

Draft Service Specification for Consultation

B6 Constraint Management Pathfinder 2024/25

7th February 2022



Contents

1. Purpose	1
2. Introduction	1
3. Background	1
4. Service Outline	1
4.1 Technical Operation	1
4.2 Commercial Information	2
5. Tender Procedure	3
5.1 Contract Terms	4
5.2 ESO's Requirements	4
6. Technical Specification and Evaluation	5
6.1 Technical Requirements	6
6.1.1 Availability	6
6.1.2 Instruction to Arm	6
6.1.3 Arming	6
6.1.4 Disarming	7
6.1.5 Tripping	7
6.1.6 Arming/Disarming Instruction	7
6.1.7 Onshore Generation	7
6.1.8 Offshore Generation	7
6.1.9 Distribution-connected Generation	8
6.1.10 Service Stacking	8
6.1.11 Control and Indication Facilities	8
6.1.12 Units Connected to the Same Circuit Breaker	8
7. Indicative Timeline	9



Disclaimer

This guidance document has been prepared by National Grid Electricity System Operator and is provided voluntarily and without charge. Whilst National Grid Electricity System Operator has taken all reasonable care in preparing this document, no representation or warranty either expressed or implied is made as to the accuracy or completeness of the information that it contains and parties using information within the document should make their own enquiries as to its accuracy and suitability for the purpose for which they use it. Neither National Grid Electricity System Operator nor any other companies in the National Grid Plc Group, nor any directors or employees of any such company shall be liable for any error or misstatement or opinion on which the recipient of this document relies or seeks to rely other than fraudulent misstatement or fraudulent misrepresentation and does not accept any responsibility for any use which is made of the information or the document or (to the extent permitted by law) for any damages or losses incurred.

1. Purpose

The purpose of this draft Service Specification is to provide interested parties and prospective participants with the details of the B6 Constraint Management Pathfinder 2024/25 (hereafter referred to as “B6 CMP 2024/25”) service, including both the commercial aspects and technical requirements. National Grid Electricity System Operator (hereafter referred to as the “ESO”) is launching a consultation on the draft Service Specification. The aim of the consultation is to provide all interested stakeholders an opportunity to ask questions, provide feedback and co-create the final Service Specification with the ESO.

2. Introduction

The ESO is seeking to reduce network congestion costs and create an electricity system that can operate carbon-free. To support this aim, this Pathfinder is seeking to connect Generators in Scotland (already connected to/contracted to connect to the transmission network in Scotland before October 2024) to the Anglo-Scottish Commercial Intertrip Scheme (known as the “B6 CIS”) to be disconnected within 150 milliseconds (ms) should a network fault occur. This could allow the ESO to operate the system at a higher capability, thus maximising the use of existing assets and reducing potential curtailment on renewable Generators.

The ESO is requesting Generators in Scotland (north of the B6 boundary) to express an interest in the B6 CMP 2024/25. The information provided by the Generators at this stage shall be subject to technical assessments conducted by the ESO and the Scottish Transmission Owners (TOs) to understand if the Generators fulfil the technical requirements of the service. Further information on the technical assessments, as well as the commercial aspects of the B6 CMP 2024/25 process, can be found over the following pages.

3. Background

In 2021 the ESO tendered for an intertrip service aimed at expanding the B6 CIS, thus opening the market to new entrants. The approach for the initial B6 CMP service (hereafter referred to as “B6 CMP 2023/24”) referenced an annual tender process, the first of which concluded in November 2021. Since then, the ESO has sought to develop its approach based on feedback received and lessons learned. This Service Specification for the B6 CMP 2024/25 establishes the renewed service details for service delivery from October 2024 through to at least September 2025.

