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European Commission
DG Energy - ENER.B.2
'Internal Market II: Wholesale markets; electricity & gas'
Rue De Mot 24-26 - B-1049 Bruxelles

February 7nd 2013

Dear Sir/Madam,

Consultation on generation adequacy, capacity mechanisms and the internal market in electricity

Thank you for the opportunity to comment on the above consultation. Centrica is an integrated energy company operating predominantly in the UK and North America. Our UK supply business British Gas serves around 12 million homes, while our UK generation business Centrica Energy manages a diversified portfolio of CCGTs, offshore wind farms, and nuclear plants (in partnership with EDF). We also have generation interests in the Netherlands.

As the leading energy supplier in the UK we have a keen interest in ensuring that the market designs developed in Northwest Europe ensure security of supply for our customers. We believe that the development of renewable generation will create significant challenges for security of supply, and we doubt that energy-only markets can address these issues effectively, even if they are reformed to produce sharper price signals and more effective cross-border flows.

As a result, we recommend that the European Commission does not discourage the development of capacity mechanisms where they are needed. The Commission should only prohibit design features that may cause *significant* and *enduring* distortions in cross-border trade and investment. The Commission should ensure that its intervention does not lead to undue delays or unnecessary restrictions in the development of capacity mechanisms, as this could seriously damage investor confidence.

We hope that these comments are useful. Do not hesitate to contact me if you have any questions.

Yours faithfully,

By e-mail

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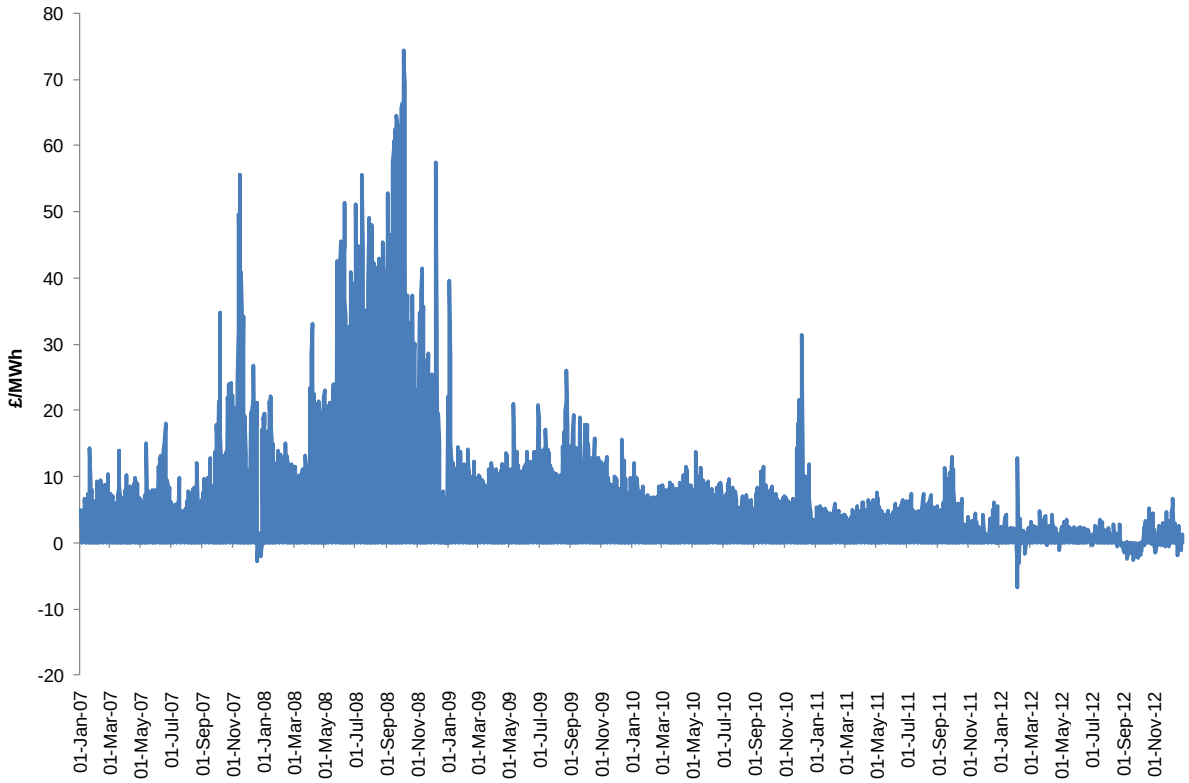
(1) Do you consider that the current market prices prevent investments in needed generation capacity?

