August 14, 2009

EnerNOC Comments on National Grid Initial Consultation:
Operating the Electricity Transmission Networks in 2020

Question 10 (p. 24) – Do you share our view that distribution companies, suppliers, aggregators and NGrid will all value and compete for demand side services?

Yes. Leveraging market forces will inevitably lead to the most cost effective delivery of demand side services in GB, maximizing both economic and environmental benefits to the market, customers, and society. The demand side of the electricity market is underdeveloped from a market efficiency perspective in most or all competitive electricity markets worldwide (including GB). However, these markets are increasingly poised for the development of robust, competitive, market-based demand side resources.

It is incumbent on National Grid to create markets that stimulate investment in the development of demand side resources. While this type of investment may occur on a localised basis—an end-user trying to manage its energy costs, or a supplier trying to manage peak-period energy delivery costs—it is only National Grid that has a sufficiently holistic and independent view of the GB electricity market to implement market rules that incentivize the wide-scale build-out of cost effective demand side resources.

In doing so, we urge National Grid to recognize that different types of end-use providers can deliver different types of demand response services (e.g., capacity, energy, ancillary services) with varying characteristics and, in fact, the same facility can provide different demand response services depending on the timing, frequency, duration, and total incentives associated with different products.

Aligning interests is important to maximizing market participation by demand side resources. For example, when it comes to providing firm, guaranteed service, aggregators are often in the best position to insulate all parties from risk. EnerNOC's extensive experience in the North American electricity markets has demonstrated that the ability to aggregate resources to mitigate end-use provider risk is essential to overcoming provider reluctance to participate in demand side services. Markets that do not allow for the aggregation of end-use provider sites have consistently failed to achieve substantial market penetration of demand side services and are unattractive to most end-use providers.

Additionally, it is critical that demand side services are built upon an even playing field, one in which third-party service providers, such as aggregators, are not competitively disadvantaged when competing for end-use providers with distribution companies and suppliers who may also be permitted to enlist end-use providers for demand side services. Toward this end, it is imperative that non-discrimination and open access principles be considered in the development of market rules. For example, it is important to ensure that distribution companies do not restrict access to meter data at the end-use provider premises or erect other barriers to competition from third-party service providers.

Allowing market forces to drive the growth of demand side services will enable the GB electricity market to benefit from competition among service providers. In short order, best practices and the most cost-effective, efficient resources will emerge. Furthermore, coordination among service providers and across distinct categories of demand side services will be important. For example, a single industrial provider could participate in a number of different demand side services, including energy efficiency initiatives, or demand response services for reliability, balancing or reserve, price response, and peak load reduction purposes. Each category represents a distinct resource and value to the electricity grid, and end-use providers can and should be able to participate in activities that are appropriate to the end-use provider's business. Individual end-use providers obviously use electricity in different ways and have different capabilities and participation preferences. Demand side services should be designed to be compatible with each other and not be mutually exclusive. This will maximize participation and all associated benefits.

Question 16 (p. 34) - Do you have any views on our projected volumes, prices and costs for STORR under Gone Green?

As demonstrated in Figure 6 on page 29 of the Consultation, the increase in wind resources within the National Grid system will in part increase the amount of STORR capacity National Grid procures. In considering the STORR

resource mix, we would like to highlight that demand response resources are well-positioned to provide National Grid with low-cost, efficient flexibility to handle variability on the power system, including incremental variability introduced by wind energy.

Wind energy output tends to be relatively constant over periods of time less than 10 minutes, with significant variations tending to occur over periods of 30 minutes or more. These characteristics match nicely with the capabilities of most demand response resources, making them ideally suited to accommodate the incremental grid variability added by wind energy. Rather than only procuring traditional supply-side generation to provide operating reserves, we encourage National Grid to consider demand response resources that can provide similar operational characteristics with a reduced environmental footprint and at a lower cost.

