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Ownership unbundling, competition and interconnector investment: analysis of the German case

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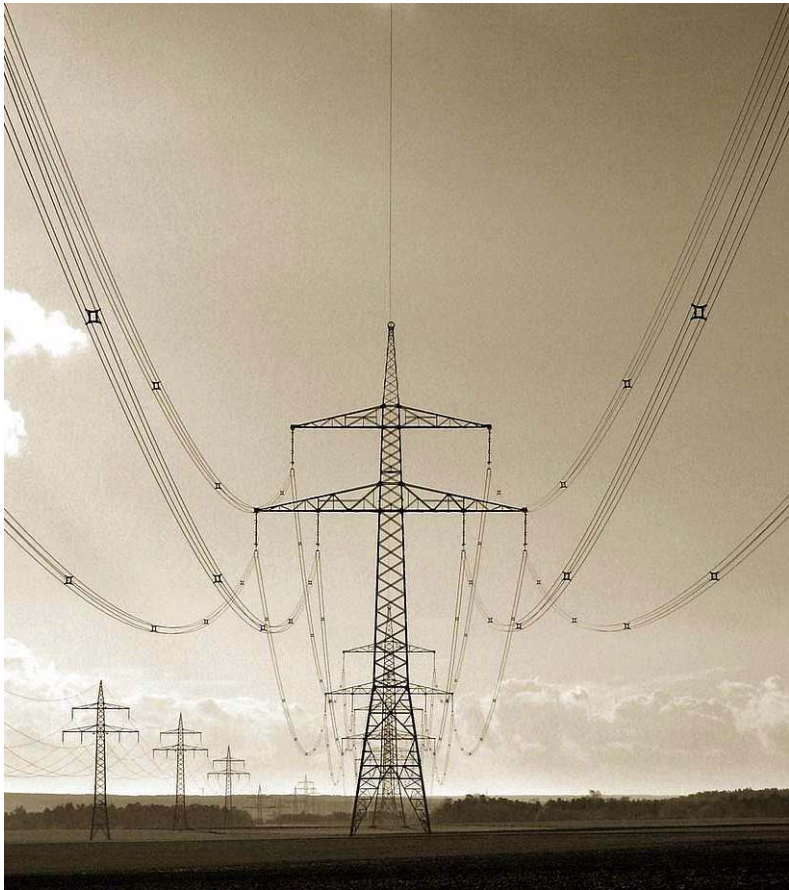

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Unbundling: 3rd EU package

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Sector Inquiry - 10 January 2007

Proposal for 3rd EU Energy Directive

- **Deep ISOs**
- **Ownership unbundling**
- **Third way or EEU (effective and efficient unbundling)**

Unbundling

- **Should improve competition**
- **Should enhance network investment – interconnectors**
  - **Should improve internal market**
  - **Should improve competition**
  - **Should improve supply security**

    underlying argument: „strategic investment withholding“

Ownership unbundling: The „battle fields“

1. Competition effect
   - How much „competition“ will OU achieve?
2. Interconnector effect
   - Higher I-capacity improves competition
   - Higher I-capacity leads to more international trade and thereby lower production costs
3. Cost effect
   - New investment increases CAPEX
     - Additional Generator-capacity
     - Additional Interconnector capacity
   - Effect on economies of scope and synergy effects
   - Effect on coordination of investments

Strategic investment withholding

Are incentives of vertically integrated utilities (VIU's) to invest in new transmission capacity low?

