



Ben Smithers  
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Dear Ben

**Demand Side Response Consultation 64/13**

Please find enclosed our response.

At high level we believe that we agree with Ofgem on three main points;

Industry Parties need to be confident that there is accessible value in demand side response to justify investment in enabling it

The value of demand side response services needs to be effectively signalled to the customer

Customers need to be aware of and able to access the opportunities

This response is not confidential

Yours Sincerely,

A handwritten signature in black ink, appearing to read "Chris Harris".

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**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

Elements of value - DSR has the potential to alleviate national energy balance in all timeframes from sub-second to decade, as well as transmission constraints, distribution constraints and system support such as voltage and reactive power. The regulatory architecture does not at this point reveal the value to the consumer except for some specifics (half-hourly power to consumers with meters that measure half-hourly, short term operating reserve, and triad).

Wider changes in market fundamentals, especially due to Electricity Market Reform (and to a smaller extent Smart meters) will affect electricity wholesale market spot price level and shape and volatility. These, in turn, affect value of demand-side response.

Asymmetry of visibility of response in production and consumption sectors - The value of response should be clearly visible in all sectors at the same time. The current system essentially regards demand as inelastic, provides a price signal to the net production sector, then elicits an associated response that pre-empts DSR that may be cheaper.

Data protection – Demand response in the residential sector is essential both to achieve the depth of response needed to enable security of supply and the low carbon transition and to provide the enabler to individual consumers to reduce their bills. The current approach to data protection and privacy has not yet arrived at a solution that both ensures privacy-by-design and at the same time has the ability to have a data-enabled response that can optimise value for consumers. Whilst privacy and DSR are in some natural tension, privacy-by-design can be enabled by techniques which enable the ‘de-personalisation’ of data, aggregation and encryption, and focussing the privacy rules on the usage and abuse of data more than the rules on the storage and transmission of data.

Regulatory/institutional framework - A stable framework for DSR price signals should be as available to the net consumption sector (mainly consumers) in addition to the net production sector (e.g. power generation). Education on the benefits and fundamentals of DSR are essential to ensure engagement. As advancing technologies are essential to the success of DSR, the framework must be capable of easily adapting to accommodate these.

Settlements – The settlements activity in the Ofgem Smarter Markets Coordination Group is welcome and should enable the development of (towards universal half-hourly) settlements at a pace fast enough to manage the take up of smart tariffs. It should be recognised that DSR is not limited to half hourly national balancing and therefore that industry facing settlements for more complex response will need to be scoped and sized to accommodate any substantial take up of more complex DSR. This is particularly the case for the business sector, and the Low Carbon Network Fund has showed substantial innovation in the types of DSR that can be contracted.

Cost socialisation- This remains an important social/cultural issue for the universal service provision of energy through pipes and wires. As this is inefficient, socially as well as in total, it is essential that the gradual introduction of cost reflective charging occurs, whilst recognising and ensuring consumer protection needs at all stages. Consideration should also be given to the cost of maintaining the provision of data and keeping the management systems updated in line with new technologies.



**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?**

*Partially*

Substantial existing physical infrastructure - The infrastructure exists for simple day/night management of heat, through the economy 7 tariffs, which have survived in the Retail Market Review. Despite this, the longevity of the tariff, and the physical capability in most dwellings to respond (more so as heat electrifies), response is modest. The key barrier to response is weakness of price signal. This is partly intentional (protection of vulnerable consumers who would pay more if they cannot manage their load), and partly a product of the regulatory culture of cost socialisation at the expense of cost reflectivity.

Resolution of competing price signals - The market arrangements are not set up for endemic DSR involving more than half-hourly balancing of energy at national level, in nominally unconstrained networks. For participation of transmission and distribution networks in all timeframes (specifically using DSR to delay reinforcement), requires either direct network-consumer commercial interaction that does not destroy energy balancing by suppliers, or supplier-network commercial interaction. Market arrangements would need to develop to accommodate this. The Low Carbon Network Fund (LCNF) has provided a rich array of test cases in which the project in question would require changes to market arrangements to roll out nationally.

