The Energy Crisis

Emergency Interventions and Structural Reform

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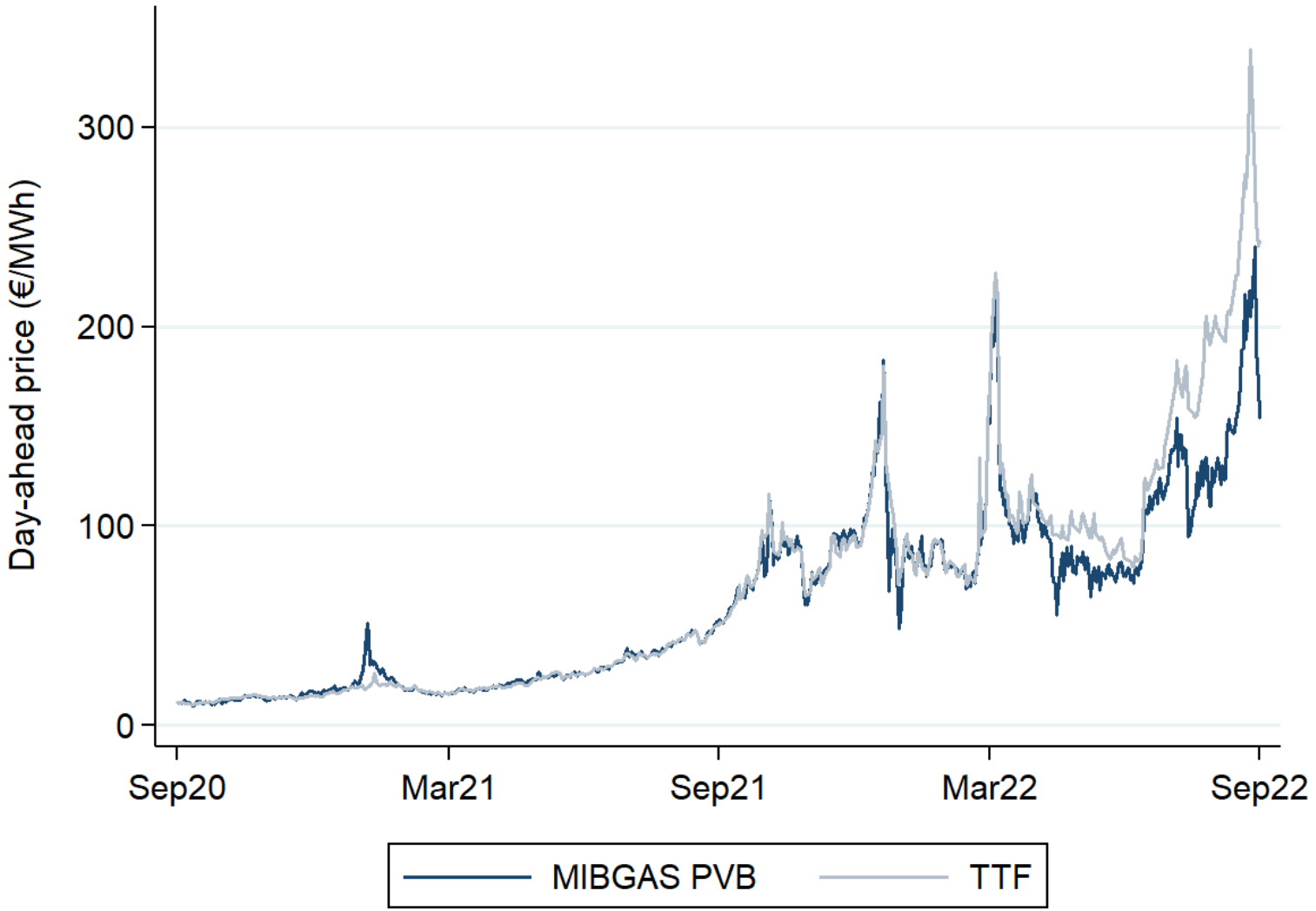
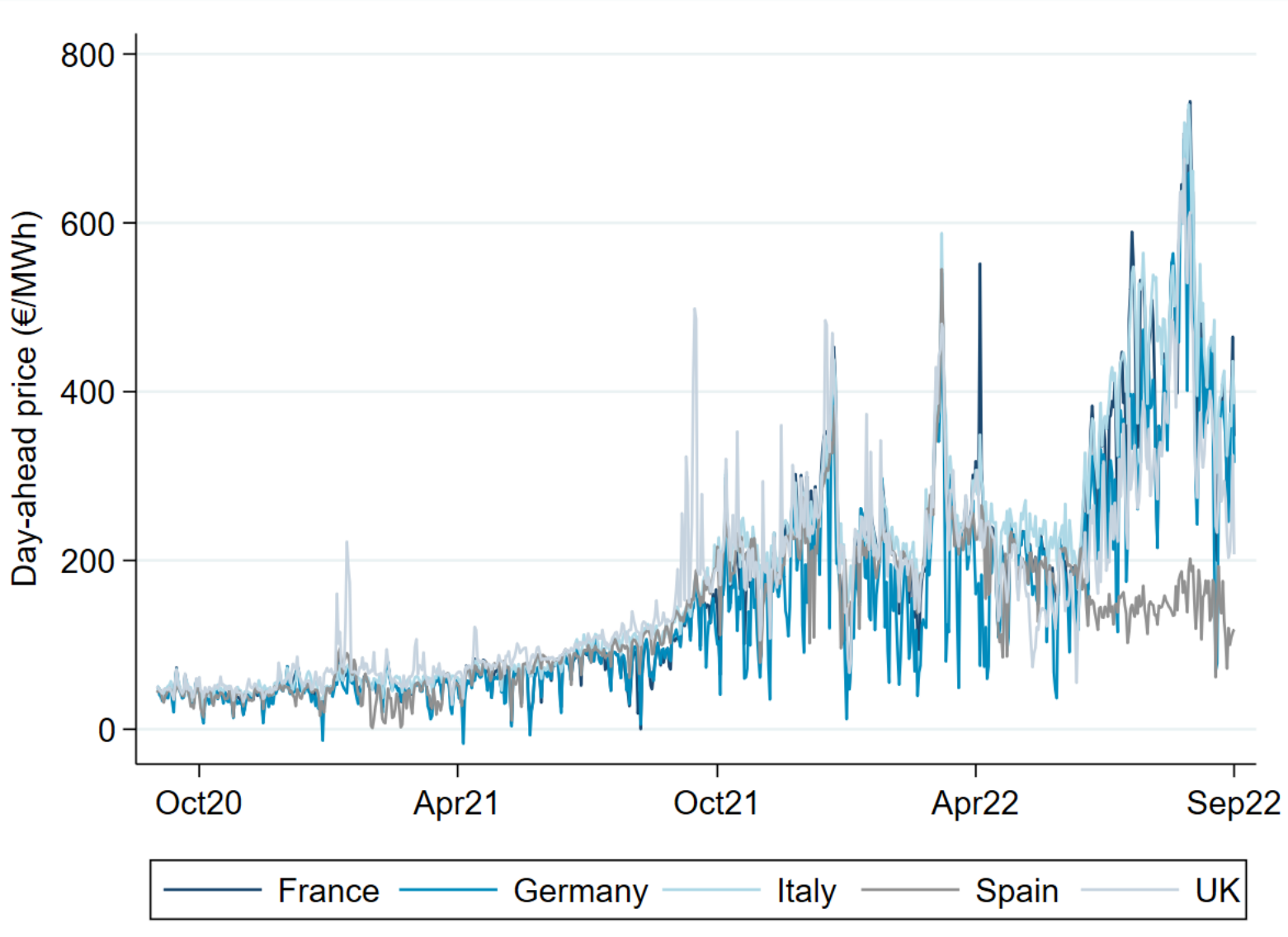
IMF Virtual (Virtual)

