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# Substation Bay Sharing Policy

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# 1. Introduction

## 1.1. Background

As part of the 2023 Connections Action Plan jointly published by Ofgem and government, the National Energy System Operator (NESO) has worked with the Transmission Owners (TOs) to develop policies which seek to enhance the utilisation of existing designs, circuits and assets where a user would connect. Bay sharing seeks to ensure that new bays, or existing substation bays which may be underutilised, can be shared with other projects to ensure more efficient use of connection infrastructure.

## 1.2 Purpose of This Document

It is noted that varying forms of bay sharing are already practiced by the TOs.

The purpose of this document is to describe the process that NESO and TOs will follow to ensure a transparent and consistent approach to managing customer connection applications that are potentially suitable for bay sharing. It also aims to facilitate the application of bay sharing within the network going forward <sup>1</sup>.

## 1.3 How Does Bay Sharing Work?

Bay sharing can exist in two forms:

**‘Direct Bay Sharing’** meaning direct connection of more than one User to Connection Points in one TO substation bay; or

**‘Indirect Bay Sharing’** meaning sharing of a TO substation bay by connection of more than one User to radial TO circuits remote from the main bay. Examples of these include grid park concepts or collector substations.

To accommodate an additional project at a substation, the TO may propose a shared solution which will allow multiple customer connections from the same circuit or bay. This can be effective where there are physical limitations preventing further extension of a substation. It can also

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<sup>1</sup> It is noted there are various code modification and actions linked to Connections Reform and the Connections Action Plan ongoing at the time of publishing this policy. NESO will aim to update this policy, in collaboration with the TOs, in light of any relevant related changes.

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increase efficient utilisation of existing bays, minimising scenarios, for instance, where smaller projects are the sole connector into a bay that has much higher rated capacity.

Illustrated examples of bay sharing can be found in Appendix A.

For the avoidance of doubt, both 'direct' and 'indirect' bay sharing are within the scope of this policy.

## 2. Eligibility Criteria

This policy applies to customers seeking a direct transmission connection.

The TOs will consider the feasibility of bay sharing solutions as a matter of course. They may decide to pursue such a solution following discussions with the customer around bay availability. These discussions will usually happen at the pre app stage, although it may be raised by the TO at a later stage where the possibility arises. Bay sharing will likely be a more feasible solution for instances whereby a new TO substation would be required to connect a customer.

Following a customer's submission of a connection application, whether or not a certain project is a suitable candidate for bay sharing will ultimately be at the discretion of the relevant TO. The bay sharing solution may be identified at connection offer stage or after acceptance of the offer at a later stage of the connections development process, as optimised solutions are identified (where this does not impact the customer's existing rights).

Key criteria to be considered by the TO in the suitability of bay sharing will include, but are not limited to:

- **Ratings and Capabilities:** TOs will have to ensure that equipment ratings and capabilities are not exceeded (pre-fault, during fault, or post fault).
- **NETS SQSS Compliance:** Where the bay sharing solution is driven by the TO, sharing a bay would generally need to comply with the NETS SQSS. Where the bay sharing is requested by the customer, this could be made compliant under the Variation to Connection Design rules by agreeing a departure from the standard requirements.

Given that bay sharing arrangements are likely to involve multiple Users connected to a single circuit or connected to what is essentially a supplementary busbar, these connections would only be compliant if the User exercises their right to request a Variation to Connection Design. Therefore, either scenario would be required to satisfy the criteria in clauses 2.15 to 2.18 of the NETS SQSS. Bay sharing arrangements that do not meet these criteria, for example loss of infeed in excess of 1800MW, will not be permitted. The requirements on circuit complexity (NETS SQSS Appendix B) would need to be adhered to and the recommendations on substation configuration and switching arrangements (NETS SQSS Appendix A) would be followed.

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- **Spatial Constraints:** There must be sufficient physical space within and around the substation for additional connections, equipment and required extensions or modifications.
- **Transmission Owner System Impact Analysis:** this includes impact on fault levels, point on bar loading, infeed loss risk due to the substation switching arrangement and ensuring stability and reliability of the system is not compromised.
- **Economic Viability:** assessment for the most economical means of connecting the user will be considered by the TO. Relevant additional works will be classified as attributable works, which are secured against the sharing customers that will be benefiting from the shared solution. Following this, upon connection, any ongoing costs linked to maintenance, operation etc are then recovered through usual Transmission Network Use of System (TNUoS) charges.
- **Regulatory Compliance:** This includes compliance with relevant codes (including but not limited to Grid Code, Security and Quality of Supply Standard), the TO obtaining necessary planning permissions/ consents and land rights (as required) and ensuring the contractual rights of other customers within the substation are not infringed upon.
- **Project Specific Factors:** The technology type of the projects under consideration and project construction programme timelines will also be considered to ensure coordinated implementation, integration and system access.

## 3. Transmission Owner Boundaries

There are differences in the approach towards bay ownership boundaries between National Grid Electricity Transmission (NGET), Scottish Power Transmission (SPT) and Scottish and Southern Electricity Networks (SSEN) as detailed in table below, which apply the Principles of Ownership in accordance with CUSC 2.12 (see Appendix B for reformatted summary of CUSC 2.12.1).

