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Electricity System Team
Department for Business Energy and Industrial Strategy
3 Whitehall Place
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Dear Sirs,

Call for evidence on a smart, flexible energy system

Fred.Olsen Renewables (FOR) is a wholly owned subsidiary of Bonheur ASA and is responsible for the group's renewable energy activities. FOR's main focus is onshore wind power and the first investment was made back in 1996. The main office is based in Oslo and the activities are focused on the Scandinavian market and the UK. Significant efforts have been made in developing green field projects. This has proven particularly successful in the UK (under Fred.Olsen Renewables Ltd – FORL) and the company's first large scale wind farm, Crystal Rig, commenced operation in 2003. Since then, six additional wind farms have been constructed in Scotland, one under construction in Scotland, one in Norway and one in Sweden, which brings FOR's total installed capacity up to 595.8 MW.

Fred.Olsen Renewables Ltd (FORL) welcomes the opportunity to respond to the Call for Evidence. The key priorities should be:

- **Consistency** – The transition to a smarter energy system will have wider impacts. It is essential that government policy is clearly telegraphed, has longer term consistency and is transparent in its application.
- **Clear Vision** – The transition to a smart, flexible energy system will create numerous opportunities in industrial strategy, growth and export. It will be important to not consider energy policy in isolation.
- **Need for a 'Whole System' Approach** – We support the overall thrust of the Call for Evidence on a Smart, Flexible Energy System and consider that providing a long term vision for the electricity sector is important to allow market participants to invest in the technologies and infrastructure needed for a smart and flexible electricity system. Consideration needs to be given to the future of transportation, heat and the other networks to ensure that energy system as a whole can be developed to effectively transition to a smart, flexible, low carbon system.
- **Fair and Level Playing field** – the objective should be to create a fair and level playing field for all market participants to be able to provide flexibility services that are technologically agnostic.
- **Programme Delivery** – The scope of the call for evidence is significant with numerous policy and regulatory frameworks highlighted in the Call for Evidence which extends across government, regulators, code administrators, network operators and industry participants. To ensure the proposals are implemented within the appropriate time frames it is important that the implementation process is considered with a forward work programme being developed with an appropriate delivery vehicle established to achieve these goals.
- **Agree the fundamental drivers** - The electricity/energy sector is becoming more diverse. The number of participants who can add value is multiplying. How to engage with and regulate this new market is in danger of becoming overly complex and creating ever higher barriers to entry. The challenge is to make it clear, simple and predictable. With this in mind there are a number of fundamental things which need to be agreed:-

- What is a DSO, what are its functions, where and how does it interface (both voltage 33/132/275 KVA and contractually) with the TO and how consistent can we make the rules governing the DSO function. Instinctively each DNO becoming a DSO with its own set of charging rules and incentive schemes is both inefficient and costly. What is the correct balance? Simplicity and consistency are needed to create a manageable functioning market for all market participants.
 - At the moment the CUSC and BSC are complicated codes and are resource intensive for those who take part in the panels. This has been a good system, but is increasingly unrepresentative. Recent code changes have very large potential impacts on embedded generation and CM participants, yet these parties have no voice on the panels and are too small to resource their individual participation. This is an issue that must be addressed to ensure storage, DSR, CM and embedded generators can play an active part in how the market evolves.
 - Brexit provides stark choices for the GB energy market. In designing the future of charging and how to incentivise efficient investment; our approach to the EU going forward is an important factor. If we wish to trade as part of the internal energy market (probably the best outcome for consumers) then the rules we implement need to closely match the EU market. Charging is an important part of this mix. This principle should be a government priority within the early negotiations. Answers given in this response assume that a close tie will remain with the EU energy market.
 - The Prime Minister and BEIS have stated that there are several core themes to their vision for the UK. Spreading the wealth of the economy to a greater number of people and creating economic growth outside the Golden Triangle. Energy policy offers an ideal opportunity to harmonise these aims in a new Industrial Strategy post Brexit. If the UK is to be competitive as economy outside the EU it has to encourage industry and energy to move closer together, and create an environment where business can invest in the energy it consumes and be located next to places where energy is abundant and cheap. This is not dissimilar to the industrial revolution around coal in the north of the UK. Electricity is the engine of the new industrial economy. In the short term it is a no regrets investment in infrastructure that keeps the economy moving and employs people outside of the south east. In the longer term it is the energy that will drive the economy. We hope Government take this basic principle into account when devising all new energy and industrial strategies.
- **Interconnection** – interconnection could change the way the future energy market works and has not been adequately considered within this paper. It will be critical to consider the relationship and associated charging and consequences be considered appropriately.

We have attempted to answer the questions raised in the Call for Evidence, we have not responded to questions where we either have no opinion or where the questions is outside the scope of FORLs interests.

We are happy to engage further should you have questions or require clarifications.

