

Workgroup Consultation			
<h1>GC0117:</h1> <h2>Improving transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Stations requirements</h2> <p>Overview: This modification will set out within the Grid Code a consistent connection process and enduring operational requirements across Great Britain.</p>	<h3>Modification process & timetable</h3> <ol style="list-style-type: none"> 1 Proposal Form 20 June 2018 2 Workgroup Consultation 07 July 2022 - 05 August 2022 3 Workgroup Report 21 September 2022 4 Code Administrator Consultation 14 October 2022 - 14 November 2022 5 Draft Final Modification Report 16 November 2022 6 Final Modification Report 30 November 2022 7 Implementation TBC 		
<p>Have 5 minutes? Read our Executive summary</p> <p>Have 20 minutes? Read the full Workgroup Consultation</p> <p>Have 30 minutes? Read the full Workgroup Consultation and Annexes.</p>			
<p>Status summary: The Workgroup are seeking your views on the work completed to date to form the final solution(s) to the issue raised.</p>			
<p>This modification is expected to have a: High impact on Embedded Generators, Distribution Network Operators and BM participants. Medium impact on transmission owners (including OFTOs and interconnectors), transmission system users, system operator and generators.</p>			
<p>Modification drivers: EU network code (as retained UK law, post Brexit) and GB Grid Code Compliance.</p>			
Governance route	This modification has been assessed by a Workgroup and Ofgem will make the decision on whether it should be implemented.		
Who can I talk to about the change?	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> Proposer: Garth Graham Garth.Graham@sse.com Phone: 01738 456000 </td> <td style="width: 50%; vertical-align: top;"> Code Administrator Chair: Ruth Roberts Ruth.Roberts@nationalgrideso.com Phone: 07972172169 </td> </tr> </table>	Proposer: Garth Graham Garth.Graham@sse.com Phone: 01738 456000	Code Administrator Chair: Ruth Roberts Ruth.Roberts@nationalgrideso.com Phone: 07972172169
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How do I respond?	Send your response proforma to grid.code@nationalgrideso.com by 5pm on 5 August 2022		

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Executive summary

The Grid Code does not currently apply consistency of access arrangements across GB and, as such, does not assist the creation of a pan-GB market for power stations and power generating module (PGM) technology, by increasing the commonality of power station requirements.

What is the solution and when will it come into effect?

Proposer's solution: A single, common, harmonised solution would apply across the whole of GB. Currently, there are up to three different applications of 'Large', 'Medium' and 'Small' Power Station depending simply on which of the three onshore TO licensed areas a generator connects. Further details on the definition of Large Medium and Small Power Stations can be found below by reference to the current version of the Grid Code. The proposer's solution for future Power Stations across GB is to define Large Power Stations as 10MW and above and Small Power Stations as less than 10MW. There would be no concept of Medium Power Stations. This proposal is non-retrospective and would be expected to apply from 2027 when the appropriate NGENO IT systems have been upgraded.

Implementation date: With respect to the changes to the Grid Code this would be 10 working days after The Authority's decision expected in 2023 and for compliance implementation this would be anytime between 10 days following implementation up to circa 2027 depending on The Authority's decision. Please see the summary table of NGENO's estimated delivery timeframes and associated costs in Annex 11, which takes account of the need to make changes to the NGENO IT systems (i.e., it will take time to apply the changes associated with some of the options).

Summary of all alternative solution(s) and implementation date(s):

WAGCM1

- Under this option, the Power Station thresholds of Small (less than 50MW), Medium (50 – <100MW) and Large (100MW or greater) that currently apply in England and Wales would also be applied in Scotland. The Large, Medium, and Small Power Station classification criteria would then be the same across GB. This could be implemented 10 working days following The Authority's decision.

Potential Alternative 1

- Large/Small Power Station Threshold changed to 100MW. This alternative has been raised by UKPN with implementation 10 working days following The Authority's decision.

Potential Alternative 2

- "LEEMPS Plus" – Medium Power Station Threshold changed to 10 – 100MW across GB. This has been raised by NGENO. This could be implemented 10 working days following The Authority's decision although the earliest possible compliance implementation is 2027, pending the outcome of the Balancing Transformation Strategic Review.

Potential Alternative 3

- Use the Regional Development Programme (RDP) for Power Stations of 10MW and above. This has been raised by NGENO. This could be implemented 10 working days following The Authority's decision although the earliest possible compliance implementation is 2027 pending the outcome of the NGENO Balancing Transformation Strategic review.

Potential Alternative 4

- Hybrid solution of Potential Alternative 2 & 3 but with a lower Small Power station threshold. This would require Small Power Stations greater than 1MW but less than 50MW to be part of an RDP and the LEEMPS Plus potential alternative to apply for Medium Power Stations between 50 – 100MW. This proposal has been raised by NGEN. This could be implemented 10 working days following the Authority's decision although the earliest possible compliance implementation is 2027, pending the outcome of the Balancing Transformation Strategic review.

The original solution and the alternatives were discussed at length during the course of the workgroups including the individual features of each approach and the implications on users. Information on these can be found in Annex 4.

What is the impact if this change is made?

