

INVESTMENTS IN FLEXIBILITY OPTIONS UNDER DIFFERENT ELECTRICITY MARKET DESIGNS

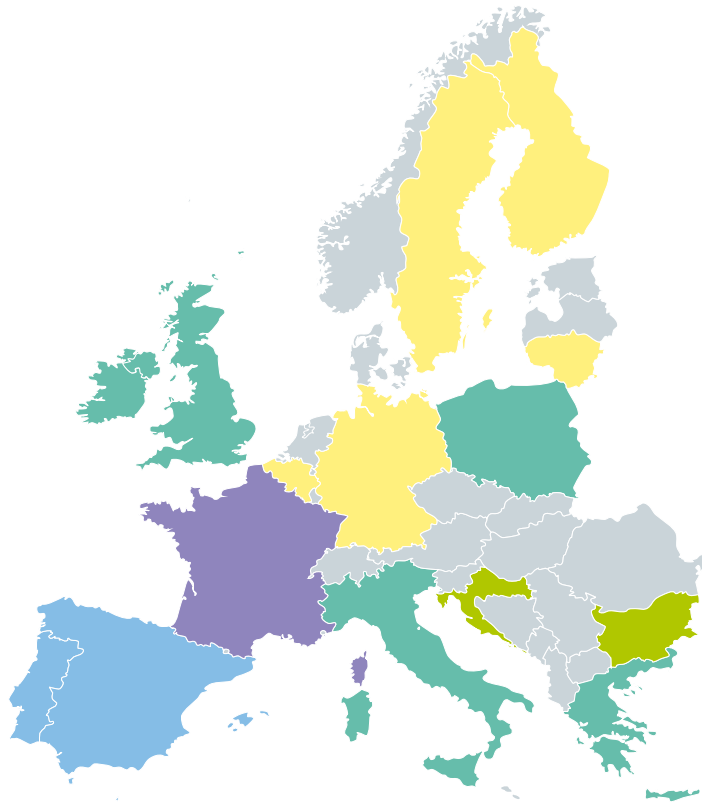
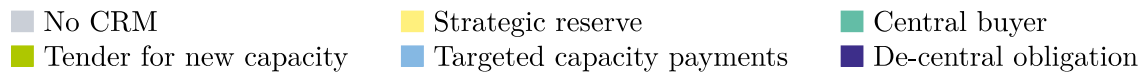
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REFLEX Stakeholder Workshop
Brussels, 3rd April 2019

Agenda

- [1] The European Debate on Electricity Market Design
- [2] Overview of the Scenario Framework
- [3] Impact of the Electricity Market Design on...
 - Investments and Wholesale Electricity Prices
 - Generation Adequacy
- [4] Conclusions

The European Debate on Electricity Market Design



Background

- Energy-only market (EOM) is the traditional electricity market design in Europe
- Recently, several European countries have started implementing capacity remuneration mechanisms (CRMs)

Research questions

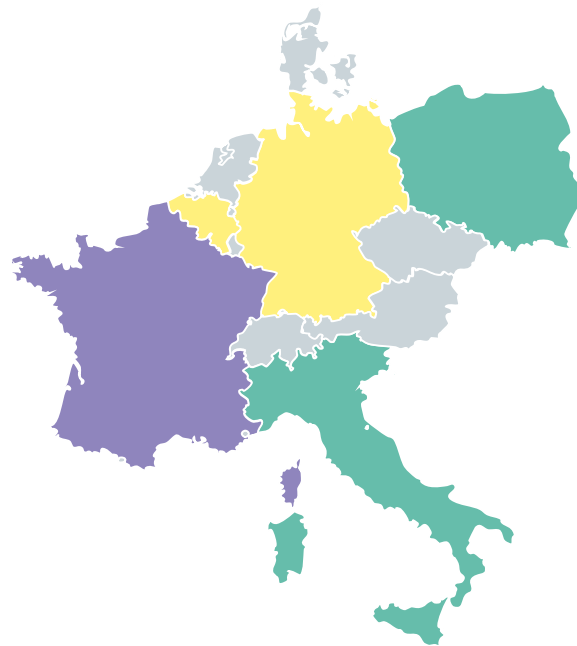
- What are the long-term cross-border impacts of uncoordinated market design changes?
- Is a coordinated European electricity market design more appropriate?

