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Capacity Markets and the EU Target Model – a Great Britain Case Study

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SUMMARY

The growth of interconnection between national electricity markets is key to the development and competitive efficiency of the Single EU Market for Electricity. However, in parallel with the development of the Single Market, a growing number of EU Member States have implemented – or are in the process of developing – national Capacity Mechanisms in order to ensure future security of supply, which may distort the cross-border trade of energy across interconnectors and reduce total welfare. In particular, the Electricity Market Reform (EMR) legislative package recently brought in by the UK government introduced a Capacity Market (in which two rounds of auctions have taken place to date) for the provision of generation capacity from 2018. In order to ensure that such national markets do not distort the wider energy market, it is important that the role of cross-border capacity, and the availability of interconnector capacity, is correctly consolidated into such mechanisms. In the first annual GB auction the net contribution of interconnection was included on a conservative basis informed by historical data, and while interconnectors have since been permitted to bid into the Capacity Market at a de-rated value (in a similar manner to domestic generation), generators in other markets are still not able to explicitly participate. This may continue to introduce market distortions and adversely impact both short-term dispatch and long-term investment decisions in both the GB and neighbouring markets. A number of routes are available to resolve this through a mechanism to permit cross-border participation of generators, but this requires resolution of a number of complicating factors, not least a means for properly allocating transmission capacity without introducing further distortions to the energy market. Alternative solutions could be enacted at an EU-level, such as through the alignment of Capacity Mechanisms to a common model, or the introduction of an EU-wide single Capacity Mechanism, but the current regulatory focus appears to remain on resolution of such issues at a national level.

KEYWORDS

Capacity Market, Cross-border Trade, Interconnectors, Generation Adequacy, Network Adequacy

INTRODUCTION

The realisation of interconnector capacity is vital for the creation of a single EU market in electricity. Historically across Europe, transmission interconnections between national systems have been developed to promote security of supply, but increasingly have taken on a wider role in order to promote competition, trade and an increase in overall welfare across EU Member States[1] [1]. A shortage of interconnection capacity creates barriers to trade, and so the European Commission has been taking steps – most significantly through the Third Energy Package of 2009 [2] – to promote investment in new cross-border connections. The Energy Union package of 2015 refers to desirable levels of interconnection of 10% and 15% by 2020 and 2030 respectively, although there is no proposal for these targets to be mandatory [3].

However, a number of EU Member States have, in recognition that existing energy markets may not provide adequate levels of security (in terms of generation adequacy, implemented 'capacity mechanisms' which remunerate generators or Demand Side Response (DSR) for committing to be available to generate across some future time horizon. EU Member States which have established, or are seeking to establish, capacity mechanisms include Austria, Belgium, France, Germany, Greece, The Republic of Ireland[2], Italy, The Netherlands, Poland, Spain and the United Kingdom[2] [4]. Increased interconnection also exposes inefficient generation to market forces, resulting in plant closure, which can further impact security of supply and incentivise the use of capacity mechanisms. Such mechanisms can take a variety of forms, with the European Commission recognising six categories within two broad types [5]:

1. Targeted mechanisms where support is given to additional capacity expected to be required on top of what is provided by the market:

- Tender: where a beneficiary of a tender receives public financing for the construction of a power plant;
- Reserve: where contracted capacity is held in reserve outside the market and only activated where necessary;
- Targeted capacity payment: where a price set by a central body is paid to a subset of capacity in the market (such as a specific technology type);

2. Market-wide mechanisms where support is provided to all (or the majority of) providers of capacity in the market:

- Central buyer: where a volume of capacity required is set and a market determines the price at which this is provided through a central bidding process;
- De-central obligation: where an obligation is placed on market participants (such as retailers) to contract sufficient capacity to cover their demand;
- Capacity payment: A price for capacity expected to achieve sufficient investment is fixed, and the market responds with a variable volume.

[1] In the GB market, however, development was initially driven by trading opportunities.
[2] The Republic of Ireland is integrated into a Single Electricity Market (SEM) with Northern Ireland, a territory of the United Kingdom, covering the entire geographical island of Ireland. The electricity market of Great Britain is discussed within this paper, which does not include Northern Ireland, but the body responsible for setting the energy policy of Great Britain is the Government of the United Kingdom.

