Completing the Internal Electricity Market beyond Market Coupling

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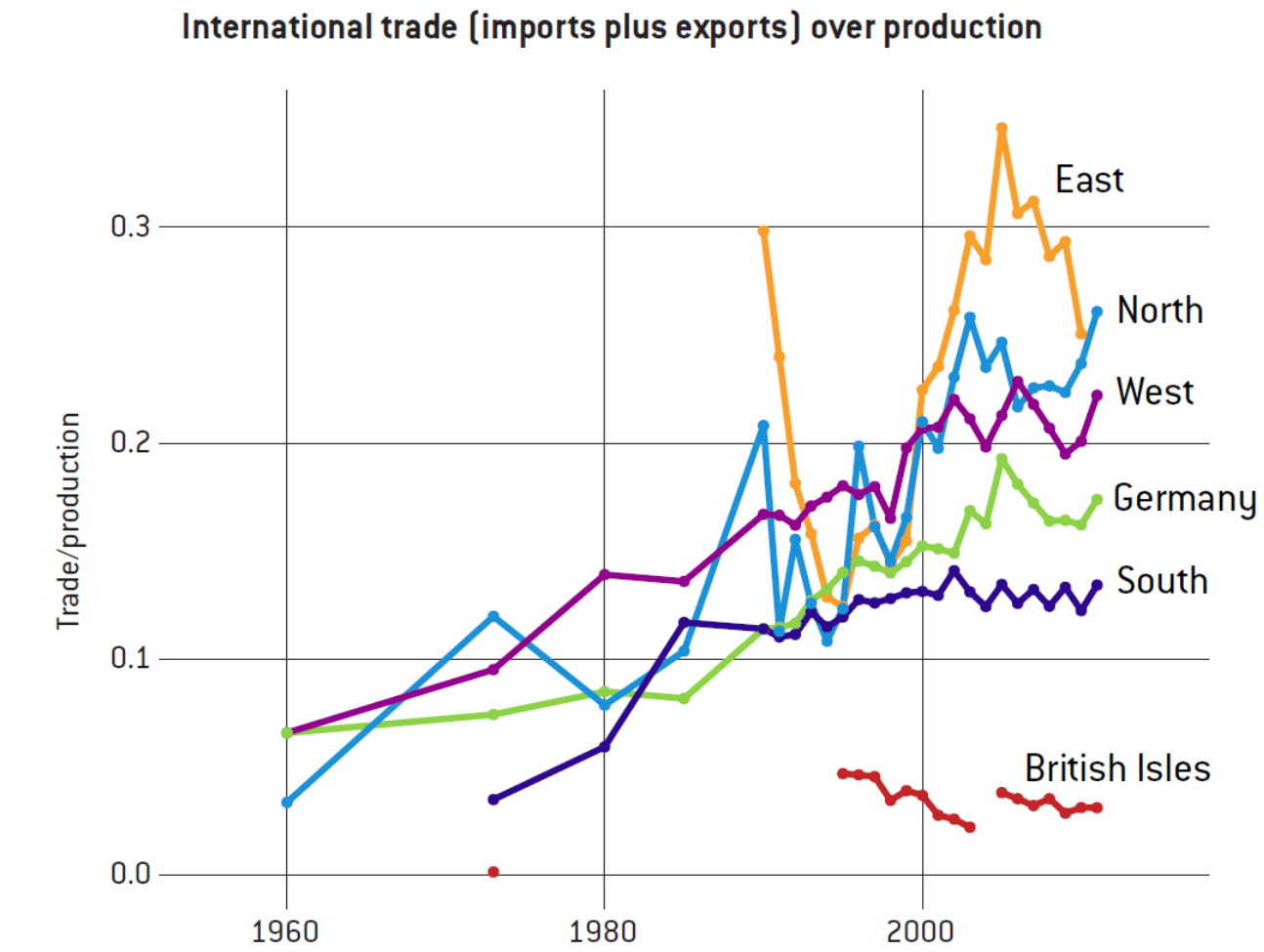
Agenda

1. Substantial Benefits of Integration
2. Wholesale market is a declining segment
3. Market Integration beyond Market Coupling

