

SSE Generation – Examples of NETS

[Example 1]

Directive 72/2009

“Article 23

Decision-making powers regarding the connection of new power plant to the transmission system.

The transmission system operator shall establish and publish transparent and efficient procedures for non-discriminatory connection of new power plants to **the transmission system**. Those procedures shall be subject to the approval of national regulatory authorities.”

[Example 2]

Ofgem’s 2019 report to the Commission that was issued at the end of July 2019 which, at pages 16-17, sets out:

https://www.ofgem.gov.uk/system/files/docs/2019/07/great_britain_and_northern_ireland_regulatory_authorities_reports_2019_1.pdf

“Monitoring time taken to connect and repair

Under Article 37(1)(m) **[this was one of the Articles that was considering during the Workgroup as being relevant for the purposes of understanding the EU definition of ‘transmission system’]**, of the Electricity Directive, regulators are required to monitor the time taken by transmission and distribution system operators (DSOs) to make connections and repairs. Here we report on how we monitored this requirement during 2018.

Transmission

As set out above, NGET is the owner of the onshore transmission system in England and Wales. The system in Scotland is owned by SPT and SHE-T, and the offshore network is owned by a variety of OFTOs.

All customers wishing to directly connect to the National Electricity Transmission System (NETS) [we cannot find any reference in this Ofgem report to 'MITS'] will require a contract with the ESO. The process of connecting to the NETS is summarised below:

- Applications for a connection to the transmission network in Scotland and offshore, at voltages of 132kV and above, are made directly to the ESO.
- Once the application fee has been received, the project can be 'clock started', meaning the ESO must offer terms for a connection within three months.
- The ESO, in turn, makes an application to the relevant network company (NGET, SPT, SHE-T) asking it to specify the most economic and efficient design and provide costs for the completion of necessary work.
- The ESO utilises the information received from the network company and produces an offer. The offer includes a contract and details of any onshore construction works needed as a result of the connection.
- Upon receipt of the connection offer, the user has three months to accept or decline the connection offer. Once the offer is signed, the user becomes a contracted customer.

For offshore generators and interconnectors, the connection point is sometimes less obvious because of its distance from the onshore transmission system. The ESO carries out a process called 'CION' (Connection and Infrastructure Options Note) to identify the connection point with the lowest cost.³⁰

Each network company is required by their licence to deliver timely and effective connections to the network.³¹ For both SPT and SHE-T a timely connections financial incentive is in place under the RIIO price control framework, by which their annual revenues are reduced if they fail to offer terms for connection to its transmission network within the specified period. NGET currently has no direct financial incentive on timeliness of connection offers but it needs to comply with its licence obligations, failing which financial penalties may be levied through enforcement action.

We receive biannual 'Timely Connections' reports. These reports provide us with information on the factors affecting the connection dates offered to generators. This enables us to assess whether any changes to the existing framework are needed. A non-confidential version of the report is available on NGENSO's website³².

³⁰ Please see the CION Process Guidance Note: <https://www.nationalgrideso.com/connections/registers-reports-and-guidance>

³¹ Data for this reporting year not yet available.

³² <https://www.nationalgrideso.com/document/130601/download>

For the latest period, between April to September 2018, 76% of offers in England and Wales met the customer's requested connection date, albeit some were provided with access restrictions, which facilitated an earlier date than would have otherwise been provided. The equivalent percentage for Scotland was 52%. Many generation connections also remain in a 'scoping' phase without planning consent or awaiting a successful outcome in the Capacity Market and there is therefore significant uncertainty as to which generation is going to connect and in what timescales.

All OFTOs own and operate the offshore transmission systems, which are built by offshore generators to connect their generating stations to the NETS (the generator build model). As such, there have been no problems under the offshore transmission regime with the time taken to connect during this reporting year. OFTOs' licences require them to report, every quarter, offshore transmission system performance. Where an OFTO exceeds the annual availability target, the OFTO is rewarded up to 5% of annual revenue, and where that performance has fallen below the target of 98% availability, the OFTO is penalised up to 10% of its yearly revenue and up to 50% over five years. Where the OFTO is able to demonstrate that performance has fallen as a result of an 'Exceptional Event'³³, this period will not count against their availability target. When reviewing Exceptional Event claims, we look at whether the event was beyond the reasonable control of the OFTO and, if so, whether the OFTO has followed good industry practice to manage the impact of the event on the availability of the services (both in anticipation of the event and after the event has occurred). In 2018, system availability on the offshore transmission system was above 98%."

