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A Smart, Flexible Energy System – A call for evidence

SmartestEnergy welcomes the opportunity to respond to BEIS's and Ofgem's Call for Evidence on a Smart, Flexible Energy System.

SmartestEnergy is an aggregator of embedded generation in the wholesale market, an aggregator of demand and frequency services and a supplier in the electricity retail market serving large corporate and group organisations.

We answer the consultation questions below in the order in which they appear in the document.

Please note that our response is not confidential.

Q1. Have we identified and correctly assessed the main policy and regulatory barriers to the development of storage? Are there any additional barriers faced by industry? Please provide evidence to support your views.

> We believe that the main policy and regulatory barriers to the development of storage have been identified. We certainly agree that the way in which storage is charged for using the electricity network, the absence of a definition of storage and how final consumption levies are charged are all very important issues requiring resolution. Clearly, a definition of storage is required in legislation. Other changes could be proposed through normal industry change.

Q2. Have we identified and correctly assessed the issues regarding network connections for storage? Have we identified the correct areas where more progress is required? Please provide evidence to support your views.

> The problems associated with connection are just as serious for embedded generation as they are for storage. In our view queues for connection are not specifically a problem for batteries per se. Embedded generation generally requires

an export connection and a smaller capacity for import. Storage is little different as a charging connection does not need to have such a great capacity. The process for gaining connections needs to be speeded up one way or another.

Q3. Have we identified and correctly assessed the issues regarding storage and network charging? Do you agree that flexible connection agreements could help to address issues regarding storage and network charging? Please provide evidence to support your views, in particular on the impact of network charging on the competitiveness of storage compared to other providers of flexibility.

We agree that storage should pay some contribution towards distribution charges to reflect their use of the network. DUoS charging should reflect the fact that storage imports at times of low demand and exports at periods of high demand. However, it is inappropriate that storage should pay TNUoS for peak usage or even BSUoS. Given the fact that embedded benefits are likely to be cut, it would be something of an unfair double whammy to make batteries pay TNUoS charges.

It is also entirely inappropriate that storage should pay for RO, FiT, CfD, CM and CCL obligations when importing because the power will be supplied twice. It is the delivery to the end consumer which should attract these charges.

Given the reliability of batteries, storage should be treated as non-intermittent.

Q4. Do you agree with our assessment that network operators could use storage to support their networks? Are there sufficient existing safeguards to enable the development of a competitive market for storage? Are there any circumstances in which network companies should own storage? Please provide evidence to support your views.

There are no circumstances in which network companies should own or even operate storage where it can compete with non-system operator assets. Such an arrangement would inevitably lead to market distortion through likely preferential deployment. A level playing field would be guaranteed to be maintained if all storage were kept in non-system operator hands. DNOs/DSOs need to focus on the development of market-based solutions so that they can call on storage when required. This would be consistent with the principles of unbundling. It also occurs to us that there is a potential conflict between a DNO having a choice between investing in new wires and network assets and making greater use of a storage market. Clearly, DNOs are going to have to demonstrate to Ofgem that they have made the most economic decisions and/or be subject to further incentives.

Q5. Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage? Please provide evidence to support your views, including any alternative regulatory approaches that you believe we should consider, and your views on how the capacity of a storage installation should be assessed for planning purposes.

For licensing purposes we are of the view that storage should be treated in the same way as generation i.e. there should be no need for licensing where the facility is under 50MW. Storage should, however, be subject to the same standards as other generation (such as G59.) Similarly, for planning purposes, storage could be treated in the same way as generation.

Q6. Do you agree with any of the proposed definitions of storage? If applicable, how would you amend any of these definitions? Please provide evidence to support your views.

We agree with the need for a separate definition for storage from that of generation, although we anticipate storage to be treated like generation at a licensing level. For example, for licensing purposes we are of the view that storage should be treated in the same way as generation i.e. there should be no need for licensing where the facility is under 50MW. The definition of storage is really required so that charging arrangements at the distribution level can be clarified.

The Capacity Market definition reads:
"storage facility" means a facility which consists of -
(a) a means of converting imported electricity into a form of energy which can be stored, and of storing the energy which has been so converted; and
(b) a generating unit which is wholly or mainly used to re-convert the stored energy into electrical energy.

