Remuneration of RES and conventional power: Convergence or continued divergence?

Katherina Grashof
Institut für ZukunftsEnergieSysteme (IZES)/
Free University of Berlin

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Central question

Shall RES power ultimately be marketed through a power market based on marginal costs

?

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Central question

Shall F-RES power ultimately be marketed through a power market based on marginal costs

- and should we push for this now ?

On a meta level: Do we try to deal with tomorrow‘s questions using yesterday‘s answers?

Presentation structure

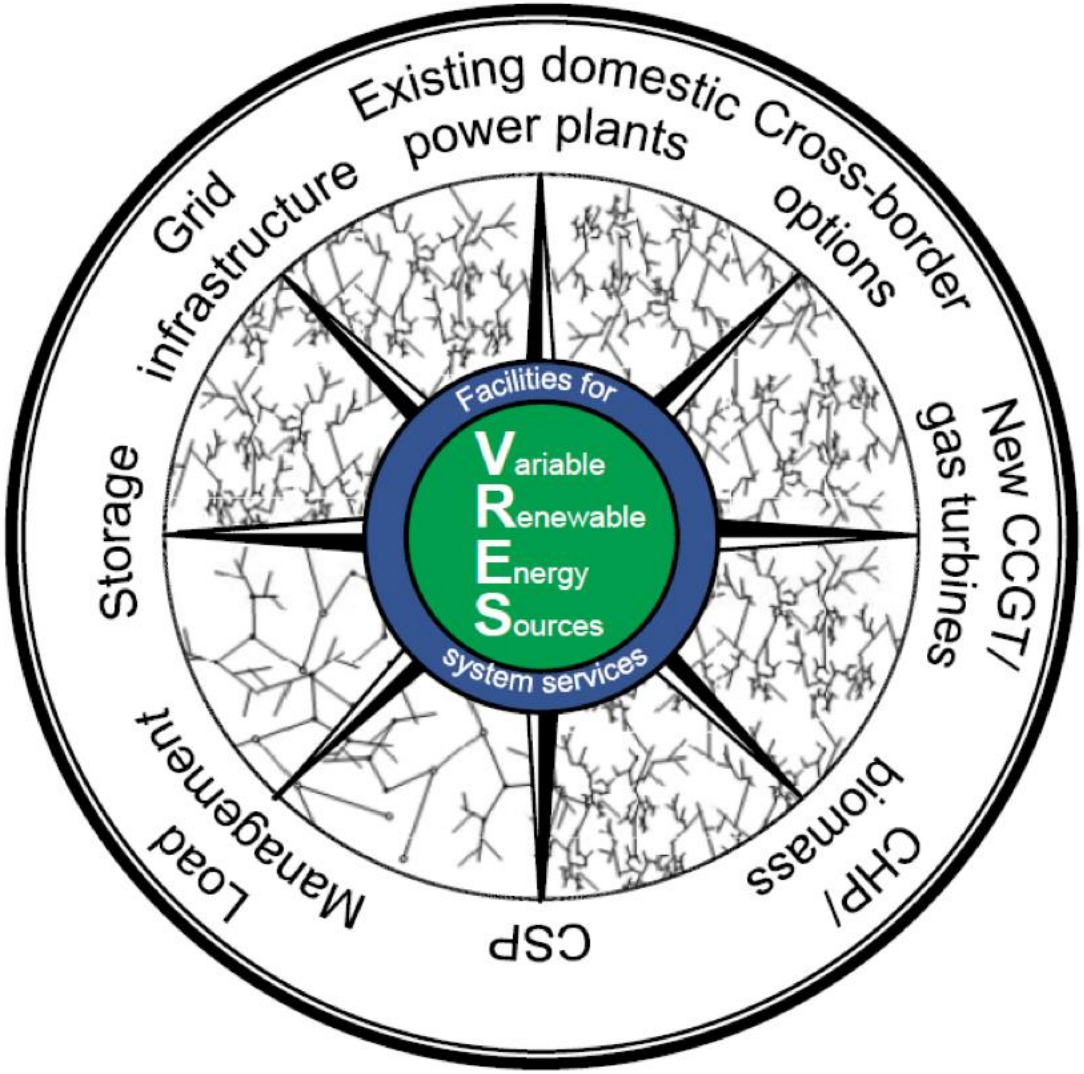
1. Marketing of conventional and renewable power
2. The idea of „market integration of RES“
3. Effects on dispatch of fluctuating renewables (F-RES)
4. Effects on technical lay-out of fluctuating renewables (F-RES)
5. Effects on risk allocation