Yours sincerely,



Graeme Cooper
Executive Director
Fred. Olsen Renewables Ltd

cc. Gareth Swales Commercial Director Fred. Olsen Renewables

Response to call for evidence questions

Section: Removing policy and regulatory barriers

Enabling Storage

Question 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?

We agree with the main policy and regulatory barriers identified in this consultation. These are:

- How storage connects to a network
- How storage is charged for using the electricity network
- The absence of a definition of storage in legislation
- How final consumption levels are charged to storage

We consider 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.

A level playing field between different assets providing flexibility is needed across all markets to allow the most efficient deployment of technologies including storage.

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 are supportive of the work done by the DG DNO Steering Group and the Quicker and More Efficient Connections (QMEC) work stream which has support issues regarding storage in traditional technologies. Although a great deal of work has been done to improve the overall connection process at distribution level for generation assets there are issues that need to be addressed specifically for storage. Standardisation of how storage is treated by DNOs across GB is important. This includes the definition of storage through to engineering safety standards on system security.

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?

It is essential that any changes to the charging regime should be mindful of the need to develop electricity storage as an essential part of the transition to a least-cost, sustainable and secure electricity system. To this end, a level playing field must be created for electricity storage. This does not mean treating storage identically to either demand or generation (as it is neither), but creating a new classification for storage that enables it to compete on an equal basis. BSUoS and DUoS charges should therefore reflect the operation of storage. End user levies on storage should be removed.

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. This should coincide with work to enhance Ofgem's website to include key information on the various network codes. In addition to the names of the various codes and links to the relevant administrators' websites, it would be useful if Ofgem could provide an easy to follow introductory guide providing an overview of codes including, for example, which codes parties need to sign up to, the code modification process, appeals process, collateral and compliance requirements, and the relevant objective(s). This would be particularly useful for new entrants.

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?

We support network companies using new technologies as a way of avoiding costly network reinforcement. When determined through a cost benefit analysis that other technologies, such as storage, can provide a cheaper option to address network issues there should be a tendering process to allow the market to provide the service. We do not support network companies owning and operating storage assets. This should also be consistent with the unbundling rules.

However, there may be situations where it is beneficial for the distribution or transmission party to own storage if network ownership delivers a more efficient solution to a network stability than other infrastructure. Where storage is used to defer asset investment, we would expect contractual and operational safeguards that prevent that intent from being undermined. This should only be considered once the project has been offered to the market and failed to attract bids from commercial organisations to build the asset.

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

We agree that the assessment of regulatory approaches is useful in giving clarity to storage regarding its role in the energy system.

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

We would define storage in primary legislation as a new activity with separate storage licence regime. Ofgem would have powers to grant licences to authorise the activity (Government, or Ofgem, may also have powers to grant or allow an individual or class exemption). Subsequent to this (or in parallel) a licence would be developed for storage with industry. This would provide the storage industry with its own regulatory regime; but as well as a longer timeline, it could potentially create uncertainty for both incumbent storage operators who are licensed as generators and current storage developers, as this new regulatory framework may need to be adopted by them. The priority should be to get a definition for storage in legislation as soon as possible.

Aggregators

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

Barriers to accessing the Balancing Market are a concern for Aggregators due primarily to uncertainty around DSR availability. The Authority should follow National Grid's Power Responsive Campaign to find ways to add certainty to the market through definitions and access to the balancing market. Many market participants have proposed that National Grid should reduce the number of products and services to enable simplification.

Cross-party impacts are a concern for the market, as there must be a balance between encouraging Aggregators whilst ensuring that the supplier is not affected by a third party. The European Clean Energy Package proposals include the inclusion of a restriction on requiring Aggregators to pay compensation to Suppliers. This model would cause issues for suppliers adversely affected without compensation, especially if a contract or agreement was not reached prior to aggregation. A level playing field is required which enables new market entrants to offer up innovative products without financially penalising suppliers who have incurred costs.

Other market barriers include the inability to get real time data on usage and availability of technologies such as DSR and generation is compromised due to a lack of smart meters and monitoring devices.

Barriers around consumer protection have also been addressed to some extent in the European Clean Energy Package draft proposals, with assurances being prepared for customers that wish to enter or exit a contract.

The ancillary services market also needs to be reformed to allow participation of new technologies – this also requires other price signals, such as triad, to be appropriate to ensure the value of each market is cost reflective.

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

Whilst it would be positive for the UK to have an excess of DSR flexibility on the system now, simultaneous load switching is not likely to be a significant issue in the immediate future and will likely only become a problem in the future as Electric Vehicles (EVs) become more common. Smart capabilities and network reinforcement are important to the development of the market, meaning that some action is likely to be necessary before EVs become common.

