
European Energy Market Reform

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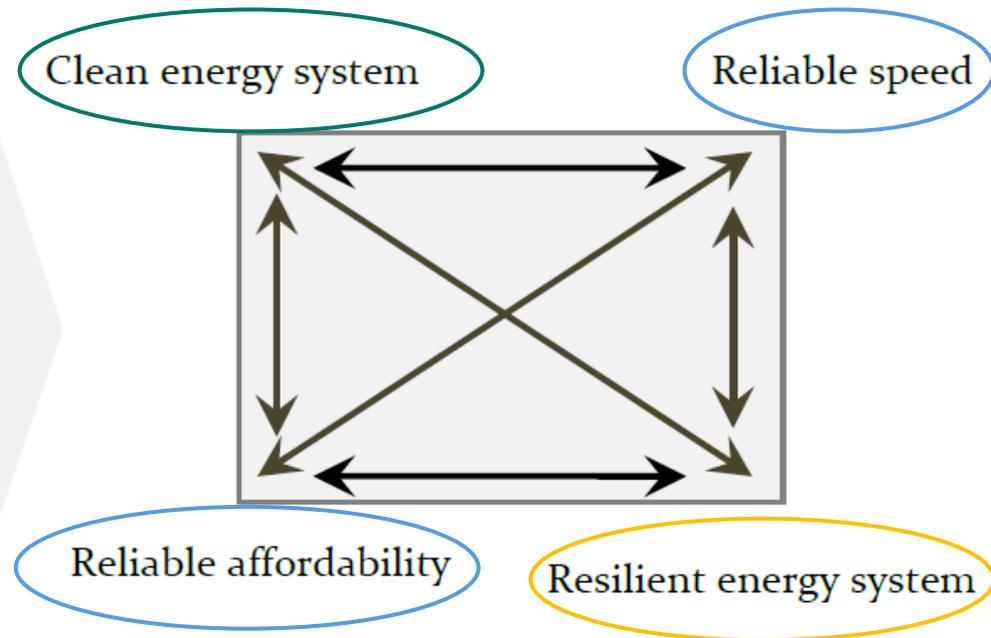
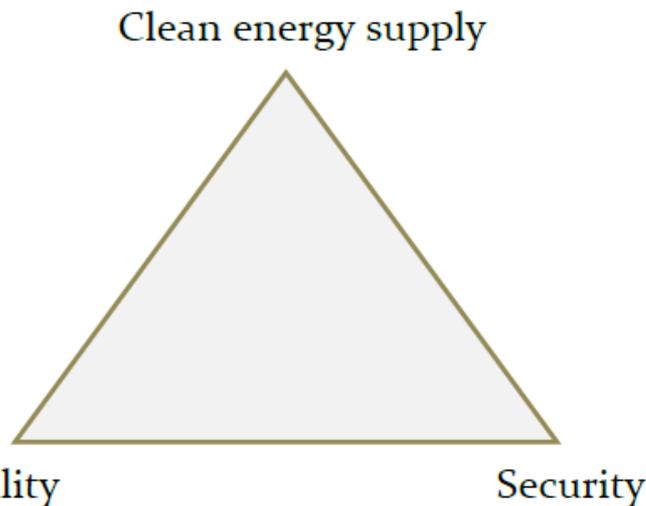
German Institute for Economic Research (DIW Berlin)

Does the current market design meet the requirement of just transition?

Issue: Failure to unlock and use demand side flexibility and storage at scale for energy system