My questions to you

1. How to adress this – quite economic – issue from a political scientist perspective?

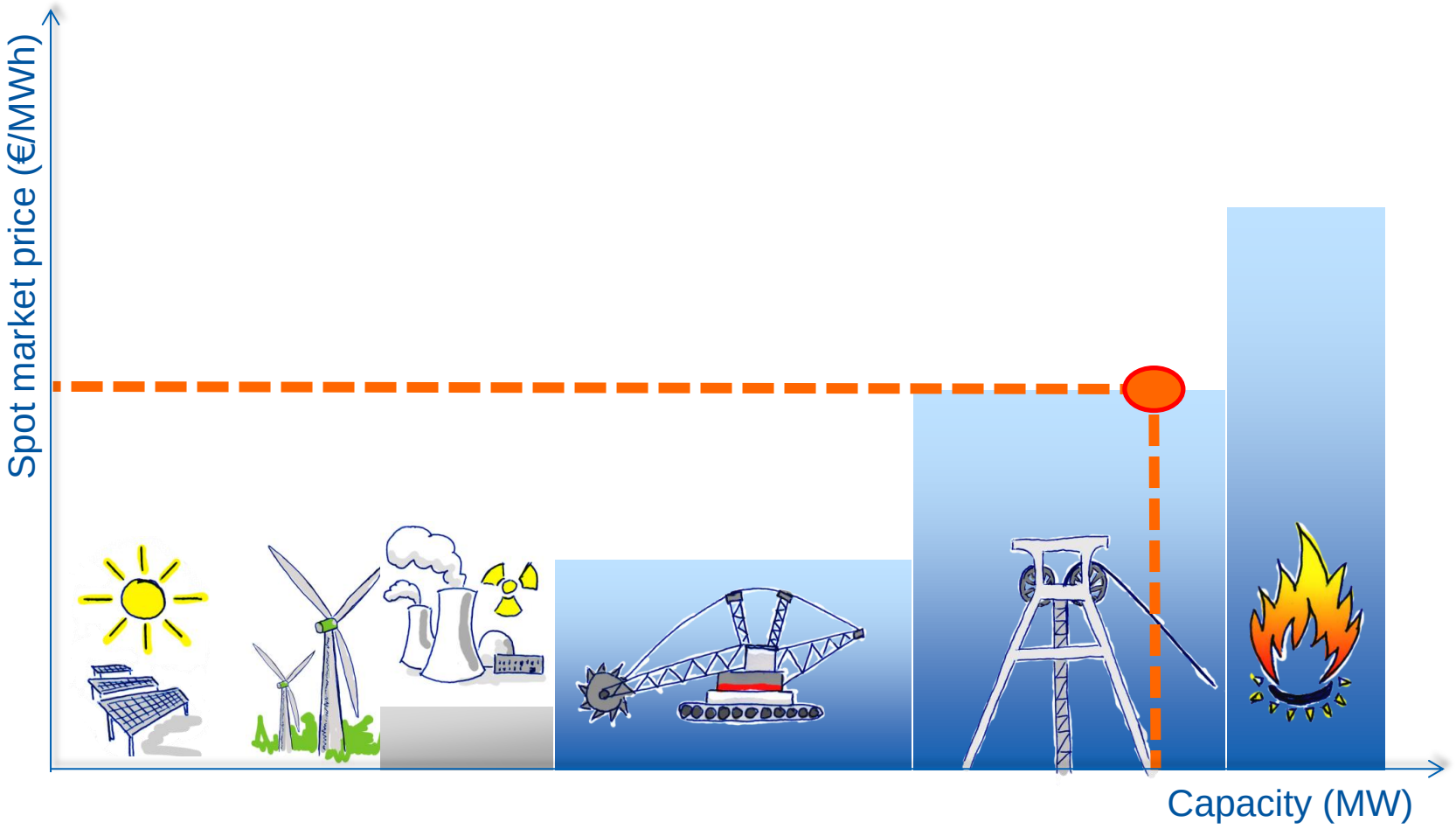
2. What are your arguments with regard to the question?