This is, by and large, adequate. However, in order to be relieved of the above mentioned charges (see answer to Q3) it is important that the stored power is exported and cannot be used on site (with the effect that behind the meter storage could be used to avoid the environmental obligations.) In other words, at the moment environmental charges are triggered each time energy passes through a settlement meter and a loophole could be created if there is a blanket exemption for storage because the power could equally be used on site as exported to another consumer (via another settlements meter). A solution to this could be that the environmental charges for the import to newly defined storage is charged on a net basis (i.e. export is netted off.) Once storage has been defined it will therefore be necessary to make changes to the market rules for RO, FiT, CfD, CM and CCL obligations.

In the scenario of power being imported twice (once by the battery and once by the end consumer) it is not unreasonable that DUoS charges should be charged on both as the distribution system will have been used twice.

Q7. What are the impacts of the perceived barriers for aggregators and other market participants? Please provide your views on:

- balancing services;
- extracting value from the balancing mechanism and wholesale market;
- other market barriers; and
- consumer protection.

Do you have evidence of the benefits that could accrue to consumers from removing or reducing them?

We are not convinced that there are any significant barriers in this sphere. It is true that independent aggregators do not have direct access to the balancing mechanism but in addressing this it is important that independent aggregators do not free-load. Flexibility is not really something which can be disaggregated from energy; there is flexible generation and flexible demand reduction, both of which are measured in terms of energy. It is inappropriate for independent aggregators to target the valuable aspects of a customer's characteristics without taking responsibility for balancing, metering, distribution costs and all the administration and obligations associated with supplying a customer. Ofgem should recognise this in their guidance for and assessment of Project Terre.

Q8. What are your views on these different approaches to dealing with the barriers set out above?

Please see our answer to Q10 below.

Q9. What are your views on the pros and cons of the options outlined in Table 5? Please provide evidence for your answers.

Please see our answer to Q10 below.

Q10. Do you agree with our assessment of the risks to system stability if aggregators' systems are not robust and secure? Do you have views on the tools outlined to mitigate this risk?

We have no evidence to suggest that mass simultaneous demand response would cause system issues. However, aggregators' systems do need to be robust and secure and going forward the kinds of standards and performance checks which are typical under the BSC would not be inappropriate. Customers could lose real value if data is lost or instructions are not received. This is just as appropriate for large customers as small.

More generally, though, we believe that there is a clear risk to customers and suppliers if independent aggregators are not licensed. Where independent aggregators are competing with suppliers there is a danger that competition will not be on a level playing field and customers are in danger of being misled. Aggregators of all shades need to be regulated and/or under the same obligations as suppliers.

Q11. What types of enablers do you think could make accessing flexibility, and seeing a benefit from offering it, easier in future?

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Some form of co-ordination between TSO and DSO will be required in the future to ensure that there are no conflicting incentives for providing flexibility.

Q12. If you are a potential or existing provider of flexibility could you provide evidence on the extent to which you are currently able to access and combine different revenue streams? Where do you see the most attractive opportunities for combining revenues and what do you see as the main barriers preventing you from doing so?

It has been said that the current Triad charging methodology is preventing providers of flexibility from offering into other mechanisms such as STOR etc. A solution to this would be to charge Triad over longer periods so that the flexibility can be offered for operational purposes.

Q13. If you are a potential or existing provider of flexibility are there benefits of your technology which are not currently remunerated or are undervalued? What is preventing you from capturing the full value of these benefits?

Not applicable

Q14. Can you provide evidence to support changes to market and regulatory arrangements that would allow the efficient use of flexibility and what might be the Government's, Ofgem's, and System Operator's role in making these changes?

Aside from the necessary changes to the treatment of storage and the need for markets on the DSO side to be established, as mentioned above, we believe it is important to allow the recent changes to the cash-out regime to bed in for two or three years to establish whether they are sufficient to incentivise greater use of flexibility and to assess what the value of that flexibility really is before any further regulatory changes are made. Indeed, it is wrong to presuppose a certain amount of flexibility and set the price to achieve it. The cash out price should be cost reflective and the market should evolve around those incentives. Other requirements, such as the need for greater half hourly settlement, are already in train. Smarter offerings from suppliers to customers should lead naturally from these initiatives and further intervention is unnecessary in the market.

Q15. To what extent do you believe Government and Ofgem should play a role in promoting smart tariffs or enabling new business models in this area? Please provide a rationale for your answer, and, if you feel Government and Ofgem should play a role, examples of the sort of interventions which might be helpful.

Aside from facilitating smart tariffs, which they are already doing, Government and Ofgem should play no further part in promoting smart tariffs or enabling new business models. There is a real danger of government "picking winners." If the

customer appetite is out there it will happen naturally. If not, there is no point in forcing it.

