



# EAI Response to Commission Consultation

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Generation Adequacy, Capacity Mechanisms and the Internal Market in Electricity

**Electricity Association of Ireland  
Markets Committee**

**6<sup>th</sup> February 2013**

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The Electricity Association of Ireland (EAI) is the trade association for the electricity industry on the island of Ireland, including generation, supply and distribution system operators. It is the local member of Eurelectric, the sector association representing the electricity industry at European level.

EAI aims to contribute to the development of a sustainable and competitive electricity market on the island of Ireland. We believe this will be achieved through cost-reflective pricing and a stable investment environment within a framework of best-practice regulatory governance.



Electricity Association of Ireland  
Tel: +353 1 5242726  
[www.eaireland.com](http://www.eaireland.com)

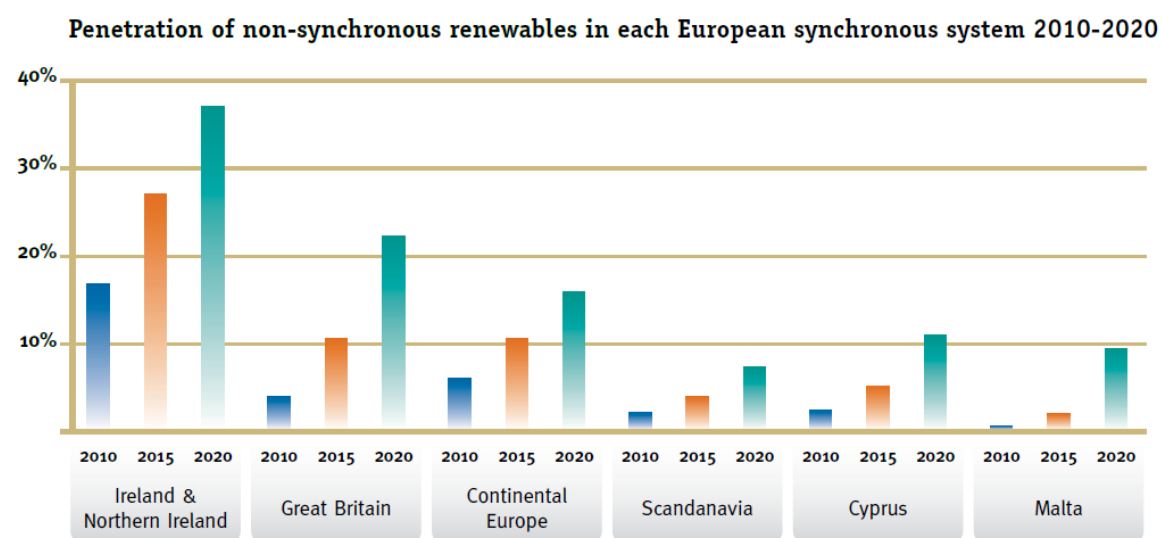
## Introduction

The Electricity Association of Ireland (EAI) welcomes the opportunity provided by the Commission to comment on energy policy matters which we believe are of critical importance to the future development of the electricity sector within the Single Electricity Market (SEM) and Europe in the context of a competitive, sustainable and integrated market.

The European Union has a number of targets and objectives in respect of energy policy and markets and climate mitigation with both a near term (2020) and longer term (2050) focus. The European Commission has issued Communications on Roadmaps towards a low carbon economy and corresponding energy framework to 2050. Both suggest that the European Council's objectives for 2050 can best be achieved through decarbonisation of the electricity sector and progressive electrification of energy use within the economy.

In order to advance along the energy Roadmap, Europe faces a major challenge in integrating high levels of low carbon generation, much of which will be variable renewable, into its electricity system. The 2020 energy and climate targets as applied to the UK, including Northern Ireland, and Ireland effectively place the SEM at the forefront of these challenges. In this context the SEM is acting as a de facto early pilot for the technical, organisational and market responses that Europe will have to consider and adopt as the level of variable renewables on the European network system moves towards the levels already present in the SEM today (see Figure 1 below). Thus it is the case that the experience of our members operating within the SEM can offer significant insights into how Europe might resolve the challenges of tomorrow. Given the above, we are disappointed at the level of predetermination contained in the Commission's paper and the opportunities missed for a more comprehensive survey of opinions on this critical topic.

