

2nd public Workshop



TradeRES
New Markets Design & Models for
100% Renewable Power Systems



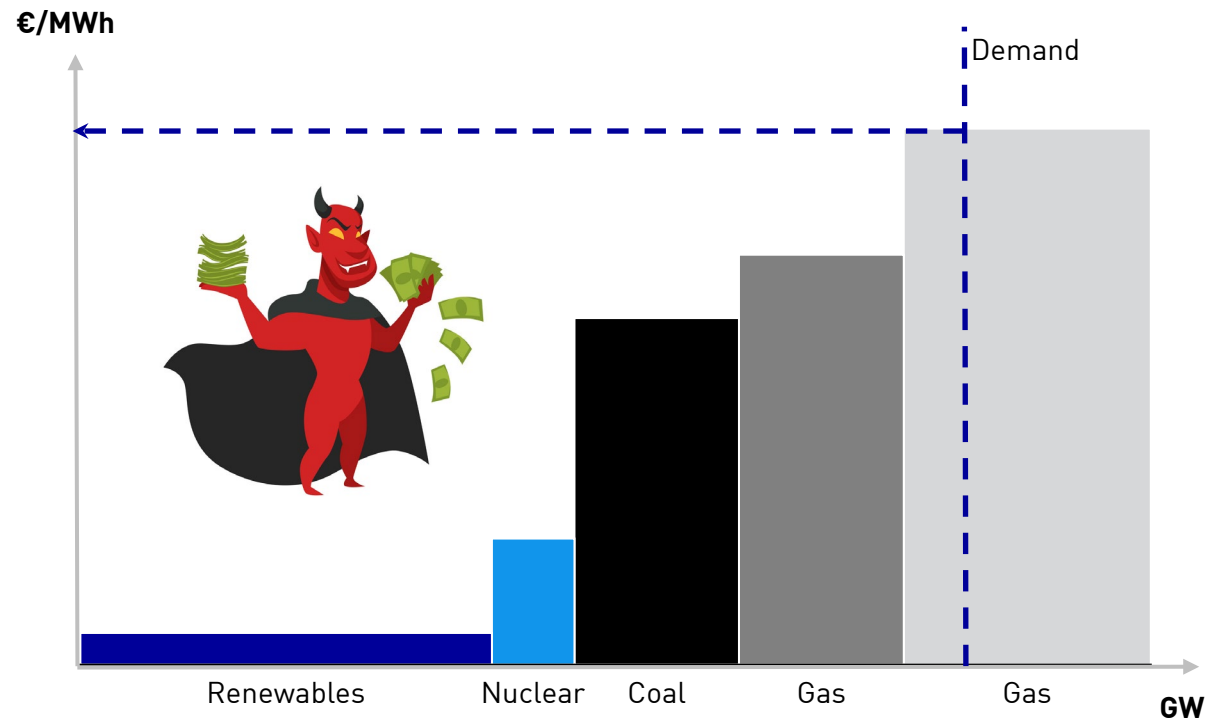
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 864276



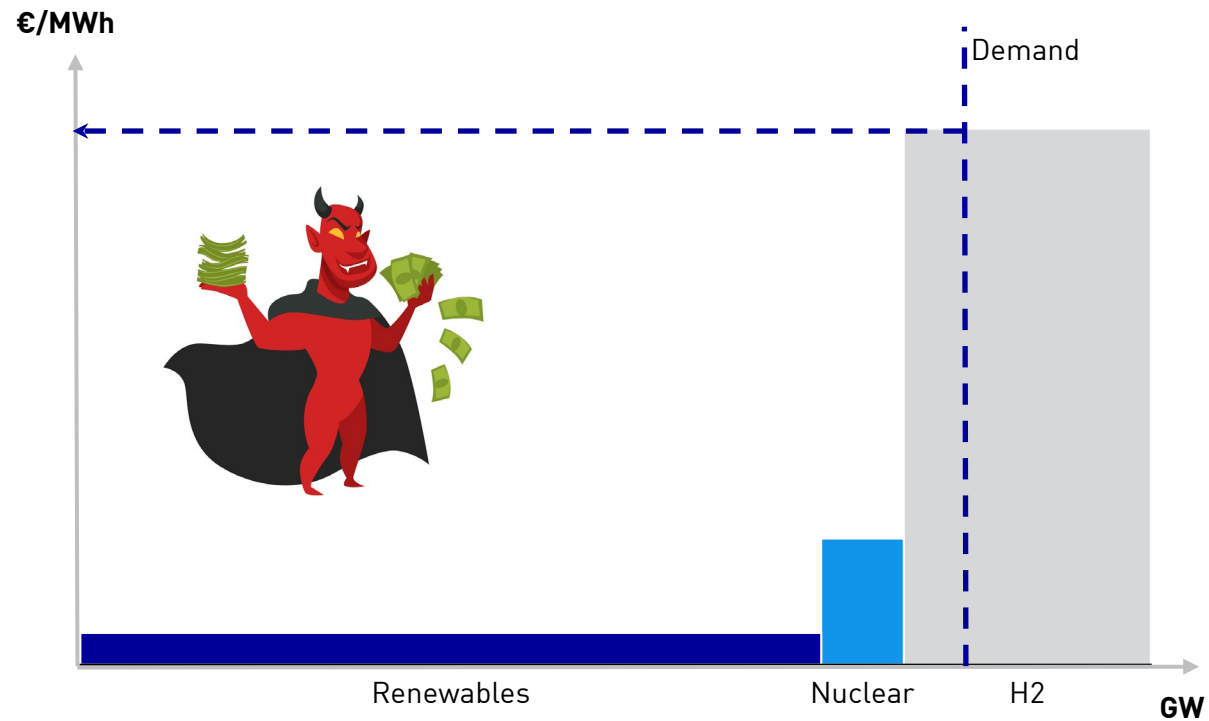
How current market design proposals are threatening the expansion of renewables

Silke Johanndeiter
28.11.2022

The current energy crisis made EU policy-makers discover the „evil“ of marginal pricing



The current energy crisis made EU policy-makers discover the „evil“ of marginal pricing



One of the hottest proposals: the „Greek“ market splitting model



Non-Paper

– Policy Options to Mitigate the Impact of Natural Gas Prices on Electricity Bills –

Lasting Ways to Mitigate the Impact of High Gas Prices on Electricity Bills

The Commission has also started preparing a longer-term and more structural method to mitigate the effect of high gas prices on power prices. By bringing this reform forward, the benefits of lower cost renewables could be brought to consumers on a lasting way. Such a reform should address only those essential elements of the market design that can be implemented rapidly; they should focus on two different sides of the electricity market.