Retail Market Review tariff limits – We recognise the need to re-baseline the supply sector in terms of consumer understanding and trust, and at the same time must recognise that the industry and regulator owe it to consumers to provide and facilitate products that are tailored and enable the lowering of energy bills. It is important then to plot a path towards allowing smart tariffs without jeopardising the newfound trust and engagement of consumers. A trial and derogation approach may well be the best way to allow the pioneer population to benefit, without undue risk to consumer protection.

The Electricity Market Reform Capacity Mechanism (CM) – Whether or not DSR is included or not will be crucial in understanding the potential take-up of DSR, and even without DSR the best possible design for peak-based obligation will be essential for consumers. Until the CM discussions are resolved and the energy bill is delivered there is no supportive framework for large scale DSR and therefore reviewing its commercial likelihood is difficult.

Attenuation of price signal – At this point the price signal for DSR is attenuated at every point in the value chain from primary energy, through wholesale markets, transmission, distribution and supply. Even in the industrial sector where consumer protection is not a direct issue, this attenuation causes the price signal to be too weak to justify the capex and opex for DSR preparedness.

Uncertainty - Uncertainty in value will deter any DSR supplier /generator investment or risky/suboptimal deviation from current operations. Although the present consultation appears to focus on embedded energy consumers; consideration needs to be given to incentives for all market segments, and the right amount of commercial protection of early adopters who invest. Policy stability can help substantially here.

Availability of central consumption data at meter level– Both suppliers (to make products) and consumers (to evaluate opportunity and impact) need some kind of access to central data, and the ability to relate changes to core consumption profile that are caused by weather, other exogenous



effects, price and opportunity for simple and complex response. These data need to be highly accurate, highly granular (half-hourly), timely, fully continuous over time, and verifiable.

Industry governance - Whilst there is a need for robust governance, under the current arrangements, The Distribution Connection and Use of System Agreement (DCUSA) and the Distribution Network Operators (DNOs) are too rigid in their application, and this will have to be overcome to ensure that DSR can function within the market. There are currently three changes to these codes 'in flight' so this will help to reduce some of the barriers. The introduction of the Smart Energy Code will also be a benefit.

**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?**

No

Whilst there are pockets of good work being done and Ofgem is to be commended, as are DECC, trade associations, and industry parties in the collaborative work, for example in the Low Carbon Network Fund (LCNF), Electricity Network Strategy Group (ENSG), Smart Grid Forum (SGF), Smarter Markets Coordination Group (SMCG) and now Future Trading Arrangements (FTA), more work needs to be done to overcome the challenges. The challenges are now well known, for example commercial and technical interoperability, live information flow, communication connectivity, data handling, conflicting demands (e.g. network constraint versus energy balancing), data security and privacy.

Market Arrangements - What does not exist at present is an agreed set of market arrangements, which we would expect to be adaptations of the current Supplier Hub model. Nor is there an agreed set of criteria (e.g. system resilience, energy balance in rare event such as anticyclone, consumer protection) to judge against. We believe it to be essential that SGF develops the key requirement of prospective Distribution System Operators (DSO), and that DSO and aggregators are recognised in market design to be developed in SMCG and FTA.

Visibility – The required adaptations to the Supplier Hub regulatory model and changes such as Distribution Connection/Code can appear somewhat arcane, and yet the core requirement, to enable consumer participation, keep the system stable and resolve competing signals can be explained.

The Supplier Hub – Whilst it does seem that the Supplier Hub is a very good starting place for a consumer centric regulatory model, other models (strict supplier hub<sup>1</sup>, consumer hub, DSO hub<sup>2</sup>, point-to-point<sup>3</sup>, central planning etc) should be considered, perhaps not as likely candidates but to provide models for specific forms of DSR.

