

## Annex 5 – First Code Administrator Consultation Responses



**InterGen (UK) Ltd**  
2<sup>nd</sup> Floor  
81 George Street  
Edinburgh  
EH2 3ES  
United Kingdom

**GC0096 – Energy Storage**  
Code Administrator Consultation  
[grid.code@nationalgrideso.com](mailto:grid.code@nationalgrideso.com)

10 June 2019

Dear Code Administrator,

**GC0096 – Energy Storage - Consultation**

InterGen is one of the UK's largest independent generators, with a track record of developing, constructing and operating large scale power generation projects. We have been active in the market since the 1990s.

In the GB market, we operate a portfolio of three flexible gas-fired power stations totalling 2,490MW; an investment of some £2.1bn. These are located at Rocksavage (Cheshire), Spalding (Lincolnshire) and Coryton (Essex). Together they represent almost 2.5% of GB generating capacity. Additionally, in the December 2016 T-4 Capacity Market (CM) auction InterGen won a fifteen-year agreement to construct a 300MW OCGT at our Spalding site which is expected to commence operations later this summer.

InterGen is owned by major international investors looking to continue to invest in major infrastructure projects in the UK including China Huaneng – one of the world's largest power generators with around 170GW of installed capacity. As part of these plans we are seeking to develop grid scale energy storage projects at two of our sites, with planning consent already secured at Spalding for a 175MW project. We see system benefits to operating storage alongside conventional gas as a “hybrid” facility and appreciate the opportunity to participate in consultations such as this as we are keen to ensure that energy storage projects and such hybrid benefits are afforded a level playing field in the market. Given this, we fully support the intent and direction of GC0096 – in particular as we believe energy storage will in the future play a key role in delivering value for money to consumers and in lowering carbon emissions.

Please do not hesitate to get in touch with me should you have any questions regarding any of the points raised in this response, or if you wish to discuss our energy storage plans in more detail.

Yours sincerely,

Morris Van Looy  
**Head of Growth and Strategy**  
mvanlooy@intergen.com  
Mobile: + 44 (0) 7771 813 830

## GC0096 Code Administrator Consultation Response Proforma

### GC0096 – Energy Storage

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

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Any queries on the content of the consultation should be addressed to Rashpal Gata-Aura at [Rashpal.gataaura@nationalgrideso.com](mailto:Rashpal.gataaura@nationalgrideso.com)

These responses will be included within the Draft Grid Code Modification Report to the Grid Code Review Panel and within the Final Grid Code Modification Report to the Authority.

<b>Respondent:</b>	<i>Morris Van Looy, Head of Growth and Strategy mvanlooy@intergen.com</i>
<b>Company Name:</b>	<i>InterGen (UK) Ltd</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale.  (Please include any issues, suggestions or queries)</b>	See Q3 below

### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	Yes. GC0096 removes some uncertainties, thereby encouraging a greater range of participants and more competition in provision of services to aid system operation.

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<b>Respondent:</b>	Paul Graham, paul.graham@sembcorp.com
<b>Company Name:</b>	UK Power Reserve Limited
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<p>By explicitly defining Storage within the Grid Code this modification, and associated Consultation, assists in facilitating effective competition in the generation of electricity, by enabling the deployment of additional balancing assets alongside traditional generation only assets.</p> <p>Storage assets will also assist in increasing network security at both transmission and distribution system levels.</p>

### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	Yes. Please see statement above.

Q	Question	Response
2	<b>Do you support the proposed implementation approach?</b>	Yes, we support the proposed implementation approach – particularly given that it has come as the result of an extended period of consultation and review.
3	<b>Do you have any other comments in relation to GC0096?</b>	It is disappointing that the original 'fast track' approach was significantly delayed. The changing of personnel, as well as lack of resource within NG TSO would appear to be the major factors in this.

