

Reply to the Commission Consultation on Generation Adequacy, Capacity Mechanisms, and the Internal Market in Electricity

The Regulatory Assistance Project

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

There are actually several different questions embedded in this question. Current market prices where? Would current market prices support investment in generation capacity? If not, do current prices signal that no investment is needed in generation capacity? Would market prices support investment when investment is needed? If so, would the investment signaled by market prices be the right kind of investment? Taking these questions in order:

- a) “Current market prices where?” This first question reflects the fact that the European power market is still a collection of independent balancing authorities and control areas, some of which are more closely coordinated than others. That said, it is not necessary to answer it for the purposes of this consultation, since the remainder of the questions are applicable to any of the European control areas.
- b) “Do current market prices support investment in generation capacity?” Even this question does not have a single answer, since the answer depends on what kind of generation capacity. Current market prices do not support investment in new nuclear capacity, for instance, and they probably never will, since new nuclear investment is not competitive with the available alternatives given its capital cost, its development and construction lead times, and the base load capacity factors it must maintain to be economically viable. It is possible, on the other hand, that in some locations current market prices would support investment in open cycle combustion turbine generation, and there are a number of other possibilities in between. The general answer to the question, however, is that in most locations current market prices, both spot prices and forwards, appear to be, on average, below the level that would support investment in new generating capacity.



The Regulatory Assistance Project

Beijing, China • Berlin, Germany • **Brussels, Belgium** • Montpelier, Vermont USA • New Delhi, India
rue de la Science 23 • B - 1040 Brussels • phone: +32 2 894 9300

www.raponline.org

Does that mean that current market prices prevent investments in *needed* generation capacity? Not at all. One must first be reasonably sure that investment in generation capacity is needed before one can answer that question. In addition to the question of how one gauges “adequacy” (which is addressed in the next set of questions) this highlights a serious flaw in the question posed in the Consultation document: The proper question is not whether market prices signal a need for investment in *generation capacity*, the proper question is whether they signal a need for investment in *new resources*. As has been amply demonstrated in some of the ISO markets in North America, some of the most economic resources available in response to open solicitations for new “capacity” resources turn out to be efficiency and demand response investments. It is a serious shortcoming of this and many of the other enquiries currently being conducted regarding resource adequacy that they continue to frame these questions explicitly in terms of generation capacity alone.

- c) “If not, do current market prices signal that no investment in generation capacity is needed?” On the available evidence, the simple answer to this specific question is “yes.” In nearly every region of Europe the problem facing the wholesale power market is that the system is *oversupplied* with generation capacity at the moment. What the current market prices are telling us is that *disinvestment* from generation capacity is needed. This is the result of the combination of flat demand (owing both to the economic downturn and to improvements in efficiency) and the policy-driven addition of low-carbon generating capacity (in some member states, quite a lot of low-carbon generating capacity) to markets that were already fully served (and in some cases, e.g., Spain, already in surplus). It is therefore no surprise that average wholesale power prices are quite low. This is sometimes called the “merit order effect,” in which the addition of surplus must-run capacity into a fully supplied market results in a transitory depression in market prices. The effect is no doubt real, and the present value of the price reductions may well be significant, but it is certainly temporary. If and when the market is allowed to re-balance supply and demand (through some combination of retirement of surplus capacity and growth in demand) this aspect of the merit order effect will disappear. It must also be emphasized that currently low wholesale market clearing prices are not a reflection of the marginal cost of production of variable renewables; contrary to a common misconception, marginal clearing prices in a properly functioning, fully competitive market reflect the *value* of the marginal kWh of electricity – this may or may not equal the marginal *cost* to produce that kWh, and in many scheduling periods it clearly does not nor should it. Furthermore, renewables are virtually *never* the marginal resource on the system and therefore do not set marginal prices regardless of what their marginal production costs are. Current average low prices reflect the

fact that there is too much capacity in the market and therefore the value of the marginal kWh of electricity is very low, in some scheduling periods far below the marginal cost of production of the marginal generating unit.