-> EMR introduction of flexibility targets and instruments good

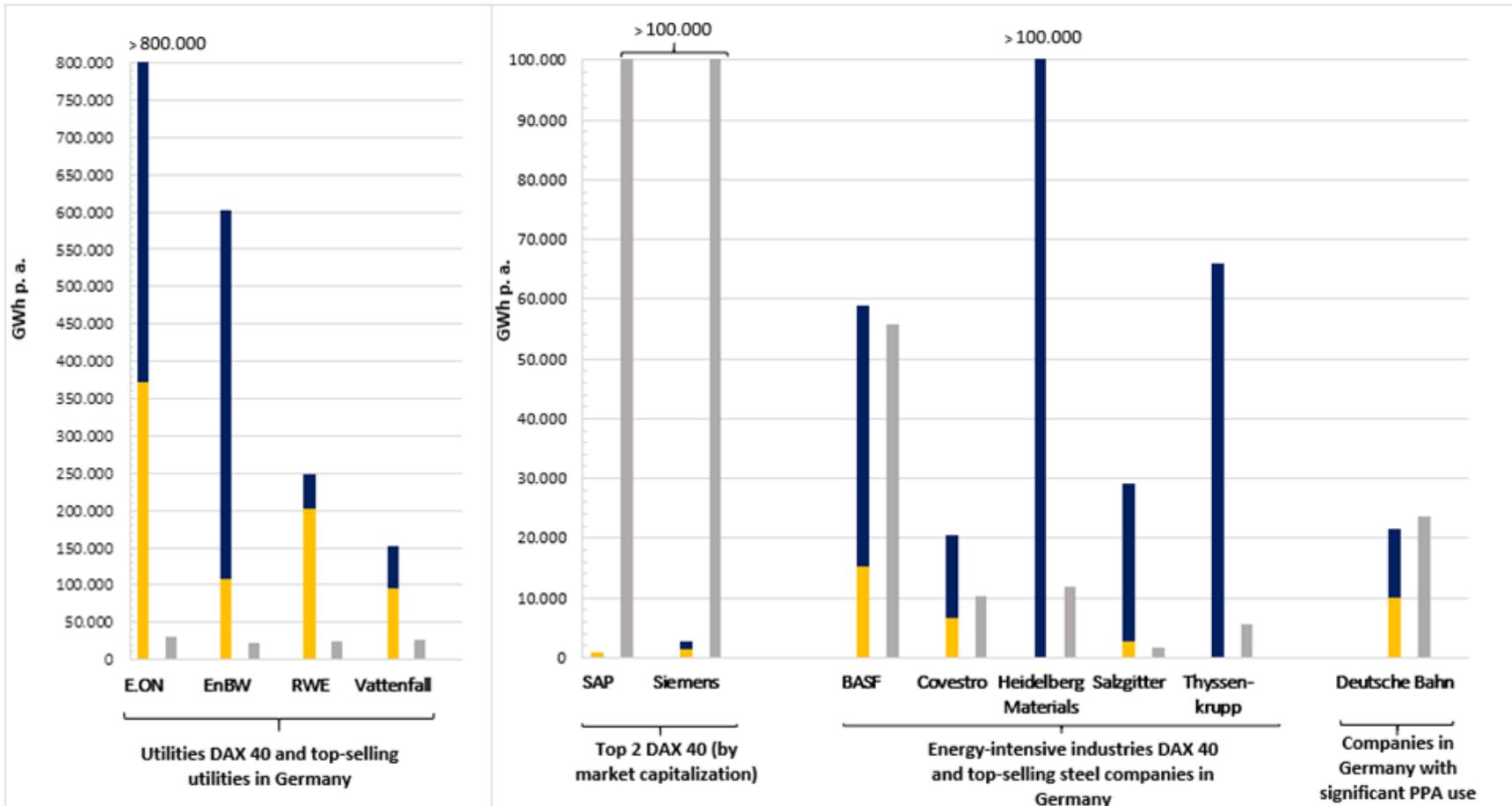
-> We need to focus on elephant in room (local pricing)



Issue: Unstable electricity costs and uncertain investment-framework for renewables industry
-> EMR focusing debate on CfD versus PPA important

Issue: Retaining/investment in peaking capacity only utilized in extreme events.

- EU Investments in production of PV and Wind turbines require clarity about scale of wind & solar expansion that will materialize in next years
- Concern on planning & permitting are being addressed
- **Now main concern - can RE projects be financed at scale?**
- Projects require stable revenue streams to access low-cost debt for affordable & competitive RE costs
- EMR focuses discussion on two options to provide this stability
 - Power Purchasing Agreements (PPAs)
 - Publicly tendered Contracts for Difference (CfDs)

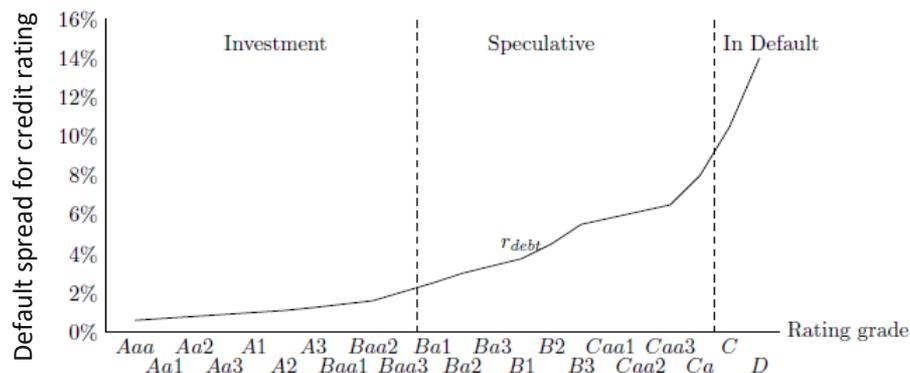


PPA guarantees do not address this constraint

Source: Karsten Neuhoff, Fernanda Ballesteros, Mats Kröger, Jörn Richstein (2023): Contracting Matters: Hedging Producers and Consumers with a Renewable Energy Pool. [\(link\)](#)

4 PPAs increase financing costs and thus RE cost for consumers

1. Counter Party risk for developers increases with PPA : LCoE approx. 10% higher
2. Higher financing costs for demand side imply increased LCoE of 20%