The argument: *strategic investment withholding*

- **Building new and larger interconnector capacity creates stronger competition for the competitive businesses**
- **Hence, VIU will hesitate to invest in interconnectors**
- **The same may hold for new connections of power plants**

Argument is basically correct

- **Seems to be important in the USA as well**
- **One of the drivers behind ISO's**

However, the are limits to the argument of strategic investment withholding (SIW)

Limits to the SIW argument

VIU‘s may be short on generation side and long on purchase side

- Additional T-capacity increases buying power and thereby increases competitiveness

VIU‘s may have low-cost, excess generation capacity

- Additional T-capacity allows larger market

Exports can actually decrease competitiveness on own market

- For instance: “residual supply index”

$$RSI_j = \frac{\sum_{i \neq j} Q_i}{D}$$

Analysis for the German case

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This analysis relies on a social cost benefits analysis for unbundling of German TSO's

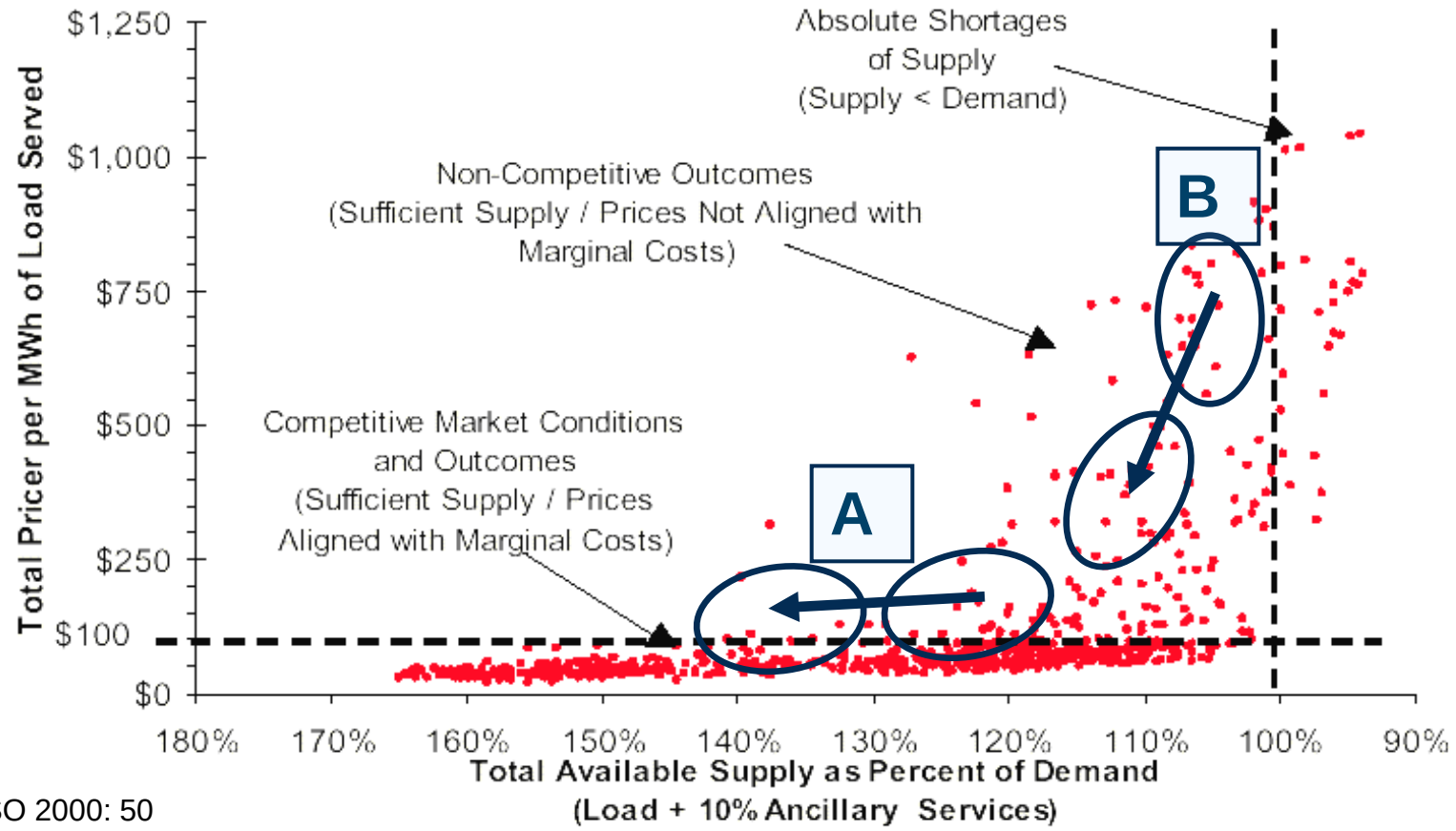
The competitive concept for the SCBA relies on the Residual Supply Index, for which parameter values were calculated by London Economics (2007) for the EU-commission