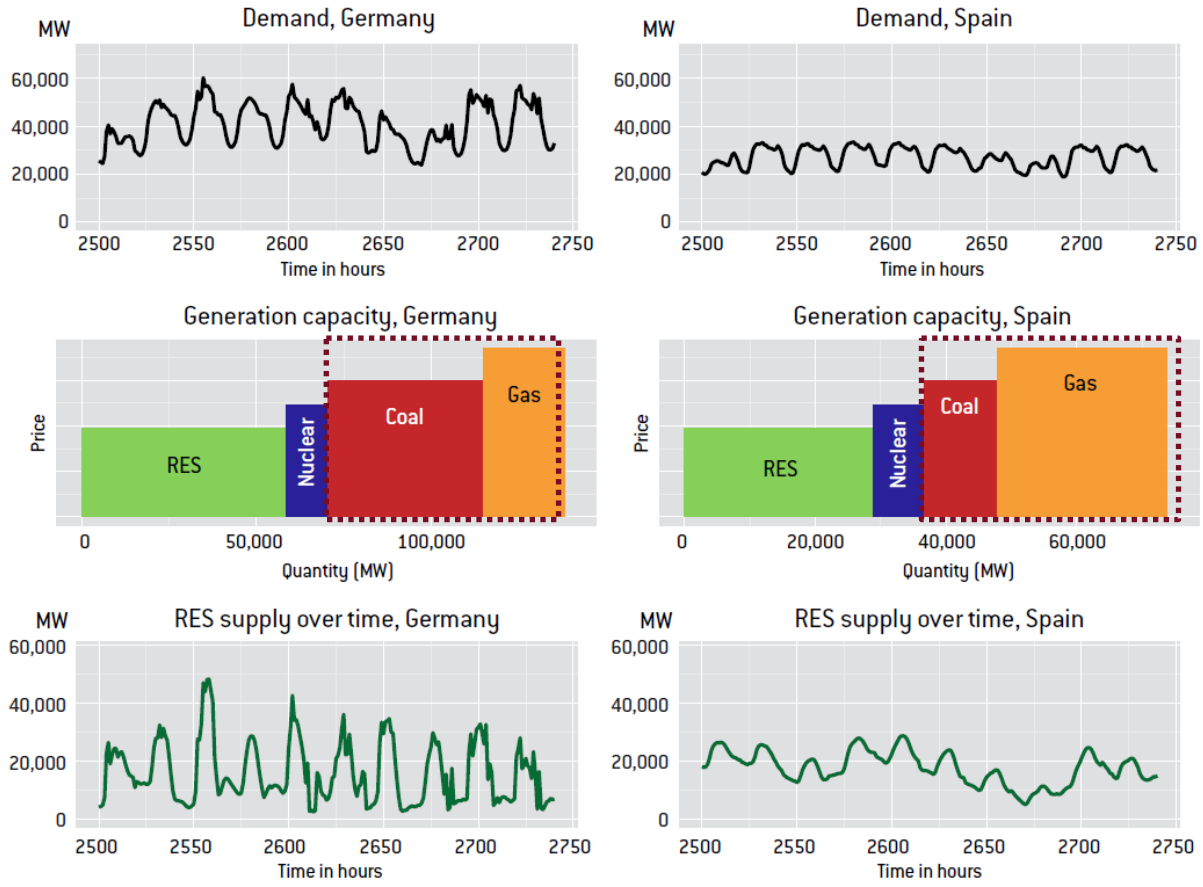
Market integration is a continous process with incremental benefits



Source: Bruegel based on IEA Electricity Information 2001, 2005, 2011; Eurostat, World Bank, Lagendijk (2008).
Note: West = Austria, Belgium, France, Luxembourg, Netherlands; East = Czech Republic, Estonia, Hungary, Poland, Romania, Slovakia, Slovenia; South = Greece, Italy, Portugal, Spain; North = Denmark, Finland, Norway, Sweden; British Isles = United Kingdom, Ireland.