The EU Network Codes/Guidelines implementation has resulted in a substantial programme of work within the GB industry. However, this modification does not have any impact on any on-going Ofgem led Significant Code Review. This modification facilitates the implementation of consistent technical standards across GB for the connection of new generation.

Interactions

The Grid Code was where the primary GB impact of the EU Connection Code modifications arose. Some consequential changes were made in the STC code, the Distribution Code and BSC and further changes may be required to the Distribution Code to implement the changes proposed in GC0117.

What is the issue?

The Grid Code does not currently apply a consistency of access arrangements across GB and, as such, does not assist the creation of a pan-GB market for power generating module (PGM) technology, by increasing the commonality of PGM requirements.

The additional requirements that currently apply to the same generator seeking to connect a 'Type' (e.g., Type C or Type D) of PGM within the single GB synchronous area are contrary to the aim and purpose of the European Network Codes¹ and will continue to lead to consequences that do not benefit the consumer or enhance the efficient and effective operation of the System. For example, the current baseline arrangements appear to lead to the consequence of deliberate under-sizing of generators to fit below an arbitrary MW threshold which varies depending on where in GB the plant is located, leading to a loss of economy of scale and particularly for renewable generation, a reduced ability to efficiently exploit the available energy resource, which ultimately is reflected in a higher cost of production and a greater cost to end consumers.

Also, it has anecdotally had other potentially perverse outcomes, such as of the dearth of small-scale thermal generation² being built in recent times in Scotland. This, in turn is leading to knock-on effects from lack of synchronous generation on the distribution system (e.g., lower fault level, system inertia).

Why change?

This Proposal is one of several which seeks to build on the relevant provisions of the EU Network Codes/ Guidelines. Although the UK has now left the EU, the majority of these requirements have been integrated into UK law through the application of Statutory Instruments.

The full set of EU Network Codes/ Guidelines are:

- *Regulation 2015/1222 – Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015*
- *Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016*
- *Regulation 2016/631 - Requirements for Generators (RfG) which entered into force 17 May 2016*
- *Regulation 2016/1388 - Demand Connection Code (DCC) which entered into force 7 September 2016*
- *Regulation 2016/1447 - High Voltage Direct Current (HVDC) which entered into force 28 September 2016*
- *Transmission System Operation Guideline (TSOG) - entry into force anticipated Summer 2017*
- *Emergency and Restoration (E&R) Guideline - entry into force anticipated Autumn 2017*

The Requirements for Generators (RfG) (EU) Network Code was drafted to facilitate greater connection of renewable generation; improve security of supply; and enhance competition to reduce costs for end consumers, across EU Member States.

¹ Which are, post Brexit, retained UK law, i.e., in their retained forms they are still applicable in GB.

² Or this more accurately described as a dearth of dispatchable flexible generation <100mw.

The code specifically sets out, in Recitals (3) and (27), the need for harmonised technical standards for the connection of new generation.

Although Grid Code modifications [GC0100](#), [GC0101](#) and [GC0102](#) implemented RfG into the GB Grid Code in 2018, which provided consistent technical treatment of Power Generating Modules across the whole of GB, the same approach was not adopted with respect to Power Stations. Whilst there are consistent technical requirements in the Grid Code and Distribution Code for Type A, Type B, Type C and Type D Power Generating Modules, it should be noted that this consistency does not apply in respect of Power Stations, which could comprise of any combination of a Type A, Type B, Type C and Type D Power Generating Module.

[Extracts from Ofgem letter of 15 May 2018 as referenced in footnotes]

Applying a consistency of access arrangements across GB “...*should help improve competition between manufacturers and make it cheaper to build PGM technology, thus reducing costs for consumers*”² as neither manufactures or generators will need to develop / specify different requirements for the same sized plant depending on whether they are connecting in Carlisle, Glasgow or Perth; a distance of about 150 miles (from Carlisle to Perth); or between Carlisle and Penzance, a distance of about 450 miles.

Furthermore, achieving “...*harmonised systems across the GB energy market should help make it easier and more efficient to operate the electricity system, by introducing a common, clear set of requirements which every new connection to the electricity network will need to meet*”.³

Implementation of this change “... *should also help facilitate competition in the generation of electricity by improving transparency and consistency of access arrangements across different electricity systems in [GB]. This removes a potential barrier to entry and allows market participants to trade between Member States more easily by ensuring that there is a level playing field in terms of connection requirements, thus improving competition in generation*”⁴ [emphasis added] as generation plant of the same size will be treated in a non-discriminatory manner across the whole of the GB system.

The “*European Regulations [such as the RfG] intend to deliver a harmonised set of rules for the operation of the electricity sector in Europe. The European Regulations aim to help ensure security of supply, facilitate the decarbonisation of the energy sector and create a competitive, pan-European market which benefits consumers*”.⁵”

This modification aims “*to introduce commonality and reduce complexity of arrangements across GB. This should improve the security and efficiency of the system as a whole and encourage further harmonisation thereby providing a clear and predictable framework from which to operate by. This, in turn, should encourage increased standardisation of equipment and specifications across the whole of [GB] and lead to improved economies of scale and increased interconnection driving improved security of supply. We therefore consider that [the] modification will promote the security and efficiency of the electricity generation, transmission and distribution systems.*”

Guidance from BEIS and Ofgem was to apply the new EU requirements within the existing GB regulatory frameworks. This would provide accessibility and familiarity to GB parties, as well as putting in place a robust governance route to apply the new requirements in a transparent and proportionate way.

