ESB GT's response to Ofgem Call for Input: ***The Future of Distributed Flexibility***

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1. INTRODUCTION

This submission presents ESB Generation and Trading's ("ESB GT") response to the Ofgem Call For Input: ***The Future of Distributed Flexibility.***

ESB GT welcomes this opportunity to discuss this important topic. ESB's portfolio in Great Britain includes a combined-cycle gas turbine plant in the northwest, offshore wind farm interests in Scotland, and a growing onshore wind presence. A central feature of ESB's business is to deliver benefits to consumers by investing in the most efficient renewable assets, particularly offshore and onshore wind at locations where the wind resource is highest. Naturally, it is important for the rules to facilitate investments at locations where the energy yield is economically viable for these renewable assets.

By way of an introduction, ESB is Ireland's foremost energy company, with around 7,000 employees. Established in 1927 by the Irish Government, and remaining 95% state owned, ESB created the first fully integrated electricity system in the world. ESB owns the transmission and distribution systems in Ireland and Northern Ireland. ESB have been present in Great Britain since market liberalisation and for 25 years has powered homes and businesses across the country, investing around £2 billion. ESB was one of the first IPPs in the UK with our investment in Corby Power Station (350 MW) in the early 1990's.

ESB is supporting Britain's transition to a low carbon future by investing in flexible and renewable generation assets, including combined-cycle gas turbine, wind, and biomass technologies. ESB opened Carrington Power Station (880 MW) in 2016, one of the most flexible and efficient plants in the market on the site of an old coal plant near Manchester. This was the first large-scale gas-fired station to come on stream in Great Britain since 2013. Carrington is owned by ESB's 100% subsidiary Carrington Power Limited. ESB also owns 125 MW of onshore wind generation capacity (with over 1,400 MW in the development pipeline across the UK), a 7 MW battery storage project in Lincolnshire, and recently invested in the 353 MW Galloper offshore wind project.

2. KEY POINTS

i) **There is no doubt that the energy system of the future, which will be required to achieve the UK's net zero objectives, will only function safely and securely with effective flexibility provision.** The move away from a system with a relatively small number of inputs and offtakes to one with millions of connected parties will require smart, digital operation. This can only be achieved utilising both *Consumer Energy Resources (CER)* and *Distributed Energy Resources (DER)*

ii) **Distributed Energy Resources (DER) will continue to play a critical role in ensuring security of supply and system resilience**. We agree that Consumer Energy Resources (CER), such as electric vehicles, heat pumps etc have a key role to play in maintaining a resilient energy system, but even with the contribution from CER, there is no doubt that DER will continue to play a critical role.

iii) **We accept that there needs to be a common vision for distributed flexibility and that Ofgem is best placed to monitor and oversee the development and implementation of this vision**. However, we believe that industry participants must have a central role in developing *"accessible, coordinated and trusted markets for distributed flexibility"*

iv) **We believe that a common digital energy infrastructure should offer a transparent, true value, and competitive platform for flexibility markets.** It should also stimulate and promote a wide range of new innovative companies and solutions that can develop exciting customer propositions.

v) **After considering all four archetypes, we believe that *Archetype 3: Medium* is the most appropriate solution for a common energy digital infrastructure.** Archetype 3 offers the best combination of functionality, information provision, operational efficiency and transparency. It also offers the potential for innovation around standards and protocols, and common infrastructure. There is a potential downside that it is quite a complex solution which could be quite costly and take time to deliver, though not as much as Archetype 4.

vi) We would prefer to see an open, transparent approach to institutional delivery models for a common digital energy infrastructure. We would prefer an Open Tender with a licensed governance regime as competitive tendering should achieve the best value for money.

3. DETAILED RESPONSES

Section 1 - The imperative, potential, and challenges of flexibility

Q1. What do you think distributed flexibility could contribute to the energy system?

There is no doubt that the energy system of the future, which will be required to achieve the UK's net zero objectives, will only function safely and securely with effective flexibility provision. The move away from a system with a relatively small number of inputs and offtakes to one with millions of connected parties will require smart, digital operation. This can only be achieved utilising both *Consumer Energy Resources (CER)* and *Distributed Energy Resources (DER)*.

We agree that CER, such as electric vehicles, heat pumps etc have a key role to play in maintaining a resilient energy system. However, as the Call for Input (CfI) acknowledges, provision of flexibility services is not the primary function of these devices and so clear incentives must be put in place to ensure timely and reliable delivery. Even with the contribution from CER, there is no doubt that DER will continue to play a critical role in ensuring security of supply and system resilience. The electricity network will need to utilise a mixture of renewable energy sources such as solar, wind, batteries, and other forms of storage, to maximise efficiencies of the electricity network as a whole. Therefore, any flexibility platforms that are developed, must recognise the key role of DER.

