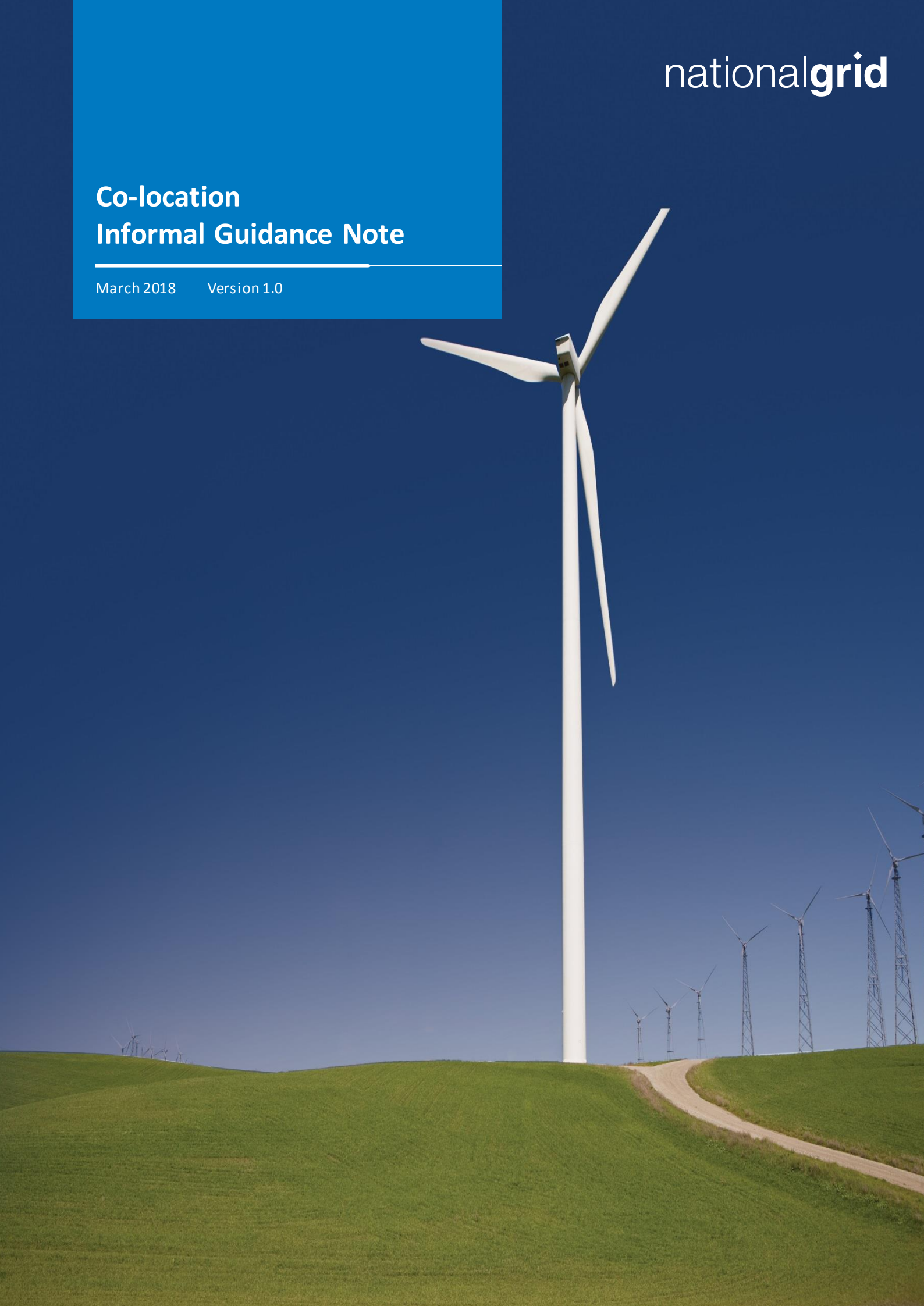


Co-location Informal Guidance Note

March 2018 Version 1.0



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DRAFT

1. Foreword

The energy system continues to change in order to deliver lower carbon, smarter and more decentralised energy. In this environment the potential for electricity storage to function as a key enabler of flexibility and to play an increasing role in helping to manage supply and demand has been identified as a key component of a future flexible energy system.

