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and
Energy System Integration Team, OFGEM, 4th Floor, 9 Millbank, London, SW1P 3GE

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Dear Sir or Madam,

A Smart Flexible Energy System, A Call for Evidence

Green Frog Power are very grateful, as always, for the opportunity to engage in discussions and consultations with Ofgem and BEIS regarding continued improvements to the regulatory and policy framework of the GB electricity Market.

We have 230MW of new-build gas-fired generation with Capacity Market obligations that are now in construction or completed. Fast-starting and flexible, we are building our business to meet the needs of the rapidly evolving electricity market. We have a further pipeline of new gas-fuelled plant to build over the next three years that will maintain our position at the forefront of the UK's power

market: we've built more capacity that is reliable than any other British company in the past five years.

We are pleased to note that Ofgem acknowledges some of the shortfalls in the existing market structures. We wish to express some caution, though, regarding Ofgem's suggestion that the regulator should be involved in setting up a flexibility trading platform. We think that if such an idea is in fact a good one, the market should deliver it. It is, however, prudent for Ofgem to provide the regulatory support and environment to enable such a trading platform (or equivalent alternative) to emerge.

In addition to considerations of the benefits of a flexibility trading platform, we strongly agree with Ofgem in their identification of the requirement for sharper price signals.

We think that two key elements are missing from the consultation. We think there should be more focus on concerns about forward market liquidity for small-volume, short-period peaking products.

Over the longer term, the ability to effectively hedge positions will be crucial to any businesses which operate in this sphere, and crucial to the ability to compete fairly with larger incumbent electricity generators who can more effectively risk manage a far greater proportion of their portfolios. For this market to mature to the benefit of market entrants and consumers, forward market liquidity is an absolute necessity.

The continuance of cash-out reform is essential for achieving flexible generation. We applaud Ofgem's excellent work in bringing forth cash-out reform, and we urge you to consider bringing forward earlier the next steps planned for implementation in 2018 – PAR1 and £6,000/MWh cash out. The transitional phase has already improved price signals as seen by the responsiveness of the market to the periods of tightness evident in late 2016.

Conversely, any indication that there is a lack of enthusiasm for the planned reforms will undermine the market's belief in the regulatory and policy commitment to flexible and responsive providers of balancing services.

If the market believes that the regulator and government are committed to the price signalling required to bring forward small and flexible sources of generation, then consumers will benefit.

Green Frog Power agree that the development of heat maps for demand is an excellent idea and will help in informing appropriate locational decisions. We question the proposed thinking about whether adding storage to a site is considered a material change to a connection agreement. Notwithstanding the point that storage differs from conventional generation in terms of when it uses the system - perhaps the thinking should be framed from the perspective of why it should be considered a change rather than why it should not be considered a change.

It would be appropriate for regulators, policy makers and industry to consider that

flexible connections should be considered in terms of all the differing types of complementary technologies and different ways of using them, including those not yet thought of. System design should be robust to innovation and creative solutions that could benefit the system, efficiency and the consumer in terms of reduced carbon emissions, reduced cost, and increased security of supply.

Storage should, conceptually, be considered intermittent. Its fuel (electricity) is of limited duration (by definition) and we think that the characteristics mirror more closely those of wind and/or solar than those of other technologies with firm fuel supplies. Due to these characteristics, we think it important to ensure that any market structure or arrangements should ensure that there is never any incentive, direct or indirect, for storage to consume power in peak periods or during times of stress. We note with approval that this is already considered in the Capacity Market design.

We agree with the noted concerns about the lack of transparency in the procurement process for balancing services. It is unclear to us if this is an issue of familiarity or whether it is an issue of convenience – calling many small parties could be viewed as less convenient than calling on one larger party – perhaps even when the smaller parties offer a clear price advantage.

Green Frog Power welcomes the proposal to investigate the concerns that suppliers have about the impact of DSR and aggregators on their consumption accounts and balancing costs. Though a complicated issue, it seems clear that suppliers should not be made to absorb all the risk of paying for power that is not

needed because of the actions of other parties which are beyond the control of the suppliers who bear the exposure. We think that this issue toes into the embedded benefit review that is underway – as embedded benefits provide a way for these parties to work together to manage that risk.