[In addition Ofgem's report – at page 18 – goes onto report on tariffs for transmission, in the following terms:]

"3.1.3 Network tariffs for connection and access

Under Article 37(1)(a), (3)(c), (d), (6)(a), (8), (10), (12) [these were some of the Articles that I was considering during the Workgroup as being relevant for the purposes of understanding the EU definition of 'transmission system'], of the Electricity Directive, NRAs are required to fix or approve transmission or distribution tariffs or their methodologies. In this section we report on our activities related to the regulation of tariffs and network charges (for transmission and distribution) during the reporting period.

Transmission

In GB users of the electricity transmission system are subject to three types of transmission charges: Connection charges, Transmission Network Use of System (TNUoS) charges and Balancing Services Use of System (BSUoS) charges. For all three charges, the methodologies must be approved by Ofgem, but we do not set or approve the level of individual charges.

Transmission Connection Charges

For the purpose of the GB domestic regime, connection charges relate to the provision and maintenance of connection assets that are solely required to connect a particular user (i.e. a generator) to the transmission system. The cost of these assets are recovered directly from the user via connection charges that are imposed by the ESO under its connection charging methodology.

Transmission Network Use of System Charges

TNUoS charges relate to the cost of installation and maintenance of the GB electricity transmission system. The costs are recovered by ESO under its TNUoS charging methodology. TNUoS charges are recovered from all users of the GB electricity transmission system (excluding interconnectors). Portions of these charges vary by location, reflecting the costs that users impose on the transmission system. TNUoS charges broadly combine three components: local charges (generators only), wider locational charges and residual charges (generation and demand).

Balancing Services Use of System Charges

The ESO recovers the costs of balancing the system through BSUoS charges, derived from the BSUoS charging methodology that is set out in Section 14 of the Connection and Use of System Code (CUSC)."

[It should also be noted that Ofgem's approach above, in its 2019 report, accords with its previous annual reports to the Commission going back some ten years or so since the Third Package came in.]

[Example 3]

Ofgem's Forward Looking Charges & Access documentation included a helpful guide on 'Current Arrangements' which contains information on this topic, such as:

Transmission Access (para 1.6-1.11)

“Transmission access is allocated through the connection process, on a first-come-first-served basis. Transmission-connected generators and large generators connected to distribution networks have explicit access to the **transmission system**. “

“As part of the connection process, transmission-connected generators and large generators connected to the distribution network agree their required Transmission Entry Capacity (TEC). This access to **the transmission system** is “financially firm”.”

“Where a generator seeking to connect to the distribution network may have an impact on the transmission network, the Statement of Works process requires the likely impact on the **transmission system** to be assessed.”

“Some small DG can agree the ability to export to the **transmission system** – through a Bilateral Embedded Generator Agreement (BEGA), which provides them with formal Transmission Entry Capacity, or may have a Bilateral Embedded Licence Exemptible Large power station Agreement (BELLA), as applicable. ”

“When a DNO receives a request from a generator intending to connect to the distribution network which it believes will have a significant impact on the **transmission system** it is required to request NG ESO, in conjunction with the relevant TO, to perform some analysis to determine whether there would be an impact – this is known as the ‘Statement of Works’ process. ”

Model used to calculate TNUOS charges (para 1.59-1.69)

“The Transport model calculates the marginal costs of investment in the **transmission system** which would be required as a consequence of an increase in demand or generation at each connection point or node on the **transmission system**. It does this by modelling the **transmission system** as over 900 “nodes” (basically junctions where different parts of the network meet, such as a substation). These nodes are connected by over 1400 “circuits” (transmission lines or cables that carry power). ”

[The Ofgem document also details the current arrangements for Transmission Connection Charges (at para 1.20-1.28) which make for informative reading.]

