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11th January 2017
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Ecotricity Response to the Call for Evidence on a Smart, Flexible Energy System

Dear Electricity Systems Teams,

Ecotricity is an independent renewable energy generator and supplier, with over 190,000 gas and electricity customers. Our commitment to those customers is that the money they pay for their energy bills will contribute towards powering the UK from renewable sources. We have followed this pledge since first generating renewable electricity in 1998, and are now at the forefront of new renewable generation with ongoing research into a number of new technologies including tidal power, biomethane and storage. In 2011 we introduced the Electric Highway, a network of Electric Vehicle (EV) charging points which now stretches across the country with charging points at all motorway service stations. By ensuring that EV drivers had the opportunity to charge at regular intervals, the Electric Highway, has played a significant role in increasing EV uptake.

As a renewables generator and a new entrant into the storage market we welcome this call for evidence on flexibility. A smart, flexible system is essential for enabling the decarbonisation of the energy market and ensuring energy security whilst keeping prices low.

Much needs to be done in order to get to this point. We believe that the following aims must take priority:

- Increase regulatory certainty for storage and collocated generation.
- Ensure the treatment of storage with respect to charging and network connections reflects the fact that is dispatchable and brings system benefits.
- Amend the connections queuing system to ensure that storage can be prioritised when it brings benefits to others in the queue.

- Improve transparency and competition in balancing services by ensuring that all services are procured through open auctions.
- Ensure that DNOs publish all available information on best places to connect storage to improve accessibility and ensure competition.
- Enable DNOs to make system wide upgrades to their networks by amending their mandate under the RIIO process.
- Decrease the clip size for Firm Frequency Response (FFR) to 1MW.
- Encourage automated smart appliances and home storage to ensure domestic customer level Demand Side Response (DSR).

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?

Yes, we agree that network connections, network charging and a lack of regulatory clarity are all barriers to storage.

Question 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?

Yes, the consultation identifies the key issues with respect to network connections. We would welcome additional clarity on the connections process and the network security standards that are needed. We would urge DNOs to prioritise resolving the remaining uncertainties on this.

With respect to information about where connections are available, we find heat maps to be particularly useful for our new generators and we believe that they could be effectively applied to storage. We note, however, current heatmaps are not always kept up to date and do not cover lower voltage lines. We would urge DNOs to expand the coverage of their heatmaps for both storage and generation.

These changes would enable storage developers to identify areas where storage would be most valuable to the network quickly, which will increase the overall benefit that each new storage installation brings to all parties.

We agree that storage should be given priority over other customers in the connection queue when the DNO can show that this would benefit other customers. We would urge DNOs to take a more creative and proactive approach to assessing how storage could be used to relieve strain on the network. For, example, as a generator, we have been told that there is no spare capacity for network connections in the south of Scotland. If this is indeed the case, then the DNO should explore whether and how storage could be used to free up more capacity.

We have direct experience of the problematic way in which connection queues operate in relation to storage. On one of our sites in development, Alveston Wind Park Ltd, we initially secured a 20MW grid connection. Our final wind park will be around 7MW in capacity and we wanted to make use of the remaining 13MW by installing storage. When we applied to add this storage we were sent to the back of the connections queue, despite the fact that this change will not increase the connection capacity needed and will not add strain to the grid. A more pragmatic approach is needed.

Question 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?

The way in which storage is classified by DNOs is inconsistent: it is usually classed as non-intermittent, but in some circumstances it is not. Classifying storage as intermittent is inappropriate because it ignores the fact that it is controllable and flexible. Intermittent generation is subject to a flat rate, whilst non-intermittent charges vary depending on the strain on the network. Classifying storage as non-intermittent therefore provides an incentive for it to be used to balance the network, rather than add to its strain. Connection charges should also be amended to take account of the fact that storage tends to export in times of peak demand and imports during peak generation, reducing stress on the network.

We understand that this question is also being considered as part of the Common Distribution Charging Methodology; however, this process is likely to take some time. Given the current inconsistencies and potential delays we believe that it would be helpful for Ofgem to issue guidance clarifying that storage should be treated as non-intermittent.

We believe that the wider network benefits of storage could be taken advantage of through flexible connections. For example, where the DNO can receive a guarantee that the storage will only import in times of high generation and low demand, and only export in times of low generation and high demand should be rewarded.

Question 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 have concerns about the competition implications of DNOs owning their own storage. Regardless of whether they do start owning storage, it is essential that they publish all relevant information about best places to connect. This would improve accessibility and competition for all prospective storage developers and ensure that no one has an unfair advantage due to inside information.

Question 5: 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.