Q16. If deemed appropriate, when would it be most sensible for Government/Ofgem to take any further action to drive the market (i.e. what are the relevant trigger points for determining whether to take action)? Please provide a rationale for your answer.

Please see our answer to Q15

Q17. What relevant evidence is there from other countries that we should take into account when considering how to encourage the development of smart tariffs?

We are not in a position to answer this question.

Q18. Do you recognise the reasons we have identified for why suppliers may not offer or why larger non-domestic consumers may not take up, smart tariffs? If so, please provide details, especially if you have experienced them. Have we missed any?

Yes, we do recognise the reasons identified for why larger non-domestic consumers may not take up smart tariffs. Customers have contradictory drivers in the shape of a need for cheaper electricity and a desire for simplicity. The 'easy to compare' part is also a practical consideration; if there is too much disparity between the products offered by suppliers then it could take an agent a non cost effective amount of time to evaluate offers between suppliers. Even in the I&C sector there is a tendency for customers and TPIs to prefer simple, easy-to-compare tariffs. That is their choice. The benefits of HH billing are there for those who want them. Even if it is believed that this is an area for intervention, as we have said above, further change should not be instigated now because changes to the cash-out arrangements have not taken full effect.

Q19. Are distribution charges currently acting as a barrier to the development of a more flexible system? Please provide details, including experiences/case studies where relevant.

It would not be appropriate to use the DUoS charging structure as an additional lever for flexibility. Costs are costs and should be cost reflective. We do not believe that there is currently any real evidence of a conflict between the structure of DUoS tariffs and other incentives to be flexible.

We would note, however, that the use of regulated revenue for setting network charges is a barrier to the cost effectiveness of a flexible energy system, as it means that efforts to operate flexibly to optimise DUoS and TNUoS bills are a zero sum – if everyone optimises the bill then the tariffs will increase to offset the loss in revenue. Consumers who do operate flexibly are just increasing the cost burden upon those

who are not. Increasing flexibility on the system should reduce total overall costs by way of reducing the allowed revenue needed for transmission and distribution.

The document states that "at present the vast majority of distribution connected users pay DUoS on a flat-rate volumetric (p/kWh) basis." This is not true of half hourly metered customers on pass-through contracts which makes up quite a sizeable volume of electricity. The structure of reasonably flexible tariffs is in place so there is no barrier as such.

Q20. What are the incremental changes that could be made to distribution charges to overcome any barriers you have identified, and to better enable flexibility?

We think that adjustments to tariff rates will happen naturally as more and more meters are settled half hourly. If customers value simple tariffs and suppliers are prepared to smooth out these costs we do not see any need for intervention.

Q21. How problematic and urgent are any disparities between the treatment of different types of distribution connected users? An example could be that that in the Common Distribution Charging Methodology generators are paid 'charges' which would suggest they add no network cost and only net demand.

This example is not discussed in the document and is phrased here in a somewhat leading manner. It could be argued that the charges paid to generators would be higher but are tempered to account for any network cost they do cause. Costs are calculated on a net basis and it should be noted that generators would generally not be importing but would be offsetting local demand.

Q22. Do you anticipate that underlying network cost drivers are likely to substantively change as the use of the distribution network changes? If so, in what way and how should DUoS charges change as a result?

Red/amber/green charging already reflects costs on the network at different times of the day. Further change is unnecessary.

Q23. Network charges can send both short term signals to support efficient operation and flexibility needs in close to real time as well as longer term signals relating to new investments, and connections to, the distribution network. Can DUoS charges send both short term and long term signals at the same time effectively? Should they do so? And if so, how?

Charges send short term and long term signals through within-day/seasonal variation and overall level respectively. At present this could easily be done at voltage level. The question is whether it should be done more locationally and we are not entirely sure that this is currently practical or desirable. However, under a

regime where embedded benefits are removed or significantly reduced, it may be necessary to recognise the proximity of generation to demand in a more sophisticated manner.

Q24. In the context of the DSO transition and the models set out in Chapter 5 we would be interested to understand your views of the interaction between potential distribution charges and this thinking.

Please see our answers to questions relating to Chapter 5 in the relevant sections below.

Q25. Can you provide evidence to show how existing Government policies can help or hinder the transition to a smart energy future?

Government policies themselves we would argue can clearly help the transition. However, the way in which these policies are implemented through constant consultation and evolution is not helpful. It is difficult to know whether the creation of the DCC and Smart meter roll-out would have been any more successful had government not been involved. It is, however, almost certainly overly complex and bureaucratic. The constantly changing rules around the Capacity Market have also clearly been detrimental to investor confidence.