**Figure 1**



Data collated from information submitted to the National Renewable Energy Action Plan by EU Member States to the EU Commission in June 2010.  
Source: Eirgrid / SONI

## Framing the Debate

In light of our experiences to date, the Electricity Association of Ireland (EAI) has significant, legitimate concerns at the manner in which the debate has been framed in the Consultation Paper. These relate in particular to:

- The manner in which capacity mechanisms are considered as a market interference and
- a conflation of “security” as it relates to generation adequacy and “flexibility” as it relates to the technical capacity of generation units to respond to short-term fluctuations in supply consequent on high penetration levels of variable renewable generation in an electricity market.

With reference to the first bullet point, we would strongly challenge the inference contained in the reference to the SEM in Section 4.3 of the Paper that the capacity mechanism, which is a central feature of the market legally compliant design<sup>1</sup>, is a block to efficient interconnector trading. Given that the internal market for electricity (as currently being developed via the ENTSO-E Network Codes process and Target Model) does not define an EU-wide energy market design, we believe that the Commission can follow a similar approach on this issue by specifying rules for capacity trades across borders that can facilitate the economically efficient use of interconnectors (as opposed to defining an EU wide capacity mechanism). In this context, the 2-year extension with interim measures provision for Ireland and Northern Ireland in the current draft Capacity Allocation and Congestion Management Code was predicated on **aligning** the Single Electricity Market for integration – not changing or mandating its design.

The response we provide to the Commission’s queries reflects our technical and commercial experience and the pragmatic and effective approach adopted in the SEM to delivering secure supplies of electricity in a relatively small, weakly interconnected system with high levels of wind generation. We recognise that other market approaches can be applied to generation adequacy but we would suggest that none have yet been tested to the levels of stress observed within the SEM. While evidence is not yet available, we would have concerns that the impact on final customers of the response behaviour to high stress of alternative market designs could be so severe as to elicit significant political responses.

## EAI Views

The experience of EAI members in the SEM and their knowledge of alternative market structures lead us to making the following observations:

- **Capacity Remuneration Mechanisms (CRMs) are compatible with the Internal Energy Market and existing regulations.** Depending on design and trading rules, it is clear to us that CRMs can be constructed to comply with the internal electricity market, in particular where they are a core feature of market design.
- The choice of market design in a given member state and the level of security of supply that it delivers reflect a range of factors including geography, indigenous energy resources, market size, degree and nature of interconnection, composition and age of current

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<sup>1</sup> SEM market design is made up of three components, energy payments, capacity payments and ancillary services payments. Energy market prices are based on bids reflecting the short run marginal costs of generators whereas the capacity payment contributes towards generators’ fixed costs

generation portfolio, scale of adjoining market(s) etc.. **The specific characteristics of individual markets must play a role in considering whether that market requires a CRM to be adopted as an integral part of its design.** Progress towards a harmonised/ coordinated approach to CRMs on a pan-EU scale, if necessary or desirable in the long-term, will take investment, experience with the Target Model and must avoid retroactive effect.

- This should not inhibit progress towards an internal market as EAI considers it is **possible to design mechanisms that permit efficient trading across interconnectors** between energy-only markets and those with CRMs. As noted above, we would strongly challenge the argument contained in the reference to the SEM in Section 4.3 of the Paper that the capacity mechanism, which is a central feature of the market design, has created difficulties in cross border trade with GB.
- **Given the features of the SEM market and the characteristics of its current design, it is crucial to retain provision for CRMs, not least from a security of supply and regulatory stability perspective.** This does not prevent moving towards the progression of electricity market integration and general societal benefit from efficient interconnector trading.
- In this context **EAI supports the continued availability of CRMs** and does not accept the excessive constraints proposed by the Commission, which amounts to their implicit rejection via a very narrowly defined acceptable form of CRM and the implicit rejection of existing CRMs such as that of the SEM which is both justified and integral to market design and which has been openly endorsed by the EU<sup>2</sup>.
- CRMs are designed to provide generation adequacy. However, plant flexibility to support the high penetration of variable generation is a different characteristic and should be addressed separately. **In principle the two mechanisms should not overlap.** Clarity on the distinction between ‘generation adequacy’ and ‘flexibility’ is necessary. The former ensures that there is sufficient generation (megawatts) in a market to meet demand at any one time and in certain scenarios. Capacity mechanisms are not, nor should they be, technology specific. However the need for plant flexibility will become an integral service feature of the operation of systems with high penetrations of variable generation in the future. The incentivisation of this service will be crucial in light of existing low carbon and renewable objectives. The capability of a CRM to provide both capacity and sufficient flexibility for a system with significant levels of variable generation is highly questionable.