Investigated Electricity Market Design Settings

■ No CRM ■ Central buyer
■ Strategic reserve ■ De-central obligation



(a) European EOM

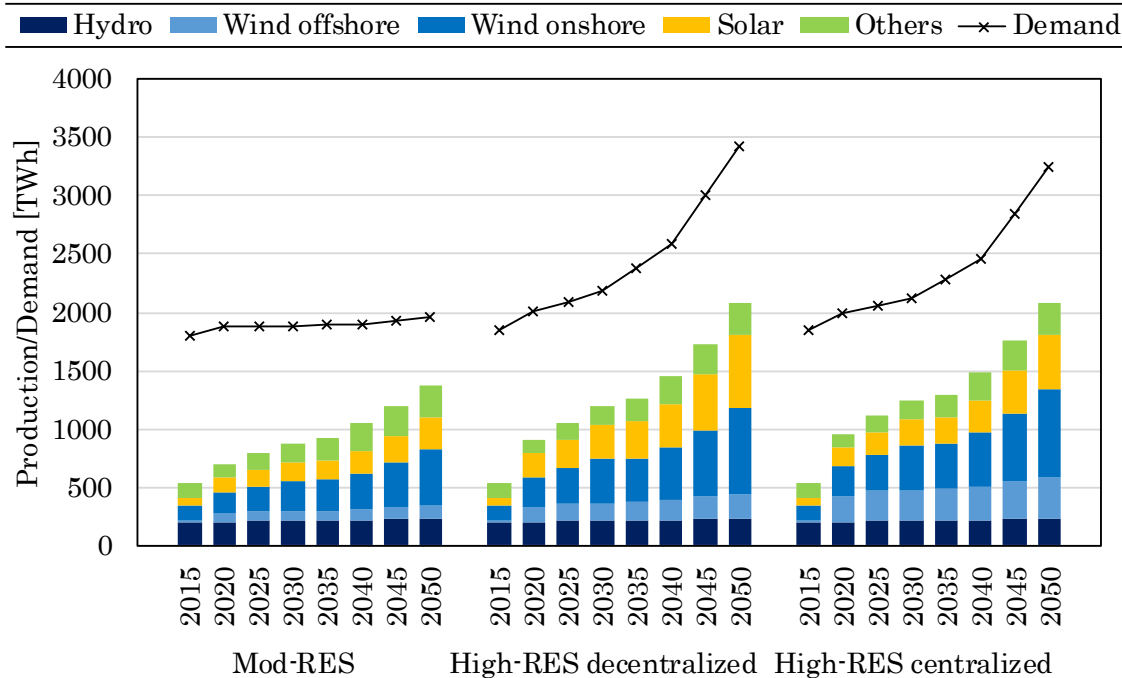


(b) National CRM policies



(c) Coordinated CRM

Overview of the REFLEX Scenarios



Background

- Values are aggregated over all countries modelled in PowerACE
- Both demand and feed-in of renewables are exogenous input data for PowerACE