Q26. What changes to CM application/verification processes could reduce barriers to flexibility in the near term, and what longer term evolutions within/alongside the CM might be needed to enable newer forms of flexibility (such as storage and DSR) to contribute in light of future smart system developments?

It is important to allow MPANs to be added to CMUs to replace MPANS that find they cannot offer the service. This would protect the ability to offer flexibility when required.

Government proposes to bring forward the deadline for Unproven DSR CMUs to undertake their assessments from one month to four months prior to the start of the delivery year. This effectively takes three months off the sales window (i.e. the period in which an aggregator/supplier can win and sign up customers.) The current arrangements are already challenging, especially for new entrants who are trying to get an aggregation offering off the ground. The proposals are far too restrictive and make the arrangements much more favourable for big single site CMUs.

Q27. Do you have any evidence to support measures that would best incentivise renewable generation, but fully account for the costs and benefits of distributed generation on a smart system?

Concerns have been raised that netting of charges is inappropriate because customers still require the security of the network when their embedded generation does not generate. There should be no issue here. As we have already suggested, there should be more of a move to usage rather than peak charging. Importing customers would therefore pay for the distribution system on an "as used" basis i.e. the solution is to build the capacity charges into the red/amber/green tariffs.

Any charging arrangement which removes the principle of netting would have to take account of the relative distance between generation and demand and this we believe is too complex for a first generation smart system.

We are also aware of some anomalies in remote parts of Scotland where embedded generators face transmission charges (in the form of flipped embedded benefits) even where they do not use the transmission network and/or there is an active network management system in place.

Q28. Do you agree with the 4 principles for smart appliances set out above (interoperability, data privacy, grid security, energy consumption)?

This certainly seems to make sense in the domestic context. We agree that smart appliances can play an important role and open standards (which encourage interoperability) are essential. However, we are not entirely convinced that they are appropriate for bespoke commercial systems.

Q29. What evidence do you have in favour of or against any of the options set out to incentivise/ensure that these principles are followed? Please select below which options you would like to submit evidence for, specify if these relate to a particular sector(s), and use the text box/attachments to provide your evidence.

- Option A: Smart appliance labelling
- Option B: Regulate smart appliances
- Option C: Require appliances to be smart
- Other/none of the above (please explain why)

Option A (smart appliance labelling) is probably the best option here but it is important that features like interoperability are highly visible.
Option B (regulating smart appliances) seems far too centrist for a free market economy.
Option C (requiring appliances to be smart) sounds good but would not, of itself, ensure the interoperability which, in the domestic context, would be extremely desirable. A high degree of co-ordination with European standards may be required.

Q30. Do you have any evidence to support actions focused on any particular category of appliance? Please select below which category or categories of appliances you would like to submit evidence for, and use the text box/attachments to provide your evidence:

- Wet appliances (dishwashers, washing machines, washer-dryers, tumble dryers)
- Cold appliances (refrigeration units, freezers)
- Heating, ventilation and air conditioning
- Battery storage systems
- Others (please specify)

  Battery storage systems in the commercial sector do not require any of the labelling/regulatory options listed under Q29.

Q31. Are there any other barriers or risks to the uptake of smart appliances in addition to those already identified?

There are no other barriers or risks that we are aware of in the domestic arena.

Q32. Are there any other options that we should be considering with regards to mitigating potential risks, in particular with relation to vulnerable consumers?

No

Q33. How might Government and industry best engage electric vehicle users to promote smart charging for system benefit?

No comment.

Q34. What barriers are there for vehicle and electricity system participants (e.g. vehicle manufacturers, aggregators, energy suppliers, network and system operators) to develop consumer propositions for the:

- control or shift of electricity consumption during vehicle charging; or
- utilisation of an electric vehicle battery for putting electricity back into homes, businesses or the network?

No comment.

Q35. What barriers (regulatory or otherwise) are there to the use of hydrogen water electrolysis as a renewable energy storage medium?

No comment

Q36. Can you provide any evidence demonstrating how large non-domestic consumers currently find out about and provide DSR services?

Demand control systems are commercially available. Clearly, in a competitive market there is an incentive on vendors to engage with customers.

Q37. Do you recognise the barriers we have identified to large non-domestic customers providing DSR? Can you provide evidence of additional barriers that we have not identified?

We recognise the barriers (cultural, regulatory, commercial and structural) and can think of no other barriers.

Q38. Do you think that existing initiatives are the best way to engage large non-domestic consumers with DSR? If not, what else do you think we should be doing?

