ENERNOC

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Via email transmission to EMR-condoc@decc.gsi.gov.uk

DECC Consultation Co-ordinator
3 Whitehall Place
London SW1A 2AW

Re: EnerNOC UK Limited Comments in response to Electricity Market Reform Consultation Document (dated December 2010)

To Whom It May Concern:

EnerNOC UK Limited is pleased to provide responses below to the Department of Energy and Climate Change (DECC) Energy Market Reform Consultation Document. EnerNOC provides responses herein to the elements of Electricity Market Reform that relate to the proposal for capacity mechanism.

Company Overview

EnerNOC, which stands for Energy Network Operations Centre, unlocks the full value of energy management by reducing real-time demand for electricity, increasing energy efficiency, and mitigating emissions. Our technology-enabled energy management solutions help meet the needs of utilities and system operators that deliver energy and are responsible for maintaining the real-time balance between supply and demand. At the same time, we help commercial, institutional and industrial organisations use energy more intelligently and generate cash flow that benefits the bottom line. In short, EnerNOC brings proven energy management expertise and innovative ideas to both groups through a full suite of energy solutions including:

DemandSMART – Comprehensive Demand Response
EnerNOC's industry-leading, full-service demand response (DR) application, DemandSMART, enables our utility and system operator customers to get access to clean, reliable capacity where and when it is needed most, and allows our end-use customers to maximise new sources of revenue and identify energy savings opportunities. To date, we provide demand response capacity to more than 100 utilities and system operators around the globe, and participate in a wide variety of demand response programmes and electricity markets, including capacity, energy, and ancillary services. EnerNOC is the world's largest provider of commercial, institutional, and industrial DR with over 5.3 GW of demand response under management, and is transforming the energy landscape with cutting edge energy efficiency and smart grid applications that enable a more responsive, reliable grid today.

EfficiencySMART – Data-driven Energy Efficiency
EfficiencySMART is a suite of data-driven applications and services to help commercial, institutional, and industrial customers meet their energy management needs. EfficiencySMART Commissioning blends initial and retro-commissioning services with real-time, persistent commissioning technology that leverages Building Management System (BMS) data to ensure that buildings are operating at their maximum efficiency and that savings are maintained over time. EfficiencySMART Insight utilises a web-based solution to offer customers visibility into energy usage and spend across an entire portfolio of facilities in order to rapidly identify and harvest a range of low-cost and no-cost energy savings previously hidden from you. Lastly, EfficiencySMART Services includes a wide range of energy engineering, energy project design, and utility programme management services.

CarbonSMART – Enterprise Carbon Management
EnerNOC's CarbonSMART application is an enterprise-class carbon accounting system to measure, manage, and report greenhouse gas (GHG) emissions and prioritise GHG reduction efforts. CarbonSMART provides a scalable, transparent, and auditable solution for collecting and transforming carbon accounting information into actionable, quantifiable energy efficiency savings. Delivered as Software as a Service (SaaS), CarbonSMART is coordinated, centralised, and easy to deploy and manage across the largest enterprises.

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Responses to Consultation Document Questions

Current Market Arrangements

1. Do you agree with the Government's assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?

Yes. The case made by the Government for the likely inability of the current market structure to support investment in low-carbon generation is practically irrefutable in every particular. The case made in the consultation paper includes references to D3 resources (Demand-side management, Demand Response, Distributed generation[1]) as well. The Government's assessment about the current market's inability to support sufficient investment in low-carbon generation can also be said about D3 resources.

D3 resources are a critical enabler to support cost effective investment in low-carbon generation resource types such as intermittent renewables. This is so because intermittent renewable resources need to be balanced by another resource (which can be either traditional generation or a D3 resource) and often require transmission infrastructure. D3 resources can provide this critical balancing function that can enable further cost effective investment in other low-carbon supply resources.

As we will explain in further detail in the duration of these comments, EnerNOC believes that the most critical policy priority for the DECC to facilitate the growth of D3 resources and investments in low-carbon generation is a capacity mechanism that is able to send the proper investment signals to the market in terms of the value of building and operating such environmentally-friendly forms of electricity resources. While there are a variety of permutations a capacity mechanism can take – and which will need to be examined by the DECC and other stakeholders to ensure a well-functioning result – the need for, and importance of, a capacity-based mechanism to advance D3 resources and low-carbon generation is undoubtedly clear.

2. Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?

Yes. There is a tremendous amount of demand for investment capital globally in the energy sector worldwide. Supply investments in liberalised markets are viewed as increasingly speculative versus investments in lower risk regulated network business enjoying more stable price regulation.

Options for Market Efficiency and Security of Supply

19. Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?

Yes. The Consultation Document does an admirable job of discussing the potential merits and demerits of establishing a capacity mechanism for the Great Britain electricity market. As discussed in the Consultation Document, policy choices regarding the design of the capacity mechanism can serve to enhance potential gains and mitigate risks.

The Government is wise to concern itself with market distortions and other unintended consequences of instituting substantial change to the market. The analysis in the Consultation Document on ways that design elements can be addressed at minimising such risks is exactly the correct approach. It does not follow that a capacity market will necessarily lead to undesired results.

The key is and will be careful consideration of short and long term implications of various details of a capacity mechanism. On the one hand, as with any policy change, more experience yields information that informs further adaptation,

[1] Certain types of distributed generation such as distributed renewable resources and combined heat and power (CHP) are low carbon by nature. Other distributed generation resources, such as diesel or natural gas fired internal combustion engines are not low carbon, but importantly, have other attributes that can facilitate penetration of other low carbon generation resources. For example, the added ramping flexibility and of afforded by distributed generation will add reserves capability that can facilitate greater penetration of wind and solar resources. The distributed nature of these resources can also be leveraged strategically to avoid line losses from traditional fossil fuel generation resources located well away from the load sink. All D3 resources support increased penetration of low carbon energy resources.

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refinement, and improvement. Capacity mechanisms in the United States have undergone substantial revision over time, and over time the mechanisms are being continually improved. There are nevertheless emerging best practices that can and should be leveraged by the DECC. On the other hand, frequent, substantive changes can undermine the very purpose of creating a capacity market, as it increases uncertainty for market participants. EnerNOC would recommend that DECC's market design anticipate this tension by providing both a mechanism for making adjustments to the market over time and appropriate controls to limit substantive changes. For example, the capacity mechanism could establish at the outset that there will be a comprehensive review of the programme every three to five years. This embedded review model would not necessarily foreclose interim refinements, but it would signal that major policy changes will be considered in the context of a comprehensive periodic review. Such a model promotes stability in the emerging market that will be created by the capacity mechanism, which further promotes investment in demand resources. Similar major policy review mechanisms have been included in United States capacity markets, including PJM and ISO-NE.

While EnerNOC recommends that a comprehensive periodic review be embedded in a capacity mechanism in order to promote stability, we do not recommend that the mechanism be subject to a "sunset" that discontinues the capacity mechanism unless it is renewed. Sunset provisions are a serious deterrent to long term investment, because there can be will be no certainty that the capacity mechanism will be renewed. Experience in the PJM market in the United States with a sunset element in its economic demand response program yielded unfavorable results and a dramatic decline in the early gains that were made.

20. Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?

Yes. Without question, well-designed capacity mechanisms have been very successful in promoting the deployment of demand side resources. EnerNOC's experience in numerous capacity-based markets and programmes in the United States and other countries, as well as with STOR market in Great Britain, have demonstrated that capacity mechanisms have helped unleash tremendous latent potential for demand side resources to lower costs, improve market efficiency, improve reliability, and improve air quality and climate impacts.

It is equally clear that "energy only" markets like the current Great Britain market have not been successful in attracting levels of demand side resource investment that are commensurate with markets with a capacity mechanism. This experience is not unique, and energy markets around the world have instituted, or are beginning to institute, capacity-based mechanisms to address such issues. In North America, for example, the energy-only market in the state of Texas, ERCOT, has implemented a capacity-based demand response program to ensure adequate reserve capacity and address some of the limitations inherent in energy-only markets. In light of recent reliability issues within the ERCOT market, there is also increasing pressure mounting from regulators and other stakeholders that ERCOT needs to consider expanding such mechanisms in order to send the proper investment signals that energy prices alone are unable to achieve. Similarly, in the Ontario electricity market jointly operated by the Ontario Power Authority (OPA) and the Independent Electric System Operator (IESO), large-scale capacity-based demand response programmes have been instituted in order to both encourage the participation of demand side resources and facilitate investments in new capacity as the province prepares to retire aging and polluting coal-fired generation facilities. This trend can also recently be seen in France, where new legislation will create both capacity and demand response obligations for various market participants. While all three markets utilise – or will utilise – different capacity mechanisms, there is clearly alignment among the system operators and regulators in all three markets in the recognition for the need for markets to recognise the value of capacity.