Yes—Figure 1 shows the clean spark spreads (CSS – the profit margin per MWh earned by an average gas-fired plant) in Great Britain since 2007. Since the end of 2008, the CSS has been consistently under £10/MWh, which is generally considered to the minimum level necessary to attract new investment. Over the past two years the CSS has been below £5/MWh, and has been negative during some periods. Other countries in Europe are currently experiencing similar market conditions. These prices levels explain why there has been very little new investment in thermal capacity in GB recently.

Figure 1 Clean spark spreads in Great Britain



Source: Heren data, Centrica Energy analysis.

The absence of investment signals in GB is worrying because there is an urgent need for new investment to replace old capacity that is due to retire. The UK regulator Ofgem expects that generation margin may decrease to 4%, a level typically seen as critical (see Figure 2).

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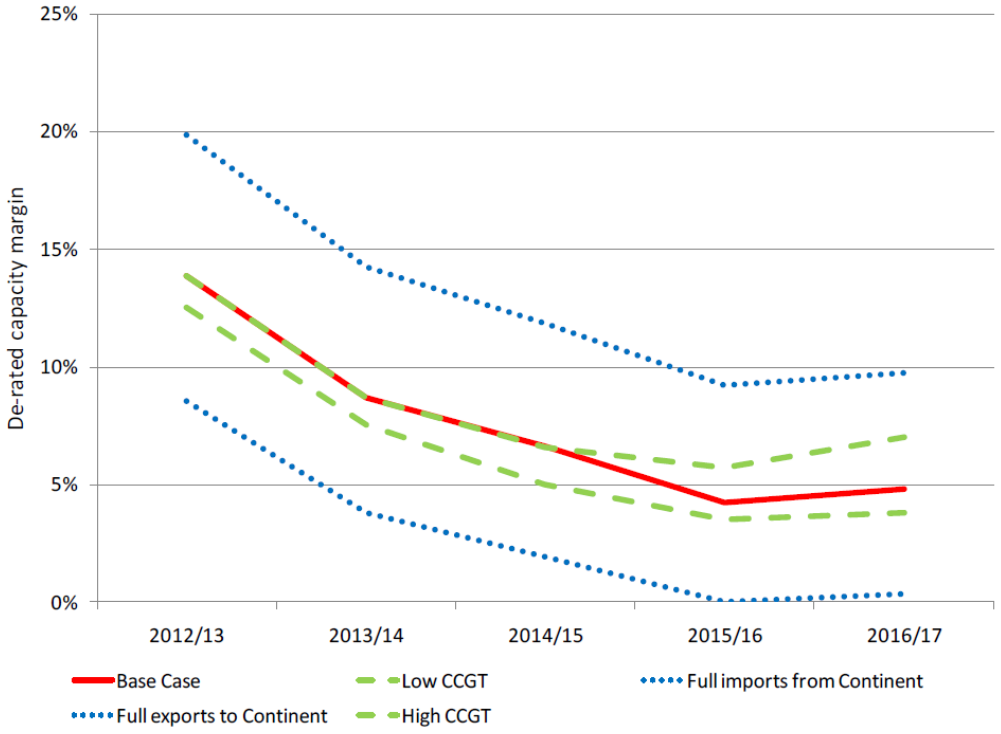
Figure 2 Ofgem's assessment of generation margins in GB



Source: Ofgem capacity assessment 2012

(2) Do you consider that support (e.g. direct financial support, priority dispatch or special network fees) for specific energy sources (renewables, coal, nuclear) undermines investments needed to ensure generation adequacy? If yes, how and to what extent?