The full document can be found at:

[https://www.ofgem.gov.uk/system/files/docs/2019/09/000 - working paper - summer 2019 - existing arrangements final.pdf](https://www.ofgem.gov.uk/system/files/docs/2019/09/000_-_working_paper_-_summer_2019_-_existing_arrangements_final.pdf)

[Example 4]

[https://www.ofgem.gov.uk/system/files/docs/2019/09/000 - working paper - summer 2019 - _glossary_final.pdf](https://www.ofgem.gov.uk/system/files/docs/2019/09/000_-_working_paper_-_summer_2019_-_glossary_final.pdf)

Balancing Services Use of System (BSUoS) Charges

The Balancing Services Use of System (BSUoS) charge recovers the cost of day to day operation of the **transmission system**. Generators and suppliers are liable for these charges, which are calculated daily as a flat tariff across all users. The methodology that calculates the BSUoS is set out in Section 14 of the CUSC.

Connection charges

At transmission, connection charges cover the provision of electrical plant, lines and ancillary meters to construct entry and exit points on the national electricity **transmission system**. They also cover charges in respect of maintenance and repair where these costs are not recoverable as Use of System Charges, including all charges provided for in the statement of connection charging methodology (such as Termination Amounts and One-off charges). At distribution level, the full cost of new sole use Connection Assets are charged to the connectee. In addition, the connectee pays for a share of the Reinforcement costs under pre-determined apportionment rules.

Connection and Use of System Code (CUSC)

The CUSC is the contractual framework for connection to, and use of, the National Electricity **Transmission System** (NETS) in Great Britain.

Distribution network

In England and Wales this is the wires, cables and other network infrastructure that typically operate at 132kV and below, while in Scotland it is the infrastructure that operate below 132kV. Distribution networks carry electricity from the **transmission system** and Distributed

Generation to industrial, commercial and domestic users.

GB Transmission System

The system consisting of high voltage electric wires owned or operated by transmission licensees with Great Britain. This term is referred to in the CCCM and is similar to the term National Electricity Transmission System or “NETS” which is defined in the CUSC.

Local circuit tariff

TNUoS charges have two components – a wider network tariff and a local charge. Local charges are only paid by generators. The local circuit charge refers to the infrastructure between the location of the generator and the first connection to the Main Integrated Transmission System (MITs).

National Electricity Transmission System (NETS)

This is the system consisting of high voltage electric wires owned or operated by transmission licensees with Great Britain and offshore and used for the transmission of electricity from power stations to sub-stations, or between sub-stations, or to or from external interconnection. This system includes any plant, apparatus or meters that are owned or operated by any transmission licensee, within Great Britain or Offshore, in connection with the transmission of electricity, but does not include Remote Transmission Assets. This term is referred to in the CUSC and is similar to the term GB Transmission System which is defined in the CCCM.

Transmission System Operator (TSO)

TSOs own, operate and maintain the transmission networks. There are 3 licensed TSOs in Britain, and each is responsible for a regional transmission services area.

User Commitment Methodology

The user Commitment Methodology are the rules by which parties must underwrite works which they trigger on the transmission system. In the event that the party terminates its

Connection Agreement prior to connection (or even if it reduces the capacity at which it eventually connects), it must pay a Cancellation Charge (the liability) to the network operator. They may also be required to provide security to cover a proportion of the liability prior to the start of any works on the connection.

[Example 5]

NGESO's final Technical Report into the 9th August 2020 event, and in particular the glossary of terms on pages 37-38.

“Connection and Use of System Code (CUSC): This code is the contractual framework for connection to, and use of, the National Electricity Transmission System (NETS).”

“Grid Code: The Grid Code specifies technical requirements for connection to, and use of, the NETS. Compliance with the code is a requirement under the CUSC.”

“National Electricity Transmission System (NETS): This is the system consisting of high voltage electricity lines owned or operated by the three transmission licensees within Great Britain. The term also encapsulates a number of offshore transmission lines.”

“Offshore Transmission Owners (OFTOs): operate and maintain electrical transmission assets. In some cases, they also design and build these assets. In other cases, Generators design and build the electrical transmission assets and then transfer them to OFTOs at constructions completion.”

“Transmission Operator (TO): The UK power network consists of three onshore Transmission Operators (TOs): National Grid Electricity Transmission Plc (NGET) (England, Wales), Scottish Power Transmission Limited (southern Scotland) and Scottish Hydro Electric Transmission Plc (northern Scotland, Scottish islands groups). Transmission operators maintain, operate and develop the core electrical transmission infrastructure used to transmit electricity around Britain.”