## Summary

Geographic characteristics yielding large energy storage capabilities, historic investments, energy infrastructure development, meshed synchronous systems across borders, and recent policy have facilitated the integration of variable renewable generation capacity in the North-West Europe market. These characteristics are not all shared within other regional markets. Technical considerations will limit the capability to integrate and benefit from such advantages across Europe.

The SEM represents a region lacking geographic features for major energy storage and with currently limited interconnection (characterised by two long distance sub-sea DC interconnectors with reliability constraints) to a large market. It also has the highest level of penetration of variable

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<sup>2</sup> For example – “the formation of the All-Island market in Ireland in 2007 was a positive contribution to the construction of the internal electricity market” from “Making the Internal energy market work”, EU Commission, COM(2012) 663 final, Brussels, 2012

renewable generation within a regional system and the highest wind energy targets in the EU. The current market design features, incorporating a capacity remuneration mechanism as a central element, have ensured security of supply to date. More critical in the future will be the technical flexibility features of back-up generation plant as variable generation levels increase further. This challenge will need to be addressed separately.

The experience of the SEM today is very relevant to a broad spectrum of regional markets in the future. Consequently, considerations of market design should not preclude the role of legal and market compatible features, such as capacity remuneration mechanisms, from supporting the efficient and cost effective delivery of wider energy policies.

## Detailed Comments

Question	Response
(1) Do you consider that the current market prices prevent investments in needed generation capacity?	<p>The question is ambiguous:</p> <ul style="list-style-type: none"> <li>• Investment decisions are based on future expectations of value drivers and assessments of market stability, not current prices.</li> <li>• However, transmission “black spots” within a market can result in overall capacity being adequate but security of supply problems within specific areas of the market. Significant transmission investment must be a priority to ensure efficient implementation to counteract these negative market effects.</li> </ul>
(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?	<p>The question is ambiguous.</p> <ul style="list-style-type: none"> <li>• Supports for variable renewable capacity, including those aimed at achieving binding targets are consistent with wider EU policy.</li> <li>• More generally, Third Party interventions can act to increase or decrease investment security and, consequently, security of supply.</li> <li>• It should also be noted that other EU policy measures (e.g. Industrial Emissions Directive) can act to undermine security of supply.</li> </ul>
(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?	<p>As experience with efficiently functioning day-ahead and intraday markets develops it should contribute to improved security of supply. A proper assessment of its contribution will not be possible until the Target Model is operating for some time. Importantly, their contribution will only be meaningful to the extent the network infrastructure is put in place to allow meaningful levels of trade and national TSOs fully coordinate their activities in line with Network Codes. The time taken to reach the point where security of supply is addressed at a European level will depend on the level of prudence member states adopt towards their long-term reliance on the firmness and reliability of interconnector capacity.</p>
(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?	<ul style="list-style-type: none"> <li>• Ensure investors are attracted to the market to deliver plant with the appropriate characteristics (e.g. flexibility to back up variable generation). The diversity of domestic factors across Europe -such as market design, geography,</li> </ul>



Question	Response
	<p>interconnection levels etc. would caution against any form of “one-size-fits-all” mechanisms.</p> <ul style="list-style-type: none"> <li>• Ensure the delivery of critical infrastructure to strengthen interconnection between peripheral / isolated electricity systems.</li> <li>• Ensure a stable investment environment for all electricity sector projects, which includes coherent and predictable policy at EU level</li> <li>• Address how both energy and capacity factors are treated in relation to interconnector trading rules.</li> <li>• Clearly define the roles of the party(ies) responsible for security of supply (and the measures they may take to ensure this).</li> <li>• Provide a period of stability in respect of regulations/changes to market design and rules, avoiding unwarranted retrospective changes to existing CRMs which are a central feature of many electricity market designs.</li> </ul>
(5) What additional steps could Member States take to support the effectiveness of the internal market in delivering generation adequacy?	<p>Member States should implement the Target Model in their markets, ensuring that market specific circumstances and technical limitations are fully considered and respected.</p> <p>Simultaneously they should facilitate and expedite the construction of networks infrastructure which is central and critical to market integration and the benefits it can deliver in terms of security of supply .</p> <p>Support the above by creating a stable investment environment.</p>
(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?	<p>No comment on the first part.</p> <p>The application of lower standards to willing customers is already a market feature through Demand Side Bidding mechanisms. Extending this beyond the current range is dependent on the deployment of Smart Metering and Grid technology and the assessment of domestic customer preferences</p>