Flexibility options to complement Wind & PV



Source: IZES 2012

Power Market Merit Order



Source and ©: Schlipf 2012

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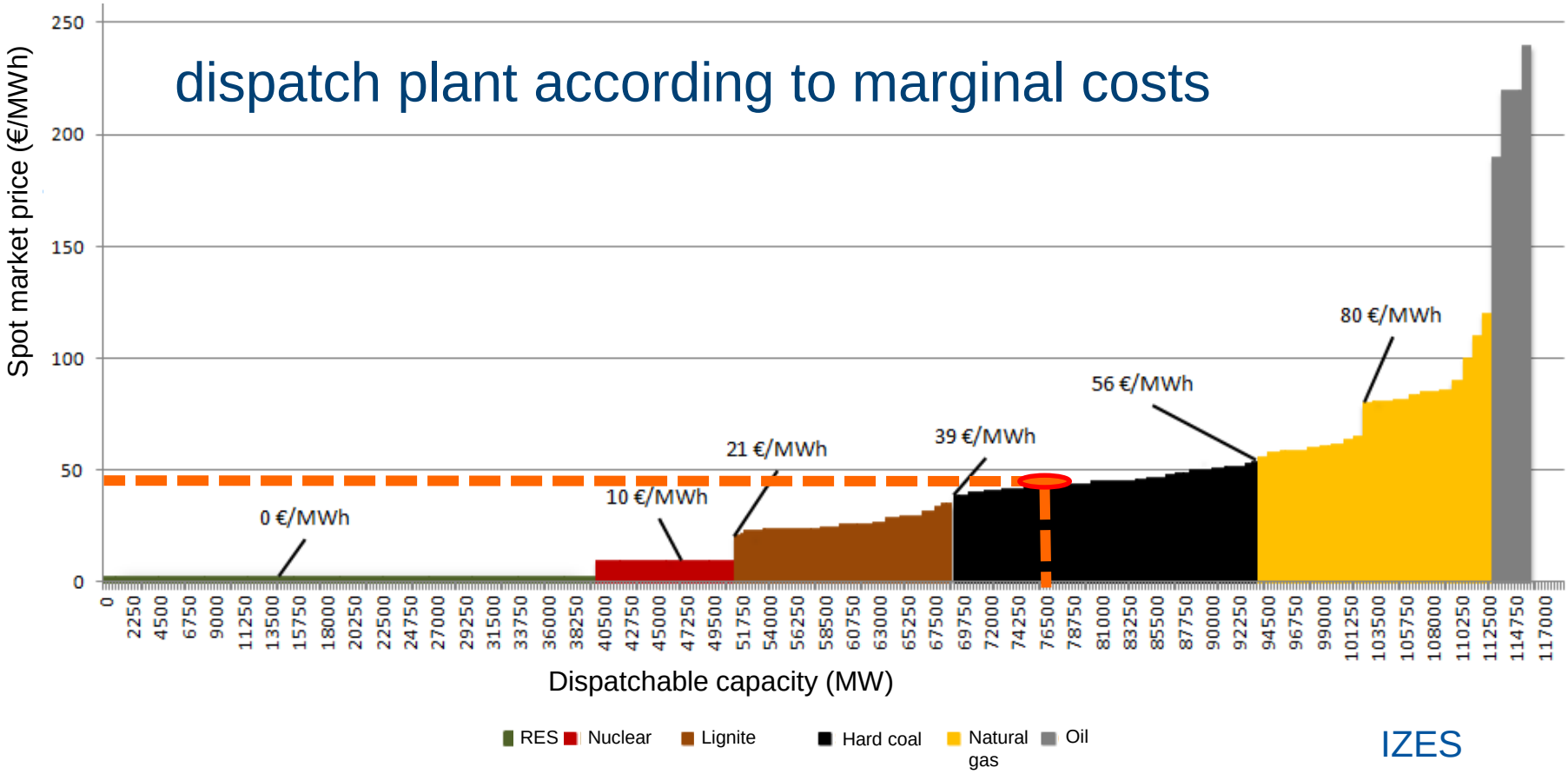

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„Traditional“ fossil + nuclear power marketing

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- Sell on future market
- Optimise returns on spot market (day-ahead + intraday market)

Example

In 2011: Sell 1 MW for 1. – 31.3.2013 for € 50/MWh at future market (at fuel costs of 30 €/MWh)

On 10.3.2013: day-ahead market price for 11.3.2013 is at

- 40 €/MWh: use own plant MAKE or
- 20 €/MWh: buy at power exchange BUY

„Traditional“ fossil + nuclear power marketing

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(Simple) Theory of liberalised power markets:
Power sale returns cover capital (construction) and operational (fuel) costs

In practice
- Largest part of capacity stock built (and payed back) before liberalisation
- Decicive supportive factors after liberalisation
  - Windfall profits from free emissions trading allowances
  - Premium for CHP plants
  - ...

Today
Power prices too low to cover capital and (hard coal and gas) capital costs of conventional generation

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Optimal dispatch of plants = according to their operating (marginal) costs

„Traditional“ fossil + nuclear power marketing vs. „Traditional“ RES remuneration through FIT

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„Traditional“ RES remuneration: Feed-in tariff to cover cap. costs
Fixed tariff per kWh fed into the grid, irrespective of time + place

Theory behind:
Without FIT, renewables are too expensive & risky to compete on the power market

Every RES kWh fed into the grid is a good kWh

Call for „market integration of RES“

„RES should act at the same markets
as conventional technologies,
earn returns in this competitive environment
and bear the market price risks“ (VKU 2013)

Goals associated with „F-RES market integration“

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Effects on dispatch of F-RES

- Switch off RES in times of negative prices
- Maintenance in times of low prices

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Effects on optimal technical lay-out of F-RES

- Wind: large rotors, small generators
- PV: east/west orientation

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System infrastructure

- Improve RES production forecasts
- Lower need for grid expansion

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Learning for future transition stages