REMIT and the Electricity Transparency Regulation (No 543/2013) - REMIT clearly covers consumption as it includes final customers with supply contracts of 600 GWh or more. Therefore, any arrangements need to consider that all those brought within REMIT's scope are required: to disclose inside information - information of a precise nature which is specific enough such that if it were made public would be likely to significantly affect prices – and, having registered with Ofgem, to report transactions to ACER (as well as complying with the prohibitions on insider trading and market manipulation).

<sup>1</sup> No contracting allowed outside supplier hub, e.g. STOR

<sup>2</sup> DSO is hub except core tariff between supplier and consumer

<sup>3</sup> Consumer contracts with supplier, who contracts with DSO, who contracts with transmission/system operator



Electricity Transparency Regulation (No 543/2013) - A parallel piece of EU legislation which also needs to be considered is the Electricity Transparency Regulation (No 543/2013) requiring those with consumption units (receiving electricity for their own use excluding TSOs and DSOs) of 100 MW or more to provide their planned availability and planned and unplanned changes of 100 MW or more to the TSO (National Grid) which will send the data to the European Network of Transmission System Operators for Electricity (ENTSO-E) to put on the central information transparency platform.

National Grid and BSUoS - Interaction of NGET with DSR providers needs to be understood and absorbed in the current Balancing Services Use of System (BSUoS) framework. Visibility of NG take-up and potential impacts on the system need to be communicated sooner rather than later. Customers making decision around DSR need to have robust links with their supplier to ensure accidental activation of take or pay clauses is avoided and that particularly large users who utilise DSR do not fall foul of REMIT regs around market visibility

**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.**

Yes

Trust – Trust by consumers in the industry is essential for DSR and it must be recognised that it will be expedient for many actors to foment mistrust in the industry in the areas of data/privacy and in automated device/circuit control. It is essential that government and the regulator do not participate in the fomenting of distrust. The Retail Market Review provides the opportunity for a new beginning, that should not be wasted.

Consumer protection – Which will be influenced by the degree to which consumer trust is assumed to be restored. Vulnerable consumers not only need to be protected from generally high unit costs and the adverse effects on annual bill of a smart tariff in the absence of any demand side management, but also from the perspective of interruption and security of supply. Whilst this is much improved in the smart system, this is in a context of generally lower system reserve margins. It is also worth noting that a system with DSR is more efficient and therefore provides the possibility for subsidy for vulnerable consumers, ideally for energy measures (insulation, DSM and DSR) but with a backstop of direct financial subsidy.

Communication and education – In the short term, the consumer and/or the device need the signal to respond to. In the medium term, both consumer and device must be enabled to engage with the signal, and a debate is needed on the relativity of a consumer's rights to local autonomy (complete control of their devices) and consumers' right/requirement for a continuous universal service in the form of networked electricity. Whilst the supplier hub model (or the consumer hub model) does provide local autonomy, a rigid approach disallows consumer empowerment in DSR. It is worth noting that consumers already accept central control of circuits that enables them to reduce their bills – in the form of Tele-switching.

Data privacy - A significant challenge and one that we believe is something of a "showstopper" is the status of the debate on data privacy. Privacy is of course very important and we believe that the Data Protection Act and the European Convention for Human Rights are fit for purpose and should be used to guide the approach to privacy in consumption data. With a shortage of data, parties (suppliers, stakeholders, the regulator, DECC, industry) cannot model, test and trial specific DSR actions, nor can the industry (DCC, Elexon, etc) commit the cost to build a data infrastructure





that can support the DSR. We believe it to be clearly in the interests of consumers, both in relation to their bills and in relation to sustainability, to use data in the most effective manner to encourage DSR.

Automation – Consumers will be enabled to use DSR to reduce their bills largely through automation. To use a common example, for those who choose to participate by doing their laundry using off peak electricity, this will be most effective by automation than by rhythm-of-life (in this case going to the washing machine in the middle of the night). At the same time, the automated response can have a smaller or larger effect on rhythm-of-life depending on choice (in this case taking the clothes out at different times). So, whilst the electrical response is automated, the consumer is affected by the response and needs both to understand the effect in real time and to have a degree of discretion in altering the DSR.