Question	Response
<p>(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:</p> <ol style="list-style-type: none"> <li>National level</li> <li>Regional Level</li> <li>European Level</li> </ol>	<p>No.</p> <p>The larger the geographic area over which generation adequacy is assessed the greater the risk that deficits (reflecting weak networks infrastructure) in sub-regions may not be identified.</p> <p>Adequacy assessments, should be carried out on a national basis due to individual Member State attributes. National assessments can take into account the “firmness” of interconnection availability/ adequacy.</p> <p>Generation adequacy assessments should take into account the potential for capacity closures based on commercial assessments.</p> <p>As smart metering develops and the scope for demand response increases significantly then this factor needs to be further considered in such assessments.</p>
<p>(8) Looking forward, is the generation adequacy outlook produced by ENTSO-E sufficiently detailed? In particular,</p> <ol style="list-style-type: none"> <li>Is there a need for a regional or European assessment of the availability of flexible capacity?</li> <li>Are there other areas where this generation adequacy assessment should be made more detailed?</li> </ol>	<p>It is not clear what is meant by the term “flexible” capacity in the context of this document and clarification in this regard would be welcomed. While it may not be appropriate that the Commission prescribe a formal and technical definition for “flexibility”, a need to distinguish “flexibility” from “Generation Adequacy” nevertheless exists.</p> <ul style="list-style-type: none"> <li>• Generation adequacy assessments should take into account the potential for capacity closures and non-build out of included forecasted capacity, based on commercial assessments.</li> <li>• Account should also be taken of the role of demand-side responses, smart grids and developing <i>reliable</i> interconnection.</li> <li>• EAI considers that the requirement for firm capacity with the ability to respond rapidly to short-term variations in generation supply will increase as levels of variable generation on the system increase dramatically. EAI defines “flexibility” in terms of this inherent response capability of generating plant. Flexibility will become critical to security of supply needs in systems characterised by high levels of variable generation EAI is of the view that incentivising flexible plants is not encompassed by a capacity adequacy-only approach as reflected in this Consultation. There is therefore a need to reward plant with defined flexible</li> </ul>

Question	Response
	<p>characteristics separately, in addition to overall installed capacity which is necessary for adequacy, in the context of security/continuity of supply.</p> <p>In assessing future adequacy and flexibility, the physical nature of interconnectors needs to be considered i.e. whether they are synchronous (AC) or non-synchronous (DC).</p>
(9) Do you consider the Electricity Security of Supply Directive to be adequate? If it should be revised, on which points?	Yes.
(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?	<p>It is unclear what the purpose of such actions would be and where they interact with the ongoing work by ENTSO-E in the context of the Target Model Network Codes. We are unclear as to what value they would add.</p> <p>Is the consequence of a negative finding a redesign of market features? If so does this not decrease stability and increase risk for investors?</p> <p>A different focus applies to both in the context that electricity capacity is exposed to more dynamic system risks whereas gas capacity is mainly exposed to external supply risk rather than energy storage (notwithstanding the fact that gas storage capacity may be limited or non-existent in some regions).</p>
(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 preference regarding security of supply?	<p>While harmonisation of adequacy standards may be a legitimate longer term objective once the energy markets are operating effectively as a “single” market, we do not consider it to be appropriate in the short to medium term.</p> <p>As aforementioned, in light of differences between Member States (e.g. markets, geographical etc.) unilateral considerations must be taken into account to avoid undermining security of supply in any one Member State. The application of a uniform standard may increase costs unnecessarily (where based on customer expectations) for relatively isolated small systems such as the SEM.</p> <p>A harmonised high level methodology for measuring adequacy could be applied. TSOs could then determine the appropriate standard within each market for interconnected control areas taking into account the impacts on/ benefits for, neighbouring markets.</p>