The final point in response to this question is that while many regions of Europe are in a surplus capacity situation, it is possible that the existing portfolio of capacity is no longer a good fit for purpose given the evolving nature of the supply mix. That is, as more variable renewable production enters the market, the balance of the resource portfolio must either be more operationally flexible than has heretofore been necessary or demand must become more responsive to real-time conditions in the power system (preferably both). If the existing resource portfolio is not flexible enough to adapt to the increase in variable production it is likely that prices will be more volatile, and in fact that is the pattern we are seeing in the market at the moment. This volatility in prices has also been said to be preventing investment in needed generation capacity. In the short run, it is low prices and volatility that will drive disinvestment from surplus generating capacity, and that in itself is not a bad thing. The problem will come if the resources that withdraw from the market are those more flexible resources the power system will need most going forward. That is the real challenge facing the wholesale market today – ensuring that the market properly reflects the value of those dispatchable capacity resources providing the system with the flexibility it needs to fully utilize low marginal cost resources,¹ while at the same time ensuring that the value of those resources unable or unwilling to adapt their operating profile as needed shifts downward in line with their actual value to the power system. What is needed, in other words, is not investment in capacity resources per se, but rather a realignment of investment based on those resource attributes of most value to the power system. This will be explored at more length below.

- d) “Would market prices support needed investment when investment is needed?” That is a difficult question to answer without knowing the answers to a number of other questions. If the market is fully competitive (i.e., there is no need for administrative interventions to mitigate abuse of market power), and if investors have confidence that regulators and politicians will allow market prices to form without undue interference (rather than arbitrarily capping them) then market prices should certainly support needed investment when investment is needed. Full implementation of the IEM and proper design and implementation of the Target

¹ “Fully utilize” is used here to refer to the optimal trade-off between the cost of curtailing low-marginal-cost variable resources and the cost of avoiding such curtailment. Some level of economic curtailment of such resources should be expected.

Model are both important in promoting these conditions. An additional issue is that in the absence of real *participation by demand in price formation*, market prices will tend to be much more binary than they would otherwise be. That is, if customers or aggregators of customers are not enabled to participate in day-ahead and intra-day energy markets, a “boom-bust” cycle develops, where prices remain below the level needed for investment until the need for new resources becomes somewhat urgent, at which point prices rise quite steeply for a period of time until new resources come into the market or demand responds by reducing consumption, at which point prices return to previous low levels.

While it is unlikely that these conditions will ever be fully satisfied in practice, in those markets where good progress has been made in that direction (e.g., Australia and Texas), there is some evidence that a market environment would support needed investment in capacity, albeit with little room to spare.² Allowing large customer loads and aggregations of smaller customer loads to participate in price formation day-ahead and intra-day (which is technologically entirely feasible) can lead to much less erratic pricing and to price formation that can signal the need for investment farther in advance of when it’s needed.³ Each of these issues is within the gift of EU and (more importantly) Member State regulators and policymakers to address, and in that sense the answer to the question posed is “yes they would, if you choose to permit the market to do so.” The further away from the ideal conditions the market is (i.e., the less competitive/liquid the market is, the more regulators and legislators manipulate it or threaten to manipulate it, and the less

² Here and elsewhere in our response to the Consultation, we wish to make clear the distinction between the ability of the IEM as currently envisioned to support investment to ensure resource adequacy and system security, and its ability to support investment in low-carbon resources and energy efficiency. As we have written elsewhere, even under ideal conditions the current design of the IEM will struggle to support investment in many of the cost-effective energy efficiency measures and low-carbon resources required to accomplish the EU’s GHG reduction targets. Commercialization support continues for now to be appropriate for critical pre-commercial technologies. Even beyond the point, however, where they have achieved commercial competitiveness “on average” with fossil generation they will still be disproportionately disadvantaged under the current market structure. This is due to the way short-term energy prices can be expected to respond more often than not to their variable production patterns. It is likely that some form of market mechanism and/or more effective regulation of environmental externalities will be required for the foreseeable future to support cost-effective deployment of these resources.