Benefit of jointly optimising the fossil plant operation and dispatch

Figure 7: Graphical representation of the data



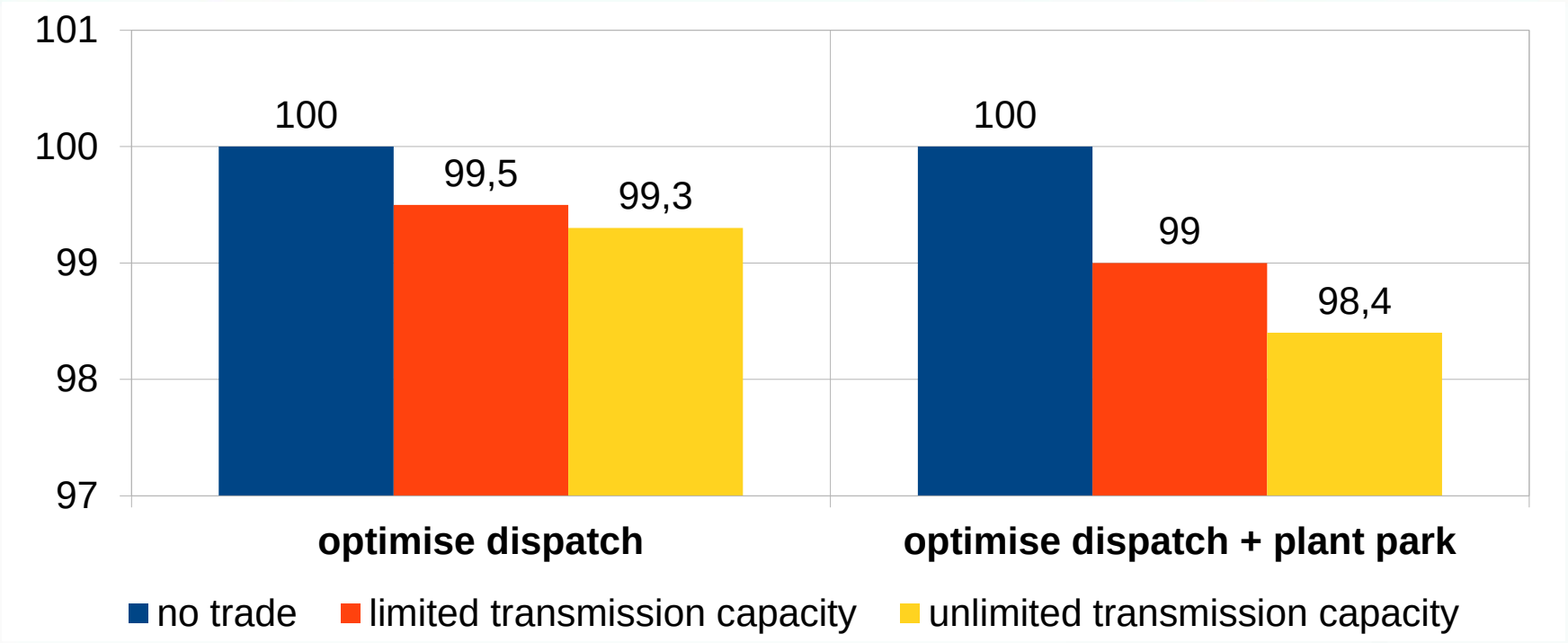
Source: Bruegel.

- **2012 data on load, wind, PV and installed capacities**
- **Cost assumptions:** Delarue *et al* (2011)

Cases:

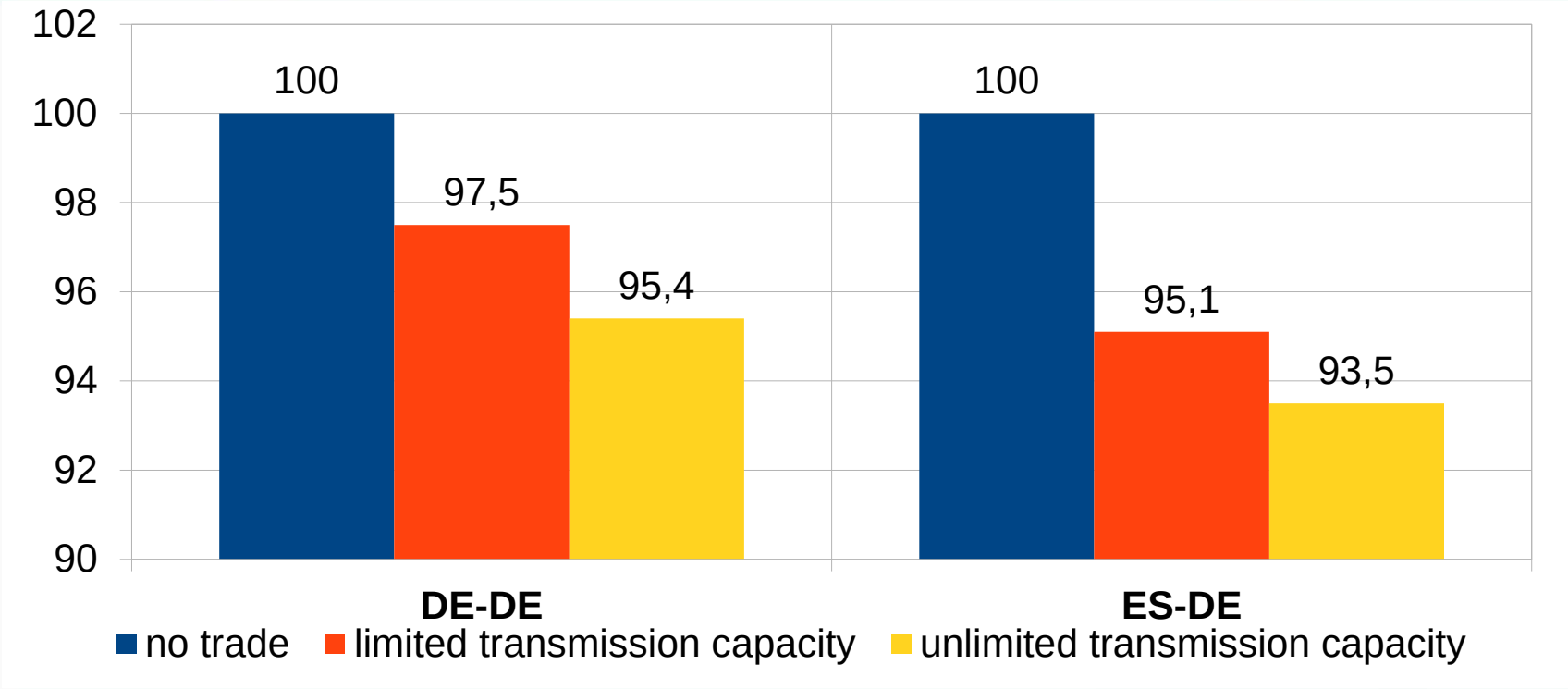
- Stat.opt vs. Dyn.opt
- DE-DE vs. DE-ES
- 1xRES vs. 2xRES
- **generation full cost**
- **Data and code on the website**