As part of the Electricity Market Reform (EMR) implemented by the UK Government in 2014, a Capacity Market was introduced for the Electricity Market of Great Britain which broadly follows the Central Buyer methodology, and the design was accepted by the EU Commission as being within State Aid rules. To date two annual auctions have taken place, for the provision of capacity from 2018 onwards.

This paper evaluates the goals and design of the GB Capacity Market, and in particular focuses on how the implementation has treated interconnector capacity, in order to determine the Mechanism's impact on interconnector development and the convergence of the GB electricity market with the Single Market.

BACKGROUND TO THE GB CAPACITY MECHANISM

The early attractiveness of gas generation and slow growth in electricity demand helped to maintain adequate capacity margins in the UK after liberalisation in 1989, but the last decade has seen the margin eroded and confidence in capacity adequacy has reduced for several reasons [6]:

- Age and environmental concerns (particularly the EU Large Combustion Plant Directive and Industrial Emissions Directive) leading to widespread retirement of coal plants;
- Nuclear plants being retired at the end of their operational lifespans;
- Rising and volatile gas prices deterring new gas plant;
- A policy-driven uptake in renewable and intermittent low-carbon generation;
- Uncertain trends in electricity demand.

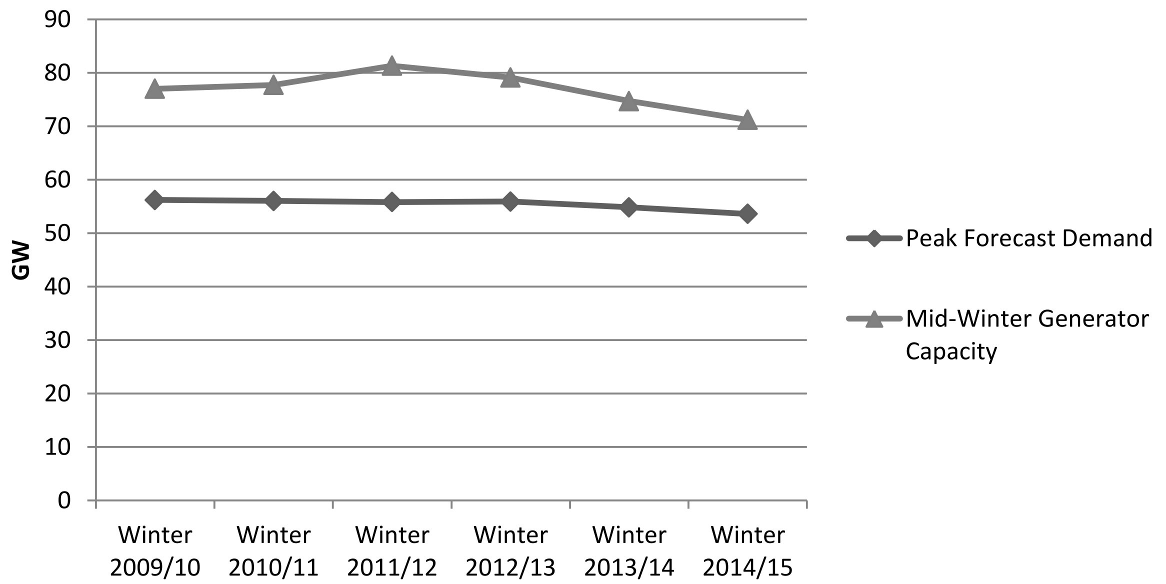

Figure 1 – Forecast demand and generation capacities for the last 6 GB Winter Outlook reports from National Grid [8]. The Mid-Winter generation capacity is the declared amount of available generation capacity at the beginning of the season.

In the energy-only market introduced in GB under the New Electricity Trading Arrangements of 2001, the expectation was that capacity adequacy would be maintained by electricity prices rising if the market anticipates an impending shortage of capacity – the "peak load pricing theory". However, it has proven difficult for generators to base major capital investments on the basis of high prices in periods of supply scarcity due to both operational risks and an uncertain political climate [7], as well as the impact on market prices from increasing volumes of zero marginal cost renewable generation. Figure 1 below shows the reduction in capacity against forecast demand over the last 6 Winter Outlook reports from National Grid.