- **To be precise, we use the LE estimates for *squared PCMU-RSI***

References:

- **Brunekreeft, G., 2008, "Ownership unbundling in electricity markets – a social cost benefit analysis of the German TSO's", Discussion Paper EPRG 08-16, University of Cambridge, and UNECOM DP-0805.**
- **Özdemir, Ö., Hers, S., Fischer, E.B., Brunekreeft, G. and Hobbs, B.F., 2009, "A nodal pricing analysis of the future German electricity market", forthcoming.**

Competitive concept: LI-RSI



Source: CAISO 2000: 50

Competitive concept: RSI

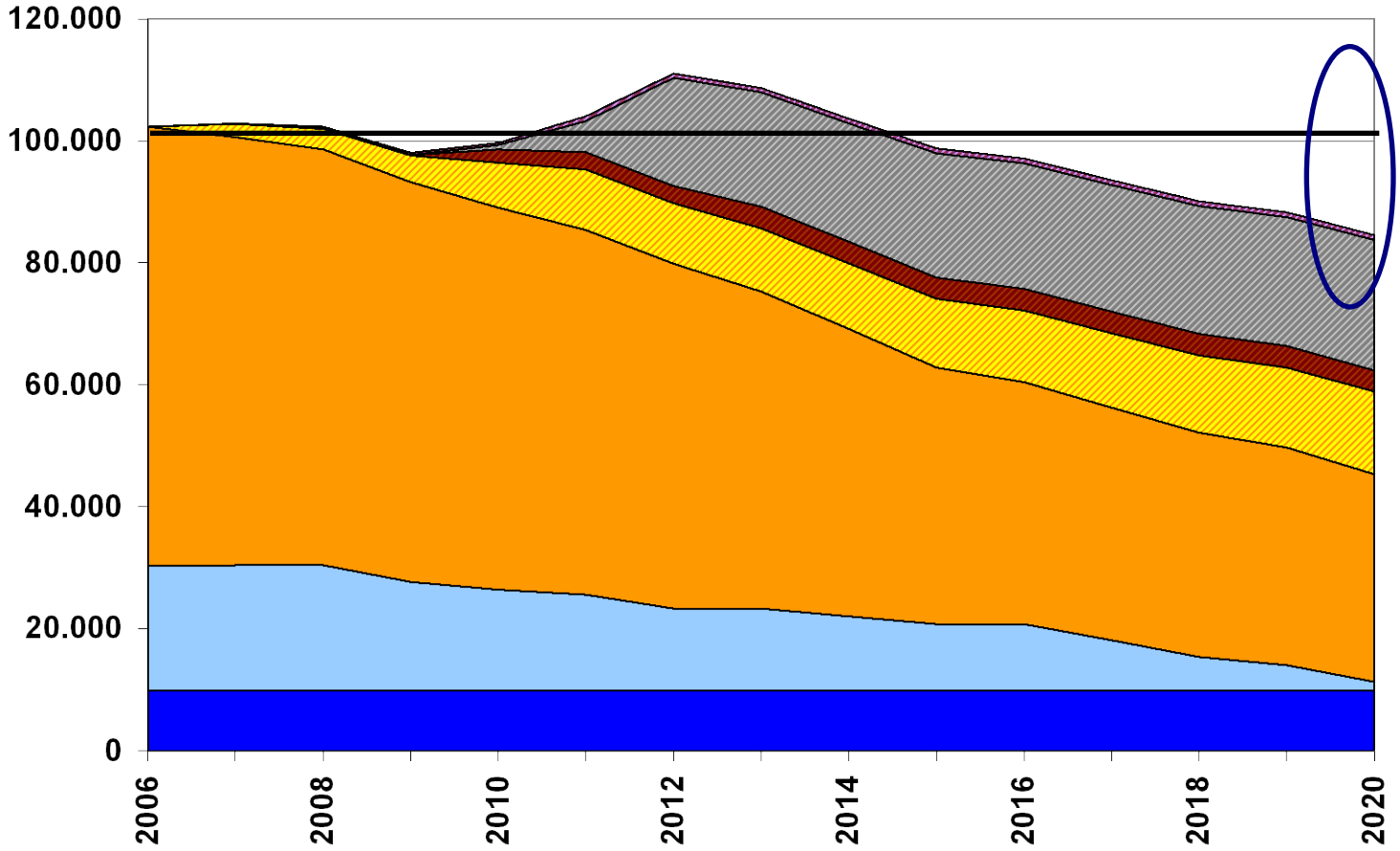
$$RSI_{t,s} = \frac{\sum_{all\,i} Q_{i,t} - TUC_{j,t}}{Load_{t,s}}$$