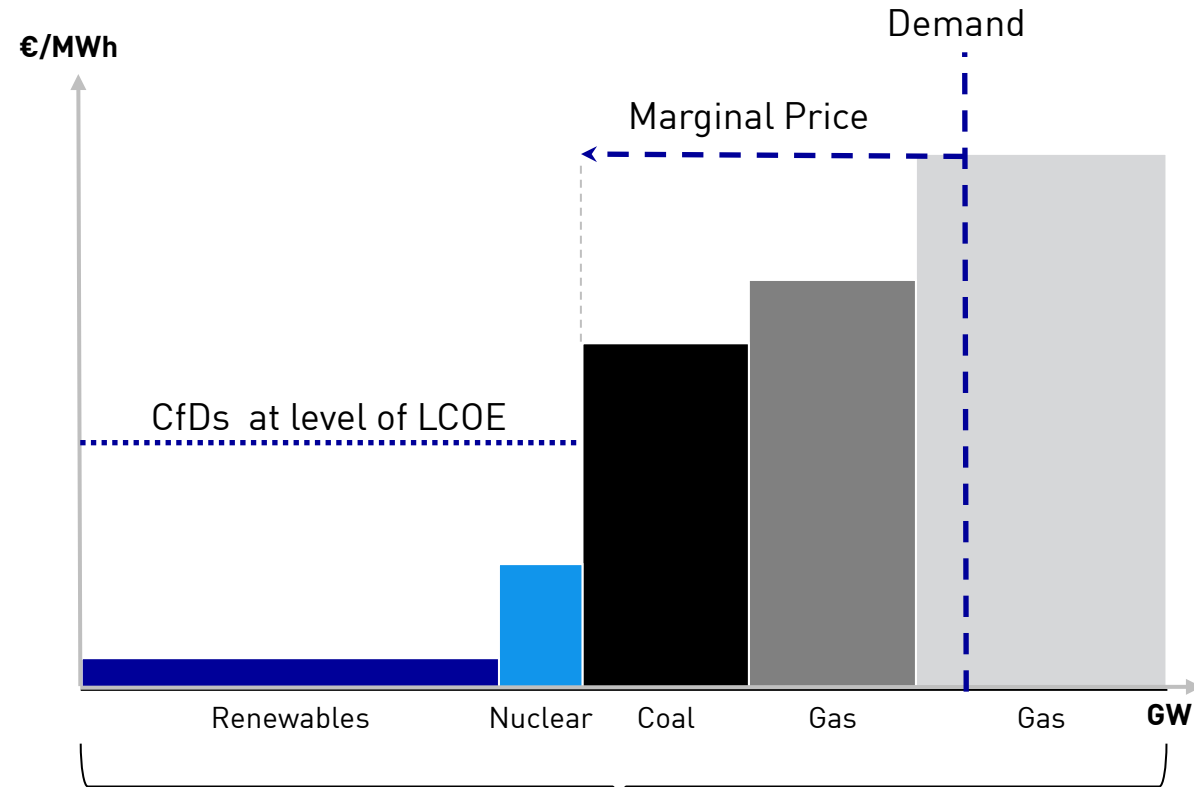
One Side of the Market: Remunerating Renewables and other Technologies Based on Their True Production Costs

Renewables and other types of inframarginal generators (e.g. nuclear) would be remunerated under contracts for difference, independently of the marginal price. The price of these contracts would typically be established by tendering and will be a direct function of the actual production costs of the relevant technologies.

The Other Side of the Market: Effective Competition for Gas in Well-Functioning Short-Term Markets

The main role of gas-fired power generation in such a new system would be to counterbalance the effect of volatile renewable generation until alternative technologies are increasingly able to take over this role.

To achieve this aim at the least cost to consumers, the new revenue structure for inframarginal generators based on contracts for difference needs to be complemented with a well-functioning short term market, which ensures that the cheapest and more efficient technology is used at any moment in time. This can be ensured through a well integrated and interconnected market whereby any barriers for alternative technologies like storage and demand response are removed so that they compete on a level playing field and they can progressively replace gas-fired powerplants in addition to renewable and low carbon sources.