More specifically, in sections 5.45 – 5.50, the Consultation indicates that demand side developments (principally smart metering, electric vehicles and embedded generation) will result in peak demand remaining flat at 60 GW through 2020. We believe some of these demand side resources, particularly demand response, can and should play an increasing role in the STORR volumes projected in Table 5 on page 32 of the Consultation.

Today, demand response resources make up part of the STOR (Short Term Operating Reserve) service. Section 6.18 indicates that while STOR utilisation will grow modestly (page 31 describes a 10% increase in hours in 2016 and another 10% increase in 2020), this growth is expected to come from a broadened availability window, not capacity growth. Section 6.18 specifically states on page 32 that "[i]t is also assumed that there is no net change in provider volume." It is our belief that demand response resources can play a much greater role in the STOR market than they do today, both by replacing existing supply side resources (to reflect the 'no net change in provider volume' suggested above) and by delivering program growth above and beyond the 10% increases contemplated in section 6.18.

Demand side services, and demand response in particular, are cost-effective, environmentally friendly, flexible, and, most importantly, highly reliable. However, the discussion in Section 6.18 and the data provided in Table 5 indicate that a vast majority of National Grid's STORR growth will come from gas, UK trade and interconnection, with additional contributions from coal, hydro and pumped storage.

While we recognize the importance of a varied resource stack, we strongly recommend that National Grid leverage to the greatest extent possible demand side resources before determining the necessary growth in and procuring thermal resources (like gas) to meet STORR needs. Additionally, while we understand that interconnection will play a valuable role in meeting National Grid's future balancing needs, it is worth noting that the effective use of demand side resources can help to delay investments in new transmission and distribution infrastructure.

Question 36 (p. 63) – How much electricity demand in GB do you think could be regarded as discretionary or deferrable and hence available for use as a Balancing Service or other energy service?

We recognize that every market is different, particularly across national borders. However, given our substantial experience managing demand response resources in North America (EnerNOC currently manages well over 3 GW of dispatchable demand response capacity), we think it is useful to provide some perspective on discretionary or deferrable demand that we have driven in North American programs.

In general, our experience indicates that between 5% and 10% of a system's peak demand can be reduced through the use of demand response for emergency or reliability programs intended to maintain system reliability and prevent blackouts or brownouts. Typically, some but not all of the resources in an emergency or reliability program can also provide ancillary services or other forms of demand side service that feature shorter dispatch and response times, and increased event frequency.

PJM, a regional transmission operator (RTO) in the Eastern United States, experienced an all-time peak demand of 144,644 MW during the summer of 2006.[1] As of June 24, 2009, almost 7,300 MW of demand response capacity was

[1] http://www.ferc.gov/market-oversight/mkt-electric/pjm.asp

enrolled in the PJM Emergency Load Response Program, representing approximately 5% of PJM's total system peak.[2] While emergency demand response is only one form of demand side resource, this PJM experience indicates the large and growing role that demand response capacity can play in competitive electricity markets.

Finally, at a national level, the Federal Energy Regulatory Commission (FERC) estimated in a recent report that demand side resources could reduce as much as 20% of US peak demand by 2019.[3]

Question 37 (p. 63) – What specific actions should National Grid take to facilitate Balancing Services from demand-side providers while maintaining the required quality and volume of services.

In our experience, a handful of steps will go a long way in maximizing demand side resources available for balancing services.

First and foremost, the use of capacity payments is critical to the development of demand side resources. Like the availability payments that are a part of the STOR service, capacity payments compensate providers for the capacity they make available regardless of whether or not the resource is deployed. Capacity payments are critical for two reasons:

- In many cases, capacity payments have been critical to the development of supply side resources, where a firm payment stream is necessary to justify substantial up-front investments in infrastructure. Demand side resources are no different: capacity payments provide providers and aggregators with financial certainty, enabling investment that might otherwise not be justified for energy-only payments.
- Capacity payments engage providers in a manner that leads to firm commitments. Because the provider recognises that it has been getting paid to be on call for performance when the need arises, and because future capacity payments are typically dependent on event performance, providers view performance as mandatory and as a result capacity based resources have proven to be highly reliable.