Q	Question	Response
2	<b>Do you support the proposed implementation approach?</b>	Yes. Assuming an Authority decision in summer 2019, the proposed implementation approach provides a clearer background against which InterGen can plan.
3	<b>Do you have any other comments in relation to GC0096?</b>	<p>Further work on this subject will no doubt be required. Technical detail will need to be defined, especially in proving compliance, and this may be a difficult process particularly for some forms of “hybrid” installations (e.g. energy storage alongside thermal stations).</p> <p>Further, the status of electricity storage will have to be addressed at European level at some point, and this may require the issues covered in GC0096 to be revisited.</p>

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<b>Respondent:</b>	<i>Isaac Gutierrez</i> <i>Lead Electrical Engineer</i> <i>Telephone number work: 01416143104</i> <i>Mobile: 07761693652</i> <i>Email: igutierrez2@scottishpower.com</i>
<b>Company Name:</b>	<i>Scottishpower Renewable Ltd (UK)</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale.</b> <b>(Please include any issues, suggestions or queries)</b>	<i>For reference, the Grid Code Applicable Standard objectives are:</i> <i>(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</i> <b>Impact of the consultation on this objective is positive</b>  <i>(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);</i> <b>Impact of the consultation on this objective is</b>

	<p style="color: red;">positive</p> <p>(c) <i>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; Impact of the consultation on this objective is positive</i></p> <p>(d) <i>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 Impact of the consultation on this objective is positive</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements Impact of the consultation on this objective is positive</i></p>
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### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	Yes. GC0096 clarifies new and co-located storage systems connection requirements in line with the latest version of the UK Grid Code. There should not be any more ambiguous treatment (like use to be in the past) to energy storage systems grid connection
2	<b>Do you support the proposed implementation approach?</b>	Yes

Q	Question	Response
3	<b>Do you have any other comments in relation to GC0096?</b>	No

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<b>Respondent:</b>	<i>Andy Vaudin</i> <i>andrew.vaudin@edfenergy.com</i>
<b>Company Name:</b>	<i>EDF Energy</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<p><i>For reference, the Grid Code Applicable Standard objectives are:</i></p> <ul style="list-style-type: none"> <li><i>(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</i></li> <li><i>(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);</i></li> <li><i>(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</i></li> </ul>

	<p><i>transmission system operator area taken as a whole;</i></p> <p>(d) <i>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</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements</i></p>
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### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	<p>Yes.</p> <p>Specifically objectives (a), (b) and (c):</p> <ul style="list-style-type: none"> <li>• The code amendments will provide consistency for developers and manufacturers in the provision of new plant.</li> <li>• The code amendments will help to ensure that new storage plant can contribute to system operability, security and efficiency.</li> </ul>
2	<b>Do you support the proposed implementation approach?</b>	<p>Yes, we agree that new Energy Storage plant should meet applicable sections of the Grid Code which are consistent with the existing generator requirements and that the modified definitions and technical requirements for Storage will incorporate the European Network Code Requirements.</p>
3	<b>Do you have any other comments in relation to GC0096?</b>	<p>It is important for system security and for effective competition that equivalent Distribution Code changes for Energy Storage follow on from this GC0096.</p>

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<b>Respondent:</b>	<i>Nicholas Rubin – 02073804007, <a href="mailto:nicholas.rubin@elexon.co.uk">nicholas.rubin@elexon.co.uk</a></i>
<b>Company Name:</b>	<i>ELEXON Ltd</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<i>For reference, the Grid Code Applicable Standard 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</i>

	<p><i>transmission system operator area taken as a whole;</i></p> <p>(d) <i>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</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements</i></p>
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**Code Administrator Consultation questions**

Q	Question	Response
1	<p><b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b></p>	<p>As recognised in Ofgem and BEIS' Smart Systems and Flexibility Plan, electricity storage operators raised concerns that they believe the regulatory and industry arrangements should more clearly explain how they apply to electricity storage.</p> <p>In light of these concerns and growing numbers connecting electricity storage facilities to the distribution and transmission systems, we believe that GC0096 will provide clarity to market participants about how the Grid Code's requirements apply to electricity storage facilities.</p> <p>In general the proposal seeks to treat electricity storage facilities like other generators. This approach is aligned with Ofgem's treatment of storage as a form of generation, which it has proposed to make clear by consulting on changes to the standard conditions of the generation licence. To achieve this outcome, GC0096 proposes to extend existing Grid Code provisions to electricity storage by expanding existing definitions to include electricity storage. This is instead of creating distinct and different arrangements for storage facilities.</p> <p>Whilst in general the proposal seeks to treat storage like generation, the nature of operating electricity storage means it can operate like other demand facilities, e.g. HVDC. To ensure consistency between storage and other demand facilities, GC0096 seeks to ensure that certain requirements that apply to demand facilities also apply to storage facilities depending on its mode of operation.</p> <p>We believe the effort to treat storage similarly to comparable technologies depending on its mode of operation should help to achieve a level playing field, which provides consistency and certainty in treatment. In principle this should avoid unintended consequences and undue discrimination.</p> <p>For these reasons we believe that the solution ought to support the achievement of Objectives (a) and (b).</p>

Q	Question	Response
2	<b>Do you support the proposed implementation approach?</b>	We recognise the proposer's and workgroup's efforts to design a pragmatic approach to implementation that addresses respondent's concerns about how changes may affect the projects that are in development.