Consumers pay weighted average of CfDs and marginal price

One of the hottest proposals: the „Greek“ market splitting model



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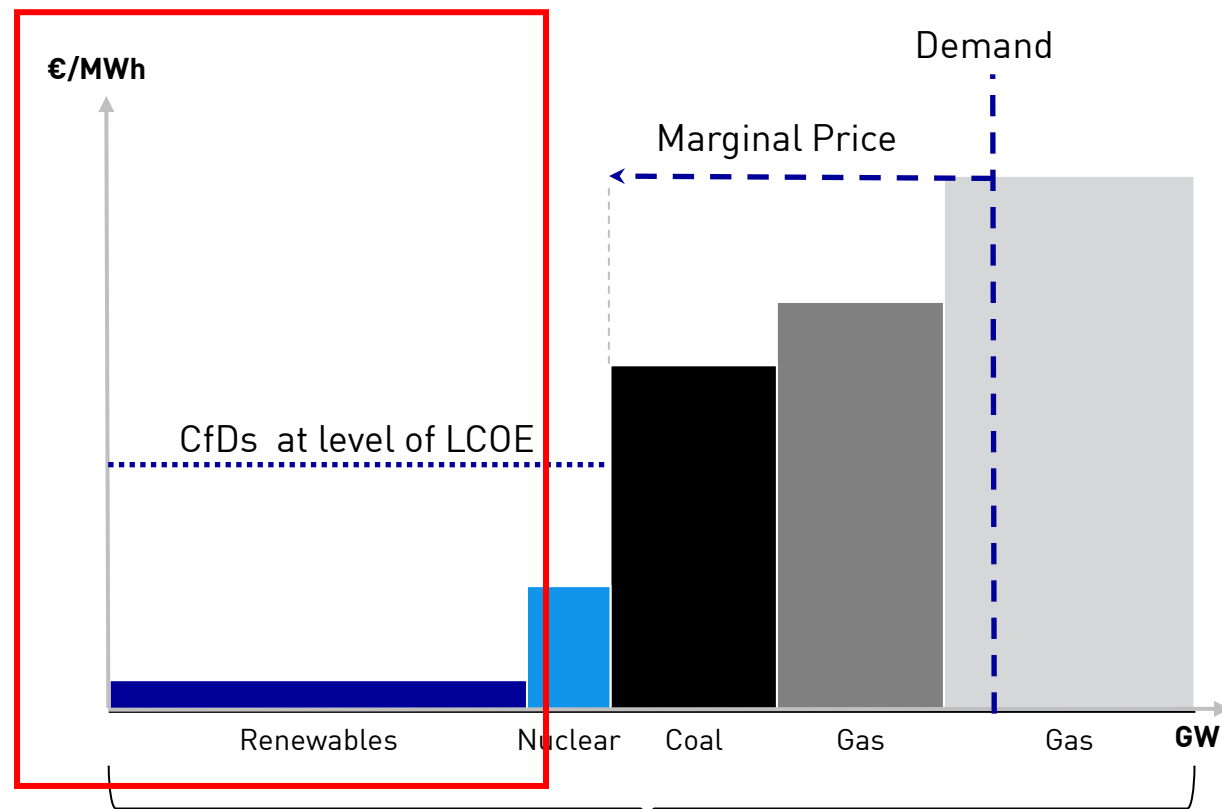
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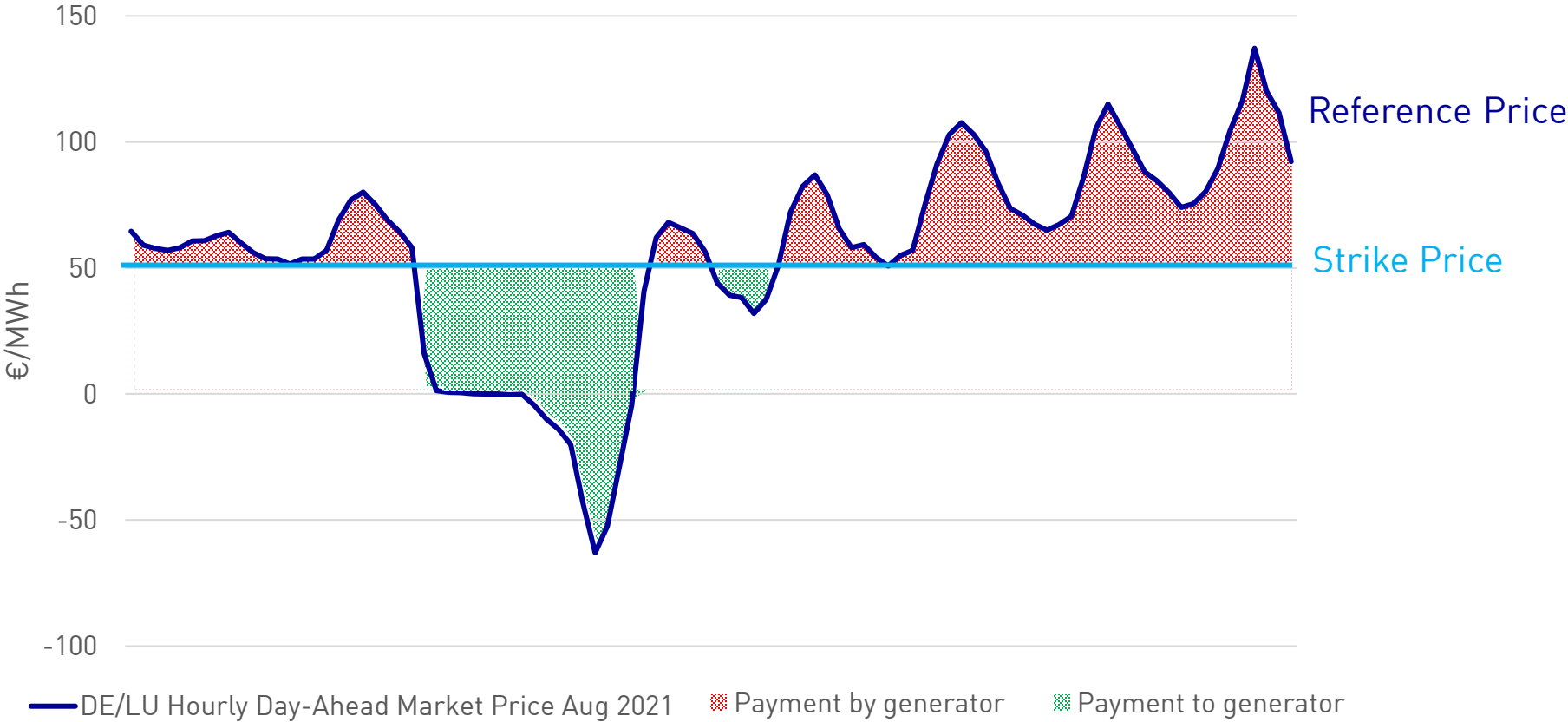


Consumers pay weighted average of CfDs and marginal price

1) CfDs always cause inefficiencies either in the long- or in the short-run.