[Example 6]

The CUSC itself and in particular Exhibits B and D (weblink below) which is where the generator/producer makes an application to the TSO to connect and use the transmission system; which is to the NETS (not MITS).

In terms of connecting to the transmission system in GB there are numerous references to NETS (rather than MITS) in Exhibit B of CUSC including:

“1. **The Company** requires the information requested in this application form for the purpose of preparing an **Offer** (the “**Offer**”) to enter into an agreement for connection to and in the case of a directly connected power station, use of the **National Electricity Transmission System**.”

“8. In the course of processing the application it may be necessary for **The Company** to consult the appropriate **Public Distribution System Operator(s)** on matters of technical compatibility of the **National Electricity Transmission System** with their **Distribution System(s)** or to consult the **Relevant Transmission Licensees** to establish the works required on the **National Electricity Transmission System** or to release information to **The Authority** in accordance with the **Transmission Licence**.”

“15. **Applicants** have the option to request a **Connection Offer** on the basis of a **Design Variation**. In requesting such an **Offer**, the **Applicant** acknowledges that the connection design (which provides for connection to the **National Electricity Transmission System**) will fail to satisfy the deterministic criteria detailed in paragraphs 2.5 to 2.13 or 7.7 to 7.19, as appropriate, of the **NETS SQSS**.”

“19. **The Company** will provide an **Offer** based upon the **National Electricity Transmission System** Security and Quality of Supply Standards (NETS SQSS). The criteria presented in the NETS SQSS represent the minimum requirements for the planning and operation of the **National Electricity Transmission System**.”

[The application form itself, within Exhibit B, that the producer has to complete and sign also has the following references:]

Section A

“6 If this is an application for connection to the **National Electricity Transmission System Onshore** in England and Wales please complete 6a. If this is an application for connection to the **National Electricity Transmission System Onshore** in Scotland please complete 6b.

6a. Have you made any applications for connection to the **National Electricity Transmission System Onshore** in Scotland which are being processed prior to **Offer** by **The Company** or where an **Offer** has been made that **Offer** has not yet been accepted by you but remains open for

acceptance?..... 6b. Have you made any applications for connection to the **National Electricity Transmission System Onshore** in England and Wales which are being processed prior to **Offer** by **The Company** or where an **Offer** has been made that **Offer** has not yet been accepted by you but remains open for acceptance?"

Section B

"1. Please identify (preferably by reference to an extract from an Ordnance Survey Map for **Onshore** locations, or with the latitude and longitude or some other corresponding equivalent for **Offshore** locations) the intended location (the "**Connection Site**") of the **Plant** and **Apparatus** (the "**User Development**") which it is desired should be connected to the **National Electricity Transmission System** and where the application is in respect of a proposed **New Connection Site** other than at an existing sub-station."

Section E

"1. We hereby apply to connect our **Plant** and **Apparatus** to the **National Electricity Transmission System** at a **New Connection Site**."

"7. We confirm that we are applying in the category of:

Directly Connected Power Station []

Non-Embedded Customer []

Distribution System Directly Connected to the

National Electricity Transmission System []"

[There are, within Exhibit B, three references to MITS.]

"Any variation to connection design must not reduce the security of the **MITS (Main Interconnected Transmission System)** to below the minimum planning standard, result in any additional costs to any particular customer and compromise a transmission licensee's ability to meet other statutory obligations or licence obligations"

Section E

"Enabling Works [*Directly Connected Power Station or Distribution System where associated with Distributed Generation only*]

1. We confirm we do not/do want the **Enabling Works** to be greater in scope than the **MITS Connection Works**.

2. If you want the **Enabling Works** to be greater in scope than the **MITS Connection Works** specify the concerns, reasons or technical requirements that you are seeking to address by this.”

[The equivalent documentation that the generator signs in terms of using the transmission system in GB is set out in Exhibit D – link below – and like Exhibit B, it is based on NETS not MITS.]

CUSC, Exhibit B

<https://www.nationalgrideso.com/document/91426/download>

CUSC, Exhibit D

<https://www.nationalgrideso.com/document/91436/download>

[end]