Yours faithfully,

Graz Macdonald
Head of Regulatory and Policy Analysis
Green Frog Power Limited

Removing policy and regulatory barriers

Enabling Storage

- 1. 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?**

Green Frog Power agrees with the key barriers identified in this consultation. Fair treatment of all technology types is necessary to ensure a level playing field and the most efficient outcome that is best for consumers and all market participants.

- 2. Have we identified and correctly assessed the issues regarding network connections for storage? Have we identified the correct areas where more progress is required?**

We have been and continue to be supportive of the work done by the DG DNO Steering Group and the Quicker and More Efficient Connections work stream which address the issues emerging with the growth in volume and type of distributed connection generation. We think there remains a lot of work to be done to ensure that flexibility is appropriately considered at the connection agreement stage to ensure faster queuing and reduced cost.

3. 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?

Green Frog Power agrees that BSUoS and DUoS charges should reflect the unique characteristics of storage. However, it is unclear if the correct answer is to halve charges, as the networks are being used to deliver fuel (in essence) as well as to “reverse” deliver the final product. We would welcome further thinking on this issue.

The implementation of European Network Codes offers a genuine opportunity to rationalise the existing GB Code structure and make it more accessible to users. Users should be able to easily identify the obligations associated with their rating, connection voltage and technology without reference to multiple sources.

It would be useful for Ofgem to provide some simple guidance and overview of codes including which codes to sign up to, the code modification process and how to engage with it, appeals processes and compliance requirements.

4. 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?

Green Frog Power supports the use of new technologies as a way of avoiding network reinforcement. When determined through a robust and transparent cost-benefit analysis that other technologies can provide the least-cost option to network issues there should be open and transparent tendering process. Consistent with unbundling rules, we do not support network companies owning and operating storage assets.

5. Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage?

Green Frog Power agrees that the assessment seems sensible.

6. Do you agree with any of the proposed definitions of storage? If applicable, how would you amend any of these definitions?

No comment

Aggregators

7. What are the impacts of the perceived barriers for aggregators and other market participants?

No comment

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

No comment

9. What are your views on the pros and cons of the options outlined in Table 5?

No comment

10. 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?

The system is already protected against largest single loss of generation on the transmission network, therefore, the reduction in potential DSR would need to be exceed this volume to impact system stability. There has also been significant work done to mitigate against significant losses through the work done to modify Rate of Change of Frequency (RoCoF) settings for distributed generation. There is already a significant volume of demand which participates in Triad avoidance, therefore, reviewing the impact this currently has on the system will give some indication of system stability risk.

Local impacts of load switching may have impacts on how the Distribution Network Operators manage the networks and should also be considered.

Providing price signals for flexibility

System Value Pricing

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

We think it is important that prices signals are sharpened through improved forward power market liquidity and through ongoing cash out reform. Reliability and credibility of the Regulator's resolve in regard to price signals is crucial to ensuring that the correct investment is enabled and that projects to raise finance. To this end, we think it is crucial that Ofgem indicate their intention to bring forward the final phase of cash-out reform.

Forward market liquidity should be helped by an credible long-term sharpened cash-out price signal. In the meantime, we urge Ofgem to consider undertaking a small generators' (or aggregators) Secure and Promote. We think this will help to ensure ongoing improvements in forward market liquidity which will enable improved hedging, risk management, and overall, lower investment costs.

The move to Distribution System Operators, in principle, should facilitate the use of smarter DUoS tariffs which will support flexibility. Smart meters and smart

appliances will also facilitate a much smarter system with aggregators and suppliers able to innovate in this area to give consumers choice of dynamic tariffs.

12. 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?

No comment

13. 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?

No comment

14. 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?

Reforming the market to ensure a level playing field for all technologies should be the priority. This will enable the market to decide which technologies can be deployed most efficiently.

Incentivising the superior capabilities of ancillary providers and maintaining a technology neutral approach amongst providers is important. The EFR tender specifically focused on battery storage, which we do not think is an ideal approach beyond the introductory phase.

Smart Tariffs

15. 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.