While improvements in technology will likely enable customers to vary consumption and respond to price and other signals, these advancements alone are likely to be insufficient. The availability of smart meters and dynamic pricing arrangements may change consumer behaviour over time, but this change (and the scale of it) is not likely to occur at a pace sufficient to enable the Government to meet its policy objectives of decarbonisation – while smart meters may be commonplace over the coming years, how long will it be until homes are full of the next-generation appliances that are actually able to leverage such infrastructure? Capacity-mechanisms that better value D3 resources are one way to spur growth in this area.

There is more than a century of inertia behind customer indifference to intra-day and seasonal variations in the cost to supply and deliver electricity. As a result, we have today in Great Britain and most of the world an electricity market that is generally a one-sided market, with very high inelasticities of demand. This condition will not likely change quickly, even with an enlightened customer base open to improving the way we use energy. Change will be slow because there are

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twin problems of customer indifference and consumer product limitations that will hinder progress toward more dynamic interactions between supply and demand in the electricity sector.

Even with motivated customers, there has also been more than a century of inertia behind consumer product design indifference toward electricity cost differentials. Inasmuch as customers have historically not seen pricing differentials in electricity, there was and still is a lack of interest in purchasing consumer products that could adjust consumption levels in response to price or other triggers. Even with newer technologies embedded in consumer products, uptake will be slow because customers are not likely to adapt quickly to swap out products that are functional in order to access this new technology. For example, a factory is not likely to replace expensive production equipment costing millions of pounds that is otherwise fully functional without a solid business rationale. Instead, they are far more likely to replace equipment as it begins to fail or become obsolete according to more normal schedules for replacement.

Capacity mechanisms help overcome these twin barriers to deployment of demand side resources. As stated above, there is tremendous latent potential for demand side resources. However, realising this potential largely requires retrofitting existing appliances, equipment, and buildings to unleash this potential.

One of the primary reasons capacity mechanisms have been successful in bringing demand side resources to market is the capacity payment provides a tangible revenue stream that helps create a cost effective business case for making the necessary investments in demand side resource functionality. Without a capacity mechanism, in energy only markets the return on investment for such investments are far more speculative.

21. What do you think the impacts of introducing a targeted capacity mechanism will be on prices in the wholesale electricity market?

A capacity mechanism, targeted or market-wide, will bring down overall prices to customers in the wholesale electricity market through increased market efficiency, especially by unleashing the potential of demand side resources. Instead of maintaining high cost generation resources that may only operate a very few hours per year, demand response resources can supplant those resources and maintain system reliability and become an additional valuable resource for maintaining security of supply.[2] In addition to meeting capacity needs, demand response resource can also cost effectively provide reserve capability that can supplant traditional "spinning" and "non-spinning" (i.e. "secondary" and "tertiary") generation reserves.

22. Do you agree with Government's preference for the design of a capacity mechanism:

a central body holding the responsibility;

Yes. As is noted in the Consultation Document, bilateral capacity mechanisms tend to have much less transparency and liquidity, and increase the advantages of vertical integration. In markets in which there are a relatively small numbers of buyers of capacity, bilateral markets in practice can lead to buy side exercise of market power because the purchasers (in this case, the retail suppliers to end use customers) may have the ability to artificially suppress the price by withholding purchases of capacity from willing sellers. A centrally administered capacity market mechanism can serve to better police both monopoly and monopsony exercises of market behaviour.

volume based, not price based; and

Both volume based and price based targeted capacity mechanisms have advantages and disadvantages. If the target volume is set too low, an inefficiently low amount of demand side resources will be able to participate. If the target volume is set too high, the price of obtaining the target volume would be more expensive. There are similar concerns of arriving at the right level of demand side resources with price based targeted capacity mechanisms, and neither approach is clearly superior.

EnerNOC supports the Government's preference for a volume based mechanism for two important reasons. Volume based mechanisms have the attribute of allowing for more natural price discovery. Second, priced based capacity

[2] Demand side resources in markets with capacity mechanism are treated as a dispatchable form of "supply."

