

Smarter Markets
Ofgem
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Creating the right environment for demand-side response

EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. Our interests include nuclear, coal and gas-fired electricity generation, renewables, and energy supply to end users. We have over five million electricity and gas customer accounts in the UK, including residential and business users.

We welcome the opportunity to respond to this consultation. This response can be published on Ofgem's website.

We believe that it is in consumers' interest that peak demands are shifted to off peak periods, creating flatter load patterns and increasing the use of relatively low cost base load generators. Demand-side response (DSR) could be an important tool for meeting this goal.

At present it is unclear who will take the lead in delivering DSR, and whether actions used mainly to balance national issues will this solve the majority of local (distribution network) DSR needs. We therefore believe that a critical first step is for Ofgem to examine the relationship of DSR actions across the system to assess the relevant interdependencies and correlations. The results of such analysis will help determine whether local DSR should be a commonly used tool from RIIO ED2 (2023-2031) onwards; as a tool used by exception, or one used as a temporary fix before a longer term solution is implemented. Once the relationship between DSR actions by all parties identified in the consultation is understood, it will help shape the market model, and both the commercial, and regulatory frameworks.

DSR by one actor has the potential to impact others in the energy system. It is therefore vital that communications arrangements are established so that information can be shared in advance, enabling parties can take appropriate mitigating actions. Without such communications, savings achieved by one party could be more than offset by increased costs to another, to the overall detriment of customers. This is a priority to resolve and create a solid foundation for allowing DSR growth.

An associated area of concern is the negative impact on forecasting accuracy arising from the wider use of DSR. This has implications for the design of regulatory incentives, such as balancing costs etc.

SMETS 1 meters are not suitable for DSR applications and lessen the opportunity for customers to participate in DSR schemes, thereby reducing the DSR potential in GB. The more SMETS 1 meters installed in the foundation stage of the smart meter rollout, the bigger the problems will be. Issues include:

- SMETS 1 meters will not be fully integrated into the DCC, unlike SMETS 2 meters, restricting the access to services that can be offered to customers.

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- SMETS 1 meters will not meet the security standards that later SMETS meters have to achieve (smart meters in the Data Communications Company (DCC) will be classed as critical national infrastructure). When dealing with controllable demand, security is a particularly key feature and consumers must be able to trust how their data is being used by other parties.
- SMETS 1 meters will not have an interoperable Home Area Network (HAN) that smart appliance and Low Carbon Technology (LCT) manufactures can use in their devices (at least in any volume). In contrast, SMETS 2 meters will have to meet interoperable HAN standards that can be incorporated into mass produced devices. These devices will be able to connect to SMETS meters other than SMETS 1 for years to come.

The DCC, along with SMETS 2 meters, is a key enabler for DSR services to allow mass volumes to domestic and small non domestic customers to participate. The costs of messaging and reliability of service will be relevant to developing DSR business cases in future. If the costs are high, or service is unreliable, then alternatives to DSR will more likely to be used, which may not have the advantages to the customers of lower bills or have the same potential to reduce CO2.

The vast majority of domestic and non-domestic customers are not currently ready for DSR introduction. To enable participation by these customer groups, the following items actions are essential:

- Continue to rebuild customer trust in the energy industry, as well as in DSR as this a relatively unfamiliar concept for many consumers;
- Develop engagement with customers to help them understand the advantages of DSR. This may need the help of central coordination of communications at some level to ensure consistency of messages;

Finally, the unregulated market that DSR currently operates in creates risks to the end-to-end national infrastructure. This is particularly the case once a DSR operator controls over 1GW of controllable demand as they become a Centre for the Protection of National Infrastructure (CPNI) risk. The level of regulation for an aggregator doing a small trial should not be the same as one which can potentially cause wide scale security of supply issues.

Our detailed responses are set out in attachment to this letter. Should you wish to discuss any of the issues raised in our response, or have any queries, please contact Andy Jones on 07875 119072, or myself.

Yours sincerely,

A handwritten signature in blue ink that reads 'Paul Delamare'.

Paul Delamare
Head of Downstream Policy and Regulation

Attachment

Creating the right environment for demand-side response

EDF Energy's response

Q1. 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.