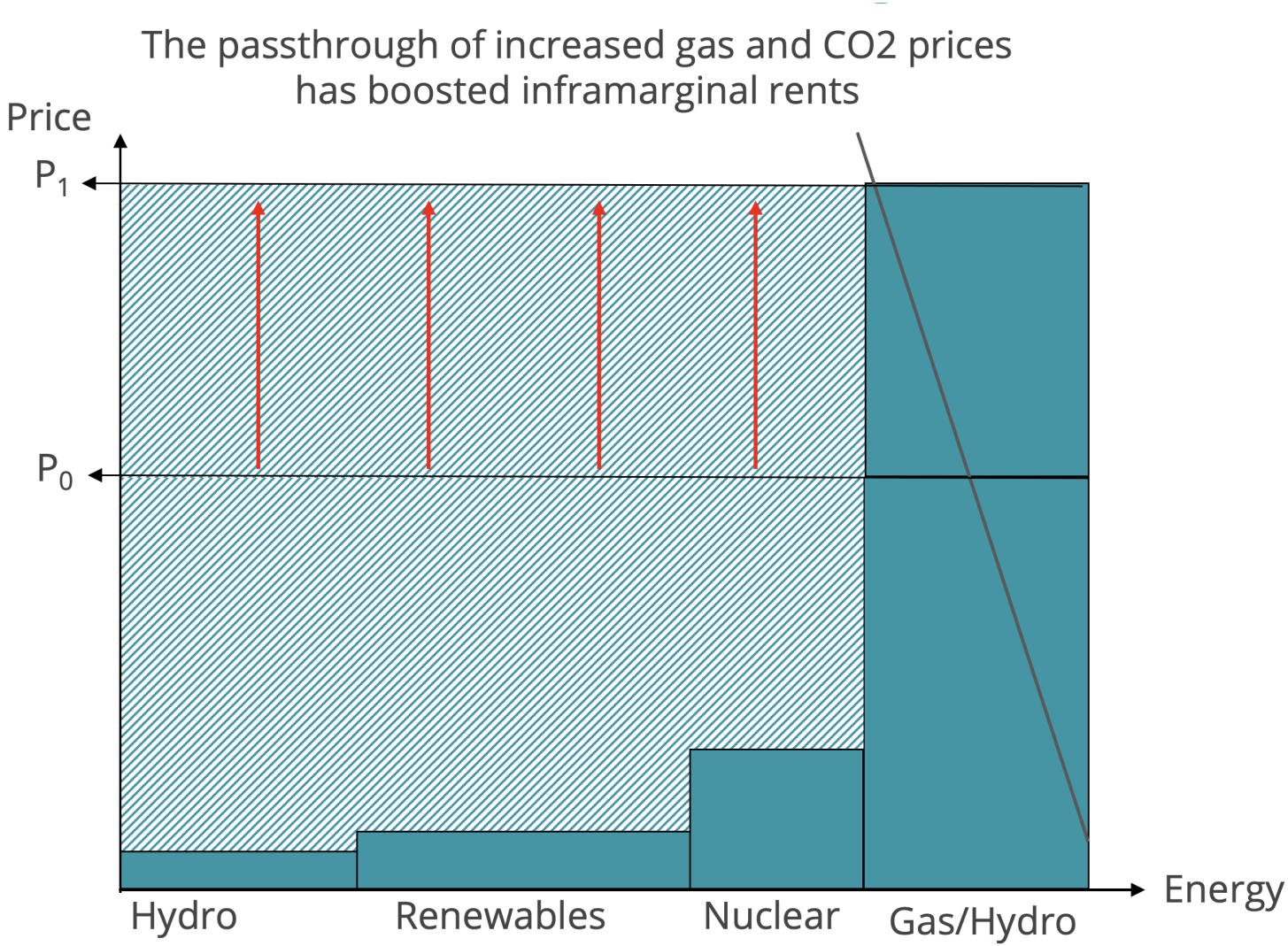
Wholesale gas prices in Europe



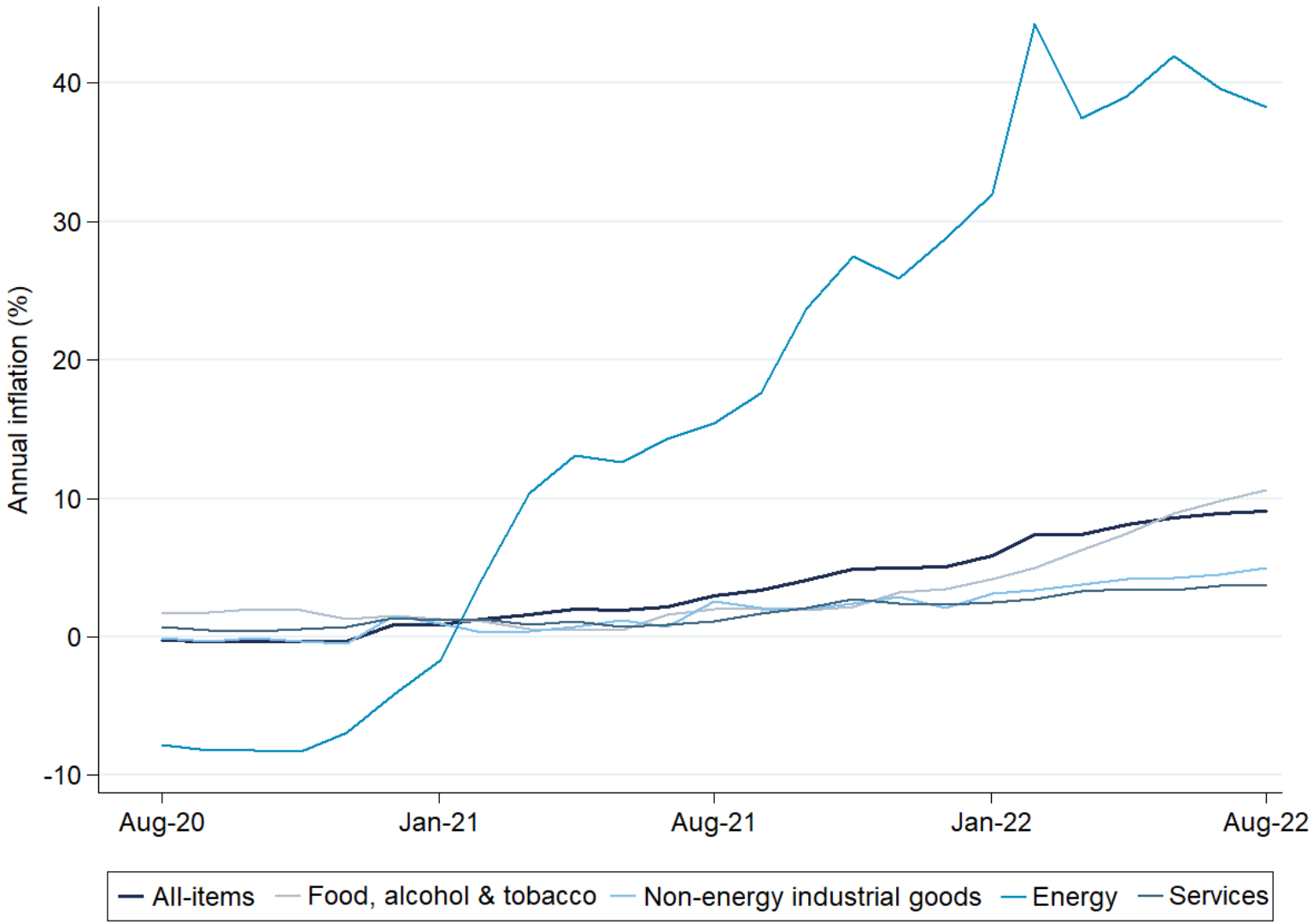
Wholesale electricity prices in Europe



Electricity prices have gone up beyond the cost increase



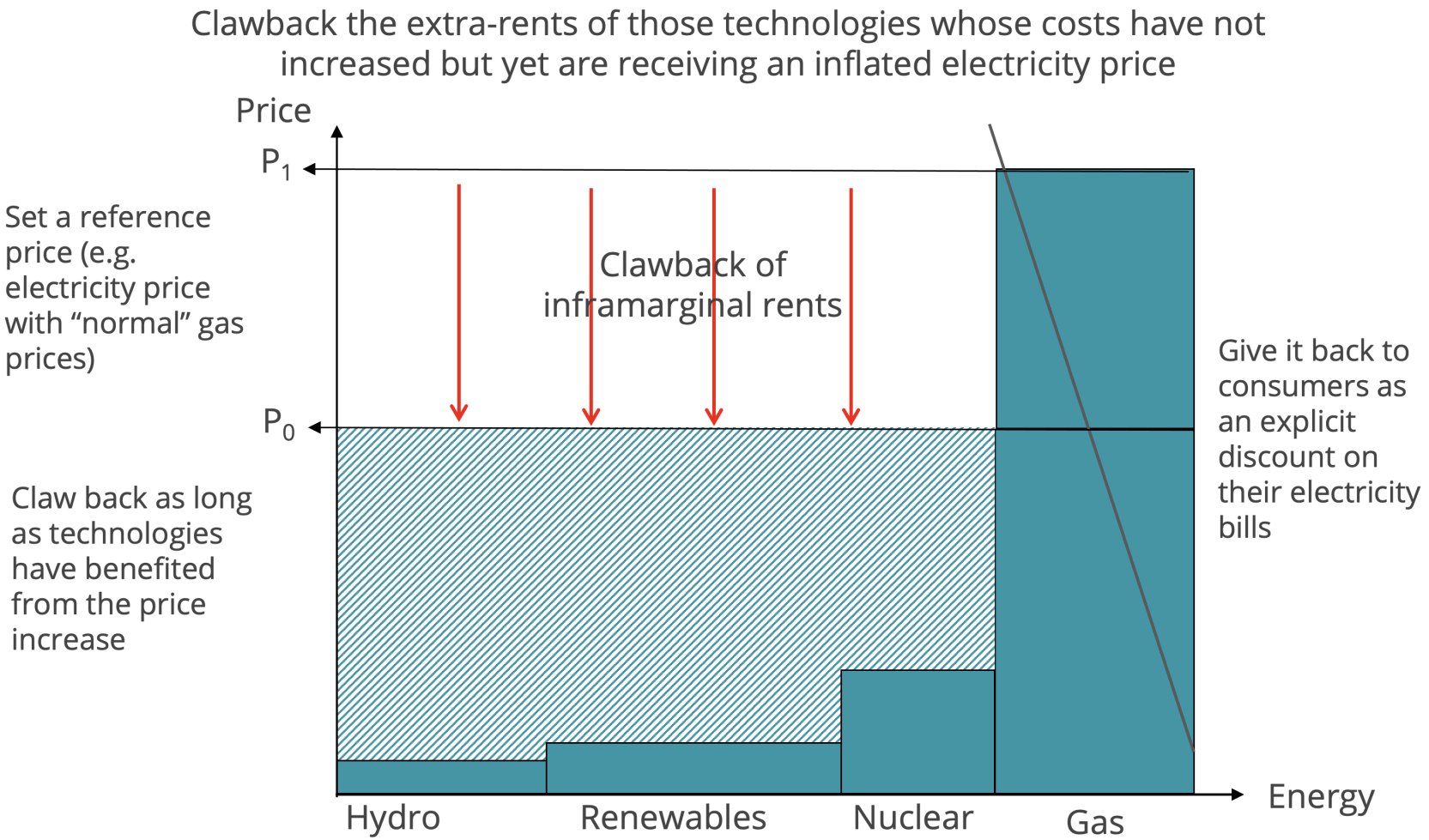
Inflation Components in Europe



Emergency measures to reduce electricity prices

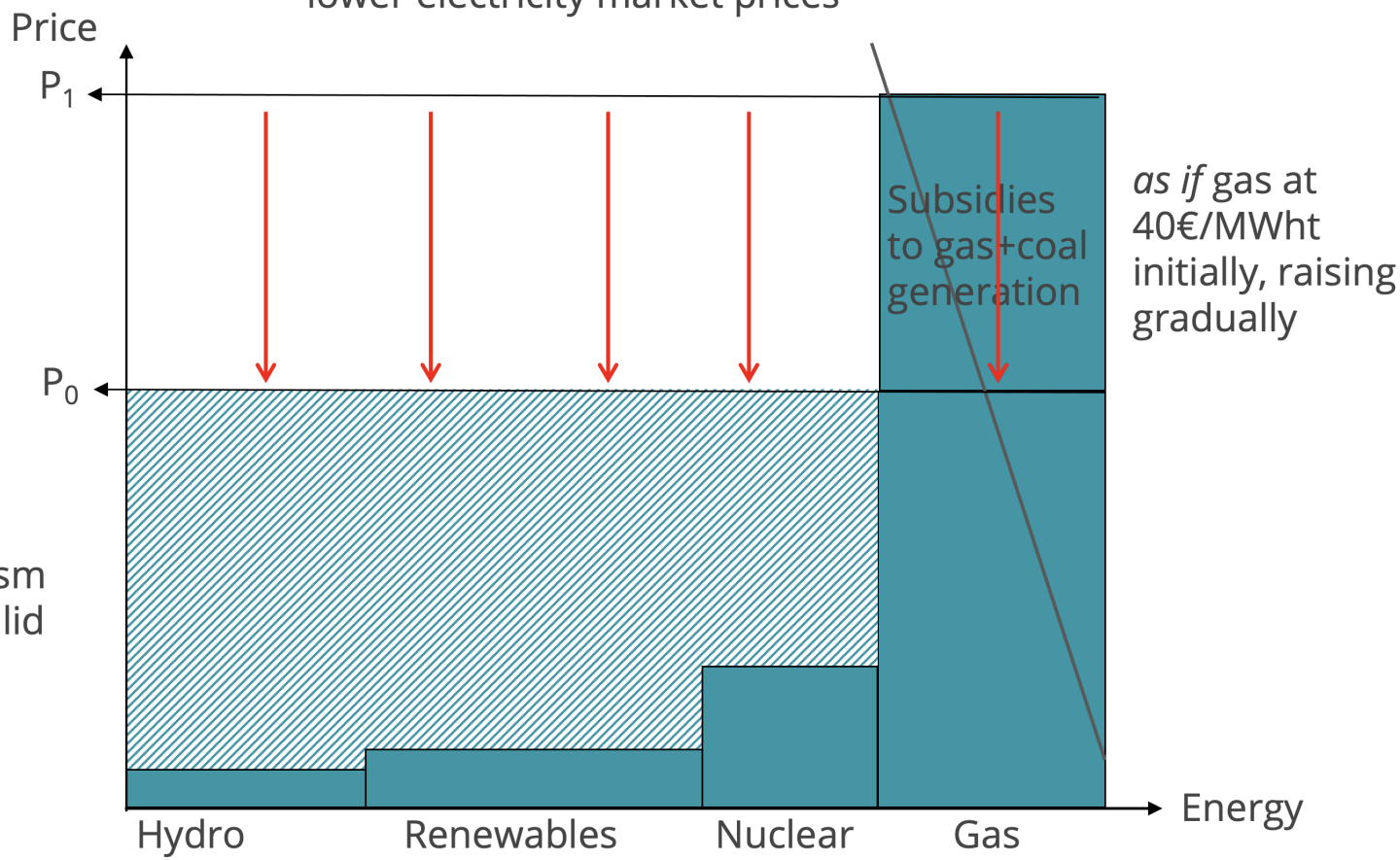
Price cap on inframarginal producers

The EC has agreed today on setting a 180/MWh price-cap



Iberian measure

Subsidize the price-setting technologies so that they pass on the subsidy to lower electricity market prices