Second, program parameters that match business operations are key. While the STOR service presents an attractive opportunity, the wide window of program availability hours significantly limits the universe of potential providers as most commercial, institutional, and industrial (C&I) providers lack substantial load early in the morning, late in the evening or on weekends and holidays.

If National Grid were to develop a program targeting C&I providers with program hours focused on business hours in the commercial work week, substantially more demand side resources would be available, both through new providers entering the market and existing providers making larger capacity commitments. By developing demand side programs that match business operations, National Grid could not only grow the size of its demand side resources, but also maximize value by obtaining those with less stringent requirements at a lower cost, creating a more efficient electricity market.

Third, it is important that National Grid consider the importance of aligning baseline calculations and M&V with the nature of demand side resources. For example, the use of a baseline calculated as measured demand three minutes before notification (as typically used in STOR) is not effective for all potential demand side resources. A cold storage facility where compressors cycle off and on can be curtailed, providing a valuable service to the GB electricity market, but may only be viewed as a reliable resource with a baseline that considers a broader window of multiple data points, rather than a narrow window immediately prior to event dispatch (i.e., are the compressors off or on at that moment versus the next).

As a further recommendation that relates to M&V, we encourage National Grid to think about technology specifications in terms of required attributes, rather than required hardware platforms. Consider the communication requirements in the STOR service, which mandate the installation of an SRD device for data communications.

[2] http://www.pjm.com/committees-and-groups/committees/~/media/committees-groups/committees/drsc/postings/2009-2010-load-management-pro-reg-data-20090624.ashx

[3] "A National Assessment of Demand Response Potential", FERC, June 2009

Instead of setting a specific hardware requirement, we would encourage National Grid to instead specify a series of required data attributes (real time, low latency, etc.) and allow the service provider to determine the most efficient solution possible. This will drive innovation, resulting in more reliable service at a lower cost.

Finally, third-party aggregators provide tremendous value in the development of demand side resources. By engaging third parties in bilateral contracts and allowing them to make long term commitments, National Grid will provide the certainty that enables third parties to make long term investments in demand side infrastructure. Third parties have been the driving force behind recent, substantial growth of demand side resources in North America, offering value through, for example:

- Provider recruitment
- Provision of varied services to maximize participation in demand-side programs
- Active management of a portfolio to ensure high performance
- Portfolio risk mitigation to allow a pool of end-use providers who are not in the business of being real-time electricity market participants to be combined into a single, highly reliable resource

We believe that National Grid should create markets that allow providers to offer demand response with flexibility across a variety of characteristics, and that each market should sufficiently compensate providers for their commitment. Additionally, we also believe that end-use providers benefit from simplicity in program design. We are open to working with National Grid to discuss the mix of markets that can best achieve these aims, ultimately resulting in the procurement of the most demand side services that provide the greatest total benefit to all stakeholders.

Question 40 (p. 66) – Is our mapping of technology to Balancing Services reasonable?

We are in general agreement with the mapping in Table 14. However, we believe that the notion of using 'Large Industrial sites' should be expanded to reflect the entire range of C&I providers we have enabled to participate in demand response programs throughout North America. While in some cases large industrial customers do work directly with utilities and grid operators to provide demand side resources, they represent only a sub-set of all C&I customers with greater than 200 to 300 kW of connected load, most of whom do not have the internal resources to engage directly with the utility or grid operator. This dynamic highlights one of the benefits of involving third-party service providers, as among other things they are able to engage and enable these providers to provide valuable service to the grid. To the extent that this class of customers is not considered in the Dynamic Demand, Smart Metering, or Large Industrial site categories, we strongly believe that they should be included for consideration in Table 14.