Recital (27) of the RfG also sets out that:

“The regulatory authorities, Member States and system operators should ensure that, in the process of developing and approving the requirements for network connection, they are harmonised to the extent possible, in order to ensure full market integration.”
[emphasis added]

What is the solution?

Proposer’s solution

A single, common, and harmonised solution would apply across the whole of GB.

Currently, there are up to three different applications of ‘Large’, ‘Medium’ and ‘Small’ Power Station depending simply on to which of the three onshore TO systems a generator connects. Further details on what these can be found by reference to the current version of the Grid Code.

With the support of the industry, this modification would be used to develop a harmonised GB solution applying the EU Connection Codes requirements, before consulting with the wider industry and then submitting to Ofgem for a decision.

Given the above, there appears to be six broad options of what a single, common, harmonised solution could look like by changing the existing Small / (Medium) / Large Power Station thresholds. Prior to any detailed Workgroup discussion these options included:

1. Applying the present ‘North of Scotland’ threshold of 10 MW in the ‘South of Scotland’ and England & Wales;
2. Applying the present ‘South of Scotland’ level threshold of 30 MW in the ‘North of Scotland’ and England & Wales;
3. Applying the present England & Wales level threshold of 50 MW in the ‘South of Scotland’ and the ‘North of Scotland’; or
4. Applying the level based on the RfG Types (B?) C and D thresholds; or
5. Applying the level based on other figures than those associated with the four options above.
6. A further option variation could be centred around removing all references to ‘Small’, ‘Medium’ and ‘Large’.

For the avoidance of doubt, this proposal would only relate to ‘New’ generation connections and not to ‘Existing’ generation connections (based on the definitional approach of ‘New’ and ‘Existing’ contained in the RfG).

However, where, in accordance with Article 4(1) of the RfG, an *Existing* Type C or Type D Power Generating Module has been modified to such an extent that its connection agreement must be substantially revised, then it shall, at the same time of its connection agreement is so revised / amended (if applicable), be re-classified according to the proposed solution from its *Existing* ‘Small’, (‘Medium’) or ‘Large’ level to the *New* ‘Small’, (‘Medium’) or ‘Large’ level.

Thus, for example, if hypothetically Option 1 were implemented then an existing 40MW plant in England & Wales which would currently be classified as ‘Small’ would, if their plant were ‘substantially modified’ (as per Article 4(1) of the RfG, be reclassified as ‘Large’ once their connection agreement was revised / amended. Conversely, if, in

similar circumstances, Option 3 were adopted, then an equivalent 40MW plant in the North of Scotland would become 'Small' (from their current 'Large' classification).

Current, baseline, Grid Code definition of 'Small', 'Medium' and 'Large' can be found in Annex 5.

Workgroup considerations

The Workgroup convened 14 times to discuss the issue, detail the scope of the proposed defect, devise potential solutions, and assess the proposal in terms of the Applicable Code Objectives.

Refresher Presentation by the NGESO

Due to the time elapsed between the previous Workgroup meeting in July 2019, as a result of the need to progress other EU compliance work, the ESO delivered an updated presentation at the Workgroup meeting in May 2021 highlighting the background context of the modification and a summary of the need for harmonisation of access arrangements in Great Britain. There was discussion within the Workgroup around the defect and if it would be a solution applied either for (i) newly connected generators and those existing generators which had been subject to significant equipment modifications or retrospectively applied, (ii) be applied to (i) plus retrospectively to all existing generators as well (irrespective of whether or not they had substantially modified their plant or apparatus). The discussion also linked into RfG requirements and the impact of CUSC Clause 6.3.

The presentation also covered the types of connection agreements and differences in the agreements in each transmission region. The Workgroup noted the issue of retrospectivity and suggested that it may need to be raised as an alternative proposal. The ESO's presentation can be found in Annex 6.

A summary table of the current arrangements in GB for small, medium, and large power stations for England and Wales and two Scottish transmission areas can be found in Annex 4.

Reason for different definitions of Small medium and large in GB -Historical context

At vesting in 1990, a cornerstone of the privatised industry landscape was the treatment of Large, Medium and Small Power Stations which in turn defined the connection process, technical requirements and charging arrangements. With the introduction of the British Electricity Transmission and Trading Arrangements (BETTA) in 2005 this issue became even more focussed noting that i) the definitions of Large, Medium and Small Power Stations are different in Scotland to those in England and Wales and ii) the enduring obligations and connection process applicable to Large, Medium and Small Power Stations are very different. To put this into context, a Large Power Station in the North of Scotland would be one with a registered capacity of 10MW or above whereas a Large Power Station in England and Wales is one with a registered capacity of 100MW or above. Under the current arrangements a Large Power Station (even if Embedded) is required to sign the Connection and Use of System Code (CUSC), satisfy the applicable requirements of the Grid Code and be part of the wholesale market whereas an Embedded Small and Licence Exempt Embedded Medium Power Stations need only have a connection agreement with the Distribution Network Operator and satisfy the applicable requirements of the Distribution Code.