Yes—Support for low-carbon generation means that thermal plants will increasingly play a backup role in the energy system and their load factor will decrease substantially. For example, Poyry estimate that average load factors for CCGTs will decrease to 15% by 2030, implying that the profits realised during running periods must rise substantially to make projects economic (see Figure 3 below)

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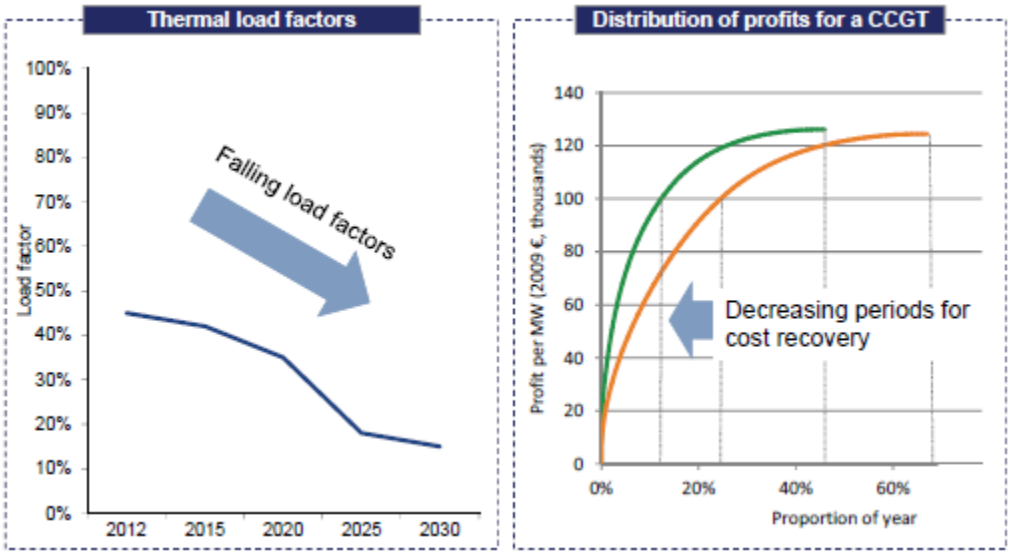
Figure 3: CCGT load factors and periods for cost recovery



Source: Poyry.

Under such conditions, prices would have to rise to very high levels at times of scarcity to support new investment in thermal plants (potentially close to the Value of Lost Load for consumers, typically estimated to be around €12,000/MWh). Prices at these levels are untested and could have adverse consequences for small participants (e.g. wind generators and small suppliers). They are also likely to be politically unacceptable. The combination of these factors would create huge pressures on regulators to cap prices in the wholesale market. For these reasons, generators are unlikely to invest when the business case of their projects is contingent on capturing very high prices during a few hours in the year.

(3) Do you consider that work on the establishment of cross-border day ahead, intraday and balancing markets will contribute to ensuring security of supply? Within what timeframe do you see this happening?

No—These initiatives may increase the likelihood of power flowing towards markets experiencing difficulties (insofar as such difficulties translate into higher power prices), but this will not be sufficient to guarantee security of supply in Europe. Many European markets will continue to have limited interconnection with adjacent markets over the foreseeable future, in which case the more efficient use of transmission capacity will only have a small impact on security of supply. More importantly, there is a strong risk that adjacent markets will experience difficulties simultaneously in the future, insofar as security of supply events will increasingly be driven by temperatures and wind speeds, and weather fronts can cover large regions in Europe. When that is the case, the management of interconnection capacity makes little or no difference to security of supply.

(4) What additional steps, if any, should be taken at European level to ensure that internal market rules fully contribute to ensuring generation adequacy and security of supply?

We believe that the completion of existing initiatives should be sufficient to ensure that the internal market contributes to security of supply, albeit we believe such benefits will be limited and insufficient to ensure security of supply (see our answer to question 3).

In our opinion, the priorities should be to ensure that:

- real time wholesale prices truly reflect the value of generation at times of scarcity;
- interconnectors flow towards the markets experiencing difficulties at times of scarcity.