- Development of F-RES market products

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Conceptions of justice

- level playing field with conventional technologies with regard to market risks

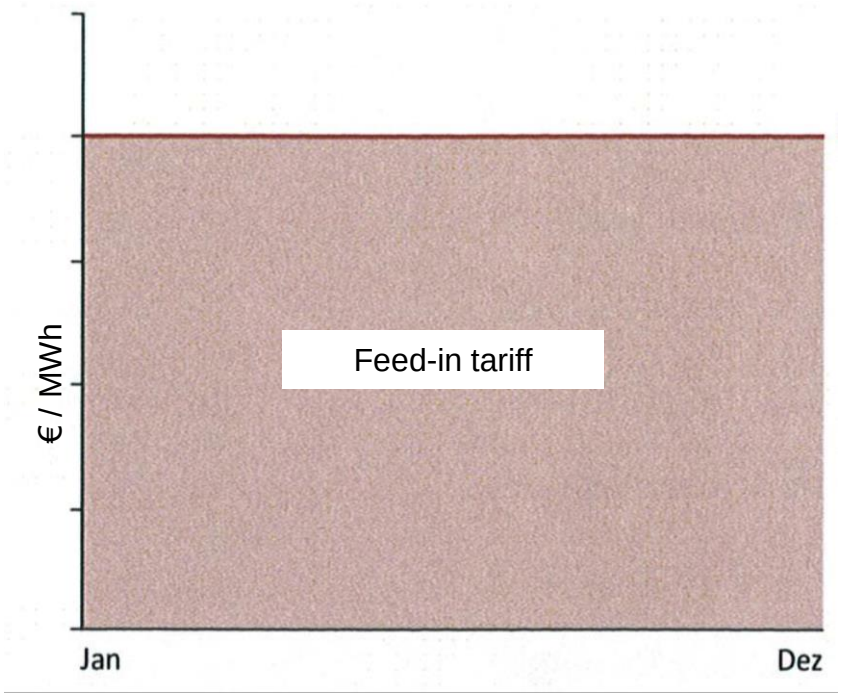
Characteristics of conv. vs F-RES technologies

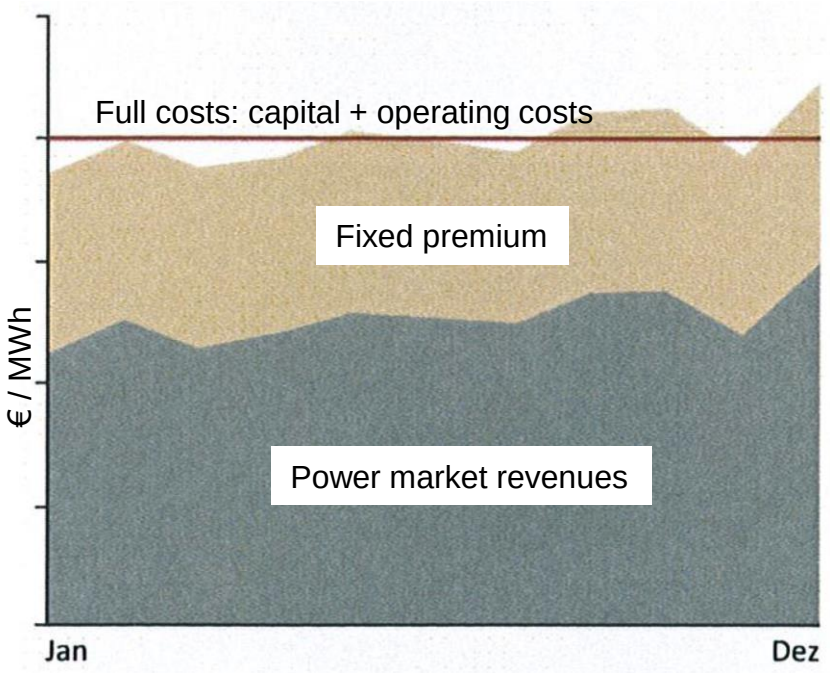
	Conventional fossil & nuclear	F-RES Wind & Solar
Storageability	Low / expensive	Low / expensive
Cost structure	Significant operating costs	Almost only capital costs
Forecastability	Years ahead, very low outage risk	Hours to 1 day ahead, significant weather risk
Controllability	Gas: fast, large range, cheap Nuclear, lignite: slow, limited range, associated with costs	Very fast, only downwards, cheap
Current power sale	Future and spot markets	FIT: TSO sell power day-ahead
Current dispatch	According to merit order Negative bids on power exchange to save costs for Herunterfahren	According to weather conditions Negative bids on power exchange to secure feed-in priority

Proposition for „market integration“

Because F-RES destroy their own market prices, they need an additional income to market revenues (Raffaele‘s principle # 2)