To date there has been observable growth in electricity storage and acceleration in the development of storage technology. We have seen that this has led to a heightened interest in co-locating storage alongside both renewable and non-renewable installations. We expect to see a gradual increase in the number of applications for the co-location of new generation, in particular storage, alongside new and existing generation assets.

We are keen to help industry better understand the process for co-locating storage and other forms of generation with existing generation that is connected, or contracted to connect, to the National Electricity Transmission System within the current framework. This document provides informal guidance on some of the processes customers will need to be mindful of when considering co-location. It aims to provide clear and transparent information that will hopefully assist customers in future when thinking about their projects and in discussion with their Electricity Connections Contract Manager as part of the application process.

The document does not change or replace existing industry codes but rather seeks to clarify how transmission connected co-located sites are treated at present and in line with the existing framework. We believe this will deliver further consistency and transparency for the benefit of our customers. It will also serve to complement similar work being undertaken by Ofgem and by industry with the ENA Open Networks Project, which together should give our customers wider-ranging coverage of co-location across both distribution and transmission.

John Twomey
EU and UK Commercial Strategy Manager
Electricity System Operator

2. Purpose

On 24th July 2017 the Department for Business, Energy and Industrial Strategy (BEIS) and Ofgem published their Smart Systems and Flexibility Plan¹ (the 'Plan') to provide clarity on the action being taken by Government, Ofgem and industry (including National Grid Electricity System Operator) to deliver a smarter, more flexible energy system.

Within the Plan a number of actions are documented, some of which relate to the removal of both perceived and actual barriers to storage being able to easily co-locate with generation assets. In parallel, we have also been investigating this issue with wider industry, including in specific relation to co-located transmission connections i.e. where a customer wishes for one technology type to be co-located with a different technology type, which includes storage.

Based upon feedback from stakeholders, but also to support Actions 1.4 and 1.6 of the Plan, we are publishing this guidance to clarify how transmission connected co-located sites are treated at present under the existing regulatory framework across three key themes (connection, charging and compliance) and to highlight where changes are likely to be made to each of these themes in future.

This will further support additional clarity and transparency for co-location in general, and storage technology more specifically, in addition to that provided through work being undertaken by Ofgem and by industry through the ENA Open Networks Project. This guidance will be kept under review and in future it may also be incorporated into a broader publication being developed as part of the ENA Open Networks Project. This broader piece of work includes distribution connected assets across the various DNOs and we understand that the ENA Open Networks Project expect to release a guide for formal consultation in Spring 2018.

We hope that this document provides you with additional clarity and transparency in respect of co-located transmission connections but in the event you have further questions please get in contact with your Electricity Connections Contract Manager and if you do not have one please contact transmissionconnections@nationalgrid.com.

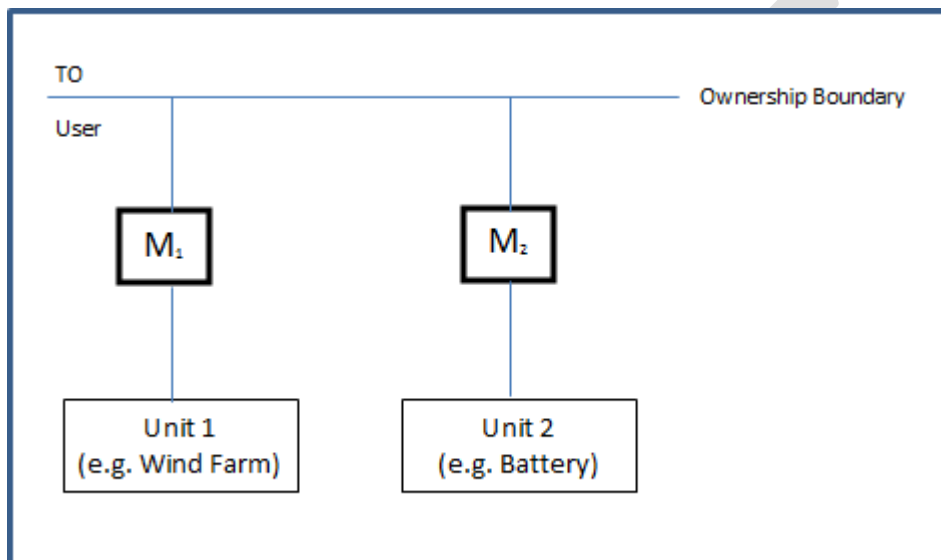
¹ https://www.ofgem.gov.uk/system/files/docs/2017/07/upgrading_our_energy_system_-_smart_systems_and_flexibility_plan.pdf