4. Service Outline

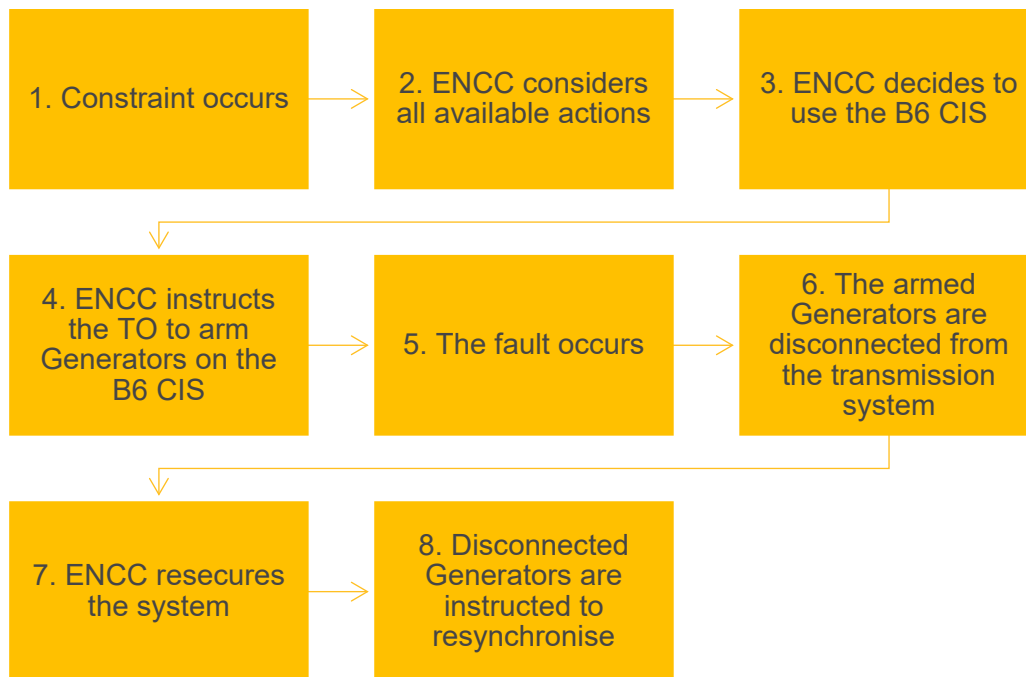
4.1 Technical Operation

The Electricity National Control Centre (ENCC) monitors network constraints and ensures that the electricity system is operated in a safe, secure, and economic manner in real time. When a constraint is active, i.e., the expected flow across the constraint circuits exceeds the transfer capability of the circuits, the ENCC curtails generation to reduce the expected flow by taking actions in the Balancing Mechanism (BM). The objective of the B6 CMP 2024/25 is to provide the ENCC with an additional tool to manage network constraints.

Under the B6 CMP 2024/25 service, once a constraint occurs the ENCC assesses the constraint and looks to arm the excess volume of generation that exceeds the transfer capability to be intertripped, provided that the armed volume does not exceed the largest permissible loss on the system. Once armed, the Generator is informed by the ESO that they are armed on the B6 CIS. If

any of the faults selected to be monitored on the B6 CIS materialise, the B6 CIS shall trigger the opening of the required transmission circuit breaker(s), thus disconnecting the Generator from the transmission system in 150ms. Following the fault, the Generator shall be notified by the ENCC that they have been disconnected. The ENCC then resecures the system by investigating the cause of the intertrip event and taking action to recover the system. During this time, the Generator shall be instructed to remain desynchronised until further instruction from the ENCC. The Generator shall be deemed automatically disarmed following the fault, but upon resolving the network fault, the ENCC shall instruct the Generator to re-synchronise onto the transmission system and resume operation when it is safe to do so. The above process is summarised in Figure 1:

Figure 1: Technical Operation of the B6 CIS



4.2 Commercial Information

Generators can earn two forms of revenue under the B6 CMP 2024/25 service, as below:

1. Arming fee (£/MWh): this is the fee that the ESO pays when the Generator is armed until either the Generator has been notified that they have been disarmed or until a trip occurs on the circuit that the B6 CIS was monitoring and the Generator is tripped as a result. This payment shall cover all settlement periods the Generator was armed for. The arming fee can be resubmitted monthly during the service delivery period and is paid on a £/MWh basis. Generators shall be paid based on their actual MW output to account for changes in how much the asset is exporting during the arming period, using data provided by Elexon. This has changed from the B6 CMP 2023/24 tender process, where Generators were asked to provide a set arming fee per settlement period for each of their assets and has removed the need to derate wind output by 65%.
2. Tripping fee (£/trip): this is the fee that the ESO shall pay, as a one-off cost per trip, should the network fault occur when the Generator is armed on the B6 CIS. This payment is intended to cover costs incurred by the Generator in being tripped off and cannot be resubmitted during the service term.

