

Distributed Generation Connection Guides: G99 Types B-D Summary

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Acronym Guide

BEGA	Bilateral Embedded Generation Agreement	IDNO	Independent Distribution Network Operator
BELLA	Bilateral Embedded Licence exemptible Large power station Agreement	NGET	National Grid Electricity Transmission
CFD	Contracts for Difference	NGESO	National Grid Electricity System Operator
DNO	Distribution Network Operator	NHH	Non-Half Hourly (meter)
ENA	Energy Networks Association	RO	Renewables Obligation
EREC	Engineering Recommendation	PGF	Power Generating Facility
FITs	Feed in Tariffs	PGM	Power Generating Module
SEGs	Smart Export Guarantees	PPM	Power Park Module
HH	Half Hourly (meter)	SPGM	Synchronous Power Generating Module
ICP	Independent Connections Provider		

Note that this document covers the process for connecting generation to the distribution networks in Great Britain. Northern Ireland has different connection arrangements, for example different versions of Engineering Recommendations G98 and G99 are in use. For more information, refer to the Northern Ireland Electricity website: www.nie.co.uk

Introduction

Who is this Guide for?

This Guide is intended to help you, as a developer or prospective owner of any form of **Distributed Generation**, to connect your Power Generating Module to a distribution network in Great Britain. It may also be useful for installers or manufacturers of distributed generation equipment. Note that the term 'DNO' as used in this guide generally refers to both DNO and IDNO companies.

This "summary" guide is written for the developers of Distributed Generation projects which are covered by **Engineering Recommendation (EREC) G99**. This covers either:

- Projects with a capacity of **more than 16A per phase** (if there are multiple generation units connected at the same premises, then 16 A or more is the combined capacity per phase); or
- Projects connected at a **higher voltage** than 230 V (single phase), or 400 V (three phase); or
- Any other projects that are **not type tested** under the requirements of EREC G98.

If your project is within the scope of EREC G98, there are **alternative guides** and summary guides you can read. They are available on the Energy Networks Association website.

In particular, this Guide is written for projects within the scope of EREC G99 Types B—D, ie the Power Generating Module has a registered capacity greater at or above 1 MW, or is connected at or above 110 kV (in practice in GB this is at 132 kV or above).

What is the aim of the Guide?

This is a 'summary' form of a much more detailed guide, available on the Energy

Networks Association (ENA) website. The purpose of this summary guide is to act as a **simplified 'route map'** of the processes for getting a generation project connected to the distribution network.

You should be aware that the process of getting connected described in this guide is **only part of the process** of developing your distributed generation. For example, this guide does not cover:

- Designing, installing and operating the generation units themselves;
- Planning and financing the project; and
- Resolving local planning issues.

The format of the Guide

This Guide has been written and formatted with you, the reader, in mind. We have tried to make this Guide as clear and easy to read as we can, bearing in mind that some of the issues discussed are technical and complex. In particular:

- Any acronyms and terms which may be unfamiliar are explained in the glossary.
- Text is **emboldened** for emphasis.
- Where necessary the Guide distinguishes between the arrangements that apply in Scotland and those which apply in England and Wales. This is indicated with a Scottish flag.
- There is a pointer on where to find more information at the end of the guide.



Governance of the Guide

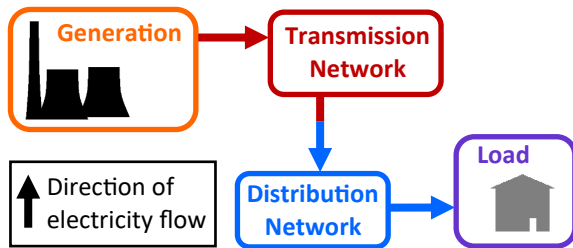
This Guide is a Distribution Code Review Panel (DCRP) document. The DCRP will update the Guide periodically.

Note: Many of the terms used in this guide are defined in the Glossary.

A: Background-The GB Power Sector

Traditional power system

In the traditional power system, electricity generally flows in one direction; from large power stations (mostly coal, gas and nuclear), into the transmission system, through to distribution systems and delivered to loads (such as homes, businesses and factories).



Changing power system

An increasing number of small electricity generating units are being developed, often connected to distribution networks. This is known as Distributed Generation, and can bring advantages such as low carbon energy sources and reduced transmission and distribution system costs.

However, it can result in the electricity flows in the network being less predictable. As this is not what the network was designed to deal with, this can cause issues around network control and protection.

Important terms

Transmission Network / Transmission System: Transports electricity over long distances across the country. Electricity is transported at a high voltage to reduce losses. Transmission voltages are 275 kV or 400 kV. In Scotland, 132 kV is also used.

Distribution Network / Distribution System: Transports electricity from the Transmission System (and from Distributed Generation) to loads like homes and businesses. The voltage is reduced to the correct supply voltage for the loads. Distribution voltages are 132 kV and lower in England and Wales, and less than 132 kV in Scotland. Most domestic customers are supplied at 230 V.