³ see, e.g., “Electricity Scarcity Pricing Through Operating Reserves: An ERCOT Window of Opportunity” (W.W.Hogan, Nov. 2012).

elastic demand is in response to rising scarcity), the less likely it is that the market will be able to do what it should be capable of doing in a timely manner. If intervention in support of investment becomes necessary (and that remains to be seen), it will be because the market has been prevented from operating as it should, not because a competitive wholesale energy market is incapable of supporting needed investment, regardless of the level of renewable penetration.

- e) The last question raised here is whether the market will signal support for capacity resources with operational and economic characteristics that are consistent with what the power system will actually need and should therefore actually value. This is a crucial question and will be addressed in the answers to the subsequent questions in the Consultation.

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 and no. Direct financial support for specific energy sources that will rarely if ever be on the margin and therefore do not set prices (and this certainly applies to renewables and nuclear) does not in and of itself undermine investments needed to ensure resource adequacy, as long as the closing of the resulting surplus of productive capacity is allowed to proceed unimpeded. Far more problematic would be direct support for existing resources that are economically obsolete and should be allowed to retire.

Priority dispatch is a different matter. There was a time when priority dispatch was an important step to ensure that wind and solar generation gained sufficient access to the grid, but with the unbundling of transmission and distribution businesses from generation businesses priority dispatch has become less important. Priority dispatch does distort the investment market because it interferes with unit commitment and dispatch scheduling decisions that might otherwise support the business case for investment in needed flexible conventional generation.

As for special network fees, special treatment of resources with respect to grid balancing services is a complex topic, since it is problematic in many cases to define objectively the “right” way to allocate increases in system services costs among new and existing resources, especially when many existing resources are ill-suited to the emerging market environment. As an example, the decision to expand nuclear production in the 1960s required considerable system investments to enable the grid to operate reliably with the addition of very large, inflexible single generating units. In that case it was considered most efficient to socialize the costs of integrating the new

technology across all stakeholders rather than assign those costs specifically to the new entrant on the scene. Similarly today, the most equitable and efficient approach to system services fees and costs is most likely to ensure that the markets for such services are designed to attract as much cost-effective supply as the system needs from the lowest cost sources available, and to allocate the costs in some transparent fashion across all market stakeholders.

- 3) ***“Do you consider that work on the establishment of cross-border day ahead, intra-day and balancing markets will contribute to ensuring security of supply? Within what timeframe do you see this happening?”***
- 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?”***
- 5) ***“What additional steps could Member States take to support the effectiveness of the internal market in delivering generation adequacy?”***
- 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?”***

The answers provided above provide guidance as well in response to questions 3, 4, 5 and 6 of the Consultation. As should be clear from the foregoing, the sooner there is a fully functioning, fast and transparent cross-border trade in day-ahead and intra-day energy and balancing services, the more robust and effective market prices will be in meeting the resource investment challenge. The end-of-2014 timeframe for full implementation of the IEM now appears to be optimistic, but the closer Member States hew to that timetable the sooner we will be able to answer with any confidence the open questions about the effectiveness of market prices. Until then questioning the investment effectiveness of prices produced by the IEM is somewhat premature. Member States, particularly those concerned about resource adequacy, should be moving more deliberately to implement full market coupling, to expand cross-border trading of day-ahead and intra-day energy and balancing services, to open the energy and balancing markets to demand-side participation, and to expand region-wide access to capacity resources rather than (as in some cases) trying to impose border restrictions.