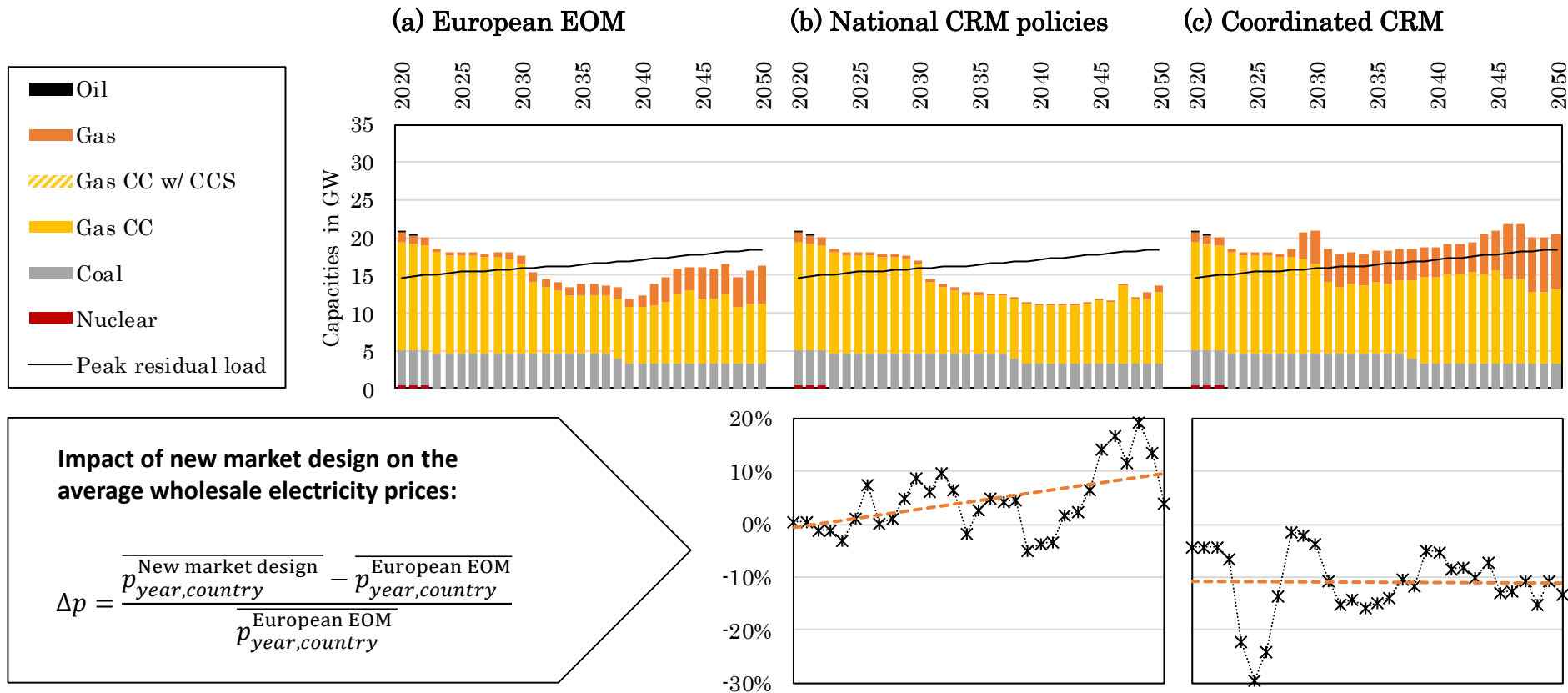
Characteristics

- Higher demand and feed-in of renewables in the High-RES scenarios
- Technology composition of renewables differs between the two High-RES scenarios

➔ Simulations are carried out with the agent-based electricity market model PowerACE, in which the investment decisions are driven by individual profit maximization.

Mod-RES Scenario

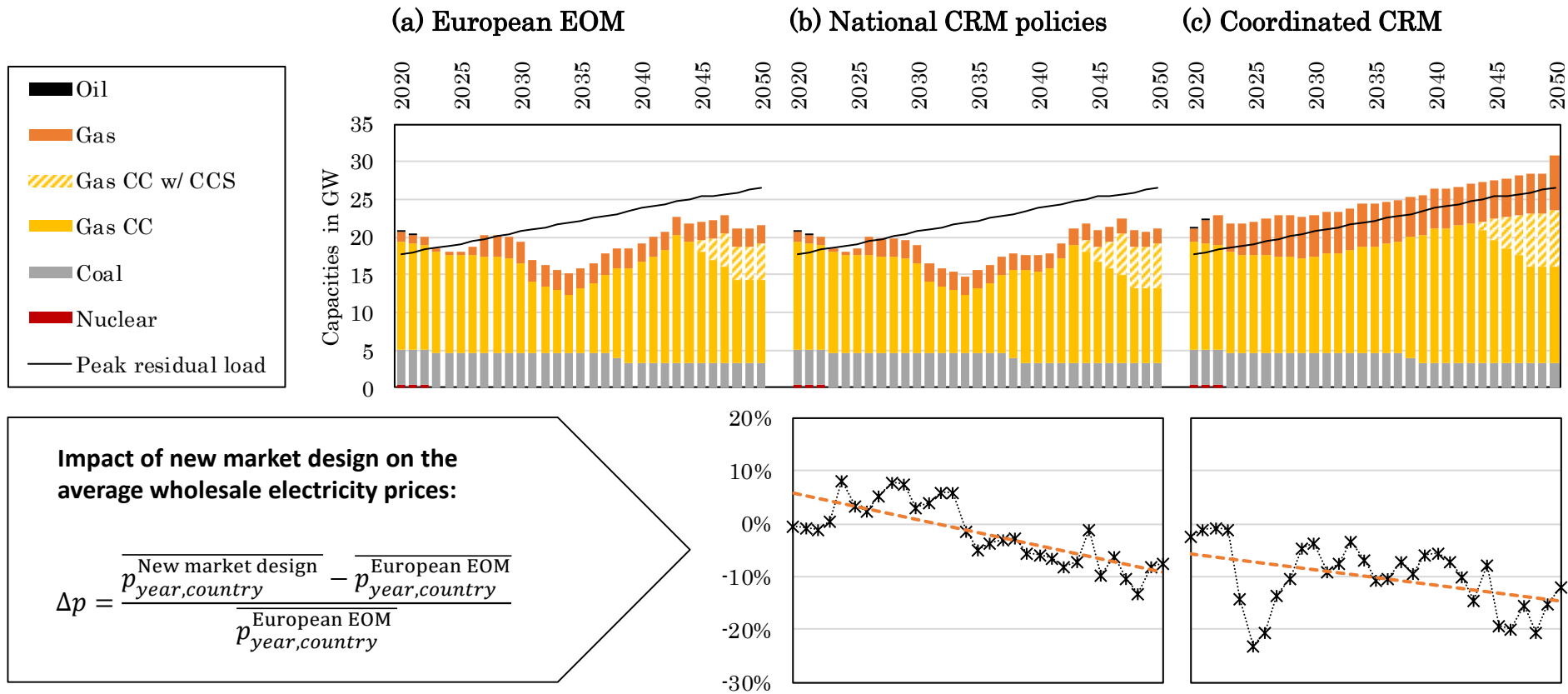
Investments and Wholesale Electricity Prices – Netherlands