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mechanisms are subject to revision that can make long term investment decisions more difficult. EnerNOC would welcome the opportunity to provide more detailed suggestions on the design of a volume-based mechanism, as appropriate.

An illustration of the second point is the Ontario Power Authority (OPA) "DR3" capacity mechanism in Ontario, Canada, referred to above. Under the OPA DR3 program, demand side resources are paid a set price for capacity that can vary amongst different regions. The price of DR3 demand side resource capacity is based upon an administrative determination that is not particularly susceptible to predicting or understanding pricing trends, especially the magnitude of pricing changes. Moreover, the administrative determination is subject to substantial exercise of discretion. This inability to reasonably forecast pricing within a range beyond a limited forecast window is a deterrent to long term investment.

a targeted mechanism, rather than market-wide.

EnerNOC has been successful in both types of markets and can support either approach. It is fair to say that growth in demand side resources have been more successful in regions that have a market-wide mechanism. However, the reasons for this comparative success may have more to do with artificially low limits placed upon the market opportunity in regions with a targeted capacity mechanism, which may be volume or price based. With market-wide mechanisms, the market opportunity for demand side resources is limited generally only by the ability to compete on price against traditional forms of supply. In regions with a targeted capacity mechanism, there is a tendency of the utility or regulator to design tender opportunities that are too conservative, and can limit opportunities for demand side resources.

EnerNOC supports a targeted capacity mechanism in the Great Britain electricity market for the practical reason that it will be easier to launch than a market-wide mechanism, and therefore will likely be accomplished more quickly. However, in adopting a targeted mechanism, EnerNOC would urge that the Government mind itself to not craft a mechanism that limits the potential for cost effective demand side resources to flourish under the new design.

23. What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?

As described above, a capacity mechanism will encourage investment in demand side resources and other emerging energy resources and technologies. Capacity mechanisms have the advantage of providing a revenue opportunity for customers that is more or less "bankable," and therefore less speculative as an investment opportunity.

24. Which of the two models of targeted capacity mechanism would you prefer to see implemented:

Last-resort dispatch; or Economic dispatch.

EnerNOC has been successful in markets with either a last-resort or economic dispatch trigger. A last-resort dispatch trigger has advantages over economic dispatch for a number of reasons, however.

Last-resort dispatch is particularly useful in the development of a nascent demand side resource market. This is so because "emergency events" as are typically associated with last-resort dispatch tend to be infrequent and of relatively short duration. Customers seeking to participate in demand response are often initially concerned with whether participation will involve too great a disruption. There is an appreciation that emergencies are relatively infrequent, and generally substantial effort is put forth to restore conditions to normal operations as quickly as possible. There is much less appreciation and understanding by customers in terms of energy pricing, and there are considerable variables – fuel prices, geopolitical instability, etc. – that can make economic dispatch much less predictable. There is also considerable concern amongst customers that high prices may persist for a long period, leading to customer fatigue.

25. Do you think there should be a locational element to capacity pricing?

Yes. Having a locational element to capacity pricing is not only correct from a physics and economics perspective, but it is also essential to ensure that fair value is realised from demand side resources. Demand side resources are, by definition located at the load "sink." This fact gives demand side resources a locational advantage over all other types of generation resources: there are no line losses with demand side resources.

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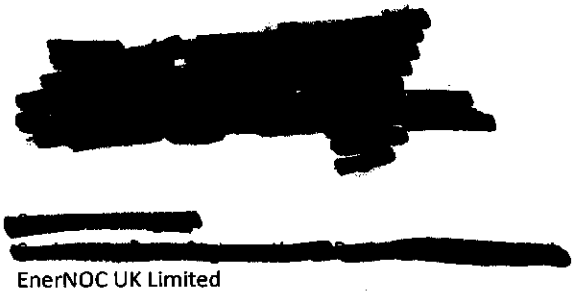
Another advantage of demand side resources is that they can be readily targeted to communities and areas where it can provide the most benefit. It is often difficult to site generation or build transmission to serve congested load pockets in densely populated communities. No one ever protested the construction of a demand side resource.

Conclusion

EnerNOC fully supports the Government's initiative to adopt a capacity mechanism as part of Electricity Market Reform. As the largest provider of demand side management in the world, EnerNOC has substantial experience with capacity mechanism in the numerous markets in North America and elsewhere, and will be pleased to offer further assistance as appropriate.

Sincerely,



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