Question	Response
<p>(12) Do you consider that capacity mechanisms should be introduced only if and when steps to improve market functioning are clearly insufficient?</p>	<p>The question is ambiguous.</p> <p>EAI strongly challenges the inference that capacity should not be considered an integral part of electricity market design and the corollary that capacity mechanisms are tools to address temporary market failure.</p> <p>EAI is of the view that capacity mechanisms are a legitimate feature of market design and are especially valuable when accommodating large scale penetration of non-synchronous renewable generation. EAI considers that it is possible to allow Member States to define national solutions to the generation adequacy issue without distorting trade. This would entail defining guidelines for how scarcity is treated in prices exchanged across borders.</p> <p>In this way, energy-only markets without capacity mechanisms (whereby scarcity is implicitly included in the energy price i.e. a long run price) can couple with markets that have capacity mechanisms (whereby scarcity is explicitly valued through the capacity price) provided the price offered at the border is the energy plus capacity price. Equally valid is for coupling to be based on the energy-price only where both markets have a capacity mechanism. The fact that different markets/Member States may determine capacity differently should not be considered a distortion of trade. Coupling based on the energy price only completely removes any scope for distortion.</p> <p>As noted earlier in this context, the 2-year extension provided to Ireland and Northern Ireland in relation to market integration was predicated on <b>aligning</b> the Single Electricity Market for integration – not changing or mandating its design.</p> <p>The effective operation of energy markets is subject to other policy imperatives, including a binding requirement to provide 35% approx. of energy from renewable generation in the EU electricity system by 2020. Market design must take account of these imperatives.</p>
<p>(13) Under what circumstances would you consider market functioning to be insufficient:</p> <p>a. to ensure that new <i>flexible</i> resources are delivered?</p> <p>b. to ensure <i>sufficient</i> capacity is available to meet demand on the system at times of highest system stress?</p>	<p>We note the distinction in the question between flexibility and capacity, however, it is premature in that services encompassed by “flexibility” have yet to be defined, particularly in the context of large scale penetration of variable generation capacity. Having identified these services, it has then to be determined the extent to which market-based provisions of such services can best be delivered. The consideration of</p>

Question	Response
	<p>“capacity” in the traditional sense is not appropriate in the context of system stress induced by high levels of variable generation capacity. In such systems it is essential to ensure the provision of sufficient capacity in the overall sense but also the provision of a sufficient level of responsive/flexible capacity. In SEM’s experience, both adequate and flexible capacities are equally important and must be monitored and rewarded appropriately in line with market and system needs. A delineation exists between both and binary criteria for a CRM are inappropriate. Incentivisation of flexible capacity, as discussed above, must be encouraged and dealt with separately from ensuring generation adequacy.</p>
<p>(14) In relation to strategic reserves:</p> <p>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?</p> <p>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?</p>	<p>The questions are ambiguous.</p> <p>Where strategic reserves are in place they tend to comprise older generating plant which, in the case of fossil fuel capacity, have limited flexibility. Consequently they address generation adequacy but not the flexibility issues associated with a transition to a renewable, typically variable, generation regime. Equally strategic reserves are just that – strategic. They should not be utilised to address shortfalls resulting from planned closure of existing (e.g. nuclear) plant.</p> <p>Clearly strategic reserves impact the functioning of an energy-only electricity market by reducing the value of scarcity. However this loss impacts all operators equally. It is a political judgement as to whether the cost of this interference exceeds the direct plus indirect benefits of reduced price volatility.</p>
<p>(15) In relation to capacity markets and/or payments:</p> <p>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?</p> <p>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?</p> <p>c. Are there any models of capacity mechanism the introduction of which would be irreversible, or reversible only with great difficulty?</p>	<p>As noted previously, EAI distinguishes between capacity mechanisms that are , (i) designed to support the “missing money” issue in an energy only market and (ii) market designs where payment for capacity is an inherent design feature. CRMs that are an inherent design feature, must not be reversible to the detriment of investor confidence and security of supply.</p> <p>As to the design of capacity mechanisms, these should reflect the underlying energy market and should also ensure that the value for capacity has a market basis. Provided there is consistency of treatment between markets/Member States, then we believe it is possible to allow Member States to define national solutions to the generation adequacy issue, in whatever way they deem appropriate, without distorting trade. This would entail defining a rule on trading electricity at the border either</p>