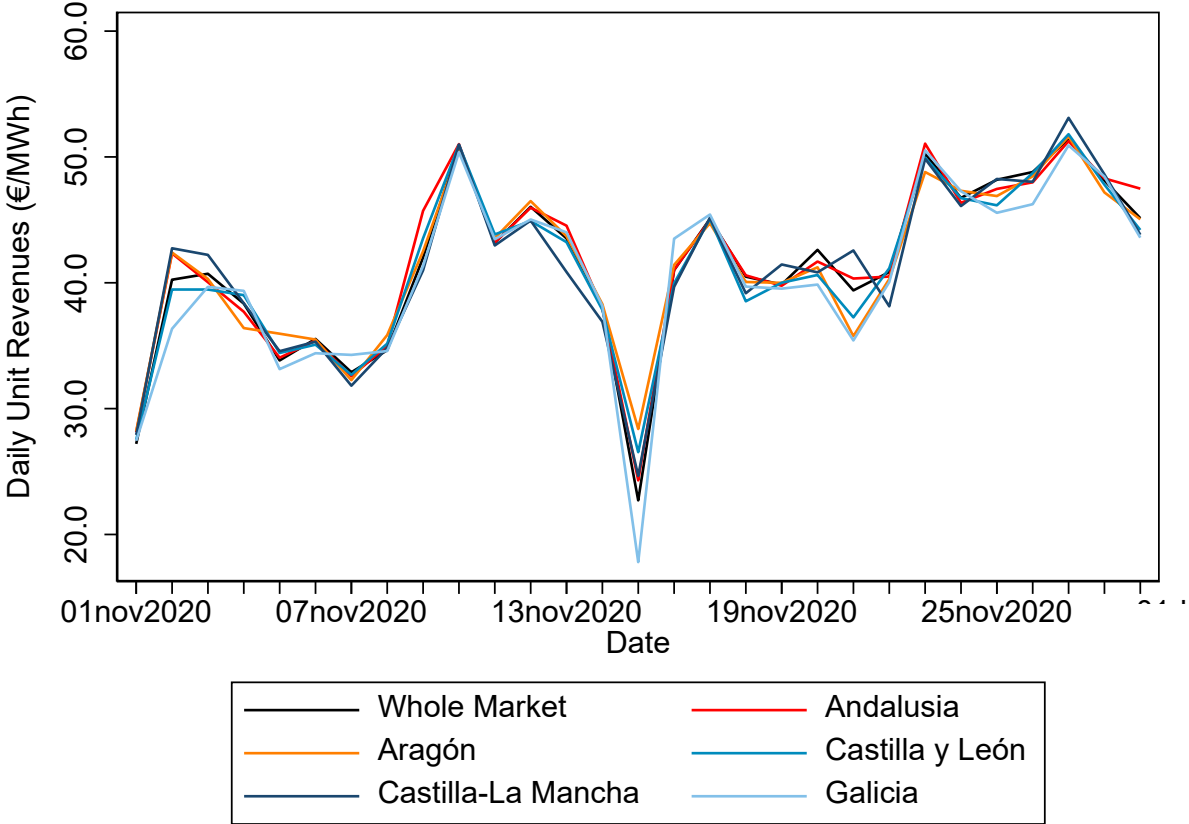
CfDs with a short reference period eliminate price signals causing inefficient investments in the long-run

CfD with a strike price of 50€/MWh and an hourly reference price



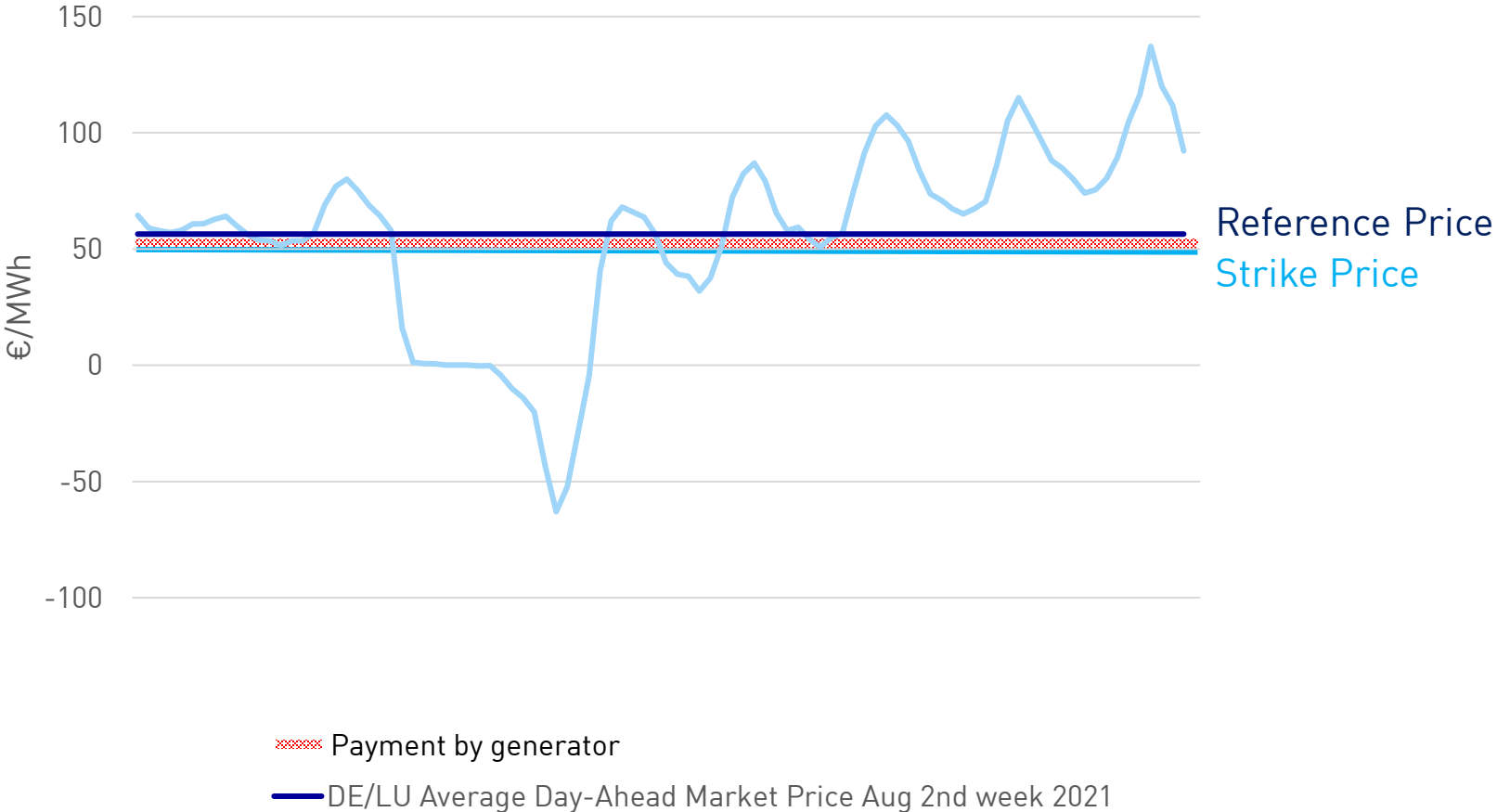
Empirical evidence shows that market prices can send locational signals