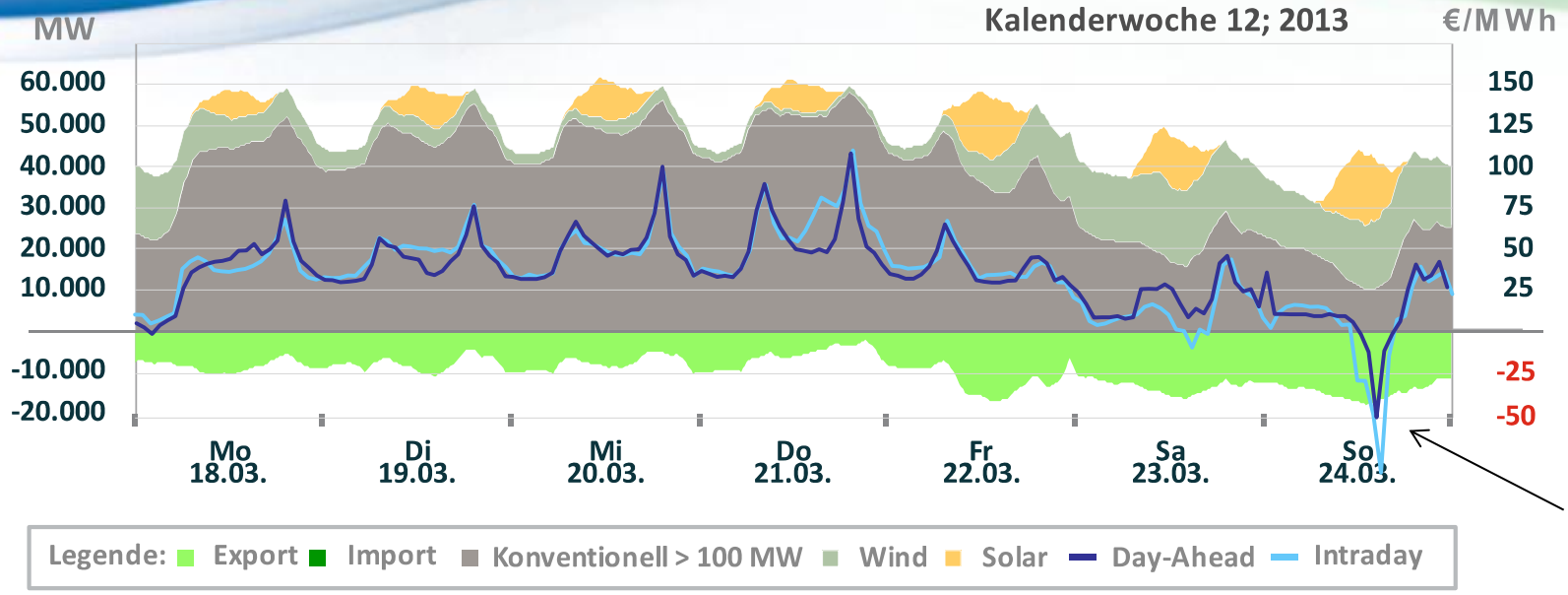
Replace FIT with fixed premium



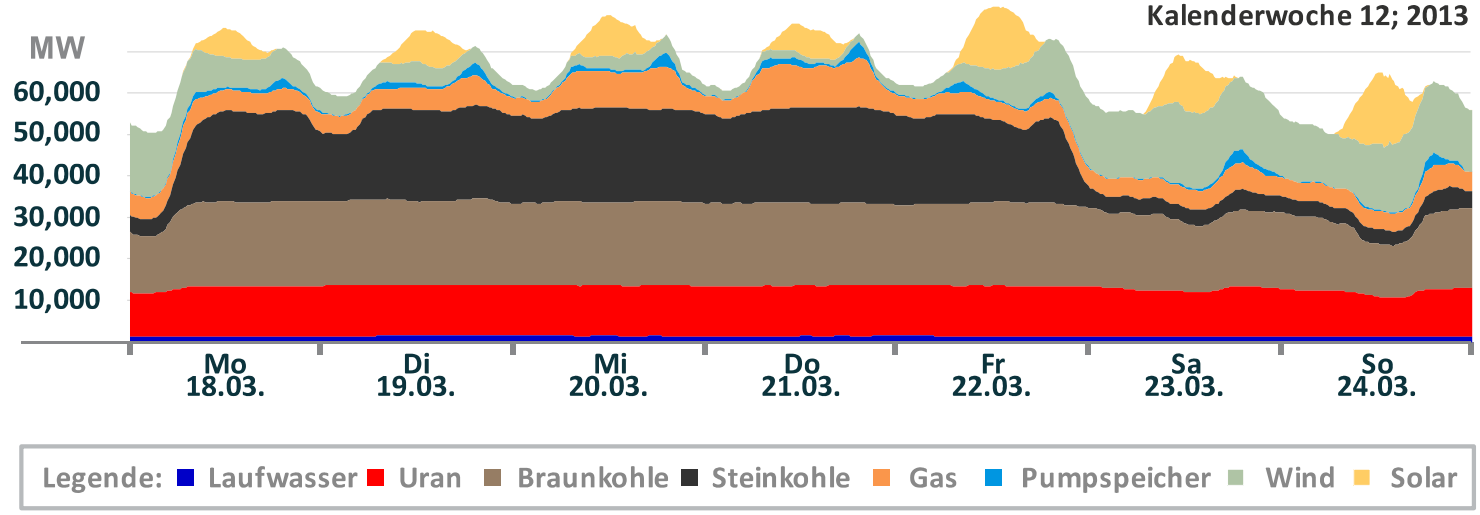


Source of graphics: MVV 2013

Effects on F-RES dispatch



RES pay negative prices, but also nuclear & Lignite do



Conv. Generation here: 29 GW

RES: 30 GW

Source: Fh ISE 2013

Effects on optimal technical lay-out of F-RES

Power price developments are highly uncertain over 10 to 20 years

Current proposals for fix premiums expect

- fix premium: 80% of plant refinancing
- market revenues: 20% of plant refinancing