Although the EU Requirements for Generators (RfG) Connection Network Code introduced common technical requirements for generators, such that new Power Generating Modules have to meet the same technical requirements irrespective of its location, being purely based on size, this did not amend the existing distinctions in Grid Code. This modification will ensure consistent treatment of new Power Stations across GB, in particular with respect to the connection process and the enduring obligations they are required to meet with regard to data provision. This modification does not extend to charging.

Consideration of other options

Summary of 6 Proposer's Options initially considered (100MW, 50MW, 30MW & 10MW)-(A/B/C/D RfG Thresholds)

The Workgroup discussed the possible options suggested by the proposer that are available for harmonisation and their implications, such as the increased visibility of available generation to NGENSO. In order to assess the implications and impacts of each option, a questionnaire was prepared and circulated amongst the industry for completion. This questionnaire covered the following issues:

- Visibility of generation connected to the GB Distribution Systems.
- Associated operational metering costs;
- The connections process and types of applicable Agreements under CUSC (e.g. Bilateral Embedded Generation Agreements (BEGAs) or Bilateral Embedded Licence exemptible Large power station Agreement (BELLAs));
- Applicable costs from the connection application process to data submission and operation in real-time.
- Identification of other costs; and
- Single data submission to both the ESO and DNO's and avoidance of duplication.

In addition, and as part of the investigation following the 9 August 2019 event, Ofgem initiated a Request for Information (RFI) in order to gauge a view on the visibility of generation, in particular embedded generation. This is something that has been an important input to the Open Networks Work which is looking at the holistic and industry wide changes that may be required for GB to meet its net-zero targets.

Workgroup Title

The Workgroup agreed to change the title of the modification, replacing Power Generating Module PGM to Power stations, to bring the terminology up to date. This change was made to the title on the modification page on the ESO website.

Workgroup discussions on alternative Proposal from Northern Powergrid

The original proposal is for a single, harmonised, Small – Large Power Station categorisation threshold of 10MW that is applied across all of GB. This alternative proposal is to apply the present England & Wales categorisation thresholds, Small – Medium threshold of 50MW and Medium – Large threshold of 100MW, across all of GB. According to the Workgroup members who support this approach, the advantage of this proposal is that it would require no change to the arrangements in England and Wales and reduce the connection and enduring burden on new generators connecting in Scotland. According to the Workgroup members who do not support this approach a potential disadvantage of this proposal is that it may reduce the visibility and controllability for new generators connecting in Scotland, and that it would not address the NGENSO's concern that they require increased visibility and control of embedded

generation across all of GB. A Workgroup member who supported this alternative proposal recognised these concerns but was of the view that they are more appropriately addressed by the current Open Network initiatives.

Most of the Workgroup voted in support of an alternative to formally become WAGCM1. It was agreed that both the original proposal and this WAGCM1 alternative proposal presents the Authority with valuable options to choose from. Some Workgroup members felt that the current thresholds in England and Wales (50 MW and 100MW) do not recognise the changing requirements of the system, the increased investment in the transmission system in Scotland (such that it is more meshed and integrated than at the time the thresholds were initially set in Scotland) and the increasing number of smaller parties connecting to the network, in particular the trend of say a large 500MW thermal plant being decommissioned and, for example, 10 x 50MW embedded plants being commissioned which would fall outside the balancing mechanism. Some Workgroup members noted the following in relation to this WAGCM1 alternative:

- It is a straightforward change which seeks to maintain the existing arrangement in England & Wales and addresses the core of the defect of the Proposal by providing harmonised levels.
- It seeks to holistically align with the Open Network's suggestions in relation to the role of the DNOs and addresses the defect but could create potential issues with the need to change thresholds in Scotland.
- It addresses the defect better than the current thresholds, which perpetuates regional differences between Scotland and England and Wales but, makes the evolution of the co-ordination between NGENSO and DNOs more urgent.
- Whilst addressing the defect, the ESO representative noted this solution does not recognise the ESO's role of operating the Balancing Mechanism or indeed the ESO's role in managing System Frequency which are fundamental pre-requisites to managing a safe, secure and economic System through the need to instruct plant in the Balancing Mechanism and selecting Generation for appropriate Ancillary Services.

Further details on the WAGCM 1 can be found in Annex 7.

Questionnaire Feedback

To gauge an initial understanding of the issue and seek views from stakeholders, the ESO developed a questionnaire which sought to identify the impact and costs on Generators depending on the type of Power Station they owned and operated, the view being that from these results, the ESO could understand the potential costs arising from the impact of changing the Power Station thresholds. The questionnaire was issued to parties on the Grid Code circulation list and Distribution Code circulation list, the latter being achieved with the help of the ENA.

The ESO questionnaire received 8 responses, consisting of five generators, of which four had storage and 3 Distribution Network Operators. Of the Generators, three owned and operated Embedded Small Power Stations with no CUSC Contract and none owned or operates Embedded Large Power Stations.

- One Generator commented that they are developing sites in Scotland rated less than 100MW and would be applying for a BEGA due to the opportunity to be in the BM and for Transmission constraints to be paid via the BM, although noted that having no direct agreement with the ESO would streamline the process and make it cheaper to connect.