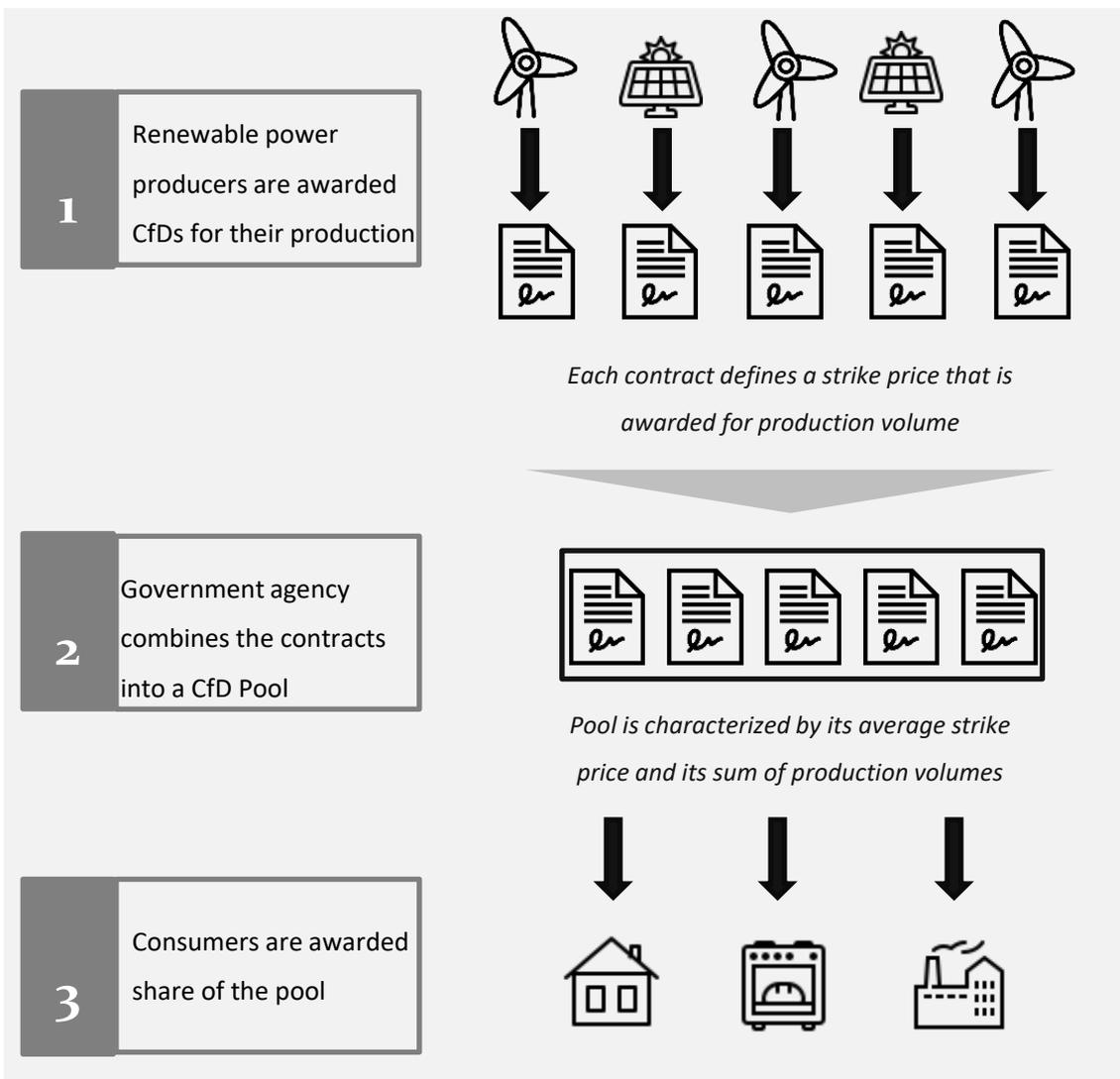
Graph from: Damodaran 2017

3. Total effect of higher financing costs and risks on balance sheet
 - 29% (DIW 2018/May 2021))
 - 28% (Aurora Energy Research, 2018)
 - 25% (Enertrag, 2019)

PPA guarantees can only address counter party risk (10%)

How can CfDs back the just transition?