Key organisations

National Grid Electricity Transmission (NGET): The Transmission Owner for England and Wales. The Transmission Owner for northern Scotland is Scottish Hydro Electric Transmission Plc, and for southern Scotland, SP Transmission Plc.

National Grid Electricity System Operator (NGESO): The System Operator of the transmission system in England, Wales & Scotland.

Distribution Network Operator (DNO): Owns and maintains public electricity distribution networks. There are six DNOs in Great Britain.

Note: You may be connected to an Independent DNO's (IDNO) network or a private network rather than the DNO's network. In this Guide when we refer to DNOs, this also applies to IDNOs.

Suppliers: Buy electricity in bulk from generators, and then sell to consumers. They are responsible for providing bills and customer services, and arranging metering and meter reading. Electricity supply is a competitive market so you can choose and change your electricity supplier.

Elxon: The Balancing Settlement Code company for Great Britain.

Ofgem (Office of Gas and Electricity Markets): The regulator of the power system in Great Britain.

B. The Role of Distributed Generation

What is driving Distributed Generation?

Environmental concerns—The increased concern over the damage that Greenhouse Gases may be doing to our environment. Distributed Generation technologies are often renewable or low carbon means of generating electricity.

Government policy—The Department for Business, Energy and Industrial Strategy (BEIS) is developing policy to ensure that in the UK energy supplies are secure, low carbon, and fuelled from a diverse mix of energy supplies. This includes supporting Distributed Generation

Security of Supply—The need for secure and reliable sources of energy, both now and into the future.

Technological innovation

Technology is developing all the time, and there are more generating technologies and network techniques available now than there were when the national grid was being developed.

To incentivise innovation in energy networks, Ofgem runs two mechanisms: the **Network Innovation Allowance** (NIA, an allowance awarded to each network company) and **Network Innovation Competitions** (NIC, where network companies bid competitively to fund larger projects).

For more information, and details about individual projects, refer to the Smarter Networks Portal, hosted by the Energy Networks Association: www.smarternetworks.org/

Benefits of Distributed Generation

The benefits that increased Distributed Generation has on the UK and its electricity system include:

- **Increased energy mix** —often lower carbon; and
- If Distributed Generation is connected close to the point of use:
 - **Reduced need for network infrastructure;**
 - **Reduction in transmission and distribution losses.**

The commercial benefits to having Distributed Generation include:

- **Lower electricity bills**—through using your own energy onsite instead of importing from the grid;
- **Selling energy** that you generate, and gaining from **incentives** like FITs and CFDs; and
- **Participation in Ancillary Services**—Larger units (more than around 3 MW) may be able to participate.

Impacts of Distributed Generation

As well as introducing benefits, the increased penetration of Distributed Generation in UK distribution networks also poses challenges, including:

- **Thermal ratings** being exceeded;
- **System voltage** rising beyond the acceptable limits;
- **Reverse power flows**, i.e. power flows in the opposite direction to which the system has been designed;
- **Fault level** rising above the rating of equipment; and
- **Power quality** being affected, e.g. flicker, voltage unbalance or harmonics.

C: An Overview of Getting Connected

Below is a summary of the major tasks of the connection process. These tasks are described in more depth in this section of the guide.

1. PROJECT PLANNING PHASE

2. INFORMATION PHASE

3. DESIGN PHASE

4. CONSTRUCTION PHASE

5. ENERGISATION PLANNING & NOTIFICATION PHASE

6. COMPLIANCE, TESTING AND COMMISSIONING PHASE

ONGOING RESPONSIBILITIES

PGMD continually updated

1. Project Planning Phase: Useful Documents

Consult useful documents and information, including:

- The DNO's Long Term Development Statement (LTDS) - available on their websites.
- National Grid Electricity Transmission's ten year statement
- Supporting information provided by your DNO

2. Information Phase

A connection is often made up of two types of work:

- **Non-Contestable**—The DNO must complete this work as it covers work on existing network equipment owned by the DNO.
- **Contestable**—Either your DNO or an Independent Connections Provider (ICP) can complete this work. This often includes work on new infrastructure.

Using an ICP to install the contestable work allows the work to be competitively bid for, and so it could bring some cost advantages.

At the same time, any design and installation work that an ICP does will need to be approved by the DNO, as it is likely that the DNO will take over ownership of the infrastructure after construction. This brings about additional costs which will need to be accounted for when making this decision.

You may wish to invite quotations from a number of ICPs, as well as the DNO for comparison.

The National Electricity Registration Scheme (NERS) assesses ICPs and accredits them for various items of contestable work. DNOs stipulate that all or most items of Contestable work need to be carried out by accredited ICPs. A list of accredited ICPs can be found on the Lloyds register website.

General Tip: Communication with the DNO

Communication with the DNO from an early stage and throughout the project means you can discuss potential issues early, and allows you to plan your project effectively. You can also request additional information like budget estimates and feasibility studies, though some DNOs will charge for this.

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3. Design Phase

Formal Connection Application

A standard application form is used by all DNOs and the DNO will tell you what supporting information they need. An online application process may be available on your DNO's website. The more information you can provide on your form, the more accurate the connection quote will be.