The UK Energy Act 2013 set out a package of legislation for the Electricity Market Reform (EMR), which includes long-term Contracts for Difference for low-carbon generation, and a Capacity Market (the first such to be in place since the Pool[3] was replaced).

GB CAPACITY MARKET DESIGN

An auction is conducted annually for delivery in 4 years' time; i.e. the 2014 T-4 auction was for capacity delivery in 2018/19 and onwards. Existing generators and DSR are only eligible for one-year agreements for capacity, whereas new-build generators may be able to establish agreements for up to 15 years. Generators requiring substantial refurbishment may negotiate agreements for up to 3 years. The auction is technology-neutral other than in applying a de-rating factor to each technology according to its likely contribution to security of supply at time of system stress.

The parameters for an auction are provided by the Secretary of State, normally informed by the annual electricity capacity report and an estimate of demand-side response capacity, which are typically commissioned from the System Operator, and the reliability standard set by legislation. These parameters include:

- the demand curve
- the target capacity
- the price cap
- the price-taker threshold

The electricity capacity report includes a forecast of how much of the peak demand for electricity will be met by interconnector capacity, but the overall recommendation is intended to be technology-neutral.

In order to participate in the auction, bidders must undergo a pre-qualification assessment 5 months ahead of the auction which determines their eligibility to participate (based on such items as their historically metered data and their credit status), and the de-rated capacity (calculated by technology class) which they are eligible to bid into the auction. Generators receiving support for low-carbon generation are not eligible to participate.

The market is conducted as a pay-as-clear Dutch auction, starting at the price cap (£75/kW in the auctions to date) and reduced progressively in £5/kW bands until the capacity remaining intersects with the demand curve. A full description of the auction process is available in [9].

[3] The Pool was the mechanism in place for the wholesale market between 1990 and 2001, acting as a compulsory day-ahead last-price market, and included a capacity payment based on loss of load probability.

CAPACITY MECHANISMS WITHIN THE EU

The EU approach to capacity mechanisms has varied across legislative packages. In April 2015, in response to the growth in national capacity mechanisms, the European Commission launched a state aid inquiry into their use, in order to determine whether they ensure sufficient electricity supply without distorting competition and trade in the Single Market. Such mechanisms are permitted when "there is a real risk of insufficient electricity generation capacity" [10] in order to encourage new generation capacity, postpone closures of existing plant, or reward consumers for actions which lead to reductions in peak consumption. Design of such a mechanism, in addition to generic competition and market stipulations, is required to include:

- A clear demonstration of the reasons why the market cannot be expected to deliver adequate capacity in the absence of intervention;
- A description of the unit of measure for quantification of security and its method of calculation;
- Assessment of the impact of variable generation (including in neighbouring systems), demand-side participation, and interconnectors;
- A remuneration only for availability: that is, a payment made per MW capacity committed to be available, and not per MWh sold;
- Adequate incentives to existing and future generators and allow for potentially different lead times for different technologies, and be open to potential aggregation of both demand and supply;
- The ability for operators from other Member States to participate where it is physically possible for them to do so.

Additionally, the mechanism should not reduce incentives to invest in interconnection capacity, undermine market coupling, strengthen market dominance, undermine pre-existing investment decisions or give preference to low-carbon generators with equivalent technical and economic parameters (that is, the mechanism should be distinct and separate from one designed to decrease the carbon intensity of generation).

The EU 2014 review of the United Kingdom's progress within the Single Market [11] found that greater interconnection is needed, and that recent successive legislative and regulatory changes are of concern and interventions must be kept in line with Internal Market and State Aid rules. However, in July 2014, the Commission found that the proposed UK Capacity Market for Great Britain was within EU state aid rules and "embraces the principles of technology neutrality and competitive bidding to ensure generation adequacy at the lowest possible cost" [12]. However, this decision faced some opposition, particularly from environmental groups, as it was viewed as a mechanism for providing preferential treatment to existing coal plants which might otherwise face closure, when assessed alongside the UK Government's freeze of the Carbon Price Support in the 2014 Budget [13].