A renewable CfD Pool

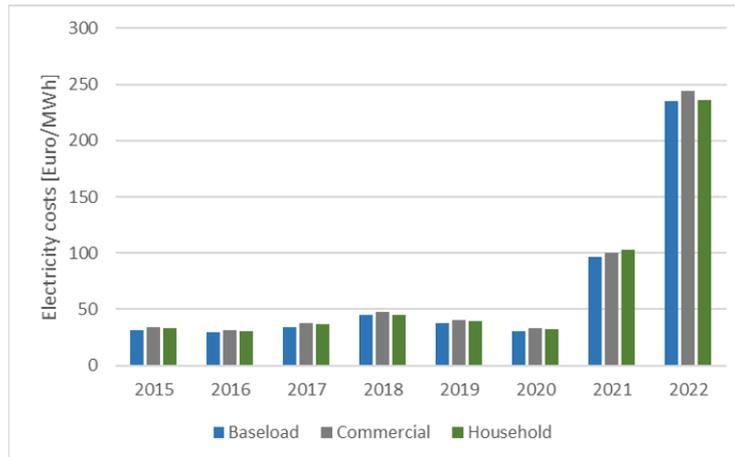


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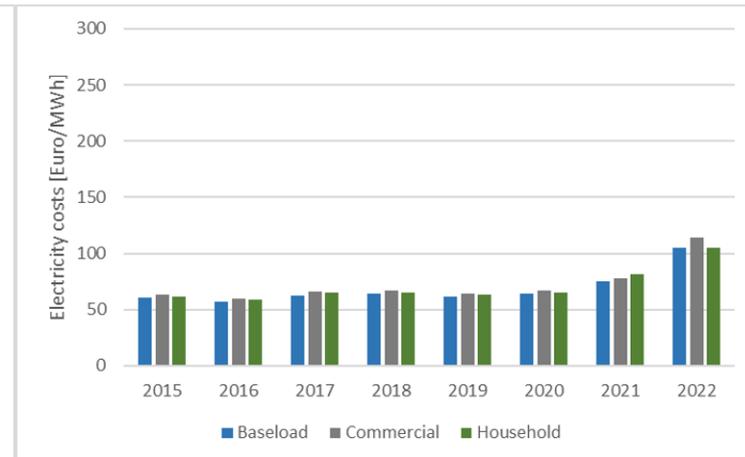
- Scale of CfDs matches required wind- and solar investments. Gives clarity for investments in manufacturing.
- Avoids financing costs premium from PPA model and risks of gaming from public PPA guarantees
- Ensure necessary incentives for system friendly technology choices
- Facilitate hedging for flexibility products
- Hedge price risks and ensure low RE generation costs are passed to consumers

Reliable and affordable power prices for consumers

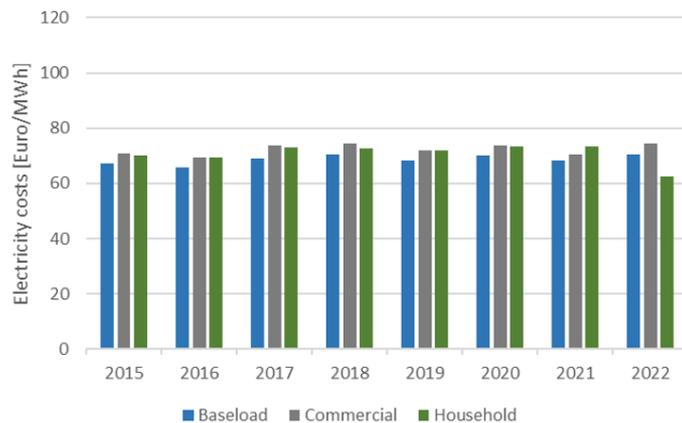
(i) Spot price



(ii) Spot price + 100% CfD Pool



(iii) Spotprice + 100% CfD Pool + 4h batterystorage/day



Source: Karsten Neuhoff, Fernanda Ballesteros, Mats Kröger, Jörn Richstein (2023): Contracting Matters: Hedging Producers and Consumers with a Renewable Energy Pool. [\(link\)](#)

Benefits RE deployment:

- Avoids constraints from limited contracting and thus financing capacity
- Eliminates policy risks that could jeopardize project (falling prices etc.)
- Simplify financing so project developers can focus on acceptance
- Scales project-pipeline by reduce equity requirements & facilitating entry

Benefits consumers:

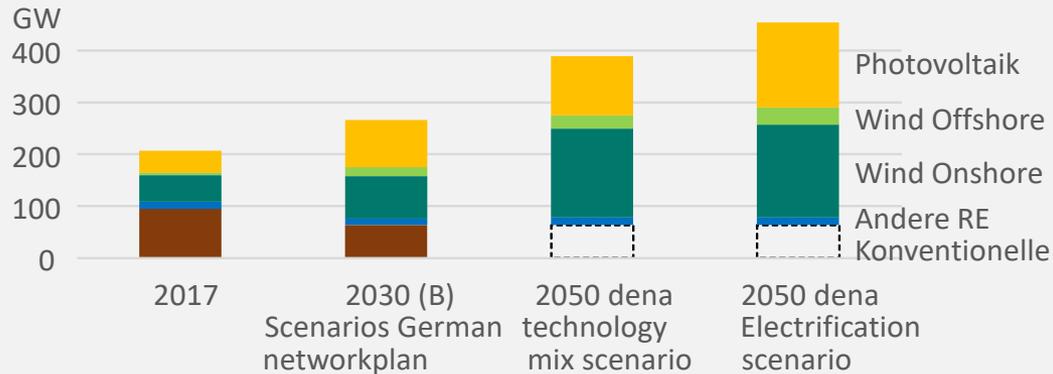
- Accelerates access to low- and stable energy costs across EU
- Avoids financing risks and cost from cherry picking at attractive site

Unlocks flexibility:

- Avoids possible distortions to efficient operation from PPAs
- Ensures investments in flexibility reduce not increase risks