- 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?”***

Individual Member States will continue to have a legitimate interest in ensuring to their own satisfaction that their supply of energy is secure. As such it is unreasonable to suggest that they be prevented (even if it were legal to do so) from taking action to address legitimate security of supply issues as long as those actions are in compliance with applicable EU laws and regulations. To the extent that adequacy assessments are just that – assessments – inconsistencies in how individual Member States treat various resources and compile data can undermine the quality of information available to European and Member State energy security agencies but would not, in and of themselves, undermine the functioning of the market. At the point at which such assessments form the basis for intervention in the IEM, however, there is clear justification for requiring that the technical rationale for such national differences in standards and treatment of resources to be objective, transparent, and compliant with EU laws and regulations, in particular with competition law. In reality, given the range of actions already in place or under consideration at the national level based on expressed Member State energy security concerns, there is already a strong rationale for requiring convergence at the EU level in the methods and standards used by Member States and regions to assess resource adequacy. While a single EU-wide procedure may not be practically achievable in the foreseeable future (or even appropriate), it seems realistic and appropriate to work toward procedures standardized at a regional level that can easily be translated to a reliable EU-wide analysis of European resource adequacy.

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?”

The proper question is *resource* adequacy, not *generation* adequacy. The challenge of assessing “resource adequacy” in a market with a large and rising share of production from variable renewables is addressed at length in our paper [“What Lies ‘Beyond Capacity Markets’?”](#) (September 2012).⁴ In short, resource adequacy is the term traditionally employed to determine if investment is keeping pace with the current and forecasted demand on the system. Because it was traditionally reasonable to assume that the system operator could cost-effectively extract all of the services needed to balance the system from the capacity resources procured to meet resource adequacy, the “investment question” was by definition a simple question of the quantity of firm capacity resources available to the system.

⁴ Available for download from www.raponline.org

As the share of variable renewables on the system grows, however, the “investment question” will become more complicated, particularly since the desire to invest more capital to meet resource adequacy has always been constrained by the desire to ensure that reliability is delivered at least cost to the consumer. To assess whether investment is sufficient to deliver reliability at least cost to the consumer it will become increasingly necessary to forecast not only gross demand but also net demand. Net demand is gross demand less that demand that is effectively met by near-zero-marginal-cost variable production⁵ and constitutes the demand that the balance of higher-marginal-cost, dispatchable generation, and demand-side resources will be expected to meet. Recent studies of what net demand can be expected to look like in such a system make it clear that the demand for and therefore the value of resource flexibility will rise dramatically, such that it may no longer be possible to take for granted that the operational flexibility of system capacity resources will be well matched to the system’s need for flexibility services. In other words, simply adding up the capacity value is no longer a sufficient approach to gauging whether investment is keeping up with the needs of the system; it will be necessary to understand the operational flexibility of system resources as well. The lowest cost approach to delivering security of supply will be to optimize the extent to which the resources the system relies on to provide productive capacity can also provide the system with the operational flexibility it needs. In other words, a resource adequacy assessment that values investment in capacity without regard to the operational flexibility of that capacity will lead inevitably to costly and unnecessary overinvestment and, quite possibly, to reduced system reliability.

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?”

11) “Should generation adequacy standards be harmonized across the EU? What should be that standard or how could it be deployed taking into account potentially diverging preference regarding security of supply?”

These questions should be focused on resource adequacy, not generation adequacy. See response to question 7 above. It is essential to the functioning of a competitive energy market that consumers or their designated representatives be free to decide how much reliability they want and what they’re prepared to pay for it. As such it is reasonable for a Member State to decide, on behalf of its domestic stakeholders, to pay more or less for a higher or lower standard of reliability. It is not reasonable, however, for a Member

⁵ Net demand also excludes that part of gross demand effectively served by production from other non-dispatchable resources, such as combined heat and power plants that cannot change their power output in response to the demands of the power system.

State, on the pretense of greater domestic security of supply, to intervene in the electricity market in a manner that obstructs competition or otherwise frustrates the implementation of the provisions of the 3rd Energy Package. Therefore the treatment of system resources for the purposes of assessing resource adequacy should be harmonized at the regional level to the extent necessary to ensure that the objectives of the 3rd Energy Package are met, and regional processes should converge at the EU level. However, as long as those criteria are satisfied, individual Member States should be able to choose how much security of supply they wish to provide to their domestic constituencies and how much they and their constituencies are prepared to pay to achieve it.