(Note: TUC – total uncommitted capacity)

For the RSI, among other things, the following matters:

- **total generation capacity on the market**
- **total cross-border interconnector capacity**
  - **Note that the effect of import and export differ:**
    - **If ΔI leads to more Import competition increases**
    - **If ΔI leads to more Export competition decreases**

Projected G-capacity in Germany



Low capacity

Source: BDEW, 2007

Public supply only; New RES not included

Projected I-investment at German borders

CESI et.al., 2005, “TEN-Energy Invest”, Study prepared for European Commission DG TREN, October 2005, p. 94.

Cross-border connections			Scenarios					
Country A	Country B	TEN-E	S1 baseline 2005-2013	S1 baseline 2014-2023	S3 high RES 2005-2013	S3 high RES 2014-2023	S5 I & G optim. 2005-2013	S5 I & G optim. 2014-2023
Austria	Germany	EL8	0	0	0	1200	1700	2600
Czech Rep.	Germany	EL8	0	0	0	1300	400	1400
Germany	Netherlands	EL1	0	0	100	2600	0	0
Germany	France	EL1	0	0	0	0	0	0
Germany	Denmark	EL7	0	0	1200	4100	400	800
Germany	Poland	EL8	0	0	0	1900	0	0
Switzerland	Germany		0	0	0	1900	0	0
Luxembourg	Germany	EL1	0	0	0	0	0	0
		Sum	0	0	1300	13000	2500	4800

Exports

Imports

Base assumptions

Assume for sake of the argument that unbundling would accelerate the interconnector investment by one year.

Two cases:

- **case A: high G-capacity**
- **Case B: low G-capacity**

Period: 2008 to 2030

Discount factor: 7%

Elasticity: 0. Demand growth: 0%

CS-PS sharing parameter (CS + αPS): α = 0.8

- **alpha weighs consumer surplus versus producer surplus in social welfare**

Results

		Generation capacity	
		High	Low
Δ- Inter-connector	Imports only	ΔCS = 475 ΔSW = 95	ΔCS = 1956 ΔSW = 391
	Imports and Exports	ΔCS = -494 ΔSW = -99	ΔCS = -2174 ΔSW = -435

Note: numbers are in million euros

Note: the interconnector effect means 1 year of accelarated I-investment

Note: these numbers are net of interconnector investment costs!

Note the negative sign of the numbers of the bottom row

Conclusions

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The effects increase strongly with low G-capacity

Interconnector-effect of unbundling are positive for imports only, but turns negative if exports are included

If I-effect includes imports and exports, and G-capacity is high, TSO will likely want to build interconnector

- **Prices in Germany are low exports important**

If I-effect includes only imports, and G-capacity is low, TSO will not want to build the interconnector

This is the target of OU

However, be careful with policy conclusion

- **This is a partial analysis and does not consider effects on the other side of the border**

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Thank you very much!

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