Please note that there is no availability fee for this service and the cost of providing an intertrip connection between the B6 CIS and the transmission circuit breaker to facilitate the connection is expected to be financed through regulatory funding rather than by the Generators themselves. Generators should not factor in the costs of connecting to the B6 CIS in their pricing submissions.

5. Tender Procedure

This section details the process that the ESO shall use to determine which Generators to connect to the B6 CIS for delivery in 2024/25. This is as follows:

1. Generators express an interest in the B6 CMP 2024/25:
 - a. To do so, Generators must populate and return the expression of interest (EOI) submission proforma, expected to be released by the ESO in March 2022 – refer to section 7: Indicative Timeline for further information.
 - b. For clarity, Generators that were successful in B6 CMP 2023/24 are required to express an interest in B6 CMP 2024/25 to be considered in this year’s tender.
2. The ESO and TOs conduct Feasibility Studies. The output of these shall confirm whether the Generator meets the ESO’s requirements and is therefore technically feasible to be connected to the B6 CIS.
3. The ESO shall sign all technically feasible Generators up to the B6 CMP Framework Agreement. Please refer to section 5.1: Contract Terms for further information.
4. In parallel to point 3 above, the ESO shall request prices from all technically feasible Generators.
5. The technically feasible Generators who have signed up to the B6 CMP Framework Agreement and provided prices shall be assessed using the following process:

There are currently 36 channels available on the B6 CIS. The ESO shall contract with a maximum of 36 Generators, noting the provision set forth in section 6.1.12: Units Connected to the Same Circuit Breaker. The ESO shall determine the cheapest 36 Generators by normalising the tripping fee to a unit MWh rate and adding this to the arming fee to determine service cost using the following formula:

$$\text{service cost} = \text{arming fee} + \frac{\text{tripping fee (£/trip)}}{\text{TEC} \times 1500 \times 25}$$

the above is where:

- arming fee and tripping fee are values submitted in the commercial tender
- TEC = the Transmission Entry Capacity of the generating asset
- $\frac{1}{1500 \times 25}$ = the probability of a fault occurring within 3000¹ settlement periods or 1500-hours over 25-years²

¹ 1500-hours are used to determine the lowest estimate of the average value to the ESO from this service.

² This is a rudimentary estimation based on the proportion of exposed conductor across B6 CMP monitored circuits and the total amount of exposed conductor on the GB transmission system, while considering the frequency of the type of faults to be monitored by the B6 CIS.

The ESO shall ensure the total capacity of the 36 Generators meets at least the base MW requirement on the B6 CIS. This base requirement is set to 1.6GW for the B6 CMP 2024/25, which is double the intertrip volume requirement of 800MW on the system, thus providing contingency for the ESO in operational timescales. For this reason, if the lowest cost combination of 36 Generators is unable to meet the ESO's base MW requirement of 1.6GW, then the ESO shall reassess the combination of Generators to identify the lowest cost combination of 36 Generators that at least meets the ESO's base MW requirement of 1.6GW.

Please note the following provisions:

1. The arming fee and tripping fee provided by each Generator in this process shall act as their price cap, meaning neither the arming fee nor the tripping fee can be increased during the service term, but the arming fee can be decreased to encourage ongoing competition.
2. The ESO, at its sole discretion, can change the details of section 5: Tender Procedure at any stage of the B6 CMP 2024/25 process up to contract award. This includes, but is not limited to, changing the base requirement of 1.6GW and/or the number of Generators able to connect to the B6 CIS. For example, if the ESO identifies extreme price disparities between the Generators, then at the ESO's sole discretion it can choose to reduce the number of Generators able to connect to the B6 CIS, which is currently set at 36.