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

As should be clear from the answer to Question 1 above (specifically, the text at Question 1(d)), it is difficult to give a blanket answer to the question of whether, and if so when, intervention specifically to encourage investment in capacity resources is necessary or desirable to “improve market functioning.” As described above, discrepancies between actual and desired conditions degrade the market’s ability to efficiently deliver the desired level of service reliability, and reasonable people can disagree about the point at which confidence is lost. It is our view that as long as cross-border trade in energy, balancing services, and capacity is not restricted it is possible (if suboptimal) for the IEM to achieve its objectives with differential capacity investment mechanisms operating in different areas. Indeed, as long as the foregoing conditions are met, the net market effect of national or regional capacity mechanisms can be expected to equalize across the resulting seams over time. In reality, of course, it is likely that, in implementing capacity investment mechanisms, Member States will be tempted to impose various restrictions on cross-border trade. For that reason we recommend that if a Member State concludes that the market is not or will not deliver the desired level of security of supply without the introduction of a capacity resource investment mechanism, the adoption of such a mechanism at regional level, requiring the Member State to secure the cooperation of neighboring states, should be strongly encouraged in preference to purely national mechanisms. One way to move in this direction would be to make it eminently clear that national-level capacity resource investment mechanisms will be evaluated from the presumption that they restrain trade and will receive particularly close scrutiny on questions of competition and compliance with the provisions of the 3rd Energy Package, whereas the assessment of regional mechanisms will benefit from the presumption that they are, by definition, consistent with the cross-border trade objectives of the 3rd Energy Package. Absent a regional agreement, a Member State could perhaps be permitted to rebut this presumption by demonstrating that its capacity mechanism is open to allowing reliably-committed resources from

outside of the adopting Member State to participate on an even basis with in-country resources.

- 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?”***

All reliability assessments include an assessment of the quantity of resources needed to meet a certain level of service reliability and the cost to do so. No power system seeks to provide reliability at any cost, and all power systems use an implicit or explicit version of the “value of lost load” against which to optimize the loss of load probability. This would customarily be translated into target and minimum reserve margins. Assuming the process for setting the standard for determining performance against these metrics is consistent with the recommendations in our answer to Question 11, it would be reasonable to be concerned with the functioning of the market if the actual probability of lost load has risen above the target with no significant movement by market actors to invest in new capacity resources. Similarly, system operators and the responsible authorities establish security standards for the availability of primary, secondary, and tertiary reserves (as well as reactive power supply and black start capability), and if the supply of such services is falling below what is required to meet the established standard on a regular basis with no significant new investment on the horizon in more resource flexibility, it is reasonable to be concerned that the market is not functioning as desired.

It would be more efficient and more reflective of the actual demand for service reliability to allow customers or their designated representatives to determine how much they’re willing to pay to be assured of electricity service at various levels of on-demand service. Various technological options are available today to give consumers of certain energy services the flexibility to choose whether, or when to purchase electricity without noticeably degrading their enjoyment of the related service, and such technologies can be expected to proliferate in the future if enabled to do so. Such options will be available to different types of consumers at different cost levels and will be economically attractive to deploy at different levels of real-time pricing. This would obviate the need for price caps and it would eliminate the arbitrary setting of target and minimum reserve margins by central administrators. In doing so, two of the most important threats to the proper functioning of the wholesale market have effectively been neutralized. It will also enable the more gradual expression of scarcity pricing farther in advance of the need for new investment, reducing price volatility and reducing the likelihood of extreme scarcity pricing. While there are critical details to be worked out, including a process to set and enforce a minimum standard for universal service, this is the direction in which Member States should be heading if they are truly

concerned with ensuring that their constituencies receive the level of service reliability for which they are willing to pay. It will still be incumbent on system operators to assess and maintain the level of various categories of reserves and other services necessary to meet the reliability standard set by customers. It may well prove to be beneficial for market operators to implement a demand curve for critical services and a mechanism to spur investment in resources to provide the services. This would be more compatible with the objectives of the IEM (since system operators already operate markets for balancing services anyway) and could also be sufficient to address concerns about investment in needed capacity resources.