There is currently very little certainty with respect to how the addition of storage would affect an existing RO or FIT accredited site. This, and in particular the fact that developers need to re-accredit a site following the addition of storage, causes significant nervousness amongst investors in the original installation. This re-accreditation risk can prevent storage being added to such sites. The fact that in practice Ofgem will almost certainly approve the re-accreditation is not sufficient comfort to nervous investors. We believe that Ofgem should amend the process for adding storage so that re-accreditation is not needed and issue guidance clarifying that storage will not invalidate an existing site.

Question 6: 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 do not believe that any of the definitions are sufficient because none of them allow for other types of storage including mechanical and heat. Therefore, whichever is chosen should be amended to include this.

Aggregators

Question 7: 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?

A key barrier to access balancing services is the complex and opaque manner in which balancing services are procured. It is difficult for new entrants to navigate these multiple methods or to get much visibility of available prices. We believe that the best way to tackle this is for National Grid to openly publish information about what they need and for all balancing services to be secured via auctions, which should be open to as many participants as possible. The grid should not be able to contract for balancing outside of these auctions as this will reduce competition. For example, prior to last year's Enhanced Frequency Response (EFR) auction we understand that a bilateral contract for balancing services was agreed between National Grid and RES, which resulted in less capacity being auctioned. In future, such arrangements should either be included within the EFR/FFR auction, or form a separate open tender process.

We agree that current clip size limits in balancing services present a barrier to Demand Side Response (DSR) and storage, which tend to operate in much smaller clip sizes than generation. The recent reduction of clip size of EFR to 1MW, which resulted in a significant increase in participation from storage, is a good example of the potential success of this. We believe that National Grid should take the same approach to FFR.

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

We do not have any strong views on this.

Question 9: What are your views on the pros and cons of the options outlined in Table 5? Please provide evidence for your answers.

We believe that a Code of Practice for aggregators combined with a watching brief from Ofgem would be sensible.

With respect to the impact on suppliers' balancing positions, it is important that suppliers are able to protect themselves against unexpected shifts in demand by large consumers. However, we believe that suppliers should be able to manage this themselves by having contractual requirements that oblige notification of involvement in balancing services and/or compensation for their impact.

Question 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 believe that the penalties in place are already sufficient.

Smart tariffs

Question 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.

Our response to this question is combined with question 16.

Question 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.

The most effective way for the Government and Ofgem to intervene in relation to Demand Side Response (DSR) at a domestic consumer level is to help encourage uptake of in home storage and smart appliances. We believe that such appliances, combined with smart meters will enable the development of automated DSR at a domestic level, which could have significant results in aggregate.

Although consumers can gain financial benefit from changing their consumption habits in response to smart tariffs, the hassle involved in this compared to the relatively small financial gain means that smart tariffs are unlikely to be sufficient on their own. The most effective means of achieving a smart system which includes domestic customers is through combining smart tariffs and grid support service earnings with home storage and smart appliances. This will be best facilitated through aggregators; whilst the end consumer that gets the financial benefit, they would have limited involvement in the front end. Contracting for grid support delivery services and organising its delivery would be done by the aggregator or other third party intermediary.

Please refer to our response to the section on electric vehicles

Question 18: 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?

We agree that consumer preference for simplicity and perception of low reward for smart tariffs are key reasons why uptake of smart tariffs has been limited. As noted in response to Question 15, manual responses to time of use is too time consuming and complicated to be attractive to many consumers. A far more effective approach would be to promote and reward the uptake of technology that can automate this.

Other Government Policies

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

As noted in response to Question 5, the current lack of certainty that developers have with respect to treatment of a site with existing RO or FIT accreditation works as a disincentive for co-locating storage with generation.

On the question of how to ensure that the same unit of energy does not receive a double benefit, we believe that this can be easily achieved through installing a BSC accredited meter between the generator and storage. Ecotricity has a number of RO accredited wind parks with onsite demand. Our generation is metered by BSC compliant meters at the base of the wind turbines before power is taken on a private network to the onsite customer. This generation data is submitted to Ofgem and ROCs are granted for them. We separately meter spill to the grid of power not consumed by the onsite customer, but this has no bearing on the RO process. We believe that this straightforward mechanism could easily be applied to onsite storage.

We understand the convenience, from a system perspective of keeping storage in a separate BMU and this would be one way of ensuring that storage providers do not pay end consumer costs. However, we are concerned that this would increase costs for developers both through the need to maintain an additional BMU and extra administration costs. If the Government does decide to take this proposal forward, it is important that storage BMUs are eligible for embedded benefits: storage brings down system costs, a service that embedded benefits are designed to reward. Furthermore, without embedded benefits, storage development will not be sufficiently profitable.

Question 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?

