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Creating the right environment for demand-side response (ref 64/13)

SSE is pleased to provide comment on the above consultation. We welcome the ongoing engagement with Ofgem in relation its Smarter Markets work and have provided answers to the specific questions posed by Ofgem in the attached annex.

Overall, SSE remains supportive of the work that Ofgem is currently undertaking in relation to demand-side response. We have provided additional comments in response to the questions below, however we firmly believe that industry must reach a solution that supports the best interests of the market as a whole and is supported by a full Impact Assessment and Cost-Benefit Analysis.

Ofgem's proposals appear to be consumer centric, we would like to see Ofgem undertake an element of domestic and non-domestic consumer research in order to determine whether the proposals appear workable in their current format. This research should also look to ascertain exactly what consumers expect from demand-side response.

Given the cross-market impacts of demand-side response and settlements (a separate work stream under Smarter Markets), it is encouraging to see Ofgem engaging with a range of industry participants such as network operators, generators and suppliers. SSE would wish to see this input continuing throughout the project. Given the dynamics of a demand-side response market the potential impacts and conflicts between participants cannot be fully understood without timely and appropriate input. Given these cross party impacts, we see it as key that Ofgem take the lead on this work.

We have provided some further thoughts and analysis in response to the specific questions posed by Ofgem in the attached annex. We would welcome the opportunity to discuss this in more detail at the earliest opportunity.

Yours sincerely

Steven Findlay
Regulation

Annex

Precondition 1: Industry parties need to be confident that there is value for them in demand-side response to justify the investment

Question 1: *Are there any additional key challenges associated with revealing the value of demand-side response across the system? If so, please identify and explain these challenges.*

Yes, quantifying technology specific demand-side response (DSR) capabilities in the UK context and engaging with appliance manufacturers is an additional requirement. There remains a lack of knowledge at national level of how much different types of electric load can provide in terms of DSR and what technology adaptations may be required to optimise future devices. From a customer's perspective, it is unlikely that retrofitted appliances will be cost effective to purchase therefore there is a need to work with appliance manufacturers and agree how any additional costs can be covered.

Control, in terms of response time and reliability of DSR, is not fully understood and should be further investigated and trialled, particularly with respect to aggregated DSR services. For example, the impact of using a single platform or third party to mediate between customers and primary actors (DNO, SO etc) should be assessed and measured against what direct relationships can ordinarily achieve.

Question 2: *Can current regulatory and commercial arrangements provide the means to secure demand-side response being delivered? If not, what will regulatory and commercial arrangements need to deliver in future?*

The current regulatory and commercial arrangements governing the operation of the electricity market strongly favour generation derived services. The vast majority of 'demand side' services currently procured for STOR, fast reserve and frequency response are back up generators and not 'true' demand management. This is perhaps a reflection of the current framework that offers no advantages for creating more energy efficient and carbon reducing balancing services.

At the moment DSR incentives are limited to organisations that have back up generation. True demand reduction and time shifting load for DSR could be given additional incentives compared to other measures that rely on fossil fuel generation. This would promote innovative new methods to balance supply and demand in an environmentally friendly way. From a holistic point of view DSR, can also reduce the transmission and distribution network losses that occur with the use of centralised power generation.

Question 3: *Is current work on improving clarity around interactions between industry parties sufficient? If not, what further work is needed to provide this clarity?*

The different drivers and relationships between market participants should be thoroughly investigated and greater communication can be facilitated by Ofgem. For example there is a clear crossover in the management of capacity margin and the residual balancing arrangements. This is highlighted by larger customers actively managing demand for lowering Triad charges levied by the Transmission Operator, which can subsequently reduce the potential DSR service opportunity to the System Operator.

Precondition 2: The value of demand-side response services needs to be effectively signalled to customers

Question 4: *Are there any additional key challenges associated with effectively signalling the value of demand-side response to consumers? If so, please identify and explain these challenges.*

Transparency for customers is crucial when promoting and offering DSR. One particular area that Ofgem should consider is the importance of making domestic consumers aware of the energy and carbon efficiency benefits that DSR can have in addition to any financial gain. For example, more dynamic automated control of electric hot water and storage heating as apposed to static overnight charging may deliver a more efficient and better quality of service (increased heat availability when required).

Question 5: *Do you agree that signals to customers need to improve in order for customers to realise the full value of demand-side response? Does improving these signals require incremental adaptation of current arrangements, or a new set of arrangements?*

Whilst signals need to be improved to customers allowing them to assess and access the value of DSR, the focus from Ofgem on time of use signals is a cause for concern due to the questionable benefits they have.

To date, industry has little experience in offering time of use tariffs and the small scale trials that have gone ahead provide inconclusive support. Ofgem in the final EDRP report stated that the expected demand reduction from using time of use tariffs in the UK is only 3%.¹ Furthermore there have been no direct load control trials that show how smart meters can offer automated DSR. A mass pilot study report carried out by VassaEtt has provided evidence that time of use tariffs and critical peak pricing can reduce or shift demand by up to 10% in some countries.² However, in the UK which has a mild maritime climate, there is limited air conditioning load and the majority of space heating is met by gas boilers rather than electricity; evidently there is less flexible load compared to some other countries.

If Ofgem is to drive forward plans for utilising time of use tariffs then this position should be justified by clearly identifying the potential value for stakeholders, namely for customers. At the moment this knowledge is unclear and there are reasons to believe that mechanisms such as peak pricing do not have enough value in the current market for customers to engage. For example, a Capgemini report states that real-time and peak pricing requires at least a 1:3 differentiation between peak and off-peak wholesale electricity prices, however, the current ratio is closer to 1:2.³

As Ofgem has mentioned any time of use tariff structure must benefit customers and not give preferential treatment to certain groups of customers. This will be very challenging given the diversity of customers income groups, age, installed appliances and willingness to engage.

