

Towards a European approach to capacity mechanisms

The introduction of cross-border participation in capacity mechanisms

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ELEMENTS OF A NEW TARGET MODEL FOR EUROPEAN ELECTRICITY MARKETS

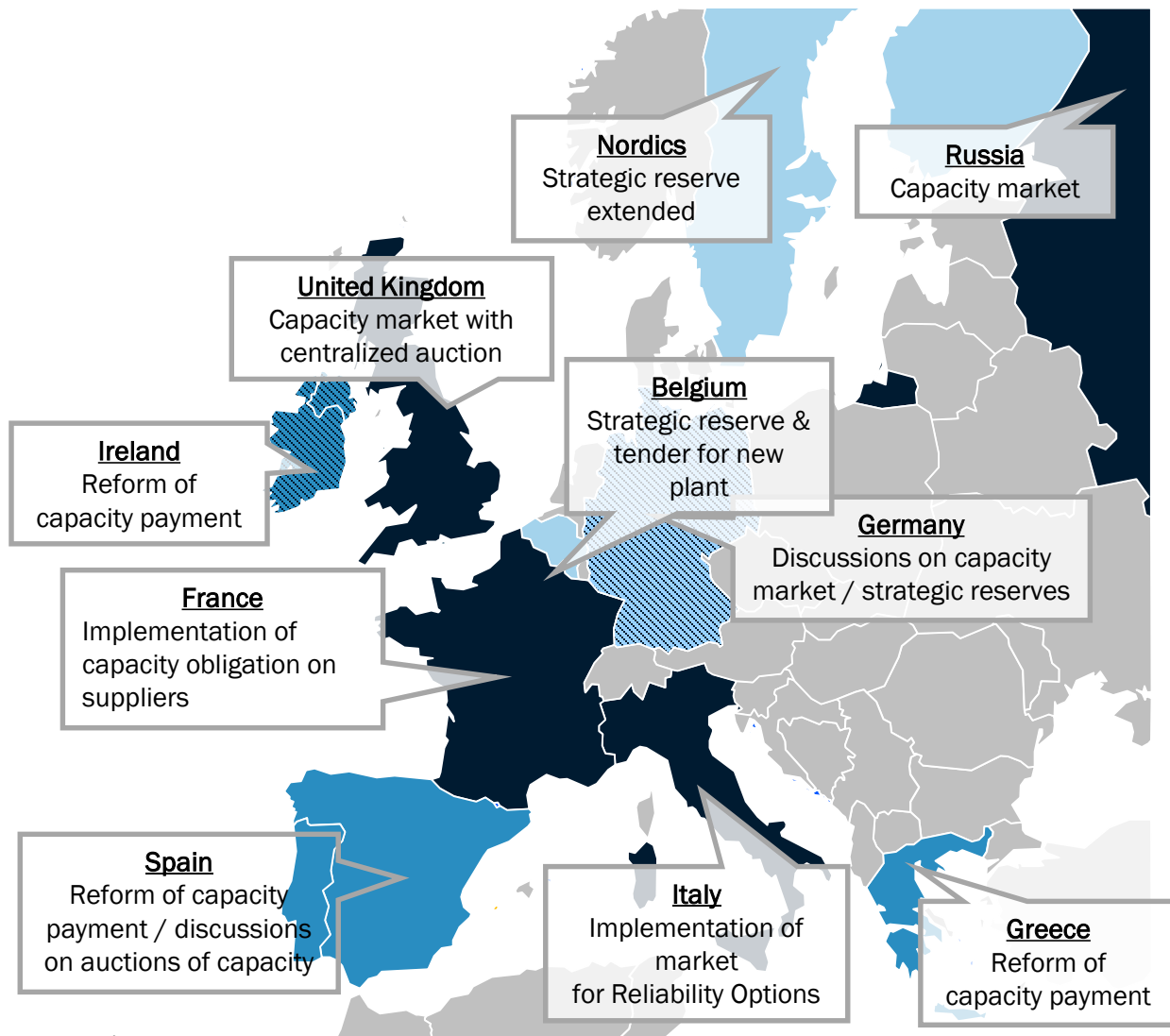
Towards a Sustainable Division of Labour between Regulation and Market Coordination

8 July 2015

Introduction: capacity mechanisms in Europe

Emergence of plethora of national based CMs runs deeply against EC's view of how internal energy market should evolve

Capacity market Capacity payment Strategic reserve



- Patchwork of different CM designs emerging across Europe
 - Central premise of CM is one of autarky....
 - ...i.e. *national* security of supply.
 - ...rather than considering wider European interactions.
- EC therefore very keen also to have interconnection included in the way in which national CMs are designed...
- ...reflected in State Aid approval in recent GB CM

Towards a European approach for capacity mechanisms?

