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## Acronym Guide

|      |                                  |      |   |
|------|----------------------------------|------|---|
| DNO  | Distribution Network Operator    | IDNO | Independent Distribution Network Operator |
| ENA  | Energy Networks Association      | NHH  | Non-Half Hourly (meter)                   |
| EREC | Engineering Recommendation       | PGF  | Power Generating Facility                 |
| FITs | Feed in Tariffs                  | PGM  | Power Generating Module                   |
| HH   | Half Hourly (meter)              | PPM  | Power Park Module                         |
| ICP  | Independent Connections Provider | SPGM | Synchronous Power Generating Module       |

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 G83/G98 and G59/G99 are in use. For more information, refer to the Northern Ireland Electricity website: [www.nie.co.uk](http://www.nie.co.uk)

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

# 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 generating unit to a distribution network in Great Britain. It may also be useful for installers or manufacturers of distributed generation equipment.

This “summary” guide is for developers of distributed generation projects which are covered by **Engineering Recommendation (EREC) G99**. This covers either:

- Projects with a capacity of **more than 16 A 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 projects that are **not type tested** under the requirements of EREC **G83/G98**.

In particular, this Guide is written for projects within the scope of **EREC G99 Type A**, ie the **Power Generating Module has a registered capacity greater than 16 A per phase but less than 1 MW**.

If your project is within the scope of EREC **G83, EREC G98 or EREC G59**, there are **alternative guides** and summary guides you can read.

## 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 **Power Generating Module** 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.



Because the topics covered here are technical and complex, it is necessary to refer to such concepts as voltage and power. Where possible, terms that may be unfamiliar have been defined.

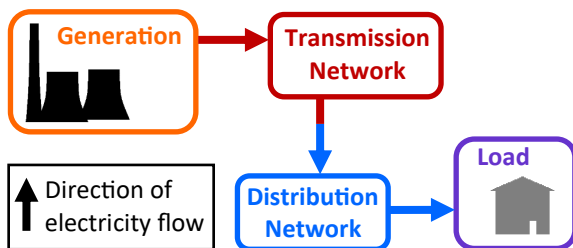
## Governance of the Guide

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

# 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 System Operator for Great Britain, and also 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**.

**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/](http://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
- **Participation in Ancillary Services**—Larger units (more than around 3MW) 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.

## 1. FIND AN INSTALLER

Installers must be competent

## 2. REVIEW INFORMATION and DISCUSS WITH THE DNO

Hold meetings with your DNO

## 3. SUBMIT APPLICATION FORM

## 4. APPLICATION ACCEPTANCE

Accept a Connection Offer from your DNO

## 5. COMPLIANCE

Submit relevant compliance forms

## 6. INSTALLATION AND COMMISSIONING

Infrastructure is installed and tested

## 7. INFORM THE DNO

Submit the Installation and Commissioning form

## 8. ONGOING RESPONSIBILITIES

### 1. Find an installer

For installations up to 50 kW certified generation products and installers can be found [here](#).

### 2. Review Information and Discuss with the DNO

You should look for supporting information published on the DNO's website, as this can be a valuable resource.

You must also discuss your plans with the DNO before starting work, including issues such as feasibility and potential charges. You should do this as soon as possible in your planning, as the DNO's response may have a significant impact on how you plan your project.

### 3. Submit Application Form

Once you have planned the project and exchanged information about your plans with the DNO, it is time to submit an application form. If your Power Generating Module is less than 50 kW three-phase or 17 kW single-phase, then you can use a simplified application form (Annex A.1 of EREC G99). For larger schemes, you should use the standard application form, which is generally available on DNOs' websites.

### 4. Application Acceptance

When you submit your application form the DNO will assess the impact that your Power Generating Module may have on the network. Once the DNO has conducted these assessments, they will produce a Connection Offer. This will specify the conditions for your connection, and inform you of any connection charge that you may be asked to pay.

You should ensure that you fully understand this offer before accepting it. You should discuss questions with your DNO if you are unsure.