Benefits increase when allowing to re-optimise the plant park



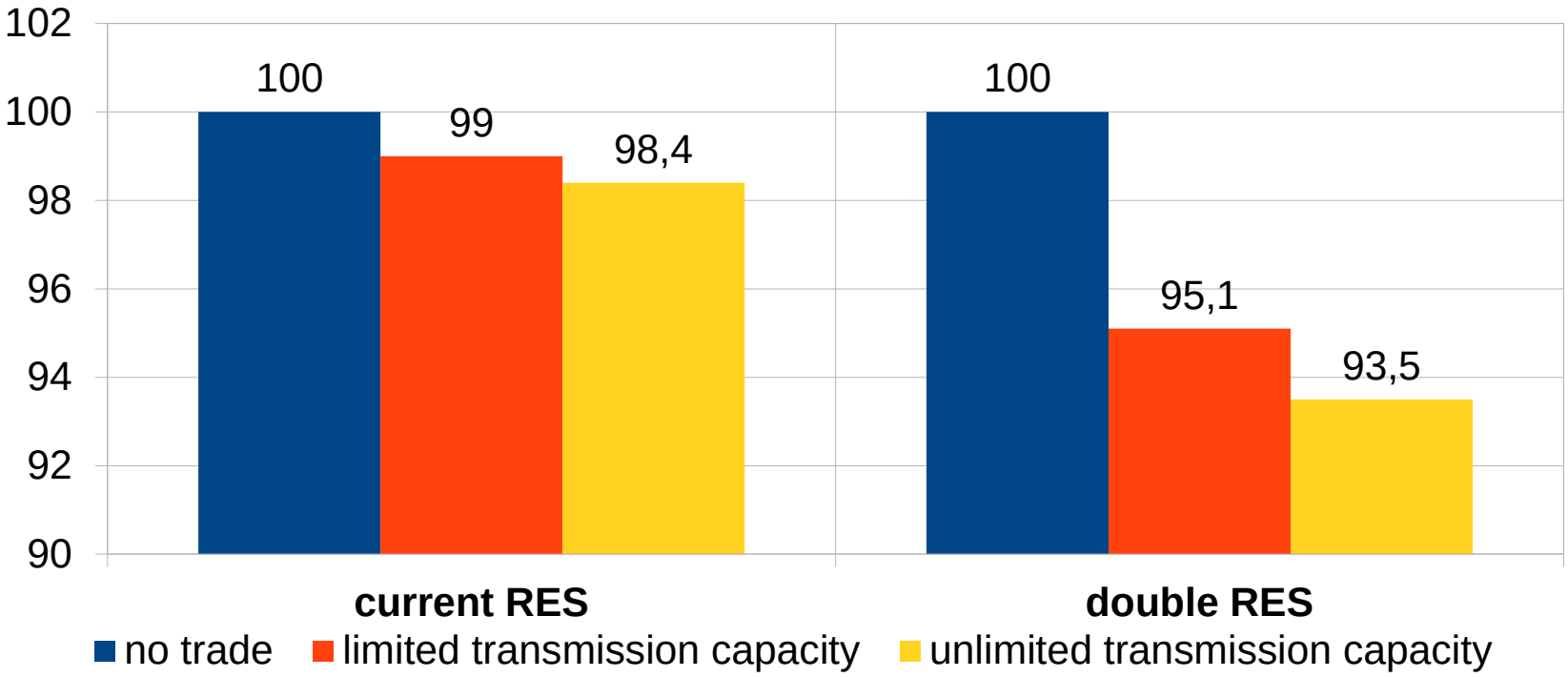
Case: DE-ES; current RES

Benefits increase with the heterogeneity of partners



Case: double RES; optimisation of dispatch and plant park

Benefits increase with the RES share

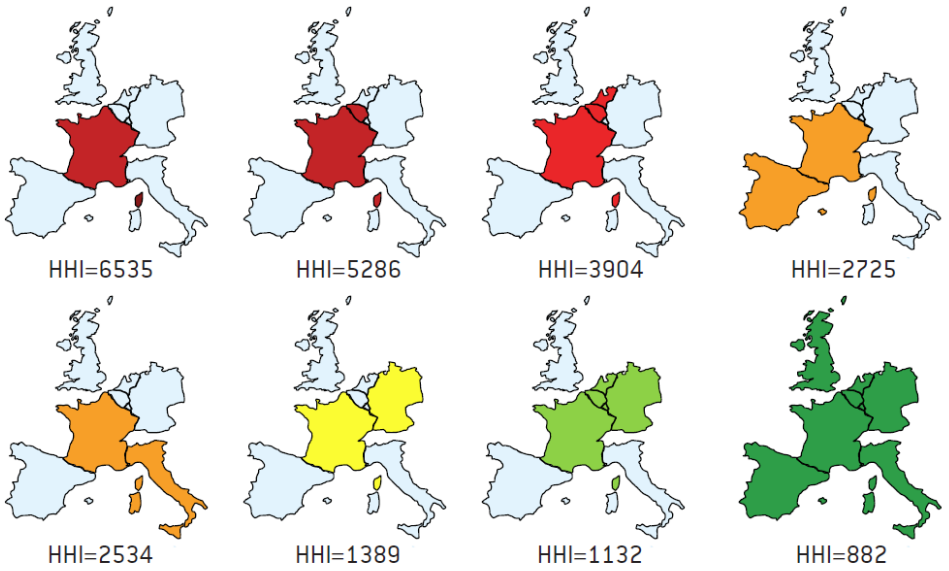


Case: DE-ES; optimisation of dispatch and plant park

Additional benefits:

- a wider portfolio of technology options (e.g. efficient vs. flexible units)
- coordinated storage usage
- increased competition between generators
- …

Figure 4: Concentration indicator for generation companies for different market configurations



Source: Bruegel based on companies' capacities reported in their 2012 annual reports, and total capacities reported by national regulators. Note: the reported Herfindahl-Hirschman-Index (HHI) is the sum of the squared market shares of all major electricity producers in the included countries. In US competition law, an HHI below 1500 indicates an unconcentrated market, an HHI between 1500 and 2500 indicates a moderately concentrated market and an HHI above 2500 indicates a highly concentrated market. Colours range from green (least concentration) to red (greatest level of concentration).