Interconnected countries should have consistent security of supply standards and compatible within day spot market pricing arrangements such that the “right” price signals are created to ensure power flows in the direction of most stress.

(5) What additional steps could Member States take to support the effectiveness of the internal market in delivering generation adequacy?

As explained in our answer to question 4, we believe the priority should be to ensure that wholesale prices truly reflect the value of generation at times of scarcity.

(6) How should public authorities reflect the preferences of consumers in relation to security of supply? How can they reflect preferences for lower standards on the part of some consumers?

We believe that public authorities will have a role in determining reliability standards as long as all consumers cannot directly contract for different levels of security. Public authorities may use different tools to assess willingness to pay (eg stated preferences in consumer surveys, revealed preferences where contracting is possible), depending on information availability and local market structures. Consumers may opt for lower standards of reliability though interruptible contracts if the systems support this type of approach. The roll out of smart meter will progressively increase the potential for such services.

(7) Do you consider that there is a need for review of how generation adequacy assessments are carried out in the internal market? In particular, is there a need for more in depth generation adequacy reviews at: a. National level b. Regional Level c. European Level

Yes, at regional level—We believe there might be merit in examining how cross-border capacity would be used at times of system stress, and this type of study is best coordinated at regional level.

(8) Looking forward, is the generation adequacy outlook produced by ENTSO-E sufficiently detailed? In particular, a. Is there a need for a regional or European assessment of the availability of flexible capacity? b. Are there other areas where this generation adequacy assessment should be made more detailed?

We understand that the ENTSO-E report largely relies on the aggregation of national analysis. In our opinion, this report would be more valuable if it relied on direct modelling of security of supply events and generation adequacy at regional level. This modelling exercise should evaluate scenarios reflecting potential regional disturbances caused by extreme weather events or gas supply emergencies.

(9) Do you consider the Electricity Security of Supply Directive to be adequate? If it should be revised, on which points?

Yes—the principles set out in the Directive are adequate and we do not see any need for further changes at that level.

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(10) Would you support the introduction of mandatory risk assessments or generation adequacy plans at national and regional level similar to those required under the Gas Security of Supply Regulation?

Potentially—there might be some merit in introducing more detailed risk assessments at regional level, with a focus on the risks caused by weather-related events and the role of interconnection.

(11) Should generation adequacy standards be harmonised across the EU? What should be that standard or how could it be developed taking into account potentially diverging reference regarding security of supply?

No—We do not see any benefits in harmonising generation adequacy standards across the EU. Consumer preferences may vary across the EU for very valid reasons, eg the structure of demand, the level of risk aversion of consumers, the willingness to pay of consumers, etc. It is important that this decision is taken by public authorities that are accountable to their consumer base.

(12) Do you consider that capacity mechanisms should be introduced only if and when steps to improve market functioning are clearly insufficient?

No—We believe that capacity mechanisms should be introduced *in parallel* to other reforms designs to improve market functioning (for example reforms designed to 'sharpen' price signals in the market). We believe that changes in trading arrangements are necessary, but not sufficient to ensure security of supply. This is because generators will be inherently reluctant to invest when the business case of their projects is contingent on capturing very high prices during a few hours per year (see our answer to question 2). Issues with generation adequacy are bound to materialise as renewable penetration increases. The policy decision to promote the artificial introduction of very large amounts of intermittent generation across many Member States has effectively disrupted the normal functioning of the electricity market for the foreseeable future. Market signals can therefore no longer be relied upon to spur adequate investment in security of supply for customers.

We also note that capacity mechanisms are typically complex interventions that take time to 'bed down' before becoming effective. It is not realistic to assume that these schemes can be set up at the last minute when all other options have been exhausted and reliability issues are starting to materialise.

Finally, we believe that early intervention would not necessarily lead to increased costs if the right design is adopted. The type of market-based mechanisms developed in France and Great-Britain essentially enable generators to participate in the wholesale market normally, while receiving a 'top-up payment' from a counterparty if their market revenues do not allow them to break even and their participation is required to ensure security of supply. This approach means that the costs of the scheme remain low as long as energy revenues are sufficient. The capacity mechanism only acts as a 'safety net' when energy revenues become too low or too volatile.