Consumer approach – instruction or incentive - There will also need to be high-level engagement on the benefits of more automatic DSR (such as fridges etc and storage) that doesn't come across as instruction, but moreover, as an incentive. This would support the ENSO suggestion earlier this year that system operators could reduce fridge load remotely.

Stakeholders – Explaining the value of price signals to stakeholders (media, consumer advocates, politicians) is essential. Sadly it is very easy for the key message (helping consumers by enabling consumers at the heart of the solution) to go awry or be misrepresented, particularly in the areas of privacy, consumer protection, generally rising costs of carbon and primary energy

Retail Market Review - The Retail Market Review clearly presents a significant challenge to DSR, as tariff innovation is essentially thwarted for a period in which the regulator, suppliers and consumers establish a clear foundation of trust from which to build consumer empowerment in DSR. We recognise the need for the RMR and also note that mass rollout of smart meters (on which DSR is critically dependent) has not yet begun. Therefore we believe that suppliers and other stakeholders should “plot a path to smart”, recognising RMR and the smart meter rollout.

Technical signalling – The communication signal can arrive to the consumer through many channels and gateways, for example internet, long range / mesh radio, GPRS, text and to the meter, device, consumer control centre etc.. This is complicated in terms of rules (e.g. only SEC parties can connect to the DCC), protocols and communication layers, and devices available to consumers (meters, phones, apps, computers, intelligent devices). The challenges in arriving at a sensible solution for Home Area Network protocol for smart meters is an example of arriving at the best balance between interoperability and universality and foreclosure of innovation by picking winners. Similarly the key consumer device to enabling DSR, the smart meter, necessarily has capability that is both uniform of reach version of capability which is not unlimited. A case in point is the inclusion, or not, of “last gasp” meter communication capability during distribution outages.

Signal conflict – it is easy to envisage a situation in which national grid, the distribution system operator, a supplier, and an aggregator send signals to a consumer that either compete for the same response or which request opposite response (e.g. increase load to use cheap national energy but decrease load to reduce network stress). In addition to the tension, the signals could arrive at, at least four different gateways to the consumer.

Network capacity – The smart system will minimise capacity cost by using DSR. However, even after taking the signal size, signal conflict, protocol/gateways and forced cost socialisation into account there remains the issue of an approach to network access that both reduces overbuild whilst at the same time having an equitable approach to access to a capacity that has limits at certain times. Presenting the choices for network size/reinforcement has been extremely challenging, with some risk of overbuild being the simpler, but more expensive, choice.



**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?**

*Yes we agree*

*Evolution rather than revolution of market arrangements seems best but we do believe that all models should be considered*

Signal effectiveness - The signal needs to increase in size, in timely and effective delivery to the consumer, and in a form married to the kind of response that can be made. This is driven by the approach of the regulator to releasing price signals through the value chain, and an overall approach to consumer connectivity (who can connect to what physically and what contracts are allowed/encouraged). The supplier may not be the only bearer of the price signal.

Economy 7 as key example and key potential - The simplest example is economy 7. The time window is stable and the price signal constant between price changes. Another example is triad, in which the time window is not known definitely but can be estimated, and the price signal is constant between price changes. DSR to support national energy balance or local distribution constraint may need a price signal that is both stronger, or variability down to real time, and requiring an automated response.

Complex DSR - For any DSR other than national energy balance, the current arrangements need to be adapted so that the commercial signal can be provided, the monies paid, and energy balance not to be disrupted unduly

The value of DSR and complex DSR – For suppliers and others to fund the development and infrastructure to provide DSR products requires them to see the value and to be able to access the value. Currently the value is limited due to regulatory attenuation of price signals and inaccessible due to limitations in the industry architecture and systems for settlement. Finally, suppliers are disallowed from using consumption data to model the value that consumers could access. Each of these three issues needs to be solved before there is material development in DSR beyond trials. Therefore the role of the Supplier therefore, is paramount in communicating the value and operation of DSR for the Customers benefit.