Please see our response to the Capacity Market consultation in Annex A and our proposed amendment to the Capacity Market Rules in Annex B.

As noted in our consultation response, it is important that the Government refrain from the proposal to increase credit requirements for DSR. This could risk reducing the already low participation of DSR in the auction, this counteracting the Government's efforts to increase DSR. Our proposal to introduce a maximum carbon emissions limit of 450g CO₂/kWh was proposed primarily for climate change requirements, would have the added benefit of favouring flexibility in the form of Demand Side Response and storage.

Our modification proposal to amend the definition of a Distribution Connection would ensure that co-located storage, which is owned and operated by a party not named on the connection agreement to participate in the capacity auction. We believe that such a clarification will encourage more storage participation in the capacity market.

We agree with the Government's view that entry requirements for DSR could be simplified.

Question 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?

In our report, 2030 Vision for a Green Britain¹, which was produced with modelling from Cambridge Econometrics, we propose a new method of calculating the full cost of a given technology. This method, known as the Integrated Net Cost of Energy, would account for the full costs and benefits of each form of power generation and include this within the price. We have included an excerpt from this report in Annex C.

Appliances

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

- Yes
- No (please explain)

Yes, we agree with these four principles.

Ultra Low Emissions Vehicles

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

The key barriers to EV take up remains price. We would encourage the Government to follow the example of Norway, which has exempted EVs from VAT and created a positive price differential. Other successful examples include the differential taxing of diesel and unleaded petrol. Given the significant environmental benefits of EVs over petrol cars, such tax incentives make a lot of sense.

A prerequisite to significantly increasing electric vehicle uptake without adding substantial strain to the network is strategic grid upgrades in major towns and cities, where demand for EVs can be expected to be high.

Question 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 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?

If smart charge modulation is introduced, it would be more efficient and effective for these to be incorporated into the charger, effectively making it a smart device, rather than requiring specifications in electric vehicles themselves. Such changes will require upgrading of charging hardware and thus will depend on sufficient funding being made available.

We understand the appeal of using electric vehicles for DSR, but there are many issues that must be considered first. Repeated charging and discharging would have an impact on the battery life. This could have cross over impacts on the battery warranties as EV batteries are

¹ <https://www.ecotricity.co.uk/about-ecotricity/our-eco-credentials/our-2030-vision-for-a-green-britain>

not designed to cycle whilst stationary. In addition, technical issues such as temperature regulation for air cooled batteries should also be considered.

With respect to customer propositions for grid services we believe that commercial EV charging points have a role to play in this. Where the EV owner's permission exists, we see potential for the pump operator to provide DSR and receive payment from National Grid. The charge operator could then pass this benefit onto the EV owner through a credit.

For at home or workplace charging electricity providers could provide a similar role.

Roles of different parties in systems and networks

Question 43: Do you agree with the emerging system requirements we have identified (set out in Figure 1)? Are any missing?

Yes, we agree the emerging system requirements included in the consultation. We strongly support the move to more local balancing and an increase in flexibility, and we believe that the Government has identified all key requirements for this.

Increased visibility is particularly crucial. As noted above, we find heatmaps to be a particularly useful tool and strongly support an increase in their use and incentives for DNOs to ensure that these are kept up to date.

We strongly support whole system network planning. The current process of "pay as you go upgrades" of individual lines in response to network connection requests is highly inefficient and leads to situations in which a grid connection for a small generator could cost upwards of £1million and take several years. It is one of the reasons why large areas of the network are considered "full". Planning ahead and upgrading large parts of the network before connection requests are made would avoid many of those problems.

An increase in flexibility with respect to network connections is also crucial. In our experience, DNOs tend to only give quotes in response to specific requests rather than offer a variety of options that could be much more achievable, with only minor variations from the original request. Please see our response to *Getting a Connection where the Network is Constrained* in Annex D for more details on this.

Question 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?

Yes, we agree with the proposal that DSOs be responsible for operating efficient, coordinated and economical distribution networks. They will make active use of new technologies, providers and solutions; and have an increased role in delivering an efficient, co-ordinated and economical wider system.

The current system is not sufficiently joined up and we believe that significant benefits could come from the more joined up approach described in the consultation.

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?

We agree that DNOs can and must improve visibility of the steps that they are taking and make efficient use of smart meters and other technology. We also support the position that all parties need to: increase co-ordination between each other; develop formalised frameworks for network planning and whole system requirements; and develop efficient local and whole system use of resources.

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.