Wholesale market is a declining segment

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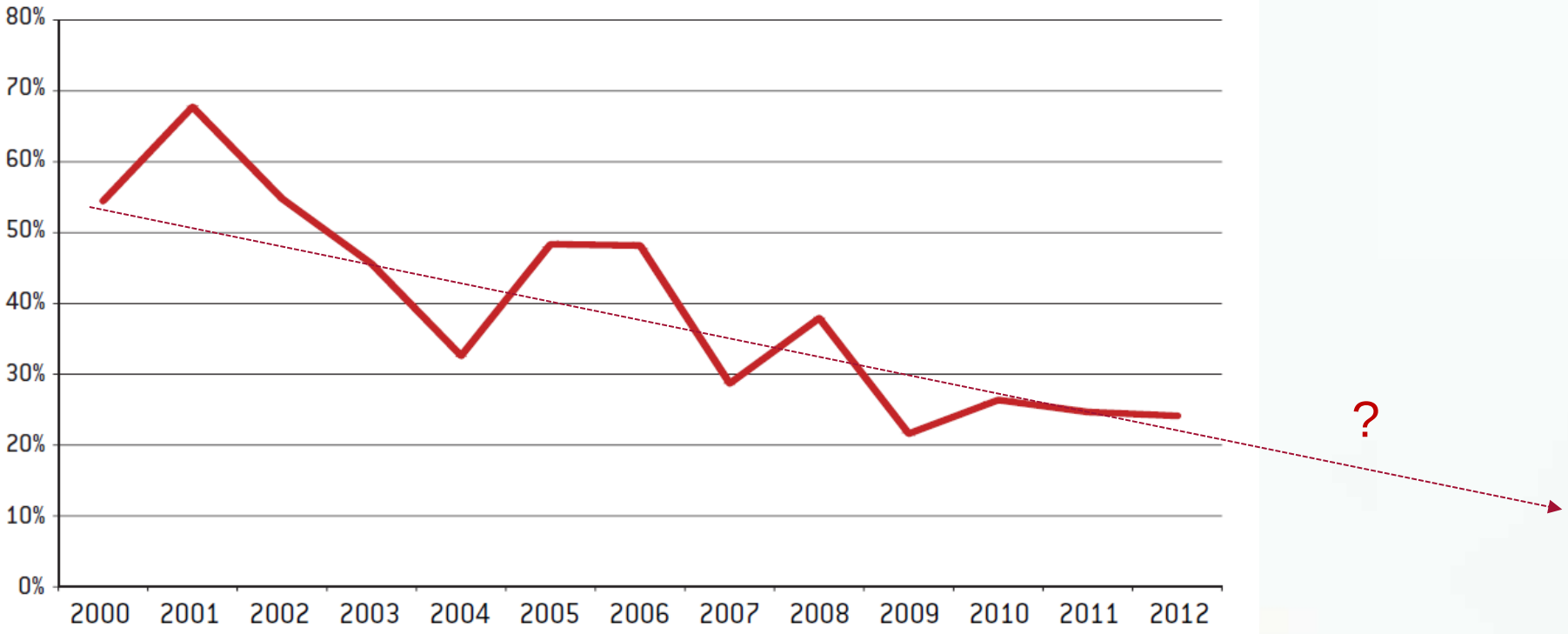
Table 12: Determinants of the value of the electricity service and how its allocation is organised

	Nationally administered provision	Purely National market arrangement	National market arrangement with an interface for imports/exports	European market	Expected change in Importance
Frequency and voltage control					+
Other Ancillary services[43]					
Balancing			Nordic+		+
Intraday delivery of electricity			Nordic+		+
Day-ahead and term delivery of electricity					-
Supply Adequacy					+
Location			Nordic		+
'Greenness'		Quotas			+
Emissions				ETS	?