If you contract an ICP at this stage, they will generally submit the forms and liaise with the DNO. However, you will need to have a relationship with the DNO as well, and some agreements may still be held directly between you and the DNO.

If the DNO is doing all the work, then the connection application will be submitted by you or your installer. The DNO's licence requires them to produce a connection offer **within 3 months** of them receiving all the required information.

Connection Offer

You, or an ICP acting on your behalf, will receive a Connection Offer from the DNO. This contains the **technical and commercial terms** under which the DNO will do the Non-contestable work and, if applicable, the Contestable work.

In some cases, a Connection Offer may be restricted by conditions such as a maximum export, or constraining output under certain network conditions.

The Connection Offer must be **reviewed carefully**—you can hire an independent consultant to help you, and you can discuss with the DNO before you reach a formal agreement.

Connection Offers are **time limited**, normally within 30 to 90 days. Your DNO will inform you how long the offer is valid for. If a Connection Offer is expired, there is no guarantee that the same offer will be made again. Connection Offers may also be withdrawn if the DNO feels that your plant is not being progressed at a reasonable rate. This may be measured by progress against 'milestones' set out in your Connection Offer.

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4. Construction Phase

Your DNO and/or ICP **constructs** your connection. You may also be installing your generation equipment. Agreements are discussed in Section G of this Guide.

You must submit a draft Power Generating Module Document (PGMD) to the DNO at least 28 days before you want to synchronise your Power Generating Module for the first time. A PGMD is a document that you submit to the DNO to confirm that your Power Generating Module(s) comply with EREC G99. It includes a checklist of criteria to meet, and a pointer to other documents that demonstrate compliance (e.g. reports of simulation studies, results of type testing, manufacturers' information, site tests). If you are connecting an Embedded Medium Power Station (ie your Power Generating Facility has a registered capacity of 50 MW or more in England and Wales) and you are not party to the CUSC (Connection and Use of System Code), in addition to the PGMD you will also have to comply with a number of Grid Code requirements.

5. Energisation Planning & Notification Phase (Type D only)

Agree site energisation data and DNO energises site (if applicable). If you are installing a Type D Power Generating Module there are additional notifications you need to obtain. Before energising your internal network for the first time, you need an Energisation Operational Notification (EON). When you want to synchronise your Power Generating Module for the first time you need to obtain an Interim Operational Notification (ION). The ION may impose limitations on the maximum allowed output of your plant.

Energy Storage

DNOs treat storage as demand when its importing from the distribution network and generation when its exporting to the distribution network, and it needs to meet relevant connection requirements (EREC G98 or G99). If you are planning to connected storage at 11kV or above you need to complete a Further Information Request, available on the ENA [website](#).

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ONGOING RESPONSIBILITIES

6. Compliance, Testing and Commissioning Phase

The requirements and tests for the **commissioning** of your generating equipment are set out in EREC G99 (Sections 15-19). You need to provide the DNO with detailed information about testing and commissioning at least 28 days before the proposed commissioning date. The DNO will inform you if they wish to witness your commissioning.

You need to record the results of the tests in the Installation and Commissioning Confirmation Form ([Form B3](#)) for Type B Power Generating Modules and [Form C3](#) for Types C and D Power Generating Modules). If you are not using Type Tested interface protection and / or you are demonstrating compliance with any other requirements on site you also need to record the results of the tests in the Site Compliance and Commissioning test requirements ([Form B2-2](#)) for Type B Power Generating Modules and [Form C2-2](#) for Types C and D Power Generating Modules).

You also need to submit final data required in the PGMD and Standard Application Form. When the DNO is satisfied that you have demonstrated compliance with EREC G99 they will issue you with a Final Operational Notification (FON). This will form part of your Connection Agreement.

Ongoing Responsibilities

Ongoing commitments are outside of the scope of this Guide, but you should be aware of them. They include:

- maintenance of the equipment;
- informing your DNO if you remove or replace part of your Power Generating Module;
- informing the DNO if something happens that affects the compliance of your Power Generating Module with EREC G99; and
- periodic testing specified by the DNO.

C: An Overview of Getting Connected

Medium and Large Power Stations

Larger Power Stations

If your project is a medium or large power station (as defined by the Distribution Code and Grid Code, see table opposite), then there are some additional complexities that you should be aware of.

	Power station size based on Registered Capacity	
	Medium	Large
National Grid (England and Wales)	50 to 100 MW	100 MW and above
SP Transmission Plc (southern Scotland)		30 MW and above
Scottish Hydro Electric Transmission Plc (northern Scotland)		10 MW and above



Generation Licence

Currently all generation with an export capacity of greater than 100 MW requires a Generation Licence. Generation between 50 MW and 100 MW capacity may be given an exemption from this requirement by the Secretary of State for Energy and Climate Change. For more information, see the UK government document: [Statutory Instrument 2001 No. 3270, The Electricity \(Class Exemptions from the Requirement for a Licence\) Order 2001](#).