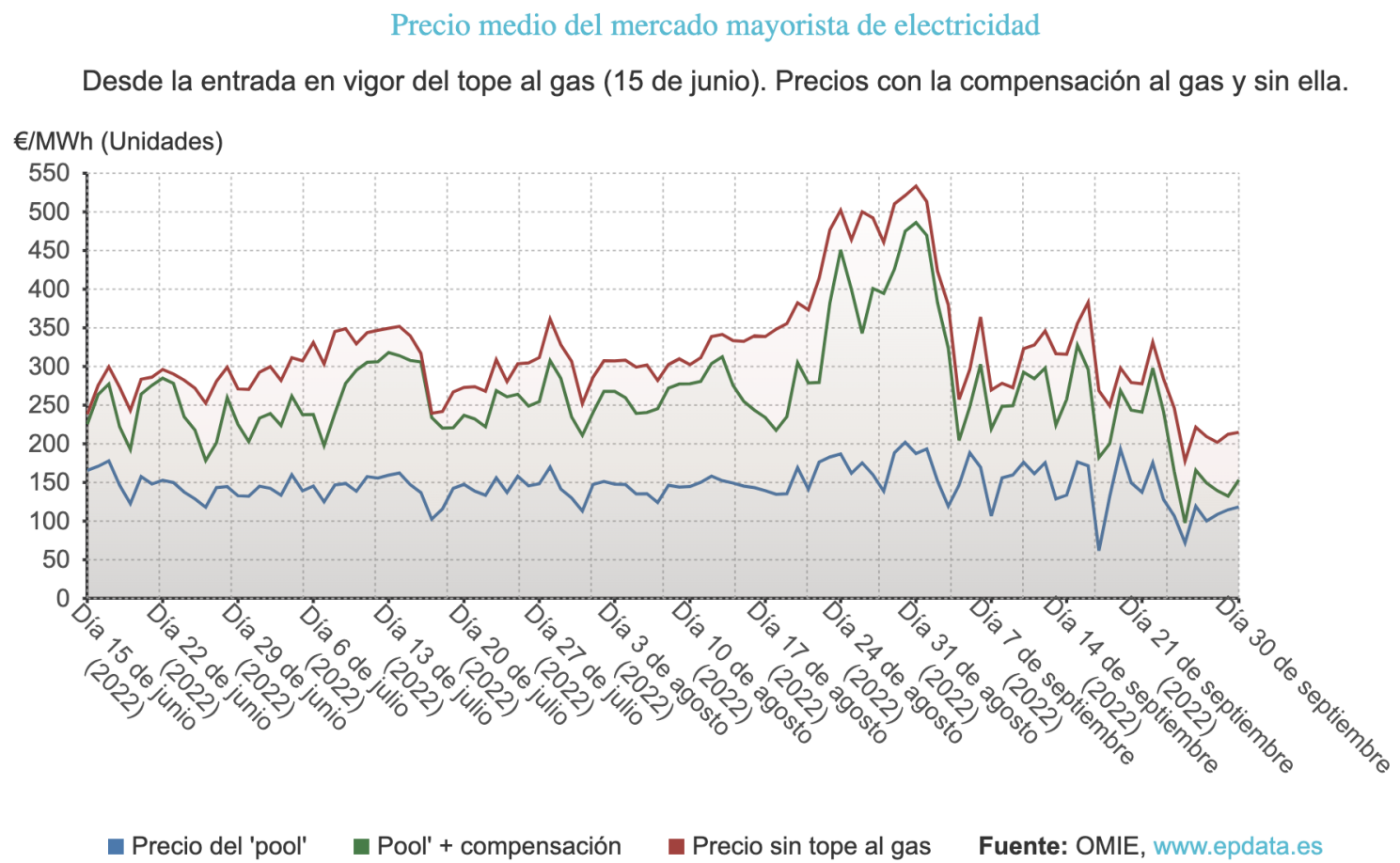
This mechanism will remain valid for one year

Iberian Measure

- The subsidies are proportionally split across the demand that is exposed to market prices
- Contracts outside the market only affected once renewed
- Windfalls reduced but marginal price distorted:
  - Electricity exports to France have (probably) increased
  - Half of the congestion rent accrues to the French TSO
    - Note: Spain + Portugal proposed a market with two-rounds to avoid the impact on trade but the CE preferred not to allow for export restrictions at the cost of the efficiency loss