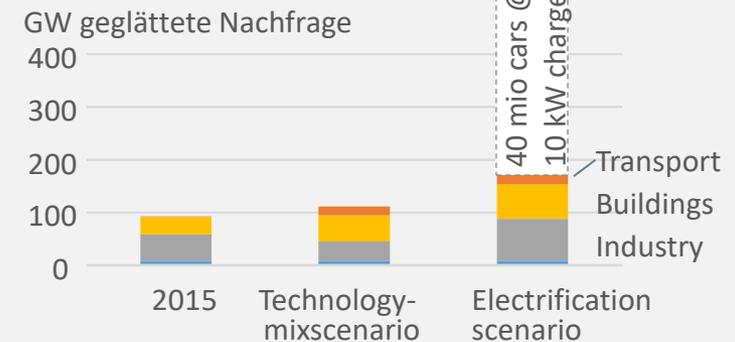
Power systems with increasing shares of wind and solar need to use flexibility locally

Generation



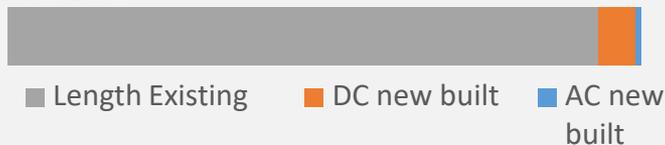
Wind and solar plants have already doubled the generation capacity connected to network, further doubling for decarbonisation until 2050.

Load

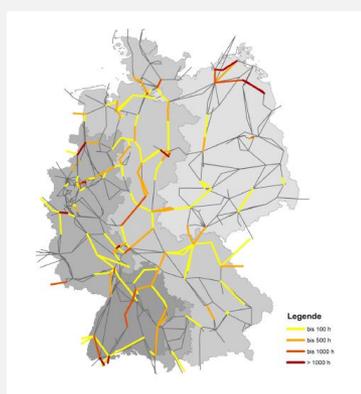


Electric cars and electrification multiple capacity of load, but also create flexibility.

Network



Networks extension is necessary and increases with renewable deployment, but less than connected capacity.

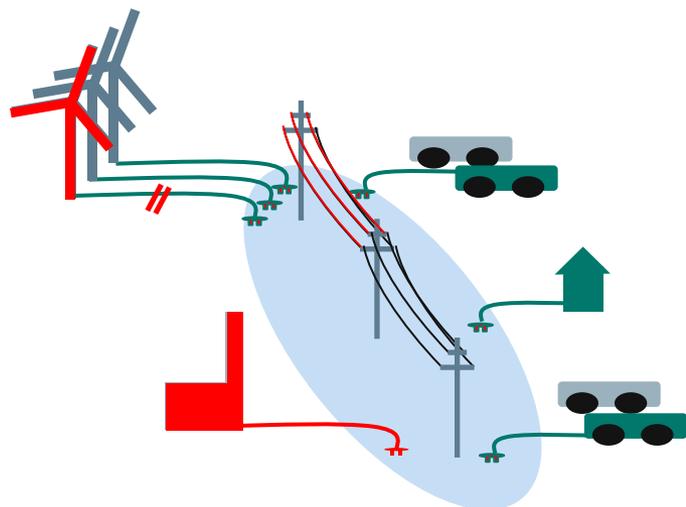


Effective load and storage management allow for wind/solar integration.

Flexibility needs to be used locally.

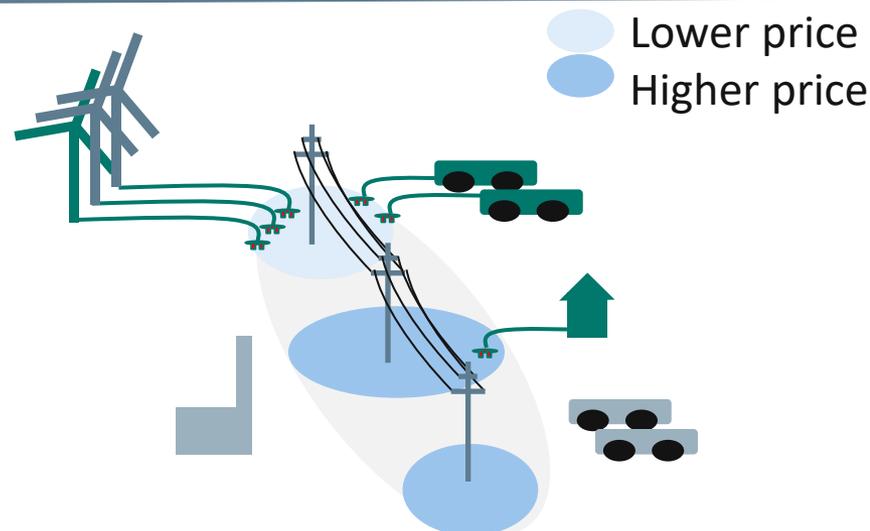
EMR fails on effective use and remuneration of flexibility: The elephant in the room – local pricing

Large pricing zone



- Zonal price balances demand, supply and imports/exports for zone.
- May result in transmission constraints.
- In such instances TSO mandates power stations to redispatch.
- Demand flexibility and storage cannot be used for congestion management.

Local prices



- Local prices balance demand, supply and imports/exports.
- Effective user of flexibility reduces wind-spill and conventional power generation.