### 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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### 5. Compliance

If your Power Generating Module is Fully Type Tested and has a Manufacturer's reference number available (the Product ID on the ENA Type Test Verification Report Register), then you should include this number in your application.

Otherwise you need to provide the DNO with a Compliance Verification Report. The format of these reports is given in Annex A.2 of EREC G99. These forms are completed by the manufacturer of your Power Generating Module. However, you (or your installer on your behalf) should obtain these and submit them to the DNO as part of the connection commissioning process.

### 6. Installation and Commissioning

EREC G99 details the commissioning tests that you or your installer needs to perform. Your DNO will complete any work required on the network. Close communication with the DNO throughout this process will allow coordinated planning of construction and connection.

Commissioning can only take place once the construction is complete. For generating units covered by EREC G99, it is your obligation to undertake appropriate commissioning tests, which the DNO may choose to witness.

You should notify the DNO at least 28 days before commissioning the Power Generating Module.

### 7. Inform the DNO

You must supply your DNO with commissioning documentation either at the time of commissioning (where tests are witnessed) or within 28 days of the commissioning date (where the tests are not witnessed). The information to be provided is captured on the Installation Document (Form A.3 in EREC G99) and Site Compliance and Commissioning Test Form (Form A.2-4, where required). DNOs may have their own installation commissioning confirmation forms on their websites.

# C: An Overview of Getting Connected

## 7. 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 your generating unit;
- 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.

### 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.

### Dealing with Disputes

If you have a dispute during the connection process which you cannot resolve with the party directly, you can contact the Energy Ombudsman:

[www.ombudsman-services.org/energy](http://www.ombudsman-services.org/energy)

As a last resort it can then be referred to Ofgem.

## 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.

**Grace Period:** 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 before 27<sup>th</sup> April 2019 can be connected under either EREC G59 or EREC G99, depending on which document the generating units were designed to. Generation connecting from 27<sup>th</sup> April 2019 must connect under EREC G99. If you are installing your generation after 27<sup>th</sup> April 2019, you may still be able to install under EREC G59, provided that you meet the following requirements:

- You have concluded a signed final and binding contract by 17<sup>th</sup> May 2018 for the main plant items, and
- You submit evidence of the above to the DNO before 17<sup>th</sup> November 2018.

If this may apply to you, you should discuss this with your DNO.



## D: The Connection Application

There are [two formal documents](#) that you need to submit to your DNO throughout the connection process. Both of these are mentioned in the previous section of this Guide, and described in further detail here:

### The Connection Application Form

For Power Generating Modules with capacity less than 50 kW 3-phase or 17 kW single phase there is a simplified connection application form in Annex A.1 of EREC G99. This needs to be submitted to your DNO **before you begin installation**. Connection of **Power Generating Modules** will only be allowed to proceed after the DNO has approved the application, and any facilitating works for the connection have been completed.

The information required includes:

- details of the **installer** of the generating units, including their qualifications; and
- **information on the proposed equipment**, including the address, meter number, capacity and type testing reference number.

For larger Power Generating Modules there is a Standard Application Form, which is available on the ENA website and generally on DNO websites. It contains data requirements to assist the DNO with carrying out system studies to assess your connection. You should do your best to provide as much of this information as possible.

### Compliance Forms

If your Power Generating Module is Fully Type Tested and has a reference number:

- You should include the reference number on your application form; and
- You do not need to submit anything further to demonstrate compliance.

Otherwise, your Power Generating Module may comprise a mixture of:

- Type tested components;
- Components where the compliance is demonstrated using manufacturers' information; and
- Components that will need to be tested on site.

In this case you (or your installer) **need to submit information to indicate how you are intending to demonstrate compliance** with EREC G99. This is done by submitting a Compliance Verification Report for each Power Generating Module (Annex A.2 of EREC G99) - either at the time of commissioning (if tests are witnessed) or within 28 days.

In some cases you will need to demonstrate elements of compliance on site. You can do this at the time of commissioning (Form A.2-4 in EREC G99).