Yes. We understand that the current mandate that DNOs have from Ofgem under the RIIO framework explicitly discourages them from carrying out strategic network upgrades in advance of receiving network connection requests. It appears that the justification for this discouragement is that such upgrades are viewed as "speculative" investments. Such a perspective might have been appropriate in the past. However, the current level of congestion on the grid and the substantial delays that generators experience, coupled with the urgent need to enable more intermittent renewable generation to connect, means that this perspective is no longer appropriate. It is essential that Ofgem reconsider its position and allow DNOs to plan the network and make strategic upgrades wherever there is limited capacity.

Question 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?

We believe that the current problems of limited network capacity and expensive grid connections will only get worse without the changes to grid upgrades proposed.

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?**

We support the market signals and arrangements approach as the one which provides the most flexibility. However, it is important that fixed constraints such as planning and other reasons for decisions with respect to generator location are accounted for and not penalised.

Conclusion:

We strongly support the Government and Ofgem's focus on moving to a more flexible system. Taking full advantage of the rapid development of storage, electric vehicles and smart technologies will require rapid changes in regulation, infrastructure and charging.

Crucial changes include: amending the way storage is treated with respect to charging and network connections, so that these reflect the system benefits that storage brings and amending the

mandate of DNOs to ensure that they make the strategic network upgrades necessary to support increased EV uptake and more distributed generation.

Changes to the balancing mechanism are also needed to ensure that all services are procured in a transparent and competitive manner. Increased participation in balancing services and the capacity market can be achieved by enabling stacking of revenues and reducing the minimum clip sizes.

We are sceptical about the possibility for significant developments that rely on changes to consumer behaviour, even with the assistance of smart time of use tariffs. However, we believe that combining such tariffs with smart meters, smart enabled appliances and at home storage so that responses to price changes can be automated has significant potential.

Ecotricity welcomes the opportunity to respond and hope you take our comments on board. We also welcome any further contact in response to this submission. Please contact Regulation and Compliance Team Manager Alan Chambers on alan.chambers@ecotricity.co.uk or 01453 761 380 or Holly Tomlinson on 01453 769366 or holly.tomlinson@ecotricity.co.uk.

Yours sincerely,

P.P. 

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Annex A: Response to Consultation on Capacity Market Rules (enclosed)
Annex B: Capacity Market Rules Change Proposal (enclosed)
Annex C: Excerpt from our 2030 Vision for a Greener Britain (below)
Annex D: Response to Getting a Connection where the Network is Constrained (enclosed)

Annex C

Excerpt from *Ecotricity's 2030 Vision for a Green Britain*

Full report available here: <https://www.ecotricity.co.uk/about-ecotricity/our-eco-credentials/our-2030-vision-for-a-green-britain>

Integrated Net Cost of Energy (INCOE)

Introduced in 2025, after rigorous testing by the Department of Energy and Climate Change and scrutiny in parliament, the new Integrated Net Cost of Electricity (INCOE) measure revolutionised the way in which Britain understands the cost, and benefit, of its energy choices to our economy and society. It wasn't popular with the oil, gas and coal industries because it revealed the true cost of burning fossil fuels. But fortunately the government stuck with it. The need to develop new ways of measuring the overall costs and benefits of different energy choices was recognised early in the 2000s as a necessary antidote to the sort of short term thinking which argued that we should just burn dirty coal for our power because it was 'cheap'. The first step was the launch of the European carbon market in 2005 which tried to make dirty sources of energy pay for their pollution. But once people noticed that the price of energy didn't include the cost of its pollution, companies, academics and civil servants began to think about what else wasn't being included. As more research was done, people began to realise that a whole raft of costs were not being considered, making it impossible to make the right decisions on how Britain should be powering itself. People pointed out that Britain was exposed to political threats to its oil and gas supply, but the cost of insuring against this risk wasn't included in their price. Britain was paying for the need to back-up renewables for when the wind isn't blowing or the sun isn't shining, but this wasn't included in their price. Britain was paying to dispose of nuclear waste, but this wasn't included in the price of nuclear power. Even though we had the European carbon market, it wasn't working properly and the real impact of carbon on our environment wasn't included in anything's price. But just as important as the costs which were not being paid for, the benefits of different energy types were not being accounted for either. Most importantly this included the massive economic opportunity for Britain of building out a renewable energy industry. When we looked at the costs and benefits of renewables we weren't measuring the new jobs and new businesses, the rejuvenation of the communities who would build parts for wind turbines and solar plants. We were looking at the picture with one eye closed. And when all of these costs and benefits were taken into account, it showed something remarkable. In 2025 when all of the impacts on the environment and people's health were taken into account for coal, and all the benefits of the jobs, new businesses and tax revenues were taken into account for the offshore wind industry, coal was shown overall to cost Britain the most, and offshore wind the least! After that Britain's energy choices were made while firmly focussed on the bigger picture.