The consultation outlines many of the key challenges of demand-side response (DSR). However, one key challenge, which in our view is not highlighted sufficiently, is the central role of the smart meter programme in terms of demonstrating the value of DSR across the system and enabling most customers to participate in schemes.

In this regard, EDF Energy believes that SMETS 1 should only be used for limited testing and trialling, and does not provide a platform for DSR activities. The reasons for this are:

- SMETS 1 will only allow restricted functionality for sending and receipt of messages to these meters; even if they are to an extent connected to the DCC, they will not be as integrated as SMETS 2 meters. If SMETS 1 meters are not integrated within the DCC, then only the existing supplier may be able to offer DSR services via the meters.
- The lack of a standard Home Area Network (HAN) to which Low Carbon Technologies (LCT) and appliance makers can build communications to in mass volumes.
- Reduced security requirements in SMETS 1 meters compared to SMETS 2 create risks which are increased by having controllable demand connected to them.

DCC uncertainties for future DSR services include the method by which messages will be sent from the DCC to metering systems. There is a possibility that unicast messaging will be used by the Communications Service Provider. Unicast messaging may not be able to meet the time-banded requirements of DSR services.

The lack of certainty of the cost of sending a DSR message via the DCC is a further risk; the more expensive the cost of the message, the harder it will be to build a viable business case. The more financially-viable messages can be sent via the DCC, the better value the DCC will be for customers.

Network operators will need to access services via the DCC. However, if the SMETS meters are not connected to the DCC this will make it extremely difficult for DNOs to put in place DSR schemes. This is a particular issue for non-domestic customers who have opted out of the DCC.

Should the DCC and SMETS metering not provide an adequate platform for DSR then all DSR actors will have to try and create business cases on separate infrastructures if they feel DSR is otherwise viable. This would be more costly to implement, not allow the same opportunity for visibility of DSR actions to be seen by all other industry parties impacted and tie customers into a longer contract to enable recovery of the additional fixed costs

(new communication devices etc). Also, it would not allow customers to swap DSR provider easily, as the equipment would likely be bespoke to the installing company.

The consultation highlights the positive impact that smart metering can have in introducing price signals to the customer on the import side of the smart meter.

The lack of export Time of Use (ToU) registers on SMETS 1 and SMETS 2 metering systems removes a tool of balancing energy flows. Without ToU registers on export it will not be possible to encourage customers to use the energy they create at certain times and encourage them to export it at different times. This not only reduces the value to the industry of generation connected to SMETS meters, but also to the customer. EDF Energy accepts it is unreasonable to have a separate calendar on the meter to manage export time periods, but it could be added to the import calendar, and the import supplier could manage the ToU periods on export to remove additional build cost to the SMETS meters.

Customer data will be important for measuring demand changes. For customers to participate in DSR, they will have to accept that data needs to be made available to the aggregator to prove the DSR actions happened.

For some DSR services, such as fast reserve, where requested drops in demand can be for short periods of time, the half hourly measurement of a smart meter may not be sufficiently granular for customers to participate in the market. This is because it may be hard to prove that an action has taken place, especially with smart appliances which only receive, not send, messages via the SMETS meter. A low cost commercially viable solution might be found in time or, if the action is taken by a large volume of customers in a small geographic area, access to network data to prove the overall expected fall or rise in demand happened, using the existing minute by minute monitoring which is in place, may be possible.

The customer's primary relationship is with the supplier but DSR, as described in the consultation, may imply a major step away from the supplier-hub principle that the existing industry arrangements are built around. To avoid suppliers being unfairly blamed for issues which are no longer within their control, the customer relationship change at domestic level has to be carefully managed to negate loss of trust or confusion.

Q2. 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?

One important area of understanding that needs to improve across the industry is the relationship between those managing energy at a national level (suppliers and TNO) and those at the local level (DNO). It is important to suppliers that peak demands are shifted to off peak periods and flatten load for generators. We have identified DSR as a positive tool to meeting these goals. EDF Energy does not have a full understanding of the divergence of local and national DSR needs in the GB environment. We believe this should be a next step for Ofgem in the smarter markets work. The understanding of this question will impact both the market model and the level of regulation and commercial arrangements, together with the oversight that will be needed in the market.