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

- a) By “capacity” we assume you to mean productive capacity, not standby capacity or strategic reserves. With that said, capacity mechanisms that discriminate between new and existing resources are by definition distortive and cannot be made compatible with the proper functioning of the internal market. Capacity markets that commit customers to pay a given price for a given resource over very long periods of time (e.g., a commitment period that begins 5 years in the future and extends for 15 years beyond that) effectively put the market into the hands of central administrative authorities and neutralize many of the most important benefits a market can deliver to consumers. The least distortive capacity mechanism is one that functions through an auction open to all new and existing resources, including qualifying efficiency and demand response resources; that creates a commitment that is far enough in the future to anticipate the commissioning of new resources (e.g. three years) but not so far that the resources procured through the auction cannot be relied upon to be there; that promises price discovery based on the actual need for capacity resources but re-sets the value of all capacity on a regular basis, perhaps once a year (it can be feasible and beneficial to provide new resources the option of a slightly longer commitment period, perhaps 5 years).
- b) The investment mechanism most compatible with ensuring flexibility in a low carbon electricity system is not a capacity mechanism per se but rather a mechanism or mechanisms to encourage investment in resources capable of providing critical system services such as primary, secondary, and/or tertiary reserves. Such a mechanism could be implemented alongside a capacity mechanism but it is also possible that a forward

services mechanism would address much more efficiently on its own concerns about capacity resource investment; by focusing on investment in flexible resources rather than capacity (i.e. by providing more certainty of revenue for services at investment timescales rather than focusing on the value of capacity at investment timescales, as traditional resource adequacy mechanisms are intended to do) it would encourage investment in capacity resources that are capable of providing needed system balancing services.

- c) All forms of capacity mechanisms are reversible only with great difficulty. This is because once the expectation has been set that government will respond to concerns about investment by implementing a capacity mechanism, investors will stop investing when the mechanism is withdrawn or expires, and they'll sit on the sidelines until the government is so desperate they reintroduce another investment mechanism, or until it's too late and prices have skyrocketed. Announcing ahead of time that the mechanism is time-limited does nothing at all to alter this pattern of behaviour. Also, the only thing more damaging to investor confidence than uncertainty over government interference with market prices is government adopting an investment mechanism, then withdrawing it, then leaving investors wondering if and when it will be re-introduced, and so on. Stating up front that it's temporary does nothing to resolve this problem.

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

See response to 15a. Investment mechanisms that: (a) enable all qualifying demand-side resources to participate on an equal footing with supply-side resources, and that (b) concentrate investment in the most valuable capacity resources (that is, those with the capabilities to meet net demand in a system with a high renewables fraction), and that (c) adjust the value of all capacity, using competitive market mechanisms, on a regular basis based on the most up-to-date knowledge about demand and about new technological development, will have the least impact on costs for final consumers. Claims that long-term contractual commitments are least cost to consumers because they lower the cost of capital are highly questionable, since governments have over the decades repeatedly over-committed to generation investment out of an abundance of caution, and in many cases committed customers for decades into the future to ill-considered investments that cost far more to build than was expected or that relied on a primary energy source that became far more expensive than anticipated. The consumer costs of such errors will far outweigh any cost-of-capital benefit that might be gained by returning key portions of the market to central command and control.

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

See previous responses. Clearly we believe that this is a very promising avenue, not only for investment in flexibility but for investment in capacity resources as well. As described in our September paper referenced above, and as described in more detail specifically in the context of the ERCOT market recently by Professor William Hogan in a submission to the Public Utility Commission of Texas,⁶ the existing markets for relevant services such as secondary reserves can be extended in exactly the same way that one would establish a forward investment mechanism to value capacity. This approach would leverage existing market functions, give revenue certainty over investment timescales to only those resources capable of meeting the system's demand for flexibility, would minimize interference with energy markets, and facilitate a gradual expression of scarcity pricing farther in advance of the need for new investment.

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

We do not see the necessity for this; evaluating regional investment mechanisms against a set of principles – and preserving the option for some regions to stay with the current energy-only model – seems the best way forward.