Based on learnings from the B6 CMP 2023/24 tender process, to save time following the EOI stage, the ESO shall grant circa 3-weeks for Generators to provide their fee submissions following the communication of the outcome of the Feasibility Study stage. Therefore, Generators are advised to begin discussing their commercial positions as early as possible to avoid any delays. Further information of indicative timings can be found in section 7: Indicative Timeline.

In future years, the ESO may undertake further EOIs to allow more technically feasible Generators to sign up to the B6 CMP Framework Agreement and thereafter participate in the subsequent tender process. Generators that were previously signed up to the Framework Agreement would still be required to submit as part of the EOI process and thereafter be assessed by the TOs to ensure the ESO's technical requirements are fulfilled. Where an existing Generator continues to meet the ESO's technical requirements of the B6 CMP service, then the Generator shall not be required to re-sign the Framework Agreement and can participate in the subsequent tender process. However, if an existing Generator fails to meet the ESO's technical requirements of the B6 CMP service, then the Generator shall not be able to participate in the subsequent tender process, though the Framework Agreement would remain in place. Please note that before future EOIs and tender processes are carried out, the ESO shall detail and/or reconfirm the technical and commercial parameters of the B6 CMP service.

5.1 Contract Terms

Please refer to the B6 CMP 2024/25 Standard Contract Terms for further information on the contractual requirements of the B6 CMP 2024/25 service.

5.2 ESO's Requirements

Once all EOIs have been submitted, the ESO shall ensure interested Generators meet the minimum technical requirements. These are:

1. The time between fault occurrence and the Generator being tripped off should be within 150ms³ – i.e. if the time of fault is t=0ms then at t+150ms, the transmission line circuit breaker must be in the open position.
2. There should be two fast acting protection channels, to ensure redundancy.
3. The points referenced under the 'TO Feasibility Studies' section below.
4. The detailed technical requirements, as set forth in section 6: Specification and Evaluation.

Due to the above, the ESO has restricted participation in this service to transmission-connected Generators only, as circuit breakers on the transmission system and the points between the Generators tend to readily meet these requirements. Therefore, the TOs shall be looking for a circuit breaker on the transmission system to disconnect the Generator.

TO Feasibility Studies

During this stage of the assessment process, a Feasibility Study shall be commissioned between the ESO and the TOs. The ESO shall provide the EOI responses to the TOs who shall thereafter advise the ESO:

1. If a Generator meets the ESO's requirements, as above.
2. If the Generator can be connected to the B6 CIS.
3. If so, whether connection to the B6 CIS will be completed by October 2024.
4. The TOs will be looking to ensure that there is no disruption to another party connected behind the identified transmission circuit breaker. If another party is connected behind the same transmission circuit breaker or downstream of the interested Generator, then the outcome of the Feasibility Study will be a failure if the other party:
 - a. Is not in agreement with the conditions of being tripped off post fault, or;
 - b. Failed to provide an EOI submission to the ESO during the EOI window; or;
 - c. Provided an EOI submission to the ESO during the EOI window but subsequently failed the Feasibility Study stage.

Please note that the ESO reserves the right to remove any Generator from the process at this stage if there is a significant risk to the system, based on the way that the TOs propose the Generator is connected to the B6 CIS, as per the Feasibility Study results.

The TOs shall provide their results in a report to the ESO, and thereafter the ESO will communicate whether the Generator has passed or failed the assessment process. Please note, the ESO will try to share as much information as possible from the Feasibility Study but may be unable to provide certain details of the assessment, as the information shared with the ESO by the TOs may be subject to System Operator Functions Information (SOFI).

6. Technical Specification and Evaluation

The ESO must operate the system to the requirements set in the Security and Quality of Supply Standards (SQSS). In planning the network in operational timescales, the ENCC operates the

³ This requirement is set by the ESO, to ensure that there is no instability on the system.

system to a secure power transfer limit considering various network faults. If the transfer exceeds this limit, the ENCC must reduce the power flow pre-empting the worst network fault, however unlikely to occur on the system. The B6 CMP 2024/25 is looking to use a CIS which will send a signal to a TO circuit breaker on the system and quickly disconnect the Generator only at the time of the fault. This means the ENCC are able to allow more generation to flow through the circuits pre-fault, hence reducing curtailment and potentially reducing network congestion costs for this region significantly. This section outlines the technical requirements and assessment process to evaluate eligibility of interested Generators.