Source: Bruegel. Note: shaded cells indicate how allocation of the service is typically organised.

Internal market loses its relevance for European consumers

Figure 1: Share of wholesale prices in price paid for electricity by industrial users in Germany



Source: Bruegel based on IEA and EEX.

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Balancing & Ancillary Services

Under way

- Network Codes
- Bilateral approaches
- Only limited work on ancillary services

What would you expect in a single market?

- Harmonised rules that consider physical constraints, not national borders (-> e.g., joint product definitions)

Operating Networks

Under way

- Operation: Regional initiatives by TSOs (e.g., CORESO)
- Congestion Management: Rollout of Market Coupling

What would you expect in a single market?

- Incentives for operators to take the best operational decision, given the entire system
- Congestion *inside* and *between* countries dealt in the same, economic way

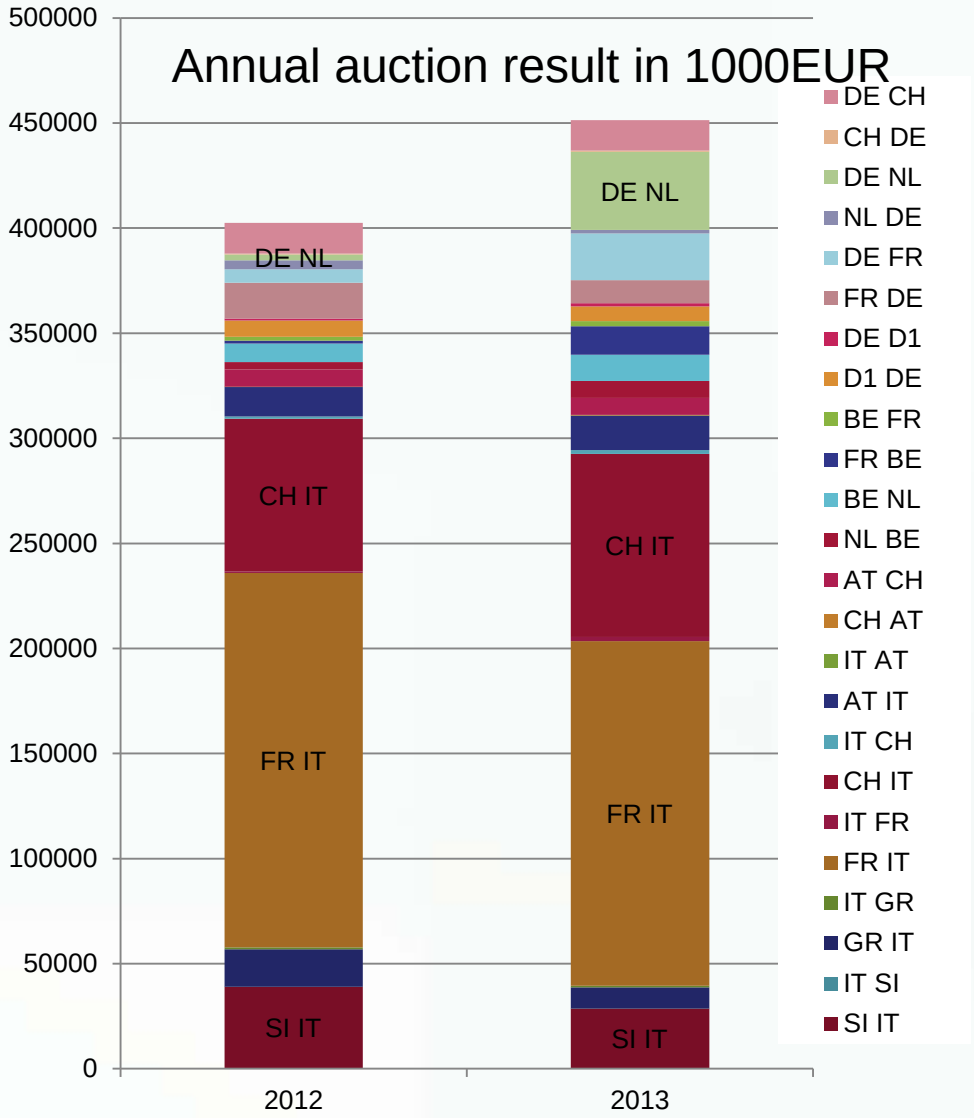
Building Networks

Under way

- Network Package -> cost-sharing for some priority lines
- some inter-TSO coordination in network planning

What would you expect in a single market?