THE ROLE OF INTERCONNECTION

EU law permits two forms of projects in the development of interconnectors: regulated projects implemented by national Transmission System Operators (TSOs), and for-profit "merchant" projects implemented by commercial investors, approved by the national regulator and the European Commission [14]. In the GB market, there are currently two routes for merchant interconnector investment [15]:

1. Regulated under the 'cap and floor' regime, available since May 2014. Under this route, developers identify, propose and build interconnections. Their revenue is regulated by both a cap and floor price.
2. Exempted from regulatory requirements for revenue treatment, with exposure to full upsides and downsides of investment.

The UK government does not see a formal role for itself in network planning or approval of interconnection beyond instituting the appropriate regulatory regime [16].

In addition to the four existent interconnectors, there are currently 6 interconnectors recognised by the GB regulator as being under development under the cap and floor regime, totalling 6.3GW, and one exempt interconnector of 1GW, as summarised in Table 1.

Table 1 - Current GB interconnection operational or under development, with the regulatory mechanism being pursued for interconnectors being commissioned after the introduction of Cap and Floor in 2014 [15]

Project	Capacity (MW)	Interconnected Market	Commissioning Date	Regulatory Mechanism
IFA	2000	France	1986	
Moyle	500	Ireland[4]	2002	
BritNed	1000	Netherlands	2011	
EWIC	500	Ireland	2012	
ElecLink	1000	France	2019	Exempt
NEMO	1000	Belgium	2019	Cap and floor
NSN	1400	Norway	2020	Cap and floor
IFA2	1000	France	2020	Cap and floor
Greenlink	500	Ireland	2021	Cap and floor
FAB Link	1400	France	2022	Cap and floor
Viking	1000	Denmark	2022	Cap and floor

The original intention was for interconnectors (or interconnected capacity) to be incorporated in some manner into the GB Capacity Auction. However, the complexity of determining the appropriate arrangements and legislation for doing so meant that they were excluded from bidding into the first auction. The EMR proposals for the first auction instead allowed for interconnection capacity to be incorporated into the target capacity and demand curve:

> *"The expected contribution from interconnectors will be reflected in the amount of capacity auctioned. For example, if 2GW of imports are expected to be available at times of GB system stress, we will reduce the amount of capacity auctioned in the Capacity Market by 2GW"* [17]

[4] More specifically, the Single Electricity Market (SEM) of Ireland, incorporating the Republic of Ireland and Northern Ireland. The SEM is correlated on price to GB but includes capacity payments and totals to higher costs, so the net flow at peak is from GB to Ireland. This may change with the new market arrangements (iSEM) being developed in Ireland and the removal of constraints between the Republic and Northern Ireland.

However, in the first auction (2014 T-4), a conservative position on net flows at times of system stress was recommended in National Grid's assessment:

> *"…while interconnectors cannot participate in the auction itself, a conservative view should be adopted about the level of capacity they would provide during times when the system is under stress. Theoretically, if the UK energy system is under stress due to high demand and low supply, you would expect prices for energy to be higher in the UK and relatively lower in neighbouring countries, where the energy system might not be under stress. Interconnected capacity should therefore naturally flow onto our system, but our operational experience tells us that this does not always happen."* [18]

Once the CM had been further developed to accommodate interconnectors they were able to participate in the second auction (2015 T-4) [19], using de-rating factors calculated on behalf of DECC using a "hybrid" de-rating approach [20], along with analysis of historical weather patterns and the modelling of the impact of interconnection on the Loss of Load Expectation [21]. This calculates the maximum average contribution to GB security of supply at times of system stress – taking into account the likely flows between markets using historical market data applied to 4 future scenarios – which is then adjusted to account for technical availability of the interconnector. The de-rating factors for the five eligible interconnectors are given in Table 2. Note the low de-rated value for the GB-Ireland interconnection, which reflects that the markets are highly correlated in terms of demand profiles and wind generation.

Table 2 - 2015 T-4 Interconnector participation [20],[25]

Project	2015 T-4 Final de-rating	Participant in 2015 T-4 auction?	Capacity Agreement awarded?
IFA (France)	52%	Yes	Yes (1033.76MW)
Eleclink (France)	56%	No	N/A
BritNED (Netherlands)	69%	Yes	Yes (828MW)
NEMO (Belgium)	54%	Yes	No
Moyle and EWIC (Ireland)	6%	No	N/A

AUCTION RESULTS TO DATE

2014 T-4

The first capacity auction, for delivery in 2018/19, was conducted on 16th-18th December 2014 and the results announced the following day [23]. 64.97GW of capacity entered the auction, with 49.26GW (75.8%) receiving Capacity Agreements at a clearing price of £19.40/kW, with a total cost of £0.99bn (in 2014 prices). The clearing price was significantly below analysts' expectations, and almost 6GW of existing capacity failed to secure contracts [24].