- The European Commission is clearly willing to strengthen cooperation for security of supply in Europe by:
 - Improving short-term markets in order to have better scarcity pricing
 - Involving consumers through demand-side response
 - Coordinating methods to evaluate generation adequacy, taking into account the contribution of interconnections
 - Aligning standards for system adequacy

 - However, it is unlikely to move towards a EU target model for capacity mechanisms:
 - The EC is concerned about the implementation of uncoordinated approaches
 - The EC considers capacity mechanisms “are often costly and distort the market”
 - Also that “they may contradict the objective of phasing out environmentally harmful subsidies including for fossil fuels”
 - Many countries are still opposed to capacity mechanisms: recently, German Chancellor Angela Merkel said she did not support proposed payments to loss-making coal and gas-fired power stations in Germany and, addressing a reception of the German Renewable Energy Federation (BFE) of wind and solar producers, said: *"I share your skepticism as regards to capacity markets. We want the most efficient solution."*
- The main focus to aim towards EU coordination in capacity mechanisms is through cross-border participation, which is required by EU State Aid Guidelines.
 - Ongoing developments are already happening in the UK, where interconnectors will be able to participate in the next capacity auction
 - RTE is organising consultations to introduce cross-border participation in the French CM
 - The EC envisages a “framework to opening capacity mechanisms across borders”

Cross border participation in capacity mechanisms: key issues

Cross border participation in capacity mechanisms: key issues

1 *Who should participate: generation/DSR or interconnector?*

2 *How much capacity can be provided across the border?*

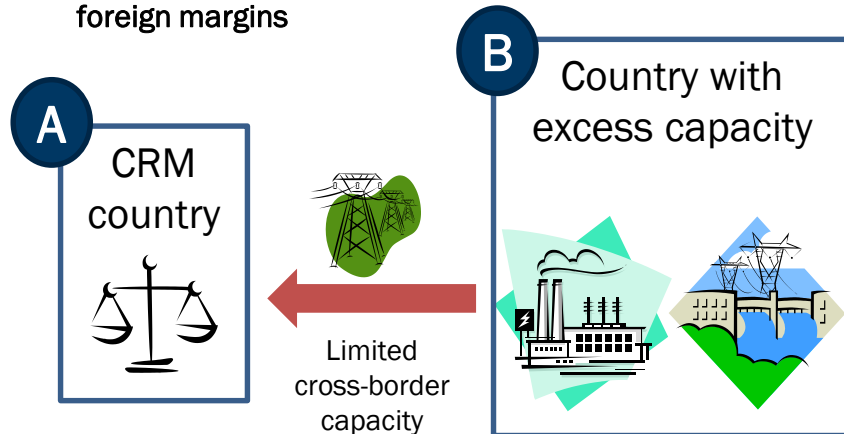
3 *To what extent cross-border capacity contributes to domestic security of supply?*

4 *How to design products for cross-border participation?*

5 *To what extent does it improve economic efficiency and competition?*

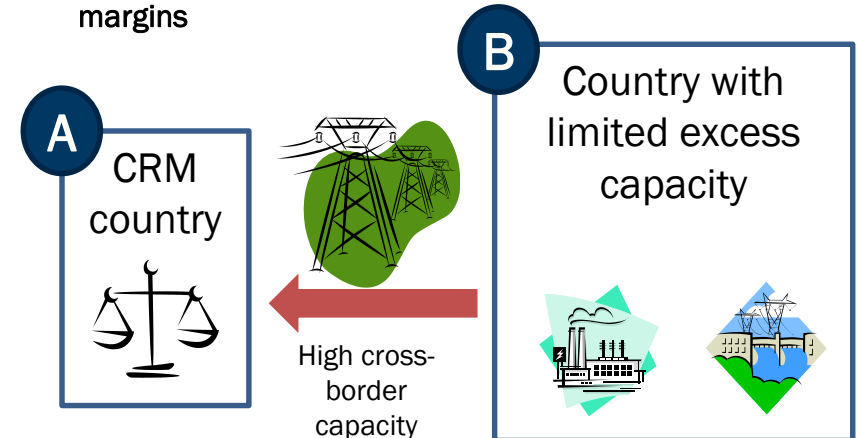
1. Where does the value of cross-border capacity come from: from the I/C capacity or from generators' capacity?