Average daily market values of wind power plants in the Iberian day-ahead market



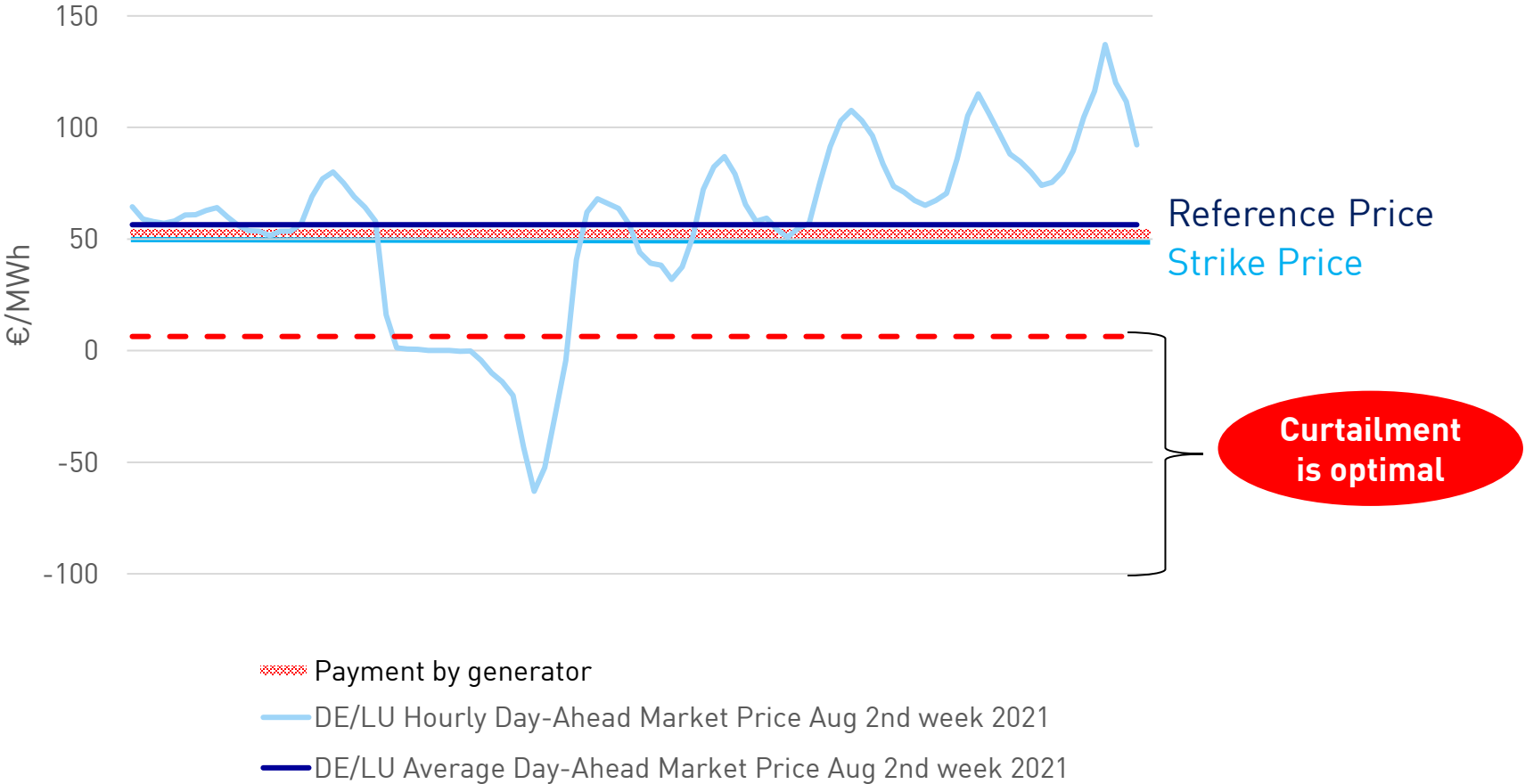
CfDs with a long reference period cause virtual variable costs leading to inefficiency in the short-run

CfD with a strike price of 50€/MWh and a weekly reference price



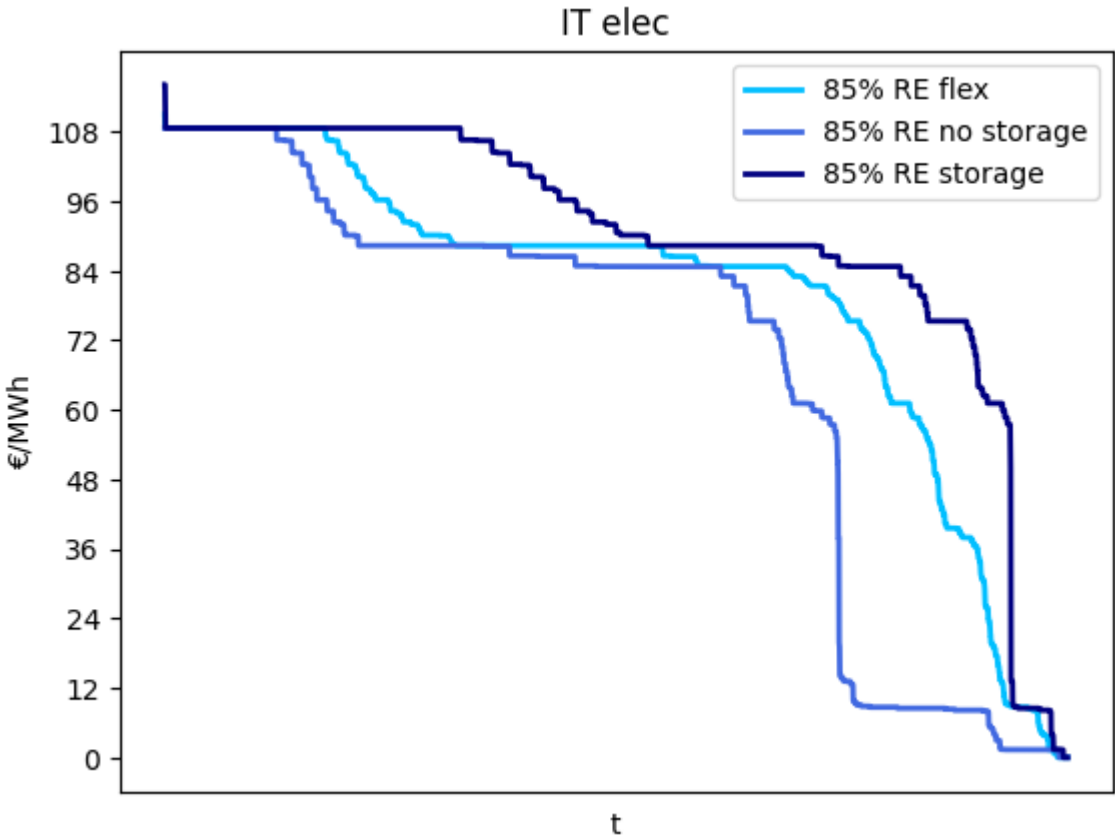
CfDs with a long reference period cause virtual variable costs leading to inefficiency in the short-run