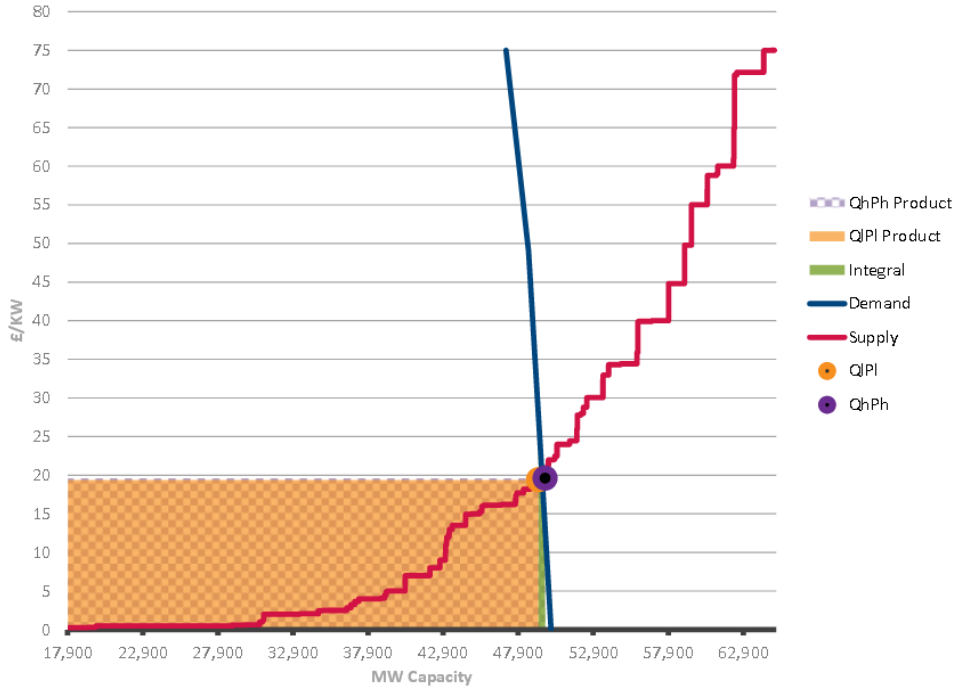

Figure 2 - 2014 T-4 Auction demand and supply curves (reproduced from [23])

2.6GW (5.3%) by capacity was awarded to 77 new-build units, and 0.17GW (0.36%) to 15 Demand-Side Response (DSR) units. The remaining capacity was awarded to existing generators.

Table 3 - 2014 T-4 Auction - Capacity awarded by technology [4]

Technology	Capacity (GW)	Capacity (%)	No. Units
CCGT	22.3	45.2	47
Coal/Biomass	9.2	18.7	29
Nuclear	7.9	16.0	16
CHP / autogeneration	4.2	8.6	36
Storage	2.7	5.5	13
OCGT / Reciprocating engines	2.1	4.3	121
Hydro	0.7	1.4	29
Demand-side Response	0.2	0.4	15

2015 T-4

The second capacity auction, for delivery in 2019/20, was conducted on 8th – 10th December 2015 and the results announced the following day [25]. 57.72GW of capacity entered the auction, with 46.35GW (80.3%) receiving Capacity Agreements at a clearing price of £18.00/kW, with a total cost of £0.94bn (in 2015 prices).