We agree that, when there will be over 20 million CER in the system, their collective performance will be extremely significant, and that CER flexibility has the capability to dramatically increase short-term market liquidity. However, CER must be aggregated to provide flexibility with meaningful impact. We agree that this aggregation necessitates that operation will be *"both data rich and probabilistic in nature"*. Conversely, as DER are larger and offer direct control, they are likely to be more able to enter markets and provide value in the near term, either because they were built as commercial energy assets, or because they have greater price elasticity than CER.

The *BEIS 2021 Smart Systems and Flexibility Plan*[1] proposes that 30GW of flexible capacity will be required by 2030 to meet current net zero targets and suggests that some £10 billion per annum may be saved by 2050 by the introduction of flexible technologies. It is expected that

[1] BEIS 2021 Smart Systems and Flexibility Plan

pumped storage hydro and green hydrogen will deliver a sizable percentage of the required flexibility capacity.

The integration of intermittent renewable energy generation into our electricity system can be achieved using flexibility and storage technology deployed at two levels: site level and grid level. Site level flexibility and storage technology enables individual renewable energy projects to become dispatchable. The technology needed to achieve this can vary and is site specific but can include batteries or electrolysers producing green hydrogen. Grid level flexibility and storage technology enables the balancing of the grid over periods of four hours to ten days.

Q2. Will a focus on CER flexibility also help enable other forms of flexibility, especially distributed flexibility

It is not clear to ESB that a focus on CER flexibility will automatically facilitate other forms of flexibility, especially DER. As already mentioned in our answer to Q1 above, we believe that DER will continue to provide the critical role in providing flexibility to ensure a secure and resilient energy system. We support the case for a common digital energy infrastructure able to *"unlock flexibility in multiple markets by facilitating information provision, market access and coordination, and effective trust and governance structures".* However, the key role of DER must be recognised.

Section 2 - An approach pivot: The case for change

Q3. Is there a 'case for change' and a need for a common vision for distributed flexibility?

We agree that there is "*a case for change"* as we do not think a consistent, low-friction environment for decentralised flexibility will emerge either organically or in time. We agree that there are structural issues that we will prevent this; for instance, that each individual actor (buyer) is *"only incentivised to improve their respective monopsony"* and that they either do not have the functional and legal ability, legitimacy, or appetite to become the pre-eminent facilitator.

Given this, we accept that there needs to be a common vision for distributed flexibility and that Ofgem is best placed to monitor and oversee the development and implementation of this vision. However, industry participants must be able to play a significant role in this development. There is considerable frustration amongst industry participants at the slow progress of the *Open Networks Project* which has been in existence since 2017 and has not yet delivered workable

solutions to the provision of distributed flexibility. We would also like to see more detail on the role of the FSO/Regional Service Providers in helping to deliver the common vision.

Q4. What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility?

We believe that industry participants must have a central role in developing *"accessible, coordinated and trusted markets for distributed flexibility"*. This could be via industry groups such as Energy UK and/or direct participation on working groups to develop the enduring solution. Customer groups, technology providers and potential new entrants would also be included as would the FSO/Regional Service Providers. These working groups would analyse the three new archetypes that are described in the CFI plus any other potential options. These groups would build on the work done as part of the Open Networks Project and address challenges around market access and coordination; high transaction costs; barriers to market entry; the limited value of individual services; limited access to information, and a lack of coordination.

Co-ordinated interaction with other initiatives such as REMA will be key so that market developments are compatible, and that effort is not duplicated.

Q5. Will certainty of an end vision help accelerate enabling work and make it cohesive?

As already mentioned, there is frustration at the relatively slow progress of the ENA's Open Networks Project. We agree that the solution is currently knowledge rich, but implementation poor and that delivery of distributed flexibility mechanisms is being outstripped by the pace of CER deployment. The certainty of an end vision should help to accelerate enabling work and make it more cohesive. The integration of certain historical and current innovation-led digital outputs and products as part of a common digital energy infrastructure should help speed up delivery. However, effective programme management with well-defined outcomes will be critical to delivery. Once again, we would suggest a key role for industry participants and other stakeholders.

Q6. When should a common digital energy infrastructure be in place? And therefore, when should development begin?

There is significant change happening currently in the energy industry. REMA would potentially introduce a significant market re-resign which would incorporate flexibility service provision. It would seem appropriate that the common digital energy infrastructure is developed at the same

time as the REMA changes. This would potentially mean that a common digital energy infrastructure could be in place after 2026/27 depending on the complexity of the solution chosen and the development time necessary.

Section 3 - What that future could look like

Q7. What should a common digital energy infrastructure look like, and why? Please consider the archetypes or develop your own proposition.

We believe that a common digital energy infrastructure should offer a transparent, true value, and competitive platform for flexibility markets. It should also stimulate and promote a wide range of new innovative companies and solutions that can develop exciting customer propositions. The question is: how best to get there and what degree of complexity is desirable/needed?

In considering the four archetypes described in the CfI, we do not believe that ***Archetype 1: Business as usual (BAU***) is a viable option and hence it is being used as the counterfactual archetype, against which all others are compared. It will not deliver a co-ordinated and smart solution, instead Its assumed end-state, is one of multiple individual markets with piecemeal improvements to certain processes to accommodate distributed flexibility.

Archetype 2: ***Thin*** is based on the concept of a directory that would assist market buyers and sellers of distributed flexibility to understand the landscape of markets and assets available. It is only a minimal change from the counterfactual and only. requires a small piece of common digital energy infrastructure, the directory itself, and for all actors to agree and deploy standardised interfaces in their systems. **We do not believe that this archetype would provide the necessary functionality to deliver a system-wide distributed flexibility transformation**, as there is no common point of access to join markets, nor is there an established or governed co-ordination mechanism between markets. This effectively means that markets and participants cannot see market-based transactions, unless they take specific action to establish bilateral data sharing agreements.

Archetype 3: Medium - this archetype most closely resembles an *"exchange"*; a "*singular and scalable digital location where multiple markets are visible and coordinated under a known governance framework, yet continue to retain their own market designs, platforms, and systems"*. This would seem to offer a more robust solution than Archetype 2 and would preclude the need for separate bilateral arrangements. We agree that an exchange would be more efficient and

would make transactions easier, more co-ordinated and more transparent. It is clear that this archetype offers a number of advantages.

Archetype 4: ***Thick*** – this archetype is a central platform for the end-to-end delivery of distributed flexibility. The central platform encompasses all activities from exploration to settlement across all markets. Central processing allows full optimisation across all markets at all voltage levels, but it is unlikely to leave any service provision with existing systems. It is clear that this archetype confers a number of advantages, most notably that it offers co-optimisation across all markets and common access point/process for all aspects and also full central governance of all aspects and, full decision-making transparency. However, this is a very complex solution and potentially very costly with a long development period which might mean that it would not be ready in time to deliver the required transformation.

Q8. What is your view on the desirability and feasibility of the archetypes or your own alternative proposition?

On balance, after considering all four archetypes, we believe that Archetype 3: Medium offers the best combination of functionality, information provision, operational efficiency and transparency. It also offers the potential for innovation around standards and protocols, and common infrastructure. There is a potential downside that it is quite a complex solution which could be quite costly and take time to deliver, though not as much as Archetype 4. We believe that Archetype 3 is the most appropriate solution for a common energy digital infrastructure.

Section 4 - Delivery considerations

Q9. Should a common digital energy infrastructure be new-build, or should it build out from existing infrastructure?

Given the characteristics discussed above that a common digital energy infrastructure should ideally possess, it seems unlikely that this could easily be achieved by developing existing infrastructure. Ideally, this would be the case as it is likely that the costs and development time could be less than for a new-build solution. However, there are some potential advantages of developing a new solution such as this would allow a purpose-built design that reduces the risk of reliance on legacy technology. "*It also has the benefit of enabling the asset (and so potentially*

governing institution) to be independent from day one, and enables more optionality change the entity(s) tasked with delivery or operation in future based on a lower risk of legacy technology lock-in".

So, on balance, we have a preference for the new-build solution as long as the costs and development time are not prohibitive.

Q10.What are the important areas for consideration when designing institutional delivery models for a common digital energy infrastructure?

We would prefer to see an open, transparent approach to institutional delivery models for a common digital energy infrastructure. We would prefer an Open Tender with a licensed governance regime as competitive tendering should achieve the best value for money.

In terms of the role of the FSO, we are not yet clear on the accountability, functions and governance arrangements for the FSO. It is therefore difficult for us to say whether the FSO is best placed to deliver the common digital energy infrastructure as opposed to other candidates. How will the impartiality of the FSO be guaranteed? The current ESO has its own commercial interests: this would need to change when it transitions to the FSO role. We would like to see further information before we can give a definitive answer to this question.

Q11.What are the important areas for consideration when designing financial delivery models for a common digital energy infrastructure?

A key question that needs to be addressed is: who is paying for a common digital energy infrastructure and where is value? We agree that there is a greater good argument around having a common digital energy infrastructure with socialised costs, but any party creating excessive value will need to be closely monitored.

We see no particular issue with the use of private finance to developing and operating a common digital energy infrastructure, as long as appropriate safeguards are in place to protect consumer interests. We agree that the risk of perverse incentives needs to be considered when designing revenue models. Revenues could be capped at a certain level, based on a set number of trades – this would remove the perverse incentive to artificially increase churn or the slicing of contracts over consumer value.