Price impact of the Iberian Measure: wholesale

Pool, Pool+Compensation, Counterfactual



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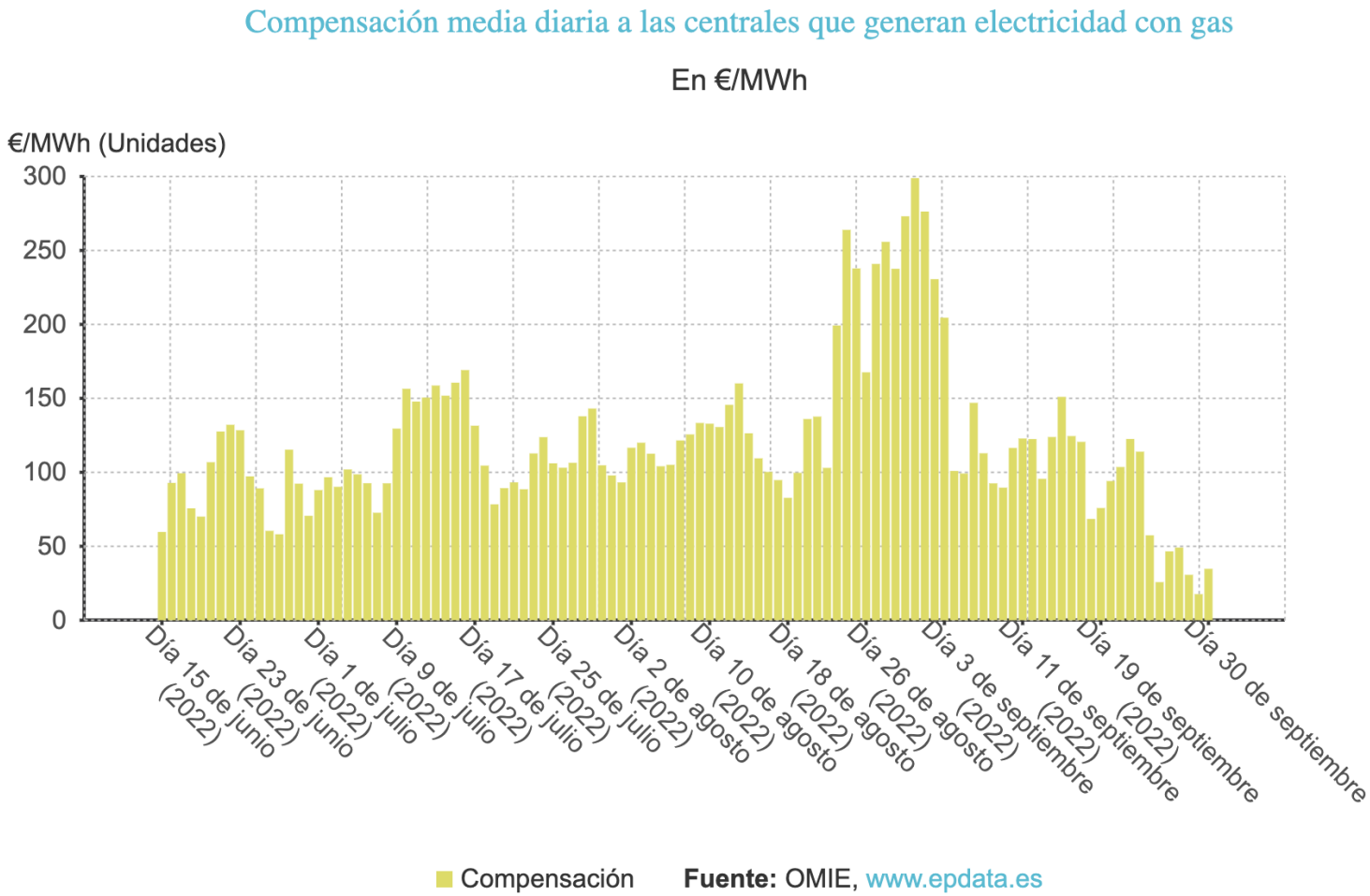
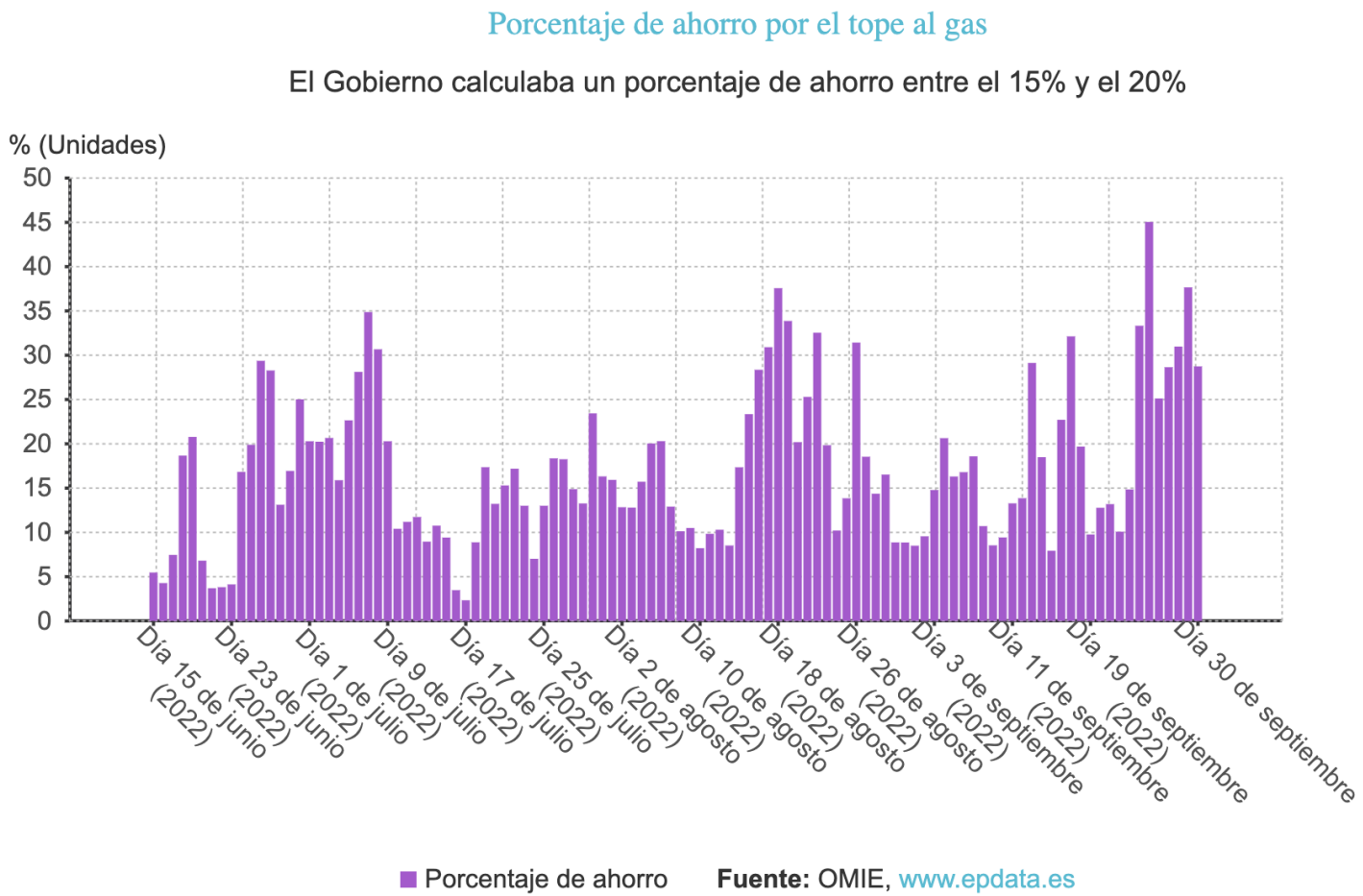
Compensation