- One Generator commented that in some circumstances, e.g., a complex multi-party Statement of Works process, a bilateral connection with the ESO may provide a more reliable means of securing network access. In general, cheaper fewer complex connections via the distribution network, where available, are preferable. A BELLA offers no discernible advantages for a developer of a Medium Power Station with ambitions to be more involved in a more diverse range of revenue streams.
- One Generator commented that the Medium Power Station threshold should be removed with the Large Power Station threshold starting from 50MW followed by a further Generator commenting that the Large Power Station Threshold should start from 50MW.
- One Generator was aware of the application and modification fees associated with a Generator with a BELLA or BEGA agreement in comparison to the streamlined process available to Embedded Small Power Stations with no agreement under CUSC.
- One DNO commented that if the current thresholds were changed between a Small and Large Power Station, each connection that becomes Large will require the customer to apply for a BEGA within the current process for combined queue management. This involves National Grid ESO completing a transmission impact assessment to gain a queue position. For customers this will add an additional application cost required by National Grid ESO (costs are for NGET 1 which covers UKPN region taken from National Grid ESO website 09/2021): Entry Application Fee (<100MW) £26,450.

The questionnaire responses can be found in Annex 8.

Access and Forward-Looking Charges Significant Code Review (SCR)

A National Grid ESO Representative delivered a presentation on 22 October 2021 to provide an update to the Workgroup on Ofgem's Access and Forward-Looking Charges Significant Code Review (SCR). As a result of the presentation the Workgroup did not foresee any implications, from the SCR, that would curtail development of GC0117.

The presentation is available in Annex 9.

Proposed Solutions

The Workgroup agreed that the six options (the original and five alternatives) as outlined below should be taken forward whilst noting that there may be more potential alternatives raised at later stages. There were resource allocation concerns with the above 10MW threshold although the ESO Workgroup member suggested that it will yield a number of important benefits such as reduced balancing costs. It was noted that generation connected to OFTO networks are generally transmission connected as such they would be bound by the requirements of the CUSC in the same way as any other directly connected onshore Generator. These arrangements are not to be confused with embedded transmission where an Offshore Transmission Network with a nominal operating voltage of 132kV connects to a Distribution Network Operators System in England and Wales.

Original

The definition of medium power station is removed, and a large power station is one with a registered capacity of 10MW or more and a small power station is one with a registered capacity of less than 10MW.

Potential Alternative 1: Large/Small Power Station Threshold changed to 100MW (Raised by UKPN)

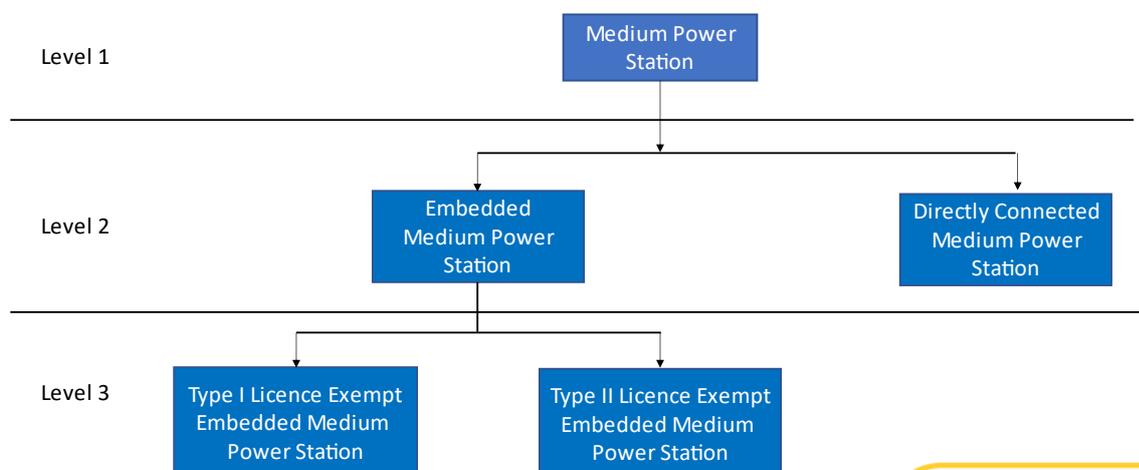
- The definition of medium power station is removed, and a large power station is one with a registered capacity of 100MW or more and a small power station is one with a registered capacity of less than 100MW.

Potential Alternative 2: “LEEMPS Plus” – Medium Power Station Threshold changed to 10 – 100MW across GB (raised by NGEN)

- Applies the existing LEEMPS arrangements and includes an additional balancing mechanism and operating code component to the arrangements so the solution becomes a hybrid of LEEMPS and BELLAs or BEGAs.
- A large power station is one with a registered capacity of 100MW or above, a medium power station is one with a registered capacity of less than 100MW but of 10MW or greater. A small power station is one with a registered capacity of less than 10MW. Owners and operators of medium power stations can either apply for transmission entry capacity (TEC) and have a BEGA or apply for licence exemption (LEEMPS Plus) where they would be treated as a LEEMPS but would be required to have a BM and operating code obligations which would be administered in conjunction with the DNO.
- A diagram showing how the existing LEEMPS and LEEMPS Plus solution would work is shown in Figure 1.0 below:

Figure 1.0

LEEMPS



Potential Alternative 3: Use Regional Development Programme (RDP) for power stations with a registered capacity of 10MW+ (raised by NGENSO)

- Apply the large/medium/small power station thresholds in England and Wales in Scotland (as per WAGCM1) but all embedded plant between 10 – 100MW would be required to participate in the BM and provide ancillary services through a Regional Development Programme (RDP). The RDP is essentially a ‘black box’ which would take the bilateral connection agreement Appendix G and DNO active network management processes into account to enable an Embedded Generator to be visible in the BM and also to be instructed by the ESO but without being subject to the full rigour of the BM in its own right. NGENSO together with DNOs are trialling several schemes using this approach.

