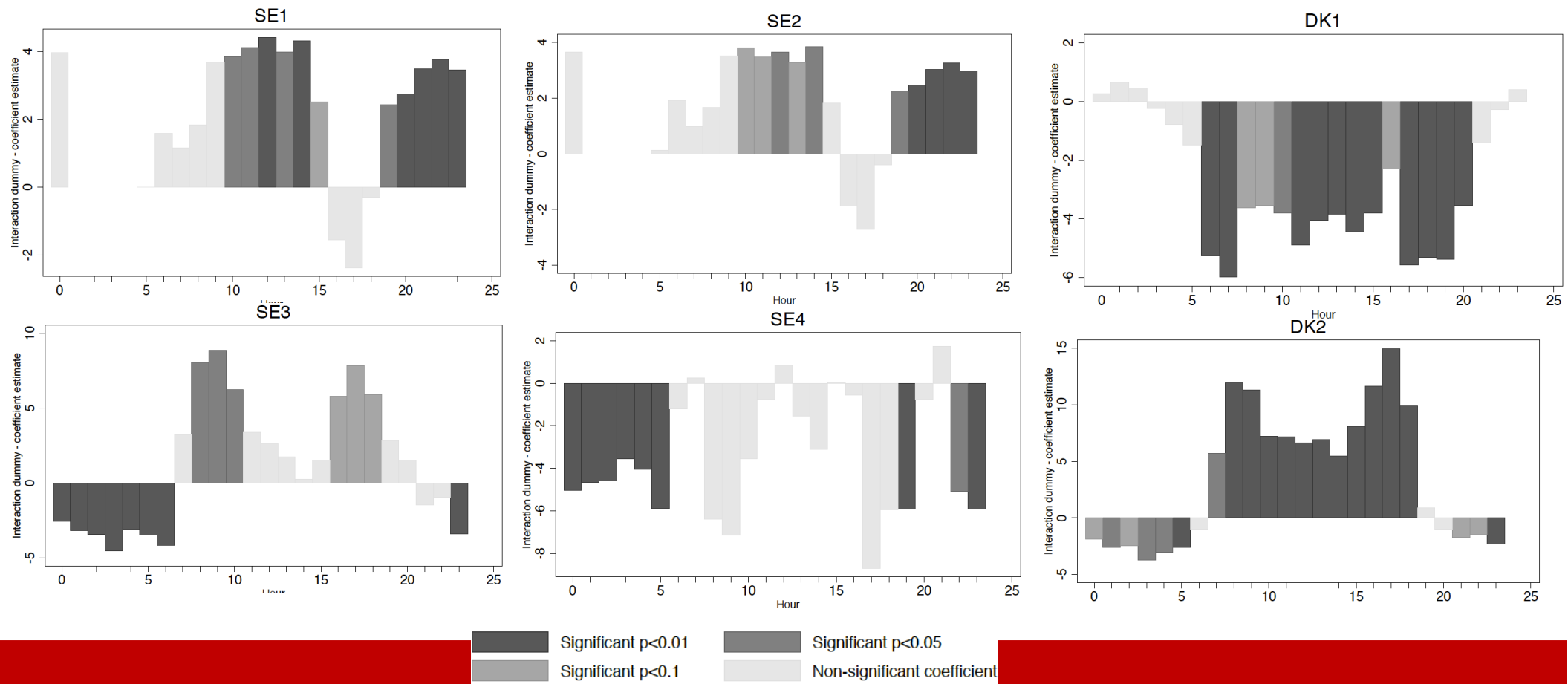
Induced congestion and price determination



Platform's impact on zonal prices

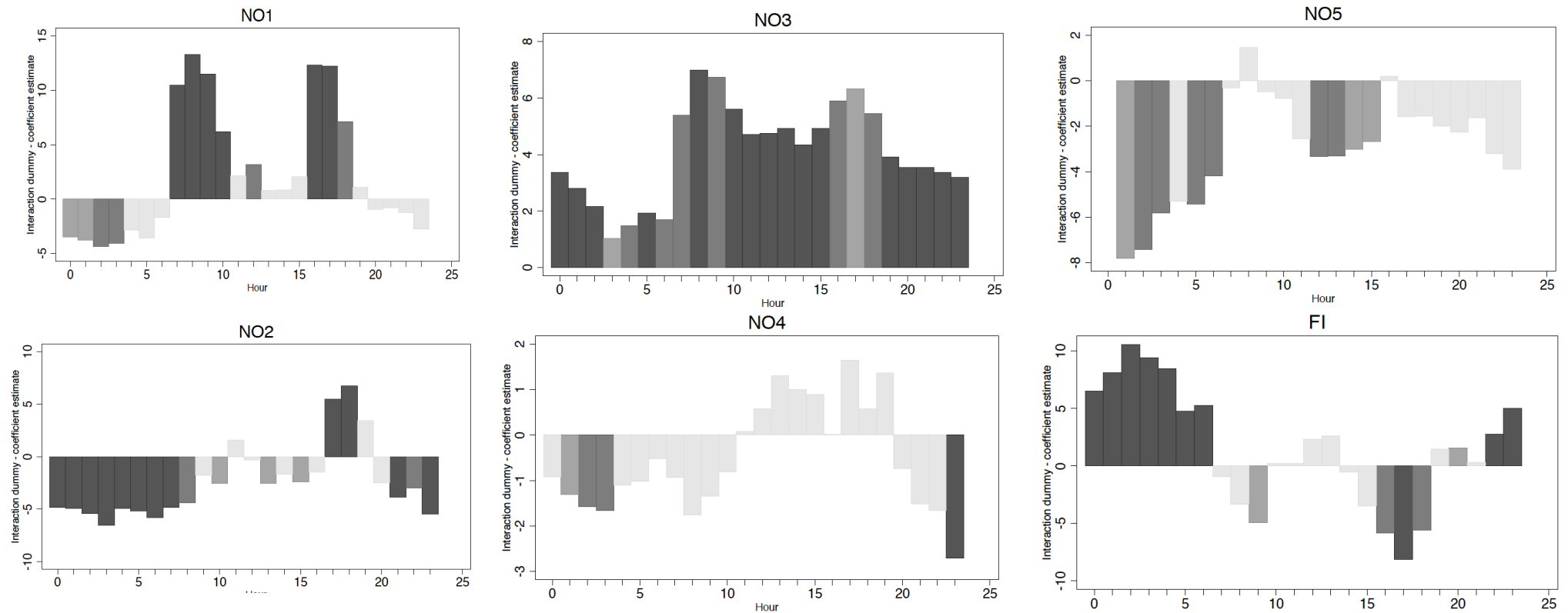
- 35% of peak hours and 24% of off-peak hours have significantly *higher* zonal prices after the implementation of the platform
- 10% of peak hours and 32% of off-peak hours have significantly *lower* zonal prices after the implementation of the platform

Platform's impact by zone (Sweden & Denmark)



Platform's impact by zone

(Norway & Finland)



Significant $p < 0.01$ Significant $p < 0.05$
Significant $p < 0.1$ Non-significant coefficient

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?