**Question 6: To what extent can current or new arrangements better accommodate cross-party impacts resulting from the use of demand-side response?**

*Significantly*

Materiality - If DSR is material enough to be useful, it is material enough to affect normal market operation. The effect is largely in energy balancing, although load increase from shifting load in time may constrain/overload networks. The experience of Low Carbon Network Fund and RIIO ED1 price control indicates that a wide blend of DSR measures is likely to be the most effective. The RIIO incentive structure will naturally drive the distribution operators and hence finding the incentive structure that is flexible enough to reward innovation and concrete enough to give investment stability, will be important.



Imbalance – Supplier imbalance is currently the cause of the greatest tension between actors. Substantive DSR/DSM would cause serious imbalance costs which are themselves an indicator of reduced network resilience. In fact the current system method of demand forecasting will become inadequate as the system operator has sight of key exogenous factors (mainly weather) but little or no sight of the commercial arrangements that drive demand change. Hence short term system operation and volume nomination needs to change anyway. This can be achieved by further modification of imbalance charging and the balancing mechanism.

Listing the tensions – There are many tensions and there is a reasonably clear priority order at this point. In approximate order they seem to use to be; supplier imbalance, local DSO constraint, reserve provision, transmission constraint. By prioritisation, the adaptations to the supplier hub regulatory model can be made incrementally.

Product range – For consumers to be at the heart of the system, they must be enabled to participate as well as benefit. Therefore we expect in the fullness of time contracts to be available for example for; reserve including primary and secondary, voltage support, reactive power, full/partial interruption, complex interruption (e.g. limit to interruptions, consumer rights of interruption over-ride), post fault delayed power restoration.

Various market arrangements are possible – However, there needs to be further consideration given to the wider impacts across all Parties and ESCO's before it is clear which industry model would provide the most appropriate. This would take factors into account such as DPA requirements for the HH and NHH sectors.

**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.**

Yes

Consumer protection is paramount – Even with recent changes through the RMR, the energy industry is a complex and potentially intimidating area. Protection must be in place to give customers the confidence to take advantage of the opportunities and in case of negative consequences if the market reacts poorly. It is as important as protection from increasing bills from smart tariffs, to avoid exclusion to consumers (in a similar vein to digital and financial exclusion). Enabling vulnerable consumers to reduce their bills is as important for others, and the solution is not to avoid the choices but to take particular care in enabling of the right choices.

Individual protection – Finding a solution to consumer protection in the short term is vital. Whilst the extreme solution of ad hoc rebates can provide a safety net, the challenge of selective application seriously undermines the value of DSR. Broadly speaking, applying a standards of conduct approach in ensuring that all consumers engage in tariffs that are best for them is the best one, with gradual increase in tariff innovation as we move from an RMR focus on simplicity to a smart focus of empowerment.

Trust – As for other questions, trust is fundamental to customer's engagement. Media representation of the energy sector is poor, particularly of the large suppliers. For customer awareness to be positive, the opportunities will have to be presented from across the industry, including consumer advocates and the regulator. Education and positive marketing from Ofgem will be necessary and should be visible at every level.





Bill increases – Any system that rewards DSR will in the short term cause bill increases for those who do not/cannot provide DSR, although in the longer term the system cost reductions (e.g. reduced redundant capacity in generation, transmission and distribution) will flow to all consumers.

Quantification – Whilst it is essential that the individual consumer is at the heart of the solution, the wide societal benefit (the consumer as beneficiary of the whole system change as well as their own bill) is important. The difficulty of this challenge is evidenced by the production side approach to Electricity Market Reform.

Reference case/s – There are many very useful scenarios that assume a large amount of demand response, whether this be voluntary DSR or mandatory through system lost load. Perhaps the best example is the DECC 2050 pathways zeta scenario which is ostensibly “do nothing” voluntarily on DSR but in fact entails substantial load variation. For each reference case and DSR variant of it, it does seem possible to model costs and consumer impact.