Potential Alternative 4: Hybrid solution of Alternative 2 & 3 RDP solution greater than 1MW or 10MW but less than 50MW and LEEMPS Plus solution for between 50 – 100MW (raised by NGENSO)

- The same thresholds are used as per WAGCM1 but medium power stations (50 – 100MW) would meet the requirements of Alternative 2 and small power stations with a registered capacity of less than 50MW and greater than 1MW would have to be managed via a RDP and meet the requirements of Alternative 3. The initial thinking as presented to the Workgroup was that Small Power Stations between 1MW and less than 50MW would need to be included within an RDP, however following this initial view, further discussions were held with the ESO’s information technology team who advised that the data volumes, costs and delivery timescale meant that this option is more likely to limit the level required to 10 MW or greater (and not 1MW to 10MW) but less than 50MW.

Having considered all the alternatives the Workgroup then formally determined that the following should be taken forward as a Workgroup Alternative Grid Code Modification (known as ‘WAGCM1’).

WAGCM1 (raised by Northern Powergrid)

- Under this option, the power station thresholds of small (less than 50MW), medium (50 – <100MW) and large (100MW or greater) that currently apply in England and Wales would also be applied in Scotland. The large, medium and small power station classification criteria would then be the same across GB.

All forms relating to the WAGCM 1 and the 4 potential alternative proposals can be found in Annex 7.

A summary table of the original, WAGCM 1 and the 4 potential alternatives can be found in Annex 10.

A summary table of NGENSO estimated delivery timeframes and costs for these 4 potential alternative proposals (plus the Original and WAGCM1) can be found in Annex 11.

Workgroup consultation specific questions:

- Do you think that the solutions have been clearly explained?

- Do you think that the implications arising from the solutions for different stakeholders (e.g., Generators with different sizes of power stations) have been explained clearly enough?
- Of the solutions proposed (i.e., the original and alternatives) which solution do you favour and why?
- Do you think there are unintended consequences in defining Type 1 and Type 2 Licence Exempt Embedded Medium Power Stations (LEEMPS) separately? If so, please state your reasons.
- Do you think that there is merit in establishing a holistic net-zero view of the technical and commercial arrangements for connecting new and operating existing and new generators to meet the requirements of all stakeholders, then developing the necessary cross code changes to implement the new framework, rather than just change the definitions of power station sizes with this Grid Code modification?

ENA Open Networks Project update

A person from the team involved with the Open Networks Project delivered a presentation *on WS1B P6 Operational DER Visibility and Monitoring*³ to the Workgroup. This presentation document can be found in Annex 12.

It was clarified that the project covers the visibility of generators' real time, or close to real time data (to both DNOs and NGENSO) but was not intended to cover control. During the discussion, the ESO Workgroup member noted that under the Grid Code and bilateral agreements, operational metering signals should be refreshed every 1 second. For embedded generators connected to the DNOs' systems (with no CUSC contract), it was not clear that SCADA systems had the ability to transmit operational metering data at the same refresh rate and whether it could be regarded as real time data.

The Workgroup raised the following comments in relation to the above:

- DNOs should ideally have visibility of embedded generation of 1MW above, which should also be available to the ESO however, this facility only provides for visibility and not control or interactions with the balancing mechanism.
- The Open Networks workstream were tasked with reporting their findings on the visibility aspects of their project at the end of 2021.
- The Open Networks work included a CBA to determine the cost against the benefit of providing the enhanced embedded generation visibility for the Workgroup to review.
- There would be costs to customers where there is not sufficient control in place.
- It was noted that Open Networks is largely a piece of work developed between the DNOs and ESO under the auspices of Ofgem's direction and as such was not open to full representative stakeholder input and lacked the full open governance process as per the Grid Code.
- It was suggested that the Workgroup maintain communications with the Open Networks team as the solution develops particularly to avoid possible negative implications or duplication arising from this modification.
- Remote monitoring on all new sites is determined by the HV designs for each DNO, but for G99 compliance all new (or significantly modified existing) installations $\geq 1\text{MW}$ must have the ability to provide remote monitoring capability to the DNOs

³ [https://www.energynetworks.org/industry-hub/resource-library/on21-ws1b-p6-operational-der-visibility-and-monitoring-requirements-\(13-dec-2021\).pdf](https://www.energynetworks.org/industry-hub/resource-library/on21-ws1b-p6-operational-der-visibility-and-monitoring-requirements-(13-dec-2021).pdf)

Retrospectivity discussion

The Proposer clarified that the original proposal did not include retrospectivity. The Proposer further clarified that there are four ways retrospectivity could apply. These include (i) full retrospectivity, (ii) retrospectivity applied in respect of data alone, (iii) retrospectivity applied to RfG compliant plant or (iv) no retrospectivity. The ESO expressed favour of no retrospectivity for all potential solutions due to the potential complexities that may result and the additional costs to which existing users may be exposed. It was recognised by the Workgroup that retrospectivity is rarely applied as it can lead to the erosion of existing investment and lead to unintended consequences. One Workgroup member promoted the use of retrospectivity in relation to data provision alone (i.e., real time data, structural data, and scheduled data).