Precondition 3: Customers need to be aware of and able to access the opportunities

Question 7: *Are there any additional key challenges associated with customer awareness and access to opportunities around demand-side response? If so please identify and explain these challenges.*

¹ Energy Demand Research Project, Aecom on behalf of Ofgem, 2011

² The potential of smart meter enabled programs to increase energy and systems efficiency: a mass pilot study, VaasaEtt, 2011

³ Demand Response: A decisive breakthrough for Europe, Capgemini, 2010

Acceptability by customers is a key challenge in relation to DSR. In previous Ofgem reports such as Demand Side Response (2010) it is established that customers do not favour an interruptible supply or direct load control of their household appliances e.g. wet appliances.

However, the majority of customers were willing to have their hot water dynamically controlled. With approximately 12 million domestic hot water tanks in the UK each equipped with a 3kW immersion heater, dynamic switching of electric water heating represents a DSR opportunity that does not warrant behaviour change or customer interaction.

Ofgem has suggested that direct load control can exist within a time of use tariff structure. Nevertheless there is an argument to have a clear separation between direct load control (i.e. automated DSR) and time of use tariffs. The former has the ability to time shift loads with much greater reliability and does not necessarily require behaviour change. In contrast time of use tariffs have greater uncertainty, particularly in the case of static low granularity time of use tariffs. Attempts to combine these together may cause extra complexity that is unnecessary and unfavourable to customers.

As Sustainability First have highlighted in their papers, there are around 2 million radio teleswitch customers in the UK that provide a readily available method of automatically time shifting electric space and water heating.⁴ Since these loads provide the majority of total flexible load in the UK there is a requirement to assess what advantages a new technology i.e. smart meter system will have over existing technologies. There is an argument Sustainability First make that the current radio teleswitching is underutilised and can in fact offer a much more dynamic DSR service.

It is estimated that 200 MW of teleswitched domestic load currently provides a Fast Reserve service to the System Operator, proving that the technology can meet the same requirements as other reserve services. Importantly there is a further order of magnitude of unutilised teleswitch load (~2GW) that could also offer DSR without any additional capital cost. This metered load is distributed throughout GB, which is an important attribute for managing the transmission network. In terms of customer value, part of the revenue from providing the System Operator with an ancillary service could be distributed to customers. There may also be energy efficiency benefits of having a more dynamic service compared to Economy 7, which charges inversely to when most demand occurs in the evening.

Currently, locations within our distribution network, especially Scottish Hydro Electric Power Distribution, existing network constraint is managed by careful allocation of load switching times via the radio teleswitch infrastructure. At these locations it is important that existing arrangements endure as metering equipment is replaced by smart meters.

The introduction of new technology provides an opportunity for all industry parties to work together to not only maintain but enhance existing arrangements. Under proposed new arrangements the control of load will effectively transfer from network operators to suppliers and it is therefore vital that suppliers and network operators work together to provide appropriate solutions with proportionate consumer benefit. Failure to manage this transition could potentially result in networks being adversely affected and customer service being compromised.

Question 8: *Is any additional work needed to explore the role of third parties in helping customers to access and assess demand-side response offerings?*

As mentioned previously in Q1 a third party will need to ensure that energy can be procured from customers for the primary actors in a reliable and timely manner. Ofgem should ensure that if a third party is to act on behalf of consumers (e.g. as an aggregator) that they receive a guaranteed level of protection, data security and quality of service.

⁴ Sustainability First GB Electricity Demand – realising the resource, 2011-2013

Conclusion

Question 9: *Are there additional preconditions for delivering the right environment for demand-side response? If so, please explain what these are and why they are important, as well as attaching a priority relative to those challenges we have already identified.*

A key barrier to investing in new DSR schemes is the uncertainty over how and if customers will engage in the way that is intended. From a suppliers point of view, when contracting a position in the balancing and settlement system, DSR would need to be taken into account. The high risk associated with time of use tariffs or other customer dependent schemes may have negative knock on effects in the supplier's ability to deliver its declared energy to market. Additionally, there is uncertainty over the revenue that will be generated by any investment into new DSR, since the System Operator and Distribution Network Operators already have a portfolio that meets their requirements.

Question 10: *Do you agree with the priority and timing we have attached to addressing each of the key challenges identified above?*

According to Ofgem's own analysis and base case scenario the capacity margin may reduce to just 4% in 2016, increasing the risk of interruptions to supply.⁵ At the same time Ofgem is relying on smart metering to facilitate potential DSR, which will not be rolled out countrywide until 2020. There is a risk that by depending on smart metering there will be a lack of investment in short-medium term DSR measures that can help alleviate risks associated with the predicted shortfall in capacity margin.

With the introduction of smart metering there needs to be early engagement and development of agreements between industry parties to ensure that any new charging arrangements introduced by suppliers do not alter existing network loading in a way that adversely impacts upon network operation.

The capacity market provides a good opportunity for DSR to provide a cost effective approach to ensure security of supply. One of the key attributes that should be considered within the capacity market is the response rate, in this way DSR has clear benefits when compared to many generation sources. However, there is a danger that the capacity market might interfere with the general flexibility of the system and risks deferring capacity away from the balancing mechanism. Careful consideration will be required when integrating the capacity market into the current balancing arrangements.

⁵ Electricity Capacity Assessment, Ofgem, 2012