Case 1: limited cross-border capacity compared to foreign margins



Adding 1MW of generation in B does not provide any additional SOS to A. However, adding 1MW of cross-border capacity does increase ability of B to support A SOS.

Case 2: high cross-border capacity compared to foreign margins



Adding 1MW of cross-border capacity does not provide any additional SOS to A. However, adding 1MW generation in B does increase ability of B to support A SOS.

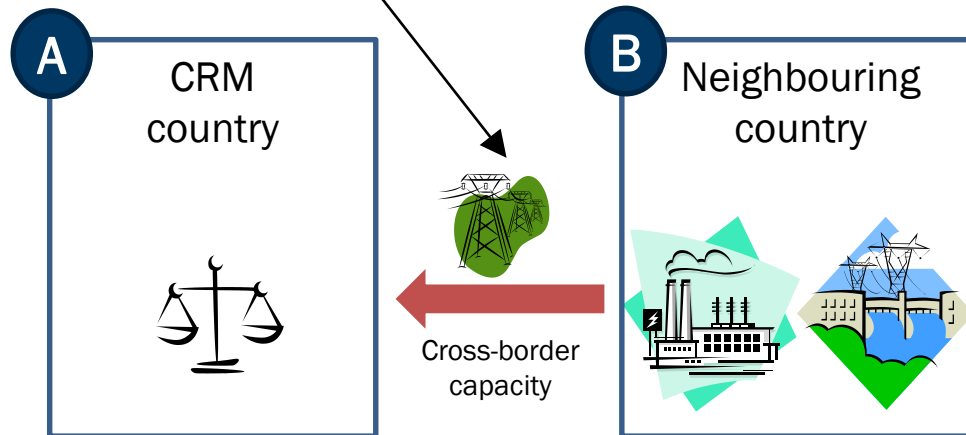
- Cross-border contribution to SOS depends on I/C capacity availability and generation margins across the border.
- Depending on the situation, the value might be brought by transmission and/or generation capacity:
 - If cross-border capacity is scarce, most of the value is brought by I/C;
 - If cross-border capacity is not scarce, most of the value is brought by generation across the border.
- In practice, it is not obvious to determine ex-ante in which situation one is, and value is shared between generation and transmission, so mechanisms should be adapted to share value.

2. How to evaluate the contribution of interconnectors to security of supply? The different types of risks to take into account

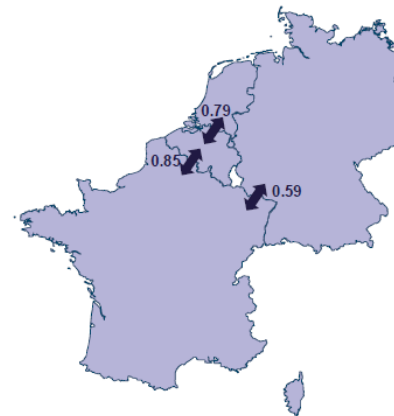
1

Operational Failure

Technical fault in the interconnector prevents the flow of electricity across to the CRM country at times of system stress