(13) Under what circumstances would you consider market functioning to be insufficient: a. to ensure that new *flexible* resources are delivered? b. to ensure *sufficient* capacity is available to meet demand on the system at times of highest system stress?

While we support initiatives to improve the functioning of energy markets, eg through sharper price signals, we are sceptical regarding their ability to ensure generation

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adequacy and sufficient flexibility. We think there is then a role for SOs or public authorities to procure the right level of capacity and flexibility required to ensure the specified system reliability is achieved. There is a complex interaction between capacity and flexibility and how much of each is needed to ensure security standards are met. There needs to be appropriate market-based arrangements to deliver the right mix of different resources.

(14) In relation to strategic reserves: a. Do you consider that the introduction of a strategic reserve can support the transition from a fossil fuel based electricity system or during a nuclear phase out? b. What risks, if any, to effective competition and the functioning of the internal market do you consider being associated with the introduction of strategic reserves?

No—We do not have a view on whether a strategic reserve is the right mechanism to address the specific issue of a nuclear phase out. However, we *do* believe that it is *not* an appropriate form of intervention in the more normal market contexts faced by the majority of Member States.

The key risk with strategic reserves is that they might effectively suppress price signals and investment incentives in the 'unsupported' part of the market, and that this might, in turn, increase the need for out-of-market interventions. This could eventually create a vicious circle where the buyer would be forced to maintain an increasing proportion of capacity resources outside normal market conditions and the unsupported generation sector would progressively disappear. We think that strategic reserves should be avoided in most contexts.

The consultation paper states that Strategic Reserves have been a success in Nordic markets where they have been implemented. Our understanding is that there has been a continuing debate over the risk of distortions, especially in Sweden. For example:

– the Energy Markets Inspectorate (EMI) has argued that the reserves would not provide a sustainable solution to the issue of capacity adequacy and should be replaced by a more market-based solution;[1]

  'The main argument against having the Government responsible for the peak load reserve is that investments in peak-load production will only be carried out if they can be financed within the framework governing the procurement of the reserve. This leads to a continued need for a larger power reserve. State responsibility for the power reserve therefore does not give rise to a stable long-term handling of the problems related to peak load shortages.'

– for similar reasons, NordREG, the regional association of energy regulators, has argued that non-market interventions such as the peak load reserve can have adverse consequences on market dynamics and should only be prolonged if security of supply cannot be achieved through other means;[2]

– Nord Pool Spot has expressed concerns that the deployment of the reserve to mitigate 'unreasonably high price' would dampen investment incentives for commercial developers. Similarly to the EMI, Nord Pool has argued that the long-term objective should be to phase out the reserves and establish a more market-

[1] Energy Market Inspectorate (2006), 'Price formation and competition in the Swedish electricity market'.
[2] NordREG (2009), 'Peak load arrangements – assessment of Nordel guidelines'.

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based approach to capacity adequacy. In the shorter term, Nord Pool is recommending that the dispatch price be set sufficiently high to cover the total costs of the reserve (fixed and variable).[3]

(15) In relation to capacity markets and/or payments:

a. Which models of capacity market and /or payments do you consider to be most and least distortionary and most compatible with the effective competition and the functioning of the internal market, and why?

We believe that **Capacity Markets** are the least distortionary form of intervention. A Capacity Market is a system whereby the system operator procures sufficient capacity through a centralised auction run on a yearly basis. This approach is market-based, transparent, and it has a good track record of ensuring security of supply without introducing any significant distortions in the jurisdictions where it has been applied (notably in the PJM area and the New England market in the US). Unlike capacity payments, capacity markets are administered entirely separately from energy markets, which minimises the risk of distortions noted in the consultation paper for cross-border trade between the Irish and GB markets.

b. Which models of capacity market and /or payments do you consider to be most compatible with ensuring flexibility in a low carbon electricity system?