Transmission Owner	Bay Ownership Practice
NGET	Ownership boundary depends on the type of bay (GIS or AIS):  <i>AIS</i> - customer owns up to the clamps on the busbar. <i>GIS</i> - customer owns up to the gas reserve on the busbars (owns part of the busbars as well)

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SPT and SSEN	Both TOs have full ownership of their bays, with bilateral discussions with the customer determining whether the TO will be required to build out to the project or vice versa.
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Where a customer is offered a bay sharing solution by SPT or SSEN, their bay ownership practices will be maintained in line with the status quo, although the category of assets might change from connection assets to infrastructure assets. The liability arrangements between the respective projects for the necessary infrastructure modifications will be attributable to the customers sharing the bay in accordance with the existing CUSC User Commitment Methodology.

For customers connecting within England and Wales, due to bay boundary practices, possibility of bay sharing may be limited by RIIO T3 allowances.

## 4. Exceptions / Limitations to Bay Sharing

In addition to the eligibility criteria noted within Section 2 above, the following exceptions/limitations may also apply:

One limitation to bay sharing is the Infrequent Infeed Loss Risk, defined in the NETS SQSS as 1800MW. There may be instances where the TO switchgear in the substation bay is capable of a higher export capacity however could be restricted to much less due to the substation busbar configuration.

Additionally, in the interest of developing an economic, efficient and coordinated connection, the TOs may determine it necessary to implement a bay sharing solution even though it may impact the system access of other users within that substation. In such circumstances any increased risk of loss of supply (compensated if not already excluded for local asset outages) that might result for the other users would need to be considered by the TO, NESO and affected parties when deciding if bay sharing would be appropriate.

## 5. Roles and Responsibilities

### 5.1 Transmission Owners

The TOs will be required to ensure that bay sharing opportunities are considered, noting the statutory duty and licence requirements to develop and maintain the network in an economic, coordinated and efficient manner.

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Although the contractual relationship is between NESO and the customer, the TO will work with NESO, and if necessary, the customer, in the establishment of any bay sharing solutions. Other responsibilities of the TOs in this process are listed below:

- Evaluate applications based on eligibility criteria - technical, operational and regulatory, including but not limited to the criteria listed in Section 2, to ensure the safe, reliable and efficient integration of the bay sharing solution.
- Design of the project solution i.e., the form in which the bay sharing infrastructure is best suited to take place.
- Discuss a suitable development plan with NESO and customers (particularly in the event that the shared solution impedes on the customer's project site e.g., construction of a remote collector substation on one of the customer's sites). For customers with existing agreements, the TOs will be expected to have such discussions with NESO and the customer before changes to the customer's agreements are processed. Relevant discussions will also include liability arrangements between the respective projects for the necessary infrastructure modifications.

### 5.2 NESO

As NESO has the contractual relationship with the TO, and has the same obligations as the TOs in respect of development, maintenance and operation of an efficient, economical and co-ordinated system of electricity transmission, NESO will be involved in discussions with the TO and customer regarding any bay sharing solutions identified.

For existing customers, once the bay sharing solution has been identified by the TO, the changes to the customer's agreements will be processed in the usual manner. For new customers, the bay sharing solution will be reflected in the connection offer.

### 5.3 Customers

We expect Customers to engage in necessary conversations with NESO and relevant TO regarding any bay sharing proposal, given its importance to their connection. Following the formal inclusion of the sharing solution within the customer's agreements, the customer will be required to ensure their project meets the terms of their Bilateral Connection Agreement (BCA) and Construction Agreement (ConsAg) in the usual manner.

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## 6. Termination Implications

Once a bay sharing solution has been agreed by the relevant TO, NESO and the customers (e.g in this instance, Customer A and Customer B) in the event that Customer A terminates for any reason, implications to both customers would have to be considered by the TO. This includes standard termination costs to be applied to Customer A. Customer A may also be liable for additional termination costs depending on the construction phase of the projects.

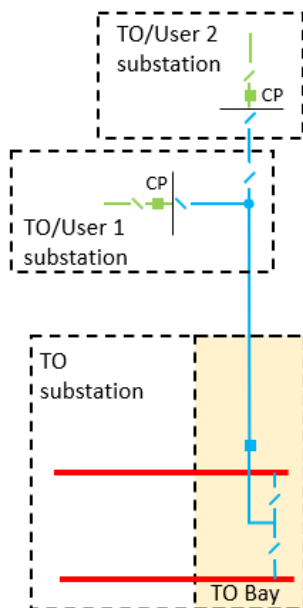


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## Appendix A – Bay Sharing Examples

