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12 January 2017

Electricity Systems Team
BEIS,
3 Whitehall Place
London
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Energy Systems Integration Team
Ofgem
9 Millbank,
London
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Dear BEIS and Ofgem teams,

Response to call for evidence on a smart, flexible energy system

Introduction to GBSL

Grid Battery Storage Limited (GBSL) was formed by two highly respected senior executives to realise the potential of battery electricity storage. We are working to deliver electricity storage projects meeting commercial needs as they emerge, providing multiple services where possible to maximise project benefits and thereby reduce costs to provide each service. Our initial projects were targeted at National Grid Enhanced Frequency Response tenders but our present projects include cost-reducing use of storage in distribution networks and commercial applications of storage for industrial customers.

Our views in principle on a smart, flexible energy system

GBSL's senior management has worked across the spectrum of generation technologies, including nuclear, large transmission connected CCGTs, embedded reciprocating engines, solar, hydro and now storage.

The regulation for the GB electricity system and markets was established when the market was dominated by large centralised generators and the transmission and distribution networks were largely intended to transport this electricity to end customers. The system today has moved to significant embedded generation and the 2016 T-4 Capacity Auction has demonstrated the further shift to storage and demand-side response – while achieving security of supply at low cost.

We want to see open and transparent markets and where regulated charges must be applied, we firmly believe that these should reflect costs.

GB electricity regulation needs to be overhauled to ensure that the wider variety of participants can all participate fairly in line with the key principles of open and transparent markets backed by cost reflective regulated charges where required.

Our key messages on storage and regulation are remarkably straightforward:

1. The present double distribution system CDCM charging for storage connections (load and export, each of which should recover the network costs) is not fair and cost reflective: it must be reduced to a fair level;
2. In storage where energy is simply imported, stored and exported, levying of end user charges is completely inappropriate and should be removed;
3. Regulatory changes place a huge loading on market participants, particularly smaller ones, and produce market uncertainty. Therefore only changes which are absolutely essential should be implemented.

Our specific responses to the call for evidence questions are on the pages which follow. Please do not hesitate to contact me if there is any issue that you would like to discuss further.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'A.P. Blumfield', with a stylized flourish at the end.

Andrew Blumfield

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Questions 1-6: 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?

We agree with the set of barriers identified, but items 2 and 3 are substantially the most important: network charging and final consumption levies. Other than these, the GB electricity market in general enables storage to compete better than many other EU markets because of the long-standing principle of cost-reflective charging and half hourly pricing.

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?

GBSL does not believe that change is for connections is required for DNO connections – we are content with the existing information provision and contract arrangements. We have accepted four DNO offers and the only key question arising is whether a firm or non-firm connection is needed. This is an appropriate question for each project and can be agreed between project and DNO.

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?

We are in general agreement with the issues on storage and network charging but have the following specific comments:

- Storage should be treated as non-intermittent because its operation is driven by market prices or other service requirements (in the same way as a gas-fired generator for example) in a systematic way, rather than randomly or in a way that is related to resource availability (solar or wind).
- We agree of course that network charges should represent a cost reflective and fair recovery of network costs and with your comment that incurring both load and export charges leads to payments which are unfairly greater than those for other users. We have attached a calculation prepared for our EFR tender projects that shows the high level of charges for an example Scottish and Southern Electricity Networks SEPD site (10MW; application of CDCM basis confirmed in discussions with SSEN). In summary:
 - We used actual 2015 frequency data and a second-by-second model to calculate energy flows in each half hour;
 - The calculation attached combines these energy flows and the charges from the 2017/18 SEPD charging statement to calculate the total charges below for non-netted half-hourly imports and exports.

The total is a very substantial cost contribution that we do not believe is fair because CDCM recovers both import and export charges for a single connection.

SEPD CDCM charges 2017-18 (applicable to 11kV connection)							
	Unit rate 1 p/kWh (red/black)	Unit rate 2 p/kWh (amber/yellow)	Unit rate 3 p/kWh (green)	Fixed charge p/MPAN/day	Capacity charge p/kVA/day	Reactive power charge p/kVarh	Excess capacity charge p/kVA/day
HV HH Metered	6.572	0.210	0.044	101.65	5.03	0.168	5.03
HV Generation Non-Intermittent	-4.022	-0.191	-0.064	125.89		0.151	

Energy flows		
Net charge MWh (+=import) (-=export)	Charge MWh (DNO load)	Discharge MWh (DNO gen)
546	6,382	(5,981)

DNO charges for 11kV sites (CDCM calculation)						
Unit rate 1 (red)	Unit rate 2 (amber)	Unit rate 3 (green)	Fixed charge	Capacity charge	Total	Total £/kW
12,665.75	514.39	(656.89)	831	183,595	196,949	19.69

We do not see any significant benefit in flexible network charging for storage – projects need more rather than less certainty to obtain delivery. Where the network has a smart grid solution in place, the existing arrangements as used for generation, together with the reduction of double charging as above, should be sufficient.

There is no question on final consumption levies for storage in the call for evidence. GBSL's view is that it is essential that storage is not considered as an end-user – where energy is simply stored and exported, levying of end user charges is completely inappropriate.

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 agree that network operators can and should use storage to support their networks, where that is economic, but they should be required to access storage as a service from independent owners.

We do not believe that network operators should be allowed to own storage beyond the initial test projects already installed. The network cost deferral is only part of the total revenue stack for such projects and to access other revenues would require the network operators to participate in National Grid services and the energy market. This is not an appropriate activity for a regulated network utility in the existing competitive market.

The distribution network operators are inexperienced in procuring services of this type and the lack of previous market interest for DNO services may relate to procurement processes that are inappropriate; lack of understanding of the development process; lack of understanding of investor requirements and lack of outcome transparency in procurement. The success of National Grid's EFR procurement with 4 year contracts demonstrates that there is very substantial interest in the marketplace from storage developers for well-structured procurement.

5. Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage? Your views on how the capacity of a storage installation should be assessed for planning purposes?; and 6. Do you agree with any of the proposed definitions of storage?

The proposed approach seems appropriate, either definition is acceptable and GBSL has no specific view on capacity assessment. Our only concern is that we are one of the many participants in storage with limited resources, so our strong bias is to the minimum necessary regulatory change.

Questions 7-10: Aggregators

No comment: no relevant experience.

Questions 11-14: System value pricing

GBSL's view is that the existing GB market arrangements already fully value flexibility and all of the relevant revenues for 11kV and above connections, so the arrangements do not require revision.

Questions 15-19: Smart tariffs

GBSL projects involve only half hourly customers and markets, which do not require revision.

Questions: 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; 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 do not believe distribution charges to be acting as a barrier to flexibility and storage, other than double charging for imports and exports as highlighted under question 3. Our strong preference is for no other change because one is not required.

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.

Not problematic at all, other than double charging for imports and exports as highlighted under question 3.

Questions: 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?; 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?; 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.

In common with many developers and generators, we are not highly familiar with the CDCM and EDCM models used to determine distribution charges. All we can say is that the present charges are not a barrier to flexibility and storage and that we do not support any change (other than double charging for imports and exports under CDCM as highlighted under question 3) unless it is essential. Any change adds uncertainty and costs for all market participants and government.

If it is essential to make a change to regulation, the change should be rigorously constrained to the key objectives of openness, transparency and cost reflection. It is our view that the last re-opening of transmission charges consequent on project TransmiT generated enormous regulatory work and cost but gave a result that did not properly meet those key objectives. This experience should be at the front of the minds of BEIS and Ofgem in making any decision to substantially re-open distribution charging.

Questions 25-32: Other Government policies

No comment –our projects do not suggest changes are required to other government policies.

Questions 33-35: Ultra Low emission vehicles

No comment: no relevant experience.

Questions 36-39: Consumer engagement with Demand Side Response

No comment: no relevant experience.

Questions 40-42: Consumer protection and cyber security

No comment: no relevant experience.

Questions 43-48: Roles and responsibilities

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

In our view Figure 1 is comprehensive. The emerging system requirements define a good framework but importantly, in line with changing only what is essential, there should be no need to take action in many parts of the framework.

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 – these are questions for DNOs

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?; b) How could industry best carry these activities forward? Do you agree the further progress we describe is both necessary and possible over

the coming year?; c) Are there any legal or regulatory barriers (e.g. including appropriate incentives), to the immediate actions we identify as necessary? If so, please state and prioritise them.

We fully support more active network management by DNOs, the creation of the DSO role and the significant increase in DSO-SO-TSO engagement.

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?; 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?

The GB electricity market is already very complex and including yet greater complexity (such as locational market signals) is quite unlikely to have the desired economic effect, because it generates uncertainty and greater difficulties of understanding for participants.

We do not have a view on which of the future models is appropriate, except that as before our overriding concern is that the changes should only be made if they are essential to openness, transparency and cost reflection.

Our one key concern on roles is that the role of the SO and DSO needs to be well separated from the TO and DNO roles to avoid SO/DSO decisions being influenced by the economic impact of those decisions on the TO/DNO. We cannot see how this can be fully implemented without SO and DSO being separately owned from the networks: we believe that this separation will be essential to the creation of a level playing field.

Questions: 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: no relevant experience.

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

No comment: no relevant experience.