

CONSULTATION RESPONSE TEMPLATE

<i>NAME OF RESPONDENT</i>	David Brewster, President EnerNOC Inc. EnerNOC UK Limited
<i>CONTACT DETAILS</i>	dbrewster@enernoc.com
<i>TYPE OF COMPANY</i>	Demand Response (DSR), Energy Management
<i>INTEREST IN DSM</i>	Interested in pursuing demand side management opportunities in Ireland and Northern Ireland, including participation in the Single Electricity Market (SEM)

SECTION 2

QUESTION 1: Do you agree with our characterisation of the four types of benefits that demand side management can provide?

ANSWER: EnerNOC agrees with the general categories of benefits that demand side management (DSM) can provide, namely overall demand reduction, static peak reduction, and flexible measures (in and across days), but also encourages the Regulatory Authorities in the Republic of Ireland and Northern Ireland to also recognise the important ancillary service benefits that DSM can provide as well. Grid operators around the world are increasingly utilising DSM for ancillary services, and EnerNOC itself provides Tertiary and spinning/non-spinning reserves through commercial and industrial demand response (DSR) in multiple markets in the United States and United Kingdom. With increasing levels of wind deployments and the associated challenges of intermittency and system integration, as well as ever-improving technology which continues to make loads more responsive than ever before, both the need for DSM-based ancillary services, and the ability for DSM to provide such resources, is steadily growing.

QUESTION 2: Are there other cost savings which you believe demand side management can deliver?

ANSWER: Yes, DSM can provide important system benefits in addition to reducing generator market power, enhancing supply competition, and enhancing security of supply. Targeted demand response can also defer or avoid distribution, transmission, and generation investments, saving end users money as well as providing system planners with increased flexibility in the options available to them. In addition, price-response demand resources can also mitigate or prevent extreme spikes in electricity prices, reducing price volatility and rates for all users (since such spikes are often 'socialised' across customers on non-dynamic tariffs).

QUESTION 3: Are there additional studies and reports (to those listed in **Error! Reference source not found.**) which you are aware of and believe we should review?

ANSWER: EnerNOC would also recommend the Brattle Group's paper, "The Power of Five Percent," which highlights how price-responsive demand resources can lead to significant cost savings for both demand response participants and all end users.

QUESTION 4: What other insights do you have from your experience of demand side management adopted internationally?

ANSWER: One insight EnerNOC has gained in its experience providing demand response capacity to more than 100 utilities and grid operators around the world is the major role DSR can play in a system when regulations and rules are properly designed to incent demand side management. In the US market of ISO-New England on the eastern seaboard of the country, states such as Connecticut and Maine now have more than 10% of their state peak demands met through DSR.

Another important insight is the demonstrated ability to demand response resources to compete alongside traditional supply resources. For example, in the aforementioned market of ISO-NE, as well as the US market of the PJM Interconnection, DSR compete directly against generation in the forward capacity markets used by both system operators to procure resources. This ability to compete even extends to ancillary service markets, such as PJM's Synchronised Reserve Market, in which large end-users and aggregators like EnerNOC offer quick-response resources to the market on an hourly basis. Today, as much as 25% of PJM's Synchronised Reserves (essentially a combination of traditional spinning and non-spinning resources) can be provided by DSR.

QUESTION 5: Are you aware of other quantitative findings from international experience which you believe are important for us to capture and consider?

ANSWER: The Regulatory Authorities may also be interested in the Pacific Northwest National Laboratory's GridWise Demonstration Project paper, PNNL-17167, which demonstrates how the exposure to real-time consumption and pricing data together can alone lead to energy savings of 5-15%.

QUESTION 6: Do you agree with our identified drivers of future value for demand side response/management? Are there any additional drivers we should consider?

ANSWER: We agree, and believe that demand side measures can provide future value in all the cases cited, included transmission and distribution constraints, and increased ancillary service requirements.

SECTION 3

QUESTION 7: Are there any other aspects of current demand side activity in the All Island Market which should be captured?

ANSWER: Based on EnerNOC's current understanding of demand side activity in the All Island Market, we believe that this Paper captures all current, major DSM activity.

QUESTION 8: Do you agree with our high level assessment of the potential for demand side management in

Ireland by 2020?

ANSWER: EnerNOC has not yet engaged in a rigorous market potential analysis of the various customer classes and end-users across the Republic of Ireland and Northern Ireland, but from a high-level perspective, the estimates contained in the DSV 2020 Consultation Paper appear directionally correct.

SECTION 4

QUESTION 9: Do you agree with our definition of each individual demand side measure?