The existing initiatives are sufficient. The document talks about the risk that domestic and smaller non-domestic customers will not offer flexibility to the system. A distinction needs to be made between "offering flexibility" through a demand side initiative and "responding to price signals." At present, larger demand side offers flexibility to the system so that domestic and smaller non-domestic customers can enjoy uninterrupted supplies at a reasonable cost. This means, under some initiatives, that larger sites are being paid not to take electricity. It would be absurd to extend this to all customers. In the coming years all customers (including domestic) will be able to take advantage of half hourly pricing through smart appliances, smart meters and smart tariffs. In the very long term we can foresee that, with correct pricing, there should be no need for any additional incentives for any parties to "offer" flexibility; all customers would be responding to the same price signals.

Q39. When does engaging/informing domestic and smaller non-domestic consumers about the transition to a smarter energy system become a top priority and why (i.e. in terms of trigger points)?

This role should fall naturally to the vendors of the technology as and when it becomes available.

Q40. Please provide views on what interventions might be necessary to ensure consumer protection in the following areas:

- Social impacts
- Data and privacy
- Informed consumers
- Preventing abuses
- Other

As we have intimated above we are sceptical of the need for any interventions in the areas of social impact and informing customers. However, it is not unreasonable

that customers should have control of their data and aggregators and TPIs need careful oversight to prevent abuse.

Q41. Can you provide evidence demonstrating how smart technologies (domestic or industrial/commercial) could compromise the energy system and how likely this is?

No

Q42. What risks would you highlight in the context of securing the energy system? Please provide evidence on the current likelihood and impact.

We have no evidence to offer which relates to the risks of a secure energy system.

Q43. Do you agree with the emerging system requirements we have identified (set out in Figure 1)? Are any missing?

The issues illustrated in Figure 1 seem reasonable.

Q44. Do you have any data which illustrates:
a) the current scale and cost of the system impacts described in table 7, and how these might change in the future?
b) the potential efficiency savings which could be achieved, now and in the future, through a more co-ordinated approach to managing these impacts?

We have no data to offer.

Q45. With regard to the need for immediate action:
a) Do you agree with the proposed roles of DSOs and the need for increased coordination between DSOs, the SO and TOs in delivering efficient network planning and local/system-wide use of resources?
b) How could industry best carry these activities forward? Do you agree the further progress we describe is both necessary and possible over the coming year?
c) Are there any legal or regulatory barriers (e.g. including appropriate incentives), to the immediate actions we identify as necessary? If so, please state and prioritise them.

Ofgem's RIIO initiative has not very successfully encouraged greater innovation from DNOs and just calling them DSOs is not likely to do so either. BEIS have also talked of the need for DNOs to "transition to DSOs." It is much more important to develop the interaction with the TSO.

Given the issue of conflict between system operator actions and distribution needs and given the need for more a system-wide charging structure (as illustrated by the embedded benefits debate) there is a clear need to move to a combined TSO and

DSO role sooner rather than later. We see little point in establishing and reinforcing a DSO role within the DNOs when there is a need to move to a more centralised arrangement now. We are of the view that National Grid should take on the role of nationwide DSO, leaving the DNOs the core responsibility of managing their wires. This split would be very similar to the one created at the formation of BETTA where the Scottish companies reverted to asset owners and NGT took on the role of TSO and ensuring that revenues were collected and redistributed to the asset owners.

We are very concerned that even now initiatives to improve the security of supply standards used by DNOs for investment planning are not looking at the system as a whole. In the embedded debate it was identified several years ago that the costs caused on the transmission network by exporting GSPs should be passed to DNOs so that they could be factored into their investment planning and charging in the interests of economic efficiency. It is highly regrettable that National Grid and DNOs are still operating in silos.

Q46. With regard to further future changes to arrangements:
a) Do you consider that further changes to roles and arrangements are likely to be necessary? Please provide reasons. If so, when do you consider they would be needed? Why?
b) What are your views on the different models, including:
i. whether the models presented illustrate the right range of potential arrangements to act as a basis for further thinking and analysis? Are there any other models/trials we should be aware of?
ii. which other changes or arrangements might be needed to support the adoption of different models?
iii. do you have any initial thoughts on the potential benefits, costs and risks of the models?

Please see our answer to Q45

Q47. Can you give specific examples of types of support that would be most effective in bringing forward innovation in these areas?

No

Q48. Do you think these are the right areas for innovation funding support? Please state reasons or, if possible, provide evidence to support your answer.

Please see our answer to Q45

Should you wish to discuss any aspect of this matter, please do not hesitate to contact me.

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