Illustration

Framework enabling regional introduction of locational pricing urgently required.

Market based redispatch is impossible, if market participants can anticipate constraints

- Southern participant anticipates re-dispatch price exceeds spot price
 - Generator will only bid in re-dispatch market
 - Load increases day-ahead procurement to sell reduction in re-dispatch market (Inverse behaviour in North)
- Re-dispatch volume increases – with two implications:
 - Nominated schedules as basis for network operation less reliable
 - Risk of insufficient operational generation in load pockets
- Similar in-dec games resulted in failure of CA power market in 2001

External estimates for storage and flexibility options very imprecise

1. Create renewed incentives for inc-dec game

- If for example cost estimate for load reduction \gg real cost
- Load buys additional power, benefits if cost estimate $>$ spot price
- Redispatch volume increases
 - > Nominated schedules as basis for network operation less reliable
 - > Risk of insufficient operational generation in load pockets

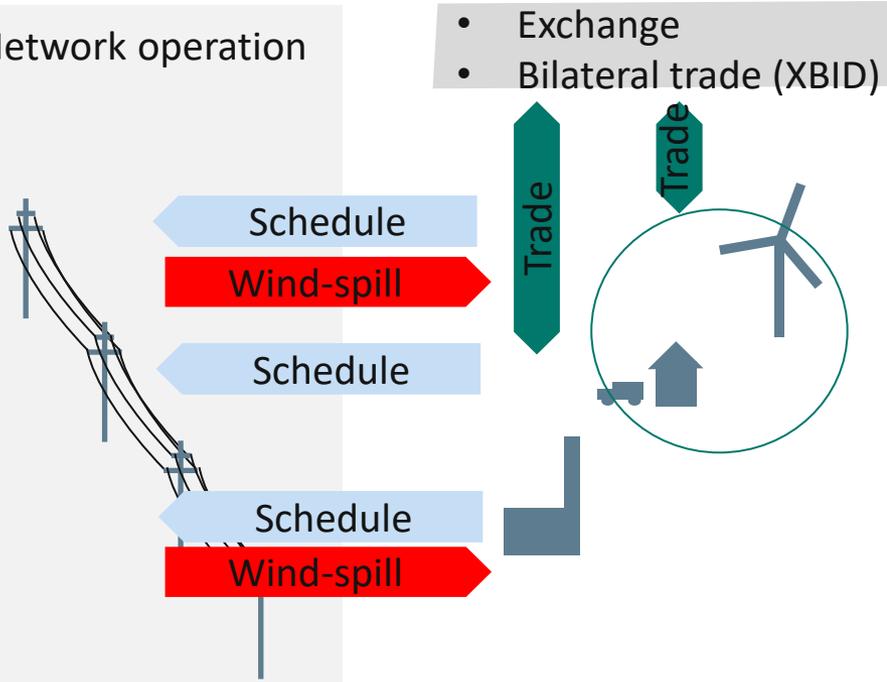
2. Inefficient merit order for load flexibility

- > inefficient redispatch
- > less flexibility remaining for system balancing

Power auctions with local prices create robust, liquid, simple, sustainable market

Large pricing zone

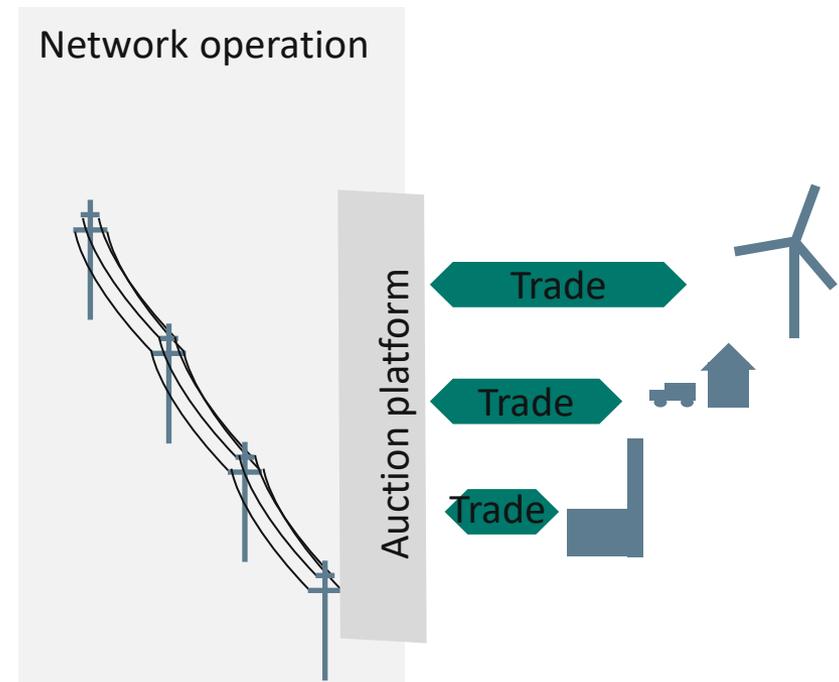
Network operation



- Nomination of schedules at unit basis
- Re-dispatch at unit level
- Requires 24/7 trading floor