Probability of coincidental peaks – source: Eurelectric



2

Market Risk

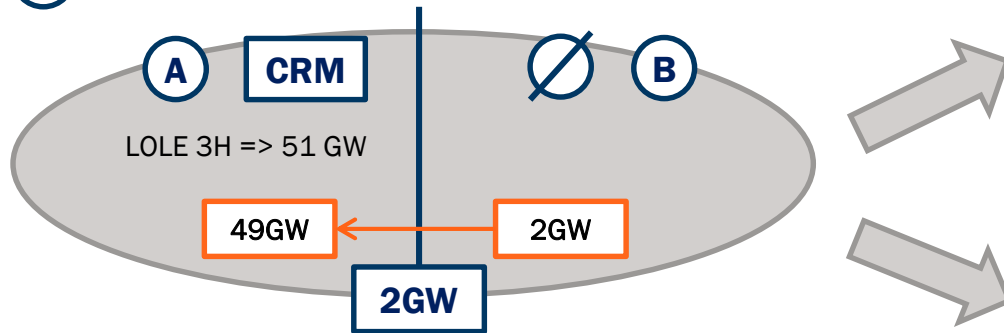
Coincidental scarcity - The interconnector does not import to the CRM country at times of system stress despite being technically available to operate, i.e., the connected market does not have sufficient surplus energy in excess of its own demand to allow exports to the CRM country.

Market failure risk – Flows on the I/C are determined by energy prices in the target model (TM): flows go from the low price to high price area. However, prices may not reflect scarcity, or the TM may not work.

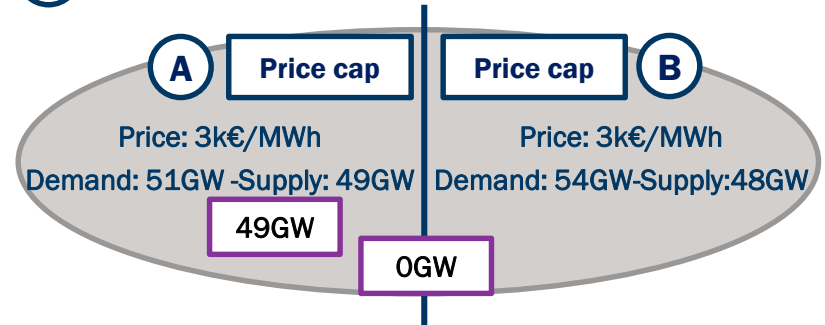
- Whatever the approach for cross border participation, it is necessary to evaluate the contribution of the interconnector to security of supply by taking into different kinds of risks.
- In addition, foreign capacities (DSR or generation) could also have to be de-rated to reflect their availability (as for domestic generators/DSR operators), but also potentially their contribution to the CRM country security of supply

3. Evaluation of the contribution to security of supply: the case of coincidental scarcity

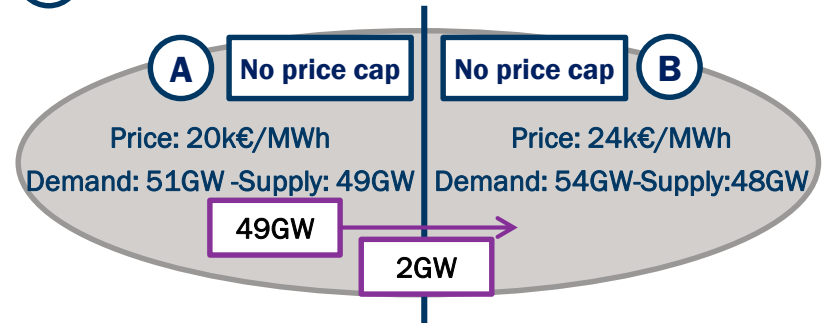
1 Capacity procurement



2a Energy market: scarcity situation simultaneously in A & B



2b Energy market: scarcity situation simultaneously in A & B



Consequences of the coincidental scarcity:

- Without intervention on energy markets: Whilst country A contracted capacity up to 51GW, only 47-49GW of its demand is satisfied depending on the situation.
- Country A paid to guarantee its supply, including for cross-border capacities, but cannot rely on them when supply tightens.
- A statistical approach would have led to the same outcome in the short-term, so what is the added value to pay for cross-border capacity?
- In the longer term, supply in country B may have been even lower without cross-border participation in the country A CRM, so net flows may have further deteriorated security of supply in country A (“capacity leakage”).

- Without specific rules / control on capacity contracted abroad – particularly at times of scarcity – cross border participation in CRMs has no value added in terms of security of supply over a simple statistical approach.

4. The definition of capacity products is a key – particularly whether the obligation is based on energy delivery or availability

a

Energy delivery obligation



Capacity providers must deliver energy into the network when the system operator calls for stress events, whatever the energy price signals are.