There are a number of conditions in a Generation Licence, including:

- compliance with the **Distribution Code**, and parts of the **Grid Code** that apply to you; and
- compliance with the **Balancing and Settlement Code (BSC)** and becoming a party to the Balancing and Settlement Code Framework Agreement.

To apply for a Generation Licence, you should look up the UK government document: [Statutory Instrument 2008 No. 2376, The Electricity \(Applications for Licences, Modifications of an Area and Extensions and Restrictions of Licences\) Regulations 2008](#). This contains detailed information about how to make the application, including information about the costs of a Generation Licence.

National Grid Interfaces

If your Distributed Generation project is classed as a large power station, you will need to enter into an agreement with National Grid (NG). These could be:

- **Bilateral Embedded Generation Agreement (BEGA)** - This gives you the right to export onto the transmission network and to operate in the energy balancing market. If your generating units have a capacity of more than 100 MW you must enter into a BEGA. Developers of smaller stations have the option to enter into a BEGA if they wish to take part in the wholesale electricity market;
- **Bilateral Embedded Licence Exemptible Large Power Station Agreement (BELLA)** - This applies to the Scottish large power stations which do not need to hold a generation licence because they are below the 100 MW threshold. Scottish generators of this size can choose to enter into a BEGA or a BELLA. A BELLA allows you to export onto the transmission network, but you cannot take part in the energy balancing market.

C: An Overview of Getting Connected

EREC G99 was introduced in May 2018. It is based on EREC G59, which was revised to take account of a European Network Code called Requirement for Generators. Generation connecting to the distribution network must connect under EREC G98 or G99.

Types of Power Generating Module

Power Generating Modules are classified in EREC G99 as Power Park Modules (PPM) or Synchronous Power Generating Modules (SPGM) - see glossary.

In terms of classifying your Power Generating Module as Type A to D – for a Power Park Module, this is based on the total capacity of all non-synchronous generating units in the Power Generating Facility (all behind a single Connection Point). For Synchronous Power Generating Modules, this is based on the capacity of each Synchronous Power Generating Module, even if there are multiple modules in a Power Generating Facility.

For further information on this and for examples, refer to the full Guide for Type A Power Generating Modules and/or EREC G99.

Vehicle to Grid

Vehicle to Grid (V2G) is in its infancy and trials are being undertaken to further understand and demonstrate its benefits. For V2G the electric vehicle will be considered as both a demand and a generator by DNOs. The application you need to submit will depend on the power export capacity of the V2G unit and what generation or storage devices are already connected at the designated charging point. It is likely that V2G will be > 16 A/phase and therefore G98 is not applicable and G99 should be used. The current situation is that installers follow one of two generation application processes and sets of forms, which are as follows below:

- Where the total of all generation, fixed storage and the power export capacity of the V2G is < 50 kW 3-phase or 17 kW single-phase, the G99 Simplified Application Form A1-1 can be used.
- Where the total of all generation, fixed storage and the power export capacity of the V2G is > 50 kW 3-phase, the connection application should be made using the Standard Application Form.

In addition, your installer should complete forms associated with a standard Electric Vehicle (EV) charge point, such as the ENA EV installation form (“Application Form for the Installation of Low Carbon Technologies”). The DNO may request further information, such as a photograph of your electric meter and consumer unit. The ENA Low Carbon Technology Working Group has been looking at ways to simplify the connection application process and associated forms for V2G applications, including considering a single process that combines the aspects of EV as demand and generation. **This is now available and an updated version was published on the 7th July 21. The form is available at the [ENA website](#) under the heading “Connecting electric vehicles (EVs) and heat pumps”.**