ANSWER: EnerNOC would respectfully recommend a few minor revisions to the current definitions of demand side measures.

In the case of energy efficiency, the current definition appears to recognise only traditional capital-based measures such as equipment retrofits. Today, however, some of the most innovative energy efficiency offerings instead focus on system optimisation and behavioural changes that can provide savings equal to or greater than these traditional approaches. EnerNOC's SiteSMART energy efficiency application, for example, uses near real-time interval data from a Building Energy Management Systems and tracks tens of thousands of end-use loads to find patterns of anomalous usage and other opportunities for savings, and reduces energy usage by 10% or more.

EnerNOC would also make more explicit the inclusion of system operator/utility – dispatched response in Industrial/Commercial DSR, as such resources are often directly called upon and not simply self-responding to price signals from the market.

QUESTION 10: Is our description of the current policy baseline for each demand side measure accurate and complete. If there are omissions please point them out.

ANSWER: One important aspect of the current policy baseline for Industrial/Commercial DSR not mentioned is the requirement for Demand Side Units (DSU) in the SEM to also take on supply obligations through an associated Trading Site Supplier Unit (TSSU). Such a requirement is a stark contrast to the Aggregator/Curtailment Service Provider (CSP) model found in countries including the United States, Canada, United Kingdom, Australia, and New Zealand, where third-parties can assemble portfolios of demand response resources and offer them into markets without becoming involved in energy procurement. These third-parties specialise in identifying, enabling, and offering demand response capacity into markets, and not necessarily in participating in other aspects of energy markets.

QUESTION 11: Do you agree with our categorisation of different types of “market issue” and typical remedies for each?

ANSWER: Yes, the categorisations appear reasonable.

QUESTION 12: Do you agree with our identified barriers and enablers for each of the specific demand side measures we have identified?

ANSWER: Not entirely. As alluded to above, EnerNOC does not view the 4 MW minimum capacity threshold for DSU to be a barrier to entry to participation in the SEM; rather, it is the requirement for a DSU to also be a supplier. Such minimum capacity thresholds exist in many markets (e.g. National Grid's Short Term Operating Reserve Market in the UK requires a minimum resource size of 3MW), and as long as the thresholds and performance calculations allow for aggregation of smaller resources into groups of reasonable size, they should not create significant barriers. Requirements to take on supply obligations, however, do create barriers as they require innovative third-party companies to operate outside their core competency in order to provide the types of services they specialise in.

EnerNOC would also note that two factors relating to the current pricing structure may create barriers to participation: complexity and lack of advanced visibility. Customer participation will be greatly enhanced to the extent that it is easy for them to understand how their participation translates into compensation. The current structure is challenging in this regard. We also find that markets in which customers can forecast capacity payment levels for one or more seasons (e.g. ISO New England and PJM Interconnection's 3-year forward capacity markets) provide the proper signals to invest in demand response capacity. To the extent that energy payments are a small component of the total compensation, it is less critical that the energy payment levels are known in advance. We view this change as important, but less so than addressing the DSU/Supplier issue as mentioned above. If changes to pricing would cause delays, we recommend the issue be addressed through a subsequent process.

QUESTION 13: Do you agree with our identified market issues for each specific demand side measure and our proposed remedies to address these?

ANSWER: Other than the inclusion of the DSU/Supplier issue discussed in this Consultation Response, EnerNOC believes the Regulatory Authorities have properly identified the "overly restrictive regulations" and remedies, such as addressing the bar on DSUs at sites with export capacity, and more stringent monitoring and telemetry requirements for DSUs of 10 MW or more. Regarding the former, sites with export-capable distributed generation should not be excluded from DSU participation: such sites likely represent some of the most capable and savvy energy loads and consequently are highly probable to be good demand response (DSR) candidates, either from the use of their DG alone, or coupled with curtailment measures. Finally, in regards to real-time monitoring and telemetry requirements, EnerNOC would contend that such requirements are only cost-prohibitive and barriers to entry when they are required to be present at every demand site within a DSU. Rather, such requirements should be imposed at the DSU level, so that a company like EnerNOC could install such technology in our Network Operation Centre (which controls and manages all of our sites), but still utilise our own preferred monitoring and load control equipment at each individual end-user site. EnerNOC strongly believes that near-real-time metering should be a requirement for demand response resources, but under our proposed approach, system operators receive the data they need without imposing undue financial burdens on DSM providers. In addition, EnerNOC believes that system operators should, as appropriate, accept alternative metering technologies that meet all of the functional requirements of the traditional approach. For example, EnerNOC has developed an innovative application of instant messaging technology for communication with metering and control devices that can deliver SCADA-like functionality, at a fraction of the cost. We believe that by allowing for the use of such alternatives which meet the functional requirements of other approaches, enablement costs can be reduced, and the amount of DSR can be maximised.