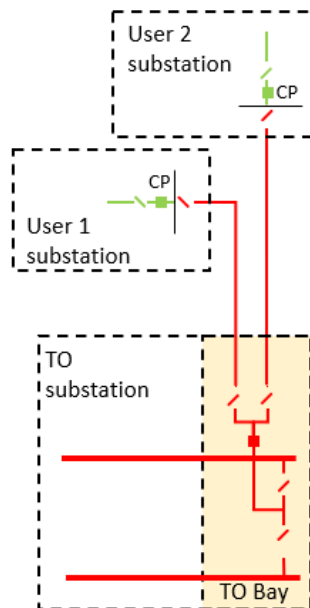
The diagrams below illustrate different conceptual examples of connecting more than one User to a given TO bay, by either Indirect Bay Sharing or Direct Bay Sharing (subject to technical and spatial constraints). Exact bay sharing solutions, including ownership boundaries may vary from the below and will be specified within a customer's agreements. These illustrations are indicative, and a double busbar arrangement does not exist at all sites. The diagrams also only represent the sharing of a bay exclusively by generation (for the avoidance of doubt, including BESS). It does not consider sharing by demand or any combination of generation and demand. Further requirements driven by SQSS demand criteria would need to be considered in those other circumstances.

Indirect Bay Sharing  
TO radial teed circuit sharing  
is NOT Direct Bay Sharing

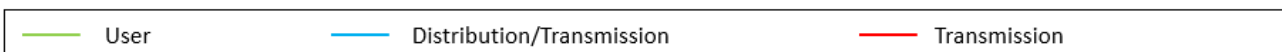
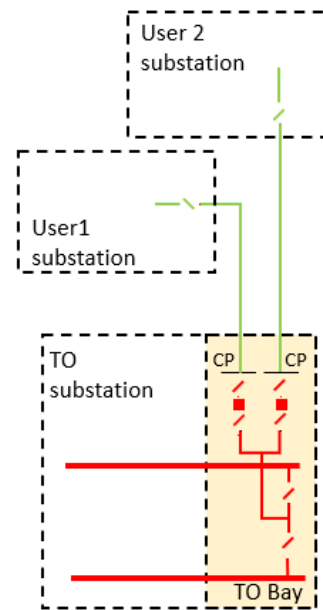


In England and Wales the blue circuit at or below 132kV would be a distribution system

Indirect Bay Sharing  
TO Radial circuit  
'banking'



Direct TO bay sharing  
by Users



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## Appendix B – Reformatted Summary of CUSC 2.12.1

2.12 PRINCIPLES OF OWNERSHIP		2.12.1 Subject to the Transfer Scheme or any contrary agreement in any Bilateral Agreement or any other agreement the division of ownership of Plant and Apparatus shall be at the electrical boundary, such boundary to be determined in accordance with the following principles:	
	In the case of air insulated switchgear:		In the case of Gas Insulated Switchgear:
Generator	(a) in relation to Plant and Apparatus located between the National Electricity Transmission System and a Power Station, the electrical boundary is at the <b>busbar clamp on the busbar side of the busbar isolators</b> on Generators and Power Station transformer circuits;		(f) <b>the electrical boundary will be the equivalent of those specified in this Paragraph 2.12.1</b> [read as equivalence to clauses 2.12.1 a-d] save that the electrical boundary will be at:
DNO @ Infrastructure Site	(b) save as specified in Paragraph 2.12.1(c) below, in relation to Plant and Apparatus located between the National Electricity Transmission System and a Distribution System, the electrical boundary is at the <b>busbar clamp on the busbar side of the Distribution System voltage busbar selector isolator(s)</b> of the National Electricity Transmission System circuit or if a conventional busbar does not exist, an equivalent isolator. If no isolator exists an agreed bolted connection at or adjacent to the tee point shall be deemed to be an isolator for these purposes;		(i) the first component on the outside of the Gas Insulated Switchgear Circuit Breaker gas zone on the side of that gas zone or, where a circuit disconnector is fitted, <b>the first component on the outside of the Gas Insulated Switchgear circuit disconnector gas zone</b> , on the User's side of that gas zone; or
DNO @ Connection Site	(c) in relation to Transmission Plant and Transmission Apparatus located between the National Electricity Transmission System and a Distribution System but designed for a voltage of 132KV or below in England and Wales and below 132kV in Scotland, the electrical boundary is at the <b>busbar clamp on the busbar side of the busbar selector isolator</b> on the Distribution System circuit or, if a conventional busbar does not exist, an equivalent isolator. If no isolator exists, an agreed bolted connection at or adjacent to the tee point shall be deemed to be an isolator for these purposes;		(ii) the first gas zone separator on the <b>busbar side of the busbar selection devices</b> , and in such case contain a single section of the busbar as agreed between The Company and the User and a diagram showing these electrical boundaries is attached at Schedule 1 to this Section 2.
Demand User	(d) <b>in relation to Plant and Apparatus located between the National Electricity Transmission System and the system of a Non-Embedded Customer, the electrical boundary is at the clamp on the circuit breaker side of the cable disconnections at the Non-Embedded sub-station; and</b>		
	In the case of metal enclosed switchgear, that is not Gas Insulated Switchgear:		
	(e) the electrical boundary will be the equivalent of those specified in this Paragraph 2.12.1 save that for rack out switchgear, the electrical boundary will be at the busbar shutters.		