Current Thresholds and Obligations Retrospectivity Matrix

The ESO Workgroup member noted that retrospectivity may cause significant implications and will need to be considered thoroughly. Workgroup members did discuss that under certain solutions there may be discriminatory outcomes if there is no retrospectivity. It was envisaged that a two-tier level of requirement would effectively operate in parallel during a transition period, though this would evolve over time.

The Workgroup reviewed the Threshold Matrix developed by the ESO and agreed that an analysis of the medium threshold from WAGCM1 should be added to the matrix. This is available in Annex 13.

A table outlining the retrospective considerations is available in Annex 14. This initial thinking helped the Workgroup conclude that retrospective application shouldn't be proposed.

Workgroup consultation specific questions:

- Do you agree that the solutions should only apply to new generators⁴ connected to the system i.e., not applied retrospectively?
- Should the same approach on retrospectivity apply to all solutions?

Demand Capacity

Shortly before release of the Workgroup Consultation, the Workgroup noted that whilst the defect relates to equal treatment of Power Stations across GB, it was highlighted that there are also regional differences in relation to BM Units based on the size of their Demand Capacity as provided for in BC1.4.2(a)(1) and BC2.5.5. These MW thresholds are consistent with the regional differences in Power Station Registered Capacity between England and Wales and Scotland.

It was agreed amongst the Workgroup that these thresholds should not be changed as part of this modification but should be specially raised as a consultation question, and pending the outcome of the responses, consideration should be given to establishing a separate Grid Code modification if it is thought appropriate to do so.

Workgroup consultation specific questions:

⁴ Plus also including existing generators who substantially modify their plant or apparatus.

- Do you believe it is appropriate to change the definition of Demand Capacity and associated Grid Code definitions so that they align with the changes to Large, Medium and Small Power Stations? If so, do you think this should be addressed as part of this Grid Code modification or separately?
- Do you see any unintended consequences of this changing the definition of Demand Capacity? If so, what are your reasons for this?

Registered Capacity

During the Workgroup discussions, one member raised concerns over the definition of Registered Capacity in the Grid Code. In particular, it was noted that the treatment of Registered Capacity had not universally been applied in the same way across historic power stations. The issue raised particularly revolves around Power Stations which are located within industrial sites in which the Power Station feeds demand at that site to run an industrial process rather than simply feeding power into the total system. At a transmission level these sites are few in number whereas at a distribution level the issue is more common and therefore clarification was sought in respect of this issue.

The ESO considered this issue and suggested that an appropriate way forward would be to make it clear that Registered Capacity should be based on the Rated MW output of each Generating Unit within that Power Station, less any demand used for running the Generating Units alone and should not take into account any demand used for separate purposes such as an industrial process. It was agreed that as different Power Stations had been treated in different ways in the past the best solution would be to introduce a new clause into the Grid Code definition of Registered Capacity, making this point clear and that this definition would apply for new Power Stations only so as to avoid any re-work on existing Power Stations. The suggested legal text is covered in Annex 15. It is proposed that this legal text would be an integral part of the legal text required to implement each of the alternative solutions.

In terms of Licensing one Workgroup member noted that the requirements for Generation Licensing are defined in Statutory Instrument SI 2001 3270 which uses the term "Net Declared Capacity". The ESO having sought legal advice noted that the definition of Registered Capacity and Declared Net Capacity are not the same, though ultimately it is for the Generator to make the decision with regard to Licensing and meet their Grid Code and Distribution Code obligations. It was noted that the revised legal text relating to Registered Capacity should be applied to the original solution and Alternatives going forward.

The workgroup discussed Registered Capacity at their meeting in June 2022 and the corresponding legal text. A presentation covering the concept and thinking behind the treatment of Registered Capacity is included in Annex 16. The corresponding legal text relating to Registered Capacity is available in Annex 15 which has been updated slightly to ensure consistency with the Legal text developed in the Original, WAGM and other alternatives.

Workgroup consultation specific questions:

- Do you think the suggested change in the definition of Registered Capacity is appropriate and do you think this change should apply across the solutions proposed? If not please state your reasons.
- Can you identify any potential consequential impact from the GC0117 modification proposal(s) on current electricity market or balancing

arrangements as set out in other code frameworks (e.g. BSC, CUSC)? If yes, please identify these.

Draft legal text

The draft legal text for these solutions proposed in the modification can be found in Annex 3.

What is the impact of this change?

The EU Network Codes/Guidelines implementation has been undertaken as a substantial programme of work within the GB industry. However, this modification does not impact on any on-going SCR. This modification facilitates the implementation of consistent technical standards across the EU for the connection of new generation.