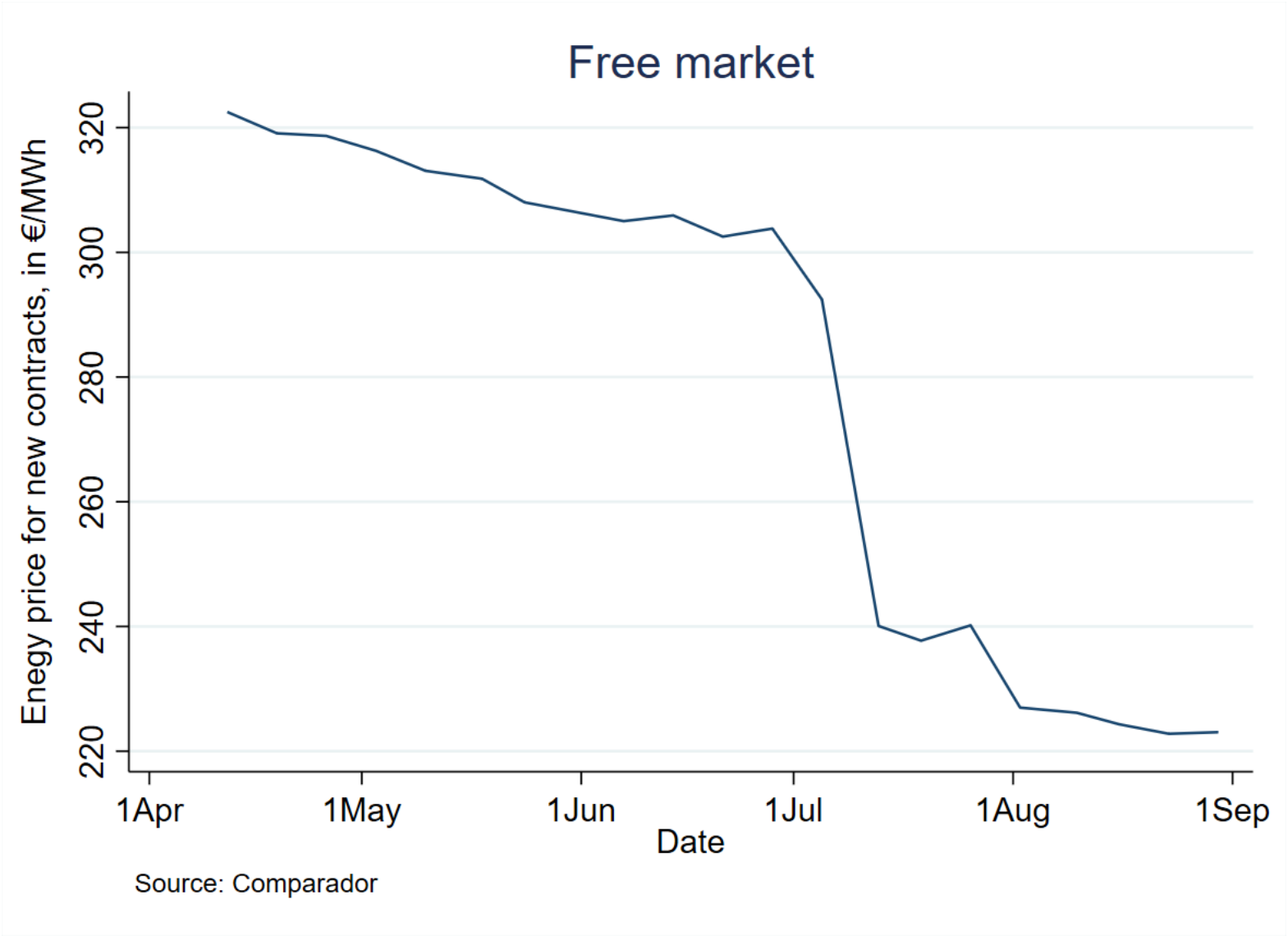


Price impact of the Iberian Measure: wholesale

Savings with respect to Counterfactual



Price impact of the Iberian Measure: retail



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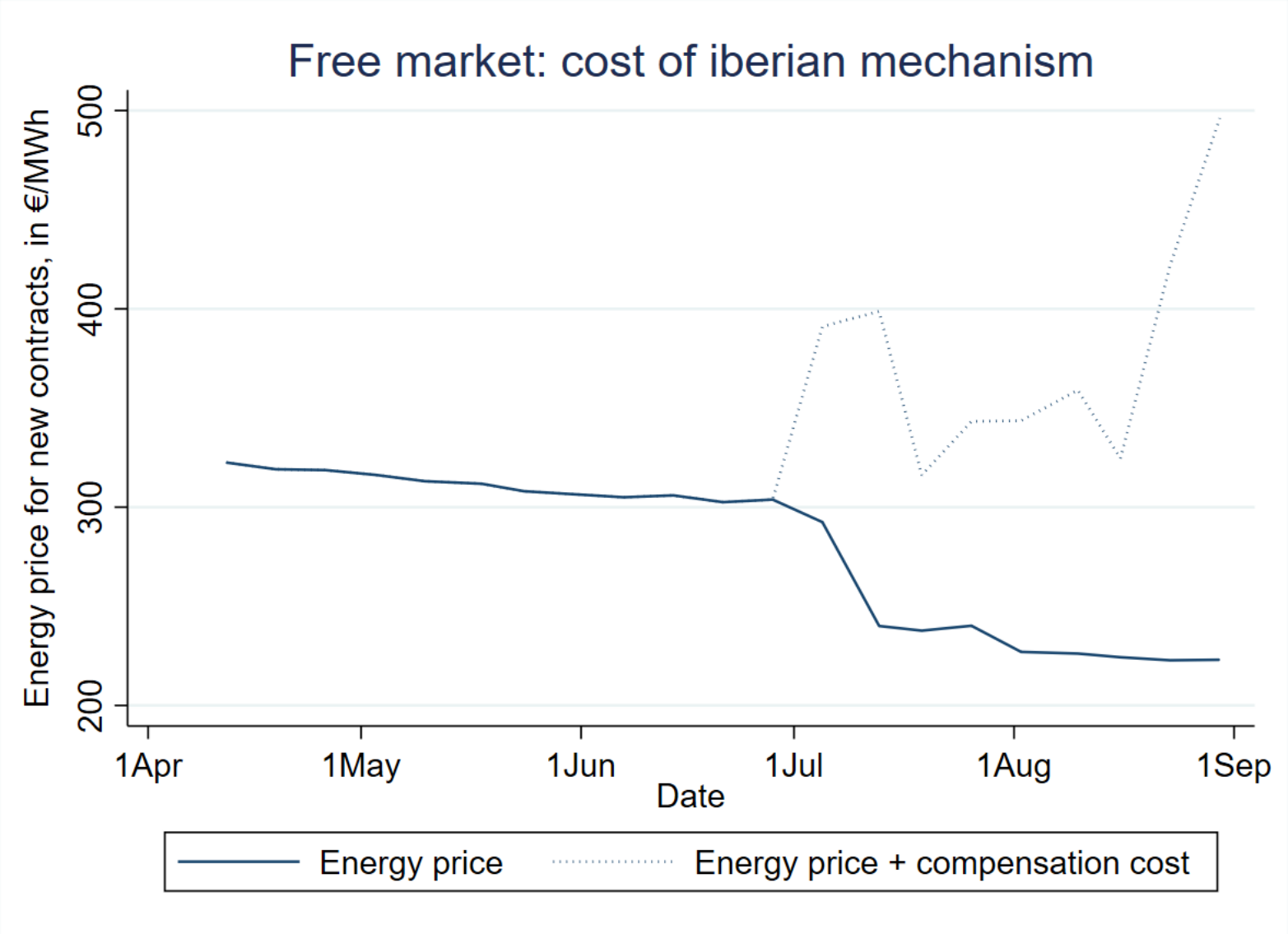
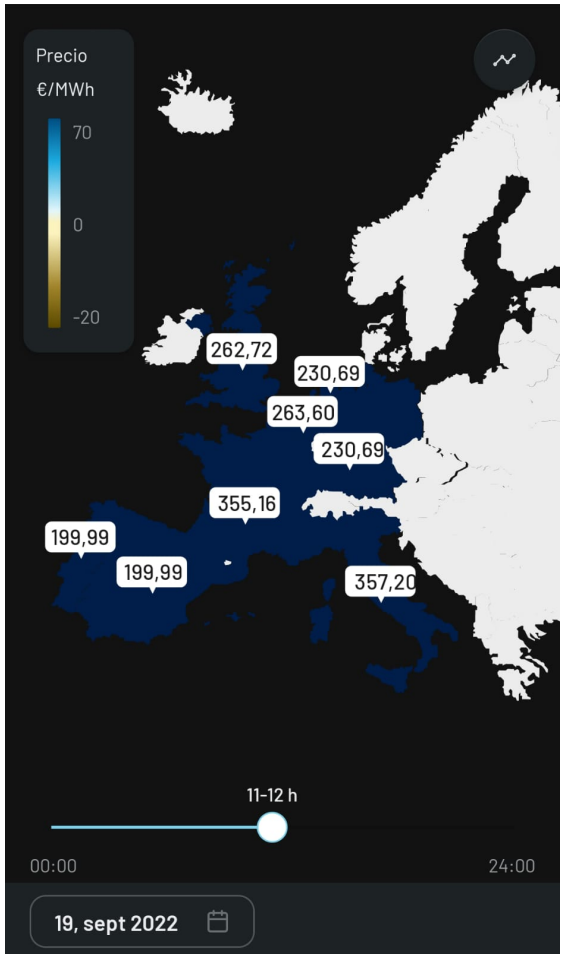


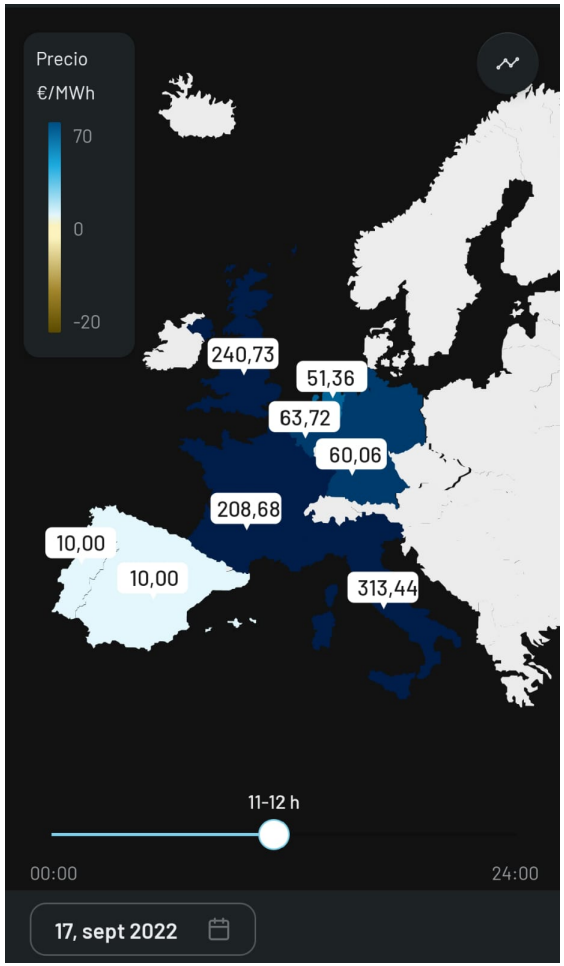
Going forward: structural reform

A Tale of Two States

Figure: Wholesale electricity prices in Europe



(a) "Energy crisis"