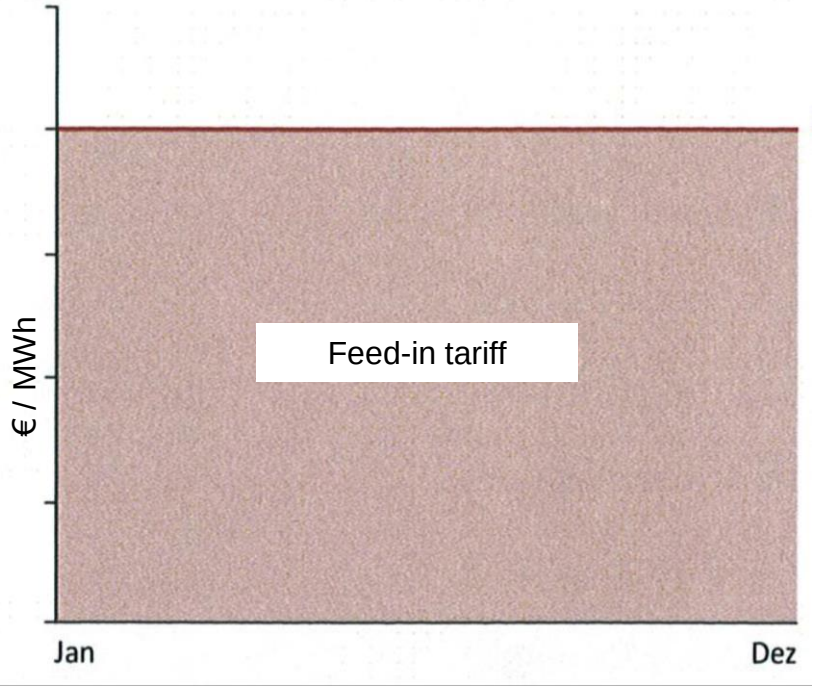
➔ Differences between Options of technical lay-out high & certain enough?

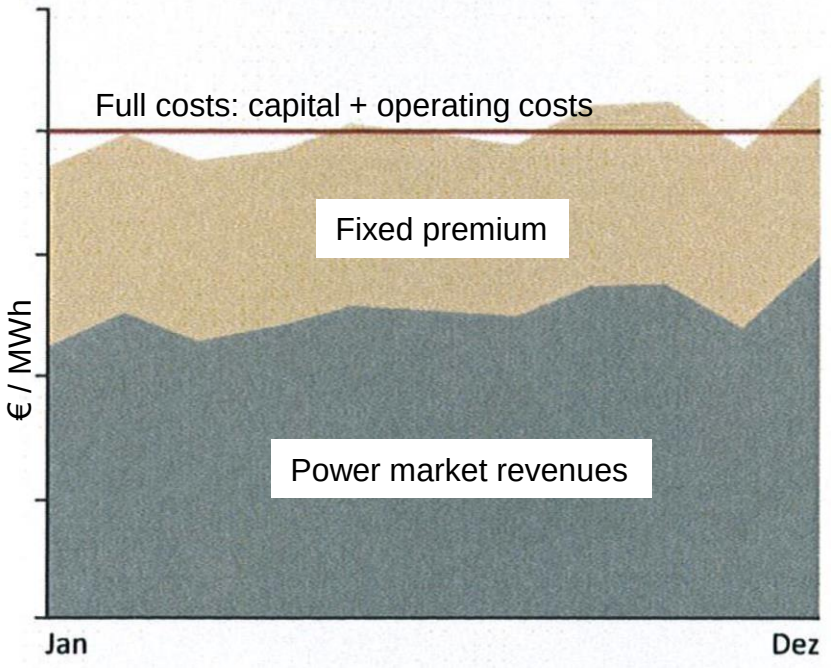
Effects on risk allocation: investor‘s perspective