- **Dispatch efficiency:** risk of distortions as it may force generators to generate at prices below their costs; however, in scarcity events, prices should hit the roof, so limited inefficiency in practice
- **Security of supply:** guarantees that contracted capacities contribute to security of supply

With regard to cross-border participants:

- **Obliging committed foreign generators to generate is insufficient and potentially distortive**
- **Obliging committed foreign generators to export to the CRM country is incompatible with the functioning of the target model, but could be done through SO intervention**
- **Obliging the interconnection to import would lead the interconnection to intervene through close-to-real-time actions or hedging contracts**

b

Availability obligation



Capacity providers must only demonstrate their availability. Price signals ensure they deliver energy to contribute to security of supply. May be complemented by an obligation to bid in balancing market, so that the SO may use capacity as a last resort.

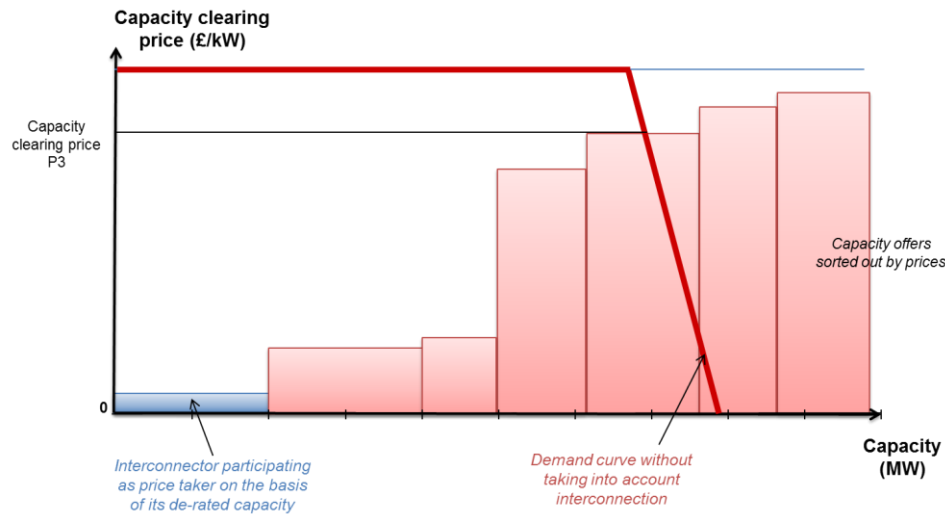
- **Dispatch efficiency:** should not create distortions as capacity providers continue to follow prices
- **Security of supply:** if prices are not reflective of scarcity, contracted capacities may not fully contribute to security of supply; however, giving the possibility to the SO to use the capacity as a last resort overcomes this issue

With regard to cross-border participants:

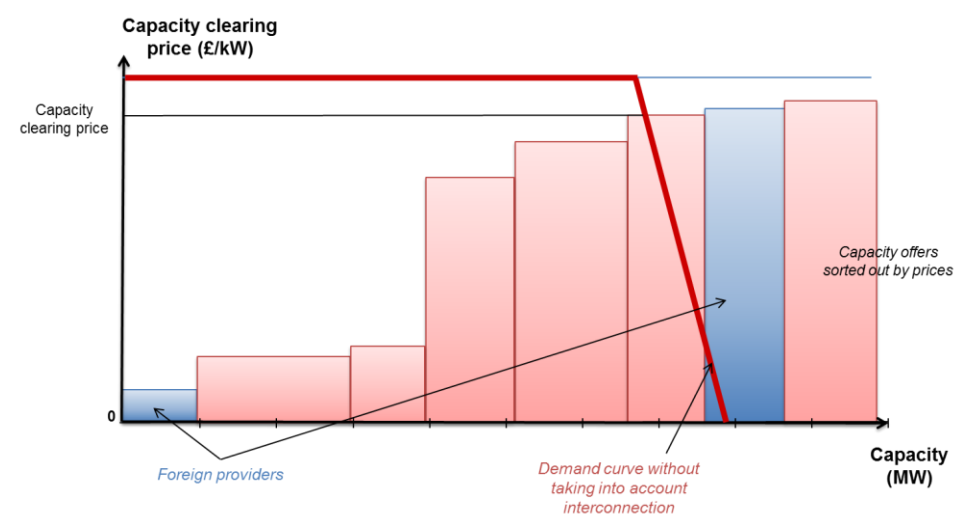
- **Contribution to security of supply in the CRM country is not guaranteed** – It guarantees the availability of the committed foreign generators, but not always to the direct benefit of the CRM country paying for it.
- **Added value of contracting abroad questionable** – *In fine*, limited benefits in the CRM country compared to statistical contribution, at least in the short term. Long-term incentives debatable, may depend on the existence of a CRM in the neighbouring country.