3. Terminology

We would like to make a distinction between a 'parallel connection' and a 'consolidated connection' as these terms are used throughout this informal guidance. To ensure that the use of this terminology is correctly interpreted we have provided more information on what we mean by each as follows.

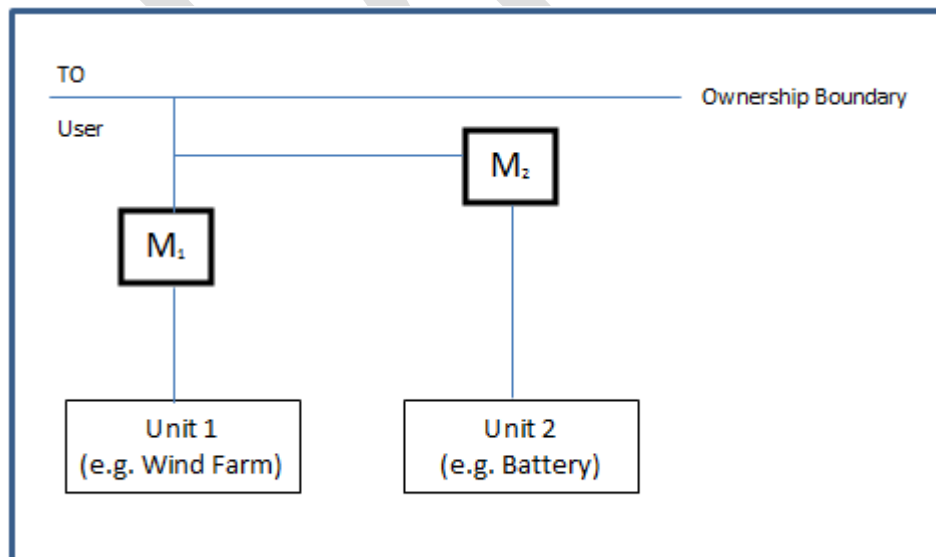
3.1 Parallel Connection

A parallel connection is one where the additional technology being co-located is connected directly to the transmission system at an existing (or contracted) connection site but with a new independent connection point and a representative example is depicted as follows.



3.2 Consolidated Connection

A consolidated connection in this context is one where the additional technology being co-located is connected to the transmission system behind an existing connection point at the existing (or contracted) connection site and a representative example is depicted as follows.



4. Co-location Guidance

We have split the guidance associated with transmission co-location into three themes:

- Connection, Compliance and Charging

There is some overlap between the themes and under each theme we have made the necessary distinctions between parallel connections and consolidated connections as detailed above. Terms in bold in this section are also codified and their definitions can be found within the Connection and Use of System Code (CUSC) and/or the Grid Code.

4.1 Connection

Where a developer wishes to co-locate an additional unit (such as storage) at an existing **Connection Site** either a **Connection Application** or a **Modification Application** will likely be required. The type of application will depend on whether or not the new unit is intended to be part of the existing contracted or connected **Power Station**. Regardless of the application type any requested increase in **Transmission Entry Capacity** (to accommodate a new unit) will be assessed on a 'first come, first served' basis. However, please note our ongoing work with industry on the 'Transmission Queue' as this could affect the approach taken in relation to the allocation and reallocation of capacity between parties under certain circumstances.

4.1.2 Parallel Connection

In the case where a developer intends to treat the new connecting unit as a new and separate **Power Station** then, as a parallel connection, a new **Connection Application** will be required i.e. for a distinct **Connection Point** and **Bilateral Connection Agreement**.

4.1.3 Consolidated Connection

In the case where a developer intends to treat the new connecting unit as a consolidated connection the new **Generating Unit** or **Power Park Module** (which will likely be a separate **BM Unit**) will then be grouped within the existing contracted or connected **Power Station**. Therefore a **Modification Application** will be required to review and potentially amend the existing **Bilateral Connection Agreement** prior to connection.