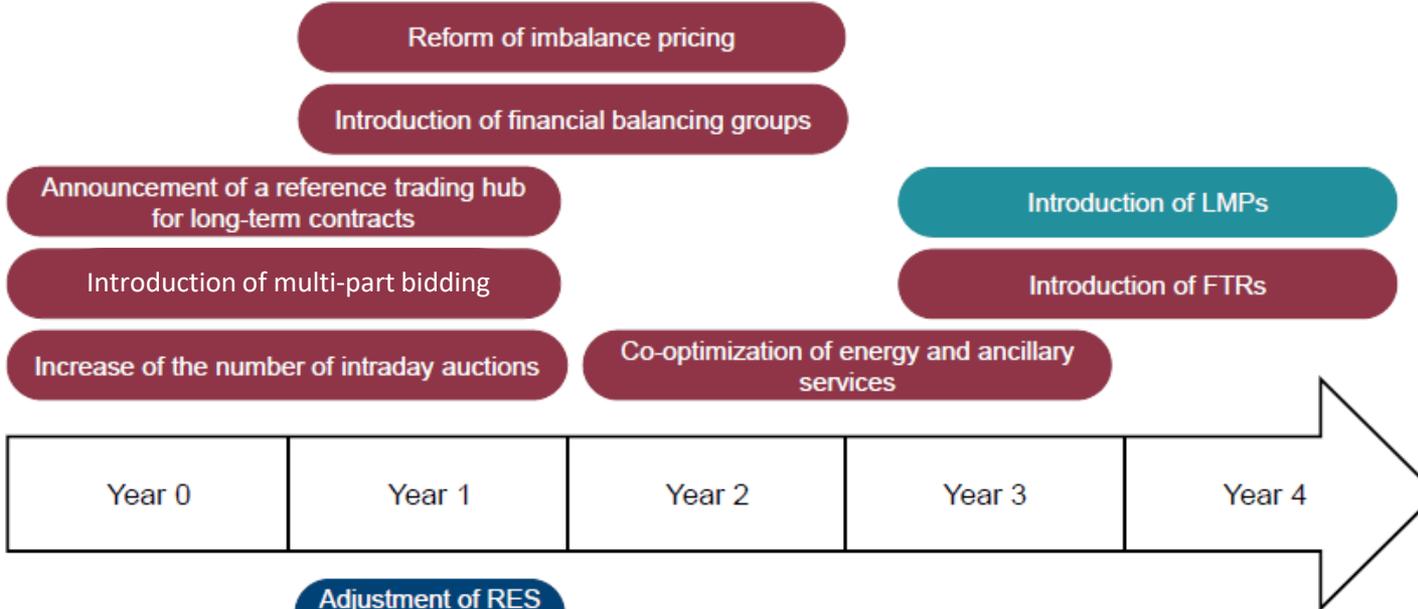
Local prices

Network operation

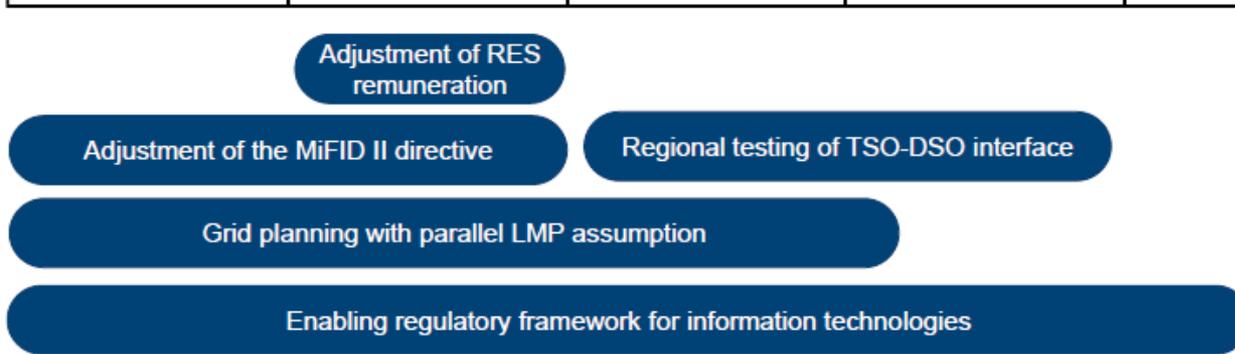


- Auction clearing internalises T
- Market coupling maximises liquidity
- Simple market access for all
- Clear interface to local platforms