➔ The Netherlands are confronted with higher wholesale electricity prices under the national CRM policies and benefit from a coordinated CRM.

High-RES Decentralized Scenario

Investments and Wholesale Electricity Prices – Netherlands



➔ In the long-term, the Netherlands benefit from lower wholesale electricity prices under the national CRM policies, but even more so under a coordinated CRM.

Mod-RES Scenario





Generation Adequacy

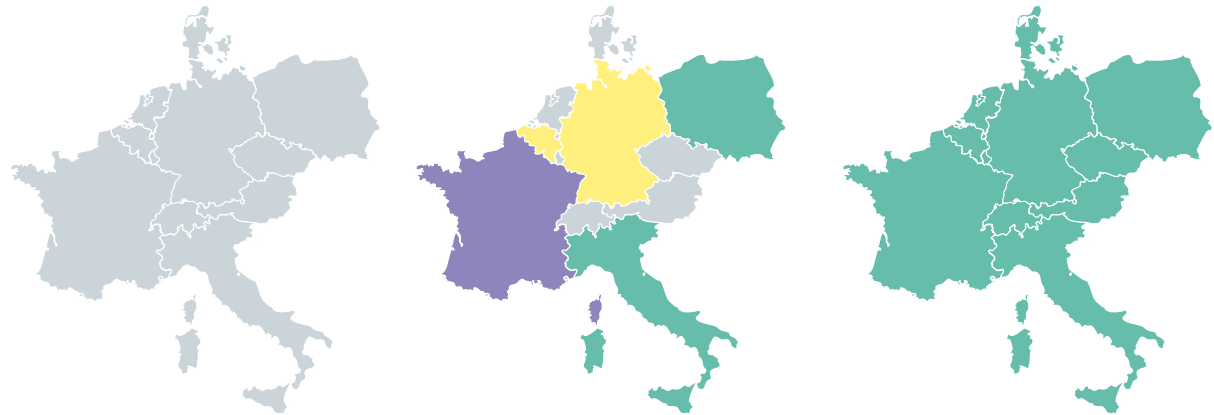
European EOM

National CRM policies

Coordinated CRM

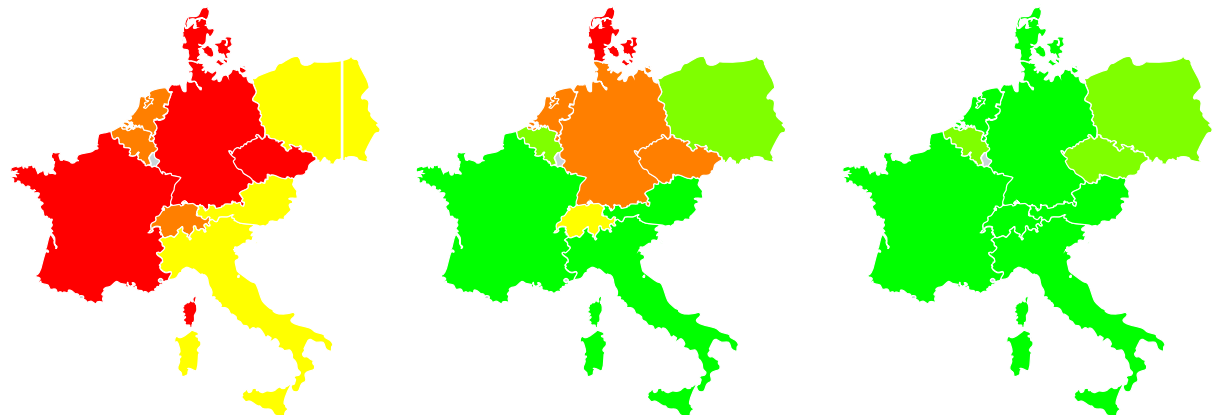
Electricity market design

-  No CRM
-  Strategic reserve
-  Central buyer
-  De-central obligation



Yearly hours without clearing of the day-ahead market

-  0 h/a
-  1–3 h/a
-  4–10 h/a
-  11–15 h/a
-  >15 h/a



High-RES Decentralized Scenario





Generation Adequacy

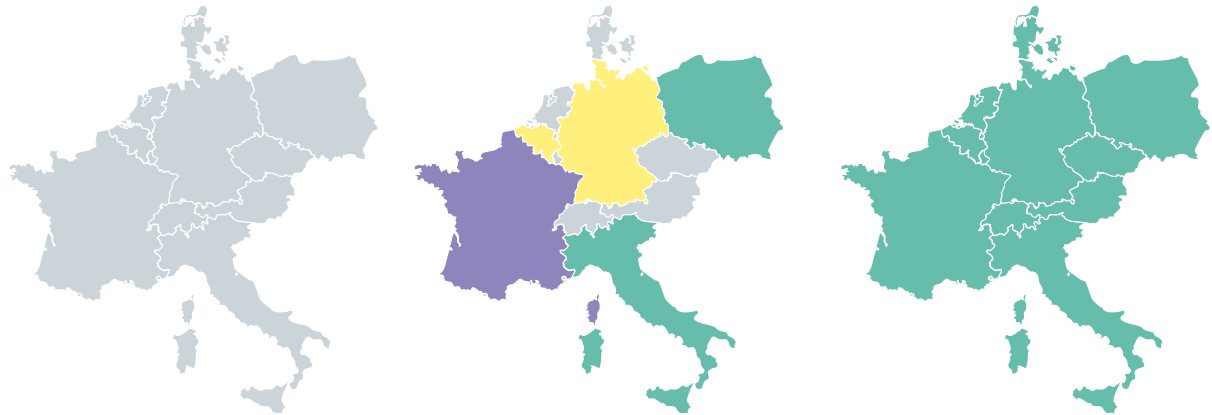
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Coordinated CRM