Q	Question	Response
3	<p><b>Do you have any other comments in relation to GC0096?</b></p>	<p>Currently the Grid Code defines Pumped Storage Plant as ‘The Dinorwig, Ffestiniog, Cruachan and Foyers Power Stations.’ The BSC’s definition of Pumped Storage Plant ‘has the meaning given to that term in the Grid Code’.</p> <p>The meaning of Pumped Storage Plant is important because BSC Section Q6.1.18 requires that the NETSO sends to the BMRA the Total Instantaneous Out-Turn Generation for a variety of fuel types, including for Pumped Storage Plant.</p> <p>GC0096 proposes that the Grid Code differentiates between Pumped Storage Plant and Existing Pumped Storage Plant. This is because certain existing Pumped Storage Plant (i.e. the Dinorwig, Ffestiniog, Cruachan and Foyers Power Stations) are subject to specific, existing Grid Code requirements and should be treated differently to ‘future’ Pumped Storage Plant.</p> <p>The proposed change to the Grid Code meaning of Pumped Storage Plant will exclude Existing Pumped Storage Plant. This means that the BSC definition of Pumped Storage Plant will consequently no longer cover the Dinorwig, Ffestiniog, Cruachan and Foyers Power Stations, and so the NETSO will no longer be required to report out-turn generation for these Power Stations as it currently does.</p> <p>ELEXON raised this consequence as part of the later stages of the Workgroup’s consideration of GC0096. The NETSO representative said they would raise a BSC Modification to ensure the BSC meaning of Pumped Storage Plant includes the Grid Code terms Pumped Storage Plant and Existing Pumped Storage Plant. To date no further action has been taken to discuss or raise the necessary BSC Modification. We encourage NETSO to discuss with us how best to raise a BSC Modification in a timely manner.</p>

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<b>Respondent:</b>	<i>Joe Duddy</i>
<b>Company Name:</b>	<i>RES Ltd.</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<p><i>For reference, the Grid Code Applicable Standard objectives are:</i></p> <ul style="list-style-type: none"><li><i>(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</i></li><li><i>(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);</i></li><li><i>(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;</i></li></ul>

	<p>(d) <i>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</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements</i></p>
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### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	Yes, subject to the comments below. Clear and unambiguous requirements for energy storage will facilitate participation by electricity storage operators providing important services to the ESO and providing additional competition in the electricity market.
2	<b>Do you support the proposed implementation approach?</b>	Yes
3	<b>Do you have any other comments in relation to GC0096?</b>	Minor typo in legal text Glossary and Definitions for <b>Existing Pumped Storage Unit</b> “A Generating Unit within an <b>Exisiting</b> Pumped Storage Plant.”
		Minor typo in legal text Glossary and Definitions for <b>Non-Synchronous Electricity Storage Module</b> “A Power Park Module comprising <b>soley</b> of one or more Non-Synchronous Electricity Storage Units.”
		Minor typo in legal text Glossary and Definitions for <b>Pumped Storage Generator</b> “A Generator which owns and/or operates any Pumped Storage Plant including an <b>Exisiting</b> Pumped Storage Plant.”

Q	Question	Response
		<p>Problematic construction in legal text Glossary and Definitions for <b>Regenerative Braking</b>. The energy extracted from regenerative braking of electric locomotives is not “stored and reused”, it is output to the System via the railway overhead lines. Similar will apply to other regenerative braking systems e.g. in elevators. I suggest the following amended definition “<i>A method of braking in which energy is extracted from the parts braked, which may be returned directly to the System and the purpose of the braking is motion control.</i>”</p> <p>The addition of the purpose is to avoid confusion with energy extraction from a non-synchronous flywheel where the purpose is provision of energy to the System.</p>
		<p>Problematic construction in legal text Glossary and Definitions for <b>Registered Capacity</b>. The definition for all other entities refers to the power from that entity to the System but in the case of an Electricity Storage Module it is the amount of power transferable in either direction. This is inconsistent without a clear reason.</p> <p>Also, there may be confusion where the normal full load Active Power in the importing direction differs from that exporting.</p> <p>I suggest that this is revised to ensure similar treatment to HVDC etc. which may also have different active power capabilities importing and exporting but only power transferred <u>from</u> the HVDC is considered in these definitions.</p>
		<p>The legal text Glossary and Definitions for <b>Registered Import Capability</b> defines this for HVDC etc. but not for Electricity Storage Units. Such inclusion could help avoid the confusion / inconsistency described above in my comments on Registered Capacity.</p>