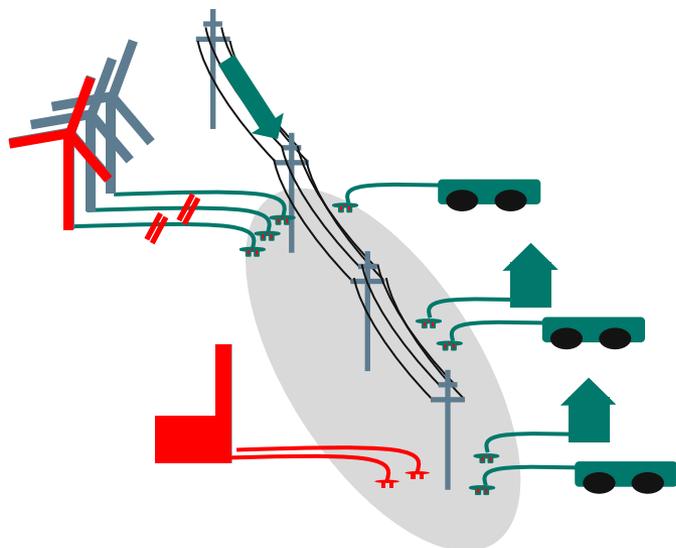
Key steps towards LMPs



Accompanying policies

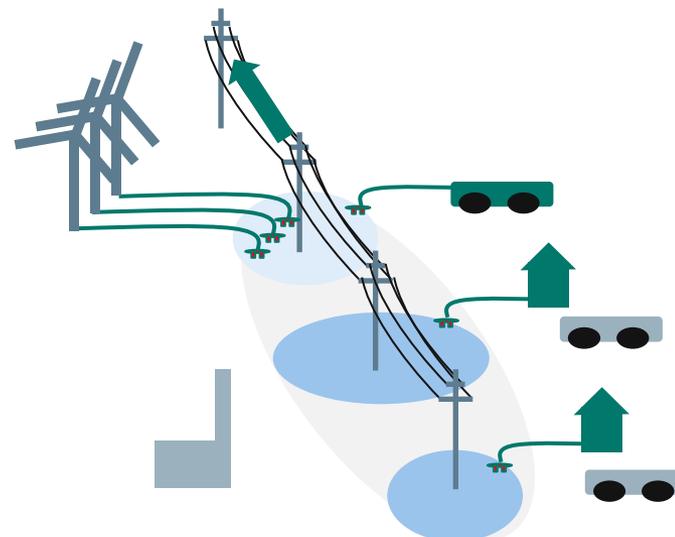


Large pricing zone



- A moderate zonal price results in imports from North.
- This can increase network congestion and may require additional re-dispatch.
- Large pricing zones create incentives for inefficient power exchange between zones and can thus increase re-dispatch and wind-spill.

Local prices



- Price is lower at locations with surplus generation capacity.
- Lower local prices trigger additional exports to the North and thus reduce wind-spill.
- Local prices result in a more efficient operation of the European power system.

Auction design for short-term markets for unit based multi-part bids instead of pooling at firm level and complex bids

- Enhances efficiency of market result to integrate more renewables
- Avoids discrimination against smaller players
- Enhances ability to identify market abuse
- Necessary for shift to small bidding zones and nodal pricing

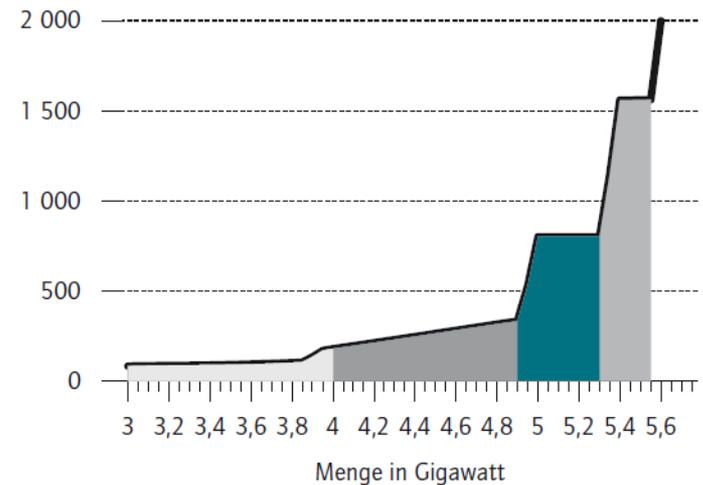
Instead EMR proposals comprises elements with uncertain benefits

1. Reduction of gate closure time to 30 minutes
 - Large effort required, trade offs involved, benefit uncertain?
2. Facilitating RE Energy sharing across entire network
 - Increases complexity, creates obstacle for local pricing

- Strategic reserve secured generation adequacy winter 2022/2023
- However, generation from reserve was allowed into market already before demand exceeded supply
- This violated rules and confirmed that rule was not credible / time consistent.
- Proposal – a strike price between 500-1000 Euro/MWh for dispatch of reserve, declining if reserve is operated for several weeks.
- For credible incentives to invest in market
- Coordination across EU would allow all countries to benefit from strategic reserves of neighboring countries.

Struktur der Angebotskurve im Land mit Stromknappheit im flussbasierten System

Preis in Euro/MWh



Long-term contracting essential to stabilize energy costs and revenue

-> Wind and solar CFD pool

Locational pricing important to unlock and use demand flexibility

-> Regional implementation of nodal pricing should be facilitated

System security requires rarely used generation (at least for transition)

-> Strategic reserve to retain such generation not viable in market

-> Moderate strike price to make price signals credible for other investors

Vielen Dank für Ihre Aufmerksamkeit!



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