C: An Overview of Getting Connected

Health and Safety Considerations

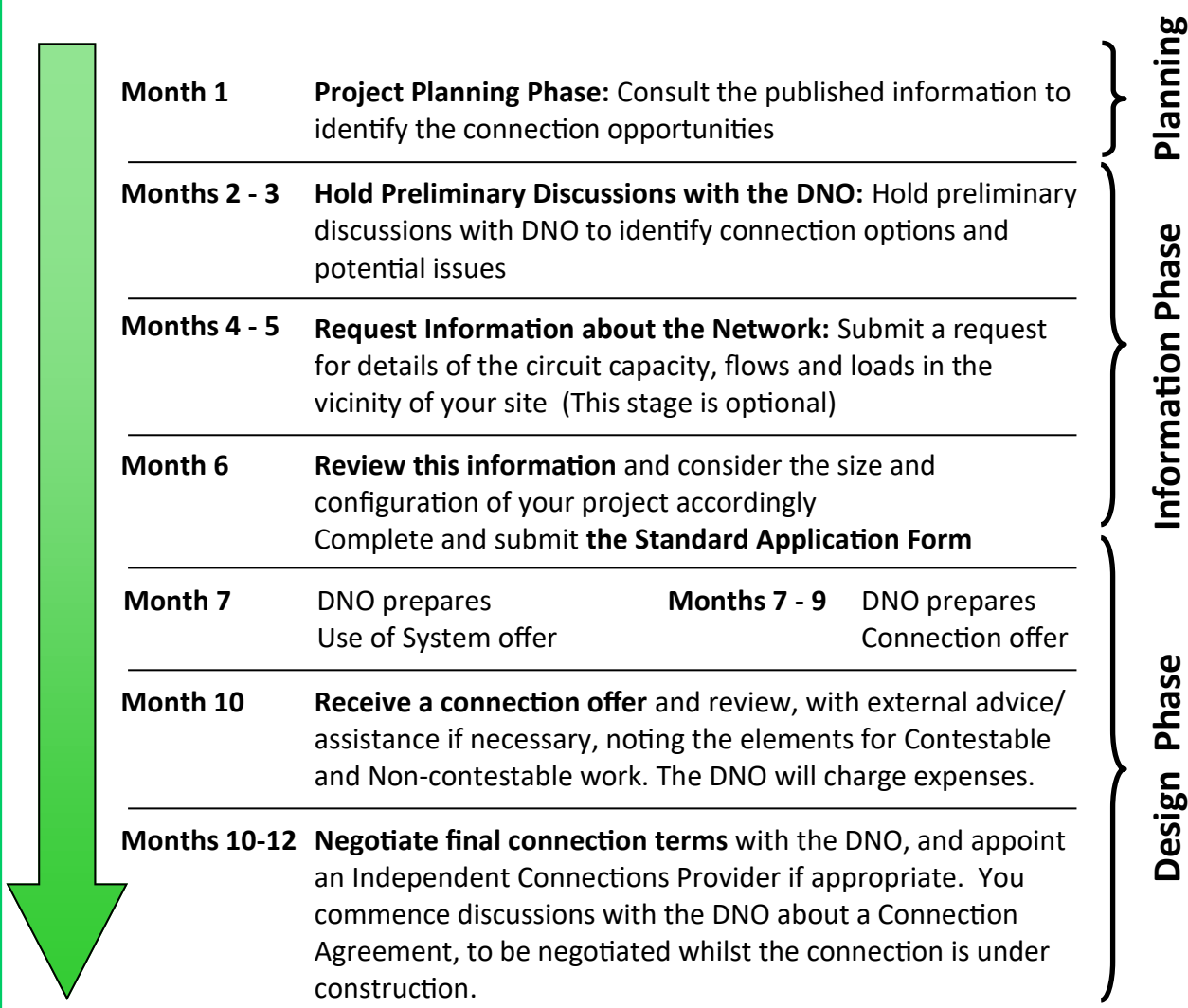
Some of the safety requirements for Distributed Generation connections are set out in EREC G99, which reflects Regulations and Acts such as the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002, and also the relevant British Standards.

D: The Connection Application Timeline

The timeline below is an **indicative** guide as to how long it might take you to have a Connection Offer agreed with your DNO. The times shown in the timeline could vary depending on, for example:

- How **complex** your connection is, and any technical or planning issues that the DNO identifies;
- How quickly you do the background work. It is possible to combine some of the stages of activity, e.g. you begin compiling the information to support your connection application whilst in the early stages of discussions with the DNO; and
- If your generation project might have an impact on the **transmission network**, the timescale could be **significantly extended**, due to the need for NGESO to carry out a Statement of Works process. You should discuss the likelihood of a Statement of Works being required with your DNO at an early stage.

Sometimes the DNO may be considering your Connection Application alongside others which would have an impact on the same part of the distribution network. In this case all the relevant applications are referred to as “interactive”, and connection applications are considered on a ‘first come-first served’ basis. Your DNO will tell you if your application is interactive.



E: Costs and Charges

Costs and charges can be divided into two categories:

CONNECTION CHARGES

ONGOING CHARGES

DNOs are obliged to publish documents about their charges, which can be found on their websites. These contain the **DNO's charging methodology** (i.e. how they calculate their charges), the **DNO's charging statement** (i.e. what the charges are), and other relevant information for connecting customers.

Ongoing Charges

- **Generation Distribution Use of System (UoS) charges:** Cover the operation and maintenance of the distribution network. They are levied by the DNO to the supplier, so you will not be charged these directly. However, they may appear as an item on your bill.
- **Transmission Network Use of System (TNUoS) charges:** Cover operation and maintenance of the transmission network. These will apply if you hold a generation licence and a BEGA.
- **Top-up and standby charges:** To supplement the output from your generating units to cover your electricity demand on site.
- **Metering charges:** If you have a Half Hourly (HH) meter, it is your responsibility to appoint a Meter Operator to install, maintain and collect data from your meter. If you are exporting, and your capacity is above a certain threshold (currently 30 kW), you must have a HH meter, If you have a Non-Half Hourly (NHH) meter, your supplier is responsible for it.

Details of Meter Operators can be found on the Association of Meter Operators website: www.meteroperators.org.uk
Changes are underway for UoS charges.