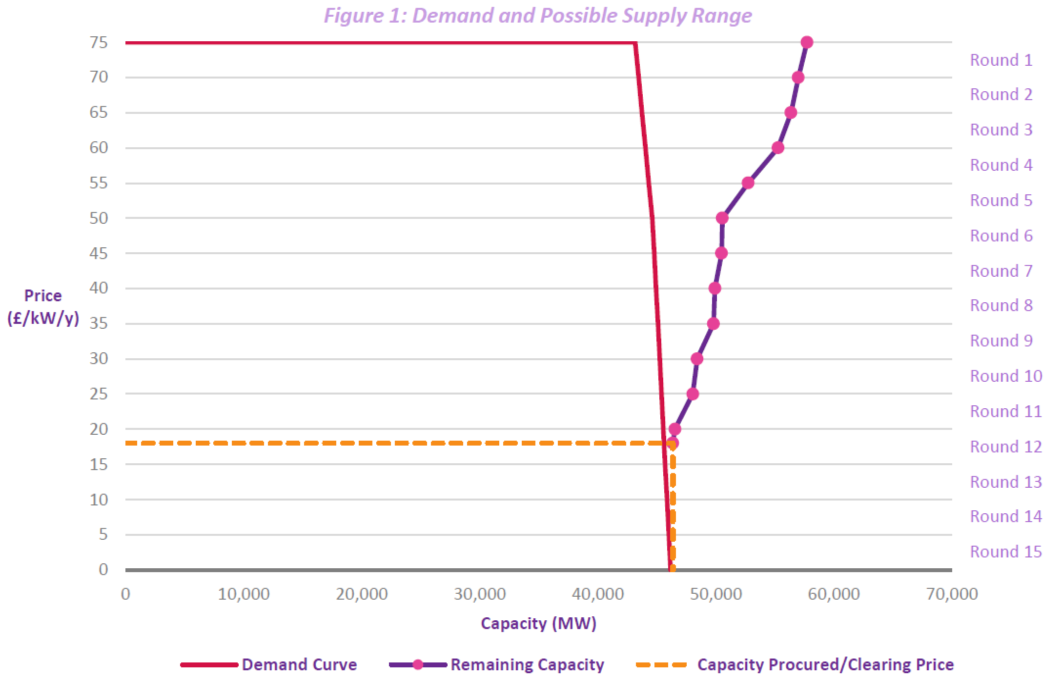

Figure 3 - 2015 T-4 Auction demand and supply curves (reproduced from [25])

1.94GW (4.2%) by capacity was awarded to 74 new-build units, and 0.5GW (1.0%) to 23 Demand-Side Response (DSR) units.

Table 4 - 2015 T-4 Auction - Capacity awarded by technology [5]

Technology	**Capacity (GW)**	**Capacity (%)**	**No. Units**
CCGT	21.8	47.1	48
Nuclear	7.6	16.3	16
Coal/biomass	4.7	10.1	24
CHP / autogeneration	4.2	9.1	43
Storage	2.6	5.7	15
OCGT / Reciprocating engines	2.4	2.4	5.2
Interconnector	1.9	4.0	2
Hydro	0.7	1.5	33
Demand-side Response	0.5	1.0	24

One new-build interconnector (the 1GW NEMO LINK between GB and Belgium) offered 540MW of capacity but exited the auction prior to clearing.

MARKET DISTORTIONS AND HARMONISATION

There are two types of cross-border distortions in markets resulting from local capacity mechanisms [4]. Firstly, static short-term distortions affect whether prices reflect the cost of production and hence whether the production of electricity is least-cost effective. If a capacity mechanism does not adequately consider non-domestic generation capacity, then wholesale distortions will arise. If a generator receives payments which affect their electricity generation bids into the market, and generators in a neighbouring energy-only market do not receive such payments, then this will alter the ability of generators in neighbouring markets to directly compete on price.

Secondly, there may be dynamic distortions which impact generation investment decisions. Capacity mechanisms may even become the main driver for investments in new electricity generation capacity, rather than energy prices, as has been demonstrated in modelling of the potential impact of a capacity mechanism in the German market [26].

Other cross-border effects have also been identified [27]:

- A decrease in peak prices, due to a solely energy-based remuneration being replaced with two-part payments to generators for energy and capacity, meaning that the 'missing money' problem (where market prices do not adequately represent scarcity value and so are insufficient to stimulate investment in new-build capacity) may be in part exported as generators in neighbouring markets cannot benefit from price spikes in the market with the Capacity Mechanism;
- Impacts on capacity, due to additional investments being triggered in regions with a Capacity Mechanism at the possible expense of investment decisions in neighbouring markets;
- A 'free-riding' effect, whereby an increase in generation capacity in a market with a Capacity Mechanism leads to a smaller increase in available capacity in a neighbouring market due to their interconnection, despite consumers in the second market not having to pay for that capacity;
- A reduction in infrastructure investment due to reduced trade leading to lower congestion rents;
- A redistribution of surpluses between generators and consumers leading to a possible decrease in total welfare.