We consider that the market will deliver effective business models if the rules and regulations are consistent, sensible and reliable.

16. 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.

No comment

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

No comment

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

No comment

Smart Distribution Tariffs – Incremental Change

19. 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.

Yes, because they are very uncertain and unpredicable.

20. 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 support a holistic approach to charging being taken forward by Ofgem to ensure that charging is fit for purpose for all technologies groups, characteristics and sizes. Ofgem should also ensure that its proposed targeted review of charging includes distribution charges.

The issue of constraint payments should also be considered in this proposed targeted review.

21. 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.

See response above.

Smart Distribution Tariffs – Fundamental change

22. 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?

Green Frog Power agrees that smarter networks and the move towards DSOs will enable the network to be used more efficiently. Dynamic DUoS charges can make an impact in terms of the price signals given to generation, demand and storage.

23. 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?

We think that this issue should be considered as part of the larger proposed targeted review of charging arrangements.

24. 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.

No comment

Other Government Policies

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

It is important that the regulatory and policy environment is transparent and reliable. Cost-effective and efficient investment in the electricity market required a degree of longer-term certainty, to the extent possible. Ensuring a level and fair playing field, and ensuring that the rules, regulations, codes and legislation are consistent and yet robust to market and technological evolution will enable the creativity and innovation required to meet the smart energy needs of the future.

It is important that the rule and code modification processes are also robust, transparent and fair, and that the complex regulatory and code interactions do not enable certain larger incumbent market participants to use this complexity to raise barriers to entry. It is very important that there is a wide representation on work groups and panels to avoid the appearance of uncompetitive behaviours.

26. 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?

Green Frog Power think that it is prudent to start considering the phase out of the Capacity Market. Ofgem should continue to work on their current successes in cash out reform, liquidity work through Secure and Promote, and by the other means of providing the sharpened price signals identified in the consultation. We believe that this would be the correct approach for providing the “missing money” to the

market, on a level playing field, that would enable the market to deliver the right investment, while removing the distortionary effects of an overly complicated capacity Market.

Green Frog Power responded to BEIS's consultation on Proposals to Simplify and Improve Accessibility in Future Capacity Auctions. We agree with the ongoing efforts to minimise market distortions and create a more open and transparent Capacity Market. Refining the structure, transparency and regulation of the Capacity Market will help secure its longevity and continued investability.

As the 2016 T-4 Capacity Market auction has proven, the storage and DSR industries are already capable of successfully competing within the existing auction regime.

27. 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?

No comment

A system for the Consumer, Smart Appliances

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

These principles appear to be sensible.

29. What evidence do you have in favour of or against any of the options set out to incentivise/ensure that these principles are followed?

No comment

30. Do you have any evidence to support actions focused on any particular category of appliance?

No comment

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

No comment

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

No comment

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

No comment

Ultra Low Emission Vehicles

34. 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.

No comment

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

Storing hydrogen is very difficult because the atom is so small. If this system worked there would be a market for it.

Consumer Engagement with DSR

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

No comment

37. 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?

No comment

38. 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?

No comment

39. 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)?

No comment

Consumer Protection and Cyber Security

40. Please provide views on what interventions might be necessary to ensure consumer protection.

No comment

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

No comment

42. What risks would you highlight in the context of securing the energy system?

No comment

The Role of Different Parties in the System and Network Operation

43. Do you agree with the emerging system requirements we have identified.

Green Frog Power agrees that the list of emerging system requirements looks comprehensive.

44. 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?

No comment

45. 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?

We agree that there needs to be increased coordination between DSOs, SO and TO develop an efficient network which takes account of the changing mix of generation technologies on the system, increased flexibility through DSR and Storage as well as smarter networks. We think there should also be consideration of an independent System Operator. We think it important to consider this now rather than wait for a new “norm” to have entrenched.

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?

No comment

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.

No comment

46. 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?

No comment

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?

No comment

ii. which other changes or arrangements might be needed to support the adoption of different models?

No comment

iii. do you have any initial thoughts on the potential benefits, costs and risks of the models?

No comment

Innovation

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

No comment

48. Do you think these are the right areas for innovation funding support?

No comment