The overall strategy for DSR could end up with national demand being balanced and DSR being carried out by exception on a local level. More work needs to be done to understand how often DSR will result in one party's DSR, either helping, be neutral, or adversely impacting other parties DSR efforts. For example, DSR schemes such as Triad reduction to reduce winter peaks would probably help all parties in industry. There will be conflicts, particularly with increasing wind generation and substations that have a profile out of sync of national demand, but these are specific instances that need special attention.

Almost all DSR needs careful management to ensure local and national DSR do not adversely impact security of supply. The work in WS7 of the Smart Grid Forum is not currently picking this question up and is the closest current work to this engineering question. With the introduction of the capacity market over the next two years this may provide crucial learning on how much extra work needs to be done.

The way DSR will be developed is still also unclear. It is possible that DSR will become a short to medium term solution to managing local constraints until the resources or technology is in place to provide a permanent fix. This approach to DSR would mean that the bulk of DSR capacity can be used to reduce the much bigger generator and national infrastructure costs, maximising the bill reduction potential to the customer. We await the findings from LCNF projects in this area as it will help shape how governance, commercial agreements and customer relationship with DSR will be formed in future.

Demand-side response is a largely currently an unregulated market. The transparency of what is happening needs to improve in several ways to secure delivery of demand-side response:

- Parties need to know that the demand they are procuring from customers is not also procured for conflicting services during the same time periods. Customers potentially could sell the same controllable demand to several parties to maximise revenue, but ultimately such a practice would create a perception of greater flexibility within the energy infrastructure at a particular point in time than really exists, potentially leading to security of supply risks.
- As an unregulated market, there is the potential for new entrants to the energy industry to put in place a DSR scheme which impacts negatively on both other parties and on other customers. It is a concern that not only could this damage assets, possibly risk security of supply and possibly increase customer bills, it could also undermine customer trust in DSR and reduce its long term potential in the UK.
- Once an aggregator controls more than 1.32 GW of demand it becomes a much greater CPNI risk than lesser aggregators and, as a result, much tighter oversight and compliance needs to be put in place to protect generation, transmission and network operator assets.

Q3. Is current work on improving clarity around interactions between industry parties sufficient? If not, what further work is needed to provide this clarity?

As the consultation highlights, whether there is a conflicting relationship, or a mutually beneficial one, all parties will need to know what is happening to demand and supply to its customers/network. No arrangements are in place to facilitate this passing of information on actions being taken. The passing of data between parties where DSR is at short notice, such as generation not able to come on line or frequency control is particularly an issue as other impacted parties will not have time to react. Suppliers, post gate closure may be financially impacted by the imbalance created in its trading positions.

EDF Energy believes the next piece of work on DSR that the Smarter Markets team should look at is the relationship between managing local and national problems. If national energy is balanced, will this negate much of the need to manage DSR on a local level? If the relationship is mutually beneficial, the market model and regulation would be different than managing one that impacts the other negatively.

Q4. 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.

We fully support Ofgem's Retail Market Review (RMR) objectives to provide consumers with simplicity and clarity in tariffs and communications. With the introduction of more cost reflective ToU pricing, the industry has to ensure that the core values of reducing complexity to the customer are not lost. The possible introduction of DNO ToU price signals could create several new issues which have to be considered. The price signal from the supplier will nearly always be stronger than the network operator (20% of the bill) to domestic customers and a clear understanding of what will be achieved by DNO signals not being in line with suppliers needs to be completed before the former's introduction.

Possible issues of DNO price signals to domestic customers include:

- Customers forced onto ToU tariffs without signing up to them;
- Conflicting time of day signals to the supplier price signals creating a complex domestic multi-rate multiple peak tariffs;
- The need to educate the customer so that they understand the tariff structure and fully engage with it.

Currently, there is a lack of consumer trust in energy suppliers and in the wider energy industry, which EDF Energy is working hard to address. To encourage customers to allow industry parties to control demand directly or send the price signals to enable DSR, trust will have to improve further. Early DSR trials and commercial services have to be careful not to further erode trust as it may take a long time to reverse loss of trust and reintroduce improved DSR schemes.