- Joint network planning based on welfare maximisation
- Cost-sharing as a principle



Renewables

Under way

- DG Competition State aid guidelines -> ?
- 2030 targets -> ?
- DG Competition investigation into the EEG

What would you expect in a single market?

- A joint scheme aimed at enabling a resilient and cost-efficient transition

Supply Adequacy

Under way

- DG Competition State aid guidelines -> ?

What would you expect in a single market?

- A joint scheme (or none at all)

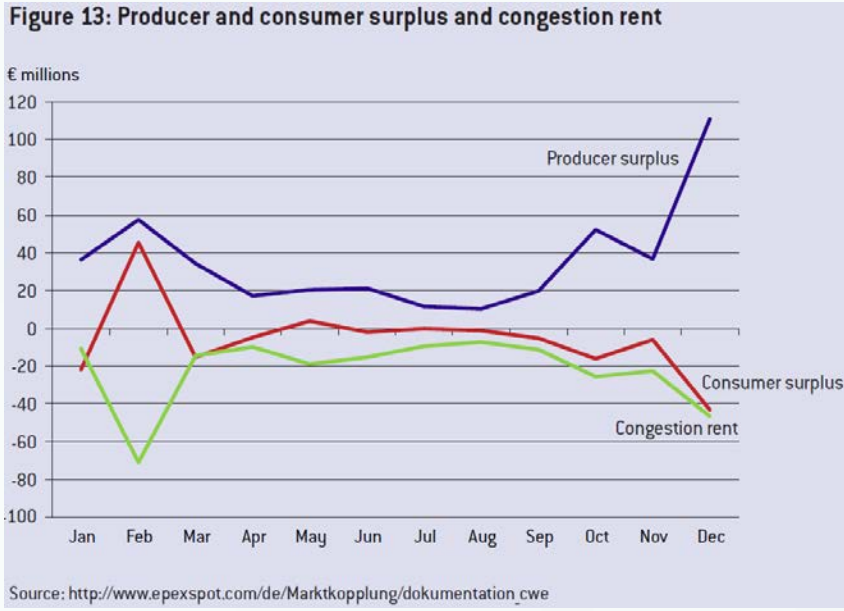
The Energy-Economics Challenge

- Numerous ‘first best’ and ‘second best’ market designs for each individual component have been proposed
- All components interact
- Different menus have been proposed
- But, little research on the welfare effects and the distributive effects of these menus exist

The Political Challenge

All design choices face significant opposition

- Private stakeholders with vested interest
- Countries have vested interest
- Differences in preferences
- Governments protecting sovereignty



Going further requires democratic legitimisation

- Current process driven by EU Commission and TSO's

A window of opportunity?

Germany energy policy has significant spill-overs on important stakeholders in all neighbouring countries

- Loop-flows
- Negative prices and price volatility
- …

All parties in the new Bundestag agree that substantial changes to German energy policy shall be done

- If Germany were open to discuss the schemes for RES, networks and capacity with other governments, most/all neighbours might agree to a mutually beneficial joint solution

Back-up

Table 5: Coincidence of hours with minimum renewables feed-in and hours with maximum load in 2012 for Zones A and B

	top 10h	top 50h	top 100h	top 200h	correlation
Renewables (min)	-	1	6	24	67%
• wind (min)	5	23	36	110	77%
• solar (min)	6	32	66	139	98%
Load (max)	-	8	40	121	78%
Residual load (max)	-	8	27	53	74%

Table 9: Coincidence of hours with minimum renewables feed-in and hours with maximum load in 2012 for Germany and Spain

	top 10h	top 50h	top 100h	top 200h	correlation
Renewables (min)	-	-	-	2	18%
• **wind (min)**	-	-	-	3	2%
• **solar (min)**	-	12	20	50	86%
Load (max)	-	4	19	43	80%
Residual load (max)	-	6	14	31	59%