EU balancing codes directly oppose the idea of the regulator doing nothing to affect or monitor the market, making this an unworkable solution. Although the exact solution will not be found quickly, basic protections and guidelines for Aggregators, Suppliers, and Consumers need to be put in place in the interim leading up to Project TERRE.

As DSR volumes increase it is also important to note the need for a controlled move to a DSR-infused system to prevent problems with the ability of Low-voltage networks to cope. The system will also need new technological capabilities in order to keep up with the transfer of data that will need to take place for the system to effectively use this flexibility. This would likely take the form of a centralised system allowing the SO to view and control available sources of DSR as capacity grows or a neutral market facilitator. These changes should be supported and encouraged by government and the regulator.

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

Approaches	Barriers to Market (in particular balancing mechanism) and Cross-party impacts	Consumer protection
Monitor	<p>A 'watching brief'</p> <p>Perhaps shared with the SO, to monitor market access barriers and issues.</p>	<p>A 'watching brief'</p> <p>Monitor consumer concerns, and microbusiness/domestic DSR.</p>
Industry-led change	<p>BSC or C16 modifications</p> <p>To support independent market access. This could include:</p> <ul style="list-style-type: none"> allowing a participation role for independent aggregators in the BSC; possibly including a financial compensation process. <p>A BSC modification proposal could be launched by the SO or other BSC party, or designated third party. Independent aggregator involvement would need to be facilitated.</p> <p>Alternatively, balancing services could be amended more closely to mimic the balancing mechanism (C16 changes).</p>	<p>Voluntary code of practice</p> <p>Note UK ADE commitment here (non-domestic).</p>
		<p>Mandatory code of practice</p> <p>The SO requires sign-up to accreditation scheme to access balancing services, or a requirement for specific aggregator role in the BSC. Code of practice set out by industry.</p>

Regulator steps in	Obligation on suppliers To sign bilateral agreements or standardised frameworks.	GAR or licence, with code of practice GAR or licence provides general legislative powers over aggregators, or a broader class of entities. Code of practice set out by industry or by Government.
	GAR or licence aggregators Require signing BSC, making them BRPs. BSC potentially modified to address cross-party effects.	GAR or licence aggregators Aggregator licence conditions or general conditions of a GAR set out consumer protection standards.
	Supply licence Aggregators required to have a supply licence.	Supply licence Aggregators required to have a supply licence and meet consumer protection standards.

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?

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. Customers could lose real value if data is lost or instructions are not received. This is just as appropriate for large customers as small.

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 for example 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. National Grid is well placed to monitor this through its annual review of system operability.

Local impacts of load switching may have impacts on how Distribution Network Operators (DNOs) manage the networks and should also be considered. In the future when SME and domestic customers are providing DSR services it will be essential to ensure that the communications equipment utilised is compliant with EU and GB specific cyber security requirements.

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?

To ensure that the full value of flexibility is realised there must be reforms to electricity charging arrangements and the ancillary services market. Once these mechanisms are reformed to allow effective price signals and revenue stacking to take place across markets price signals should align to provide the right signals for flexibility. Transparency of these mechanisms is also important to allow new projects to raise finance. The priority should be to develop products and associated revenues/contracts which are bankable to allow technologies to access the market.

The move to Distribution System Operators, in principle, should facilitate the use of smarter DUoS tariffs which will support flexibility. Further work is also needed to ensure that signals given by the DSO and SO are not conflicting leading to disrupt erratic market signals. There will need to be effective and transparent communication protocols between DSO's and the SO to enable this.

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 with regard to 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?

FORL provide balancing and ancillary services to National Grid. Wind turbines have significant technical capabilities with respect to flexibility services that are currently underutilised. Without storage co-location, wind turbines are able to offer frequency response, reactive power, demand turn up/turn down and synthetic inertia. Additionally wind turbines are able to respond quickly with steep ramp profiles and minimal zero time between ramp down and ramp up. Speed of response is valuable to National Grid and its real time operations.

Greater range of ancillary services with simple entrance to commercially access these services and consistency across treatment of services are important. Some services we do not provide due to complexity and personnel capacity to engage effectively. The major mechanisms we consider needing reform is the charging regime and ancillary services market.

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?

Inertia is not currently remunerated despite being an increasingly valuable commodity. The Obligatory Reactive Power Service is remunerated based on an outdated administrative method which is unlikely to correctly value the commodity provided.

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. Once this has been done it should be left to 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 end goal should be to ensure that National Grid have a suite of flexibility products that allows all market participants to compete on an equal basis. This includes improving the information provided to industry and looking at how National Grid can simplify its products where appropriate.

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.