There are many reasons to introduce DSR to ultimately reduce the customer bill. However, there will be instances of conflicting messages from multiple parties to certain customers (either customer groups or geographically) to alter their consumption patterns. The industry has to look at how these can be minimised; through better communication

coordination, a focus on simplification of product offerings and allowing viability of the strongest price signals.

The price differential between peak and off peak may have to improve to create the right price incentive for the customer to consider DSR. A growth in wind generation may create this without further intervention. Simple domestic tariffs smear such costs across time periods. Price signals in line with the needs of the energy infrastructure could be made stronger if these costs were not smeared and/or charged against a time of day.

Demand-side response will create a seasonal differential in services to customers. Currently an E7 or single rate customer has the same tariff all year around. However, in future, products may develop so that in summer, tariffs may feature low prices to encourage energy usage during windy low demand times and high critical peak prices in winter to reduce the triad impact. The seasonal impact has to be considered when looking at the impact both on the customer signals and throughout the energy infrastructure.

Q5. 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?

The study of how to achieve long term customer behaviour change is not complete; much of the Government's thinking assumes long term customer engagement with smart meters and ToU tariffs. There are little costs within the smart meter impact assessment that directly relate to maintaining these energy savings apart from the CDB. This leaves a challenge on how engagement with smart meters will be maintained until widespread domestic and small non domestic DSR products are on the market. How will customer behaviour change will be maintained until the end of the smart meter impact assessment period if the CDB only operates until the end of 2020.

Signals to customers will need to improve to all customers, but most of all too domestic and small non-domestic customers. The smart meter impact assessment shows only 20% of customers will have static ToU tariffs by 2030. An uptake of this scale would hinder the potential of DSR and restrict potential direct financial customer benefits. Over time, with less flexible generation and a greater need for demand to match supply will, inter alia, lead to stronger TOU price signals.

Q6. To what extent can current or new arrangements better accommodate cross-party impacts resulting from the use of demand-side response?

There is a concern that DSR seems to be involved in many disparate parts of the industry development. Many are mentioned within the consultation, such as the Smart Grid Forum, the capacity market and the smarter markets work on settlement reform. A more visibly coordinated approach to building a DSR environment would be welcomed to ensure the best solution for both the industry and the customer.

If demand response creates positive results throughout the electricity infrastructure, the value has to be passed through to the customer by those who are passively enjoying the advantages of others' DSR. Ultimately DSR should reduce the cost of energy to the end consumer, as well as providing an incentive to the actors providing the service to not

create a situation whereby every actor is waiting for another to enact DSR first, so it can enjoy the benefits without the costs.

As noted above, communication across the energy system needs significant improvement to facilitate the introduction of more DSR. It is important not to create an environment where one action may save money in one part of the energy system, while increasing cost in another.

Q7. 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.

The initial growth and focus in DSR is expected to centre on larger business customers, It is important that Ofgem and the Smart Grid Forum should prioritise these customers over the longer term potential of small non domestic and domestic customers.

With so many parties potentially offering DSR services to customers and with so many concerns being identified, some level of central coordination of customer communications may need to be considered. This coordination may be as little as a glossary of terms to minimise customer confusion, but potentially could be more. Unlike the smart meter rollout with the Central Delivery Body, the development of DSR is not going to be mandated and those companies engaged in it should do via competitive forces so a balance has to be met in ensuring the right communication to ensure trust and consistency, whilst still allowing the allocation of DSR resources is where the value is.

As previously discussed in the consultation response, the delivery of the right DCC and SMETS metering will be a vital enabler of cost effective DSR schemes and price signals to the vast majority of possible DSR participants.

The DCC for domestic and smaller businesses will be a critical enabler of DSR. EDF Energy sees it as a risk that the Communications Service Provider (CSP) could possibly use unicast to send messages to smart metering systems. Currently we do not understand the impact that a possible use of unicast messaging will have on DSR, but it may restrict larger DSR schemes that need to send messages to large audiences quickly due to the lag times it causes.

With DSR and the wider predicted growth in smart grid initiatives at lower voltage levels, we welcome a greater focus on the DCC road map to meet the challenges. The focus currently is to get the DCC ready for go live, but giving more thought now to the longer term strategy would help to not create closed doors or restrict possible value later.