Proposer's assessment against Code Objectives

Grid Code Objectives

Impact of the modification on the Code objectives:	
Relevant Objective	Identified impact
(a) To permit the development, maintenance, and operation of an efficient, coordinated, and economical system for the transmission of electricity	Positive
(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);	Positive
(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;	Positive
(d) To efficiently discharge the obligations imposed upon the licensee by this licence and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	Positive
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	Positive

Standard Workgroup consultation question: Do you believe that GC0117 Original proposal better facilitates the Applicable Objectives?

When will this change take place?

Implementation date

With respect to the changes to the Grid Code this would be 10 working days after The Authority's decision expected in 2023 and for compliance implementation this would be anytime between 10 days following implementation up to circa 2027 depending on The Authority's decision.

Date decision required by

As soon as possible

Implementation approach

If the proposed solution is adopted there will be an impact on systems and processes as this modification seeks to change the threshold between Large and Small Power Stations to a value of 10MW.

If WAGCM1 or Alternative 1 is selected there will be minimal change to systems and processes assuming there is no retrospectivity. If Alternative 2, 3 or 4 are adopted, then there will be an impact on systems and processes similar to those resulting from the original proposal.

Standard Workgroup consultation question: Do you support the implementation approach?

Interactions

<input checked="" type="checkbox"/> CUSC	<input checked="" type="checkbox"/> BSC	<input checked="" type="checkbox"/> STC	<input checked="" type="checkbox"/> SQSS
<input type="checkbox"/> European Network Codes	<input type="checkbox"/> EBR Article 18 T&Cs ⁵	<input type="checkbox"/> Other modifications	<input checked="" type="checkbox"/> Other

At this stage specific impacts have not been identified, however this will be reviewed once the solution is developed.

How to respond

Standard Workgroup consultation questions

1. Do you believe that GC0117 Original proposal better facilitates the Applicable Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?
4. Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

⁵ If the modification has an impact on Article 18 T&Cs, it will need to follow the process set out in Article 18 of the Electricity Balancing Regulation (EBR – EU Regulation 2017/2195) – the main aspect of this is that the modification will need to be consulted on for 1 month in the Code Administrator Consultation phase. N.B. This will also satisfy the requirements of the NCER process.

Specific Workgroup consultation questions

5. Do you believe it is appropriate to change the definition of Demand Capacity and associated Grid Code definitions so that they align with the changes to Large, Medium and Small Power Stations? If so, do you think this should be addressed as part of this Grid Code modification or separately?
6. Do you see any unintended consequences of this changing the definition of Demand Capacity? If so, what are your reasons for this?
7. Do you think the suggested change in the definition of Registered Capacity is appropriate and do you think this change should apply across the original and Alternative solutions proposed? If not please state your reasons.
8. Of the solutions proposed (i.e., the Original and Alternatives) which solution do you favour and why?
9. Do you think there are unintended consequences in defining Type 1 and Type 2 Licence Exempt Embedded Medium Power Stations (LEEMPS) separately? If so, please state your reasons.
10. Do you think that there is merit in establishing a holistic net-zero view of the technical and commercial arrangements for connecting new and operating existing and new generators to meet the requirements of all stakeholders, then developing the necessary cross code changes to implement the new framework, rather than just change the definitions of power station sizes with this Grid Code modification?
11. Do you agree that the revised arrangements should apply to new generators connected to the system i.e., not applied retrospectively?
12. Should the same approach on retrospectivity apply to all options?
13. Can you identify any potential consequential impact from the GC0117 modification proposal(s) on current electricity market or balancing arrangements as set out in other code frameworks (e.g. BSC, CUSC)? If yes, please identify these.

The Workgroup is seeking the views of Grid Code Users and other interested parties in relation to the issues noted in this document and specifically in response to the questions above.

Please send your response to grid.code@nationalgrideso.com using the response proforma which can be found on the [GC0117 modification page](#).

In accordance with Governance Rules if you wish to raise a Workgroup Consultation Alternative Request, please fill in the form which you can find at the above link.

If you wish to submit a confidential response, mark the relevant box on your consultation proforma. Confidential responses will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel, Workgroup or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
BEGA	Bilateral Embedded Generation Agreement
BELLA	Bilateral Embedded Licence exemptible Large power station Agreement
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
ENA	Energy Networks Association
EBR	Electricity Balancing Guideline
LEEMPS	Licence Exempt Embedded Medium Power Station
RDP	Regional Development Programme
RfG	Request for Generators
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
TEC	Transmission Entry Capacity
T&Cs	Terms and Conditions

Annexes

Annex	Information
Annex 1	Original proposal form
Annex 2	Terms of Reference
Annex 3	Draft legal text
Annex 4	GC0117 Options
Annex 5	Current, baseline, Grid Code definition of 'Small', 'Medium' and 'Large'
Annex 6	NGESO Refresher presentation
Annex 7	WAGCM1 and alternative forms
Annex 8	Questionnaire responses
Annex 9	NGESO presentation on Ofgem's Access and Forward-Looking Charges Significant Code Review (SCR)
Annex 10	Summary Table of the Original, WAGCM1 and alternatives
Annex 11	NGESO estimated delivery timeframes and costs for the options
Annex 12	Open Networks Project presentation
Annex 13	Threshold Matrix
Annex 14	Retrospective considerations
Annex 15	Registered Capacity draft legal Text
Annex 16	Registered Capacity presentation