5. Impact of cross border capacity participation on capacity prices depends on bidding rules and bidding behaviour

Capacity auction: Case 1 of interconnector's direct participation



Capacity auction: Case 2 of foreign generators' direct participation



- In case 1, interconnection participates directly, as a price taker
 - assuming a similar de-rating, same clearing price as in the statistical contribution (mere translation of supply and demand curves);
- In case 2, foreign providers participate directly, with different bid prices
 - their total bid capacity is assumed to be equal to the de-rating value of interconnection
 - cannot lead to a lower price, but could lead to a higher price if their bids are less competitive

- Compared to statistical contribution, direct foreign generators' or interconnection's participation in a CRM:
 - Does not necessarily lower costs for consumers: capacity prices are actually equal or higher in the short-term
 - Does not necessarily lead to higher competition: competitive pressure is actually lower in the short-term
 - Bidding rules may influence the outcome (e.g. price taker / price maker rules in the UK CRM)
 - But it may give long-term signals to drive investments and limit dynamic investment inefficiencies
- One of the key questions is whether contracting with foreign participants / interconnection can increase the reliability of the foreign contribution, leading to higher security of supply (therefore lowering costs)

Comparison of options to take into account cross-border contribution

Overview of the different methods to take into account cross-border contribution

1
No Contribution

Neither interconnectors nor foreign providers contribute

This applies to most countries with capacity payment mechanisms (price based)

2
Statistical contribution

Contribution evaluated statistically and deducted from capacity target (but not included in formal mechanism)

FR capacity mechanism foresees this approach (~7GW out of 9GW of import cap.). Current GB approach (net 0 contribution though)..

3
Interconnector participation

Interconnector participates directly in capacity mechanism

Solution envisaged in GB according to recent public consultation

4
Foreign Capacity participation

Foreign capacity providers participate directly in capacity mechanism

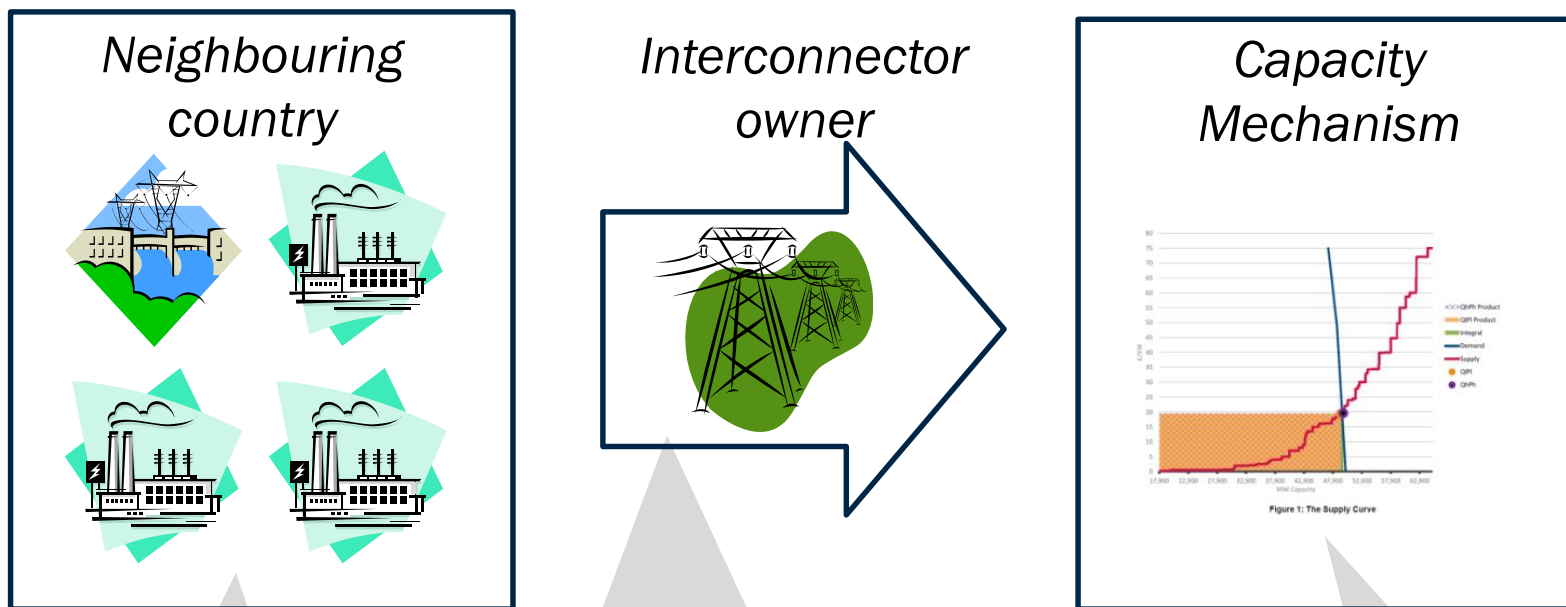
This has been implemented in the PJM Capacity Market