CfD with a strike price of 50€/MWh and a weekly reference price



Dispatch inefficiency could harm development of battery storages and flexible demand

Price Duration Curve in the Italian Bidding zone for different 85% RE scenarios



Interim Conclusion: CfDs always cause inefficiencies...

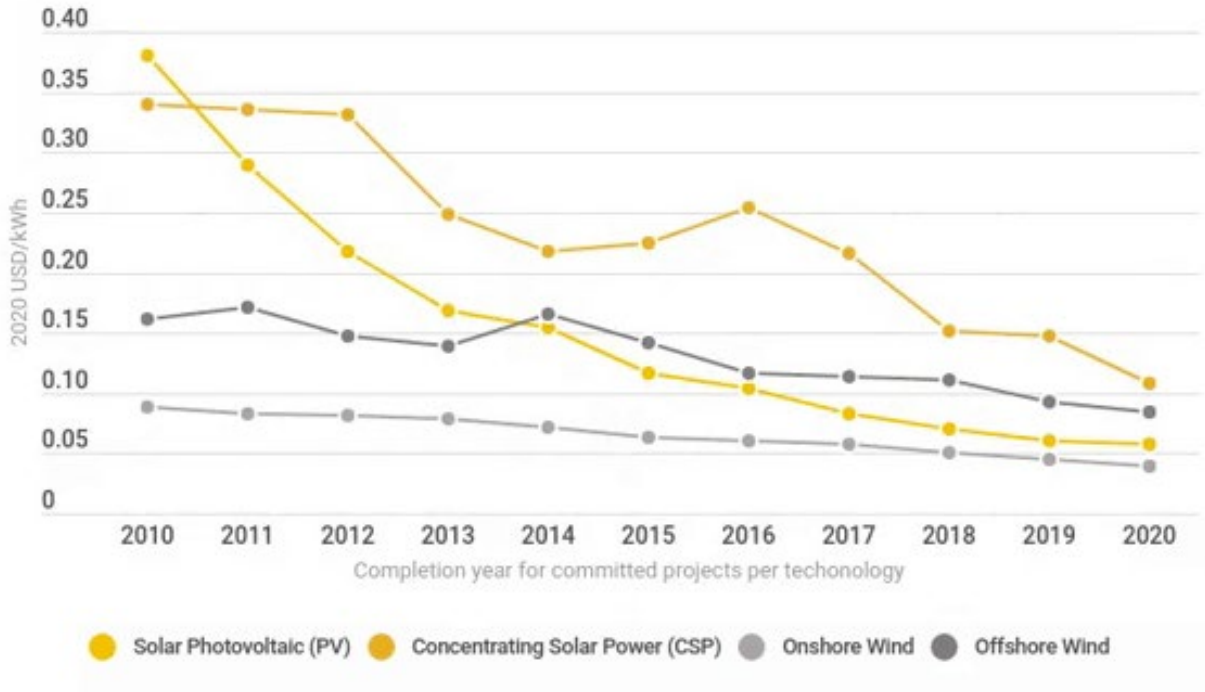
- ...either in the long-run, if market price signals are eliminated by choosing a short reference period
- ...or in the short-run, if virtual variable costs arise from choosing a long reference period and cause inefficient dispatch

2) CfD-strike price has to be determined either administratively or via auctions. Both bear high potentials for inefficiencies.

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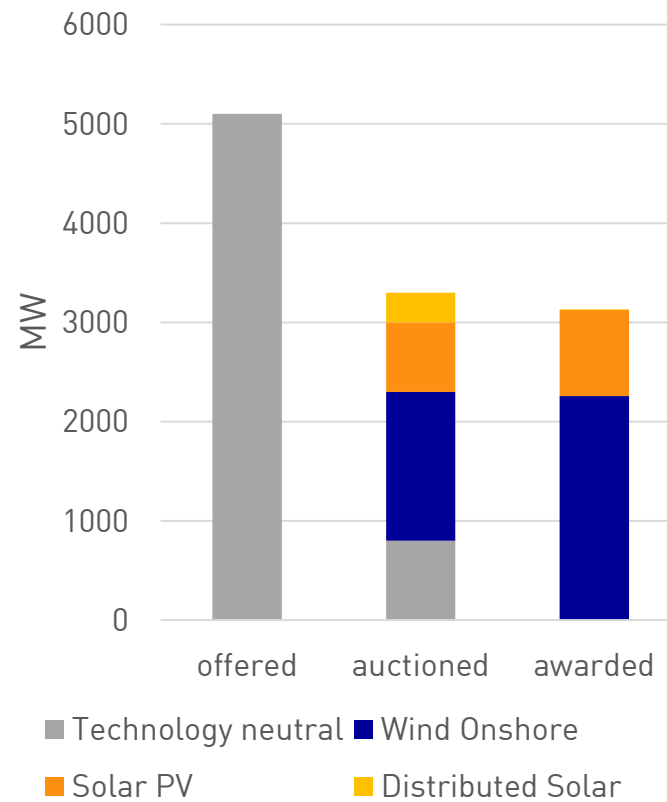
Errors in administrative determination of LCOE can either cause high costs or too few projects

Development of renewables' LCOE (2010-2020)



Auctions require defining a lot of parameters with high potential of making mistakes