Where the new unit is a different technology type i.e. a **Power Park Module** consolidated with a number of **Generating Units**, there may be different site specific technical conditions and further works could be required prior to the connection of the new unit. Where the new unit is a technology type common to the existing unit(s) within the **Power Station** it may be possible to maintain a single common set of site specific technical conditions. In respect of the system assessments required within the **Modification** period then the new unit will be assessed at its appropriate place in the connection queue, similar to the circumstance where an existing contracted **Power Station** applies for a **TEC Increase Request**.

In the event that a developer wishes the additional unit to be owned by a separate party to the registered **User** within the **Bilateral Connection Agreement** then whilst that may be possible this arrangement will likely need to be addressed between those two parties with the **Bilateral Connection Agreement** remaining between **The Company** and the currently contracted **User**; alternatively a brand new **Connection Application** can be submitted by the new **User** for a new and independent parallel connection.

4.2 Compliance

The design and timing of the connection will inform the appropriate approach for compliance.

4.2.1 Parallel Connection

In the event that the connection of a new unit is to be a new **Power Station** with a separate **Bilateral Connection Agreement** then the normal compliance process will be followed. The provisions contained in **Grid Code** CP.5 to CP.7 detail the process to be followed in order for the **User's Plant** and **Apparatus** to become operational.² This process includes the issue of three **Operational Notifications: EON** (energisation), **ION** (interim synchronising) and **FON** (full compliance).

4.2.2 Consolidated Connection

In the event that the new technology is being consolidated as an additional unit within a **Power Station** but under an existing **Bilateral Connection Agreement** then the compliance process will also pursuant to **Grid Code** CP.5 to CP.7. If the **Power Station** is operational (with an additional unit being consolidated) then **Grid Code** CP.8 will instead be followed.

This process will include the issue of a **Limited Operational Notification** (i.e. **LON**) in order for the **User's Plant** and **Apparatus** to become operational. In this instance the additional unit(s) will need to demonstrate their compliance with the appropriate sections of **Grid Code** in their own right, as well as maintaining the overall compliance of the **Power Station**.

For example, a **Power Station** connected at a **Connection Point** could be made up of a **Power Park Module** and a newly connecting **Generating Unit**, which would need to be both individually and cumulatively compliant with the relevant sections of **Grid Code**.

We would also ordinarily expect that the **Power Park Module** and **Generating Unit** would each be a separate **BM Unit** so, amongst other things, they would need to be separately instructable and controllable.

A new unit consolidated within an existing **Power Station** will be required to demonstrate compliance with a number of **Grid Code** requirements at the existing **Connection Point** i.e. a new **Connection Point** will not be created as this would then be a parallel connection.

Please note our ongoing work under GC0096 as this could possibly affect the classification of storage technology within the **Grid Code** and as a consequence affect site specific technical conditions and compliance requirements.³ Also, in certain circumstances and in accordance with published guidance on derogation requests, derogation may be considered where compliance cannot be properly demonstrated.

²<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/The-Grid-code/>

³<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/GC0096/>

4.3 Charging

As referenced within the Plan, in February 2017 we published guidance to industry on how storage technology is currently charged when connecting to the **Transmission System**.⁴ This guidance did not, however, reference co-location and as such we feel further guidance specific to co-located sites connected to the **Transmission System** is required.

4.3.1 Parallel Connection

For a new parallel connection the new technology connecting to the **Transmission System** would be treated as a new and independent connection and would therefore be charged as such i.e. the published guidance referenced above would continue to remain applicable.