QUESTION 14: What are your views on the likelihood and effectiveness of the identified policy options addressing

the specified market issue and delivering the desired change?

ANSWER: While we cannot speak for others, should the Regulatory Authorities address the TSSU requirement for DSUs, and ensure that the requirements for metering and control are not cost-prohibitive, EnerNOC would likely pursue entry in the Single Electricity Market.

QUESTION 15: Are there any unintended undesirable consequences that any of the options might create elsewhere?

ANSWER: EnerNOC respectfully cautions the Regulatory Authorities to not “silo” demand response (DSR) and distributed generation too much, as some of the best candidates for demand response also have on-site generation. For example, depending on how regulations were identified, a situation could arise where a Demand Site would have to decide if it should participate in a DSU with its curtailment capabilities, or in an AGU with its generation. In that situation, the SEM could potentially miss out on some of the site’s capacity, if it were faced with a choice where participating in DSR was mutually exclusive with DG-based opportunities.

SECTION 5

QUESTION 16: Do you agree with our identified specific demand side measures and our assessment of the different types of benefits each demand side measure provides?

ANSWER: EnerNOC does agree with the identified demand side measures and the assessments of benefits they can provide, although we would encourage the Regulatory Authorities to view demand side measures more on the benefit they provide (and how), versus the type of load or technology that provides it. For example, ancillary services can be provided by smart appliances in homes, direct load control in commercial and industrial sites, and dynamic charging capabilities for electric vehicles. As such, demand-based ancillary services would perhaps be a better category through which to view these resources, rather than the more granular groupings listed in the DSM 2020 Vision Paper. Such an approach is also more analogous to how thermal generation is thought of. For example, the issue could be framed as whether a unit type could provide baseload power, not whether it does so via turbines powered by the combustion of coal, natural gas, or from a nuclear reaction.

QUESTION 17: Are there any additional demand side measures that we should individually identify and assess? If so, what type of benefit(s) is it felt they provide?

ANSWER: If the Regulatory Authorities desire to employ specific demand side measure categories, EnerNOC suggests the inclusion of a category for data-driven operational energy efficiency, such as those services provided by continuous and/or monitoring-based commissioning services. As was mentioned earlier in this Response, solutions like EnerNOC’s SiteSMART (monitoring-based commissioning utilising building management system data), can provide energy efficiency benefits on par, or greater than, traditional energy efficiency approaches, but with far less capital expenditure.

QUESTION 18: Have we identified all of the relevant criteria for assessing the individual and comparative merits of the demand side measures?

ANSWER: As mentioned earlier in this Response, EnerNOC believes the assessment criteria should also include impacts on transmission and distribution costs, market price volatility, the provision of operating/Tertiary reserves (in addition to frequency reserves), as well as the ability for a particular demand side measure to lead towards other ancillary benefits (such as the demonstrated ability for DSR to lead to increased energy efficiency).

QUESTION 19: What are your views about our approach to high level assessment of different demand side options?

ANSWER: EnerNOC believes that the Regulatory Authorities have properly identified many of the major factors against which to measure DSM, including Policy Impacts such as competitiveness and consumer choice, security of supply, reliability, energy efficiency, renewables, sustainability, as well as electricity market benefits such as reductions in variable generation costs and CO2 emissions.

QUESTION 20: Do you agree with our assessment of each demand side measure against each of the identified factors?

ANSWER: While EnerNOC does not have access to the details of the analysis conducted, we were surprised to see that domestic energy efficiency was granted higher rankings than commercial and industrial energy efficiency measures in the categories of Security of Supply and impacts on generation costs and CO2 emissions. Our experience as the world's leading DSM company, and knowledge of energy efficiency programs in many locations, leads us to believe that energy efficiency among commercial and industrial customers would likely have a much greater impact on the aforementioned metrics compared to domestic energy efficiency measures.

In regards to Industrial & Commercial DSR, we think the Paper accurately captures the benefits of DSR in relation to Competitiveness, Security of Supply, Sustainability, and Electricity Market Metrics. However, we were surprised to see the assessments of cost of Direct Load Control, Demand-side bidding, and Autonomous Industrial & Commercial DSR. Our experience managing more than 4,800 MW of Industrial & Commercial DSR is that such resources are significantly more cost-effective on a per kW basis than their domestic counterparts (which received equal or better cost assessments in this evaluation).

QUESTION 21: Do you agree with our overall assessment of the relative merits of the different demand side options?