Result of renewable auction in Spain Oct 21



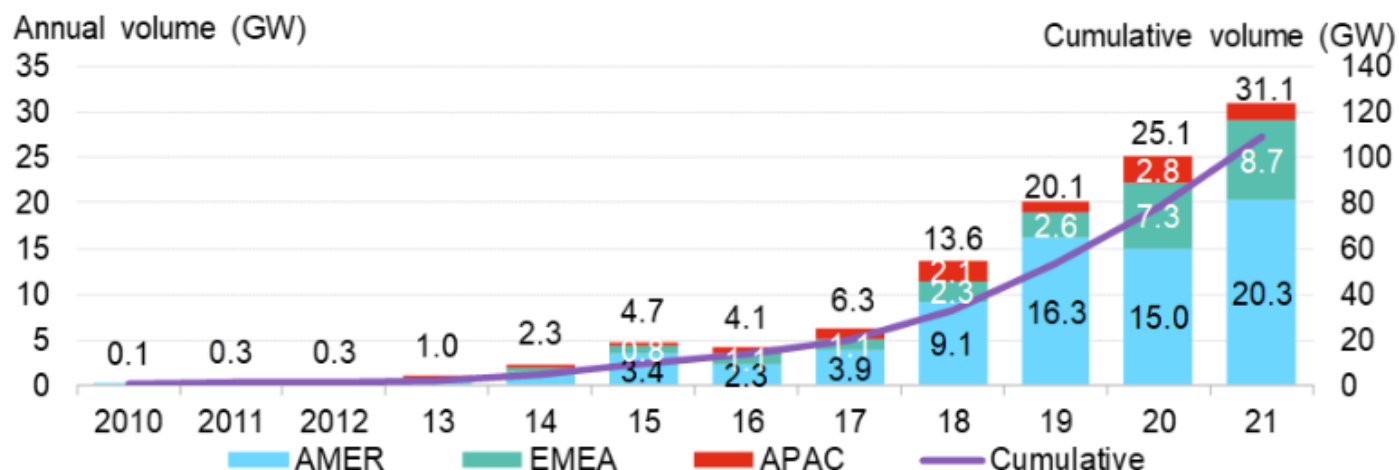
Development of innovative technologies can be slowed down or even stopped by wrong auction design



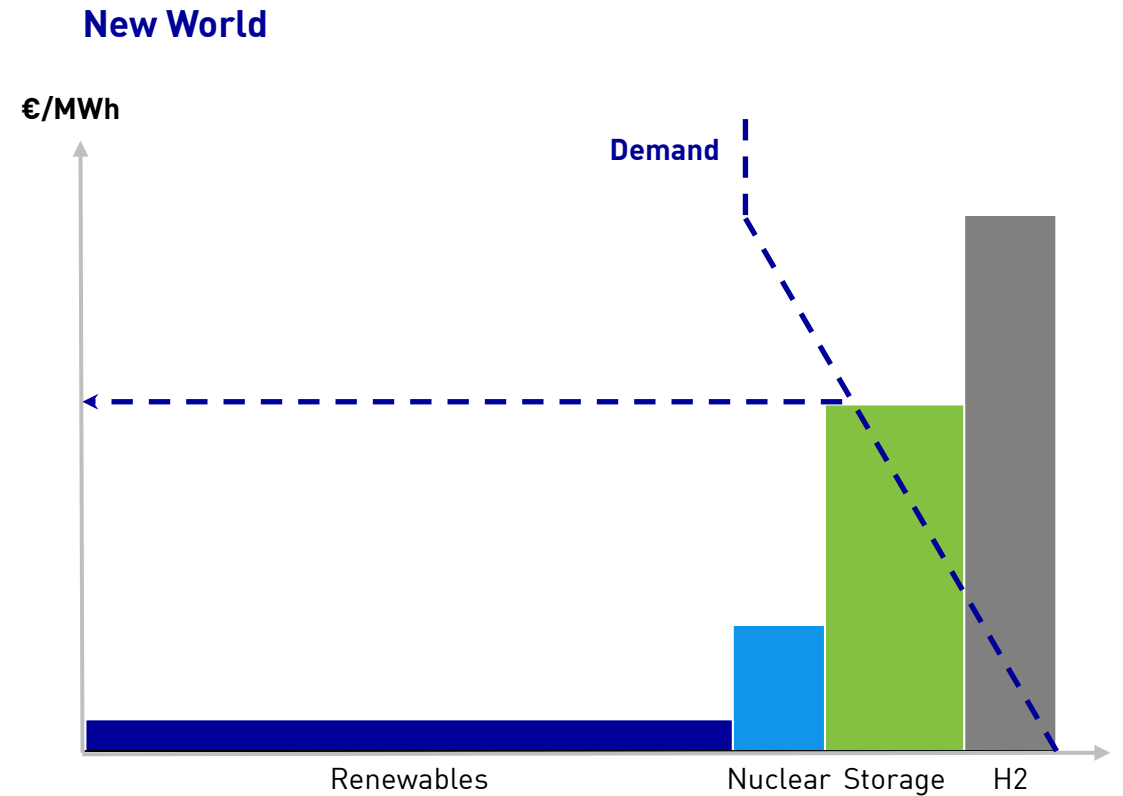
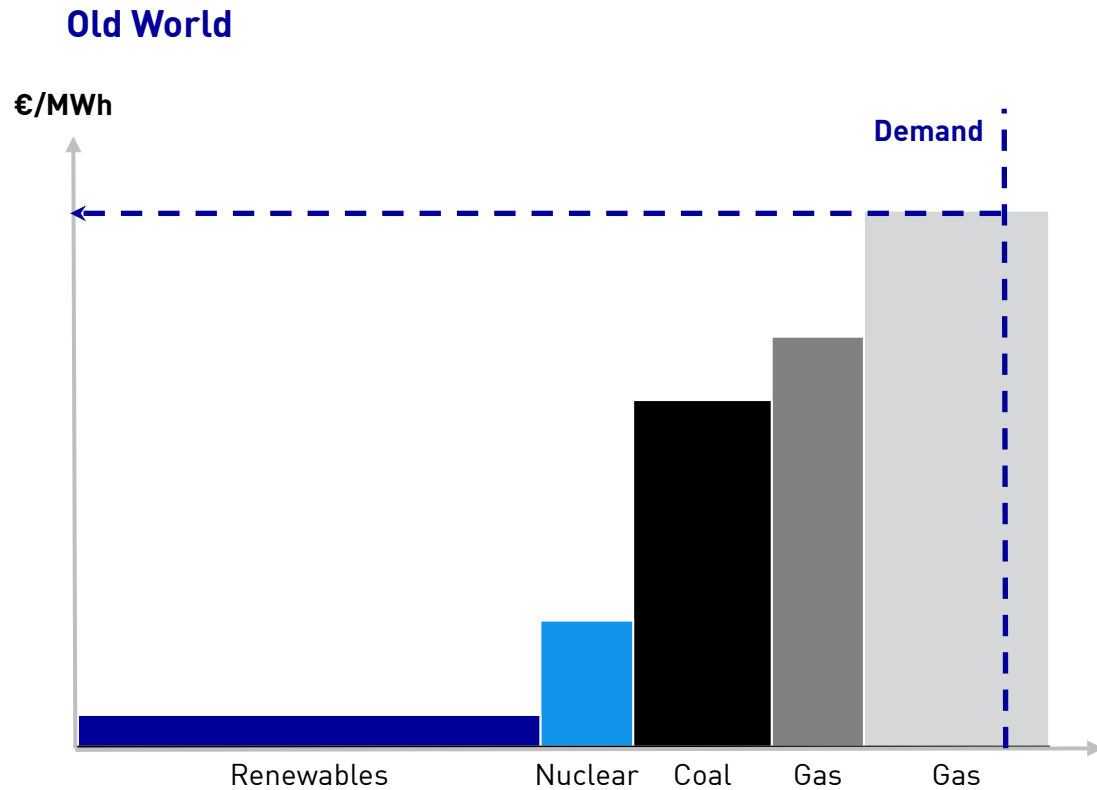
Conclusion: renewables have come a long way! Their market-integration should not be undone!