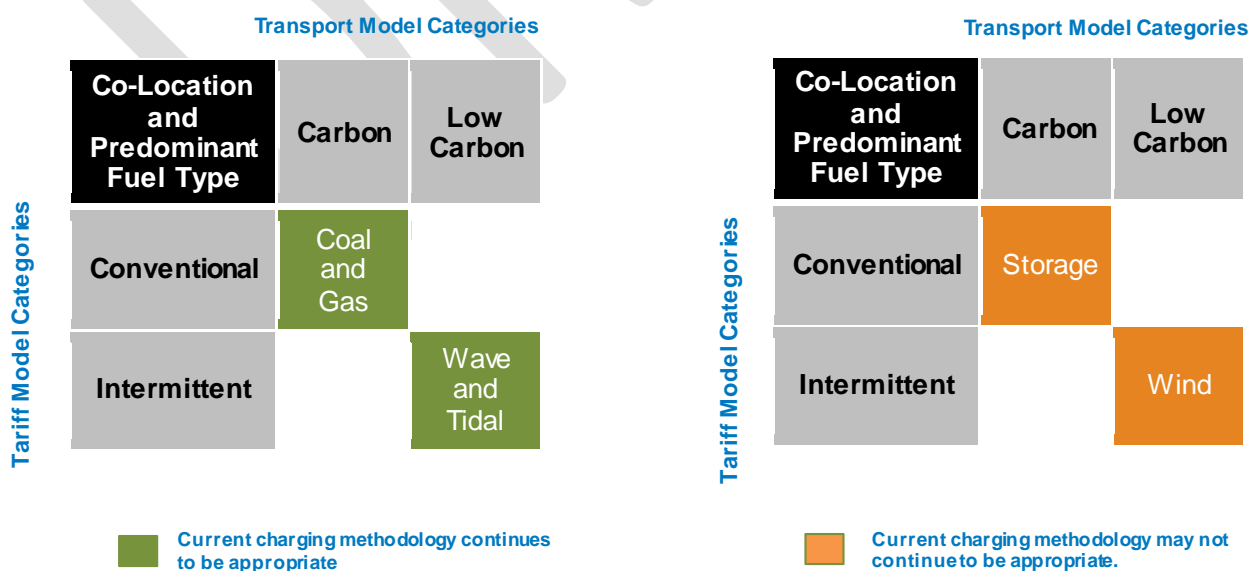
4.3.2 Consolidated Connection

For a consolidated connection with multiple fuel types and common charging characteristics (e.g. both fuel types are conventional carbon) then the above referenced published guidance would again continue to remain applicable.

However, as shown in Figure 1, for a consolidated connection with multiple fuel types but with different charging characteristics (e.g. a combination of intermittent and conventional, or a combination of carbon and low carbon) the current charging arrangements may not adequately cater for a single **Power Station** being connected to the **Transmission System**. This is because under the current charging methodologies a **Power Station** with multiple fuel types would be charged according to its predominant fuel type. Therefore, whilst the current approach remains suitable for sites where the different fuel types have the same charging characteristics it may not remain appropriate for co-located sites with different fuel types and charging characteristics.

We therefore believe that a review of charging arrangements may be required as a result of this scenario and further information will be communicated to industry in due course.

Figure1: Illustrative example of TNUoS charging methodology in relation to co-location



⁴<https://www.nationalgrid.com/sites/default/files/documents/Guidance%20on%20how%20transmission%20connected%20storage%20is%20currently%20charged%20today.pdf>

5. Summary and Conclusion

For ease of reference we have provided a summary table of the above guidance.

	Parallel Connection	Consolidated Connection
Connection	Connection Application New Bilateral Connection Agreement 'First Come, First Served' Existing Connection Site	Modification Application Modified Bilateral Connection Agreement 'First Come, First Served' Existing Connection Site
Compliance	New Connection Point New Power Station	Existing Connection Point Existing Power Station
Charging	Power Station TEC Fuel Type	Power Station TEC Predominant Fuel Type

Based on the above guidance, both parallel connections and consolidated connections will remain feasible options for new co-located transmission connections under the existing framework. However, given the clarity recently provided by Ofgem⁵ on the co-location of storage we expect that consolidated connections will likely be the more common option for co-located transmission connections.

We have also provided a list of FAQs in Appendix 1 which we hope will pre-empt some of your questions. In the event that you have further questions on the above, or on co-location in general please contact Sarah York at Sarah.York@nationalgrid.com.

⁵<https://www.ofgem.gov.uk/publications-and-updates/guidance-generators-co-location-electricity-storage-facilities-renewable-generation-supported-under-renewables-obligation-or-feed-in-tariff-schemes>

Appendix 1 - FAQs

Q1. The guidance only refers to co-location of generation with generation – is it also possible to co-locate generation with directly connected demand?