Question	Response
	<p>specifically including a value for scarcity or, alternatively, excluding its value. In this way, energy only markets without capacity mechanisms (whereby scarcity is implicitly included in the energy price i.e. a long run price) can couple with markets that have capacity mechanisms (whereby scarcity is explicitly valued through the capacity price) provided the price offered at the border is the energy plus capacity price. Equally valid is for coupling to be based on the energy-price only where both markets have a capacity mechanism. The fact that different markets/Member States may have different market designs and may remunerate capacity differently should not be considered a distortion of trade. For example, market coupling based on the short run marginal cost only removes any scope for distortion. We believe such an approach is consistent with the internal market and as such could be implemented within the 2014 timeframe.</p> <p>In this context, EAI would posit that the SEM provides an explicit, market based valuation (via a Best New Entrant calculation) for capacity compared to the implicit capacity price normally observed in energy only markets where average prices should over time reflect Long-Run Marginal Cost. In addition the SEM design ensures a market related dynamic capacity volume setting. The SEM provides a further benefit in that both the energy pricing (mandatory Short-Run Marginal Cost bidding) and capacity payment are fully transparent.</p> <p>The 2050 Energy Roadmap scenarios indicate a level of renewables in electricity generation in 2050 of between 64% and 97% (mainly wind) if the European Council objective on climate abatement is to be delivered. EAI is of the view that mechanisms to support generation adequacy and flexible back-up (and potentially also large scale energy storage) will be essential to address the scale of transition required in the electricity system in this relatively short period if the targets are to be delivered, the costs contained and the security of electricity supplies assured. A discussion of reversible or irreversible mechanism has limited relevance in the context that access to all options will be required to meet the European Council's future targets and objectives.</p>
(16) Which models of capacity mechanisms do you consider to have the least impact on costs for final consumers?	The question implies that, in the long run, the counterfactual energy-only market will deliver the required capacity and the same outcome at equal or lower total cost. It is

Question	Response
	<p>not evident this outcome would be assured when factors such as the effective market size, policy impositions, investor confidence, public or political acceptance of increasing price volatility or simple competition for investment capital from other global regions are taken into account.</p> <p>EAI's experience would suggest that where market-based, transparent, non-discriminatory and technology neutral capacity mechanisms are incorporated within the electricity market design, limiting the scope for regulatory intervention, then the imputed costs of the mechanisms can be minimised.</p>
(17) To what extent do you consider capacity mechanisms could build on balancing market regimes to encourage flexibility in all its forms?	<p>Flexibility, as EAI understands it, is a distinct system/ancillary service that differs in its characteristics from capacity adequacy. It is our view that total costs will be minimised for systems with high levels of variable generation (as will be the case for all Europe according to the Energy Roadmap) if flexibility is given separate recognition and appropriate remuneration.</p>
(18) Should the Commission set out to provide the blueprint for an EU-wide capacity mechanism?	<p>No.</p> <p>Given the large variations in physical geographies, generation mix, system sizes, levels and nature of interconnectedness and existing market designs, promoting a single preferred mechanism would appear impractical and unnecessary. Furthermore, given that the Commission has not provided a blueprint for an EU wide energy market (but rather for the treatment of the market at borders) we believe it is unnecessary to define one for capacity. The key consideration for the Commission should be to define how CRMs are treated at borders (i.e. via interconnector trading rules) not whether a common mechanism is required.</p>

Question	Response required
(19) Do you consider that the European Commission should develop detailed criteria to assess the compatibility of capacity mechanisms with the internal energy market?	<p>No.</p> <p>The Commission should restrict any intervention to establishing high level principles that give due consideration to the underlying market design framework. The Commission should therefore focus on the cross border impact of CRM and consider</p>

Question	Response required
	defining guidelines on how capacity is treated on interconnectors/at borders.
<p>(20) Do you consider the detailed criteria set out above to be appropriate?</p> <p>a. Should any criteria be added to this list?</p> <p>b. Which, if any, criteria should be given most weight?</p>	<p>EAI is of the view that:</p> <ul style="list-style-type: none"> <li>• Capacity mechanisms that are a core component of market design, as in the SEM, have been acknowledged as supporting competitive markets,</li> <li>• It is possible to design interconnector trading rules to ensure effective and efficient coupling between energy only markets and those with capacity mechanisms,</li> <li>• Such rules must consider the nature of the interconnection i.e. DC versus meshed grid.</li> </ul> <p>In light of the requirement for very large scale development of renewable generation (the majority of which is likely to be variable) over the coming decades. Until there is significant levels of interconnection across all regions and in particular to peripheral or electrically isolated areas it is premature to consider all capacity mechanisms as distortive and to seek to time limit their application or indeed set out stringent criteria such as that proposed in question 20.</p>