- Depending on the reference period CfDs either eliminate price-signals or cause inefficient dispatch
- The determination of CfDs' strike could slow down planned projects and innovation
- Renewables are finally integrated into markets and do not necessarily require further support
- Price peaks in times of crises should be addressed in a different manner by tackling the root of the problem, i.e., the dependence and shortage of fuel supply

Global PPA Volumes (2010 – 2021)



Outlook: TradeRES will provide further insights into the benefits of market integration of renewables



Thanks!

Silke Johandeiter
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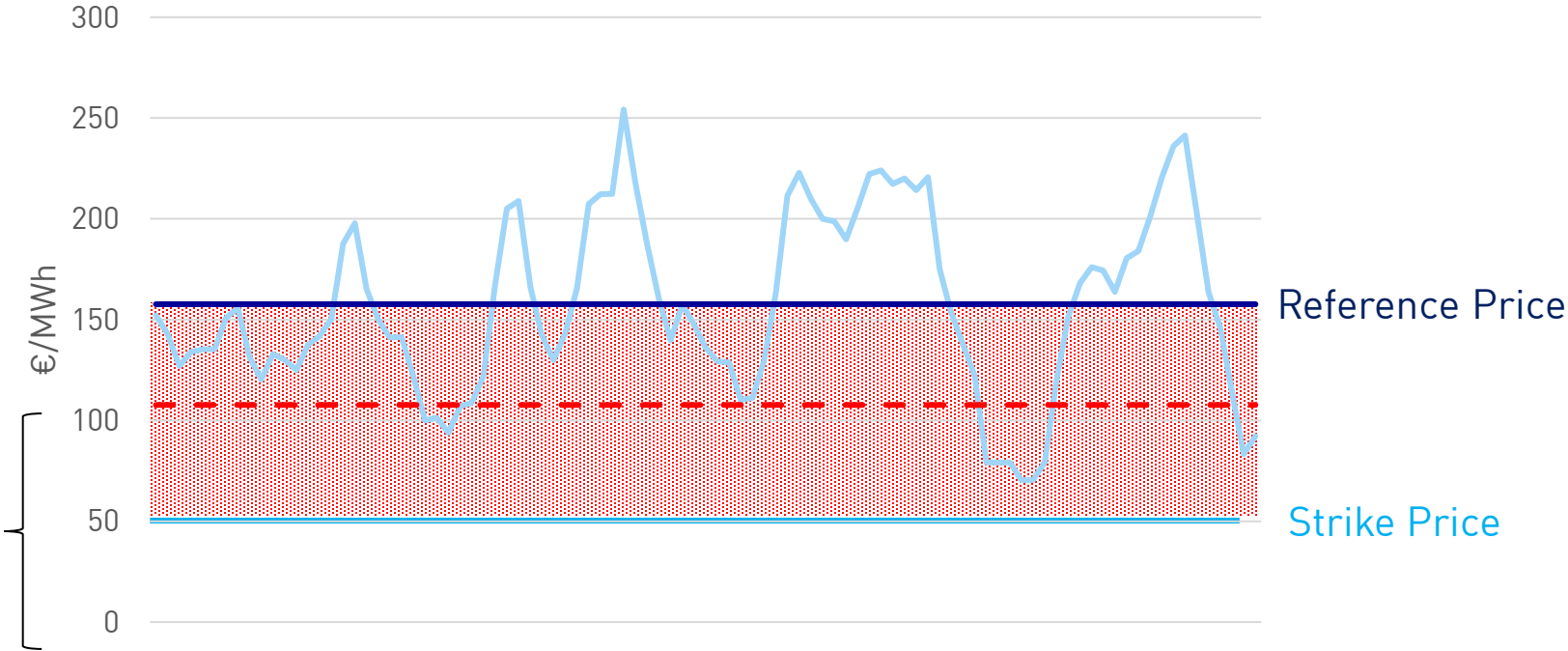


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Backup

CfDs with a long reference period cause virtual marginal costs leading to inefficiency in the short-run

CfD with a strike price of 50€/MWh and a weekly reference price



Curtailment is optimal

- DE/LU Hourly Day-Ahead Market Price Nov 3rd week 2022
- DE/LU Average Day-Ahead Market Price Nov 3rd week 2022

Even with a short reference period gaming can occur between intraday and day-ahead markets

- Producers could sell energy day-ahead to receive the guaranteed CfD-strike price
- but instead of producing it themselves they buy it intraday if market price is low
- empirical evidence shows that renewable producers understand opportunities in the intraday market

Price Bids submitted by a Spanish solar power producer