5
Cross-border Capacity Mechanism

Capacity mechanisms cover several zones OR national capacity mechanisms are "coupled"

No current international examples¹

How interconnectors could participate in capacity mechanisms



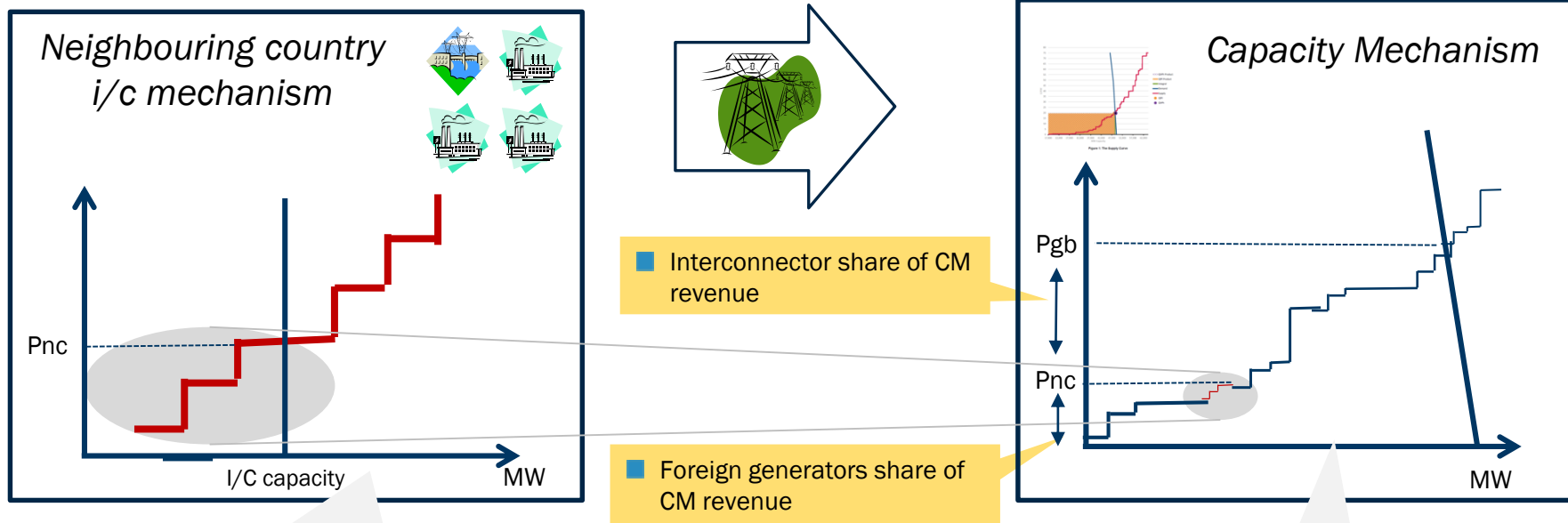
- Generators do not participate...
- ...and receive no revenues

- Interconnector owner bids full (de-rated) capacity into GB CM
- Receives remuneration for capacity at clearing price
- Despatch as per Target model
- Pays penalty if does not deliver

- Customers may benefit as (*ceteris paribus*) capacity prices could be lower than would have been

Proposal to design a model of foreign generator participation...