Connection charge

This is a one-off charge made by the DNO to cover the cost of your connection, which may contain charges for:

- **Infrastructure:** new equipment and reinforcement to the existing network necessary to accommodate your generation. You will be charged for:
 - Extension to the network
 - A **portion** of reinforcement costs
- **Budget Estimates and Feasibility Studies** (optional).
- **Approval of ICP work:** Where work is being undertaken by an ICP, the DNO may charge for design approval, inspection and monitoring of work and witnessing tests.
- **Information provision:** Determining or providing information on point of connection.
- **Statement of Works Process:** This process identifies whether work needs to be carried out on the transmission system as a result of your generation project. You may be charged for the Statement of Works itself, and any transmission system work that the project requires. The process is under review – see the full Guides for more details.
- Others, including: Administration, additional meetings or site visits, provision of Wayleaves, NGESO fees, substation locks and notices.

Note that not all DNOs apply charges for all of these items, and that not all of these items will be relevant for your project. To obtain a more accurate picture of the connection costs for your project, you can get a budget estimate from either the DNO, or from a specialist engineering consultant. You must be aware that this will be an estimate, and may not accurately reflect what you will be charged.

F: Selling Electricity-SEG

Important Point: The SEG scheme for generators opened on the 1st January 2020. The SEG scheme replaces the Feed-in Tariff (FIT) scheme that closed on the 31st March 2019 but works differently to FITs.

There are two sources of financial benefit from FIT payments which are:

- **Generation tariff:** A fixed unit for each unit of electricity generated.
- **Export tariff:** A guaranteed price for each unit of electricity exported to the grid.

The SEG scheme obliges electricity suppliers to offer an export tariff rate to an eligible generating unit.

Generators cannot receive SEG payments as well as FIT payments for exported electricity. However, if the generator continues to receive FIT generation payments and opts out of receiving FIT export payments then they are eligible to receive SEG export tariff payments.

Smart Export Guarantees (SEGs)

SEGs are a financial incentive to support distributed renewable energy generation **up to 5 MW**. SEGs are available for the following generation technologies:

- Anaerobic digestion (AD)
- CHP and Micro-CHP*
- Solar PV
- Wind
- Hydro

*Up to 30,000 domestic Combined Heat and Power (CHP) units are supported through FITs under a Micro-CHP pilot scheme. These units must have a capacity of no greater than 2 kW each.

There are financial benefits for Generation projects that use the old FIT and new SEG scheme.

Generation and Export tariff (FITs):

Installations which receive payments under the FIT scheme will continue to receive the same generation and export tariffs that were current at the time of installation. The last export tariff under the FIT scheme, before the scheme closed on the 31st March 2019, was fixed at 5.24p/kWh. This differs from the export tariff rate offered through the SEG scheme, which depends on the electricity supplier you choose to contract with.

SEG Export Tariff

The SEG scheme is an export tariff, which is a guaranteed price for each unit of electricity exported to the grid. It is an obligation for licensed energy suppliers to offer eligible generation projects an export tariff rate. The electricity suppliers decide the SEG export tariff details i.e. the rate and the length of the contract. However, although wholesale electricity prices can fall below zero due to changes in demand, electricity suppliers must always offer a tariff which is greater than zero.

G. Technical and Commercial Interfaces

CONTRACTS AND AGREEMENTS

Connection Agreement: Covers the conditions under which your equipment is entitled to be physically connected to the DNO's network and remain connected and energised during normal operation of the network. A first draft will probably be prepared by the DNO for discussion, agreement and signature. DNOs discuss the Connection Agreement in their Connection Charging Methodology, available on their website.

Adoption Agreement: If you use an ICP to construct the Contestable work for your connection, an Adoption Agreement will be needed. This will cover the arrangements for the DNO to take over responsibility for the infrastructure installed by the ICP. The Agreement is held between the DNO and either you or your ICP, depending on your circumstances. DNOs discuss the Adoption Agreement in their Connection Charging Methodology, which are available online.

Other Agreements:

- **Terms for 'Use of System'** are either covered by:
 - i. The agreement you will have with your supplier, who is a party to the DCUSA. This is the most likely option.
 - ii. Entering into a 'Distribution Connection and Use of System Agreement' (DCUSA). See the DCUSA website: www.dcusa.co.uk
- **Agreements with NGESO**, for large power stations. This will be either a Bilateral Embedded Generation Agreement (BEGA) or a Bilateral Embedded Licence Exemptible Large Power Station Agreement (BELLA) (this is explained further in Section C: An Overview of Getting Connected)
- **An agreement for electricity supply** with a supplier
- **A Power Purchase Agreement** or an **agreement with your supplier** for selling your exported electricity
- **Metering Agreements**

OPERATIONAL ISSUES

Once your Power Generating Modules have been connected, you still have some ongoing responsibilities around running your generating equipment. For example, you may need to provide the DNO with forecasts of your generation output, or exchange information with them if an unusual event occurs. These are outlined in a section of the Distribution Code called the Distribution Operation Code (DOC).

The DNO may apply conditions to your connection, such as limiting generation export under certain network conditions. If your DNO does apply such conditions, this will be detailed in your Connection Agreement. You may be offered such a connection if the network reinforcement required to fully accommodate your generation scheme is not feasible, or is very expensive.