A1. Yes but whilst similar principles would apply there will likely be some differences so if you wish to co-locate generation with directly connected demand then please contact your Electricity Connections Contract Manager in the first instance. In the event that you do not have an Electricity Connections Contract Manager please contact transmissionconnections@nationalgrid.com.

Q2. The guidance only refers to direct connections to the Transmission System – what about embedded generation?

A2. With regard to a Large Power Station which is Embedded (i.e. with a BEGA or a BELLA) then as the project is not directly connected to the Transmission System this guidance will not be directly applicable. However, the principles of this guidance remain unchanged in respect of 'Connection' and as such a Modification Application will be required by the DNO and/or Developer so we can reassess the possible effect of co-location on the Transmission System.

With regard to a Relevant Embedded Small Power Station or a Relevant Embedded Medium Power Station this is being considered through the ENA Open Networks Project and further information will be provided in due course.

Q3. I think my planned connection is a 'consolidated connection' but it will be a different design to that depicted in the diagram above?

A3. The depiction of a consolidated connection is representative and there will be other ways to configure a consolidated connection. If you would like to enquire whether your planned connection design is a consolidated connection and what this means please contact your Electricity Connections Contract Manager in the first instance. In the event that you do not have an Electricity Connections Contract Manager please contact transmissionconnections@nationalgrid.com.

Q4. Is it possible to split my contracted Transmission Entry Capacity and then provide some of it to a third party developer as either a parallel connection or a consolidated connection?

A4. Whilst there are arrangements in CUSC to transfer agreements to third parties if you would like to reallocate any Transmission Entry Capacity then this must be done via the Electricity System Operator i.e. Transmission Entry Capacity cannot simply be transferred to a parallel connection and any new connecting party must submit a new Connection Application. With regard to a consolidated connection a share of the Transmission Entry Capacity contracted could be allocated to the new connecting 'unit' within the Power Station or alternatively additional Transmission Entry Capacity could be requested.

In both cases a Modification Application would be required and the capacity would remain with the contracted User and it cannot usually be transferred to a third party, although it might be possible to make separate arrangements with a third party whilst remaining as 'lead party' under the Bilateral Connection Agreement.

If you are thinking about co-location and would like to further understand options then please contact your Electricity Connections Contract Manager in the first instance. In the event that you do not have an Electricity Connections Contract Manager please contact transmissionconnections@nationalgrid.com.

Q5. Is there a limit to the number of 'units' which can be located behind a Connection Point as a consolidated connection?

A5. There should be a single Power Station at a Connection Point (although a single Power Station may have multiple Connection Points at a Connection Site) within a single Bilateral Connection Agreement. There is technically no limit on the number of 'units' which comprise a Power Station so long as it remains compliant with the relevant industry codes, including Grid Code.

Q6. If I want to co-locate as a consolidated connection do I need to increase my contracted Transmission Entry Capacity?

A6. No. It is possible to reconfigure your contracted Power Station and utilise your existing contracted Transmission Entry Capacity but as this could have a material effect on the Transmission System a Modification Application will still be required. Even without an increase to Transmission Entry Capacity it remains possible that works or site specific technical conditions will be required prior to connection so again a Modification Application will likely be required.

Q7. I do not understand how this is applicable to my project and I have further questions – what do I do now?

Q7. Please contact your Electricity Connections Contract Manager in the first instance and they will be more than happy to discuss and answer any questions. In the event that you do not have an Electricity Connections Contract Manager please contact transmissionconnections@nationalgrid.com.

Q8. If I want to understand potential commercial opportunities that are available for co-location projects so who should I contact?

Q8. For an insight into the commercial opportunities of co-locating generation assets with onsite battery storage (e.g. demand side response) and the potential revenue streams available, please contact Commercial.Operation@nationalgrid.com.

You may also wish to consult the MEUC Guide on DSR and Storage:
<http://powerresponsive.com/wp-content/uploads/2017/12/MEUC-Guide-2017.pdf>

Disclaimer

This document is not intended to seek to change or replace existing industry processes and codes. The intention is to simply and clearly document how existing connection, compliance and charging processes apply to transmission connected co-location in accordance with the current framework.

For further information please contact either:

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