## D: The Connection Application

### The Installation Document

The Installation Document is in Annex A.3 in EREC G99. It needs to be filled in and given to your DNO **either on the day of commissioning** (where the tests are witnessed by your DNO) **or otherwise within 28 days of the date of commissioning**. The information required includes:

- details about the **site** where you are connecting your **Power Generating Module**, including meter information (**MPAN**);
- **contact details** for the owner of the **Power Generating Module**;
- **technical information** about the **Power Generating Module** itself, including the generating capacity, type test reference (**if applicable**) and primary energy source;
- details of the **installer** of the **Power Generating Module**, including the party's accreditation and qualifications;
- **supporting information**, e.g. circuit diagrams;
- a **signed declaration** as to the compliance of the **Power Generating Module** with the requirements of EREC **G99**; and
- a **signed declaration** as to the compliance with the site compliance and commissioning tests, if applicable (Form A2.-4).

There are two parts to the Installation Document:

- Part 1 is required for the Power Generating Facility; and
- Part 2 is required for each Power Generating Module.

# 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.

### 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).
- Others, including: Administration, additional meetings or site visits, provision of Wayleaves, 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. It is likely that you will need to pay for this estimate.

### Ongoing Charges

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.

DNOs are obliged to publish documents about their Use of System charges. You can find these on DNOs' websites.

UoS charges change depending on:

- the **voltage level** you are connected to; and
- the **type of meter** you have. All projects with a capacity greater than a certain threshold (currently 30kW) must have a Half Hourly (HH) meter (if metering export). If you have a HH meter, it is your responsibility to appoint a Meter Operator to install, maintain and collect data from your meter. If you have a Non-Half Hourly (NHH) meter, then it is the responsibility of the supplier to install, maintain and collect data.

With the Common Distribution Charging Methodology charges for LV generation customers with NHH meters are in the form of a single unit rate (p/kWh).

## F: Selling Electricity-Incentive Schemes

### FEED-IN TARIFFS (FITs)

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

- Anaerobic Digestion
- Combined Heat and Power (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 three sources of financial benefit from a Generation project receiving FITs:

#### 1. Generation tariff (FITs):

A **fixed price** for each unit of electricity **generated**, depending on the generation technology. The tariffs are reviewed regularly, and can be found on Ofgem's webpage. The tariff level that your generator will receive will remain the same throughout the eligible lifetime of the project, (usually 20 years).

#### 2. Export tariff:

A **guaranteed price** for each unit of electricity **exported** to the grid. The tariffs are reviewed regularly, see BEIS's or Ofgem's webpages.

#### 3. Import

#### Reduction:

**Reducing** your electricity bill by using your own electricity rather than importing from the grid.

In the case of solar PV, your tariff will also be dependent on the number of PV installations that you are receiving FIT payments for, and the energy efficiency of the property itself.

FITs are subject to "**deployment caps**" - this is a limit on the capacity that can receive a particular FIT tariff, in a particular tariff period.

The accreditation process for your generation project will depend on the generating technology you are using. **To find out more, please see Ofgem's website.**

The **Feed-in Tariffs (Amendment) Order 2015** allows two projects to share one grid connection and receive separate tariffs based on their individual generating capacity, provided that at least one project is owned by a **community organisation**. Both parties sharing the grid connection will be individually required to seek support under the FITs scheme and to meter their generation separately.

**Community Energy Schemes:** The Feed-in Tariffs (Amendment) Order 2015 has introduced an exemption to the definition of the term "site" in the FIT legislation, which is effective from April 2015. The amendment allows two projects to share one grid connection and receive separate tariffs based on their individual generating capacity, provided that at least one project is owned by a community organisation. Both parties sharing the grid connection will be required to seek support under the FITs scheme. In order to enable Ofgem to treat the individually owned sections as separate eligible installations each will be required to register as separate FIT generators and to meter their generation separately.