We believe that capacity markets should focus on ensuring that there is enough *capacity* on the system to meet peak demand under most circumstances. We do *not* think that capacity markets should be designed to procure *flexibility*. The system's needs in terms of flexibility are typically very complex, and these issues are best addressed through other instruments (eg contracts for ancillary services or for short-term operating reserves). Flexibility requirements are likely to be quite country specific taking account of local generation mixes, levels of storage, interconnection etc.

c. Are there any models of capacity mechanism the introduction of which would be irreversible, or reversible only with great difficulty?

This would depend largely on design details, notably on the extent to which these different models rely on long-term contracts. We disagree with the Commission's assertion that Strategic Reserves are always 'easily reversible'. This approach may need to rely on long-term contracts with generators, and for this reason it may not always be unwound at short notice. Conversely, there is no reason why Capacity Markets would rely more on long-term contracts. It is perfectly possible to design such markets based on one- or two-year contracts for both existing and new generators. This is the solution used in the PJM market in the US, and the one we would recommend for EU markets.

In general, we suspect that capacity mechanisms will be an enduring feature of market designs in Europe as long as intermittent generation account for a significant share of generation and the market infrastructure does not support the contracting of different levels of reliability for different customers. As such, we do not think that reversibility should be a priority when deciding on the approach.

(16) Which models of capacity mechanisms do you consider to have the have the least impact on costs for final consumers?

[3] Nord Pool Spot (2010), 'Handling the peak load reserves on the sport market'.

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We believe that **Capacity Markets** are the most cost-effective way of ensuring security of supply in the new market environment. A Strategic Reserve essentially 'sterilises' certain plants by keeping them out of the energy market outside periods of system stress. In contrast, a Capacity Market allows all plants to participate in the energy market and generate whenever the power price covers their costs. This will lead to a more efficient despatch and lower energy prices.

This is supported by the analysis done by the UK Department of Energy and Climate Change (DECC) in 2011.[4] DECC considered the relative costs and benefits of a Strategic Reserve and a Capacity Market to ensure security of supply in GB. They concluded that the Capacity Market led to the largest increase in consumer surplus. This was because the Capacity Market led to a large decrease in wholesale price, which more than offset the support costs and the increase in support payments for low-carbon generators. Table 1.1 below reproduces their results.

Table 1.1 Distributional analysis of Strategic Reserve vs Capacity Market, NPV 2010-2030, £m (2009 real)

	Strategic Reserve	Capacity Market
Change in wholesale price	-49	24,755
Change in low-carbon support	4	-7,854
Capacity payments	-1,183	-13,101
Unserved energy	418	444
Demand side response	0	59
Change in consumer surplus	**-810**	**4,302**
Change in wholesale price	49	-24,755
Change in low-carbon support*	-4	7,852
Capacity payments	1,183	13,101
Change in producer costs	-1,061	-1,298
Change in producer surplus	**166**	**-5,100**

Source: DECC EMR impact assessment (2011)

(17) To what extent do you consider capacity mechanisms could build on balancing market regimes to encourage flexibility in all its forms?

We do not see any need for an explicit linkage between capacity mechanisms and balancing regimes. In our opinion, it is more appropriate to make a clear distinction between these two instruments, where capacity mechanisms focus on rewarding capacity (ie the ability to generate at times of peak demand) while balancing regimes focus on rewarding flexibility (ie the ability to meet short-term variations in generation and demand throughout the year). Generators should be able to participate in both markets, depending on their physical characteristics and their economics. If generators get rewarded for flexibility throughout balancing regimes, they will require lower capacity revenues to break even and capacity prices will drop accordingly. As long as both instruments are broadly market based there should be no 'double-counting' of generators' contribution to security of supply.

[4] This is available at **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48133/2180-emr-impact-assessment.pdf**

(18) Should the Commission set out to provide the blueprint for an EU-wide capacity mechanism?

No—we do not think that such a blueprint would be realistic or desirable. There might be valid reasons for adopting different designs in different markets, depending on the scale of the issue, the local mix of generation and demand, and the market environment.