Risk of insufficient revenues over plant lifetime

Production risk

Risk of balancing costs for forecast errors





Source of graphics: MVV 2013

Principles of risk allocation

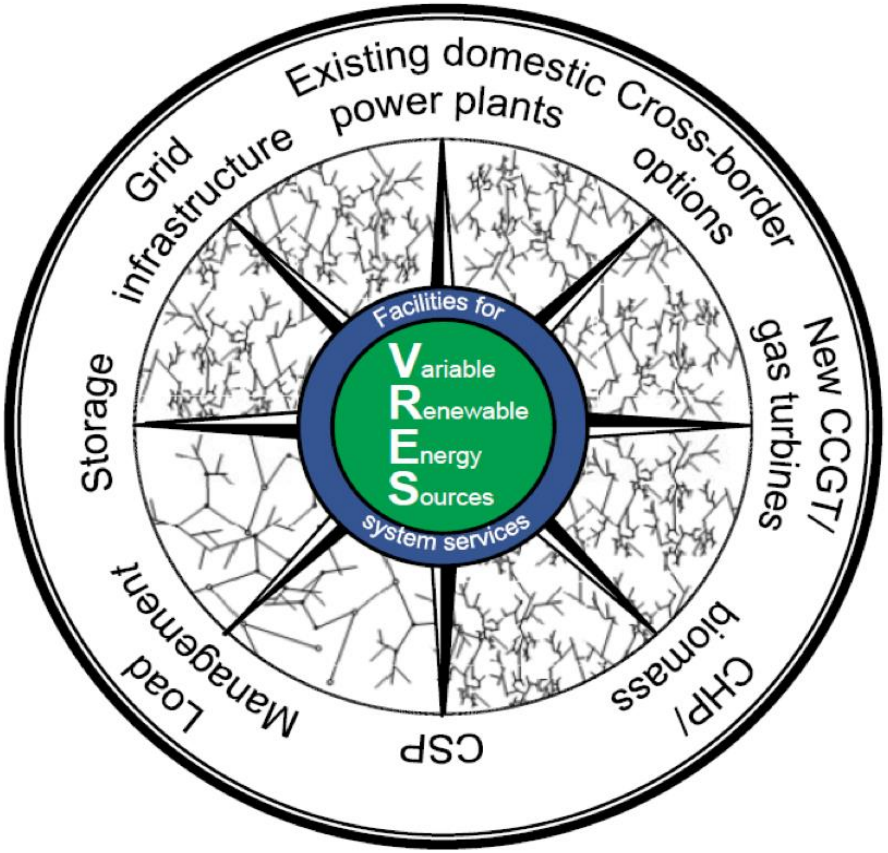
Higher risks ➔ investors, banks etc. want higher return on investment

Different options to allocate risks: give the risk to the acteur who

- „causes“ the risk
- can most easily manage the risk
- can diversify the risk to the highest extent

Preliminary conclusion

Too strong „market integration“ today risks F-RES to become flexibility options themselves - instead of pillars of the power system



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Thank you for your attention!