Q	Question	Response
		Minor typo in legal text Glossary and Definitions for <b>Synchronous Electricity Storage Unit</b> “A <i>[insert space]</i> Synchronous Generating Unit which can supply or absorb electrical energy such that the frequency of the generated voltage, the rotor speed and the frequency of the equipment are in constant ratio and thus in synchronism with the network.”

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<b>Respondent:</b>	<i>Antony Johnson</i> <i>01926 655466 / Antony.Johnson@nationalgrideso.com</i>
<b>Company Name:</b>	<i>National Grid ESO</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<i>For reference, the Grid Code Applicable Standard objectives are:</i>  <i>(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</i>  <i>(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);</i>  <i>(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</i>

	<p><i>transmission system operator area taken as a whole;</i></p> <p>(d) <i>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</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements</i></p>
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### Code Administrator Consultation questions

Q	Question	Response
1	<b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b>	We believe that this modification proposal is positive against objectives a), b), c), and d) and is neutral against objective e). We therefore fully support this modification.
2	<b>Do you support the proposed implementation approach?</b>	<p>Yes – We support the implementation approach, based on the conditional criteria of the date upon which the contract for plant items is placed and the date upon which the equipment connects to the System. We believe this approach is consistent with that used for the European Connection Network Codes and minimises the risk of any unforeseen changes being applied to existing storage projects.</p> <p>However, as part of the drafting we note that in the definition of “EU Code User” the date 2019 should be changed to 2020 and 2018 should be changed to 2019. These are typos as the report specifies an offset based on Ofgem’s decision date in the implementation section of the Code Administrator Consultation.</p>

Q	Question	Response
3	<b>Do you have any other comments in relation to GC0096?</b>	No.

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<b>Respondent:</b>	<i>Garth Graham (garth.graham@sse.com)</i>
<b>Company Name:</b>	<i>SSE Generation Ltd.,</i>
<b>Please express your views regarding the Code Administrator Consultation, including rationale. (Please include any issues, suggestions or queries)</b>	<p><i>For reference, the Grid Code Applicable Standard objectives are:</i></p> <ul style="list-style-type: none"><li><i>(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity</i></li><li><i>(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);</i></li><li><i>(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;</i></li></ul>

	<p>(d) <i>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</i></p> <p>(e) <i>To promote efficiency in the implementation and administration of the Grid Code arrangements</i></p>
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### Code Administrator Consultation questions

Q	Question	Response
1	<p><b>Do you believe that GC0096 better facilitates the Applicable Grid Code objectives? Please include your reasoning.</b></p>	<p>In broad terms, we believe that including arrangements for Storage within the Grid Code will be better in terms of (a) by facilitating the development of the transmission system by allowing for that technology to know what is required of them when connecting.</p> <p>In terms of (b) it will also, as a result of including arrangements for Storage within the Grid Code, facilitate competition by allowing for more parties (in this case Storage) to offer services as they know the applicable technical requirements.</p> <p>That having been said, we are concerned that the proposed definition of “Electricity Storage Module” could appear to introduce undue discrimination in respect of ‘Non-Controllable Electricity Storage Equipment’ which, in our view, has not been justified. This difference in treatment between storage equipment in terms of needing (in the case of ‘controllable’) to comply with Grid Code obligations or not (in the case of ‘non-controllable’) will not appear to better facilitate the Applicable Objectives and needs to be addressed (in a future Modification? Or by sending back GC0096?) in order to ensure (i) there is no unintended discrimination in treatment and (ii) a level playing field is achieved for all providers of services from storage to network operators and the market place.</p>

<b>Q</b>	<b>Question</b>	<b>Response</b>
2	<b>Do you support the proposed implementation approach?</b>	We note and support the proposed implementation approach set out in Section 8.
3	<b>Do you have any other comments in relation to GC0096?</b>	Nothing further at this time.