It is the role of Government and Ofgem to ensure there is a level playing field for market participants to compete and to ensure that there are not unnecessary regulatory or technical barriers which may limit or prohibit suppliers' ability to offer smart tariffs. Once the necessary building blocks are in place (i.e. smart metering and Half-Hourly Settlement), natural market growth will deliver effective business models, innovation and smart tariffs in response to customer demand. Smart tariffs will be a major enabler for consumer engagement in the energy market and evidence from initiatives such as the Customer Led Network Revolution demonstrates that customers respond positively to them.

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.

The structure of the distribution tariffs has also been highlighted as being unclear and complex. The tariffs themselves include capacity and energy based charges and may involve additional charges such as for excess reactive capability. There are a large number of customer categories ranging from small domestic to larger demand customers connected at extra high voltage. It is therefore difficult to determine the cost reflectivity of the tariffs, how the allowed revenue is collected from embedded generation/demand and how a move to a DSO will impact the current methodology. In addition, there are issues with DNOs having different interpretations on some aspects of the charging methodology. With no definition or agreed proposals regarding the treatment of storage this all makes it difficult to compare the tariffs across multiple DNO networks.

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 and sizes. Ofgem should therefore ensure that its proposed targeted review of charging includes all aspects of electricity network charging to ensure charging arrangements evolve to reflect the changing use of electricity networks. We consider that charging arrangements should facilitate a level playing field between industry parties connected to different networks. These arrangements should be predictable and transparent whilst reflecting the costs and benefits each user provides.

The EHV Distribution Charging Methodology (EDCM) was reviewed in 2015 and the Common Distribution Charging Methodology (CDCM) is currently under review by the CDCM review group. We consider that Ofgem should clearly set out its views with regards to the EDCM and CDCM reviews to ensure changes are taken forward through the Distribution Connection and Use of System Agreement (DCUSA) efficiently.

21. How problematic and urgent are any disparities between the treatment of different types of distribution connected users? An example could be 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?

We consider that the underlying network cost drivers on the distribution networks will remain largely unchanged. Smarter networks and the move towards DSO's means that the network we have in place can be used more efficiently which is where new dynamic DUoS charges can make an impact in terms of the signals given to generation, supply, DSR 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?

The GB market needs to simplify regulation and make investment signals clear and reliable against a change process based on a long term vision of the electricity sector. This will provide the framework for change and a background against which investors can expect to see charges evolve. It's important that methodologies cover both distribution and transmission charging arrangements as these networks continue to be interlinked. Providing appropriate cost reflective charges across these networks is important to provide the right signals for the market. The best way to achieve this is to have a DSO/TSO managed through a set of principles set out in codes and agreed by users. The interfaces between the SO and DSO together with responsibilities are the first step to prevent confusion, duplication and unnecessary cost.

As demand customers and other technologies become active in the market through smart technologies they will be able to react to short term signals efficiently and provide value for money across the system. Longer term locational and system investment signals are important, but it is difficult to respond if there is not a

consistent distribution/transmission boundary; as a consistent predictable methodology will be more difficult to create. The significance of creating two totally different systems for transmission and distribution is proving difficult.

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?

The existing process for entering the ancillary services market has a number of key issues preventing the entry of intermittent, renewable generation. The tendering process and the need for a long-term guarantee on availability of generation inhibits intermittent technologies from participating effectively. This barrier to entry makes it difficult to factor the longer term needs of the system into the design of the next generation of assets. Enabling all technologies to participate in a smart, flexible energy system by providing these services will promote the transition to a smart electricity system at least cost to consumers.

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?

We welcome the opportunity to respond to not only this call for evidence but also BEIS's consultation on Proposals to Simplify and Improve Accessibility in Future Capacity Auctions. The Department's recent efforts to remove market distortions and create a more open and transparent Capacity Market are encouraging as 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. The growth of the DSR industry and the continued reduction in costs for batteries will, we believe, enable both to make significant and valuable contributions to the future smart system. Contract lengths of CM contracts are also seen as a barrier for DSR aggregators.

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?

There is a clear benefit in utilising the full capability of the new, renewable generation which has been deployed across the UK at both transmission and distribution level. In supporting the system's ability to fully utilise this generation the costs of the system will be minimised. Network companies and the System Operator have a role to play in adapting their mechanisms to look towards alternative options beyond the conventional models currently operated. This extends to the methods used in connecting new renewable sites and reinforcing the conventional network as whilst there is an initial outlay in doing so, the cost of voltage control and controlling the system frequency can fall significantly if the capability of renewable generation in providing ancillary services is utilised.

The Role of Different Parties in the System and Network Operation

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

We consider that the list of emerging system requirements looks comprehensive.

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 TOs 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 support greater independence of the SO within the National Grid Group to provide the SO with more scope to deliver the enablers identified. A new regulatory and incentive framework which encourages risks to be managed more optimally will also need to be adopted to ensure the enhanced SO function to function as required. There may also be merit in moving to a fully independent System Operator. Where DSO's actions directly impact end consumers there will need to be effective engagement with energy retailers.

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