Because a country has no control over generation at the other end of an interconnector there has been a default methodology which assumes that interconnectors do not make any contribution to national security of supply [6], and this appears to have been the case for the exclusion of interconnectors from the first GB capacity auction. While subsequent auction rounds have and will include de-rated interconnector capacity, the non-inclusion of interconnection capacity in the first auction round could potentially have reduced the future space accorded to interconnectors (or demand side response). However, as only a small volume of contracts were given extending beyond the first year of delivery, this is unlikely to have been significant in practice.

There are 3 main determinants of a shortfall of capacity in western European markets: the level of peak demand, failures of conventional plant, and the availability of intermittent generation. The chances that each of these could occur simultaneously in two or more neighbouring countries is hence low, and the role of interconnection is enhanced by the market coupling increasing responsiveness of flows to price differentials, so that imports should occur through cross-border signals in response to all but very short-term fluctuations. However, while GB is currently interconnected to 3 different markets (France, Netherlands and Ireland), and in the future to 3 additional markets (Belgium, Norway and Denmark), continental Europe will increasingly become one market and so the correlations between GB and neighbouring markets (in terms of pricing) can be expected to change.

Modelling work [28] commissioned by the GB Regulator during the design of the Capacity Mechanism design process indicate that low system margins (less than 20%) in GB show a medium level of correlation with low system margins in Ireland and France, but very low system margins (less than 10%) do not show a definite correlation with any of the other systems. However, there are a small number of historical datapoints from which to assess this, and it is conceivable that there could be mechanisms (such as extreme weather events) which might lead to very low margin periods in neighbouring countries at the same time. Similar work [29] on modelling stress events showed that interconnectors could be expected to deliver flows of electricity at times of high stress and reduce unserved energy. Clearly, then, the value of interconnection needs to be recognised within a national capacity mechanism in order to avoid over-procurement of local capacity at significant cost to the consumer, but the question remains of the optimal methodology for harmonising interconnection with a capacity mechanism to avoid distortions in cross-border energy trading. Increasing transmission capacity under asymmetric market designs may even serve to magnify existing distortions [30].

A further concern is that if an interconnector is itself bidding into a capacity mechanism (such as in the GB 2015 T-4 auction), then how is it ensured that the capacity expected to be 'available' is actually so when it is needed? There are several ways to reflect this obligation [31]:

1. The interconnector must actually deliver energy in the required direction of system stress;
2. The interconnector must be *available* to deliver energy in the required direction of system stress, but actual flows may depend on generator behaviour;
3. The interconnector carries no obligation in either availability or delivery.

The latter case was implemented in the 2015 T-4 auction, with the de-rated capacities of each interconnector (as determined by the modelled correlations between each market) used in the auction to represent the risk of each not delivering energy when required.

Mechanisms for Harmonisation and Enablement of Competition across Borders

There are a number of means by which the joint goals of national generation adequacy and EU market harmonisation may be achieved together.

Firstly, the actual cross-border exchange of capacity could be permitted – that is, generators in neighbouring markets are allowed to bid for capacity within the mechanism. This would ensure the competitive benefits of cross-border trading in energy are extended into capacity, and reduce overall costs. However, this would introduce several complexities – a mechanism would be required to assess and certify foreign capacity and to determine its effective contribution taking into account transmission constraints, and to ensure that the foreign capacity is making the same effective provision as local participants. Further, the generation capacity would need to be matched by a firm transmission capacity across the interconnector. It would also be necessary to ensure that there were no other market distortions present between the markets. In the specific case of GB, the carbon price floor contributes to wholesale prices being significantly higher than in continental Europe. Network charging, renewable subsidies and taxation of generation and supply would also need to be harmonised to prevent distortions.