One such approach could model itself off implicit auctions...



- Generators bid to get access to CM via interconnector
- Up to level of i/c capacity
- Receives some revenues at "local CM" clearing price
- Pays penalty if interconnector not delivers energy

- Interconnector submits revealed clearing bids into GB CM
- Receives some revenue from CM but pass on some revenue to generators
- Pays penalty only if technically unavailable

- Customers may benefit as (*ceteris paribus*) capacity prices could be lower than would have been

Seven criteria for the assessment of the different options

1) Economic Efficiency

Does the proposed method encourage capacity to be procured at the most efficient (i.e. lowest) cost?

2) Security of Supply

Does the proposed method ensure that objectives of security of supply e.g. acceptable losses are met?

3) Impact on market functioning

Does the proposed method introduce new incentives that significantly affect the operation of the capacity or energy market?

4) Impact on competition

Does the proposed method affect competition in the market?

5) Incentives to invest in generation and cross-border capacity

Does the proposed method give the correct incentives to potential investors in refurbishing or building new plant and interconnectors?

6) Complexity of implementation and operation

Is the proposed method easy to understand, implement and operate?

7) Compatibility with state aid regulation

Does the proposed method contravene state aid rules?

Summary of the assessment of the different approaches to take into account interconnection in CRMs

	No Contribution	Statistical Contribution	Interconnector Participation	Foreign Participation	Cross-border Mechanism
Economic Efficiency	Red circle	Green circle with diagonal lines	Green circle with diagonal lines	Green circle with diagonal lines	Green circle
Security of Supply	Green circle	Green circle with diagonal lines	Green circle with diagonal lines	Yellow circle	Green circle
Impact on energy market	Red circle	Green circle with diagonal lines	Green circle with diagonal lines	Green circle with diagonal lines	Green circle with diagonal lines
Impact on competition	Red circle	Orange circle with diagonal lines	Orange circle with diagonal lines	Orange circle with diagonal lines	Green circle
Incentives to invest in G° & C-B capacity	Red circle	Orange circle with diagonal lines	Green circle with diagonal lines	Green circle with diagonal lines	Green circle
Complexity of implementation	Green circle	Green circle	Yellow circle	Orange circle with diagonal lines	Red circle
Compatibility with state aid	Red circle	Yellow circle	Green circle with diagonal lines	Green circle	Green circle

- The No Contribution option is clearly to be discarded.
- Cross-border CRM appears to be the most efficient solution.
- However, because of the complexity of implementation, all options except no contribution might still be worth considering, depending on trade-offs and local specificities.

Conclusions



Conclusions

- **Explicit foreign participation is attractive at first sight but raises a number of issues:**
 - It improves economic efficiency and competition only if it leads the interconnection to be de-rated to a higher value
 - To do so, addressing situations of coincidental scarcity, although they might not be so likely, is key
 - There is a trade-off between securing contribution from cross-border capacity and intervening on energy markets
 - Implementation of explicit foreign participation is complex: operational cooperation, ticket allocation processes, question of geographical scope, legal framework etc.
- **Regional approaches towards a coordinated mechanism should be sought:**
 - It requires a common view by all countries of the region about the need and rationale to implement a CRM
 - Key design choices should be aligned: as a minimum, volume-based, market-wide, and consistent product definition
 - Cost reductions stem from a coordinated capacity assessment and a “sharing of capacity” to reduce capacity to contract and avoid overinvestment on a national basis
 - As a first step, direct cross-border participation of foreign capacity providers between countries with CRM could be implemented: participants will not be allowed to participate in several mechanisms at the same time
 - Ultimately, with sufficient harmonised CRM designs, a single regional market should be aimed at
- **As long as there is no common view about CRM implementation need and critical design choices, the statistical contribution approach is a pragmatic way forward.**