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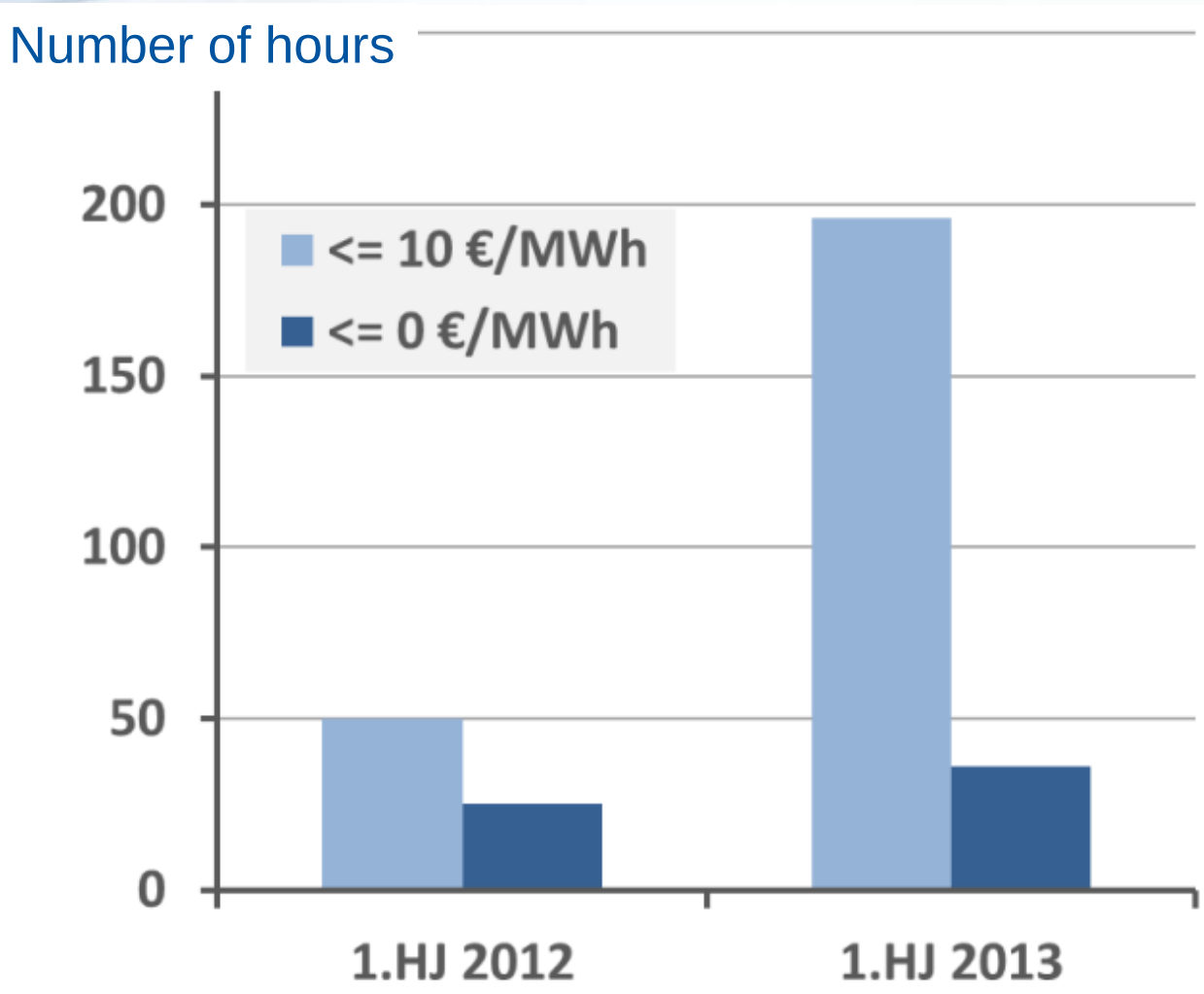
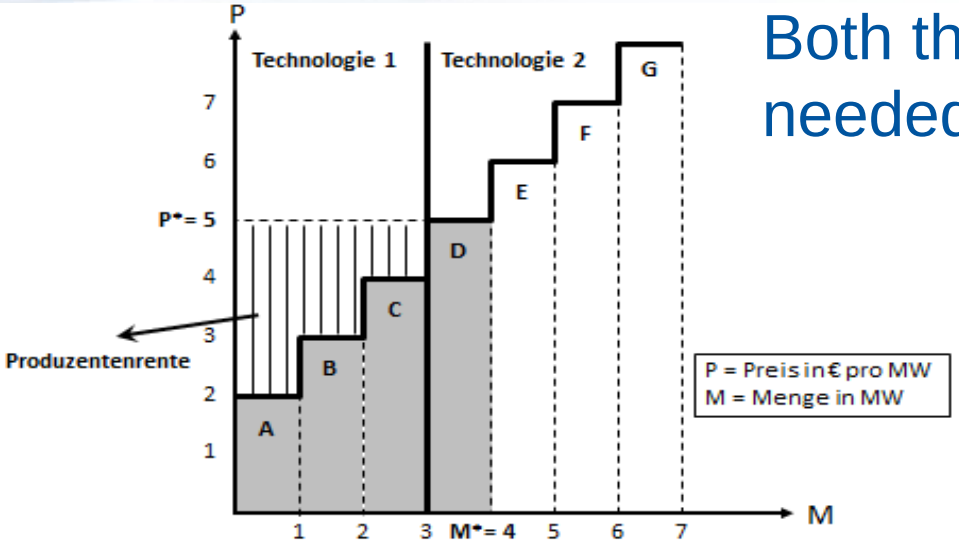
grashof@izes.de

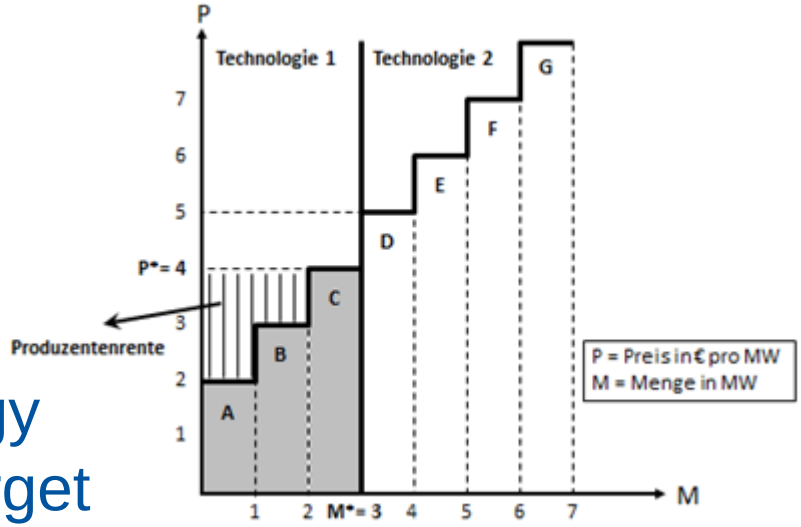
Negative prices in Germany in 2012 and 2013



Remuneration schemes with uniform price



Both thechnologies needed to reach RES target



Only cheaper thechnology needed to reach RES target

Source: Bofinger forthcoming