If a proportion of cross-border transmission capacity is reserved for this purpose, then this would limit the efficiency of cross-border energy trading. If the generator is instead required to purchase transmission rights to demonstrate an ability to deliver capacity, then while this would be more compatible with the EU target model for capacity allocation, this could lead to netted flows being inverted where both markets are capacity scarce and the provision of capacity is in opposition to the flow of traded energy. Similarly, the requirement to provide matched transmission capacity with generation capacity could be ignored under the assumption that cross-border flows are optimised, and prices should reflect scarcity, ensuring the flow is in the correct direction, but this may not occur under all conditions and would be dependent on Capacity Mechanisms between neighbouring countries being aligned. If capacity allocation is ignored, then there is no effective improvement upon the current methodology of taking into account the statistical contribution of interconnection rather than considering particular foreign generators – indeed, under such a mechanism where the transmission capacity is determined by the price-based flow, a foreign generator not participating in the Mechanism would be contributing to security of supply as much as one which was participating.

In addition, if a generator is able to access neighbouring markets, then they may be able to simultaneously bid capacity into more than one market. This could prove problematic if that generator is called to deliver in more than one market simultaneously. This could be removed via appropriate regulation, or alternatively viewed as a risk by the market operator which can be ameliorated through the use of de-rated capacities, similar to the current treatment of interconnectors in the GB Capacity Auction. Similarly, there is the question of whether transmission rights in the future purchased by a generator in one market entitles it to access the entire harmonised EU transmission system or only their domestic market – should the market harmonisation extend to the point where interconnectors are treated equitably as elements of the transmission network rather than separate entities with separate access rights?

Expanding the terms of the auction to include cross-border participation would not, however, address the issue that differing incentives between markets could lead to an implicit competition of national Capacity Mechanisms among each other, which may shift the generation mix away from the optimum, if viewed at a pan-European level [32]. A second approach would be to harmonise and coordinate national capacity mechanisms under a single design. However, with many different Capacity Mechanisms already in place, others being implemented, and a difference in generation backgrounds creating different drivers for design of those mechanisms, it seems unlikely that a single design would be appropriate across all Member States. It does not appear that such a common design is a current focus of the EU Commission. Local market designs may also reflect local physical adequacy in a more efficient manner.

Taking this idea further, a single EU-wide capacity mechanism could be enacted, as capacity installed solely to cope with scarcity in each individual market area leads to overcapacity seen in the European context. In [33], a nodal pricing market design across Europe is proposed (similar to that currently enacted within NordPool), where security is shifted away from regional operators (TSOs) towards centralised management. This approach appears to lead to an increase in transfers between countries due to more efficient use of interconnection capacity, but would obviously entail major institutional changes. However, systemic deviations away from the reference price at a node would provide a clear locational signal for power plant investment, in principle obviating the long-term need for separate capacity payments.

ENTSO-E does not advocate a radical change in the governance framework for security of supply in Europe, but proposes that national markets integrate in a local manner [34]. EURELECTRIC has proposed a roadmap to a European capacity market in which the development of national Capacity Mechanisms, and their regional coordination, form the interim steps over the next decade [35]. However there remains a wider question over whether Capacity Mechanisms will endure as an appropriate means of tackling the growing question of security of supply against the aims of decarbonisation and, if the energy-only market is currently incapable of delivering adequate capacity, whether more fundamental redesign of European electricity markets – capable of incorporating new sources of flexibility and reliability – may provide a more efficient solution [36].

CONCLUSION

In the absence of a clear EU-level roadmap to the alignment of national Capacity Mechanisms, any resolution of the conflict between the GB Capacity Market and the EU Single Market must be resolved through the redesign of that national market. While the eligibility of interconnectors in the GB 2015 T-4 auction could be regarded as an improvement on their exclusion from the 2014 T-4 auction, the inability of cross-border generation to explicitly participate is likely to continue to cause ongoing distortions in both the short-term dispatch of generation and long-term patterns of generation investment. However, the participation of generators across interconnectors raises further issues in both the certification of foreign generators and the efficient allocation of interconnector capacity without raising further market distortions. It also implies the need for EU-wide generation adequacy assessments and harmonisation of other elements which can distort the market, such as renewable subsidies. If these can be resolved, then such regional coordination of capacity markets with situation-specific cross-border trading arrangements could provide the interim steps towards a wider single EU capacity market and greater efficiency in addressing security of supply concerns across Europe as a whole.

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