Where to Find More Information

Relevant Organisations:

Energy Networks Association —the industry body for UK energy transmission and distribution licence holders and operators: www.energynetworks.org

Ofgem is a good source of up to date information about **Smart Export Guarantee** — [Ofgem SEG](#)

Note that your electricity supplier is your point of contact for the SEG scheme.

National Grid Electricity Transmission (NGET)—The Transmission System Owner in England and Wales: www.nationalgrid.com/uk/Electricity/

Has a lot of useful information available, including the National Grid Electricity Transmission Ten Year Statement and more information about connection and agreements

National Grid Electricity System Operator (NGESO) - The System Operator in England, Wales and Scotland: <https://www.nationalgrideso.com/>

National Grid's **Electricity Market Reform (EMR) Delivery Body** is a good source of information on Contracts for Difference (CFD): www.emrdeliverybody.com

Department for Business, Energy and Industrial Strategy (BEIS) - For the most up to date information on relevant Government policy <https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy>

Energy Saving Trust—www.energysavingtrust.org.uk/Generate-your-own-energy

Some Useful References:

Engineering Recommendation G98 and G99— available free of charge on the DCode website: www.dcode.org.uk/

The Grid Code of Great Britain — available free of charge on NGESO's website: [Grid code](#)

The Distribution Code of Great Britain—available free of charge on the Distribution Code website: www.dcode.org.uk/

Approved Independent Connections Providers (ICPs)—see the Lloyds Register website information on the National Electricity Registration Scheme (NERS): www.lr.org/en/utilities/national-electricity-registration-scheme-ners/search/

Metering Codes of Practice: www.elexon.co.uk/bsc-related-documents/related-documents/codes-of-practice/

For full details on **Generation Licence exemptions:** www.legislation.gov.uk/ukxi/2001/3270/contents/made

Certified generation products and installers: www.microgenerationcertification.org

The European Network Code, Requirements for Generators—available on the [EUR-Lex website](#)

Where to Find More Information

There is a great deal of published information that your DNO will provide that will be helpful for your project planning. Some of the most useful sources are summarised here, and links to the DNO websites are in the table below. You should also contact your DNO from an early stage in your project, and they will be able to advise you with information specific to your situation.

Long Term Development Statement (LTDS)

Covers the development plans for the network, and other information useful for prospective developers. An introductory chapter is generally available on the DNO's website and DNOs will give access to the full document on request. These documents are updated annually.

Connection Charge Documents

Statements and methodologies will be given for both connection charges and Use of System (UoS) charges. This information may be included in a single document, or in several, and are updated regularly. These are available on DNO websites.

Standards of Performance

Ofgem has set minimum performance standards for the provision and performance of connections, and if your DNO fails to meet these standards, you may be entitled to receive payment. Ofgem has guidance documents about these Standards on their website:

www.ofgem.gov.uk/licences-codes-and-standards/standards/quality-service-guaranteed-standards

Distributed Generation "Work Plan"

The Incentive for Customer Engagement (ICE) exists to encourage DNOs to engage with and respond to the needs of major connections customers (which includes generation customers), and includes a requirement on DNOs to set out plans on what improvements they plan to make in the next regulatory year, consisting of two parts. Part 1 covers plans for improvements for the forthcoming year; and Part 2 reviews the progress in the previous year. Check your DNOs Distributed Generation web pages.

Other Supporting Information Provided by DNOs

In recent years, there have been improvements to the information that DNOs provide, including:

- web portals and decision support tools/application hotline;
- capacity "heat maps", indicating areas that can more readily facilitate connections;
- holding events such as "open surgeries" for Distributed Generation customers; and
- more details provided on outages (historic and planned outages).

Region	DNO	Website
North Scotland, Southern England	SSE Power Distribution	www.ssepd.co.uk
South Scotland, Cheshire, Merseyside and North Wales	SP Energy Networks	www.spenergynetworks.com
North East England and Yorkshire	Northern Power Grid	www.northernpowergrid.com
North West	Electricity North West	www.enwl.co.uk
East Midlands, West Midlands, Southern Wales, South West England	Western Power Distribution	www.westernpower.co.uk
Eastern England, South East England, London	UK Power Networks	www.ukpowernetworks.co.uk

Where to Find More Information

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North Scotland, Southern England	SSE Power Distribution	www.ssepd.co.uk
South Scotland, Cheshire, Merseyside and North Wales	SP Energy Networks	www.spenergynetworks.com
North East England and Yorkshire	Northern Powergrid	www.northernpowergrid.com
North West	Electricity North West	www.enwl.co.uk
East Midlands, West Midlands, Southern Wales, South West England	Western Power Distribution	www.westernpower.co.uk
Eastern England, South East England, London	UK Power Networks	www.ukpowernetworks.co.uk
No area—IDNO	GTC	www.gtc-uk.co.uk

Glossary of Terms

Balancing and Settlement Code company: Governs the operation of the balancing mechanism. They charge generators and suppliers for the cost to the System Operator to balance the market. The Balancing and Settlement Code company for Great Britain is Elexon.