Q8. Is any additional work needed to explore the role of third parties in helping customers to access and assess demand-side response offerings?

If customers are to engage with DSR and ultimately reduce average customer bills, third parties must be aware of avoiding complexity and continue to build customer trust. It is important for all parties to support these initiatives in all they do in the industry.

The role of customer data with DSR is a key component of all schemes. Third parties may have much greater experiences in dealing with large amounts of data and implementing products from it. This experience and innovation is a positive for the development of DSR in GB, but it must be treated in the same way that suppliers and network operators have

to deal with data, especially for domestic customers. DSR data rules for all participating parties could be introduced to ensure those who are new to the industry, or gain new ways to access to data, do not misuse it. Data from smart meters does not necessarily go via the DCC and customers can give data to third parties who do not have access directly via the DCC.

Q9. 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.

EDF Energy broadly agrees with the three preconditions. The two items which need greater focus are 'Clarifying interactions between industry parties' in pre-condition 1 and 'Clarifying cross-party impacts' in pre condition 2. EDF Energy believes both of these items should be given high, not moderate, priority. Before 2020, most large-scale DSR will be working with larger consumers such as those settled today on half hourly profiles, but the volume of energy these half hourly customers can shift does mean that Ofgem and industry should consider interactions between parties sooner rather than later. Cross-party impacts of DSR will play a much larger role in future than they do today, but understanding any issues now will aid the industry, Ofgem and DECC in both shaping and regulating the GB DSR market proactively instead of reactively.

LCT technologies will be far more integrated into the energy infrastructure than almost all other domestic controllable demand as trusted type 1 devices connected to a SMETS 2, and later versions of SMETS metering. LCT's as shown by the Transform model produced by the Smart Grid Forum is a large driver of future infrastructure investment and demand. LCT technologies need special focus to ensure the best environment is provided for customers to help minimise average customer bills. It is potentially possible to control LCTs remotely by third parties without reducing the customers comfort levels, unlike most other household devices. For these reasons, commercial and regulatory arrangements for these devices may need to be different to other un-trusted smart appliances for DSR in future to ensure possible opportunities are not missed.

The two possible market models of (a) direct customer relationships and (b) a single counter party coordinating DSR across the industry, both have their advantages and disadvantages. Ofgem and industry should carry out more work to improve understanding before one model could be fully supported or a better third model produced. However, both models, unless suppliers become the counter party, move the industry away from the current supplier hub model and show a changing role of the supplier to the customer. The customer impact of having multiple relationships, and the role of the supplier in this, should be part of the thinking that needs to be done.

Q10. Do you agree with the priority and timing we have attached to addressing each of the key challenges identified above?

The Smart Grid Forum work is the primary DSR delivery mechanism for the three preconditions in a cross industry programme, which is demonstrated through the Transform model and its work on RIIO ED1 (2015-23) to deliver quality results. However, until very recently, the focus has been the DNO role and in particular on RIIO ED1. EDF Energy is not challenging that the Smart Grid Forum should be leading much of the key

challenges work, but that it still needs to prove itself when providing cross industry leadership where many parties will be impacted as greatly or greater than the DNO. The Smart Grid Forum will have to prove that it can step away from the DNO focused view of the world and provide a balanced view.

EDF Energy believes the level of market maturity to allow mass DSR for domestic and small non domestic should be in place between 2020 and 2025. This timescale is also in line with WS3 of the Smart Grid Forum and with the growth of smart grid development needed at the 'cusp' of ED2. To reach this target of 2020-5, as the Smarter Markets and Smart Grid Forum are doing, the work to shape thinking on the key matters needs to start now.

The market for larger half hourly settled customers to participate in DSR is, to an extent, in place and, as the LCNF trials are proving, is expanding in volume and scope of services. More work, such as industry communication on actions, needs be in place sooner rather than later before it has a material impact on running elements of the GB electricity infrastructure. With the introduction of the capacity market in the near future adding to LCNF trials, a greater overview of thinking is needed as to how the DSR market will shape and ensure schemes are not developed in isolation or without thought of the impacts they may have on other parts of the industry.

EDF Energy
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