## 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](http://www.energynetworks.org)

**Ofgem** is a good source of up to date information about **Feed in Tariffs** — [www.ofgem.gov.uk/environmental-programmes](http://www.ofgem.gov.uk/environmental-programmes)

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

**National Grid** —The Great Britain System Operator and Transmission System Owner in England and Wales: [www.nationalgrid.com/uk/Electricity/](http://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

**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](http://www.energysavingtrust.org.uk/Generate-your-own-energy)

### **Some Useful References:**

**Engineering Recommendation G98 and G99**— available on the DCode website: [www.dcode.org.uk/annexes.html](http://www.dcode.org.uk/annexes.html)

**Engineering Recommendation G59 and G83**—available on the DCode website and the ENA Document Catalogue System: [www.ena-eng.org/ENA-Docs/](http://www.ena-eng.org/ENA-Docs/)

**The Grid Code of Great Britain** — available free of charge on NGET's website: <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-Code/>

**The Distribution Code of Great Britain**—available free of charge on the Distribution Code website: <http://www.dcode.org.uk/the-gb-distribution-code/>

**Metering Codes of Practice:** [www.elexon.co.uk/bsc-related-documents/related-documents/codes-of-practice/](http://www.elexon.co.uk/bsc-related-documents/related-documents/codes-of-practice/)

**Certified generation products and installers:** [www.microgenerationcertification.org](http://www.microgenerationcertification.org)

**The European Network Code, Requirements for Generators**—available on the [EUR-Lex website](http://eur-lex.europa.eu)

## 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 your DNO's 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](http://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     | <a href="http://www.ssepd.co.uk">www.ssepd.co.uk</a>                     |
| South Scotland, Cheshire, Merseyside and North Wales             | SP Energy Networks         | <a href="http://www.spenergynetworks.com">www.spenergynetworks.com</a>   |
| North East England and Yorkshire                                 | Northern Power Grid        | <a href="http://www.northernpowergrid.com">www.northernpowergrid.com</a> |
| North West   | Electricity North West     | <a href="http://www.enwl.co.uk">www.enwl.co.uk</a>                       |
| East Midlands, West Midlands, Southern Wales, South West England | Western Power Distribution | <a href="http://www.westernpower.co.uk">www.westernpower.co.uk</a>       |
| Eastern England, South East England, London                      | UK Power Networks          | <a href="http://www.ukpowernetworks.co.uk">www.ukpowernetworks.co.uk</a> |

# 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.

**Close Geographic Region:** Typically, an area which is fed by the same part of the distribution network, from a single feeder or distribution transformer. A general rule of thumb is that if your installations are within 500 meters of each other, then they are likely to be within a close geographic region.

**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.

**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:** EREC G59 is called "Recommendations for the Connection of Generating Plant to the Distribution Systems of Licensed Distribution Network Operators." The purpose of the document is to provide guidance to you and to DNOs on all aspects of the connection process.

**Engineering Recommendation (EREC) G83:** EREC G83 is called "Recommendations for the Connection of Type Tested Small-scale Embedded Generators (Up to 16 A per Phase) in Parallel with Low-Voltage Distribution Systems." It sets out the requirements you must meet before your generating unit can be connected to the network. The document is aimed at the manufacturers and installers of your generating unit.

**Feed-in Tariffs (FITs):** 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. Is a synonym of a generation set as defined in the Distribution Code.

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

# Glossary of Terms

**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 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.

**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.

**Small-Scale Embedded Generation (SSEG):** A source of electrical energy and all associated interface equipment, rated up to and including 16 A per phase, single or multi phase 230/400 V AC and designed to operate in parallel with a public low voltage distribution network. In EREC G98 this is referred to as a Micro-generator.

**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.

**Synchronous Power Generating Module (SPGM):** An indivisible set of Generating Units—ie one or more units which cannot operate independently of each other—which generate electrical energy in synchronism.

**System Operator:** responsible for balancing demand with generation on a second by second basis. National Grid Electricity Transmission (NGET) 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 G83, G98, G59 or G99. Using type tested equipment simplifies the connection and commissioning process.