(19) Do you consider that the European Commission should develop detailed criteria to assess the compatibility of capacity mechanisms with the internal energy market?

No—The Electricity Directive already specifies that tendering procedures for capacity must be *transparent* and *non-discriminatory*. In our opinion these two criteria are sufficient to ensure that Capacity markets do not create distortions in cross-border trade.

Should the Commission want to develop more detailed criteria, the purpose of this exercise should be to 'streamline' the development of capacity markets and give stakeholders a degree of assurance with respect to the clearance of the design by the Commission. Such criteria should only prohibit features that are manifestly distortive.

(20) Do you consider the detailed criteria set out above to be appropriate? a. Should any criteria be added to this list? b. Which, if any, criteria should be given most weight?

These criteria are broadly appropriate. Our main comments are the following.

The Commission should clarify **criterion 4** (relating to the participation of generators from other Member States). We suggest that this principle only applies where there are no significant transmission constraints between Member States. In principle the assessment of this criterion could be linked with the determination of price zones in the target model. That is, a generator may only participate in the Capacity Market of an adjacent Member State if he is located in a price zone that overlaps with a region covered by the capacity market. So for example a generator located in Northern Ireland may participate in a capacity mechanism for Ireland (as indeed they do at the moment), but a generator located in GB may not participate in a Capacity Market in France (at least for as long as the interconnection between the two markets remains congested).

The Commission should emphasise **criterion 5**, and particularly 5.a (relating to potential distortionary effects in energy prices and locational signals). In our opinion it is particularly important that Capacity Markets do not blunt locational signals.

The Commission may want to review **criterion 6.b** (relating to participation by demand response and energy efficiency). While we strongly support equal participation by generation and demand response (ie, *temporary* reduction in demand) in Capacity Markets, we are more sceptical with respect to the contribution of energy efficiency (ie, *permanent* reductions in demand). Permanent reductions in demand are typically difficult to assess and monitor, and we understand that the experience with integrating this resource in the PJM market has not been entirely successful. We recommend that the Commission does further research on the topic before imposing the participation of energy efficiency. Permanent demand reduction does not, in the medium term, make any real contribution to security of supply either via capacity adequacy nor flexibility.

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We strongly agree with **criterion 8.d** (relating to the duration of capacity agreements). Regulators may be tempted to award longer-term contracts to new resources to facilitate new investment (up to 5 or even 10 years). In or opinion this approach would introduce a number of distortions in the market.

– **Increased risk of inefficient investment outcomes**—long-term contracts would provide generators with a multi-year price based on an auction reflecting fundamentals for a single year. Under certain circumstances, this mismatch might lead to distorted prices and inefficient investment outcomes. Suppose that capacity is tight in a given year but the market expects a drop in demand or an increase in transmission capacity in the medium term. The most efficient solution might be to delay the retirement of old units to meet short-term needs until the capacity margin improves. However, a new generator might clear at the current auction price and receive a high price for subsequent years even though new investment is not needed. The significance of this risk is uncertain; however in the US the Federal Energy Regulation Commission rejected the introduction of long-term contracts for this reason.

– **Increased risk of market manipulation**—long-term contracts would reduce the number of active participants in each capacity auction (insofar as generators with long-term contracts would not bid in subsequent auctions), which might make it more likely that market power could be exercised. Long-term contracts would also increase the incentive for new entrants to manipulate the capacity auction in the year in which they enter the market (for example by withholding capacity), since they would retain the benefit of this manipulation for a longer period). To mitigate these risks regulators will need to scrutinise the bids that set the price more carefully, which is costly.

– **Design complexities**—long-term contracts might require relatively complex legal instruments to reduce the risk of regulatory 'tinkering' with the agreement, whereas one-year agreements could be 'bolted on' current industry codes fairly easily. Long-term contracts might also introduce some complexities in the auction design (insofar as the auction would essentially need to clear for two different products) and the penalty regime (insofar as penalties are conceived as a return of the capacity payment).

For these reasons, we recommend that the Commission requires that Capacity Markets be based on contracts of equal duration for all participants.