Commissioning: A set of visual inspections and tests performed on equipment after installation, renovation or maintenance, and before it goes into full operation. Commissioning aims to ensure the equipment is working safely and as it should.

Contestable Work: There are certain tasks in the connection design and construction that are open to competition. This is called Contestable work and can be conducted by Independent Connections Providers (ICPs) or by a DNO. Conversely, when work is not open to competition it is called Non-contestable work.

Contract for Difference (CFD): A bilateral contract between a generator and the Low Carbon Contracts Company (LCCC, the CFD counterparty).

Distribution Code: The code required to be prepared by a DNO pursuant to condition 21 (Distribution Code) of a Distribution Licence and approved by the Authority (The Gas and Electricity Markets Authority - Ofgem) as revised from time to time with the approval of, or by the direction of, the Authority.

Distributed Generation: A generation project is classed as Distributed Generation if it operates while electrically connected to the distribution network. Also known as 'Embedded Generation'.

Distribution Network (System): Transports electricity from the Transmission System to loads like homes and businesses. The voltage is reduced to the correct supply voltage for the loads. The voltage is 132kV and lower. Most customers are supplied at 230V.

Distribution Network Operator (DNO): Owns and maintains public electricity distribution networks. They must hold a Distribution Network Operator Licence. These are regulated monopoly businesses which recover their costs by levying use of system charges on electricity traded using their network. There are six DNOs in Great Britain.

Engineering Recommendation (EREC) G98: Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks on or after 27 April 2019.

Engineering Recommendation (EREC) G99: Requirements for the connection of generation equipment in parallel with public distribution networks on or after 27 April 2019.

Engineering Recommendation (EREC) G59: Recommendations for the Connection of Generating Plant to the Distribution Systems of Licensed Distribution Network Operators. This is not applicable to generation connecting after the 27th April 2019.

Smart Export Guarantee (SEG): A financial incentive to support distributed and small-scale renewable energy generation, up to 5 MW.

Fully Type Tested: The whole Power Generating Module is type tested, rather than just part of the Power Generating Module.

Generating Unit: Any apparatus which produces electricity.

Generator: A person who generates electricity under licence or exemption under the Electricity Act 1989.

Independent Connections Provider (ICP): Companies that have been thoroughly assessed and granted the necessary accreditation to provide new connections in competition with the DNOs.

Independent Distribution Network Operator (IDNO): A holder of a distribution licence, an IDNO designs, builds, owns and operates a distribution network, which is an extension to existing DNO network. They typically build network for new developments such as business parks, retail and residential areas and

Glossary of Terms

leisure facilities. Your local DNO will be able to inform you if you are connected to an IDNO's network or a private network rather than the DNO's network.

Non-contestable Work: There are certain tasks in the connection design and construction that DNOs do themselves, so that they can maintain co-ordination and control of their networks. These tasks are called Non-contestable work, as they are not open to competition. Conversely, when work is open to competition it is called Contestable work.

Office of Gas and Electricity Markets (Ofgem): The regulator of the electricity system. They are responsible for regulating prices and performance in the monopoly elements of the electricity supply industry, resolving disputes between different parties when necessary, and granting the various licences in the power sector, including generation licences.

Power Generating Facility (PGF): One or more Power Generating Modules connected to at one or more Connection Points. This is a Power Station in EREC G59.

Power Generating Module (PGM): Either a Synchronous Power Generating Module (SPGM) or a Power Park Module (PPM).

Power Park Module (PPM): Generating Units that are connected to the network either through power electronics (eg solar PV or electricity storage devices connected through an inverter) or asynchronously (eg some wind turbines are induction or asynchronous generation). They have a single Connection Point to the distribution network.

Registered Capacity: The normal full load capacity of a Power Generating Module less the MW consumed when producing the same (ie auxiliary load). For Power Generating Modules connected via an Inverter, the Inverter rating is the Power Generating Module's rating.

Renewables Obligation (RO): Formerly the main support mechanism for renewable electricity projects over 50 kW, and those that are not eligible for FITs due to the type of technology (replaced by CFD).

Suppliers: Buy electricity in bulk from generators, and then sell to consumers. They are responsible for providing bills and customer services, and arranging metering and meter reading.

System Operator: Responsible for balancing demand with generation on a second by second basis. National Grid Electricity System Operator (NGESO) is the System Operator in Great Britain.

Transmission Network (System): Transports electricity over long distances across the country. Electricity is transported at a high voltage to reduce losses. The voltage is 275kV or 400kV. In Scotland, 132kV is also used.

Transmission Owner (TO): Owns and maintains the high voltage transmission system.

The Transmission Owners are as follows:

- National Grid Electricity Transmission (NGET) in England and Wales
- Scottish Power in southern Scotland (SP Transmission Plc)
- Scottish and Southern Energy (SSE) in northern Scotland (Scottish Hydro Electric Transmission Plc)

Type tested equipment: Equipment that has been tested to ensure that it meets the requirements of EREC G98 or G99. Using type tested equipment simplifies the connection and commissioning process.