ANSWER: Yes, EnerNOC wholeheartedly agrees that Commercial and Industrial energy efficiency and DSR are among the most beneficial demand side options.

QUESTION 22: Do you have any comments on our high level assessment of the benefits of different demand side measures?

ANSWER: EnerNOC recommends two small revisions. First, the definition of energy efficiency should be expanded to include the types of solutions EnerNOC has mentioned elsewhere in this Consultation, and consequently the associated capital cost of energy efficiency should be lowered accordingly. Second, EnerNOC would respectfully

contend that direct load control for large commercial and industrial sites is not high cost, especially not when viewed on a €/kW basis. (We do nonetheless support the High overall ranking such resources receive in the matrix). We believe that with the proper cost modifications, such demand response resources would be shown to be even higher value and more cost-effective in the rankings.

SECTION 6

QUESTION 23: Do you agree with our assessment of the relative priorities of different demand side options in developing a 2020 Demand Side Vision?

ANSWER: Yes, EnerNOC wholeheartedly agrees with energy efficiency and commercial/industrial demand response being identified as top priorities. As studies and experience have consistently shown, commercial and industrial energy efficiency and DSR are some of the most cost effective demand side measures (and resources in general, including compared to generation/supply) available.

QUESTION 24: What alternative views do you have on relative (merits and) priorities?

ANSWER: If we had to suggest any revisions, EnerNOC would respectfully recommend that commercial and industrial energy efficiency should receive a higher priority than energy efficiency in the domestic sector, as the former is significantly more cost effective and will result in a larger overall impact.

QUESTION 25: Do you agree with our proposed high level 2020 Demand Side Vision as described above?

ANSWER: Yes, the described 2020 Demand Side Vision properly identifies the high-level goals related to demand side management that should be pursued by the Regulatory Authorities in the Republic of Ireland and Northern Ireland.

QUESTION 26: What alternative vision would you put forward?

ANSWER: N/A

QUESTION 27: Do you agree with our proposed policy pathways for implementation of the identified different policy options for realising our proposed 2020 Demand Side Vision?

ANSWER:

EnerNOC is pleased to see the willingness to pursue a wide variety of policy options to encourage greater amount and types of demand side management in the Republic of Ireland and Northern Ireland. That said, as EnerNOC has described in this Response, from our perspective the primary barrier to entry in the SEM is the Supplier requirement for DSUs. While the policy options listed in Table 10 would result in positive developments, without addressing the Supplier requirement, the other changes made regarding I&C DSR in the SEM may not achieve the

desired result of obtaining more DSR in the All Island Market.

QUESTION 28: What alternative policy pathways would you propose based on your previous comments and responses?

ANSWER: Other policy pathways that the Regulatory Authorities may consider exploring include:

- The creation of an Energy Efficiency Portfolio Standard / Peak Reduction Standard. Many jurisdictions are now developing demand-side complements to Renewable Portfolio Standards (RPS/REPS) that include standards for both reducing overall consumption as well as peak demand levels by specified milestones. These standards are resource-agnostic, and therefore allow the most cost-effective demand side measures to provide the sought level of reductions.
- Market-based mechanisms to spur investments in energy efficiency (the ability for permanent demand reductions to be monetised via in the Single Electricity Market. Such mechanisms exist in the ISO-New England system in the US and are known as Off-Peak Resources, formerly called “Other Demand Resources.”)
- Equal treatment of Capital and Operating expenditures to remove disincentives that may exist for investments in demand side measures, which are often deemed Operating Expenses and consequently may be less financially attractive to distribution and transmission network owners. The energy regulator in the UK, the Office of the Gas and Electricity Markets (Ofgem), recently created such a policy through their recent Distribution Price Control Review 5 known as the “Equalisation Incentive.”

SECTION 7

QUESTION 29: Do you have any additional view or comments you feel are important/useful for us in (a) establishing a Demand Side Vision for 2020; (b) identifying associated policy development and (c) determining policy pathways?

ANSWER:

EnerNOC would like to voice our support for robust and data-driven measurement and verification requirements for commercial and industrial demand response. We believe it is imperative to require demand response providers like EnerNOC, as well as direct participants in the market, to have near-real-time (e.g. 1 or 5 min) interval data, and to settle on such data with the system operator. Pairing granular interval data with industry standard performance measurements such as a 5 in 10 CBL baseline, will ensure that system operators are receiving the load reductions they are expecting (and are paying for).

QUESTION 30: Are there any final comments industry stakeholders wish to make about this consultation and the proposed next steps in the consultation process?

ANSWER: