Workgroup Consultation Response Proforma

GC0163: GB Grid Forming (GBGF) - Removal of Virtual Impedance restriction

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses to grid.code@nationalgrideso.com by **5pm** on **12 February 2024**. Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

If you have any queries on the content of this consultation, please contact Jonathan Whitaker Jonathan.whitaker@nationalgrideso.com or grid.code@nationalgrideso.com

Respondent details	Please enter your details	
Respondent name:	Antony Johnson	
Company name:	National Grid ESO	
Email address:	Antony.Johnson@nationalgrideso.com	
Phone number:	07966 734856	
Which best describes your organisation?	☐Consumer body ☐Demand ☐Distribution Network Operator ☐Generator ☐Industry body ☐Interconnector	☐Storage ☐Supplier ☒System Operator ☐Transmission Owner ☐Virtual Lead Party ☐Other

I wish my response to be:
(Please mark the relevant box) ☒Non-Confidential ☐Confidential

Note: A confidential response will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

For reference the Applicable Grid Code Objectives are:

a) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity*
b) *Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);*

c) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;*
d) *To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and*
e) *To promote efficiency in the implementation and administration of the Grid Code arrangements*

Please express your views in the right-hand side of the table below, including your rationale.

Standard Workgroup Consultation questions		
1	Do you believe that the Original Proposal better facilitates the Applicable Objectives?	Mark the Objectives which you believe the Original solution better facilitates: Original ☒A ☒B ☒C ☐D ☐E Yes – we support this modification. By removing the obligation to have a real impedance between the Internal Voltage Source of a Grid Forming Converter and the Grid Entry Point or User System Entry Point (if Embedded) we believe this provides greater flexibility and cost savings to developers and manufacturers. In this regard we believe this modification will provide great efficiency which will deliver cost savings for end consumers, it will improve competition in providing flexibility for developers and it will help facilitate the volume of Grid Forming technology across GB which is an industry pre-requisite for promoting net zero. We believe this modification facilitates Grid Code objectives A, B and C.
2	Do you support the proposed implementation approach?	☒Yes ☐No Yes – We support the implementation approach.
3	Do you have any other comments?	No
4	Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?	☐Yes ☒No Click or tap here to enter text.

Specific Workgroup Consultation questions		
5		☐Yes

	Do you have any concerns with the proposal to remove the requirement mandating the use of a real impedance in a GB Grid Forming Converter? If so, please state why you believe this to be the case.	☒No
		No – Following publication of the GB Grid Forming Best Practice Guide in April 2023, it was agreed, that with the necessary compliance processes in place, the requirement to have a real impedance between the Internal Voltage Source of a Grid Forming Converter and the Connection Point could be relaxed. This permits developers to provide this impedance virtually (i.e., through software), through the use of real physical components or a combination of the two. We therefore support this modification and believe it will provide greater flexibility and cost savings to the industry at large.
6	Does the change impact your business?	☒Yes ☐No
		Potentially yes as it would mean more Grid Forming Converter based plants are likely to come forward which will reduce System Operating costs and accelerate the path to Net Zero.
7	Do you have experience with virtual impedance vs real impedance control?	☐Yes ☒No
		No other than from the findings of the GB Best Practice Group.
8	Do you think the title is a fair reflection of the modification?	☒Yes ☐No
		Yes though it could be made more explicit. We are generally happy with the title though we do agree it could be improved. One suggestion could be *"Clarification of the impedance between the Internal Voltage Source of a GB Grid Forming Converter (GBGF-I) and the Total System)"*