Lessons learned from the gas sector – There has been considerable experience learned from interruptible contracts and from firm load shedding exercises. There isn’t a substantive market for interruptible contracts with large I&C users, who have the most influence and, arguably, the greatest commercial incentive. Firm load shedding exercises have had varying degrees of success, even with contractual and legal obligations on the participants.

**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?**

Yes

Aggregators – Aggregators play a significant role in DSR in the USA. In Great Britain, they operate somewhat outside the supplier hub. Depending on the mechanisms involved, DSR could encourage growth and there is a risk of disruptions to network resilience. If market arrangements are made to accommodate aggregators, they could develop relationships with customers completely unlike that with between a supplier and a customer. Of course to protect consumers all market actors must be subject to regulatory oversight.

Device makers – Consumers can install devices that provide value to the system (Transmission TSO, SO, DSO, supplier) and therefore deserve recompense. Product standards do have a role to play but for devices above the prevailing product standard there needs to be a way to reward the manufacturer via the consumer. Consider for example the current operation of frequency responsive refrigerators. The consumer could be rewarded for the response (via the supplier in the supplier hub model). At present the reward was found by the Carbon Emission Reduction Target to supplier/s and to the consumer via free provision of the fridges.

Suppliers – Suppliers are well placed to structure customers’ needs and help them realise value. Despite the often negative media coverage, suppliers are customers’ main contact with the electricity industry and are known faces (with trust that must be earned and built). Suppliers will want to offer DSR products and so arrangements need to facilitate this. Niche suppliers may also appear with specific offerings.

Energy Service Companies, Third Party Intermediaries and other actors – A wide variety of actors will appear on the DSR landscape. It will be essential to enable innovation for consumers via some form of access whilst at the same time protecting the integrity of the system.

Innovation – Currently, commercial signals for DSR are weak and the market arrangements are not



conductive to response other than national halfhourly energy balance. The incentive for innovation in the Information/Communications/Technology (ICT) sector, is weak, with the energy industry seen as closed and slow to respond to technical advances. However, on the more encouraging side, we do see pockets of innovation. It's encouraging to note the interest of the ICT sector in Smart Grids and small-scale generation.

**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.**

Yes

There is a natural tension between cost socialisation and cost reflectivity. We believe that DSR requires cost reflectivity to receive a much greater weighting in policy formulation. Whilst this does cause short term challenges, the gains from applying cost reflective approaches are themselves socialised in the long term.

Clarity around technical terms – At the moment, there are many phrases used around DSR, demand reduction, own / decentralised / embedded generation, frequency response etc, with terms often being used informally, as a catch-all or simply incorrectly. There are multiple technologies and techniques that need to be clear. “Demand side response” describes a result yet is often used in the industry to cover everything from automated frequency response to wall insulation received due to ECO.

The right people involved – Some of the parties mentioned in our answer to question 8, such as the device manufacturers and the innovators behind them, are essential if DSR is to reach its full potential and have the maximum impact on the market.

Understanding of volatility – Less important than the preconditions identified in the consultation, this is more a precondition for successful DSR, rather than DSR itself. The increase in volatility DSR could cause has the potential to de-stabilise the market, increase risks for new entrants and have an overall negative effect. For less to be avoided, it is essential that robust analysis is done and publicised, so that the industry is prepared.

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

*Yes, although we believe that these areas need addressing in more detail in the next stage;*

- i) market arrangements
- ii) the impact on DSR of data/privacy policy
- iii) moving towards a more cost reflective approach

Regulatory uncertainty – The Energy Bill and EMR are not fully defined and therefore it is difficult to quantify the impact. The future of the energy world is likely to look quite different to current arrangements so predictions around the signals are unclear and the value of DSR hard to gauge. This uncertainty may deter investors and will initially undermine the initiative.