(b) "Energy transition"

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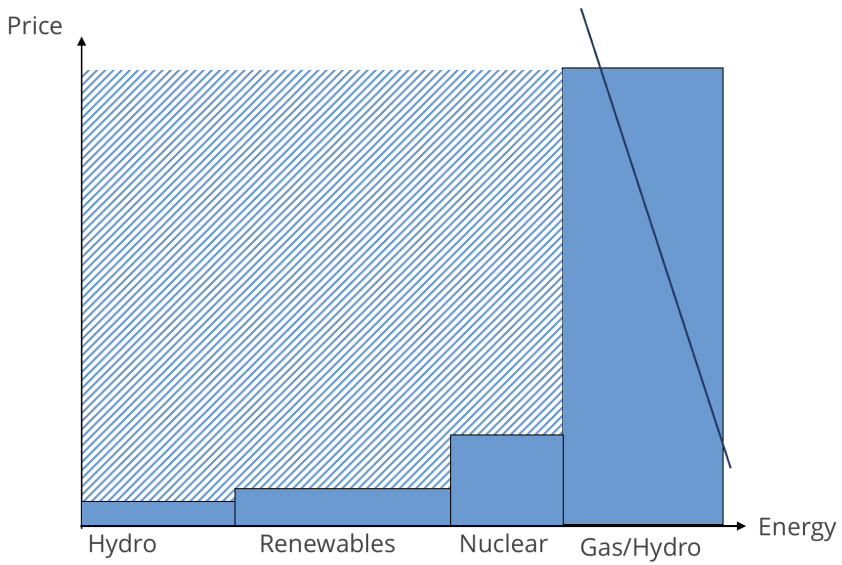
Figure: Merit-order dispatch, prices and revenues



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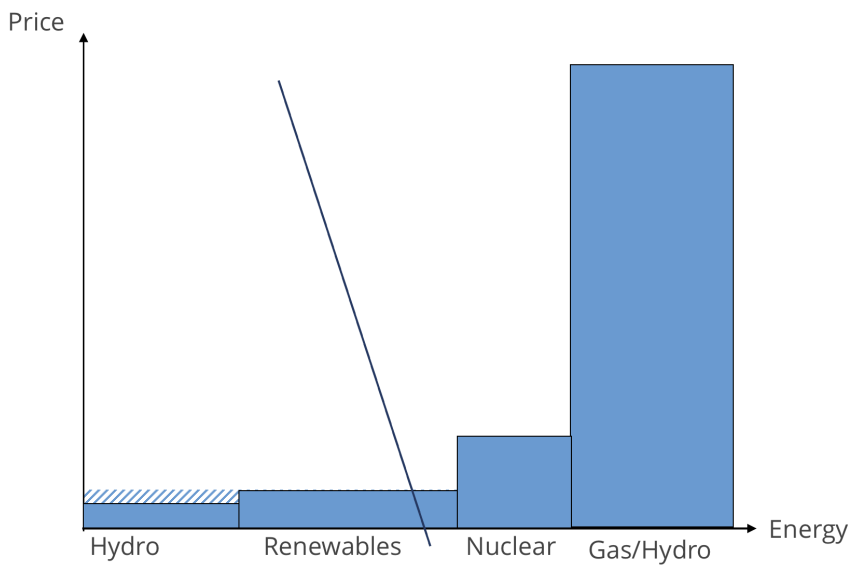

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What do these two states have in common?

1. Prices driven to the marginal cost of the price-setting technology
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Caveats: sources of inefficiency

- Large risks for cost recovery $\rightarrow$ investment delays, risk premia...
- Externalities: security of supply, learning economies...
- Electricity as an input $\rightarrow$ loss of global competitiveness
- Increase in inflation and interest rates $\rightarrow$ likelihood of recession
- Electrification discouraged $\rightarrow$ energy transition at risk

Which market architecture is suitable for these two states?

Designing contracts for renewable resources

Will future prices support today's investments?
Can this be improved through market design?

- Exposing intermittent RES to short-run prices:
  - Creates uncertainty over cost recovery
  - Makes funding more difficult and costly for the new entrants
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  - Contribute to de-risking the investments
  - Allow passing on the efficiency gains to consumers
  - Preserve price-exposure (p may differ from p')
  - Mitigate incentives to exercise market power (see next)

Designing contracts for renewable resources

Auction choices:

- Pay-as-bid vs pay-as-clear
- How much to auction-off
- Auction frequency
- How to pass on the contract prices to consumers
- Technology-neutral vs technology specific

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Reasons to allow for technology-specific approaches:

1. Learning externalities
2. Complementarities across technologies
3. Reduction of procurement costs (under some cases: when?)

Technology-Neutral *vs* Technology-Specific Procurement

(Fabra and Montero, 2023)

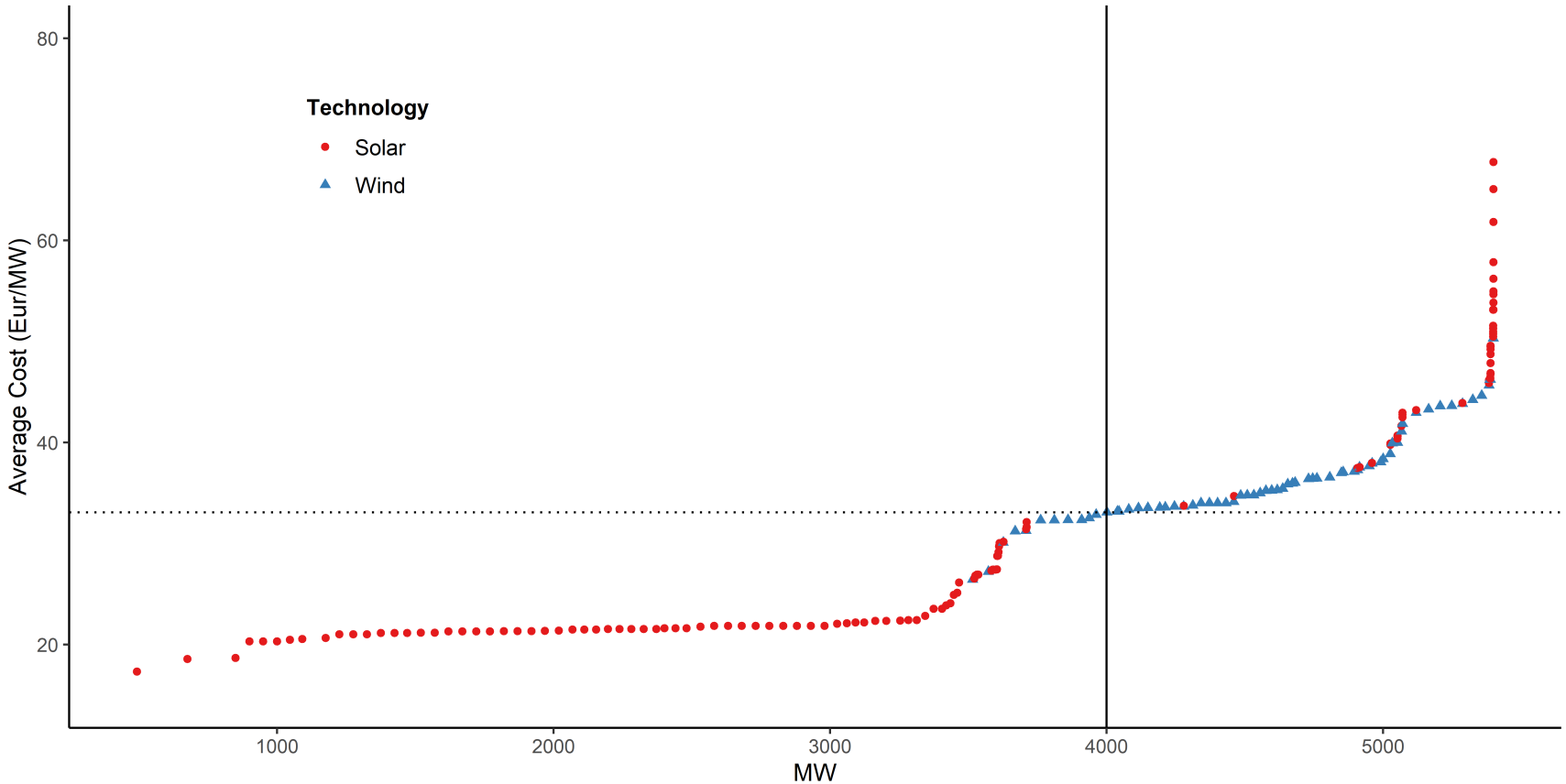

Figure: Average cost curve of solar and wind investments in the Spanish electricity market: Technology Neutral