6.1 Technical Requirements

6.1.1 Availability

1. The contracted Generator must have a signed connection agreement in place by the EOI submission deadline with a connection Completion Date prior to 1st October 2024.
2. The Generator will be deemed to be available to be armed whenever it is exporting active power onto the transmission system.
3. Generators are expected to exercise good industry practice in maintaining the scheme such that when the request to be armed is received the action can be completed in a timely manner and following a fault on the system, respond if armed within the defined timescales.

6.1.2 Instruction to Arm

1. The Generator can be armed at any time during the service term by the ESO issuing an “arming instruction” (see section [6.1.6: Arming/Disarming Instruction](#)) to the TO. During this time, the TOs, Offshore Transmission Owner (OFTO) (if needed) and the Generator shall be notified of this instruction.
2. The Generator must declare unavailable to the ESO only if the unit is desynchronised or is facing technical issues related to aspects of the B6 CIS which are within the Generator’s control.
3. The notification of an “arming instruction” is to be confirmed as soon as reasonably practicable by the ESO which shall include the date, time and the specific Generator that is armed to provide this service.
4. The ESO would only arm the generation volume up to the largest infeed loss that can be securely tripped off the system without leading to instability or large disturbances on the network, i.e. tripping of embedded generation by Loss of Main protection. The ESO shall ensure there is sufficient reserve and response in real time for the intertrip actions taken on the system.

6.1.3 Arming

1. The TO and the Generator must comply with the arming of the B6 CIS in accordance with an “arming instruction” (see section [6.1.6: Arming/Disarming Instruction](#)).
2. The Generator acknowledges that the arming of the B6 CIS can be at any point when exporting active power to the transmission network.
3. The arming period shall be from the point that the ESO issues the arming instruction to the TO.

6.1.4 Disarming

1. The ESO will instruct the relevant TO to disarm the intertrip and notify the Generators involved.
2. The B6 CIS is also deemed disarmed when either the contracted Generator is desynchronised for any reason or has been tripped by the B6 CIS within 150ms of the fault.
3. The disarming will be effective from the point when the Generator was either tripped or has been required to be disarmed by the ESO.

6.1.5 Tripping

1. Once the signal from the B6 CIS has been received, the Generator must be disconnected or desynchronised within 150ms from fault inception to circuit breaker open. The active power output from the plant should be 0MW following the event.
2. The Generator must remain disconnected until notified by the ENCC that they can be re-connected and synchronise safely.
3. There is no maximum limit to the number of trip events per annum. However, the likelihood of the intertrip being tripped is statistically low, with a probability of a trip expected to be once in every 25-years (hence the division of the submitted tripping fee by 25, in section 5: Tender Procedure).
4. The Generator shall be aware of the impact and costs of a trip on their asset's health and undertake maintenance work (if needed) to ensure the asset is able to continue delivering the service throughout the contract period.

6.1.6 Arming/Disarming Instruction

1. The form of the "arming instruction" and "disarming instruction" will be determined at the point of contract signature in relation to whether the party would like the instruction to be provided in the form of an email and/or a fax. In future, the ESO is looking to design a system where the arming status of an asset can be viewed in real time.

6.1.7 Onshore Generation

1. For an onshore Generator, the preferred approach is to trip a transmission circuit breaker, which can provide the required tripping speed (i.e. 150ms from fault occurrence) and dual redundancy.

6.1.8 Offshore Generation

1. For an offshore Generator, the preferred approach is to trip the Generator circuit breaker (usually 33kV) for each offshore generating unit, i.e. a power park module.
2. If the Generator circuit breaker is not able to meet the service requirements, the upstream OFTO breaker shall be assessed during the Feasibility Study to understand if it can be utilised for the B6 CIS.
3. The ESO shall then coordinate with the relevant TO, Generator and OFTO to determine if the unit can be connected to the B6 CIS by October 2024. If an agreement cannot be reached between the parties involved, the Generator shall be removed from the B6 CMP 2024/25 tender process.