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

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?"*

We applaud the setting of an explicit set of criteria against which resource adequacy investment mechanisms will be assessed. It is now clear that the tighter integration of control areas is crucial to the cost-effective transition to a low carbon power system. We would again recommend that the Commission send a strong signal that regional mechanisms involving the participation of multiple Member States will receive favorable consideration, while national mechanisms lacking any evidence of cooperation with neighboring Member States will be closely and critically reviewed.

Given comments elsewhere in the Consultation document it is surprising to see that the suggested criteria do not include some reference to the need to ensure that any capacity mechanism reflect the evolving demand for flexibility in the resource portfolio. It could be argued that criterion 8 implicitly reflects this concept – since the only least-

⁶ "Electricity Scarcity Pricing Through Operating Reserves: An ERCOT Window of Opportunity", W. W. Hogan, 1 November 2012

cost capacity mechanism is one that ensures investment is concentrated in capacity that can also cost-effectively meet the system's expected requirements for flexibility services, but we would prefer to see the point appear more explicitly in the criteria.

The idea that capacity investment mechanisms should be a response to market failure is explicitly expressed. Given the resource adequacy that currently prevails throughout Europe (and therefore the absence of a demonstrated failure of the market to respond to a pressing need for new investment to meet resource adequacy targets)⁷ it is difficult to see how any of the current proposals for capacity mechanisms would pass that test. The only market failure currently evident is the threat of retirement in some markets of the flexible resources the market should be valuing rather than the retirement of inflexible resources that are in reality surplus to requirements. The only capacity resource investment mechanisms that would appear to pass this test, therefore, would be mechanisms designed to tease out the projected value of resource flexibility and encourage retention and investment in resources that can provide it. As we have said previously, a services-based mechanism, which is simply an extension of markets already operated by system operators, may well turn out to be all that is needed to address concerns about resource adequacy. If a mechanism specifically targeted at capacity is still seen as being necessary, a services-based mechanism that values the operational characteristics of various energy resources and operating over comparable timescales can operate in parallel with it. Alternatively, a metric to value the operational characteristics of various capacity resources can be designed into the capacity mechanism itself.⁸

As should be clear from our response to Question 15c, criterion 3 will be impossible to satisfy, with one exception: if there is a deliberate program in place to replace centrally administered reliability standards with demand participation in price formation, the use of a capacity mechanism as a transitional measure is credible. Otherwise, it is not credible. It will be extremely difficult to reverse in the future any decision to introduce a capacity mechanism, and experience elsewhere has been that this problem is not resolved by creating a mechanism that is officially "time limited." This is not necessarily a bad thing – if one believes that the energy-only market is incapable of ensuring resource adequacy, however one defines it, then the decision to introduce a capacity mechanism is at best open-ended and most likely permanent; where such mechanisms

⁷ As noted earlier, this observation is restricted to questions regarding resource adequacy; targeted market mechanisms and regulation remain crucial to support deployment of energy efficiency and low-carbon supply.

⁸ These options, including the "forward services market" and the "apportioned capacity market mechanism" are described at more length in our September 2012 paper referenced above.

have been introduced it is assumed that they are simply one more dimension of the competitive energy market in that region.

In criterion 5, the reference to “electricity storage” is unfortunate. The reference should be to “energy storage,” including storage of grid-connected energy in any of the end-use forms that serve consumer needs. *Energy storage* thus includes using electric power to provide thermal storage in hot water, ice, or other media, and battery storage, as in electric vehicles, whether or not the batteries are capable of returning electricity to the grid.

With respect to criterion 7, we recommend a “clean first” criterion applied to any capacity resource investment mechanism. Where a capacity mechanism is preferred, the mechanism can be apportioned as described in our September 2012 paper and appropriate “clean” criteria could be built into the specifications for the various tranches of capacity resources. This criterion would help to align forward-looking capacity mechanisms, if they are to be created, with Europe’s long-term energy, climate, and environmental goals.