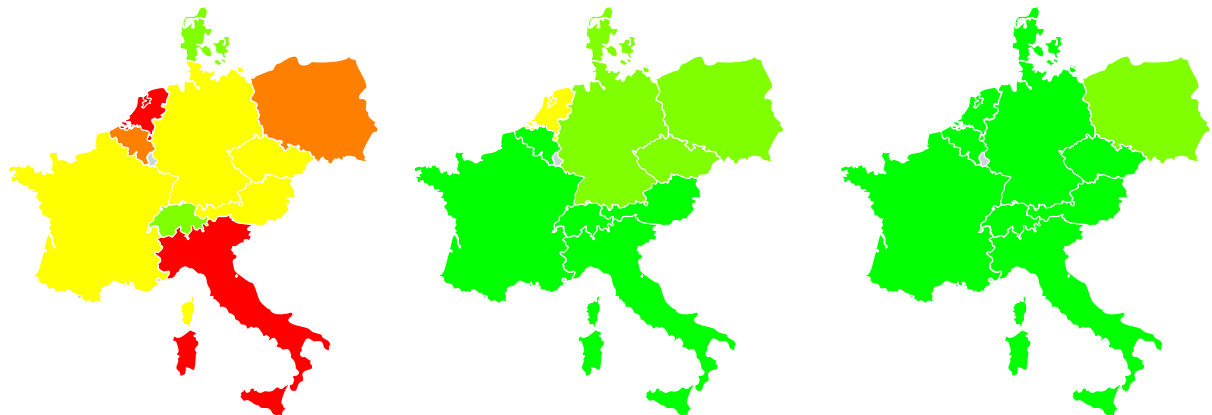
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Conclusions

Summary

- CRMs substantially shift investment incentives and reduce the amount of scarcity situations.
- Whether positive or negative cross-border effects of CRMs prevail, depends on the future electricity demand and renewable feed-in as well as the geographical location of a given country.
- A coordinated European CRM is likely to reduce wholesale electricity prices and increase generation adequacy across all countries.

Policy Recommendations

- The European Commission should continue to assess potential CRMs carefully prior to allowing their real-world implementation.
- Interconnectors should always be allowed to participate in any CRM of neighboring countries in order to avoid market distortions.
- Alternatively, a coordinated European approach to electricity market design could be considered.

Thank you! Questions?

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