6.1.9 Distribution-connected Generation

1. If the Generator is connected to the distribution network, they are excluded from the B6 CMP 2024/25; this is due to the low likelihood of distribution connections meeting the double redundancy and 150ms tripping time as stated in section [5.2: ESO's Requirements](#).

6.1.10 Service Stacking

1. The B6 CMP service is classed as a Relevant Balancing Service and can be contracted for alongside a Capacity Market contract.
2. The B6 CMP service can be stacked alongside a response or reserve service, such as Dynamic Containment, Short-Term operating Reserve etc, in that a unit can be contracted for these as well as B6 CMP though the unit would not be expected to be used for both services at the same point in time.
3. For any other current/future services, these may be stacked and able to be delivered alongside the B6 CMP 2024/25 service subject to written agreement with the ESO.

6.1.11 Control and Indication Facilities

The Generator shall:

1. Ensure correct metering at the grid supply point.
2. Ensure that the asset is available to be armed.

The TO shall:

1. Ensure that all assets are maintained and in good order and all intertrip communication signals are intact and working.
2. Prove that the remote circuit breaker to disconnect the provider will operate within 150ms from fault occurrence time.
3. Acknowledge the receipt and carry out the instruction to arm and disarm.

6.1.12 Units Connected to the Same Circuit Breaker

Because the B6 CIS is connected to transmission circuit breakers, it is possible that multiple assets could be connected behind a single circuit breaker. If there is >1 asset connected behind the same transmission circuit breaker, then:

1. If all relevant Generators submitted an EOI and the assets are technically feasible, then all shall be informed of dependencies to ensure any arrangements can be put into place between the dependent Generators. The prices requested by the ESO can either be submitted separately or jointly by the Generators, but irrespective shall be assessed as a single asset in the subsequent commercial assessment process (refer to section [5: Tender Procedure](#)). The process of jointly submitting prices (if used by the Generators) must be decided and managed between the Generators in question, as the ESO shall not be involved in any discussions between the Generators. Please note, the dependent Generators shall be treated separately from a contractual and settlements perspective but treated as a single unit by the ESO in operational timescales:
 - a. Please note that all units behind the same transmission circuit breaker must pass the ESO's requirements for the service, as set out in section [5.2: ESO's Requirements](#).

2. If only one of or some of the assets (i.e. not all assets) connected to or contracted to connect to the relevant circuit breaker have submitted an EOI, the Generator or Generators in question will be informed of the situation and removed from the tender process to avoid the risk of tripping off assets not participating in the B6 CMP 2024/25.

Please note that the ESO reserves the right to commence contracts early (pre-October 2024) if the TOs deliver the required connections for successful units before October 2024, or late (post-October 2024) if the TOs are delayed in delivering the required connections for successful units.

7. Indicative Timeline

Below is the indicative timeline for next steps for B6 CMP 2024/25:

Stage:	Indicative Start Date:	Indicative End Date:
Consultation on Draft Contract Terms and Service Specification	Mon 07/02/2022	Fri 25/02/2022
Expression of Interest	Mon 28/03/2022	Fri 22/04/2022
Publication of Final Contract Terms	Mon 28/03/2022	Fri 01/04/2022
TO Feasibility Studies*	Mon 25/04/2022	Fri 10/06/2022
ESO Review of TO Feasibility Studies	Mon 13/06/2022	Fri 01/07/2022
Generators Notified of TO Feasibility Studies Outcome	Mon 04/07/2022	Fri 08/07/2022
Technically Feasible Generators Sign the B6 CMP Framework Agreement	Mon 11/07/2022	Fri 05/08/2022
Tender Preparation	Mon 11/07/2022	Fri 15/07/2022
Tender Period (for Price Submissions)	Mon 18/07/2022	Fri 05/08/2022
Generators Notified of Tender Outcome (for Price Submissions)	c. September 2022	

* The TOs undertaking the Feasibility Studies have activities that must be undertaken to set timelines within their license obligation which supersedes the B6 CMP timeline. For this reason, these dates are subject to change to ensure the TOs remain compliant with such commitments.

Please note that following the Tender Period, Generators shall be made aware if they have been successful or unsuccessful. The results of the tender shall also be released publicly.