Technology-Neutral *vs* Technology-Specific Procurement

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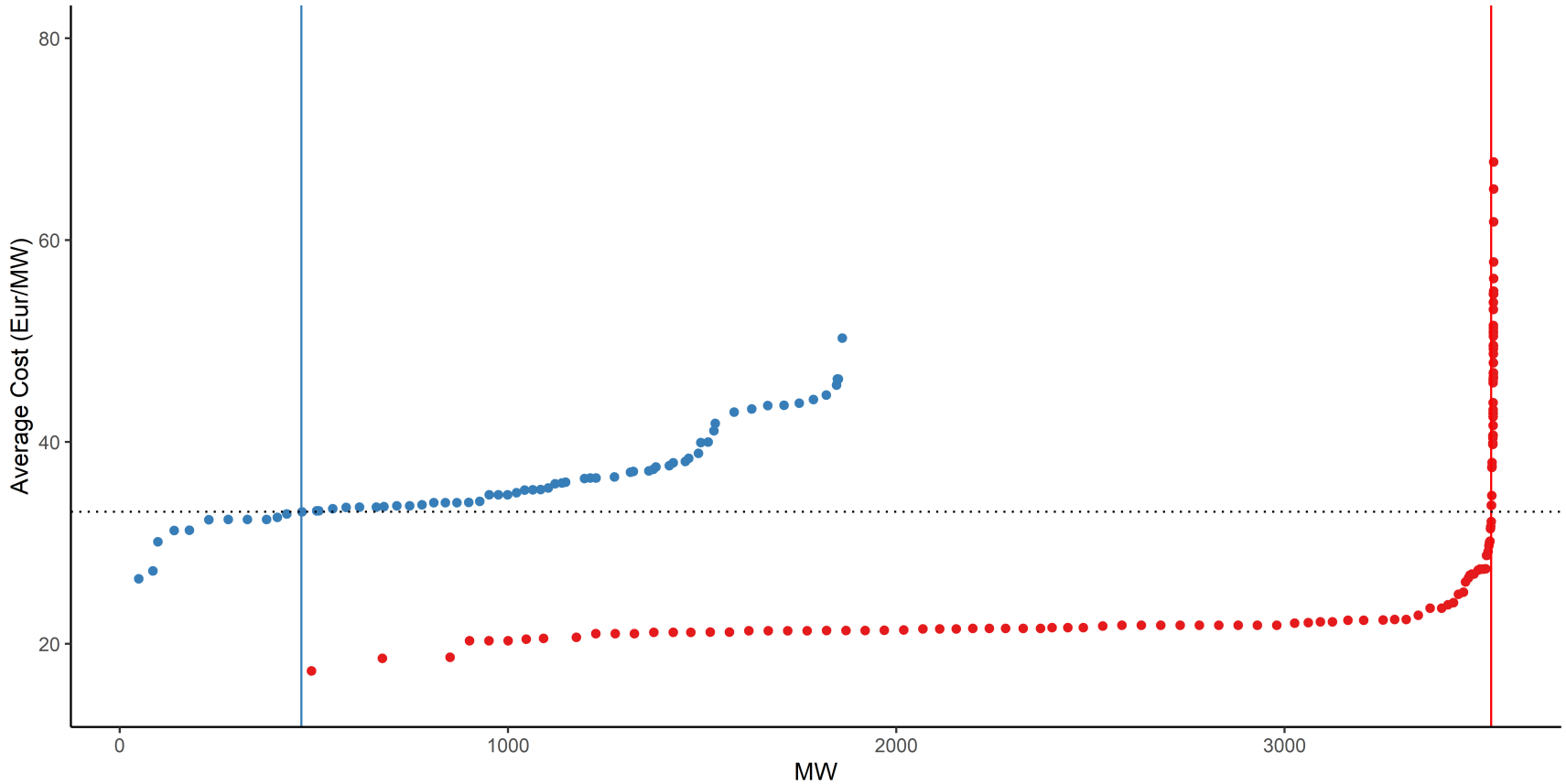

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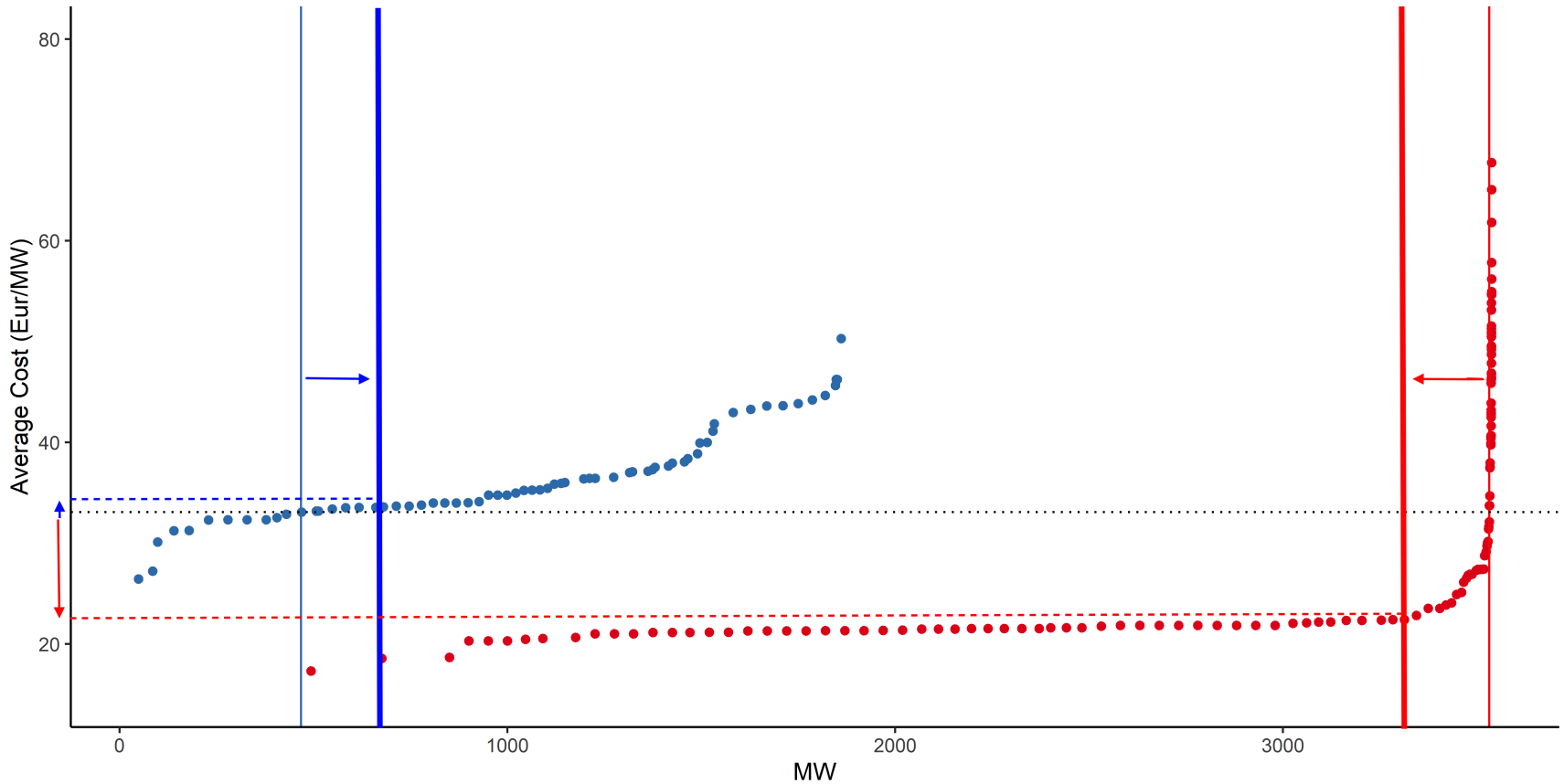

It is possible to (significantly) reduce procurement costs at the expense of (slightly) sacrificing efficiency

Designing contracts for flexible resources

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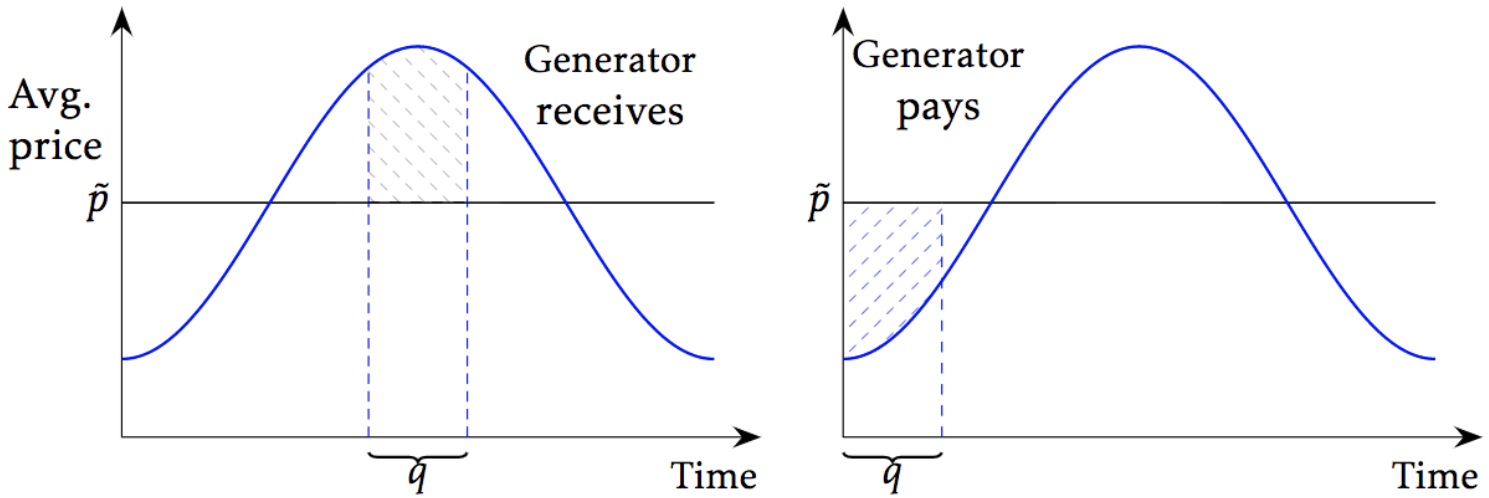
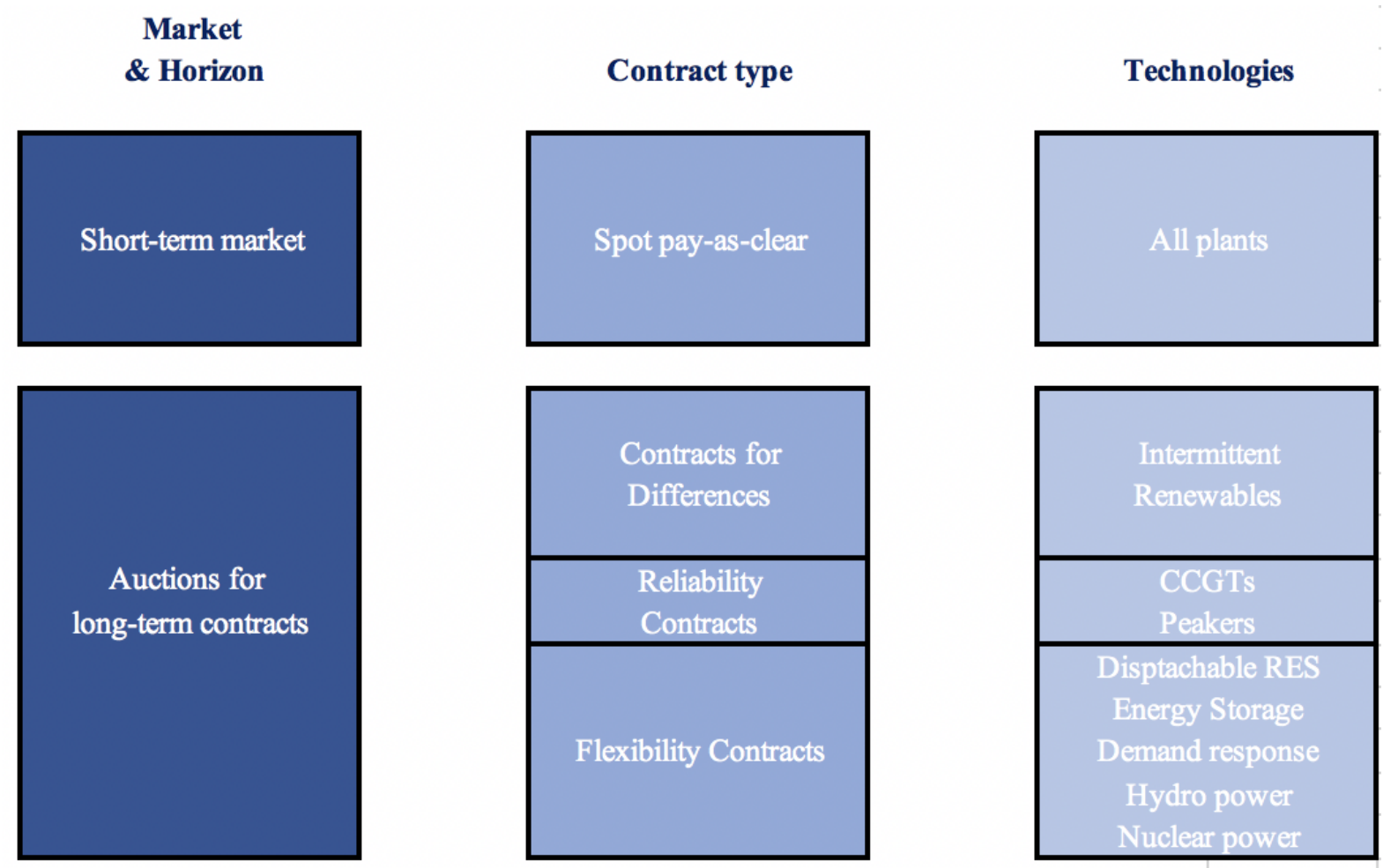


(a) Flexibility bonus **(b)** Flexibility penalty

Strong incentives to dispatch at peak times

Which Electricity Market Architecture?

"Energy Transition" state



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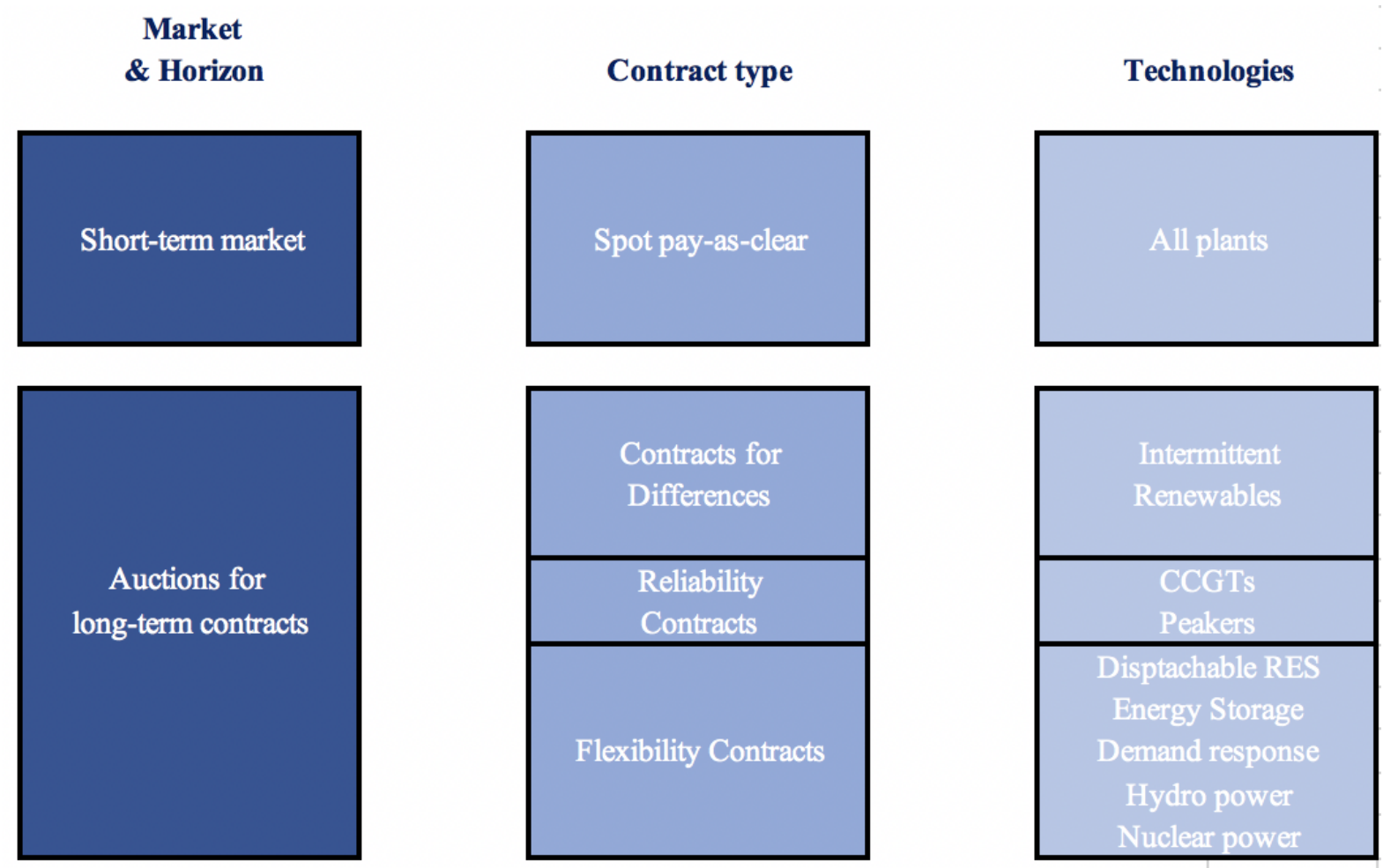

Conclusions

- There is an urgent need to reform electricity markets:
  1. Tackle the energy crisis
  2. Support the energy transition
- New electricity market architecture: aim at efficiency & equity
  1. Liquid short-run markets
  2. Auctions for long-run contracts
  3. Contracts should respond to the characteristics of the technologies
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Power markets can be a powerful source of efficiency for our economies...as long as we design them right!

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Thank You!

Questions? Comments?

More info at nfabra.uc3m.es and energyecolab.uc3m.es

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